PUBLIC REQUEST TO ADDRESS
THE BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES, CALIFORNIA

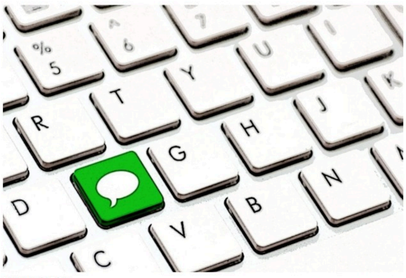
Correspondence Received

			The following individuals submitted comments on agenda item:	
Agenda #	**Relate To**	**Position**	**Name**	**Comments**
6.		**Favor**	Aura Vazquez	signalscv.com/2024/10/aura-vasquez-an-energy-solution-for-california/
			Robert Corona	
		Oppose	Jacqueline Ayer	
			Jacqueline Ayer	
			Jacqueline Ayer	
			Jacqueline Ayer	
			Jacqueline Ayer	
			Jacqueline Ayer	
			Ruthie Brock	
		Item Total	**9**	
Grand Total			**9**	

As of: 10/28/2024 3:00:05 PM

Aura Vasquez | An Energy Solution for California

SIGNAL CONTRIBUTOR OCTOBER 9, 2024 11:59 AM



Letters to the Editor

California is no stranger to the imminent threat of brownouts and blackouts – especially in the hot summer months. In L.A. County, which has a population of nearly 10 million people, it is easy for the grid to become strained. During instances of peak energy demand, we have had to turn to gas-fired plants to alleviate some of the strain on our grid, causing pollution to spew into impacted communities across the Los Angeles region. So, what is the solution?

Battery energy storage systems help enable the use of renewables by storing energy to be used when the wind is not blowing, the sun is not shining, or there are increased demands to the grid.

Near Acton, Hecate Grid's proposed Humidor BESS, a 400-megawatt and 1,200-megawatt-hour project, would connect to the grid at the existing Vincent Substation. Located on disturbed land, away from residential neighborhoods, Humidor would be an essential enhancement to the Vincent Substation, reducing congestion at this vital location on the grid while maximizing the ability for renewable energy to be delivered to homes and businesses.

Humidor will incorporate proven BESS technology, large buffer zones and comprehensive safety plans to ensure community-friendly operations. The investment in Humidor will stimulate the local economy through tax revenue, job creation and indirect spending. Additionally, Hecate Grid and Humidor have committed to providing $100,000 annually to support community initiatives in Acton.

Sited at an important location to existing infrastructure, Humidor will help scale the utilization of energy from solar and other cost-effective renewable sources generated in the Central Valley for delivery throughout the Los Angeles region. Without storage capabilities, renewable energy generation is limited as generation is curtailed during times of grid congestion. Humidor will help improve reliability system-wide, particularly during the hottest hours of the year.

BESS technology is not new and has been successfully deployed in a variety of environments across the U.S. Hecate Grid is committed to ensuring safety risks are mitigated and is working closely with the L.A. County Fire Department to meet and exceed code requirements at the Humidor site. Site-specific emergency response plans will be developed in tandem with local emergency responders, and annual trainings will ensure that the responders are knowledgeable on the project equipment.

Constant, 24/7 monitoring will facilitate immediate incident response, and the technology is designed to contain incidents to the module level and isolate the issue. Historical data shows battery storage projects have an increasingly low probability of resulting in safety incidents.

Lastly, this project would invest in the Acton and L.A. County economy. Approximately 100 union jobs will be created during construction. Once construction is complete, Humidor will employ two to four individuals to their maintenance staff, along with a 24/7 remote operations team. Additionally, the project will bring in substantial tax benefits to Los Angeles County, generating an estimated $2 million annually in tax revenue throughout the project's life.

Humidor aligns perfectly with California's commitment to resilience, sustainability and prosperity. It strengthens the grid during peak times, facilitates the use of renewables that may otherwise be curtailed and boosts the economy in Acton and L.A. County.

Aura Vasquez

Former commissioner, L.A. Department of Water and Power

Los Angeles

Signal Contributor

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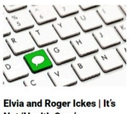

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IBEW Local Union Number 11

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, AFL-CIO

ROBERT CORONA, BUSINESS MANAGER/FINANCIAL SECRETARY

The Honorable Lindsey Horvath
Chair, Los Angeles County Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

September 11, 2024

Dear Chair Horvath and Board Supervisors:

This letter is written on behalf of the International Brotherhood of Electrical Workers Local Union 11 in support of Hecate Grid's Humidor Battery Energy Storage System, located in Los Angeles County in the unincorporated Acton area, and their franchise agreement.

The IBEW Local Union 11 represents more than 12,000 local electricians, communications and systems installers, transportation systems journeyman, civil service electricians, apprentices, construction wireman and construction electricians. We are the dynamic voice of the electrical construction industry in Los Angeles. We work with business, labor, community and environmental organizations as well as clergy and those who are working towards making a better Los Angeles, including Hecate Grid.

Hecate Grid's Project Humidor, and others like it, help enable the use of renewable energy and lessen the strain on the energy grid. Additionally, they have many positive impacts to the community during both construction and throughout future operation.

During construction, the project will create 100 valuable, skilled union construction jobs in the clean energy industry. These are good paying, family-sustaining jobs that anchor Los Angeles' union families and provide economic activity throughout the supply chain.

This project will also bring significant economic benefits to the town of Acton and to the Los Angeles County area through tax revenue.

I urge you to continue to support Hecate Grid's Humidor Battery Energy Storage System and grant them their franchise agreement.

Sincerely,

Robert Corona
Business Manager/Financial Secretary

RC/bcm opeiu#537 afl-cio

SAVE OUR RURAL TOWN

October 27, 2024

The Honorable Kathryn Barger
Supervisor, 5th District
The Los Angeles County Board of Supervisors
500 West Temple Street, Room 869
Los Angeles, CA 90012

Transmission of 99 pages and 29 attachments to:
Kathryn@bos.lacounty.gov
PublicHearing@bos.lacounty.gov
dharrison@counsel.lacounty.gov
mpestrella@dpw.lacounty.gov

Subject: Save Our Rural Town's Protest of Proposed Franchise Agreement to Hecate Grid Humidor Storage 1, LLC.

References: Letter from the Department of Public Works to the Los Angeles County Board of Supervisors Dated October 8, 2024 and Titled "Transportation Core Service Area Resolution of Intention and Introduction of an Ordinance to Grant a Proprietary Electrical Transmission Franchise to Hecate Grid Humidor Storage 1 LLC Within the Angeles Forest Highway and Vincent View Road in The Unincorporated Acton Area of The County Of Los Angeles.

Agenda for the October 29, 2024 Board of Supervisor's Meeting

Dear Supervisor Barger;

Save Our Rural Town (SORT) hereby tenders this formal protest of the proposed Ordinance granting "Hecate Grid Humidor Storage 1 LLC" (Hecate) a Proprietary Electrical Transmission Franchise; this protest is filed in accordance with Section 6234 of the California Public Utilities Code and includes the following comments setting forth our objections to the Franchise. This protest is also being filed to satisfy the statutory requirements imposed by Section 21083.3(f) of the California Public Resources Code (the CEQA Statute). Accordingly, SORT respectfully requests that you enter this protest and attending attachments as evidence of participation in the Public Hearing that will be convened on October 29, 2024 for the Humidor Franchise Ordinance.

INTRODUCTION

The purpose of the hearing scheduled for October 29, 2024 is for the Los Angeles County Board of Supervisors to consider granting a proprietary electrical transmission franchise for the construction and operation of a new 230 kV transmission line that will connect a new Battery Energy Storage System (BESS) to the existing Vincent Transmission Substation which is located in the rural unincorporated Community of Acton and is owned and operated by Southern California Edison (SCE). The BESS facility is approximately one mile from the Vincent substation connection point at the 230 kV switchrack located on the south side of the Vincent substation. The BESS and the transmission line will be owned and operated by "Hecate Grid Humidor Storage 1 LLC" (Hecate); the BESS facility is referred to herein as the "Humidor Transmission BESS" or "Humidor BESS" and the 230 kV transmission line is referred to herein as the "Humidor Transmission Line". Together, they comprise the "Humidor Project". For the purposes of this letter, the term "Humidor Project" refers to the "Humidor Project as a whole" and includes both the Humidor Transmission BESS and the Humidor Transmission Line.

The Humidor Transmission BESS was approved by the Department of Regional Planning (Regional Planning) on August 1, 2024 via a ministerial "Site Plan" review; according to the approved Site Plan, the Humidor Transmission BESS is a 544 MW battery storage facility[1] that will serve the California Transmission Grid via the 230 kV Humidor Transmission Line (see Attachment 1). The approved Site Plan authorizes construction of the Humidor BESS on property that has a "Light Industrial IL" Land Use designation under the County General Plan (General Plan) and the Antelope Valley Area Plan (AV Area Plan) and has a "Light Industrial M-1" zoning designation under the County Zoning Code.

On October 8, 2024, the Board approved a "Resolution of Intention" to grant the Franchise Ordinance and contemporaneously adopted a finding that the Franchise Ordinance is exempt from environmental review under the California Environmental Quality Act (CEQA); this is the second "Resolution of Intention" and CEQA exemption finding that the Board has adopted for the Franchise Ordinance. The first "Resolution of Intention" and CEQA exemption finding was adopted by the Board on January 10, 2023 and pursuant thereto, a public hearing was scheduled for February 14, 2023 to formally approve the Franchise Ordinance in accordance with Procedures set forth in the California Public Utilities Code. However, and for reasons that have never been disclosed, the February 14 public hearing was not convened. What is known is that substantive concerns were raised in public comments submitted prior to the scheduled hearing date; the primary concerns were that 1) The DPW is required to conduct an

[1] The Site Plan states that the Humidor BESS includes 440 battery storage containers that are each 1,236 kW (which is 1.236 megawatts); accordingly, the capacity of the Humidor BESS is 544 MW (440 containers x 1.236 MW/container = 543.84 MW).

environmental analysis of the Franchise Ordinance because the Humidor Transmission Line that is authorized by the Franchise Ordinance is not eligible for any "Categorical Exemptions" under CEQA; and 2) Because CEQA requires every environmental analysis to address the project as a "whole", the environmental impact analysis that is prepared for the Humidor Transmission Line pursuant to CEQA must also address the Humidor Transmission BESS because the Humidor Transmission BESS and the Humidor Transmission Line are two integral components of the single "Humidor Project".

With the new "Resolution of Intention" adopted on October 8, it appears that the Board is again moving forward with the Franchise Ordinance after a 21 month "pause"; the reasons for this renewed effort are set forth in a letter from the Department of Public Works (DPW) to the Board of Supervisors dated October 8, 2024 (which is referenced above and referred to hereafter as the "Board Letter"). In the Board Letter, DPW claims that the Franchise Ordinance is exempt from CEQA as both a "stand alone" activity and as a broader activity that incorporates the Humidor Transmission BESS. Specifically, DPW claims that, as a "stand alone" activity, the Franchise Ordinance is categorically exempt from CEQA because it meets the criteria set forth in Sections 15301, 15303, 15304, 15305, and 15311 of the CEQA Guidelines and Classes 1, 3, 4, 5, and 11 of the County Environmental Document Reporting Procedures and Guidelines. DPW also claims that the Franchise Ordinance in combination with the approved Humidor BESS Site Plan is, "as a whole", categorically exempt from CEQA because these combined actions meet the criteria set forth in Sections 15303, 15304, and 15305 of the CEQA Guidelines and Classes 3, 4, and 5 of the County's Environmental Document Reporting Procedures and Guidelines. DPW further claims that the combined Franchise Ordinance and approved Humidor BESS Site Plan are statutorily exempt from CEQA under Section 21083.3 of the California Public Resources Code and Section 15183 of the CEQA Guidelines. These provisions authorize streamlined environmental review for projects that are consistent with adopted General Plans and Community Plans if Environmental Impact Reports (EIRs) were certified for these Plans; they also authorize a statutory exemption from CEQA if all the environmental effects which are peculiar to the project or the project location were addressed as significant environmental impacts in the certified IERs. To support its claimed CEQA exemptions, DPW attached a 189 page "Statement of Reasons for Exemption" to the Board Letter (referred to hereafter as "Enclosure C"). Given that the Board did adopt a finding on October 8 which states that the Franchise Ordinance is exempt from CEQA, it appears that the Board agreed with all of DPW's claimed CEQA exemptions.

SORT has analyzed DPW's October 8 letter and accompanying "Enclosure C" and found numerous and substantial deficiencies therein. Our analysis demonstrates that the claims made regarding the Humidor Project's exemptions from CEQA, its environmental impacts, its consistency with adopted Plans, and its consistency with the Zoning Code are not supported by substantial evidence; in fact, these claims are controverted by substantial evidence. Because there is no substantial evidence to

support the Board's finding that the Franchise Ordinance is exempt from CEQA, the finding itself is invalid; therefore, the Board cannot adopt the Franchise Ordinance until a legally sufficient CEQA document is prepared.

Following a few preliminary comments, SORT's analysis of DPW's letter to the Board is presented in detail over the following pages and in attachments that attend this letter. First, SORT addresses the Humidor Transmission BESS component of the Humidor Project; specifically, we show that Regional Planning's ministerial Site Plan approval is inconsistent with the Zoning Code, the General Plan, and the AV Area and we demonstrate that there is no substantial evidence to support any of Regional Planning's justifications for approving the Humidor BESS. Next, we address the Categorical Exemptions that DPW alleges are applicable to the Humidor Project, and we show how these exemptions do not apply and are in fact barred by CEQA. Next, we address the Statutory Exemption that is alleged to apply to the Humidor Project and we show how the claims upon which DPW relies to support this alleged statutory exemption are not supported by substantial evidence. Finally, we describe the action that must be taken to ensure the Humidor Project complies with CEQA and we present substantial evidence pertaining to the significant environmental impacts that will result from the Humidor Project along with detailed technical information showing why these impacts will occur.

PRELIMINARY COMMENTS

SORT notes that DPW's 189 page "Statement of Reasons for Exemption" was not posted or publicly available until October 4; this has given the public very little time to review it, assess it, and provide meaningful comments before the October 29 Public Hearing date. SORT worked as quickly as possible to prepare substantive and comprehensive comments, but the effort still took a considerable amount of time. We had hoped to submit comments well before the October 29 deadline but unfortunately, that was not possible due to the amount of work involved in preparing them; therefore, these comments could not be submitted until the weekend before the hearing.

The analysis provided herein was prepared by Jacqueline Ayer, Director of Save Our Rural Town. Ms. Ayer is a certified environmental engineer and has 38 years of environmental engineering experience involving environmental impact analyses; air toxics assessments; air emission testing, modeling, and control; land use; noise analyses; and other areas of environmental concern. For nearly 20 years, Ms. Ayer has actively participated in both adjudicatory and quasi-legislative proceedings involving electrical transmission projects before the California Public Utilities Commission, the Federal Energy Regulatory Commission, the Department of Energy, and the California Energy Commission. This participation has included the submission of extensive expert witness testimony, briefs, and comments regarding the design, configuration, and need for proposed electrical transmission projects and their alternatives. Ms. Ayer has a Bachelor's Degree in Physics from Vassar College and a Master's Degree in Mechanical Engineering from the University of California at Berkeley. Accordingly, the comments

provided herein are not "lay opinion"; rather, they constitute "substantial evidence" as that term is defined by the CEQA Statute [California Public Resources Code §21080(e)(1)] and CEQA Guidelines [California Code of Regulations Section 15064(f)(5)].

THE MINISTERIAL APPROVAL OF THE HUMIDOR TRANSMISSION BESS LACKS EVIDENTIARY BASIS AND VIOLATES THE COUNTY CODE, COUNTY GENERAL PLAN, AND ANTELOPE VALLEY AREA PLAN.

In April, 2021, Hecate submitted application materials to Regional Planning for approval of the Humidor BESS on property in Acton that is zoned partly as "Light Industrial" and partly as "Agricultural"; six months later (on October 18, 2021), Regional Planning adopted "Zoning Ordinance Interpretation No. 2021-03" which declared that *all* BESS facilities are "similar" to Electrical Distribution Substations and would therefore be subject to development standards applicable to "Electrical Distribution Substations" (see Attachment 2). "Zoning Ordinance Interpretation No. 2021-03" draws no distinction between massive "transmission BESS" projects that connect to the regional transmission grid (like Humidor) and small "distribution BESS" projects that connect to local electrical distribution systems and very small private BESS that do not connect to any grid. Regional Planning did not publicize "Interpretation 2021-03" when it was released and insofar as SORT has been able to determine, no members of the public were aware of it. Regional Planning then applied the provisions of "Zoning Ordinance Interpretation No. 2021-03" to the Humidor Transmission BESS, found it to be "similar" to an "Electrical Distribution Substation", and declared that it should be ministerially approved with just a Site Plan because "Electrical Distribution Substations" are ministerially permitted in the "Light Industrial M-1" zone.

On August 8, 2022, Regional Planning ministerially approved the Humidor BESS Site Plan; this approval was issued without notice or hearing, and it authorized Hecate to proceed with securing building permits and constructing the Humidor Transmission BESS facility. Acton residents learned of the approval and "Zoning Ordinance Interpretation No. 2021-03" on January 9, 2023 when the approved site plan was released to the public. Upon reviewing the Site Plan, residents immediately noticed that the approval was issued in error because the Site Plan showed that much of the Humidor Transmission BESS facility impermissibly extended into the Agriculturally zoned portions of the project site. These concerns were conveyed to Regional Planning on January 11, 2023 and shortly thereafter, Regional Planning rescinded the approval. On August 1, 2023, Regional Planning again ministerially approved the Humidor BESS facility on the "Light Industrial M-1" zoned portion of the project site by citing "Zoning Ordinance Interpretation No. 2021-03" and concluding that the Humidor Transmission BESS was "similar" to an "Electrical Distribution Substation"; this time however, Regional Planning notified Acton residents regarding the approval and included a letter briefly explaining some of the reasons for the approval.

Regional Planning's ministerial approval of the Humidor Transmission BESS was legally deficient because:

- The "Similarity Determination" which Regional Planning made to ministerially approve the Humidor Transmission BESS directly controverts the Zoning Code.
- Regional Planning's approval of the Humidor Transmission BESS is inconsistent with the adopted General Plan and AV Area Plan.
- The Humidor Transmission BESS is not similar to an "Electrical Distribution Substation" and no substantial evidence supports Regional Planning's determination that it is.
- Regional Planning's "Zoning Ordinance Interpretation No. 2021-03" memo issued on October 18, 2021 is not supported by substantial evidence.
- Regional Planning's letter dated August 1, 2023 which explains why the Humidor Transmission BESS site plan was ministerially approved is not supported by substantial evidence.

Regional Planning's "Similarity" Determination for the Humidor Transmission BESS Facility Directly Controverts the Zoning Code.

The Los Angeles County Zoning Code is "prescriptive", meaning that uses which are expressly authorized by the Code are permitted within each development zone. Industrial uses are identified in Section 22.22.030 which lists all uses that are authorized in "Light Industrial M-1" zones as well as "Heavy Industrial M-1.25, M-2, and M-2.5" zones. As indicated in the relevant excerpts of Section 22.22.030 provided in Attachment 3, principal uses that are authorized in "Light" and "Heavy" industrial zones are identified in Subsection (C)(1); ministerial uses are designated with an "SPR" (meaning "Site Plan Review") and discretionary uses are designated with a "CUP" (meaning "Conditional Use Permit"). Importantly, neither a "BESS" nor a "Transmission BESS" are listed as ministerial or discretionary uses anywhere in Section 22.22.030(C). Nonetheless, Subsection (D) of Section 22.22.030 does authorize the approval of some industrial uses that are not listed in Section 22.22.030(C) under certain limited circumstances. Specifically, Section 22.22.030(D) establishes that any proposed industrial use which is not listed in the Zoning Code may be approved with a ministerial Site Plan Review within any "Heavy Industrial M-1.5 and M-2" zone if the proposed use is "similar" to a ministerial use that is listed in for the "Heavy Industrial M-1.5 and M-2" zones. In other words, the authorization granted by the Zoning Code to use a "similarity determination" to approve an unlisted industrial *use is expressly limited to* ***only*** *"Heavy Industrial" zones*; therefore, the Zoning Code *does not* authorize Regional Planning to ministerially approve *any* unlisted use in *any* "Light Industrial M-1" zone. Yet, that is precisely what Regional Planning did when it ministerially approved a Site Plan for the Humidor Transmission BESS. Accordingly, the "similarity" determination that was made to authorize the Humidor BESS on "Light Industrial M-1" land and the accompanying ministerial Site Plan approval that was issued by Regional Planning were in direct violation of the Zoning Code.

It is further observed that, because the Zoning Code does not identify "Transmission BESS" as a listed use authorized in the "Light Industrial" zone, "Transmission BESS" facilities like Humidor *are not* "Light Industrial" uses. Moreover, because the Zoning Code restricts the authorization of unlisted industrial uses like the Humidor Transmission BESS to only "Heavy Industrial" zones, the Humidor Transmission BESS is *by definition* a "Heavy Industrial" use.

Regional Planning Approval of the "Heavy Industrial" Humidor Transmission BESS on "Light Industrial" Land is Inconsistent with the General Plan and AV Area Plan.

Under the General Plan and the AV Area Plan, the Humidor BESS development site has a "Light Industrial IL" land use designation and can only be developed with the "Light Industrial" uses. However, the Humidor BESS is a "Heavy Industrial" use (as explained above); therefore, its approval on property with a "Light Industrial IL" land use designation is facially inconsistent with the General Plan and the AV Area Plan.

Regional Planning's Claim that the Humidor Transmission BESS is "Similar" to an "Electrical Distribution Substation" is Not Supported by Substantial Evidence.

SORT has conducted an extensive analysis of the Humidor BESS facility and also analyzed all the applicable Zoning Code provisions pertaining to "Electrical Distribution Substations" and concluded that there is no evidence which supports Regional Planning's conclusion that the Humidor Transmission BESS is "similar" to an "Electrical Distribution Substation". Details of this analysis are provided in Attachment 4; some of it is summarized here. For example, the Humidor BESS does not display *any* of the characteristics of an "Electrical Distribution Substation" as that term is defined in the Zoning Code[2]:

1) It is not "part of a system for the distribution of electric power"; rather, it is part of a system for transmitting wholesale electricity and the bulk transfer of power.
2) It does not receive electricity at a subtransmission voltage; rather, it receives electricity at a transmission voltage of 230 kV; and
3) It does not transform power down to a lower voltage and then distribute it for "general consumer use"; rather, it transforms power from Alternating Current (AC) 230 kV into Direct Current (DC) 34.5 kV power and then stores it onsite. In fact, the transformed DC power at the Humidor BESS could *never* be utilized for "distribution purposes" or "general consumer use" because distribution systems and consumers can only use AC power (typically at 12 kV).

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[2] The Zoning Code defines "Electrical Distribution Substation" as "A facility that contains an assembly of equipment that is part of a system for the distribution of electric power, where electric energy is received at a sub-transmission voltage and transformed to a lower voltage for distribution for general consumer use".

Equally important, none of the equipment identified in the approved Humidor BESS site plan are found at any Electrical Distribution Substations. For example, Electrical Distribution Substations *do not* have 230 kV transformers or 230 kV power lines because Electrical Distribution Substations operate at much lower voltages. Additionally, the circuit breakers, switchracks, connectors, busbars and other equipment operated at the Humidor BESS facility are not in any way similar to the equipment operated at an Electrical Distribution Substation because the Humidor equipment will have entirely different duty cycles and will be designed and constructed to meet entirely different standards (including NERC standards[3]). Finally, Electrical Distribution Substations only operate on "Alternating Current" (AC) and do not have "Direct Current" (DC) facilities; this is an enormous distinction because nearly the entire Humidor BESS facility operates on DC power, not AC power. Together these facts clearly prove that the Humidor Transmission BESS is nothing like an Electrical Distribution Substation and Regional Planning's claim to the contrary is not supported by *any* evidence, let alone *substantial* evidence.

Regional Planning's "Zoning Ordinance Interpretation No. 2021-03" Issued October 18, 2021 is Not Supported by Substantial Evidence.

"Zoning Ordinance Interpretation No. 2021-03" is bereft of technical detail and predominantly consists of a few superficial and unsupported statements that reveal an alarming lack of understanding regarding electrical transmission and distribution infrastructure. As explained in detail in Attachment 5; *none* of the statements presented in "Zoning Ordinance Interpretation No. 2021-03" are substantive or supported by fact. Equally important, substantial evidence directly controverts all the claims set forth in "Zoning Ordinance Interpretation No. 2021-03".

For example, "Zoning Ordinance Interpretation No. 2021-03" asserts "*The primary difference between Electrical Distribution Substations and Electrical Transmission Substations pertains to the conveyance of energy to users".* This statement is materially false. The critical difference between transmission and distribution substations *does not* hinge on "conveyance of energy to users". This fact is firmly established by numerous agencies including the Federal Energy Regulatory Commission (FERC) which has jurisdiction over transmission infrastructure but not distribution infrastructure. To distinguish between them, FERC has developed two "tests"[4] that

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[3] Because Transmission BESS facilities are part of the "Bulk Electrical System", they are subject to FERC jurisdiction and must comply with adopted NERC standards. https://www.nerc.com/pa/comp/guidance/CMEPPracticeGuidesDL/CMEP%20Practice%20Guide%20%20Application%20of%20the%20BES%20Definition%20to%20BESS%20and%20Hybrid%20Resources.pdf

[4] The "5 Factor Mansfield Test" was established in Opinion No. 454, 97 FERC ¶ 61,134 (2001); Opinion No. 454-A, 98 FERC ¶ 61,115 (2002). The "7 Factor Test" was established by FERC Order No. 888, FERC Stats. & Regs. ¶ 31,036 (1996) [at p. 402].

assess the fundamental characteristics of electrical facilities and determine whether they are "transmission" or "distribution": the "5 Factor Mansfield Test" and the "7 Factor Test". The criteria established by these tests does not include "*conveyance of energy to users"*.

Another unsupported statement in "Zoning Ordinance Interpretation No. 2021-03" is that "*BESS devices are similar in size, bulk, and use to Electrical Distribution Substations"*. There is no evidentiary basis for this claim because it is categorically false. Transmission BESS facilities can be enormous (for example, the Angeleno Transmission BESS proposed in East Acton is more than a mile long); in contrast, Electrical Distribution Substations are quite small (Acton's occupies less than 1.25 acres). Moreover, Transmission BESS facilities like Humidor are always bulky because they consist of many large "storage containers" of battery cells that are closely packed together (as shown in Figure 1). In contrast, Electrical Distribution Substations are low density facilities that are typically open air and have considerably less "bulk" than BESS (as shown in Figure 2). The reason Electrical Distribution Substations *are not* bulky is because they must maintain large separation distances between electrical equipment to prevent electrical faults. Finally, the sole purpose of a Transmission BESS is to collect and store high voltage (>200 kV) power when it is cheap and readily available on the transmission grid and then discharge it back onto the transmission grid when energy is expensive and less available. In contrast, Electrical Distribution Substations *never* put power onto any grid and instead continually accept power (at <200 kV) and route the power to distribution customers after transforming it to a lower voltage. In other words, and contrary to what Regional Planning's interpretation asserts, there are *no* similarities between a transmission BESS and an "Electrical Distribution Substation".

Figure 1: Humidor Transmission BESS Facility.

Source: Simulation provided by Hecate.

Figure 2: The Electrical Distribution Substation that serves the Community of Acton.

Source: Google Earth.

Other equally specious claims are embodied in "Zoning Ordinance Interpretation No. 2021-03" and, as explained in Attachment 5, they are all unsupported. Together, these factors demonstrate that the "Zoning Ordinance Interpretation No. 2021-03" is not supported by any substantial evidence.

The Regional Planning Letter Dated August 1, 2023 Explaining the Ministerial Humidor Transmission BESS Approval is Not Supported by Substantial Evidence.

SORT has analyzed the letter from Regional Planning dated August 1, 2024 (provided in Attachment 6) which explains why Regional Planning ministerially approved the Humidor Transmission BESS facility. This analysis (the results of which are presented in Attachment 7) reveals that the claims and arguments presented by Regional Planning lack factual basis and are even contrary to adopted transmission tariffs and FERC Orders. In short, nothing in Regional Planning's letter is supported by substantial evidence. However, the letter does acknowledge on the first page that BESS "is not expressly listed as an allowed use in the Zoning Code". This statement is both correct and critically important. As explained above, the fact that BESS facilities are not listed as permitted uses in the Zoning Code" is the entire foundation for the analyses discussed above which demonstrates that Regional Planning's ministerial approval the Humidor Transmission BESS as a "Light Industrial" use was inconsistent with the Zoning Code, the General Plan, and the AV Area Plan.

DPW'S CONCLUSION THAT THE HUMIDOR PROJECT IS EXEMPT FROM CEQA IS BASED ON A FLAWED PROJECT DESCRIPTION.

On October 8, 2024, the Board found that the granting of the Humidor Franchise Agreement is exempt from CEQA; this finding is based on the project description that DPW provided on page 4 of the referenced Board Letter which states that the Humidor Project "as a whole" consists of the granting of a Franchise Agreement for the Humidor Transmission Line and a site plan that was previously approved for the Humidor BESS. This arguably trifling description presents the Humidor Project as nothing more than a "paperwork" exercise consisting merely of a legal agreement and a site plan approval. It is no wonder that the Humidor Project was found to be exempt from CEQA; after all, processing "paperwork" rarely results in significant environmental effects.

However, the Humidor Project is much more than "paperwork"; in fact, the Site Plan provided in Attachment 1 shows that the Humidor Project includes the construction and operation of 440 open-air battery energy storage containers and 220 inverter units that are interconnected, coupled together and placed on individual concrete pads as "BESS blocks". According to the scale on the Site Plan, each "BESS block" is approximately 140 feet long and occupies about the same footprint as a 1,400 square foot house; there are 110 of these "BESS blocks" and collectively, they occupy more than *460,000 square feet*. Additionally, the Humidor BESS includes the construction and operation of a large, open air 230 kV electrical facility including high voltage transformers, switchracks, circuit breakers, and busbars. These, together with the access roads, ancillary block walls, fire protection buffers, and transmission line (which is nearly a mile long and includes one or more power line structures that are higher than 80 feet[5]), occupy nearly 20 acres; the Humidor Project is akin to a major subdivision that creates 110 residential lots each having 1,400 square foot homes! *There is no doubt* that the scope, scale, and extent of the Humidor Project is substantial, and it is certainly more significant than the mere "paperwork" project that DPW describes.

Nonetheless, DPW trivializes the scope and scale of the Humidor Project and has even inaccurately describes each of the 440 enormous Humidor battery containers as nothing more than small battery "cabinets" that are no larger than "commercial freezers"[6]. The Humidor BESS Site Plan reveals these statements to be categorically false because it shows that each of the 440 battery containers that will be constructed is at least 20 times larger than a typical "commercial freezer"[7]. Additionally, the site plan reveals

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5 To comply with "ground clearance" requirements imposed by the California Public Utilities Commission, transmission lines with voltages exceeding 200 kV are typically higher than 100 feet and are never less than 80 feet high.

6 Referenced Board Letter, Enclosure C. Page 3.

7 A typical "commercial freezer" is less than 6 feet high, 6 feet wide, and 3 feet deep. See for example https://www.kitchenall.com/coldline-t-2fe-54-solid-door-commercial-reach-in-freezer-stainless-steel.html.

that each battery container will have a capacity of 1.236 megawatts (MW) which means that the *actual* capacity of the Humidor BESS is 544 MW[8] even though the Board and the public have been repeatedly told that the Humidor BESS capacity is only 400 MW[9]. To put this in perspective, the 544 MW capacity of the Humidor BESS is sufficient to serve 476,000 homes[10] and 1.375 million residents[11] *which is nearly 15% of the entire population of Los Angeles County*[12]. In other words, the Humidor Project is *not* a minor electrical facility comprised of some small battery "cabinets" that are the size of a commercial freezer; to the contrary, it is a massive and substantial energy project with a generation capacity that can serve the energy needs of a large portion of the County's entire population. Contrary to DPW's characterization of the Humidor Project, it is not merely a "paperwork" project; it is a massive project that will result in numerous and significant environmental effects and is not exempt from CEQA.

DPW'S CLAIMED CATEGORICAL EXEMPTIONS FOR THE HUMIDOR TRANSMISSION LINE ARE INVALID BECAUSE THE TRANSMISSION LINE CANNOT BE CONSIDERED IN ISOLATION.

DPW claims on page 3 of Enclosure C in the Board Letter that the Franchise Ordinance is exempt from CEQA pursuant to Sections 15301, 15303, 15304, 15305, and 15311 of the CEQA Guidelines. However, the Franchise Ordinance is just one part of a larger project and CEQA requires that all components of the "whole" project be considered together; therefore, the Franchise Ordinance cannot be considered as an individual action for the purposes of CEQA despite DPW claims. Specifically, CEQA requires the Board to address the "whole" of the project to prevent an impermissible "piecemeal" review in which a project is chopped into smaller parts that individually undergo ministerial permit review but which cumulatively pose significant environmental consequences (*Planning & Conservation League v. Castaic Lake Water Agency* [2009] 180 Cal.App.4th 210, 235). "A narrow view of a project could result in the fallacy of division . . . that is, overlooking its cumulative impact by separately focusing on isolated parts of the whole" (*McQueen v. Bd. of Directors* [1988] 202 Cal.App.3d 1136, 1144; *City of Sacramento v. State Water Resources Control Bd.* [1992] 2 Cal.App.4th 960; *Lexington Hills Ass'n v. State* [1988] 200 Cal.App.3d 415; *City of Carmel- by the-Sea v. Board*

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8 (1.236 MW per container) x (440 containers) = 544 MW.

9 Referenced Board Letter, Enclosure C. Page 3.

10 According to the California Independent System Operator, 1 MW of power serves 750-1000 homes [see page 3 of Attachment 8]; the average value is therefore 875 homes/MW. 875 homes/MW x 544 MW = 476,000 homes.

11 The U.S. Census reports Los Angeles County has 2.89 residents per household. https://www.census.gov/quickfacts/fact/table/losangelescountycalifornia/PST045223 (2.89 residents per household x 476,000 households = 1,375,640 residents).

12 The U.S. Census reports Los Angeles County has 9,663,345 residents. Id. 1,375,640 residents served by the total capacity of the Humidor BESS ÷ 9,663,345 residents in Los Angeles County = 14.23% of Los Angeles County residents served by the total Humidor BESS capacity.

of Supervisors [1986] 183 Cal.App.3d 229). CEQA prevents evasive environmental reviews by defining "project" broadly and requiring that environmental considerations not be concealed by separately focusing on isolated parts and overlooking the cumulative effect of the whole of an action. (*Arviv Enterprises v. South Valley Area Planning Com*. [2002] 101 Cal.App.4th 1333, 1345–1351; *Nelson v. County of Kern* [2010] 190 Cal.App.4th 252, 268–270). Therefore, DPW's claim that the Franchise Ordinance is exempt from CEQA is irrelevant and the Board must accord it no weight.

DPW'S CLAIMED CATEGORICAL EXEMPTIONS FOR THE HUMIDOR PROJECT ARE INAPPLICABLE.

The Board Letter asserts that the Humidor Project "as a whole" is categorically exempt from CEQA and, citing CEQA Guidelines Section 15303, 15304, and 15305; it claims the Humidor Project qualifies for Class 3, Class 4, and Class 5 Categorical Exemptions. Close inspection of these Guidelines Sections reveals that the exemption criteria they establish are inapplicable to the scope and extent of the Humidor Project. Therefore, none of the Categorical Exemptions claimed by DPW are actually applicable to the Humidor Project.

The Class 3 Categorical Exemption: CEQA Guidelines Section 15303 establishes that only the following activities are eligible for a "Class 3" Categorical Exemption: 1) the construction of *limited* numbers of new, small facilities or structures; 2) the installation of *small* new equipment and facilities in small structures; and 3) the conversion of *existing* small structures from one use to another where only *minor modifications* are made in the exterior of the structure. Section 15303 provides examples of the minor, limited projects that are eligible for this exemption, and when constructed on legal parcels within non-urbanized areas like Acton; they include a single family dwelling and a second dwelling unit; a multi-family residential structure with four or less dwelling units; a store, motel, office, restaurant or similar structure not exceeding 2500 square feet; utilities that are required to serve these minor structures (i.e. water main, sewage, electrical, gas, and other utility extensions); and additional structures that are accessory to these minor, limited structures (i.e. garages, carports, patios, swimming pools, fences). It is clear from the plain language of Section 15303 that the application of a Class 3 exemption is tightly constrained to only small development projects involving very few structures and the limited utility infrastructure needed to support them. Accordingly, the Class 3 Exemption is facially inapplicable to the hundreds of large structures and transmission facilities that comprise the Humidor Project.

The sole basis for the claimed Class 3 Categorical Exemption is a consultant report prepared for Hecate by Stantec Consulting Services Inc. (Stantec). This report is provided at the end of Enclosure C of the Board Letter presents the following arguments on pages 4-7:

- The examples of Class 3 projects set forth in Section 15303 (i.e. a single family home, a 2,500 square foot commercial project, associated utilities. etc.) are merely "illustrative" and therefore not directly applicable.
- The Humidor BESS involves just "small scale equipment" and small "battery cabinets" and the Humidor Transmission Line will be primarily underground.
- The Project is in an industrial zone and adjacent to utilities, light industrial uses, and railroad infrastructure and it is outside of a "Significant Ecological Area".

These claims are at best inapposite and at worst, categorically false:

- The examples of Class 3 projects set forth in Section 15303 are not merely "illustrative"; to the contrary, Section 15303 expressly states that the examples establish the maximum number of structures that are allowed on any legal parcel; therefore, a development which establishes more structures than what is authorized by these examples is not eligible for the Class 3[13]. For commercial developments in non-urban areas like Acton, Section 15303 limits the Class 3 exemptions to projects that involve a single structure on a parcel of land if the structure is less than 2,500 square feet; these are not the circumstances surrounding the Humidor Project which involves hundreds of structures that occupy an area that is more than 460,000 square feet.
- The Humidor Project *does not* consist of "just small scale equipment" or small "battery cabinets"; the Humidor Site Plan clearly depicts a massive project involving 440 "shipping containers" full of large battery packs and extensive 230 kV facilities including a transmission line that is nearly a mile long.
- The fact that the Humidor Project is in an industrial zone or adjacent to a railway or not located in a Significant Ecological Area is irrelevant in determining that applicability of a Class 3 Categorial Exemption.

These facts controvert every claim made by DPW/Stantec to support the argument that the Humidor Project qualifies for a Class 3 exemption; they also clearly prove that the enormous scope and scale of the Humidor Project is ineligible for a Class 3 exemption. Moreover, the Courts have long held that Categorical Exemptions "operate as exceptions to CEQA" and must be "narrowly construed" and not "expanded beyond the reasonable scope of their statutory language". (*San Lorenzo Valley Community Advocates for Responsible Education v. San Lorenzo Valley* USD (2006) 139 Cal.App.4th, *Saint Ignatius Neighborhood Association v. City and County of San Francisco* (2022) 85

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[13] Section 15303 states "Class 3 consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. *The numbers of structures described in this section are the maximum allowable on any legal parcel*" (emphasis added).

Cal.App.5th). The application of a Class 3 Categorical Exemption to the massive Humidor Project constitutes a grotesque expansion of the statutory scope of Section 15303 which applies only to projects involving "limited numbers of new, small facilities or structures". Accordingly, the claim that the Humidor Project qualifies for a Class 3 Categorical Exemption will not withstand legal challenge.

The Class 4 Categorical Exemption: CEQA Guidelines Section 15304 establishes that the "Class 4" Categorical Exemption applies only to "minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes" and it provides the following examples of such projects: Grading on land with a slope of less than 10 percent, gardening or landscaping, filling of earth into previously excavated land, minor alterations to designated wildlife management areas or fish production facilities, minor temporary land uses, minor trenching and backfilling for surface restoration, maintenance dredging, the creation of bicycle lanes on existing rights-of-way, and fuel management activities. It is clear from the plain language of Section 15304 that the Class 4 exemption is tightly constrained to only temporary activities or *minor* land alterations such as *minor* trenching. However, the Humidor BESS will require *massive* trenching and excavation across the entire project site to construct footings and foundations for the 550 concrete pads that will support the battery "shipping containers" and inverter units; these footings and foundations will require pouring more than 38,000,000 pounds (or 19,200 tons) of concrete[14]. Additional ground disturbance activities include soil compaction across the entire 19+ acre BESS site, gravel deposition, road construction, and total grading activities exceeding 67 acres (because the project involves multiple passes – see page 157 of Enclosure C in the Board Letter). Accordingly, the massive and permanent land alterations that will result from Humidor BESS construction are facially inconsistent with the Class 4 Exemption limitations.

Nonetheless, DPW/Stantec asserts that the Class 4 Categorical Exemption applies to the Humidor Project[15] because:

- Portions of the Humidor Project are on relatively flat land and portions are on land with a 20% slope.
- The ground disturbance will be limited to trenching, grading and resurfacing/ restoring.

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[14] According to page 157 of Enclosure C in the Board Letter, the concrete needed to construct the 440 battery container and 110 inverter footings and foundations will require 12,802,233 pounds of water and the ratio of concrete:water for the footings and foundation is 1:0.5. Therefore, the Humidor project will require 25,604,466 pounds of concrete mix (12,802,233 x 2 = 25,604,466) and the total amount of concrete poured will be at least 38,406,699 pounds (25,604,466 + 12,802,233 = 38,406,699) or 19,203 tons.

[15] See page 8 of Appendix A of Enclosure C included in the referenced Board Letter.

- The Humidor Project does not remove any trees and the shrubs and junipers that will be removed by the project are not protected.
- The Humidor Project site is not within a scenic area and has no scenic resources; and, though the Antelope Valley Freeway is a scenic drive, views of the site from the freeway are obstructed by development.
- The Humidor Project site is not located within an earthquake fault zone, liquefaction zone, or landslide zone.
- The Humidor Project will not affect any wetlands and there are no natural bodies of water or aquatic features in the area.

SORT notes that a number of these claims are factually inaccurate. For instance, the "ground disturbance" resulting from the Humidor Project is not limited to just trenching and grading. Additionally, the Humidor BESS site is fully visible from the County-designated "Scenic Drive" along the 14 Freeway (as discussed in more detail below); therefore, it is in a "scenic area" and it will impair scenic views from a County designated "Scenic Drive". Equally importantly, the massive size and scope of the Humidor Project's trenching, grading, footings, pad construction, roads, and other significant "alterations in the condition of land" clearly controvert Stantec's/DPW's claim that the Humidor Project involves only minor alterations to land. Therefore, DPW's/Stantec's argument that a Class 4 CEQA exemption applies to the Humidor Project is not supported by substantial evidence (in fact, it is erroneous).

Furthermore, DPW/Stantec myopically considers the Class 4 exemption only in the context of the Project's grading, trenching, and vegetation removal activities and conveniently ignores all other Project activities which also create major "alterations in the condition of land" such as the permanent placement of massive "BESS blocks" of interconnected batteries and inverters and 230 kV facilities. The mere fact that a project involves grading or trenching and does not remove trees does not render it eligible for a Class 4 exemption; this is particularly true when, as here, the project results in other significant land alterations (such as constructing hundreds of battery storage containers, inverters, and transmission infrastructure that occupies 460,000 square feet). Moreover, Categorical Exemptions must be "narrowly construed" based on the plain statutory language (as explained above); accordingly, the Humidor Project is not a Class 4 project because its trenching, grading, soil compaction and footing installation activities are not "minor" and because it involves other activities which result in major "alterations in the condition of land". DPW's claim that the Class 4 Categorical Exemption applies to the Humidor Project improperly expands the scope of CEQA's statutory language and will not withstand judicial review.

The Class 5 Categorical Exemption: CEQA Guidelines Section 15305 establishes that the "Class 5" CEQA exemption applies to "minor alterations in land use limitations in areas with an average slope of less than 20% which do not result in any changes in land use or density" and it presents several examples: Minor lot line adjustments, side

yard variances, and set back variances that do not result in the creation of any new parcels; Minor encroachment permits; and Reversion to acreage. The Class 5 Categorical Exemption is unique in that it does not really address the *physical* aspects of a project; rather it addresses the *entitlement* aspects of a project and it applies only when a project proponent asks the Lead Agency to relax an adopted standard. Notably, Hecate has never asked the County to relax any planning or land use standards or revise any maps, so it is not clear how a Class 5 exemption is even applicable. Insofar as SORT is aware, Hecate has never applied for any setback or yard variances or requested any property line adjustments for the Humidor Project. Perhaps the Franchise Ordinance could be considered to be a form of an "encroachment permit" because it allows Hecate to construct facilities within County right of way, but the transmission line is certainly not a "minor encroachment" because it is nearly a mile long. In other words, there is no clear nexus between the Humidor Project and the scope of activities captured by the Class 5 Categorical Exemption; accordingly, a Class 5 exemption is not even applicable to the Humidor Project.

Nonetheless, DPW/Stantec makes the following claims to support an argument that the Humidor Project is eligible for a Class 5 Categorical Exemption[16]:

- The Humidor BESS facility is similar to an electrical distribution substation and transformer substation under the Zoning Code.
- Electrical distribution substations and transformer substations are permitted by right in the M-1 zone and subject to approval by a Site Plan Review.
- A Site Plan Review has been approved for the Humidor BESS.
- The southerly portion of the Project site is flat and the northerly portion is sloped with an average gradient of less than 20 percent.
- The Franchise ordinance will allow for the placement of electrical utility lines along an improved public road.
- The Franchise Ordinance will not result in any changes in land use but it will be a minor alteration in land use within an improved, generally flat roadway.

None of these factors involve a "minor alteration in land use limitations"; therefore, they fail to show how the Class 5 exemption category applies to the Humidor Project. In fact, these claims suggest that a Class 5 exemption *does not* apply because they reveal that the Humidor Project does not require *any* alterations in land use limitations (since it is claimed to be consistent with the zoning on the project site and requires only a site plan and Franchise Ordinance for approval). Accordingly, the Class 5 Categorical Exemption is inapplicable to the Humidor Project. And, even if it could be argued that the transmission line authorized by the Franchise Agreement is an "encroachment permit", it is certainly not a *minor* encroachment permit because of its size (nearly a mile long) and scope (it is a major transmission line operating at 230 kV). Therefore, the Humidor Project is not eligible for a Class 5 Categorical Exemption.

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[16] Pages 8 and 9 of Appendix A of Enclosure C included in the referenced Board Letter.

CEQA BARS THE BOARD FROM APPLYING ANY CATEGORICAL EXEMPTIONS TO THE HUMIDOR PROJECT.

CEQA bars the application of a Class 3, Class 4, or Class 5 Categorical Exemption to the Humidor Project if it meets the standards established for any of the five specific exceptions enumerated in CEQA Guidelines Section 15300.2. The Humidor Project encompasses the circumstances identified in at least three of these exceptions; therefore, Guidelines Section 15300.2 precludes the Board from relying on any of the claimed Categorical Exemptions to sidestep its CEQA obligation. These three exceptions are discussed in detail here.

The Location Exception: The "Location" exception established by 15300.2(a) specifically addresses where the project is located and it recognizes that a project which would not ordinarily have a significant impact on the environment may nonetheless result in significant impacts if it is placed in a "sensitive" location. The Location Exception precludes the application of certain Categorical Exemptions (including Class 3, Class 4, and Class 5) in locations where "the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies".

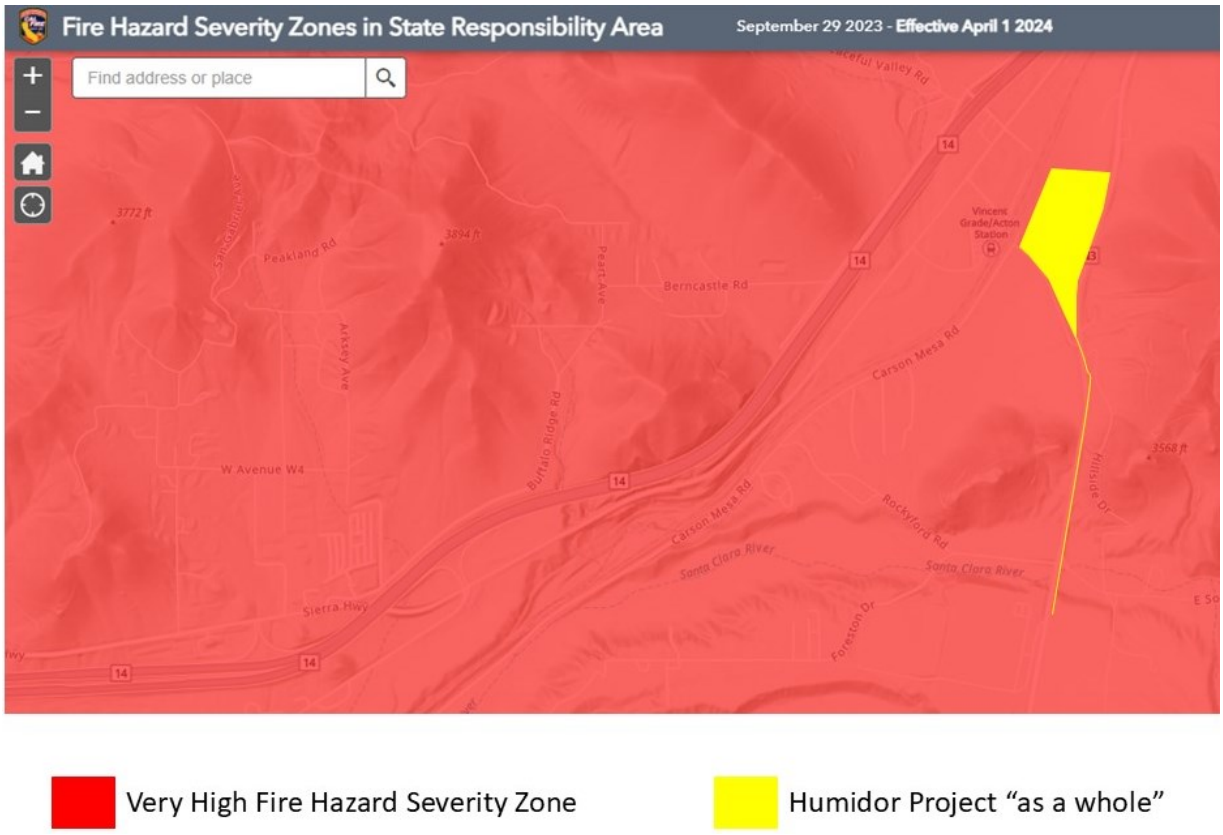
Berkeley Hills Watershed Coalition v. City of Berkeley (2019) 31 Cal.App.5th (*Berkeley Hills Watershed*) establishes the legal precedent for assessing the applicability of the "Location" exception which is contingent on the following:

- The precisely mapped environmental resource of hazardous concern must encompass an actual physical, environmental feature that has value or enhances the quality of human life.
- The determination of whether a project is located in a mapped "environmental resource of hazardous or critical concern" is based on the more deferential "substantial evidence" standard in which evidentiary conflicts are determined in the agency's favor;
- The determination of whether a project may impact the mapped environmental resource because of its location is based on a more lenient standard in which a project is deemed to pose potentially significant impacts if there is substantial evidence to support a fair argument that the impacts are possible.
- For the "Location" exception to apply, the project area must encompass environmental resources that are of hazardous or critical concern and the project must pose potentially significant effects to these resources.
- The "Location" exception does not apply in instances where the environmental resource of hazardous or critical concern poses a potentially significant effects on the project. For example, the construction of a single family dwelling unit in a mapped seismic area does not fall within the ambit of the "Location" exception because the seismic hazard resources are not affected by the presence of the dwelling unit.

The Humidor Project meets all of these criteria.

First, The Humidor Project is within and surrounded by a designated and precisely mapped Very High Fire Hazard Severity Zone (VHFHSZ)[17] which encompasses environmental resources of hazardous concern (see Figure 3). The statutory intent of the Fire Hazard Severity Zone Mapping program is to protect *resources* as well as life and property; this was clearly enumerated by the Legislature when they adopted Public Resources Code 4201[18]. Accordingly, the VHFHSZ designation applied to the area surrounding the Humidor Project reflects a substantial governmental interest in protecting resources in East Acton.

Figure 3. Proximity of Humidor Project Site to Very High Fire Hazard Severity Zone.



Source: https://osfm.fire.ca.gov/what-we-do/community-wildfire-preparedness-and-mitigation/fire-hazard-severity-zones

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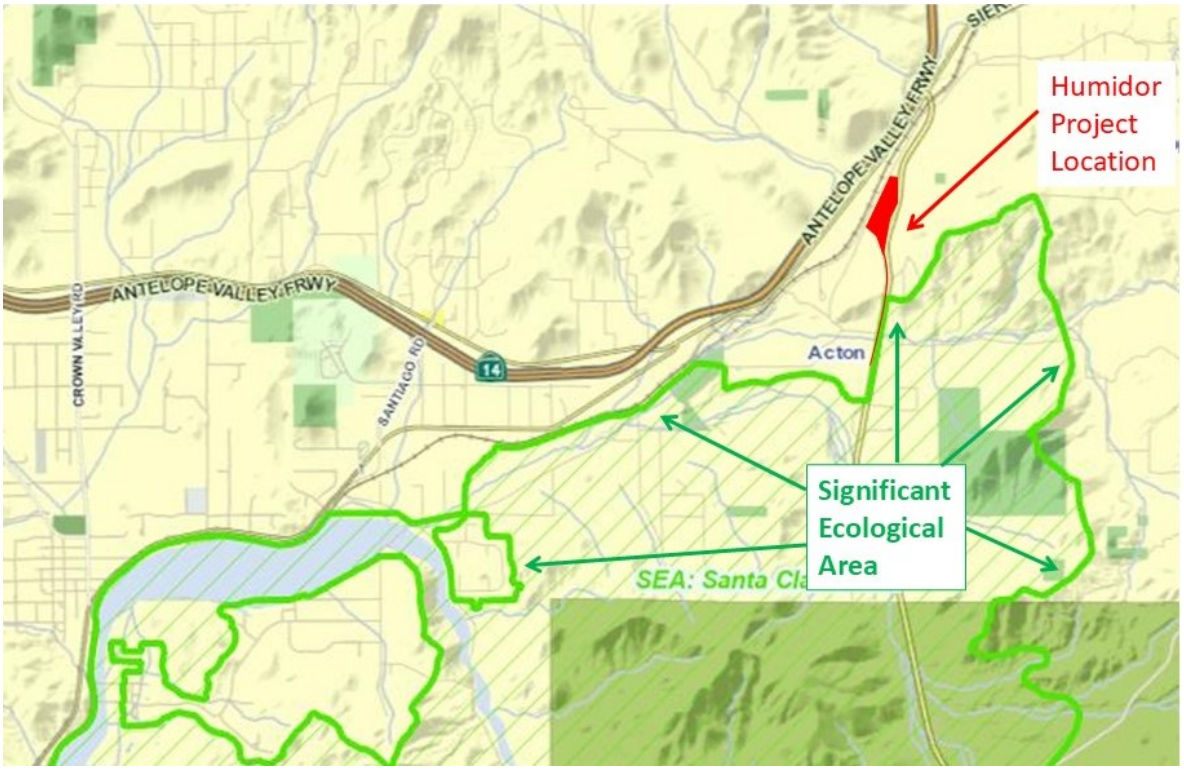
[17] Very High Fire Hazard Severity Zones are designated, precisely mapped, and officially adopted by The California Department of Forestry and Fire Protection pursuant to Sections 4201-4204 of the Public Resources Code.

[18] Public Resources Code Section 4201 states "The purpose of this article is to provide for the classification of lands within state responsibility areas in accordance with the severity of fire hazard present for the purpose of identifying measures to be taken to retard the rate of spreading and to reduce the potential intensity of uncontrolled fires ***that threaten to destroy resources, life, or property*** (emphasis added).

Second, the Humidor Project lies immediately adjacent to the precisely mapped Santa Clara River Significant Ecological Area (SEA – see Figure 4) which encompasses environmental resources of critical concern[19] including natural features, open spaces, and protected biological resources. The resources within the VHFHSZ and adjacent SEA are directly threatened by the Humidor Project's propensity to ignite, explode, and release toxic gases[20] because a wildfire triggered by a Humidor deflagration event will sweep through and destroy these environmental resources (particularly during "Santa Ana" conditions). Both the mapped VHFHSZ and the mapped SEA that surround the Humidor Project encompass resources of hazardous and critical concern in addition to extensive natural features which substantially enhance the quality of human life; therefore, the mapped "environmental resource of hazardous or critical concern" criteria imposed by *Berkeley Hills Watershed* is met and the "Location" exception precludes the Board from claiming a Categorical Exemption for the Humidor Project.

Figure 4. Proximity of the Humidor Project to a Significant Ecological Area.



Source: Regional Planning GIS System https://rpgis.isd.lacounty.gov/Html5Viewer/index.html?viewer=GISNET_Public.GIS-NET_Public

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19 Los Angeles County created the SEA program to protect unique resources and preserve biodiversity and it achieves these protections through implementation of Chapter 22.102 of the County Zoning Code.

20 The susceptibility of Transmission BESS to explode, ignite, and eject highly toxic gases is discussed in great detail below.

Third, the Humidor Project poses a significant risk to the environmental resources of hazardous concern that are mapped by CalFire because it has a propensity to explode, ignite, and emit toxic gases. The facts and evidence pertaining to the susceptibility of the Humidor Project to explosion, fire, and toxic release which are provided below constitute substantial evidence which support a fair argument that the Humidor Project may impact the resources mapped by CalFire; therefore, the "fair argument" standard imposed by *Berkeley Hills Watershed* is met.

Fourth, it is undisputable that critical resources are protected by the Significant Ecological Area that lies adjacent to the Humidor Project; it is also indisputable that these resources are threatened by the propensity of the Humidor BESS containers to explode, ignite, or release toxic gases. Therefore, the "fair argument" standard imposed by *Berkeley Hills Watershed* is again met.

Fifth, the "Location" exception applies to the Humidor Project because the Humidor Project poses a potentially significant effect on the mapped VHFHSZ and SEA that surround it; therefore, the final standard imposed by *Berkeley Hills Watershed* is met.

In accordance with *Berkeley Hills Watershed*, SORT has shown that the Categorical Exemption Exception established by 15300.2(a) applies to the Humidor Project; therefore, the Board is barred by CEQA from relying on Class 3, Class 4, or Class 5 exemptions to approve the Humidor Project.

Nonetheless, DPW insists that the Section 15300.2(a) Exception does not apply, and to support this position, DPW relies on a 19 page "Memo" that was prepared by Stantec and is included in Enclosure C in the Board Letter. This Memo asserts that there are no mapped environmental resources of hazardous or critical concern on the project site (see page 9). Stantec seems to have the mistaken impression that the "Location" Exception is constrained to only consider environmental resources on the project site; however, 15300.2(a) has no such constraint. The sole matter at issue in 15300.2(a) is whether the project may have a significant effect on a mapped environmental resource of hazardous or critical concern *regardless of the condition of the project site.* Moreover, Stantec is aware of CalFire's fire hazard severity zone maps because Stantec refers to them on page 10 of the Memo; therefore, Stantec's position must be that the fire zone maps are not indicative of "environmental resource of hazardous or critical concern". This position is erroneous for the reasons mentioned above (including the fact that the Legislature created the Fire Hazard Severity Zone Mapping program for the purpose of protecting *resources* as well as life and property). The Stantec Memo ignores all of this, and instead points out that the project site area has been previously developed, it merely supports "common plant species and vegetation communities", and does not function as a habitat linkage. None of these facts are relevant.

In short, the arguments presented by Stantec against application of 15300.2(a) to DPW's claimed Categorical Exemptions are inapposite and irrelevant.

The Significant Effect due to Unusual Circumstances Exception. The "Significant Effect" Exception established by 15300.2(c) precludes the application of any Categorical Exemptions to projects and activities where there is a reasonable possibility that the project or activity will have a significant effect on the environment due to unusual circumstances. This Exception acknowledges that unusual aspects of the project may cause a project to have a significant effect on the environment. In *Berkeley Hillside Preservation v. City of Berkeley* (2015) 60 Cal.4th 1086 (*Berkeley Hillside*) the Supreme Court established two alternative tests for assessing the validity of a claimed "unusual circumstance" exception; if either of these tests are met, the exception established by 15300.2(c) is applicable and no Class 3, Class 4, or Class 5 Categorical Exemptions can be claimed.

In the first test, an unusual circumstance is deemed to exist when the project "has some feature that distinguishes it from others in the exempt class, such as its size or location" and that the Exception applies if "there is a reasonable possibility of a significant effect due to that unusual circumstance". To meet the first test, there must be substantial evidence showing that the Humidor Project has features which distinguish it from projects within the Class 3, Class 4, and Class 5 exemption categories as well as substantial evidence supporting a fair argument that these distinguishing features may result in a significant effect.

The second test is based on a showing of "evidence that the project *will* have a significant environmental effect". To meet the second test, there must be convincing evidence that the Humidor Project will *indisputably* result in a significant environmental effect.

As shown below, the Humidor Project meets both these tests.

Test #1: *Does the Humidor BESS Project have features that distinguish it from other projects in the Class 3, Class 4, and Class 5 exemption categories and is there a reasonable possibility of a significant effect due to these distinguishing features?* YES. The Humidor Project will occupy nearly 20 acres in a rural residential area, it will include more than 100 "BESS Block" containers assemblies that are 10 feet high and 1,400 square feet in area, and also includes extensive high voltage electrical facilities (transformers, switch gear, busbars, etc.) that are connected via a new and lengthy 230 kV transmission line. Additionally, the "BESS Blocks" are prone to explosion, ignition, and toxic gas releases. The enormous size of the "whole" Humidor Project, its many large structures, its extensive high voltage transmission facilities, and its propensity to explode and ignite are all features that distinguish it from Class 3, Class 4, and Class 5 exempt projects and also create the reasonable possibility a significant effect:

- Class 3 projects only have a *limited* number of *small* structures and the Class 3 exemption provisions explicitly constrain the number of structures that are allowed on any legal parcel to the precise number that it prescribes. In rural areas like Acton, this means one small commercial structure that is 2,500 square feet or less on a single parcel or one single family home and a second dwelling unit on a single parcel or one duplex of no more than 4 dwelling units on a single parcel. These are not the characteristics of the Humidor Project which places hundreds of commercial structures on two parcels and occupies 460,000 square feet. And, unlike dwelling units and small commercial buildings, the Humidor BESS is prone to spontaneous explosions, fires and toxic gas release. These facts constitute substantial evidence that the Humidor Project is clearly distinguishable from Class 3 projects and they also support a fair argument that these distinguishing features of the Humidor Project may result in significant aesthetic, wildfire, and public safety effects. Accordingly, the Board is precluded from adopting a Class 3 exemption for the Humidor Project.

- Class 4 exempt projects only involve minor alterations to land such as grading, minor trenching when the surface is restored, and new landscaping. In contrast, the Humidor Project embodies massive and intense alterations to nearly 20 acres of land, extensive trenching in which the surface is not restored and is instead covered by roads, concrete pads, and hundreds of new structures that have the propensity to explode, ignite, and release toxic gases. These facts constitute substantial evidence that the Humidor Project is clearly distinguishable from other Class 4 projects and they also support a fair argument that these distinguishing features of the Humidor Project may result in significant aesthetic, wildfire, and public safety effects. Accordingly, the Board is precluded from adopting a Class 4 exemption for the Humidor Project.

- Class 5 exempt projects pertain only to minor alterations in land use limitations and do not involve any changes in land use. The Humidor Project does not involve any alterations in land use limitations but it does involve massive alterations to land use; these facts constitute substantial evidence that the Humidor Project is entirely distinguishable from other Class 5 projects and also support a fair argument that the Humidor Project's massive land alterations will result in in significant aesthetic, wildfire, and public safety effects. Accordingly, the Board is precluded from adopting a Class 5 exemption for the Humidor Project.

Because all the conditions of the first test established by *Berkeley Hillside* are met by the Humidor Project for the Class 3, Class 4, and Class 5 Categorical Exemptions claimed by DPW, the Board is barred by CEQA from adopting any Categorical Exemptions for the Humidor Project.

Test #2: *Will the Humidor BESS Project result in significant environmental effects?* YES. As discussed in detail below, the Humidor Project will indisputably result in significant noise and aesthetic impacts. Additionally, and as explained above, the project does not comply with land use patterns, Goals and Policies adopted by the General Plan and AV Area Plan; therefore, it will impliedly result in significant environmental effects. Because the Humidor Project meets the second test for validating the "Unusual Circumstance" Exception to the Class 3, Class 4, and Class 5 categorical exemptions claimed by DPW, the Board is barred by CEQA from adopting any Categorical Exemptions for the Humidor Project.

Additional instructions in *Berkeley Hillside* reveal further errors in DPW's assertion that the Humidor Project is eligible for Categorical Exemptions. For instance, in *Berkeley Hillside*, the Supreme Court held that "an agency may not apply a categorical exemption without considering evidence in its files of potentially significant effects, regardless of whether that evidence comes from its own investigation, the proponent's submissions, a project opponent, or some other source"; it is clear that the DPW has failed to comply with this directive because it has not considered *any* evidence provided by the public over the last 17 months pertaining to the numerous and significant adverse environmental effects that are posed by the Humidor Project[21].

The Supreme Court also observed in *Berkeley Hillside* that "In listing a class of projects as exempt, the Secretary has determined that the environmental changes typically associated with projects in that class are not significant effects within the meaning of CEQA, even though an argument might be made that they are potentially significant." The salient issue in this holding is that the project for which one or more Categorical Exemption are claimed *must comport with the conditions that are mandated by the claimed Categorical Exemptions*; this prevents Lead Agencies from claiming a Class 3 (small structure) exemption for a new 30 unit condominium development. DPW has failed to proceed in a manner that is consistent with this particular holding in *Berkeley Hillside* because, as explained, the Humidor Project is entirely inconsistent with every Categorical Exemption that DPW claims.

Additional case law supports SORT's showing that the Humidor Project is ineligible for a Class 3, Class 4, or Class 5 exemption because of the "Unusual Circumstance" Exception established by 15300.2(c). For instance, in *Azusa Land Reclamation Co. v. Main San Gabriel Basin Watermaster* (1997) 52 Cal. App. 4th, the Appellate Court held

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[21] The record shows that DPW has completely ignored all the evidence that SORT and members of the public have provided which demonstrate that the Humidor Project will result in numerous significant adverse effects on the environment; this is evident from the referenced Board Letter itself which does not even mention this evidence.

that the "unusual circumstance" standard is satisfied "where the circumstances of a particular project (i) differ from the general circumstances of the projects covered by a particular categorical exemption, and (ii) those circumstances create an environmental risk that does not exist for the general class of exempt projects." These are precisely the conditions presented by the Humidor Project: The Humidor Project's susceptibility to explosion, fire, and toxic gas releases is a circumstance that creates significant environmental risks which do not exist for the general class of projects within the Class 3, Class 4, and Class 5 exemption categories (which, in rural areas, are expressly limited to single family or duplex developments, commercial projects of less than 2,500 square feet, utility lines to support these limited developments, minor grading and landscaping activities, minor setbacks variances, and lot line adjustments).

Consistent with *Berkeley Hillside* , SORT has provided substantial evidence showing that "Unusual Circumstances" attend the Humidor Project because the Humidor Project exhibits numerous features that distinguish it entirely from other Class 3, Class 4, and Class 5 projects; we have also provided substantial evidence which supports a "fair argument" that the distinguishing features exhibited by the Humidor Project present a reasonable possibility of creating significant aesthetic, wildfire, and public safety effects. Therefore, SORT has met its burden to demonstrate that the "unusual circumstances" exception applies to the Humidor Project. *Berkeley Hillside* makes it clear that, "[E]ven if a proposed project faces no opposition, an agency invoking a categorical exemption may not simply ignore the unusual circumstances exception; it must 'consider the issue of significant effects . . . in determining whether the project is exempt from CEQA where there is some information or evidence in the record that the project might have a significant environmental effect'". DPW failed to comply with this directive and instead relied on the erroneous Stantec "Memo" which falsely claims that there is nothing unusual about the Humidor Project because it is a "small facility" which is "similar" to the "illustrative examples" of exempt projects described in the CEQA Guidelines. Nothing could be further from the truth. The Humidor Project is *not* small and it is *not* similar to the examples of exempt projects in the CEQA Guidelines.

The Stantec Memo also asserts that the Humidor Project's location in a VHFHSZ does not constitute an unusual circumstance because many areas are in a very high fire hazard severity zone. This assertion is baffling and appears to conflate the "Location" exception provisions set forth in 15300.2(a) with the "Unusual Circumstances" exception provisions set forth in 15300.2(c). Stantec fails to perceive the salient issue in *Berkeley Hillside*: namely, the "unusual circumstance" provision turns on whether the project has features that distinguish it from exempt classes of projects and does not depend on where the project is located. In other words, it is because the Humidor Project exhibits features that differ from Class 3, Class 4, and Class 5 exempt projects that the "unusual circumstance" exception applies, not because it is located in a VHFHSZ.

To shore up its argument that 15300.2(c) does not apply, Stantec devotes pages to describe the Humidor BESS safety measures that will be employed[22]; however, these arguments are all dicta and not relevant to the issue of whether the exception established in Guidelines Section 15300.2(c) applies. Worse yet, much of Stantec's irrelevant commentary is misleading and some is even patently false. For example, many of Stantec's claims are based on the reassurance that the Humidor BESS will be certified and comply with UL Test method 9540A; however (and as explained in more detail below), UL 9540A certification merely establishes that, when a BESS container *does* explode and catch fire, it may be less likely to ignite an adjacent container. UL9540A *proves* that BESS pose very real and very significant explosion and fire risks. Stantec also claims the Humidor BESS is "designed to prevent and mitigate any fire risk"; however, this claim is false because the intrinsic nature of lithium battery chemistry makes it *impossible* to design a lithium BESS that poses no fire risk.

Another troubling Stantec claim is that the toxicity of emissions released from the Humidor Project during a BESS fire event is "similar to that of other uses allowed at the site"; this statement is not supported by citations or corroborated by any facts. It is also *categorically false*. SORT has compiled a list of all the uses which are authorized on the "Light Industrial" zoning that underlies the Humidor Project (provided in Attachment 9). Inspection of this list reveals that, unlike BESS, *none* of the permitted uses are prone to spontaneous explosions and fires and *none* of them release thousands of pounds of toxic gases and affect the surrounding areas for miles when they ignite.

Another appalling example of how Stantec has misstated facts is found on page 15 which refers to a 2017 study on toxic gases[23]. Stantec states "UL9540A testing has shown that gases produced by a BESS fire are considered to be similar to other fire scenarios, such as a plastics fire, and can be treated with the same precautions as something like a sofa, mattress, or office fire". This statement is *categorically false* for several reasons. First, UL9540A only evaluates BESS fire and explosion characteristics[24] and does not assess gas characteristics; therefore, Stantec's claim that UL 9540A has shown anything related to "gases produced by a BESS fire" is patently untrue. Second, SORT has obtained a report published in 2017 which analyzed the toxicity of gases produced from small lithium battery cells and compared it to the toxicity of gases produced from a plastics fire (a copy is provided in Attachment 10); SORT believes that this is the report that Stantec cites. However, and contrary to what Stantec indicates, this 2017 study *never* tested any BESS systems. In fact, it only tested very small batteries (the largest battery cell that was tested was the size of a car battery). Third, the 2017 study completely

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[22] Pages 12-15 of the Stantec Memo appended to Enclosure C of the referenced Board Letter.

[23] The citation reads "DET NORSKE VERITAS (U.S.A., INC., Considerations for ESS Fire Safety, 2017, pp. 9-10"; no link is provided.

[24] https://www.ul.com/services/ul-9540a-test-method

contradicts Stantec's claim because it proves conclusively that *a burning lithium battery releases toxic gas concentrations that are 10 times higher than what is emitted from a plastics fire*. The data from this 2017 report is reproduced in Figure 5; it is important because it is *the concentration* of the toxic gas that makes it deadly, not the total amount released. When a burning BESS releases a cloud of high concentration hydrogen fluoride or hydrogen cyanide or other toxic compound, *it does not disperse*; rather it is carried into the surrounding area in a concentrated and therefore deadly state. This *fact* is demonstrated by dispersion modeling results that are presented in a later section.

Figure 5. Toxic gas concentrations released from a small lithium battery cell fire compared to the concentrations released from the combustion of plastic material of equal weight.

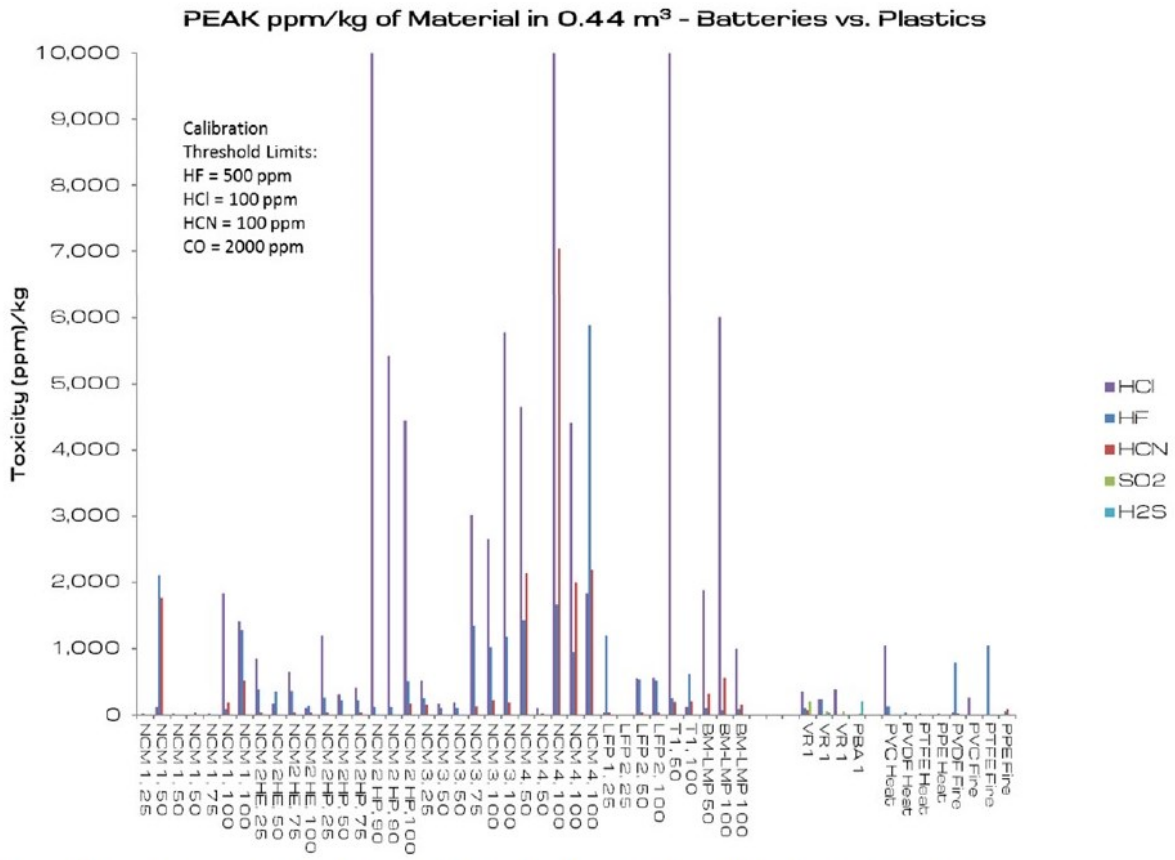

Figure 4 **Peak ppm per kg (in a 0.44 m³ volume) for all batteries tested as compared to plastics.**

Source: https://www.nyserda.ny.gov/-/media/Project/Nyserda/Files/Publications/Research/Energy-Storage/20170118-ConEd-NYSERDA-Battery-Testing-Report.pdf . This Report is provided in Attachment 10

Finally, Stantec grossly misrepresents the conclusions presented in the 2017 report. For instance, and contrary to what Stantec says, the report *does no*t state that BESS fires are "similar to other fire scenarios, such as a plastics fire, and can be treated with the same precautions as something like a sofa, mattress, or office fire". What it *does* state is that, on a weight basis, a *smoldering Li-ion battery* can be "treated with the same precautions as something like a sofa, mattress, or office fire in terms of toxicity". There is an *enormous* difference between a "smoldering lithium battery" cell and a massive BESS which contains millions of lithium battery cells; Stantec's misrepresentations ignores all of this. ***Nothing*** that Stantec says about the toxicity of BESS fires is true. Unfortunately, DPW has parroted everything that Stantec has said, which means that now the Board of Supervisors has an utterly false understanding of the toxicity characteristics of BESS fires. Stantec's deliberate misrepresentations are scandalous but Stantec is just a contractor and is therefore expected to "repackage" information in a manner that serves the interests of its client; Stantec has no duty to be accurate or honest. DPW's failure to independently verify Stantec's mendacities before parroting them to the Board is far more shameful; as the agency that is advising the Board in this matter, DPW has a substantial duty to ensure that what it reports to the Board is accurate and reliable. DPW has failed in this duty. Equally important, Stantec's and DPW's grotesque misrepresentations regarding the toxicity of BESS fires now call into question every statement and conclusion presented in the Board Letter.

The Cumulative Impact Exception. The "Cumulative Impact" exception established by 15300.2(b) precludes the Board from applying a Categorical Exemption to any project where "the cumulative impact of successive projects of the same type in the same place, over time is significant". This exception is relevant because the Humidor Project is just one of several BESS Projects slated for development in East Acton. For example, in addition to the 544 MW Humidor Project, there is the 1415+ MW Angeleno BESS and Transmission Line Project by Avantus Corporation; it is slated for development just southwest of the Humidor Project and will use lithium batteries and have the same type of large "block" configuration as the Humidor Project. The developer's description and location map are provided in Attachment 11 and show that the Angeleno BESS is more than a mile long and will occupy 6 parcels having a total of 80 acres[25]; all of the parcels are adjacent to the Santa Clara River SEA and one parcel is partially within the SEA. The Angeleno project is also adjacent to a designated scenic drive and it is wholly located within, and surrounded by, a VHFHSZ. Final purchase agreements[26] have been executed for all the parcels where the Angeleno BESS will be

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[25] The map states the project is only 68 acres, but the Regional Planning GIS system indicates that the parcels upon which the Angeleno BESS is sited (APNs 3056-017-007, 3056-017-021, 3056-017-020, 3056-019-013, 3056-019-037, and 3056-019-040) actually occupy 80.78 acres.

[26] When Avantus representatives presented the Angeleno Project to the Community of Acton on May 1, 2023, they stated that purchase contracts for these parcels had already been executed.

located; therefore, it is certain that this project will proceed. Additionally, Avantus has contacted numerous property owners in Acton to secure easements for the 500 kV transmission line that will connect the Angeleno BESS facility to the Vincent substation; these discussions remain ongoing. The Large Generator Interconnection Agreement signed by Avantus, SCE, and the California Independent System Operator (CAISO) states that the Angeleno Project will have a capacity of 1415 MW (see Attachment 12); this is more than the 1,150 MW capacity reported for the Angeleno Project on the CAISO website[27]. The difference is attributed to the fact that BESS facilities are always constructed with substantial storage reserves (typically more than 25%[28]). For example, Hecate has told DPW and the Board that the Humidor BESS is only 400 MW and it has told CAISO that the capacity is only 300 MW; however, the Humidor BESS site plan shows the actual capacity is 36% higher than what DPW was told and 81.7% higher than what CAISO reports.

There is also the Maathai BESS project by Hecate which is on a 40 acre parcel located south of the Humidor Project: it will utilize lithium batteries, it will have the same large "block" configuration as Humidor, and it will connect to the Vincent substation via the 230 kV Humidor Transmission line. The Maathai BESS is located within, and is surrounded by, a VHFHSZ and the Santa Clara River SEA. Given that Hecate has already purchased the property[29], it is certain that the Maathai project will proceed. SORT understands that the capacity of the Maathai Project will exceed 350 MW (though the CAISO website reports the capacity as only 250 MW).

The combined capacity of the Humidor, Angeleno, and Maathai BESS projects co-located in east Acton is *2,310 MW;* that is larger than any other generation facility in California (Diablo Canyon is only 2,250 MW and San Onofre was only 2,254 MW). Together, these projects will power more than 2,000,000 homes and serve nearly 6 million residents. *No community on the face of the earth is slated to have the amount of BESS facilities that are proposed in Acton*, and the cumulatively considerable

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[27] Line position 1625 of the CAISO Interconnection Report (also known as the "CAISO Interconnection Queue") https://www.caiso.com/documents/publicqueuereport.pdf .

[28] The 25% reserve capacity was clarified by Hecate during a community presentation in January, 2023 and affirmed by Avantus during a community presentation in May, 2023.

[29] Public records establish that Hecate acquired the property on October 17, 2023 by a deed which transfers the property to "33440 Angeles Forest Highway LLC"; the deed was mailed to 621 West Randolph Street, Suite 200, Chicago, Illinois 60661. This is the principal address of Hecate Grid LLC; therefore, Hecate has the deed. Additionally, "33440 Angeles Forest Highway LLC" is a corporation which, like many other corporations bearing the Hecate name, is registered in the State of Delaware; "Hecate Grid Maathai Storage 1 LLC" is just one of many Delaware-based Hecate businesses and all appear to have common addresses and control. "Hecate Grid Maathai Storage 1 LLC" is also a corporation registered in the State of California as a Delaware-based company. Relevant documents are provided in Attachment 13.

environmental, health, safety, and wildfire risks that these BESS pose to the Community are enormous and cannot be overstated. The Angeleno, and Maathai BESS are real, concrete projects that proponents have already discussed with the community and for which land acquisitions and CAISO interconnection studies have been prepared; therefore, they are "reasonably foreseeable". The Angeleno and Maathai BESS are "of the same type" as the Humidor BESS and will have the same large "block" configuration. They are also all "in the same place" as the Humidor BESS because they all surround the Vincent substation in the same area of East Acton, they are all within and adjacent to residential areas and SEA resources, and they all lie at the point where high winds originate in Acton during fire weather conditions (as discussed in more detail below). Therefore, the Cumulative Impact Exception applies to the Humidor Project and it precludes the Board from finding that the Humidor Project is categorically exempt.

There are also other BESS projects that other energy developers are looking to construct in east Acton. NextEra and Wellhead Electric are just two of several developers who have contacted property owners in East Acton to purchase their land. Additionally, SCE and other utilities are lobbying the California Public Utilities Commission to exert jurisdiction over all BESS permitting and SCE has asked for minimal review and permitting for BESS constructed on or near substation property they own[30]; if the CPUC grants this request, the 100+ acres of vacant land that SCE owns in east Acton can (and most certainly will) be utilized for transmission BESS development. These SCE lands are adjacent to the Humidor Project, they are adjacent to a designated scenic drive and the Santa Clara River SEA. and all of it is within a VHFHSZ. SORT estimates that SCE's vacant land holdings in East Acton are sufficient to accommodate up to two thousand MW of additional BESS facilities.

The BESS facilities slated for development in East Acton will cumulatively have significantly adverse aesthetic impacts; this fact is demonstrated in Figure 6 which provides "before and after" aerial photographs. The first aerial shows existing development conditions in East Acton along the 14 Freeway "Scenic Drive" and the second shows development conditions after the Humidor, Angeleno, Maathai, and SCE BESS are constructed. And, as explained in detail below, these BESS will not only result in cumulatively considerable aesthetic and noise impacts; they will also result in cumulatively considerable wildfire and public safety risks; the risk increases as more BESS containers are added. There is no question that the cumulative impacts of these "successive projects of the same type in the same place" is significant; therefore, the Humidor Project is not eligible for any Categorical Exemption.

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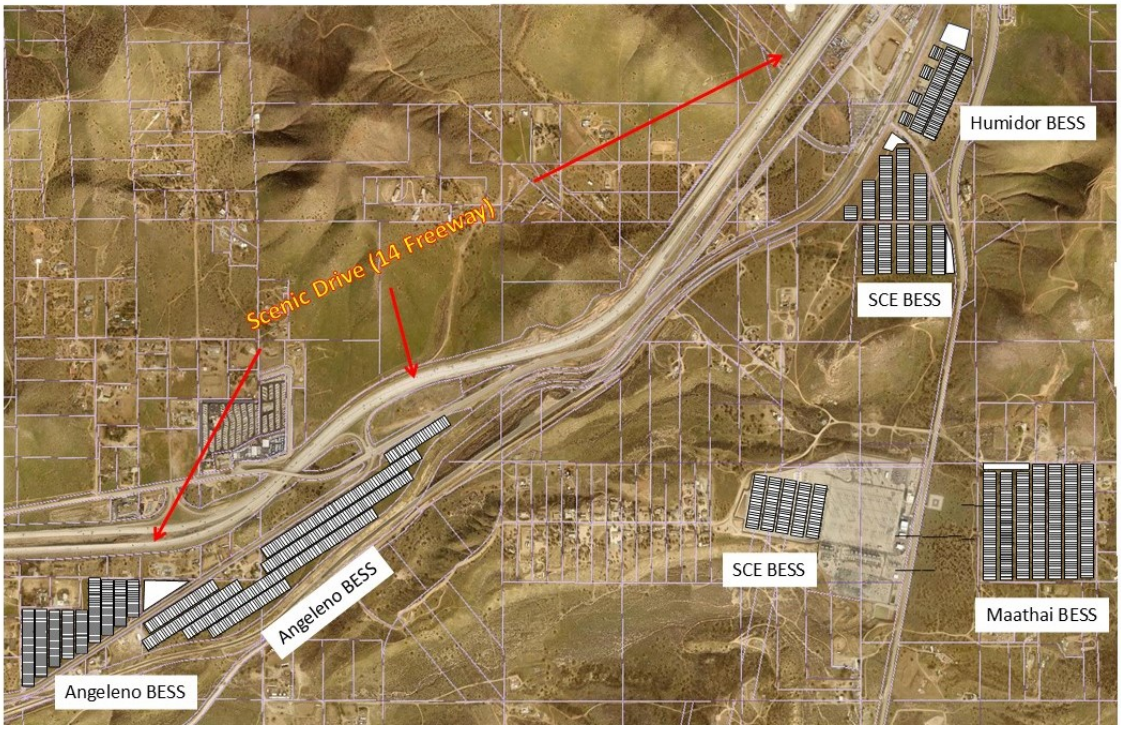
[30] In comments filed on July 1, 2024 in CPUC Proceeding R.23-05-018, SCE argued that utilities should be allowed to construct BESS on and near their substations without CPUC oversite or permitting; an excerpt is provided in Attachment 14; the full document can be found here: http://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=535053308

Figure 6. Before and After Aerial Simulations of What East Acton Will Look Like After the Humidor, Angeleno, Maathai, and SCE BESS Projects are Constructed.

Existing Conditions Along Scenic Drive

Cumulative Conditions Along Scenic Drive after BESS Projects are Constructed



Abundant case law supports SORT's contention that the "Cumulative Impact" Exception applies to the Humidor Project. For example, *Aptos Residents Association v. County of Santa Cruz* (2018) 20 Cal.App.5th (*Aptos*) establishes that a challenge to a Categorical Exemption which is brought under the "Cumulative Impact" exception must not be based on speculation regarding impacts that similar projects *could* create and instead must be based on actual evidence showing cumulative adverse impacts that similar projects *will* create. SORT has met this burden: Figure 6 proves that foreseeable BESS projects in East Acton will result in cumulative aesthetic impacts along a designated "Scenic Drive" which are clearly significant. Additionally, the information presented below also proves that these successive projects will compound the significant noise impacts and public safety and wildfire risks already posed by the Humidor Project. SORT has presented substantial evidence based on material facts that successive BESS projects are slated for development in Acton and that the cumulative impacts of these successive projects are significant; therefore, and consistent with *Aptos*, the Cumulative Impact Exception established by 15300.2(b) precludes the Board from finding that a CEQA Categorical Exemption applies to the Humidor Project.

Nonetheless the "Stantec Memo" claims that the Cumulative Exception does not apply because no "formal discussions" have commenced with the County for any projects other than Humidor; however, Stantec does not cite any legal precedent or policy or regulation which establishes that projects cannot be considered "foreseeable" until "formal discussions" with the County are convened (though SORT understands that County staff *have* had communications and interactions with Avantus regarding Angeleno and Hecate regarding Maathai). Moreover, the foreseeability of a project can be established by any number of factors such as the acquisition of specific property to accomplish the project, contractual agreements with public utilities and state-created organizations (such as CAISO), and public presentations by project developers. These are certainly the circumstances surrounding the Angeleno and Maathai BESS projects: developers have secured control over the lands where the Angeleno and Maathai BESS will be constructed, they have spent hundreds of thousands of dollars to complete required CAISO grid system studies and interconnection agreements, they have addressed the projects in community meetings, and they have affirmed an intent to proceed. Furthermore, BESS developments by SCE would probably not even involve "formal discussions" because (according to the County), SCE is not subject to County control. Therefore, SCE BESS facilities can certainly be deemed foreseeable even without any "formal discussion".

Stantec makes other claims that are equally insubstantial. For example, Stantec asserts that there is no evidence that the approval of future BESS projects would result in significant cumulative impacts. Stantec is incorrect. As explained in detail below, the Humidor BESS will individually result in significant noise and aesthetic impacts in East Acton; therefore, the significant impacts created by Humidor will become even more "cumulatively considerable" with each successive BESS development in East Acton.

Furthermore, the Humidor BESS has the potential to create significantly adverse wildfire and public safety impacts; this fact has been demonstrated repeatedly over the just last few months as evidenced by the numerous BESS fires that have occurred in Southern California which drove evacuations and forced residents into hiding to avoid toxic fumes and required emergency response personnel to remain onsite for days (and even weeks)[31]. Stantec also summarizes the CAISO interconnection process and provides statistics on CAISO's "Interconnection Queue", then argues that a BESS project is not foreseeable simply because it is identified in CAISO's "Interconnection Queue". However, this "strawman" argument lacks merit because SORT does not argue that a BESS project is foreseeable merely because it is listed on CAISO's "Interconnection Queue". What SORT *does* argue is that a BESS project is "reasonably foreseeable" if the energy developer has secured land for the project and/or executed agreements for the project and/or engaged the public and discussed it at community meetings; it is a dead certainty when, as here, energy developers have done all three.

THE HUMIDOR PROJECT IS INELIGIBLE FOR STREAMLINED ENVIRONMENTAL REVIEW OR A STATUTORY CEQA EXEMPTION.

Section 21083.3 of the CEQA Statute and CEQA Guidelines Section 15183 establish the following: 1) If a parcel is zoned to accommodate a project density and an Environmental Impact Report ("EIR") was certified for that zoning action, and if a project on the parcel is consistent with the zoning plan, then the project environmental review is limited only to significant effects that are peculiar to the parcel or to the project which were not addressed in the prior EIR; 2) If a project is consistent with adopted General Plan documents and EIRs were certified for these plans, the environmental review of the project is limited only to significant effects that are peculiar to the parcel or to the project which were not addressed the prior EIR; 3) Potentially significant off-site and cumulative project impacts must be analyzed if they were not discussed in the EIRs that were certified for adopted General Plan documents; and 4) an environmental effect is not considered peculiar to the parcel or to the project if uniformly applied development standards have been adopted pursuant to a finding that is made based on substantial evidence which establishes that the standards will substantially mitigate the environmental effect. Together, these provisions affirm that any project in unincorporated Los Angeles County which is consistent with adopted County General Plan documents and the County Zoning Ordinance is eligible for streamlined environmental review under CEQA Statute Section 21083.3 and CEQA Guidelines Section 15183; they also affirm that, under such circumstances a project is statutorily exempt from CEQA if all the environmental effects it creates were adequately addressed in EIRs certified for the adopted General Plan Documents.

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[31] The Otay Mesa BESS fire, the Santa Ana BESS fire, the SDG&E BESS fire, and the Sanborn BESS fire all occurred within a few months (though the latter did not result in any shelter in place orders because it is not located in a residential area). More information on these BESS fires is provided below.

As SORT demonstrates below, the Humidor Project does not meet the criteria for a streamlined environmental review or a statutory CEQA exemption under Section 21083.3 of the CEQA Statute or CEQA Guidelines Section 15183.

The Humidor Project is Not Consistent with the County General Plan or the Antelope Valley Area Plan.

Contrary to what DPW and Stantec assert, the Humidor Project is not consistent with either the County General Plan or the AV Area Plan.

The County General Plan: A core purpose of the General Plan is to accommodate "businesses and industries that represent the jobs of the future" [page 18] and protect employment opportunities provided by "industrial land use designation" (page 30). It also establishes that the objective of industrial land uses is to "accommodate target industries and attract high-paying jobs" (page 246). The Humidor Project does not achieve *any* of these purposes because it does not provide *any* employment opportunities (let alone "high paying" jobs). Instead, it will operate autonomously without staff or employees and will be controlled remotely by Hecate and CAISO operating hundreds of miles away. The entire Humidor Project will be expeditiously constructed using specialized, non-local electrical system installers and at most, it will provide a month of two of work for unskilled laborers. In other words, the Humidor Project does not provide *any* employment opportunities and so it is not consistent with any of the economic development and jobs/housing balance policies in the General Plan or the newly adopted Climate Action Plan. In fact, the Humidor Project controverts these policies because it eliminates an existing, permitted "paint ball" recreation facility that employs local residents and is locally owned and operated. DPW claims on page 84 of Enclosure C of the Board Letter that "Hecate-employed and contracted operational workforce would consist of locally contracted staff" but this claim is contradicted on page 4 which clarifies that *there is no "workforce"*; instead, there will only be brief maintenance visits by specialized technicians who will travel to the site once or twice per year. Because the Humidor Project fails to provide *any* employment opportunities and it eliminates a source of local employment, it explicitly contravenes the entire purpose of the underlying "light industrial" land use designation and directly controverts critical General Plan Policies including Policy LU 5.9 which preserves "industrially designated land for intensive, employment-based uses" (page 86) and Policy ED 5.9 which is to attract, retain, and expand industrial firms that "provide employment improvement opportunities for unskilled and semi-skilled workers" (page 249).

Furthermore, page 81 of the General Plan establishes that the purpose of the "IL" land use designation which underlies the Humidor Project site is "*Light Industrial, including light manufacturing, assembly, warehousing and distribution*"; however, the Humidor Project is none of these things: it is not manufacturing or assembly or warehousing or distribution. Therefore, the Humidor Project is facially inconsistent with the "IL" land

use established by the General Plan[32]. Equally important, the General Plan establishes that the purpose of the "IH" land use designation is "*Heavy industrial uses, including heavy manufacturing, refineries, and other labor and capital intensive industrial activities*"; given that the Humidor Project is a "capital intensive" use (because it will cost many hundreds of millions of dollars to construct[33]) it is a clearly a "Heavy Industrial" use under the General Plan.

Nothing about the Humidor Project is consistent with objectives or purposes established by the County General Plan; therefore, Section 21083.3 of the CEQA Statute *does not* apply and the Humidor Project *is not* statutorily exempt from CEQA. For reference, a copy of the County General Plan obtained from the Regional Planning website is provided in Attachment 15.

The Antelope Valley Area Plan: The AV Area Plan establishes fundamental tenets for development in the Antelope Valley to achieve its core purpose of ensuring land use patterns that maintain and enhance the rural character of unincorporated areas. Toward this end, the AV Area Plan adopts a robust "Rural Preservation Strategy" which, among other things, expressly establishes that the purpose of industrial zones in Rural Town Areas (which is where the Humidor Project is located) is solely to accommodate *existing* uses and "future uses *to serve local residents*" (emphasis added – see page LU-7). This purpose is also reiterated in the "Land Use Concepts" Element which states categorically that all "Light Industrial" land uses designated in Acton (including the Humidor Project site) were established to "acknowledge existing uses and to provide additional local employment opportunities" (pages COMM-4 to COMM-5). The Humidor Project is wholly inconsistent with *all* of these AV Area Plan provisions:

- The Humidor Project *does not serve* local residents because it *does not* provide any electrical service to any Acton residents; all the power it generates is conveyed to the CAISO-controlled grid and transmitted to either Northern California via 500 kV lines along "Path 26" or transmitted to the Los Angeles basin via 500 kV lines connected to the San Fernando and San Gabriel Valleys.

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[32] Under the rules of Statutory Construction, the canon *expressio unius est exclusio alterius* has force "when the items expressed are members of an 'associated group or series,' justifying the inference that items not mentioned were excluded by deliberate choice, not inadvertence." *Barnhart v. Peabody Coal Co.,* 537 U.S. 149, 168 (2003). These are the circumstances presented in the description of the purposes of industrial lands established by the General Plan.

[33] The site plan states the Humidor BESS will have 440 battery containers and each container will deliver 5,365 kWhr. According to a study published by the National Renewable Energy Laboratory, the capital cost of a utility scale BESS facility is $400/kWhr. "*Cost Projections for Utility-Scale Battery Storage: 2023 Update*" [https://www.nrel.gov/docs/fy23osti/85332.pdf]. Reconciling these facts indicates that the Humidor BESS will cost well over half a billion dollars.

- The Humidor Project does not provide *any* local employment opportunities (as explained in detail above).
- The Humidor BESS *is not* a "Light Industrial" use; in fact, it is an unequivocal "Heavy Industrial" use under the plain language of the General Plan.

Furthermore, the intensity, scope and extent of the Humidor Project is utterly contrary to rural development patterns in Acton; therefore, it controverts the core objective of the Rural Preservation Strategy which is to "preserve the rural character of the region" (page I7 of the AV Area Plan). This *fact* is proven by simply inspecting the list of developments that have been approved in Acton over the last 10 years (identified on pages 8-9 of "Enclosure C" included in the Board Letter); all of these uses "fit" into Acton's rural landscape because they are all very small, very limited, very low density and low intensity, appear to be community serving, and are, with few exceptions, either residentially-oriented or agriculturally-oriented. In contrast, the Humidor Project is a massive, high intensity, heavy industrial use that will not serve the Community of Acton in any way.

Nothing about the Humidor Project is consistent with the AV Area Plan; therefore, Section 21083.3 of the CEQA Statute *does not* apply and the Humidor Project *is not* statutorily exempt from CEQA. For reference, a copy of the Antelope Valley Area Plan obtained from the Regional Planning website is provided in Attachment 16.

These facts indisputably demonstrate that the Humidor Project is not consistent with the County General Plan or the AV Area Plan and that Regional Planning materially controverted both these plans when it ministerially approved the Humidor BESS Site Plan. Therefore, the Humidor Project is not eligible for the streamlined environmental review or the statutory CEQA exemption provided by Section 21083.3 of the CEQA Statute and Guidelines Section 15183.

The Humidor Project is Not Consistent with the County Zoning Code.

Chapter 22.22 of the County Zoning Code provides for the orderly placement of industrial uses in unincorporated areas to "achieve compatibility in the characteristics of their activities and processes in a manner that strives to be harmonious with surrounding community character and nearby sensitive uses" [Section 22.22.010]. The Zoning Code recognizes that industrial uses can be highly disruptive and are often significant sources of noise, odor, toxic emissions, and visual blight; it also recognizes that industrial which produce goods and provide employment opportunities are important and must therefore be accommodated [22.22.010]. To balance these factors, the Code establishes several industrial zones to accommodate the entire spectrum of industrial uses; these zones range from highly restrictive uses (referred to as "Light Industrial M-1" uses) to completely unrestricted uses (referred to as "Unclassified Industrial M-3" uses). At issue here are the uses permitted in the "Light IndustrialM-1"

zone because that is the only industrial zone in Acton. SORT has compiled a list of all the uses that are permitted in "Light M-1" zones (see Attachment 9) and an inspection of this list reveals that it *does not* include BESS facilities. Moreover, and as explained above, the Zoning Code does not permit the County to approve any use in any "Light Industrial M-1" zone unless it is expressly listed as a permitted use in the Zoning Code. Because the Humidor BESS was approved in the "Light Industrial M-1" zone and because the Zoning Code does not list BESS as a permitted use in the "Light Industrial M-1" zone, the Humidor Project *is not* consistent with the Zoning Code and in fact *violates* the Zoning Code. Therefore, the Humidor Project is not eligible for streamlined environmental review or a statutory CEQA exemption under Section 21083.3 of the CEQA Statute and Guidelines Section 15183.

CASE LAW DEMONSTRATES THAT THE HUMIDOR PROJECT IS INELIGIBLE FOR CONSIDERATION UNDER SECTION 21083.3 OF THE CEQA STATUTE AND CEQA GUIDELINES SECTION 15183.

Two recent court cases are instructive on the application of Section 21083.3 of the CEQA Statute and CEQA Guidelines Section 15183: *Lucas v. City of Pomona* (2023) 92 Cal.App.5th (*Lucas*) and *Hilltop Group, Inc. v. County of San Diego* (2024) 99 Cal.App.5th (*Hilltop*). These cases establish the criteria for applying the streamlined environmental review and statutory exemption provisions in CEQA Statute Section 21083.3 and CEQA Guidelines Section 15183; as explained below, both cases demonstrate that these CEQA provisions do not apply to the Humidor Project.

Lucas Reveals How CEQA Guidelines Section 15183 Does Not Apply to The Humidor Project.

In *Lucas*, the Appellate Court held that an Ordinance adopted by the City of Pomona which authorized six types of cannabis businesses was exempt from CEQA pursuant to CEQA Guidelines Section 15183 because the city approved the ordinance based in part on a "similarity determination" that the six types of cannabis businesses were "similar" to uses listed in the existing Pomona Zoning Code. Under the Pomona Zoning Code[34], the City Planning Director is authorized to approve *any* proposed use that is not listed in the Zoning Code if the Director finds that the proposed use is similar to an already listed use and adopts a "Determination of Similarity" for the proposed use. In addition to the "Determination of Similarity" for the proposed cannabis uses, the city also prepared a "Findings of Consistency" analysis for the Cannabis Ordinance which evaluated whether the cannabis uses authorized by the Ordinance were consistent with the findings of the EIR that was adopted in 2014 for the City's General Plan. This analysis concluded that the ordinance would not introduce new land use designations or result in new or increasingly severe environmental effects beyond those identified in the

[34] When *Lucas* was decided, applicable provisions of the Zoning Ordinance were in Section .501-A; however, the Ordinance was recently revised and renumbered, so applicable zoning provisions are now in Section 530.A.2. Relevant excerpts are provided in Attachment 17.

2014 EIR. The Appellate Court found that the City did not commit any legal error and it applied the deferential "substantial evidence" standard to conclude that the City acted according to the law and did not abuse its discretion by approving the Cannabis Ordinance based on the "Determination of Similarity" and "Findings of Consistency". The Court also found the City's "Determination of Similarity" constituted substantial evidence that is final and unassailable because plaintiff never challenged the "Determination of Similarity" before it was adopted. Finally, the Court concluded that, because the unchallenged "Determination of Similarity" supported the "Findings of Consistency" that the Cannabis Ordinance would not result in new or increasingly severe environmental effects beyond those identified in the General Plan EIR, the Cannabis Ordinance met the statutory exemption requirements under Section 15183.

The *Lucas* case turns on the City's "Determination of Similarity": Because the Pomona Zoning Code authorizes the city to approve any use not permitted by the Zoning Code if a detailed Determination of Similarity" analysis is prepared, and because the City prepared such an analysis, the Court found the City fully complied with the Zoning Code. And, because the "Determination of Similarity" was never challenged by plaintiff, its conclusions were deemed to constitute factual and substantial evidence supporting a finding that the project was consistent with the General Plan and its environmental effects were addressed in the General Plan EIR.

None of these circumstances apply to the Humidor Project. For instance, and as explained above, Regional Planning violated the Zoning Code when it issued a "similarity determination" declaring BESS to be "similar" to an electrical distribution substation and then ministerially approved the Humidor BESS as a "Light Industrial" project because the Zoning Code only authorizes such "similarity determinations" in "Heavy industrial M1.5 or M2" zones. Moreover, because the Humidor BESS is not a "Light Industrial" use and because it can only be lawfully approved in "Heavy Industrial" zones via a "similarity determination", it is, by definition, a "Heavy Industrial" use. The fact that Regional Planning approved this "Heavy Industrial" BESS use on land that has a "Light Industrial M-1" zoning designation and a "Light Industrial IL" land use designation proves that the Humidor Project is inconsistent with both the Zoning Code and adopted General Plan documents; therefore, it does not qualify for a statutory exemption under Section 15183. Furthermore, the "Zoning Ordinance Interpretation No. 2021-03" and the "similarity determination" that form the basis for Regional Planning's approval of the Humidor BESS Site Plan are not factual, they do not constitute substantial evidence, and they were challenged the moment that they were publicly disclosed[35] (as explained above). Application of these facts to the holdings in

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[35] The evidentiary record proves that the "Zoning Ordinance Interpretation No. 2021-03" and the Humidor BESS "Similarity Determination" were immediately challenged by the public as soon as their existence was disclosed in January, 2023. They are also being challenged in Court [Los Angeles Superior Court Case No. 23STCP03422].

Lucas clearly prove that the Humidor Project is not eligible for consideration under CEQA Guidelines Section 15183 because there is no substantial evidence showing that the Humidor Project is consistent with the Zoning Code or the General Plan or the AV Area Plan.

Hilltop **Shows that CEQA Guidelines Section 15183 Does Not Apply to The Humidor Project.**

Hilltop involves a recycling facility in unincorporated San Diego County that processes and recycles trees, logs, wood, construction debris, asphalt, and other inert material; this use is expressly authorized under the County's Zoning Ordinance in all "General Impact Industrial" zones, and under San Diego County's zoning and land use scheme, uses in "General Impact Industrial" zones are permitted on lands that have a "High Impact Industrial" Land Use designation. Because the project was slated for development on a 140 acre parcel in unincorporated San Diego County that had a "High Impact Industrial" Land Use designation, there was no dispute among parties that the project was authorized under the Zoning Ordinance and was a permitted land use under the County General Plan. On that basis, the County Planning Department found it was eligible for streamline environmental review under CEQA Guidelines Section 15183. Accordingly, the County prepared a "Guidelines Section 15183 Checklist" which found the project did not require any further environmental review because 1) there were no effects peculiar to the project or its site which the General Plan EIR failed to analyze as significant effects; (2) there were no potentially significant off-site and/or cumulative impacts which the EIR failed to evaluate; (3) there was no substantial new information that the Project would result in more severe environmental impacts than those anticipated by the EIR; and (4) the Project would undertake feasible mitigation measures specified in the EIR. Consistent with these findings, the Planning Department concluded that the project was consistent with the adopted General Plan and Zoning Ordinance, that it did not create any impacts that were not already addressed in the General Plan EIR, and that it was therefore statutorily exempt from CEQA. Nonetheless, the San Diego County Board of Supervisors denied the exemption. The applicant sued, and the Appellate Court ruled that the Project was indeed statutorily exempt from CEQA.

The fundamental conclusion from *Hilltop* is that a project is eligible for streamlined environmental review under CEQA Guidelines Section 15183 if it is an authorized use under the Zoning Code and its zoning designation under the Zoning Code matches the Land Use designation under the General Plan. *Hilltop* definitively establishes that, under such circumstances, all the requisite elements are met for the application of CEQA Guidelines Section 15183. However, these are not the circumstances embodied by the Humidor Project. As explained above, the General Plan and the AV Area Plan establish a "Light Industrial" land use designation on the Humidor BESS site, but under the Zoning Code, the Humidor BESS *is not* a "Light Industrial" use; in fact, its zoning designation is "Heavy Industrial". Accordingly, under *Hilltop*, Guidelines Section 15183

*does no*t apply to the Humidor Project; therefore, the Humidor Project *does not* qualify for streamlined environmental review and it is *certainly not* statutorily exempt from CEQA.

DPW'S CLAIM THAT THE HUMIDOR PROJECT IS STATUTORILY EXEMPT FROM CEQA IS NOT SUPPORTED BY SUBSTANTIAL EVIDENCE.

Despite the fact that the Humidor Project is inconsistent with the adopted General Plan, AV Area Plan, and Zoning Code, DPW nonetheless asserts that it is, and then invokes Section 21083.3 of the CEQA Statute and Section 15183 of the CEQA Guidelines to argue that the Humidor Project is statutorily exempt from CEQA. DPW's argument is based on the following claims:

1) The Humidor BESS is "consistent with the development density established by existing zoning, community plan, and general plan policies for which two EIRs were certified" (page 7 of Enclosure C in the Referenced Board Letter)**.**
2) There are no "project specific effects which are peculiar to the Project or its site" (page 7 of Enclosure C in the Referenced Board Letter).
3) There are no significant Project specific environmental effects that were not analyzed as significant in the General Plan or AV Area Plan EIRs (page 7 of Enclosure C in the Referenced Board Letter).
4) There are "no potentially significant off-site and/or cumulative impacts which the General Plan and AV Area Plan EIRs failed to evaluate" (pages 7- 8 of Enclosure C in the Referenced Board Letter).
5) There is "no substantial new information which results in more severe impacts than anticipated by the General Plan and AV Area Plan EIRs (page 10 of Enclosure C in the Referenced Board Letter).
6) All project specific effects "can be substantially mitigated by the imposition of uniformly applied development policies or standards (page 10 of Enclosure C in the Referenced Board Letter).
7) The Project is "consistent with the goals and policies of the General Plan and the AV Area Plan" (pages 10-84 of Enclosure C in the Referenced Board Letter).

SORT has analyzed each of these claims and found that *none* of them are supported by substantial evidence; therefore, the Humidor Project is not eligible for consideration under CEQA Statute Section 21083.3 or Guidelines Section 15183 and it is certainly not statutorily exempt from CEQA. The substantial evidence standard applies to DPW's claimed statutory exemption under Section 21083.3 and Section 15183 because both the *Lucas* Court and the *Hilltop* Court found that these CEQA provisions require an agency to examine whether a project's environmental effects were analyzed as significant impacts in a prior EIR. As set forth below, SORT's analysis demonstrates that these claims lack substantial evidentiary support; in fact, SORT's analysis demonstrates that substantial evidence *contradicts* all of these claims and proves that Section 21083.3 and Section 15183 do not apply to the Humidor Project.

The Claim that The Humidor Project is "Consistent With The Development Density Established By Existing Zoning, Community Plan, And General Plan Policies" is Not Supported by Substantial Evidence.

To support its claim that the Humidor Project is "consistent with the development density established by existing zoning, community plan, and general plan policies", DPW correctly asserts that "the Project site is designated as Light Industrial (IL)" by both plans and therefore can accommodate a use that is designated "Light Manufacturing M-1" by the Zoning Code. However, County then claims that the Humidor Transmission BESS is "a permitted use in the M-1 zone". This is categorically false because "BESS" is not a permitted use in the M-1 Zone under the Zoning Code (as explained above). In fact, Regional Planning has expressly affirmed this[36]. DPW attempts to shore up its claim that the Humidor Transmission BESS facility a permitted use in the "Light Industrial M-1" zone by pointing to "Zoning Ordinance Interpretation No. 2021-03"; however, this "Interpretation" is not supported by substantial evidence. In fact, Attachment 5 demonstrates that "Zoning Ordinance Interpretation No. 2021-03" is not supported by *any* evidence. Finally, DPW asserts (without support or citations) that Humidor BESS is a "by right" use on M-1 property and that it is treated as an "Electrical Distribution Substation" under the Zoning Code. However, and as explained above, Humidor BESS *is not* a "by right" use on M-1 property and the Zoning Code *does not* treat it as an "Electrical Distribution Substation".

It is further noted that the DPW's argument that the Humidor Project is consistent with the Development Density established by adopted County Plans is inapposite because "Development Density" provisions in these Plans pertain to residential developments (not industrial projects) and are characterized by the "number of dwelling units" allowed per acre. In fact, "development density" is addressed in only in a few sections of the General Plan[37] and the AV Area Plan[38] and it is always presented within the context of residential projects. Together, these facts prove that Section 21083.3 of the CEQA Statute *does not* apply to the Humidor Project and that the Humidor Project is neither eligible for streamlined environmental permitting nor a statutory exemption from CEQA.

The Claim "There are no Project Specific Effects Which Are Peculiar to the Humidor BESS Or Its Site" is Not Supported by Substantial Evidence.

As explained below, the Humidor BESS is prone to spontaneous explosion, deflagration, and toxic gas release; these are *not* characteristics that are shared by any "light

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[36] The Regional Planning Letter dated August 1, 2023 states that BESS is not "listed as an allowed use in the Zoning Code". A copy of the letter is provided in Attachment 6.

[37] "Density" and "development density" are only addressed in the "Housing", "Land Use", "Conservation and Natural Resources", and "Economic Development" General Plan Elements.

[38] "Density" and "development density" are only addressed in the AV Area Plan Land Use Element, the Community Specific Land Use Section, and the Plan Implementation Element.

industrial" use permitted by the Zoning Code[39]. Accordingly, the propensity of the Humidor BESS to explode and ignite presents a unique and adverse wildfire and public safety characteristic that is peculiar to the Humidor BESS. Additionally, the Humidor Project site is within and surrounded by a Very High Fire Hazard Severity Zone; therefore, the Humidor Project site has unique attributes that are peculiar to the project because they amplify the Humidor Project's wildfire and public safety effects. Together, these factors disprove DPW's claim that the Humidor Project does not present any "project specific effects which are peculiar to the humidor BESS or its site".

Nevertheless, DPW claims that "there are no project specific effects which are peculiar to the project or its site" and to support this claim, DPW asserts that the site is "comparable to other properties", it is zoned industrial, and it is developed with a commercial trucking parking lot, a paintball facility, and an electrical contractor staging/equipment yard. However, none of these assertions are dispositive. For instance, DPW's description of existing uses on the Humidor site does not constitute substantial evidence that the site does not have any peculiar features. And, though the project site is zoned "Light Industrial" the Humidor BESS is inconsistent with this zoning designation because it is a "Heavy Industrial" use; this fact alone constitutes a sufficiently "peculiar effect" to render the Humidor Project ineligible for consideration under Section 21083.3. Equally important, DPW fails to disclose numerous peculiar features of the site such as its location within a VHFHSZ and adjacent to a Significant Ecological Area and its proximity to major commuter corridors accommodating more than 110,000 travelers each day (including the 14 freeway, Sierra Highway, Angeles Forest Highway and the metrolink railway corridor). The latter is particularly important because a BESS fire at this Humidor location will force lengthy closures of these critical transportation pathways.

DPW goes on to claim that "BESS facilities have impacts similar to other common electrical facilities, such as distribution and transformer substations"; this statement is false because, unlike BESS, distribution and transformer substations do not experience a high incidence of explosions, deflagrations, and toxic gas emissions. Transformer fires do occasionally occur (in fact, one occurred at the Vincent substation[40]); however, such events are rare and do not occur at the high frequencies that plague BESS facilities. They also do not result in the release of toxic gases which threaten the wellbeing of people several miles from the site. Finally, DPW's claim that BESS facilities are "commonplace" gives the false impression that projects like Humidor are everywhere. Transmission BESS facilities like Humidor are not "commonplace"; in fact, Humidor is

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39 In Attachment 9 SORT has listed all the "Light Industrial" uses that are ministerially permitted in the M-1 Zone; none of these uses are known to be susceptible to spontaneous explosion, deflagration, or toxic gas release.

40 A 500 kV transformer caught fire at the Vincent Substation in 2003 and a large fire ensued; see highlighted portion of Attachment 18.

the *only* stand alone, CAISO grid-integrated BESS facility that the County has ever considered[41]. None of DPW's claims regarding the Humidor Project or the Humidor site are accurate or honest; more importantly, material facts regarding the Humidor Project and Humidor reveal DPW's assertion that "there are no project specific effects which are peculiar to the humidor BESS or its site" to be categorically false.

The Claim "There are No Significant Project Specific Environmental Effects of the Humidor BESS That Were Not Analyzed as Significant in the General Plan or AV Area Plan EIRs" is Not Supported by Substantial Evidence.

SORT has reviewed the Final EIRs certified for the County General Plan and the AV Area Plan and we note that both establish a "Light Industrial" land use designation on the Humidor BESS site and both required revisions made to the County Zoning Code to accommodate the new land use designations that were applied by these Plans (see for example pages 1-9 to 1-10 of the General Plan Draft EIR and page 3-10 of the AV Area Plan Draft EIR). Accordingly, the EIRs certified for both these Plans only considered the environmental effects of developing "Light Industrial" uses on the Humidor Project site; they did not consider the impacts of developing "Heavy Industrial" uses like the Humidor BESS. In fact, both the General Plan EIR and the AV Area Plan EIR draw clear distinctions between "Light Industrial" uses and "Heavy Industrial" uses and both recognize that "Heavy Industrial" uses have significantly greater environmental impacts[42]. In other words, DPW's claim is not supported by substantial evidence because neither the General Plan EIR nor the AV Area Plan EIR ever contemplated that the Humidor site would be developed with a "Heavy Industrial" use and they certainly did not analyze the environmental effects of this "Heavy Industrial" use on the site.

For instance, neither EIR assessed the significant public safety or wildfire effects of placing a "Heavy Industrial" BESS use which is prone to explosion, deflagration, and toxic gas release on a "Light Industrial" site that is within a designated VHFHSZ and adjacent to a designated SEA. Additionally, these EIRs never considered the significant noise effects resulting from the Humidor BESS's predominantly low frequency noise signature; in fact, the General Plan and AV Area Plan EIRs only considered noise effects through the lens of A-weighted frequencies and never considered BESS noise impacts

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[41] DPW identifies the County-approved battery storage projects on Page 9 of Enclosure C. None of the projects identified as "stand alone" are connected to the CAISO grid. For example, the CALD BESS is connected to an SCE distribution substation (the Calden substation).

[42] For example, the General Plan EIR recognizes that "heavy industrial" uses pose significantly higher noise/vibration impacts than "light industrial" uses; in fact, the General Plan EIR imposes a special mitigation measure on "heavy industrial" uses (like the Humidor BESS) which requires them to demonstrate that they will not generate vibration levels that affect surrounding uses (see Mitigation Measure N-5). The EIR prepared for the AV Area Plan also acknowledges concerns with industrial noise and vibration impacts and states "project-level review would be required as future developments are proposed" (page 5.2-57).

which predominate in the low frequency bands (as explained below). Furthermore, the General Plan and AV Area Plan EIRs never considered the significant aesthetic effects of placing a massive, high intensity "Heavy Industry" BESS facility on a parcel which is designated solely for "Light Industrial" uses that serve the community and provide local employment opportunities.

Nonetheless, DPW claims that "there are no significant project specific environmental effects of the Humidor BESS that were not analyzed as significant in the General Plan or AV Area Plan EIRs". The only evidence that the County provides to support this claim is something called a "15183 Exemption Checklist" which is an 84 page document found on pages 85-169 of "Enclosure C" in the referenced Board Letter. However, the "15183 Exemption Checklist" is not dispositive given that the Humidor Project is not eligible for consideration under Section 15183 *because it is not consistent with the Zoning Ordinance or adopted County Plans*. Nothing in the DPW's extensive letter addresses these inconsistencies or reconciles the fact that Regional Planning approved a "Heavy Industrial" BESS use on land that is only authorized for "Light Industrial" uses. Moreover, SORT has analyzed the County's "15183 Exemption Checklist" and found it to be rife with errors and inaccuracies (as explained in a separate section provided below); accordingly, the "15183 Exemption Checklist" does not constitute substantial evidence. Since the "15183 Exemption Checklist" is the only proof that the County offers to support its claim that "there are no significant project specific environmental effects of the Humidor BESS that were not analyzed as significant in the General Plan or AV Area Plan EIRs", this claim stands unsupported by the record. Therefore, Section 21083.3 of the CEQA Statute *does not* exempt the Humidor Project from CEQA.

The Claim "There are No Potentially Significant Off-Site Or Cumulative Impacts from the Humidor BESS which the General Plan and AV Area Plan EIRs Failed to Evaluate" is Not Supported by Substantial Evidence.

As the technical evidence provided below demonstrates, the Humidor Project will generate significant noise and aesthetic effects; these effects were never considered in the EIRs certified for the General Plan or the AV Area Plan because these EIRs never anticipated that a "Heavy Industrial" BESS use would be approved on the "Light Industrial" project site. Given that both aesthetic impacts and noise impacts are designated as "off-site impacts", it is a material fact that the Humidor Project will result in significant off-site impacts that were not addressed in the General Plan and AV Area Plan EIRS. Additionally, and as explained above, Humidor is just one of several BESS projects slated for development in East Acton which, collectively, will amplify the already significant public safety, wildfire, aesthetic, and noise impacts resulting from the Humidor Project. These cumulative impacts were also never considered in the General Plan and AV Plan EIRs. Accordingly, it is also a material fact that the Humidor Project will result in significant cumulative impacts which were not addressed in the General Plan and AV Area Plan EIRs.

Despite these material facts, DPW claims that "there are no potentially significant off-site and/or cumulative impacts from the Humidor BESS which the General Plan and AV Area Plan EIRs failed to evaluate", and to support this claim, DPW again points to the 84 page "15183 Exemption Checklist". However, and as explained above, the "15183 Exemption Checklist" is not dispositive, it is rife with errors and inaccuracies, and it does not constitute substantial evidence. DPW also lists 34 approvals issued by Regional Planning between 2014 and 2019 for small, individual residential and animal-related developments in Acton and claims these projects comprise the "past, present and reasonably foreseeable project in the vicinity of the Project area". This claim is *absurd*; putting aside the fact that a number of these minor projects are not located in East Acton, there is the problem that permits issued five to ten years ago for small accessory structures or animal rescue facilities which have already been built *do not* constitute evidence of "foreseeable projects". Accordingly, the "list" of small completed developments that DPW offers to support its claim that no cumulative impacts will result from the Humidor Project is not substantial evidence; in fact, it is not even evidence. More importantly, DPW's "list" omits all of the other major BESS facilities described above which are "reasonably foreseeable" and slated for development near the Humidor Project; in fact, at least one of these foreseeable BESS facilities (Maathai) will even use the same 230 kV transmission line as the Humidor BESS.

DPW argues that it is "difficult" to ascertain what additional BESS projects will be constructed near the Humidor BESS because CAISO will not release the information and because CAISO interconnection data is not reliable because there is "a high degree of attrition in the interconnect application process". DPW's anemic effort to identify reasonably foreseeable BESS facilities was limited to just reviewing general CAISO data pertaining to potential interconnections and thus concluded no more BESS facilities are foreseeable in East Acton. However, this conclusion is contradicted by substantial evidence obtained from non-CAISO sources; this evidence includes land records, executed contracts, developer presentations, utility briefings filed in CPUC Proceeding, and developer communications with Acton residents.

Moreover, substantial evidence provided below demonstrates that these foreseeable BESS projects will result in significant aesthetic, noise, public safety and wildfire impacts and that these impacts are cumulatively considerable. This substantial evidence conclusively demonstrates that significant cumulative impacts will result from the Humidor Project; the significant cumulative impacts from the Humidor Project were never considered in the EIRs that were certified for the General Plan and the AV Area Plan because these Plans did not anticipate a "Heavy Industrial" BESS on the "Light Industrial" Humidor Project site. Given these facts and evidence, it is indisputable that the Humidor Project is ineligible for consideration under Section 21083.3 of the CEQA Statute.

The Claim "There is No Substantial New Information Which Results in More Severe Impacts Created by the Humidor BESS Than What Was Anticipated by the General Plan and AV Area Plan EIRs" is Not Supported by Substantial Evidence.

Because the General Plan and AV Area Plan EIRs never considered any of the significant impacts created by the "Heavy Industry" Humidor Project placed in a "Light Industrial" zone, *all* of the information presented herein which shows the Humidor Project will result in significant environmental effects is "substantial new information" and it contradicts DPW's claim "there is no substantial new information which results in more severe impacts created by the Humidor BESS than what was anticipated by the General Plan and AV Area Plan EIRs". Moreover, because the General Plan and AV Area Plan EIRs were certified in 2015, neither of them considered the extensive and substantial "new information" that has been released over the last 9 years regarding the wildfire, public safety, and low frequency noise effects created by "Heavy Industry" transmission BESS uses. This information (discussed in detail below) constitutes "substantial new information which results in more severe impacts created by the Humidor BESS Than What Was Anticipated by the General Plan and AV Area Plan EIRs"; DPW acts contrary to law when it ignores this "substantial new information" and denies that it exists.

Nonetheless, DPW claims that no new substantial information exists and for support, DPW points to the "15183 Exemption Checklist" which (as explained above) is rife with errors and does not constitute substantial evidence. Accordingly, the claim that "there is no substantial new information which results in more severe impacts created by the Humidor BESS than what was anticipated by the General Plan and AV Area Plan EIRs" is baseless and insubstantial. Furthermore, "new and substantial" information provided herein proves the Humidor Project will result in much more severe impacts than what was anticipated by the General Plan and AV Area Plan EIRs; therefore, the Humidor Project is ineligible for consideration under Section 21083.3 of the CEQA Statute.

The Claim "All Project Specific Impacts Can Be Substantially Mitigated By The Imposition Of Uniformly Applied Development Policies Or Standards" is Not Supported by Substantial Evidence.

DPW argues that the Humidor Project does not require mitigation measures because it will not result in any significant environmental effects since it will comply with "uniformly adopted policies and standards"; these policies and standards include "applicant proposed measures" and "standard best management practices" and "applicable federal, state and local laws, regulations, ordinances and codes". DPW's argument fails for several reasons. For example, it embodies a post hoc logical error: just because the Humidor project complies with "uniformly adopted policies and standards" does not mean that it will not have significant environmental effects or require mitigation measures. Therefore, the mere fact that the Humidor Project will comply with uniformly adopted policies and standards does not constitute substantial evidence that the Humidor Project does not require mitigation.

More importantly, no "uniformly applied development policies or standards" are capable of substantially mitigating the project specific impacts of the Humidor Project. As discussed in detail below, the lithium chemistries employed by the Humidor BESS render it intrinsically susceptible to spontaneous deflagration, explosion, and toxic gas release; once an ignition event is initiated, it cannot be stopped. Therefore, *no standard or policy is capable of ameliorating this intrinsic characteristic or reducing its harm*. In fact, UL 9540A certification standards adopted for transmission BESS *expressly assume* that BESS containers *WILL* explode and/or ignite and when they do, they still "pass" and become certified and approved *as long as they do not ignite adjacent BESS containers*[43]. In the referenced Board letter, DPW devotes many pages to describing the standards that have been developed and are being developed in response to the public safety risks posed by BESS facilities; however, an analysis of these standards reveals that *they do not mitigate the risk*. For example, DPW claims that UL 9540A is a standard that mitigates BESS public safety and wildfire hazards [page 11 of Enclosure C], but UL 9540A does not mitigate or reduce BESS hazards; to the contrary, UL9540A affirms that BESS hazards are intrinsic and unavoidable. As another example, DPW asserts that compliance with "California Fire Code" standards will "ensure fire safe" operation of the Humidor BESS [page 167 of Enclosure C]. However, "California Fire Code" standards *do not* "ensure firesafe" BESS operations because BESS fires cannot be controlled or extinguished once ignition occurs (as discussed in more detail below). Another requirement that DPW cites is Public Utilities Code 761.3 [page 26 of Enclosure C]; however, Code 761.3 merely compels preparation of an emergency response plan which is only implemented *after* a BESS explodes/ignites. Therefore, Code 761.3 does not reduce the incidence of BESS explosions, fires, and gas releases.

It is indisputable that the standards and policies cited by DPW are reactionary in nature because they involve monitoring, alarm systems, and protocols which notify first responders *after* a BESS fire initiates; however, they *do not* make BESS facilities "firesafe" or "substantially reduce" the incidence of BESS fires. As proof of this, one need only realize that, over just a few months this year (from May to September), four different BESS facilities ignited in Southern California and caused substantial disruptions. Presumably, these facilities all complied with applicable standards and policies, yet they burned anyway. One facility (the Sanborn facility in the Antelope Valley which is the largest transmission BESS in the world) has actually ignited *four times* this year (see the fire incident reports provided in Attachment 19). Fortunately for the residents of Antelope Valley, the Sanborn BESS is not located in a fire hazard area or near any residential neighborhoods, so disruptions were minimal (though the events did tax local fire response resources).

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[43] Underwriters Laboratories ("UL") certification is the "gold standard" for BESS facilities and, as discussed in detail below, a BESS container is deemed to comply with UL standard 9540A if, when it explodes or ignites, it is less likely to cause adjacent BESS containers to explode or ignite.

Taken together, these facts demonstrate that the policies and standards cited by DPW do not substantially mitigate the fire risks and public safety impacts of the Humidor BESS; accordingly, there is no substantial evidence to support DPW's claim that "all project specific impacts can be substantially mitigated by the imposition of uniformly applied development policies or standards". Therefore, the Humidor Project is not eligible for consideration under Section 21083.3 of the CEQA Statute.

DPW's Claim that "The Humidor Project is Consistent With The Goals And Policies of the General Plan and the AV Area Plan" is Not Supported by Substantial Evidence.

DPW claims the Humidor Project is consistent with the General Plan and AV Area Plan and to support this claim, DPW provides two tables that are collectively 74 pages long and list every goal and policy in the General Plan and AV Area Plan. However, and for the reasons set forth in Attachment 20, these tables are *not* substantial evidence because 1) they embody numerous errors and misrepresentations; and 2) the few goals and policies with which the Humidor Project is consistent are trite and insubstantial. More importantly, these tables fail to address the most critical issue; namely, that the Humidor Project is fundamentally contrary to the General Plan and AV Area Plan because it involves the placement of a "Heavy Industrial" use on land designated only for "Light Industrial" land uses. This fact *is not* refuted by the evidence offered in DPW's tables; more importantly, it constitutes substantial evidence that proves the Humidor Project *is not* consistent with either the General Plan or the AV Area Plan. Accordingly, the Humidor Project *is not* eligible consideration under Section 21083.3 of the CEQA Statute and it is certainly *not* statutorily exempt from CEQA.

DPW'S "15183 CHECKLIST" DOES NOT CONSTITUTE SUBSTANTIAL EVIDENCE THAT HUMIDOR IS STATUTORILY EXEMPT FROM CEQA.

DPW has prepared a "15183 Checklist"[44] to support the claim that the Humidor Project is statutorily exempt from CEQA pursuant to Guidelines Section 15183; DPW states this "Checklist" provides "an analysis of potential environmental impacts resulting from the [Humidor] Project" (page 85 of Enclosure C in the referenced Board Letter). SORT has analyzed this "Checklist" and found many of the claims that are made to support material conclusions are either irrelevant, specious, or factually incorrect; these evidentiary deficiencies are particularly notable in the conclusions draw for aesthetic, air quality, hazards, land use, public service, and noise impacts. Therefore, the "Checklist" does not offer substantive evidence regarding the Humidor Project's environmental impacts and it certainly does not constitute substantial evidence that the Humidor Project is statutorily exempt from CEQA. Particular evidentiary deficiencies pertaining to aesthetic, air quality, hazards, land use, public service, and noise impacts are set forth below.

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44 See pages 85-169 of "Enclosure C" in the referenced Board Letter.

Aesthetics

The "Checklist" concludes that the Humidor Project will not "have a substantial adverse effect on a scenic vista" because 1) the Project is consistent with the General Plan and AV Area Plan and the EIRs certified for these plans found that the County Code and the land use patterns, goals, and policies adopted therein ensure that this impact would be "less than significant"; 2) The project is not in a Hillside Management Area or on a significant ridgeline; 3) The Project is not in a "scenic viewshed"; 4) The Project site is currently developed with a paintball recreational use and outdoor storage; 5) There is nothing about the Project or the Project site that would result in a peculiar aesthetic impact; 6) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to scenic vistas beyond what was disclosed in these EIRs; and 7) The Project will not increase aesthetic impacts identified in the General Plan and AV Area Plan EIRs and is therefore consistent with the analysis provided by these EIRs. All of these claims are fatally flawed for several reasons. For instance, Claim #2 is irrelevant and Claim #4 actually suggests that the Humidor Project *will* "substantially degrade the existing visual character of the site" because it confirms that the existing paintball facility (which actually "blends in" with the surrounding rural profile[45]) will be replaced by a massive, high intensity industrial development consisting of hundreds of densely packed white metal "storage containers" which are not camouflaged and will cover nearly 20 acres. The remaining claims are all factually incorrect. Claim # 1 is wrong because the Humidor Project *is not* consistent with the Zoning Code or the land use patterns, goals and policies established by the General Plan and the AV Area Plan because (as explained above); therefore, the findings of "less than significant aesthetic impacts" adopted in the EIRs certified for these Plans *do not apply* to the Humidor Project. Claim #3 is wrong because the Humidor Project is in a "scenic viewshed" and fully visible from a designated "scenic drive" along the Antelope Valley Freeway (as discussed in more detail below). Claim #5 is wrong because there are several unique features of the Humidor Project and the Humidor Project site that create peculiar aesthetic impacts. For instance, the Humidor Project is unique in that it is a massive, high-intensity industrial development which covers nearly 20 acres with hundreds of white metal "storage containers"; nothing like it has ever been permitted in rural unincorporated Los Angeles County. The Humidor Project site is also unique in that it is fully visible from a designated "Scenic Drive" and its location in a shallow valley makes it highly visible from virtually everywhere in the surrounding area. Together, these unusual features of the Humidor Project and the Humidor site definitively result in a "peculiar aesthetic impact". Claim #6 is wrong because the EIRs

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45 This discussion only addresses the existing paintball facility because that is the only use which has been lawfully established on the Humidor site. The storage uses are not lawfully established because they have no permits and do not conform to development standards. Because they are illegal, nonconforming uses, they are not part of the existing "aesthetic baseline". Furthermore, had these uses been legally established, they would blend in with the rural surroundings because they would comply with County development standards.

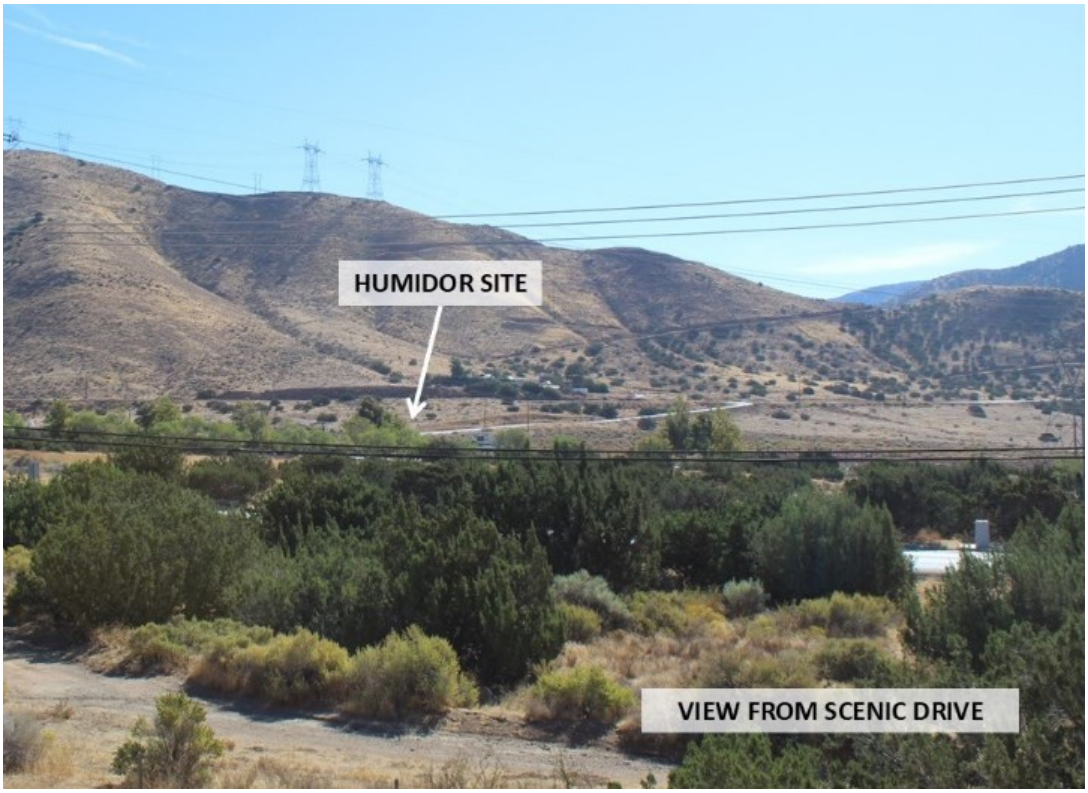
certified for the General Plan and the AV Area Plan *never* contemplated that a massive "Heavy Industrial" use would be developed in a scenic rural area where only "Light Industrial" uses are authorized; this *fact* constitutes "new information" which was "not known at the time the General Plan and AV Area Plan EIRs were certified" and it proves the Humidor Project "increases the impacts to scenic vistas beyond what was disclosed in these EIRs". Claim #7 is wrong because the Humidor Project *will* increase the aesthetic impacts identified in the General Plan and AV Area Plan for the reasons set forth above; the Humidor Project is also inconsistent with the impact analysis provided in these EIRs because it is a "Heavy Industrial" use that will be improperly developed on land designated solely for "Light Industrial" uses. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project will not "substantially degrade the existing visual character or quality of the site" is not supported by substantial evidence.

The "Checklist" also concludes that the Humidor Project will not "substantially damage scenic resources" because 1) The General Plan and AV Area Plan EIRs concluded that impacts to "scenic resources" was "less than significant"; 2) There are no designated state scenic highways located near the Humidor Project site and the Project will not result in any off-site or cumulative impacts to a scenic highway; 3) the view of the Humidor project site from the designated "Scenic Drive" along the 14 freeway is "obstructed by existing development" and therefore not visible from this designated "scenic drive"; 4) There is nothing about the Project or the Project site that would result in a peculiar aesthetic impact; 5) The project site is zoned industrial; 6) Other electrical infrastructure with similar impact profiles is in the vicinity of the Humidor Project; 7) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to scenic highways beyond what was disclosed in these EIRs; and 8) The Project will not increase aesthetic impacts identified within the General Plan and AV Area Plan EIRs and is therefore consistent with the analysis provided within these EIRs. These claims all fatally flawed for several reasons. For example, Claim #2 is inapposite because the determination of whether a project area contains "scenic resources" does not hinge on whether the area is near a "scenic highway"; therefore, the lack of a "scenic highway" in the vicinity of the Humidor Project does not render the impact of the Humidor Project on "scenic resources" to be less than significant. Moreover, the proximity of the designated Antelope Valley Freeway "scenic drive" which has a view of the Humidor Project constitutes substantial evidence that the Humidor Project area *does have* scenic resources which must be protected. Claim #1 is also inapposite: The EIR finding that "scenic resource" impacts from implementation of the General Plan and AV Area Plan would be "less than significant" is based solely on the premise that development would comply with the Zoning Code and conform to adopted General Plan land use patterns; however, the Humidor Project *does not* comply with the Zoning Code and it *does not* conform to General Plan land use patterns because it places a "Heavy Industrial" project on land designated for "Light Industrial" uses. The remaining claims are all factually incorrect. Claims #4, #5, #7, and #8 have already been repudiated for the reasons stated above; in the interest of brevity, these flaws will

not be repeated. Claim #3 is false because the Humidor Project site is visible from the 14 Freeway "scenic drive" and the 14 Freeway "scenic drive" is visible from the Humidor Project site; this fact is proven by the photographs provided in Figures 7 and 8. Finally, Claim #6 is false because the battery facilities on the Humidor site are not like *any* of the existing electrical infrastructure in the vicinity of the site. As explained in a later section that more fully addresses aesthetic impacts, the predominant feature of the Humidor Project is the many hundreds of battery "storage containers" packed tightly together on the project site; this is not a feature that exists anywhere in the project vicinity (in fact, it does not exist anywhere in unincorporated Los Angeles County). Moreover, only a handful of small structures (the 230 kV busbars, transformers, and switchracks) located on the northern end of the Humidor Project are even remotely similar to structures found at the Vincent substation. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project will not "substantially damage scenic resources" is not supported by substantial evidence.

The "Checklist" also concludes that the Humidor Project will not "degrade the existing visual character or quality of the site and its surroundings" because 1) The General Plan and AV Area Plan EIRs both concluded that impacts to "visual character" were reduced to "less than significant" by the County Code and adopted plan goals and policies; 2) The AV Area Plan establishes that new development in Rural Town Areas (where the Humidor Project is located) would be low scale and of rural character; 3) The land use patterns and development types allowed by the AV Area Plan maintain the region's rural character; 4) There is nothing about the Project or the Project site that will result in a peculiar visual quality impact; 5) The project site is zoned industrial; 6) The project site is currently developed with a paintball recreational use and outdoor storage; 7) The Project site is enclosed by three highways and a railroad; 8) The Project is a relatively low profile BESS facility designed in accordance with the County's development standards and landscaping requirements; 9) The Project is consistent with the current development of the site and the surrounding area; 10) Because the Project has no impact on visual quality, it will not have a cumulatively considerable impact; 11) The Project would not result in any off-site impacts related to impacts to scenic highways; 12) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to visual quality beyond what was disclosed in these EIRs; and 13) The Project would not increase impacts identified within the General Plan and AV Area Plan EIRs and therefore is consistent with the analysis provided within these EIRs. These claims are all fatally flawed. For example, Claim #1 is inapposite because EIR conclusions that "visual character" impacts are less than significant do not apply to the Humidor Project because the Humidor Project is not consistent with the Zoning Code, the General Plan, and the and AV Area Plan. Claims #2 and #3 actually support SORT's position that the Humidor Project is not consistent with the development types allowed under the AV Area Plan because it is an enormous, high intensity, heavy industrial use that is neither "low scale" nor rural. Other claims (including Claims #7 and #11) are irrelevant. All the remaining claims are factually

Figure 7. Photographs of the Humidor Project Site from the Adjacent Scenic Drive.



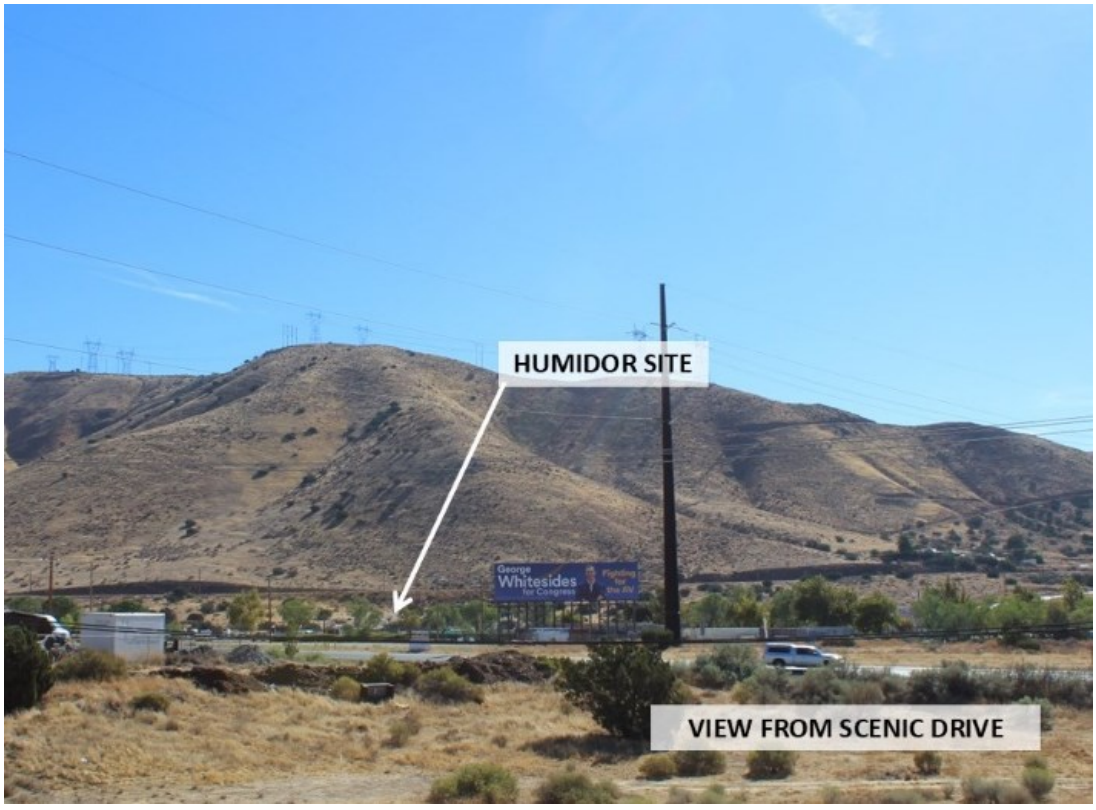
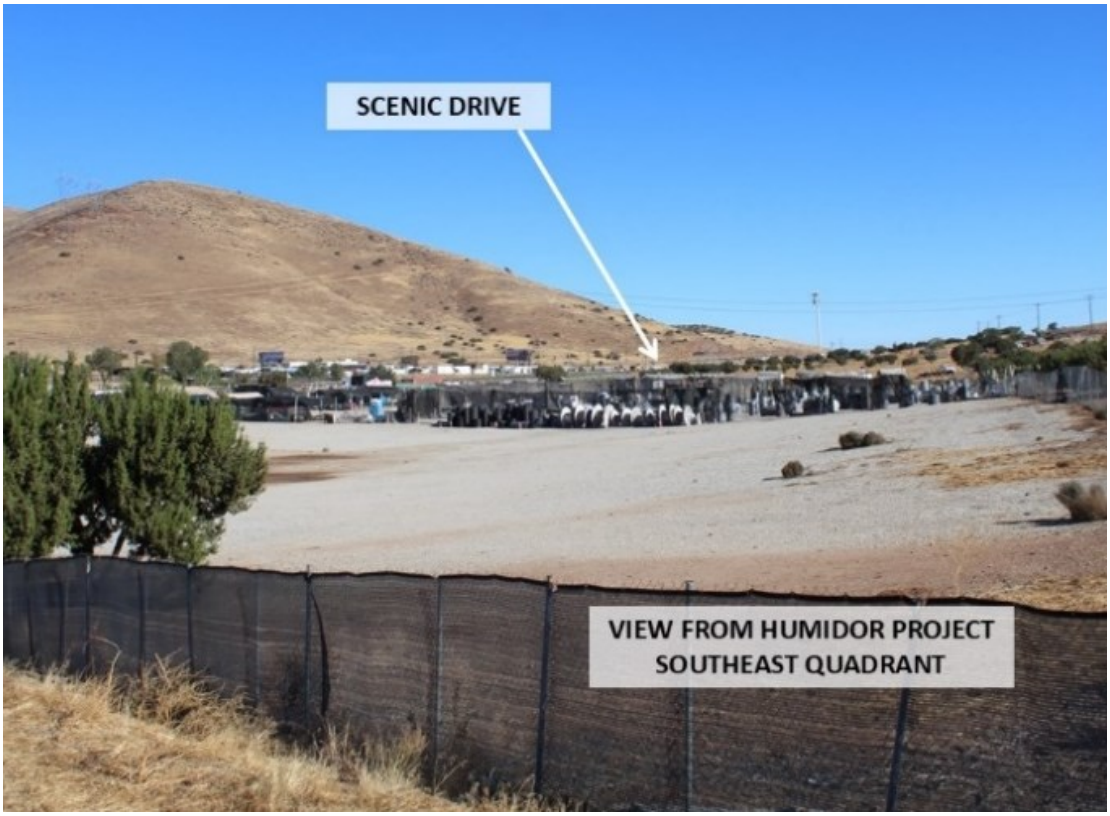


Figure 8. Photographs of the Adjacent Scenic Drive From the Humidor Project Site.



incorrect. Claims #4, #5, #6, #12, and #13 have already been repudiated for the reasons stated above; in the interest of brevity, these flaws will not be repeated. Claim #8 is erroneous because the Humidor Project is not "a relatively low profile BESS facility" to the contrary, it is a massive, high intensity development the likes of which has never been considered in rural unincorporated Los Angeles County. Additionally, the Humidor Project has not been "designed in accordance with the County's development standards" because it actually violates County development standards. The mere fact that Regional Planning approved a site plan for the Humidor Project does not render it consistent with County development standards particularly since the approval violated the Zoning Code and was based on a "similarity determination" and "Interpretation" that are not supported by substantial evidence. Claim #9 is categorically false because the Humidor Project site and the surrounding area consist of low intensity rural developments that exist in a largely "natural" state with minimal structures and is therefore intrinsically inconsistent with the massive, high intensity, heavy industrial Humidor Project. Claim #10 is also categorically false because the Humidor Project *will* have a significant impact on visual quality (for the reasons set forth above). Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project will not "degrade the existing visual character or quality of the site and its surroundings" is not supported by substantial evidence.

The "Checklist" also concludes that the Humidor Project will not "create a new source of light or glare adversely affecting day or nighttime views" because 1) Glare and nighttime view impacts are reduced by existing Zoning regulations and policies in the General Plan and AV Area Plan; 2) The Project will not have significant impacts because it will comply with the County's "Rural Outdoor Lighting" requirements; 3) The Project includes landscaping that will reduce lighting impacts; 4) There is nothing about the Project or the Project site that would result in peculiar light and glare impacts; 6) The Project site is zoned industrial; 7) The Project site is adjacent to commercial development and electrical infrastructure; 8) There is nothing peculiar about the Project with respect to light and glare as opposed to any commercial, industrial, or energy project; 9) The Project will result in a less than significant impact and therefore will not create a cumulatively considerable impact; 10) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to light and glare beyond what was disclosed in these EIRs; 11) The Project is consistent with the analysis provided within the General Plan and AV Area Plan EIRs because it would not increase impacts identified within these EIRs; and 12) The Project will not create significant light or glare impacts because the EIRs certified for the General Plan and AV Area Plan found such impacts to be "less than significant". These claims are all fatally flawed. For instance, Claim #1 is inapposite because the nighttime view protections secured by existing Zoning regulations and policies adopted by the General Plan and AV Plan do not apply to the Humidor Project because the Humidor Project is not consistent with these Plans or Zoning regulations. The remaining claims are factually incorrect. Claims #6, #7, #10, and #11 have already been repudiated for the

reasons stated above; in the interest of brevity, these flaws will not be repeated here. Claims #2, #4, and #9 are erroneous because the Humidor Project involves the installation of hundreds of large, bright white metal "shipping container" structures[46] in a desert community where dazzling sunny days are the "norm"; this will introduce a significant source of daytime glare that will be blinding to viewers. And, because the Humidor Project is in the bottom of a shallow valley, it will be visible to all the homes on the surrounding terraces and slopes as well as the more than 100,000 daily travelers on the adjoining highways and the "Scenic Drive" 14 Freeway. Accordingly, the effects of the daytime glare introduced by the project's shiny white metal containers will be significant. Furthermore, the Humidor facility will be brightly lit, and although the lights will be shielded and "pointed down" as required by "Rural Outdoor Lighting" requirements, the light that is cast will be reflected off the gravel roads and the shiny metal "shipping containers" to create tremendous nighttime glare that will egregiously affect all the surrounding homes, highways, and the "Scenic Drive" 14 freeway. Therefore, and contrary to what is asserted in Claims #2, #4, and #9, the Humidor Project *will* have significant glare and lighting impacts, it *will* adversely affect day and nighttime views in the area, and it *will* have a significant impact. Claim #3 is equally erroneous because the landscaping is only on the project's periphery and will not shield the surrounding homes and roadways (all of which overlook the shallow valley in which the Humidor Project is located); therefore, Project landscaping *will not* mitigate glare impacts. Claims #4 and #8 are wrong because the unique metal "shipping container" features of the Humidor Project and the unique "shallow valley" configuration of the Humidor Project site render the Humidor Project's "glare" impacts to be sufficiently "peculiar" to invalidate *any* claim that the Humidor Project will not be a significant source of light or glare. Finally, Claim #12 asserting that Humidor will not create significant light or glare impacts because the EIRs certified for the General Plan and AV Area Plan found such impacts to be "less than significant" is completely erroneous: these EIR findings do not apply to the Humidor Project because the Humidor Project is not consistent with the General Plan or AV Area Plan. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project will not "create a new source of light or glare adversely affecting day or nighttime views" is not supported by substantial evidence.

Public Services

The "Checklist" asserts that, when a BESS fire breaks out at the Humidor facility, it will be left to "burn out"; no "offensive firefighting tactics" will be used and no attempt will be made to extinguish it[47]. Putting aside the wildfire and conflagration concerns that

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[46] The Humidor BESS site plan approved August 1, 2023 confirms these facts.

[47] Page 157 of Enclosure C in the referenced Board Letter.

are posed by this strategy[48], it is understood that the Los Angeles County Fire Department will be responsible for responding to Humidor BESS fires[49] and will attend these fires throughout their entire "ignition window"[50] which can last for weeks. There is only one small fire station in Acton and it covers approximately 50 square miles; thus, fire response resources in the community are somewhat limited and cannot sustain deployment for a BESS "ignition window" that lasts days or weeks. Accordingly, Humidor BESS facility fires will quickly overtax local emergency response resources. Nevertheless, the "Checklist" concludes that the Humidor Project will have no impacts on fire protection services "beyond what was disclosed in the General Plan and AV Area Plan EIRs" because 1) These EIRs concluded that "Public Service" impacts were less than significant; 2) There is nothing "peculiar" about the Humidor BESS or the BESS site that would significantly impact fire protection services; and 3) There is no new information not known at the time these EIRs were certified that would increase impacts to fire protection services. These claims are all fatally flawed. Claim #1 is flawed because the General Plan and AV Area Plan EIRs never contemplated that a fire- and explosion-prone "Heavy Industrial" BESS use would be developed on remote, rural land that is designated "Light Industrial" uses; therefore, the "less than significant public services impact" findings of the General Plan and AV Area Plan EIRs *do not* apply to the Humidor Project. Claim #2 is false because the susceptibility of the Humidor BESS to spontaneous ignition and its location in a remote rural community that has limited fire response resources are indeed peculiarities in the project and the project site which, together, will tax local fire protection services. Claim #3 is false because BESS susceptibilities to fire and explosion and the need for firefighters to "babysit" BESS fires for days and even weeks is substantial new information that was unavailable in 2015 when the General Plan and AV Area Plan EIRs certified. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project "will have no impacts on fire protection services beyond what was disclosed in the General Plan and AV Area Plan EIRs" is not supported by substantial evidence.

Air Quality.

The "Checklist" concludes that the Humidor Project "will not expose sensitive receptors to substantial pollution concentrations" because 1) The project site is zoned industrial; 2) There is nothing about the project or the project site that would result in a peculiar

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[48] Because Humidor BESS fires will be left to "burn out", they pose a continuous wildfire threat to the Community of Acton; the threat is particularly significant during "Santa Ana" wind conditions where a single ember can ignite faraway vegetation and structures.

[49] Page 3 of Enclosure C in the referenced Board Letter.

[50] BESS remain prone to spontaneous re-ignition long after the initial ignition event. An "Ignition Window" is the window of time following initial ignition in which a BESS unit remains prone to spontaneous ignition; the "ignition window" can last days or even weeks. For example, the Gateway BESS fire "ignition window" extended from May 15, 2024 to May 30, 2024.

impact to air quality; 3) any gases emitted during a Humidor BESS fire will have reduced toxicity because the project is outdoors; 4) the Humidor project supports state and local greenhouse gas emission goals; 5) UL9540A testing shows toxic gases produced by a BESS fire is similar to a plastics fire and can be treated the same as a sofa or mattress fire; 6) the toxicity of gases emitted from a Humidor BESS fire is similar to that of other uses allowed at the site; 7) there is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to air quality beyond what was disclosed; and 8) the Humidor Project will not result in any off-site air quality impacts. These claims are all fatally flawed. For instance, Claim #4 is irrelevant and Claim #1 is a specious oversimplification which disregards a critical factor that repudiates *all* the "Checklist" conclusions regarding EIR consistency: namely, that the Humidor Project is inconsistent with the General Plan and the AV Area Plan because it places a massive, high-intensity "Heavy Industrial" development on land that is only designated for "Light Industrial" uses. Because the Humidor Project controverts adopted General Plan and AV Area Plan land use goals and policies, none of the EIR findings adopted for these plans extend to the Humidor Project. Claim #2 is patently absurd: the susceptibility of the Humidor BESS to explode and release a cloud of concentrated toxic gas that will endanger surrounding residential, commercial, and commuter areas constitutes unique characteristics of both the Humidor Project and its location which clearly result in a "peculiar air quality impact". Another unique feature that is peculiar to the Humidor site is that no water will be applied to suppress Humidor BESS fires when they ignite[51]; therefore, toxic gases released from the burning BESS will not be suppressed. As proof that BESS facilities result in peculiar air quality impacts, one need only consider the numerous BESS fires that have recently occurred and created air quality impacts so significant that they forced thousands of people to "shelter in place" and compelled numerous and lengthy freeway and highway closures. The remaining claims are factually incorrect. Claim #5 is categorically false because UL9540A *does not* show that toxic gases produced by a BESS fire are similar to a plastics fire and can be treated like a sofa or mattress fire (as explained previously); in fact, the 2017 report cited in the "Checklist" proves that toxic gas concentrations released from ignited lithium batteries is at least *ten times higher* than the concentrations released from a plastics fire. This characteristic makes BESS fires 10 times more lethal than plastics fires because the lethality of a toxic air contaminant depends entirely on its concentration. Claim #6 is also patently false: as explained above, the toxicity of the gases released from a Humidor BESS fire is much higher than the toxicity of gases released from the "Light Industrial" uses that are permitted on the site. Claim #7 is also categorically false because *no information was available* regarding air toxic emissions from BESS fires facilities at the time the General Plan and AV Area Plan EIRs were certified in 2015. Claim #8 is also incorrect because the Humidor Project is highly likely to experience a battery "storage container" fire and, when that happens, there *will* be significant off-site air quality impacts, including

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[51] Page 157 of Enclosure C of the referenced Board Letter.

closures on the adjacent freeway and highways as well as "shelter in place" orders and perhaps even a conflagration in the Community of Acton. Finally, Claim #3 is technically and factually wrong because a battery "storage container" fire releases the same toxic gases regardless of whether it is indoors or outdoors; the only difference is how these gases are released. An outdoor BESS container fire directly injects high concentrations of hydrogen fluoride, hydrogen cyanide, and other toxic gases into the environment at or near ground level; these gases are immediately carried into the surrounding neighborhood with virtually no dispersal or dilution. This fact is proven by dispersion modeling results prepared using EPA air modeling protocols which are presented in a later section. In contrast, an indoor BESS container fire creates some intermixing between the building air and the toxic gases before release; this could have a slight dilution effect but the concentration would still be highly toxic. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project "will not expose sensitive receptors to substantial pollution concentrations" is not supported by substantial evidence.

The "Checklist" also concludes that the Humidor Project will not result in "other emissions affecting a substantial number of people" because 1) there is nothing about the Project or the Project site that would result in a peculiar impact with respect to air emissions; 2) the Project site is zoned industrial; 3) The Project is consistent with the EIR analysis prepared for the General Plan because it will not increase impacts identified within General Plan EIR or the AV Area Plan EIR; 4) the project site currently has commercial and industrial uses; 5) The BESS will not produce emissions or odors; 6) Objectionable odors produced during construction would be temporary; 7) There is no new information not known when the General Plan and AV Area Plan EIRs were certified that would increase emission impacts; and 8) The Project would have a less-than-significant impact to emissions. These claims are all fatally flawed. For example, Claims #2, #4, and #6 are irrelevant and Claim #5 is specious: just because a project is not likely to create significant odor does not mean that it will not create other types of air emissions that will affect a substantial number of people. The remaining claims are factually incorrect. Claims #1, #3, and #7 have already been repudiated for the reasons stated above; in the interest of brevity, these flaws will not be repeated here. Finally, Claim #8 is wrong because the Humidor Project *will* produce emissions when a battery container ignites, and when this occurs, impacts will not be "less than significant" because it will trigger road closures, "shelter in place" orders, and other highly disruptive off-site impacts. Together, these facts demonstrate the "Checklist" conclusion that the Humidor Project will not result in "other emissions affecting a substantial number of people" is not supported by substantial evidence.

Hazards and Hazardous Materials

The "Checklist" concludes that the Humidor Project will not "create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials" because 1) The Humidor

Project would have a less than significant impact associated with "existing hazardous materials sites"; 2) There is nothing peculiar about the Project or the Project site that would result in hazards related to the release of hazardous materials; 3) there are no recognized environmental conditions or known hazardous materials sites registered on the Project site; 4) The Project site is not on a list compiled pursuant to Section 65962.5 of the Government Code; 5) The Project will comply with federal, state and local regulations related to hazardous materials, their use, transport, and disposal which will ensure hazardous material release impacts would be less than significant; 6) There is nothing unusual about the BESS facility with respect to hazardous materials; 7) Similar electrical infrastructure exists within the Project surroundings, including SCE's Vincent substation; 8) UL9540A testing shows toxic gases produced by a BESS fire is similar to a plastics fire and can be treated the same as a sofa or mattress fire; 9) the toxicity of gases emitted from a Humidor BESS fire is similar to that of other uses allowed at the site; 10) any gases emitted during a Humidor BESS fire will have reduced toxicity because the project is outdoors; 11) The Project would not result in any off-site impacts related to hazardous materials; 12) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase hazardous impacts beyond what was disclosed in the General Plan and AV Area Plan; and 13) The Project is consistent with the EIR analysis prepared for the General Plan because it will not increase impacts identified within General Plan EIR or the AV Area Plan EIR. These claims are all fatally flawed. For instance, Claims #1, #3, #4, and #6 are specious: The fact that the Humidor Project will not impact on "existing hazardous materials sites" and has no recognized environmental conditions or known hazardous materials and is not listed pursuant to Section 65962.5 does not mean that the Humidor Project poses no hazardous materials risk. Claim #5 is also specious: Compliance with federal, state and local regulations *does not* ensure hazardous material release impacts are less than significant; this fact is confirmed by simply reviewing all the recent BESS container fires that have occurred in 2024 which closed major transportation corridors and forced thousands of people to "shelter in place". It is likely that all the operations that were connected to these events complied with "federal, state and local regulations", yet they still created hazardous conditions. All other claims are factually incorrect. Claims #2, #8, #9, #10, #11, #12, and #13 have already been repudiated by the aforementioned explanations pertaining to air toxic hazards which also apply to the reasonably foreseeable public hazards arising from Humidor Project BESS fires; in the interest of brevity, these flaws will not be repeated here. The remaining Claim (#7) is erroneous; the approved Humidor BESS site plan shows that nearly all of the equipment (>90%) installed at the Humidor site consists of lithium-based transmission BESS containers; such equipment is not found *anywhere else* in the vicinity of the project and it certainly does not exist at the Vincent substation. These facts demonstrate the "Checklist" conclusion that the Humidor Project will not "create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials" is not supported by substantial evidence.

The "Checklist" also concludes that the Humidor Project will not expose "people or structures to a significant risk of loss, injury, or death involving wildland fires" because 1) General Plan and AV Area Plan policies and development approval conditions will minimize impacts related to wildland fires; 2) There is nothing peculiar about the Humidor Project or site that would result in a significant impact to fire hazards; 3) There are no unique features on the Project site that would exacerbate fire hazards; 4) Adopted codes and regulations ensure fire safe BESS construction and operation wherever they are located; 5) The Project site is zoned industrial; 6) is used currently as a paintball facility and outdoor storage; 7) The Humidor BESS facility poses a lower fire risk compared to the uses currently on the site because it is designed to prevent fires; 8) The BESS will pass UL 9540A testing; 9) The Project will meet code requirements and work with first responders to conduct training; 10) the BESS container will be allowed to burn itself out and no water will be used to control or suppress the burning BESS container; 11) There will be an Emergency Response Plan; 12) There will be an Emergency Response and Emergency Action Plan; 13) There will be no vegetation inside the 8-foot masonry wall surrounding the BESS containers; 14) The site will be covered by stone aggregate or concrete and will have a fuel modification plan; 15) There will be no off-site fire hazard impacts either individually or cumulatively; 16) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase fire hazard impacts beyond what was disclosed in these EIRs; and 17) The Humidor Project is consistent with the analysis within the General Plan and AV Area Plan EIRs. These claims are all fatally flawed. For instance, Claims #5 and #6 are irrelevant and Claims #9, #11, #12, #13, #14, and #15 are specious: Measures such as code compliance, training, Emergency Response Plans, Emergency Action Plans, 8 foot walls, and hardscape with no vegetation in the enclosure *do not* prevent a BESS container from spontaneously exploding or erupting into massive flames and they *do not* prevent an ember carried on the wind from sparking an off-site fire. The latter can happen quickly after a spontaneous explosion and before response plans are implemented or fire fighters arrive. And when this happens in a wildland area like Acton, there *are* off-site fire hazard impacts. Claim #8 is also specious because passing the UL 9540A test merely means that, when the BESS container explodes or ignites, it is less likely to engulf an adjacent BESS container. Claim #10 is also specious: because Humidor BESS fires will be left to "burn themselves out", it will take days (and perhaps weeks) before the fire is extinguished, and during that "ignition window", the burning BESS poses a significant fire risk to Acton particularly during high wind "fireweather" conditions. The remaining claims are factually incorrect. Claims #2 and #3 are erroneous because the susceptibility of the battery containers to spontaneously erupt in flame is a unique feature of the Humidor Project that poses a significant fire hazard; this fire hazard posed is amplified by the unique locational circumstance of the Humidor Project site in a VHFHSZ. Claim #4 is erroneous because "adopted codes and regulations" *do not* and *cannot* "ensure fire safe BESS operation" because if they could, then there would have been no BESS fires over the last several years. This is particularly true in VHFHSZs that experience dry, windy, fireweather conditions. Claim #7 is

categorically false because BESS facilities are not and cannot be designed to prevent fires and because the paintball facility poses an infinitesimally small wildfire risk compared to an enormous BESS use; this fact is proven by the significant number of BESS fires that have occurred compared to the negligibly small number of paintball facilities that have occurred in the same time frame (as discussed below). Claims #1 and #17 are also erroneous: While compliance with Plan policies may reduce wildland fire risks associated with uses that are consistent with adopted Plan land use patterns, this circumstance does not apply to the Humidor Project because the Humidor Project is not consistent with adopted Plan land use patterns. Finally, Claim #16 is patently false because *no information was available* regarding the propensity of BESS facilities to ignite and explode at the time the General Plan and AV Area Plan EIRs were certified in 2015; therefor, all the information that has come out over the last 9 years constitutes "new information" regarding BESS fire risks. These facts demonstrate the "Checklist" conclusion that the Humidor Project will not "expose people or structures to a significant risk of loss, injury, or death involving wildland fires" is not supported by substantial evidence.

Land Use and Planning

The "Checklist" concludes that the Humidor Project will not "cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect" because 1) There is nothing peculiar about the Humidor Project or the site with respect to land use compatibility; 2) The Project is consistent with the General Plan and AV Area Plan; 3) The Humidor BESS is authorized in the M-1 zone; 4) The Project proposes a BESS facility; 5) Interconnection of the Humidor BESS would provide important electrical reliability services to the local area; 6) The Humidor BESS was authorized pursuant to "Zoning Ordinance Interpretation No. 2021-03"; 7) An Electrical Distribution Substation is a permitted use in the M-1 zone; 8) The Humidor BESS is similar to an Electrical Distribution Substation; 9) Regional Planning has approved a Site Plan Review for the Humidor Project; 10) The Project meets the County's development standards; 11) The Project is consistent with the land use characteristics and development standards established by the County's General Plan and zoning, as analyzed by the EIRs certified for the General Plan and the AV Area Plan; 12) The Project would not result in any off-site impacts related to compatibility with land use plans; 13) There is no new information not known at the time the General Plan and AV Area Plan EIRs were certified that would increase impacts to land use plan compatibility beyond what was disclosed in the General Plan and AV Area Plan EIRs. These claims are all fatally flawed. For instance, Claims #4 and #7 are irrelevant and Claims #6 and# 9 are specious because, as explained above, Regional Planning's "Zoning Ordinance Interpretation" Memo is not supported by substantial evidence and the Humidor site plan approval violated the Zoning Code. The remaining claims are all factually incorrect. Claim #1 is wrong because there are many characteristics of the Humidor Project and the Humidor site which result in peculiar land use impacts including the

fact that the Humidor BESS is a "Heavy Industrial" use but the Humidor site is designated only for "Light Industrial" uses; this will obviously result in peculiar land use impacts. Claims #2 and #10 are wrong because the Humidor Project violates County development standards and is inconsistent with adopted Plan policies because it improperly authorizes a "Heavy Industrial" use in a "Light Industrial" zone. Claim #3 is wrong because Section 22.22.030 of the Zoning Code does not authorize BESS uses in the "Light Industrial" zone. Claim #5 is patently false: The Humidor BESS *does not* provide electrical reliability to the local area because it is not connected to the local distribution grid. Instead, the Humidor Project is connected to the Vincent transmission substation which only sends power north to PG&E's service territory along "WECC Path 26" or south to the San Gabriel and San Fernando Valleys. Moreover, the power generated by Humidor has already been contracted for sale to electrical customers in Northern California including customers in Solano County, Marin County, Napa County, and Contra Costa County[52]. Claim #8 is also patently false because (as explained above) the Humidor BESS *is not* similar to an Electrical Distribution Substation and has none of the characteristics of an Electrical Distribution Substation; thus, Claim #8 is not supported by substantial evidence. Claim #11 is wrong because the Humidor Project *is not* consistent with adopted land use policies and development standards since it involves a "Heavy Industrial" use on land designated only for "Light Industrial" uses. Claim #12 is wrong because the Humidor Project *will* result in significant off-site impacts (including noise and aesthetics) that are *directly related* to the land use problems caused by developing a "Heavy Industrial" use in a "Light Industrial" zone. Finally, Claim #13 is wrong because there is now extensive new information pertaining to the noise, public safety, and wildfire effects of transmission BESS facilities like Humidor which was not known at the time the General Plan and AV Area Plan EIRs were certified; these are clearly "land use compatibility" impacts that are much more significant than what was considered in the General Plan and AV Area Plan EIRs. These facts demonstrate the "Checklist" conclusion that the Humidor Project will not "cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect" is not supported by substantial evidence.

Noise

The "Checklist" concludes the Humidor Project will not "increase noise impacts identified in the General Plan and AV Area Plan EIRS" or result in the "generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance" because 1) Neither the Project nor the Project site have any peculiar qualities that would result in noise impacts; 2) The Project site is zoned industrial; 3) The Project

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[52] According to a letter from "Marin Clean Energy" (MCE), the power that will be generated by the Humidor Project has already been purchased by MCE for their customers Solano, Marin, Napa, and Contra Costa Counties. A copy of this letter is provided in Attachment 21.

site is currently developed with a paintball facility and other industrial uses; 4) The County Code maximum construction noise limit at the nearest receptor location for mobile sources is 85 dBA; 5) The County Code maximum construction noise limit at the nearest receptor location for stationary sources is 70 dBA; 6) The distance to the closest receptor is 650 feet; 7) The calculated peak projected construction noise levels at the 650 foot distance are 63.1 dBA (L_{eq}) and 66.8 (L_{max}); 8) Construction noise levels fall below both County noise ordinance thresholds for mobile and stationary equipment; 9) Project operations would not generate noise in excess levels of County standards (no citation); 10) Operational activities would not substantially change the existing noise conditions at the Project (no citation); 11) Operational noise levels would fall below the noise compatibility levels of 65 dBA for exterior areas and 45 dBA for interior spaces (no citation); 12) The Project falls below County noise level thresholds (no citation); 13) The Project will not result in off-site noise impacts (no citation). Many of these claims (including #9, #10, #11, #12, and #13) are not supported by *any* evidence and are therefore worthless. Several claims (including Claim #2 and #3) are irrelevant. Still other claims are categorically false. For example, Claim #6 is wrong because the distance from the nearest residence to the project site is not 650 feet; it is actually less than 500 feet according to County GIS data (Figure 9). And, because the nearest receptor is much closer than 650 feet, peak construction noise at this location will be considerably higher than 63.1 dBA (L_{eq}) and 66.8 (L_{max}); this makes claim #7 factually incorrect. SORT estimates the *actual* construction noise level at the closest residence will be 66 dBA (L_{eq}) and 69.9 dBA (L_{max})[53]. Claim #4 is factually incorrect: the maximum construction noise limit for mobile equipment *is not* 85 dBA; it is 75 dBA because the nearest receptor is a residence [County Code Section 12.08.440(B)(1)(a)]. More importantly, the mobile equipment threshold is inapplicable to the Humidor Project because it only applies to short term construction projects that last 10 days or less; therefore, a more stringent noise standard applies. Claim #5 is also wrong: the maximum construction noise limit for stationary sources *is not* 70 dBA; it is 60 dBA because the nearest receptor is a residence [County Code Section 12.08.440(B)(1)(b)]. Claim #8 is also false because, according to DPW's own data, noise levels generated by Humidor construction will continually exceed 60 dBA and will therefore violate County Noise standards [54]. Another false claim is that "Neither the Project nor the Project site have any peculiar qualities that would result in noise impacts"; as discussed in detail below, BESS facilities are unique in that they generate very high noise levels in low frequency bands which are highly disturbing. These facts demonstrate the "Checklist" conclusion that the Humidor Project will not result in the "generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance" is not supported by substantial evidence.

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53 This estimate is based on a geometric attenuation rate of 3 dBA per distance doubled. This is reasonable, given that Acton has little vegetation to dampen sound propagation.

54 Page 139 of Enclosure C shows construction noise levels will persistently exceed 60 dBA.

Figure 9. Distance From Humidor Project to Nearest Residence.

The "Checklist" does not Provide Substantial Evidence Showing that the Humidor Project is Statutorily Exempt from CEQA.

Public Works assembled the "Checklist" to demonstrate that the Humidor Project is eligible for a Statutory CEQA exemption under Guidelines Section 15183. However, the evidentiary support that is provided by the "Checklist" is marginal. In fact, for major environmental effects such as aesthetics, noise, hazards and hazardous materials, land use, air quality, and public services, all of the evidence cited by the "Checklist" is either erroneous, irrelevant, or entirely repudiated; none of it is substantial. Because the "Checklist" is not based on substantial evidence, it fails to demonstrate that the Humidor Project is statutorily exempt from CEQA. And, because there is no basis to find that the Humidor Project is statutorily exempt from CEQA, the Board is barred from adopting such a finding.

BECAUSE THE HUMIDOR PROJECT IS NOT CATEGORICALLY EXEMPT FROM CEQA, AN ENVIRONMENTAL IMPACT REPORT IS REQUIRED.

The Humidor Project is not eligible for any Categorical or Statutory Exemptions from CEQA; therefore, the County must conduct an environmental assessment of the Humidor Project and prepare an appropriate environmental document. As set forth herein, there is substantial evidence that the Humidor Project will have a significant

aesthetic and noise effect on the environment and will pose significantly adverse public safety, emergency response, and wildfire risks within the Community of Acton; therefore, CEQA compels the County to prepare and certify an Environmental Impact Report (EIR)[55] and it precludes the County from approving the Humidor Franchise Agreement until the EIR is certified[56]. The EIR must assess all the potentially significant environmental effects of the project and consider feasible alternatives to the project (including alternative locations), and prior to approving the Humidor Project, the Board must adopt these feasible alternatives if they reduce the significant environmental effects created by the project[57].

THE PUBLIC SAFETY AND WILDFIRE RISK POSED BY THE HUMIDOR PROJECT ARE SIGNIFICANT AND UNMITIGABLE.

The Humidor Project poses significant public safety, emergency response, and wildfire risks impacts because it includes a 544 MW Lithium Ion BESS facility; these significant environmental impacts stem from the propensity of Lithium Ion BESS containers to explode, deflagrate and release toxic gases as a result of a condition known as "thermal runaway". Thermal runaway occurs when a battery cell within the BESS container fails which leads to significant overheating and cell rupture; this drives the adjacent cell to overheat and rupture. This overheating and rupturing process propagates among the cells and with every cell failure, toxic and combustible gases are released within the BESS container; thermal runaway happens very quickly and within minutes, it creates an explosive and high fire environment which causes the BESS container to erupt in flames and even explode violently. To demonstrate the violence of Lithium Ion BESS explosions, Figure 10 is a photograph of a compromised BESS container taken the instant it explodes and just before it erupts in flames; this photograph records the September 26, 2024 BESS explosion and fire that closed the Vincent Thomas Bridge in Long Beach for more than two days. The event caused several ports to close and, according to firefighters who responded to the event, ten foot flames shot out from the BESS container.

Another reason why Lithium Ion BESS pose significant public safety, emergency response, and wildfire risks is because Lithium Ion battery fires are self-sustaining, which renders them impossible to extinguish and highly susceptible to re-ignition. That is why Lithium Ion BESS fires can persist for days and even weeks. To illustrate the persistence of Lithium Ion battery fires, Figure 11 provides a photograph of an electric car (powered by a Lithium Ion Battery) that is on fire even though the car and the battery pack are submerged in water.

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55 § 21082.2(d) of the CEQA Statute.

56 CEQA Guidelines Section 15090.

57 CEQA Guidelines Section 15092.

Figure 10. Photograph of a Compromised BESS Container the Instant it Explodes.

Source: https://ktla.com/news/local-news/batteries-burn-explode-after-big-rig-overturns-in-san-pedro/?ipid=promo-link-block1

Figure 11. Lithium Ion Battery Fires Cannot be Extinguished.

Source: https://www.youtube.com/watch?v=1zaV-JSwzzA

An additional reason why Lithium Ion BESS pose significant public safety, emergency response, and wildfire risks is because Lithium Ion battery fires release large quantities of highly toxic vapors that waft into the surrounding areas and threaten the health and wellbeing of humans and animals. All these risks are explained in more detail below and are discussed within the context of the Humidor Project and its location within the rural residential community of Acton.

The Humidor Project Will Utilize a Particularly Dangerous Lithium Ion Battery Chemistry.

The Humidor Project developer has made numerous representations over the last 21 months regarding the specific Lithium battery chemistry that will be used for the project; at a community meeting convened by the developer in 2023, presentation materials stated that the batteries would be "Lithium Ion" but the site plan that County approved on August 1, 2023 asserts that the batteries would be "Lithium Iron Phosphate" (also known as "LFP", "LFPO", "LiFePO4" and "Lifpo"). It appears therefore that the Humidor Project will be constructed with LFP BESS.

Unfortunately, a common misconception that is perpetuated by energy developers and industry shills is that LFP BESS are "safe" and are not susceptible to explosion, fire, or deflagration because they are not "Lithium Ion". In fact, the Executive Director of the California Energy Storage Alliance (a consortium of BESS developers[58] that is also known as "CESA") actually declared to the California Energy Commission, land use regulators, and the public that concerns regarding thermal runaway and fire intensity do not apply to LFP BESS![59] These claims are false. According to the U.S. Department of Energy, LFP BESS *are* Lithium Ion BESS[60] because they have lithium in both the anode and the cathode and they store and discharge energy by transferring lithium ions between the anode and the cathode[61]. In fact, the only difference between LFP BESS and other Lithium Ion BESS is that they utilize Iron Phosphate as a cathodic material, whereas other Lithium Ion BESS use a combination of Nickel, Manganese, and Cobalt

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[CK] CESA members are all the major Battery Storage System developers and include Hecate, Terra Gen, REV, Vistra, Nextera, Tesla, LG, and many others.

[CA] California Energy Commission Staff Workshop on BESS Safety on February 23, 2024; at Timestamp 1:11:38. The recording is available on the California Energy Commission Website (Docket No 24-BSS-01) and is accessible accessed via https://efiling.energy.ca.gov/GetDocument.aspx?tn=254710&DocumentContentId=90335.

[CZ] According to the DOE's Pacific Northwest Laboratory, "Lithium-ion can refer to a wide array of chemistries, however, it ultimately consists of a battery based on charge and discharge reactions from a lithiated metal oxide cathode and a graphite anode. Two of the more commonly used lithium-ion chemistries [are] Nickel Manganese Cobalt (NMC) and Lithium Iron Phosphate (LFP)" [https://www.pnnl.gov/lithium-ion-battery-lfp-and-nmc].

[CY] U.S. Department of Energy article "How Lithium Batteries Work" released February 28, 2023 [https://www.energy.gov/energysaver/articles/how-lithium-ion-batteries-work#:~:text=The%20Basics,vice%20versa%20through%20the%20separator].

as cathodic materials (which is why they are referred to as "NMC batteries"). Because *all* Lithium Ion batteries contain lithium and rely on the transfer of lithium ions, they are *all* susceptible to thermal runaway, explosion, and deflagration. Moreover, recent studies conducted by the Underwriters Laboratory Fire Safety Research Institute ("FSRI") demonstrate that LFP BESS are actually more dangerous than NMC BESS; in fact, FSRI showed that LFP BESS fires are ***more intense*** and ***more explosive*** because when thermal runaway occurs, LFP BESS generate far more hydrogen gas and combustible hydrocarbons than NMC BESS[62]. This *fact* has been corroborated by others[63] as reflected in a recent article published by PV Magazine (see Attachment 22).

The reason energy developers and industry shills claim that LFP BESS are "safe" is because the thermal runaway initiation temperature of LFP BESS is slightly higher compared to NMC BESS; however, FSRI data reproduced in in Figure 12 indicate that the actual temperature difference is small (less than 80°C). More importantly, when LFP BESS become overcharged, the temperature at which thermal runaway is initiated *is actually lower than the temperature at which thermal runaway is initiated in NMC BESS*[64]. This means that LFP BESS are ***more susceptible*** to thermal runaway than other NMC BESS in overcharge conditions! Furthermore, experiments with fully charged (but not overcharged) LFP batteries show that *the protective barrier between the anode and cathode which is supposed to prevent thermal runaway actually begins to degrade at only 80 °C*[65]; this exposes the anode and initiates thermal runaway.

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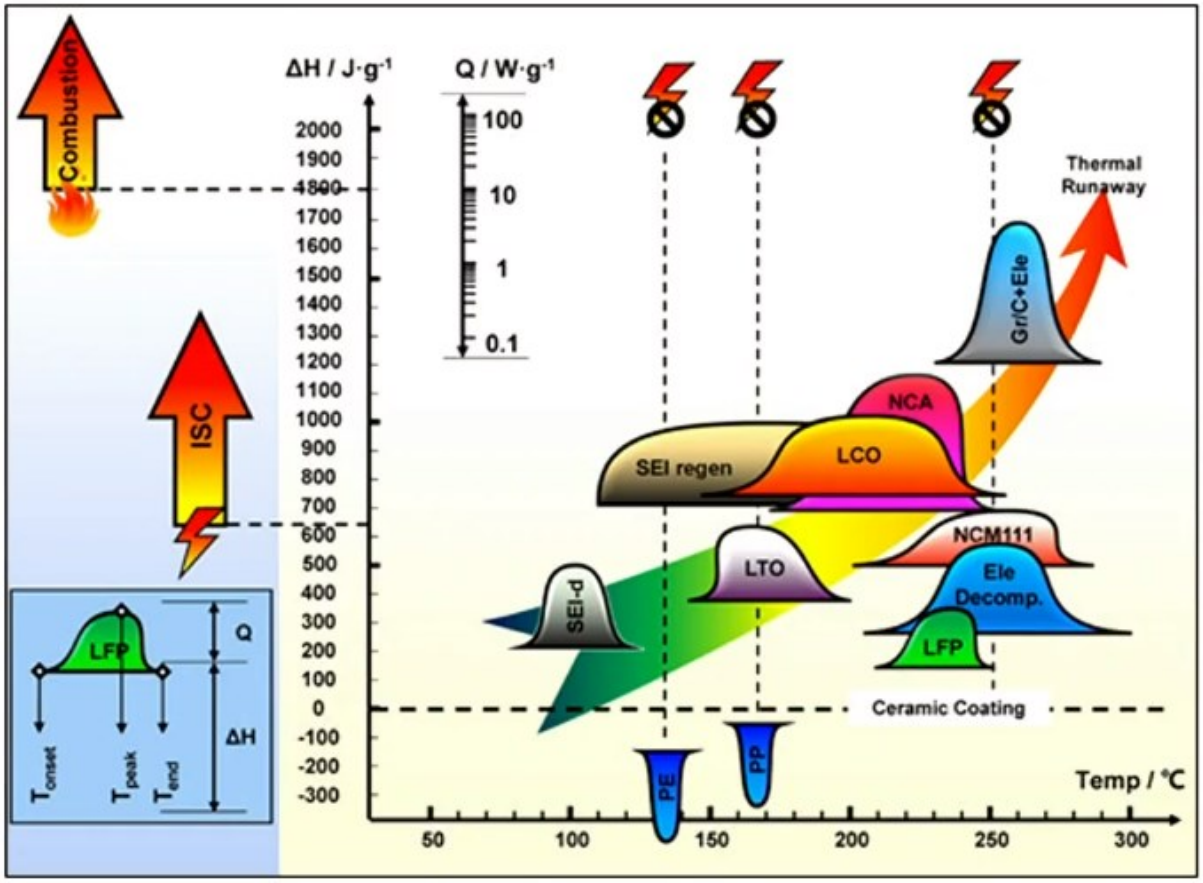
[62] LFP batteries release approximately 50% hydrogen and 20% hydrocarbons, whereas NMC batteries release approximately 30% hydrogen and 16% hydrocarbons. *The Science of Fire and Explosion Hazards from Lithium Ion Batteries*. Presentation by Adam Barowy at the UL Fire Safety Research Institute Lithium-Ion Battery Symposium March 2023 [timestamp 18:10]. https://fsri.org/research-update/lithium-ion-battery-symposium-resource-library .

[63] *A Review of Thermal Runaway Prevention and Mitigation Strategies for Lithium Ion Batteries*. Seham Shahid, Martin Agelin-Chaab. Published the Elsevier Journal of Energy Conversion and Management; Vol. 16. December 2022. Table 2. https://www.sciencedirect.com/science/article/pii/%20S2590174522001337/pdfft?md5=bbada63bced4dca9cce371e45dc62c00&pid=1-s2.0-S2590174522001337-main.pdf

[64] Thermal Runaway can be initiated at only 116 °C in overcharged LiFePO4 batteries. *Study on Temperature Change of LiFePO4/C Battery Thermal Runaway under Overcharge Condition*. Fei Gao et al 2021. Presented at the 3rd International Conference on Air Pollution and Environmental Engineering. IOP Conference Series: Earth and Environmental Science 631. https://iopscience.iop.org/article/10.1088/1755-1315/631/1/012114/pdf

[65] To prevent thermal runaway, lithium ion batteries are equipped with a solid electrolyte interphase film (known as an "SEI film"); however, charged (but not overcharged) LFP batteries have their protective SEI film begin to degrade at temperatures as low as 80°C. *Revealing the Thermal Runaway Behavior of Lithium Iron Phosphate Power Batteries at Different States of Charge and Operating Environment*. Tianyi Li, Yinghou Jia. Journal of Electrochemical Science (September 2022) Article Number: 221030 http://www.electrochemsci.org/papers/vol17/221030.pdf

Figure 12. Temperature Trends of Battery Chemistries



Source: *The Science of Fire and Explosion Hazards from Lithium Ion Batteries*. Presentation by Adam Barowy at the UL Fire Safety Research Institute Lithium-Ion Battery Symposium March 2023 [timestamp 13:55]. https://fsri.org/research-update/lithium-ion-battery-symposium-resource-library.

Finally, as further proof that LFP BESS are not "safe", one need only consider the fact that the U.S. Department of Transportation categorizes LFP batteries as Lithium Ion batteries (because they are) and it classifies them as "Dangerous Goods" because of their propensity to spontaneously ignite; it even assigns LFP BESS the same UN Number (3536) and DG Classification (Class 9) that it assigns to all other Lithium Ion BESS[66]

Taken together, these facts facially contradict the myth that LFP BESS are "safe" because they show that LFB BESS are prone to explosion, fire, and deflagration; these facts further demonstrate that, in many ways, LFP BESS are actually *more dangerous* than NMC BESS.

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66 See Section 2 of the Safety Data Sheet provided in Attachment 23 that pertains to LFP BESS units produced by *Battery Energy Storage Solutions*, an Australian Company.

Adopted Safety Standards Prove that Lithium BESS Can Cause Significant Environmental Impacts.

Underwriters Laboratories ("UL") Test Method 9540A is the primary test protocol for certifying the explosion and flame characteristics of BESS, and it establishes that large, container-based BESS systems are considered to be "UL-compliant" if the flames and explosions that occur when they deflagrate do not propagate "beyond the width of the initiating BESS" (see Figure 13). In other words, the fundamental assumption in UL 9540A is that BESS containers *will* explode and that such outcomes are acceptable as long as the explosions and flames are unlikely to engulf other BESS containers. UL 9540A constitutes a tacit admission that BESS pose very real fire and safety dangers because it expressly anticipates that UL-compliant BESS containers *will* ignite and explode.

It is also important to note that the Method 9540A test conditions are artificially constrained and do not in any way represent "real world" conditions. For instance, the UL9540A methodology for testing BESS containers requires that ambient wind speeds not exceed 12 miles per hour, and it is only under this highly restricted windspeed condition that UL 9540A certification is valid. In other words, the only time that a UL9540A-certified BESS container is unlikely to engulf an adjacent storage container is when the ambient windspeed is less than 12 miles per hour; when windspeeds exceed 12 miles per hour, adjacent containers *are* likely to ignite. This *fact* was proven by a major BESS fire that occurred at the Victoria Bess facility in Australia in 2021 in which a burning BESS container ignited the adjacent container because wind speeds exceeded 23 miles per hour[67]. A photograph of this deflagration event is provided in Figure 14 and it proves that fire-engulfed UL 9540A compliant BESS containers [68] can and will ignite other containers at relatively low ambient windspeeds.

Figure 14 also shows the remarkable fury of BESS container fires during even low wind conditions; this is a substantial problem in wind prone communities like Acton where windspeeds routinely exceed 20 miles per hour. It is a certainty that a similar event will occur in Acton if the Humidor Project is constructed, and when it does, it is likely to spark a wildfire especially if it happens during hot, dry "Santa Ana" fireweather conditions when sustained 50 mile per hour winds whip through the community.

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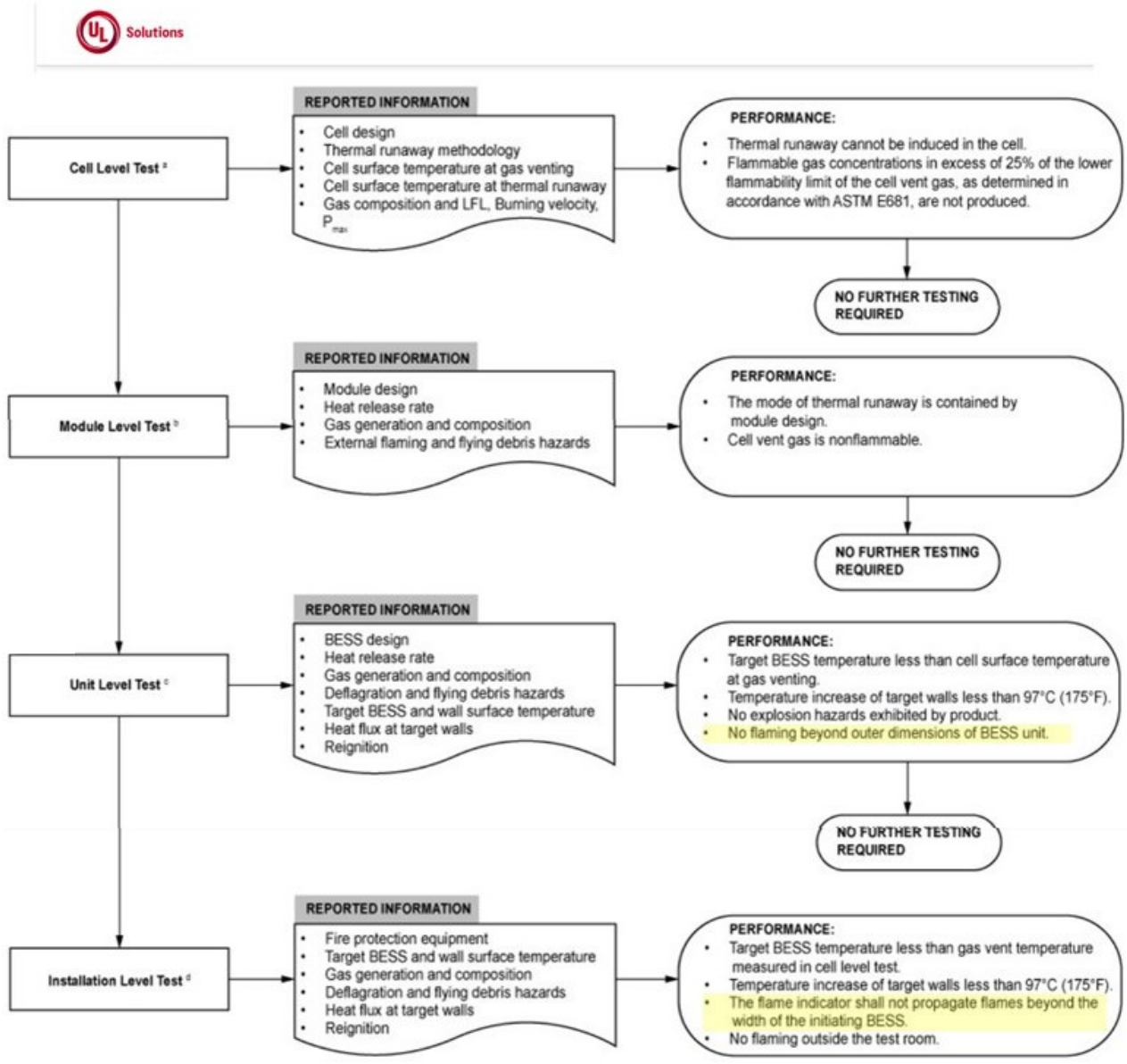
[67] Page 5 of the "Report of Technical Findings" issued for the Victoria BESS Fire incident states that "wind was the dominant contributory factor in the propagation of fire from [container number] MP-1 to [container number] MP-2. At the time of the fire, a 20-30 knot (37-56 km/hr, 23-35 mph) wind was recorded out of the north". This "Report of Technical Findings" is provided in Attachment 24.

[68] This facility was constructed in 2020 with "Tesla Megapack" products which, according to TESLA, was UL 9540A certified as of 2020 [https://r6.ieee.org/sfias/wp-content/uploads/sites/67/J-Gromadzki-Tesla-On-site-Energy-Storage-Systems.pdf Page 32].

Figure 13. UL-9540A Test Method Acceptance Chart.



Source: "UL 9540A Battery Energy Storage System (ESS) Test Method" by Howard D. Hopper, FPE - Global Regulatory Services Manager. [https://www.ul.com/news/ul-9540a-battery-energy-storage-system-ess-test-method].

Note: As indicated in the highlighted portions of this "Flow Chart", a BESS Container unit is deemed to meet the UL 9540A standard if it experiences a deflagration event which does not produce flames that extend beyond the width of the BESS Container Unit.

Figure 14. Engulfed Battery container at the Victoria BESS facility in Australia in 2021.

Source: https://www.crowdjustice.com/case/bess-battery-storage-hazardous-material/

BESS Pose Unique Risks to Acton Because BESS Fires Cannot be Extinguished and There are No Effective Fire Fighting Practices.

Once thermal runaway is initiated in a Lithium BESS, a fire always ensues and it cannot be extinguished because lithium battery fires are self-sustaining and no effective means of suppression have been developed. Given that the Los Angeles County Fire Department will not use water to extinguish BESS fires, a BESS fire ignited in Acton will simply be allowed to burn itself out; this means that flames will spontaneously erupt for days (or even weeks). This is not hyperbole, it is fact. The Gateway BESS fire that ignited in San Diego County on May 15, 2024 continued to reignite for weeks and it was not until May 30 that firefighters commented that they were "cautiously optimistic" that they would be able to "wrap it up" by June 2[69]. And, while it is true that the Los Angeles County Fire Department will use water to suppress "spot fires" that may ignite in the area surrounding the BESS fire, this will not be effective during Santa Ana conditions in Acton when "spot fires" can ignite a mile from the flame source.

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[69] "Battery storage fire near Otay Mesa ongoing two weeks later" https://www.youtube.com/watch?v=YRnNfFuQwNk

BESS Fires Occur Frequently Because There are Many Mechanisms that Trigger Thermal Runaway.

The reason that thermal runaway events and their ensuing BESS fires occur so frequently is because they are caused by many different factors. One cause is manufacturing error; for instance, if the separator film between the anode and cathode is defective, then an internal short circuit occurs and thermal runaway is immediately initiated. Other manufacturing errors will result in impaired control systems which cause the battery cells to overcharge; overcharging rapidly degrades the separator film which causes a short circuit and initiates thermal runaway. Control system manufacturing defects also cause battery cells to overdischarge (which drops the cell voltage to a level below the manufacturer's recommendation); if this occurs just a few times (which is likely if the control system is malfunctioning), thermal runaway is initiated when the cell is recharged[70]. Manufacturing errors can also result in flawed cooling systems which, as explained below, also cause thermal runaway.

Manufacturing defects are perhaps the most insidious causes of thermal runaway because they are invisible and undetectable. Manufacturing defects are also very common and widespread. Clean Energy Associates (CEA) recently conducted inspections at 64 percent of "Tier 1" lithium-ion BESS manufacturers around the world (in the United States, South Korea, India, Viet Nam, and China) and found a very high incidence of manufacturing deficiencies[71]. Among other things, the CEA study cited substandard quality control procedures, defects in upstream components that were not caught during quality checks, poorly welded wiring connections, charging/discharging failures, structural deformations, and "abnormally large temperature and voltage variations among battery cells". The study also found that 26% of the BESS systems that were inspected had deficiencies related to the fire detection and suppression system and 18% had deficiencies related to the thermal management system. Notably, each of these deficiencies (whether related to wiring, welding, structural deformations, or system controls) can (and will) result in thermal runaway event.

Another cause of thermal runaway is the failure of a mechanical cooling system (typically consisting of fans) which causes individual battery cells to exceed the temperature threshold, fail, then initiate thermal runaway. This is a constant concern because BESS generate significant heat during both charging and discharging cycles; therefore, BESS containers have extensive fan networks and cooling equipment which, like any mechanical system, is susceptible to operational "glitches" and failure; when this happens, thermal runaway ensues.

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[70] https://ul.org/research/electrochemical-safety/getting-started-electrochemical-safety/what-causes-thermal

[71] *BESS QUALITY RISKS: A Summary of the Most Common Battery Energy Storage System Manufacturing Defects.* February, 2024. CEA Insights. A copy is provided in Attachment 25. https://info.cea3.com/hubfs/CEA%20BESS%20Quality%20Risks%20Report.pdf

Another cause of thermal runaway at a BESS facility is installation errors mishaps; in fact, there are many types of installation mishaps that can trigger thermal runaway. For example, if mishandling damages a single battery cell in a manner that compromises the protective separator film, a short circuit will occur and thermal runaway will be initiated. It is important to point out that BESS containers are always shipped and installed in a charged state; this is why thermal runaway can occur even during shipping and installation and why several freeways in Southern California have been closed after recent transportation mishaps involving Lithium Ion BESS containers. Other types of installation errors can also cause thermal runaway. For example, the Australian BESS fire described above resulted from a liquid coolant leak that occurred during construction[72]. Installation errors sometimes do not reveal themselves until after construction is complete and the system is online. This was certainly the case in the Moss Landing BESS Fire which occurred because numerous vent shields were improperly installed. One of the improperly installed vent shields dislodged an umbrella valve which caused significant quantities of water to pour onto the stacked battery cells; this shorted them out which immediately initiated thermal runaway[73].

Given the numerous pathways for initiating thermal runaway and the troublesome deficiency statistics presented in the CAE report, it is surprising that there have not been *more* BESS explosions and fires. Nonetheless, more BESS fires will occur over time for several reasons. First, BESS degrade as they age;[74] specifically, the separator film between the anode and cathode degrades with time and therefore has a progressively higher probability of causing a short circuit and initiating thermal runaway. Second, manufacturing defects and installation errors will eventually assert themselves and at the very least, will cause storage system interruptions if not fires or explosions. Third, the probability of thermal runaway occurring in a particular area increases as the number of BESS containers in the area increase[75].

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72 https://www.energy-storage.news/investigation-confirms-cause-of-fire-at-teslas-victorian-big-battery-in-australia/.

73 https://www.pgecurrents.com/articles/3832-pg-e-shares-findings-september-2022-moss-landing-megapack-incident

74 "[B]atteries remain the primary cost component for BESSs. Due to a multitude of cell internal aging mechanisms, lithium-ion cells are subject to degradation, which manifests itself in capacity loss, cell resistance increase, as well as safety implications." *Aging aware operation of lithium-ion battery energy storage systems: A review*. Published November 25, 2022. Nils Collath, Benedikt Tepe, Stefan Englberger, Andreas Jossen, Holger Hesse. https://www.sciencedirect.com/science/article/pii/S2352152X2201622X

75 It is purely a "numbers game": the likelihood of a mechanical failure or an installation error or a defective BESS container increases as the total number of BESS containers increase at any given location. A recent study issued by Pacific Northwest National Laboratories ("PNNL") points out that "Regardless of project size, the fundamental question in assessing a project's risk is what happens if a single unit fails, rather than what happens if every unit fails at once"; the article continues by asserting that the risk of a fire incident at a properly designed (*continued*)

"Interventions" and "Measures" and "Standards" Do Not Prevent or Eliminate or Mitigate BESS Fires.

For years, energy developers and industry shills have insisted that BESS systems can be designed safely and constructed with fire suppression systems and "clean agents" to eliminate the possibility of fire and explosion once overheating occurs; these claims are all controverted by material evidence. For instance, a representative of 3M (which manufactures suppression systems) told the National Fire Protection Association (NFPA) that "[c]lean agents are demonstrably ineffective on preventing and stopping thermal runaway, as are foam and dry chemical"[76]. This has been corroborated by others who explain that traditional firefighting strategies fail because a BESS fire is "an electrochemical discharge between chemical components that are self-reactive. They do not require air or oxygen at all to proceed"[77]. Recently, energy developers, and industry shills have begun to claim that they have a new approach which will ensure BESS fire safety by "layering" protection systems [78]; this "layered" approach generally involves three basic mechanisms: 1) Battery management; 2) Detection; and 3) Fire suppression. However, these "layered" mechanisms are themselves not reliable and they certainly *do not* render Lithium BESS safe:

Battery Management: involves the operation and integration of the BESS and it is supposed to ensure that the tens of thousands of battery cells in a BESS container never overheat, overcharge, or overdischarge. However, "Battery Management" systems are not 100% reliable and, like the BESS themselves, can have manufacturing defects,

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(continued) BESS is decoupled from the project size because a properly designed BESS will "prevent a fire in one unit from spreading to neighboring units" (though SORT notes that this statement is only true when ambient wind speeds do not exceed the UL9540A test threshold of 12 miles per hour). Here, PNL merely articulates that a fire incident at a BESS facility is likely to be contained to a single container and not spread to other containers. However, PNL does not challenge, and cannot challenge, the indisputable fact that the probability that a fire incident will occur at a BESS facility increases as the number of BESS containers at the facility increase. The PNL Report is "*Energy Storage in Local Zoning Ordinances*". October 2023. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-34462.pdf

[76] Arizona Public Service Final Report; July 18, 2020; Document No. 10209302-HOU-R-01 [https://www.aps.com/-/media/APS/APSCOM-PDFs/About/Our-Company/Newsroom/McMickenFinalTechnicalReport.pdf?la=en&hash=37F06DD16761765FD61DDA9AE7C9C4EF]

[77] *Safety of Grid Scale Lithium-ion Battery Energy Storage Systems*. Dr Edmund Fordham - Fellow, Institute of Physics; Dr Wade Allison - Professor of Physics and Fellow of Keble College, Oxford University; Professor Sir David Melville Professor of Physics, University of Kent. June 5, 2021. Page 10. https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010106/EN010106-004001-DL2%20-%20Edmund%20Fordham%20EF2.pdf .

[78] https://www.statx.com/whitepaper/fire-suppression-battery-energy-storage-systems/; https://evloenergy.com/news/ensuring-fire-safety-in-bess; https://www.orrprotection.com/applications/power-generation-overview/battery-energy-storage-systems, etc.

installation errors, and operational "glitches". Given that thermal runaway can be initiated when just *one* of the battery cells in a BESS becomes overcharged (which, as described above, is a particular concern for LFP BESS), the fallibility of "Battery Management" systems render this "protection layer" of limited value.

Detection: involves detecting the presence of combustible gas or smoke; when this occurs, the operator can halt the BESS charging/discharging process, activate alarms, and open vents. However, what proponents fail to articulate is that "Detection" does *not* provide a warning of a possible thermal runaway event; rather is confirms that thermal runaway *has already begun*. In fact, the combustible gas that these systems detect is nothing more than the vaporized electrolyte solution which the battery cells release only *after* thermal runaway occurs. Because "Detection" occurs after thermal runaway is initiated, it does not *does not* enable operators to avoid thermal runaway or its ensuing self-sustaining fire[79]. However, detection is useful to the extent that it enables the operator to sound alarms, shut down charging operations, trigger vents, and initiate "shelter in place" warnings to the surrounding neighborhood.

Fire Suppression: involves "putting out" a BESS fire. However, BESS fires involve self-reactive electrochemical energy and do not require oxygen; therefore, and regardless of the suppression system used, they will persist and reignite in any cell in which the temperature exceeds the thermal runaway initiation threshold (which is often as low as 150 °C)[80] *regardless of the suppression material that is used*. That is why

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79 Energy developers and manufacturers present "Detection" as a panacea solution that provides sufficient advance notice of a potential problem to enable an operator to take steps and prevent thermal runaway and the self-sustaining fire that it creates. For example, STATX claims that "Detection" provides "an opportunity to mitigate the problem before it requires a response action from fire suppression equipment" [https://www.statx.com/whitepaper/fire-suppression-battery-energy-storage-systems/]. This suggests that "Detection" allows operators to "head off" thermal runaway and avoid "active suppression" when in fact "Detection" merely identifies when thermal runaway is already initiated and thus requires active suppression. ORR asserts "Detecting potential fires early can assist to prevent and mitigate the risk of fire" [https://www.orrprotection.com/applications/power-generation-overview/battery-energy-storage-systems] ; this statement is at best inaccurate and at worst, incorrect. "Detection" identifies when a thermal runaway event is already initiated and while it is useful for preventing explosions by allowing operators to vent combustible gases, It does not allow operators to prevent thermal runaway or the ensuing fire that it creates. EVLO artfully explains that its "Detection" system "forces fresh air in from outside the enclosure. Simultaneously, the venting panels open to release hot gas from the enclosure" and that "natural convection alone is enough the meet the performance requirements of NFPA 69" [https://evloenergy.com/news/ensuring-fire-safety-in-bess]. However, this system *will not* allow operators to avoid thermal runaway and its ensuing fire concerns since natural convection is insufficient to suppress ongoing thermal runaway because air lacks the thermal capacity necessary to cool the batteries (see page 20 of the Oxford/Cambridge paper cited in footnote 77).

80 See the Oxford/Cambridge paper cited in footnote 77 at pages 8 and 10.

BESS fire emergency response events require personnel to "sit" on a BESS fire for days and even weeks with water hoses "at the ready". For example, it took firefighters nearly 17 days to "clear the scene" at the Otay Mesa BESS fire that ignited on May 15, 2024 and persistently reignited[81].

Adopted standards and test methods demonstrate that "layered" protection systems *do not mitigate thermal runaway or the self-sustaining fires that thermal runaway creates*. This ***fact*** is proven by UL 9540-A which, as described above, only requires that Lithium BESS containers be designed to ensure that, when thermal runaway *does* occur, it is less likely that adjacent containers do not explode or ignite.

Lithium BESS Ignitions Threaten the Surrounding Community, Cause Extensive Disruptions, and Require Lengthy Evacuations.

SORT is aware that the Los Angeles County Fire Department has no concerns regarding the BESS safety; in fact, Fire Chief Marrone dismisses these concerns and even informed the Board that BESS container facilities rarely ignite and that, internationally, only three BESS fires have occurred[82]. These representations by Chief Marrone are factually incorrect. BESS container fires have become almost common. In fact, over just the last few months, four major Lithium BESS fires have occurred *just in Southern California*, including the Sanborn BESS (which has actually ignited 3 times over the last year [83]), the Otay Mesa BESS[84], the Santa Ana BESS[85], and the SDG&E BESS[86]. Contrary to DPW says, BESS fires occur frequently.

BESS fires are also very dangerous. In fact, when a BESS container ignites, it releases thousands of pounds of toxic gases, including Hydrogen Fluoride (HF) and Hydrogen Cyanide (HCN). These gases are emitted as highly concentrated toxic vapor which is colorless and invisible, and when it wafts into surrounding areas, it creates a life-threatening environment for miles downwind of the BESS. For instance, the ignition of a single Lithium BESS container with a storage capacity of 7.6 MWhr can release more than 3,000 pounds of deadly HF which creates a toxic cloud that is more than 2 miles in

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81 https://www.sandiegouniontribune.com/2024/06/20/fire-in-otay-mesa-puts-battery-storage-projects-under-scrutiny/

82 Remarks by Chief Marrone at the December 19, 2023 Board Meeting [Transcript page 135 at line 12].

83 One Sanborn BESS fire occurred on July 14, 2024; Kern County Fire Department (KCFD) responded. Other fires have also occurred; the incident reports are provided in Attachment 19.

84 https://www.theenergymix.com/battery-storage-fire-in-california-sparks-widespread-safety-concerns/ May 15

85 https://newsantaana.com/the-sapd-has-closed-streets-as-fire-crews-battle-a-battery-energy-storage-facility-blaze/ July 17, 2024.

86 https://www.energy-storage.news/fire-at-battery-storage-facility-in-california-triggers-evacuation-order/ Sept 5.

length[87]; prudence demands the evacuation of an area that is at least several square miles in size.

Recent events demonstrate that concerns regarding the toxicity of vapor clouds created by BESS fires cannot be overstated. At a BESS fire in Australia, the toxicity levels were so high that people located 6 miles away were ordered to "shelter in place"; a map of the affected area is provided in Figure 15. Additionally, the public safety risk posed by toxic releases by the Moss Landing BESS fire in 2022 was so significant that *Highway 1 in California was closed for more than 12 hours*[88]. Just a few weeks ago, the Vincent Thomas bridge was closed for more than 30 hours because a BESS unit exploded after a traffic mishap on the road. And, when a BESS container caught fire in July during transport, officials were compelled to close the 15 Freeway in San Bernardino County for almost 48 hours[89]. Notably, this particular BESS fire involved an LFP BESS[90]; this clearly proves that Developer claims regarding the "safety" of LFP BESS are factually incorrect and that LFP BESS are prone to thermal runaway, fire, and explosion in the same manner and to the same extent as NMC BESS.

It is an established fact that the gases released from Lithium batteries kill. According to Congressional Testimony offered by Chief Fire Marshal Flynn of the New York City Fire Department, the cause of deaths in multiple New York City micro battery fires was the toxic fumes released by the batteries. He said "There was no fire that extended to the apartments of the people that were killed there. The smoke from these devices is so toxic

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87 A study published by *Nature* reports that 20 - 200 mg of HF are released per watt-hour of discharge capacity in Lithium Ion batteries [Attachment 26]; this is equivalent to 20-200 kilograms (or 44-440 pounds) of HF per MWh. A typical BESS container can have a discharge capacity of 7.6 MWh; multiplying this by 440 pounds of HF per MWhr yields a total HF release rate of 3,344 pounds per BESS container. The application of EPA's air dispersion model for evaluating releases of hazardous chemicals (https://www.epa.gov/cameo/aloha-software) demonstrates a BESS container fire renders all areas that are downwind and within two miles of the release point to be "Immediately Dangerous to Life or Health" ("IDLH") – See Attachment 27. Notably, this analysis only considers the toxicity of the HF released by a BESS container fire; it does not consider the additional danger posed by the presence of other toxic gases such as Hydrogen Cyanide or Hydrogen Chloride.

88 https://www.ksbw.com/article/highway-1-reopened-near-moss-landing-shelter-in-place-lifted/41302918

89 https://www.vvng.com/15-freeway-between-california-and-las-vegas-reopens-after-two-day-lithium-battery-fire-near-baker/

90 To date, most BESS facilities have relied on Li-NMC; LFP BESS are still quite rare and few have been installed in the United States. When the LFP BESS ignited on the 15 freeway, news stations reported that the event was "the first in the nation" [https://www.fox5vegas.com/2024/08/15/truck-fire-behind-i-15-shutdown-was-first-us-caltrans-says/].

Figure 15. Map of "Shelter in Place" Area Ordered During an Australia BESS Fire.

Source: https://www.theage.com.au/national/victoria/blaze-at-tesla-big-battery-extinguished-after-three-day-battle-for-control-20210802-p58f6x.html

that if it reaches your apartment, you're immediately overcome by this toxic gas"[91]. Given these facts, it is entirely imprudent to locate large BESS facilities near residences or anywhere near commuter corridors, train corridors, or in locations where people congregate. Additionally, in communities like Acton where there are many animal rescues and animal training facilities, BESS facilities are particularly unsuitable because it would be difficult if not impossible for such facilities to quickly bring all their animals "indoors" and thereby “shelter in place” at a moment's notice.

Aside from the toxic cloud and explosive gases released whenever BESS containers undergo thermal runaway, the flames that are created by these events which persist and re-ignite for days pose unique and dangerous risks to communities in Very High Fire

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91 https://goldman.house.gov/media/press-releases/video-and-rush-transcript-congressman-dan-goldman-pushes-greater-regulation

Hazard Severity Zones where hot, dry "Santa Ana" conditions frequently occur with sustained winds exceeding 40 miles per hour. Under these conditions (which occur frequently in Acton), a massive wildfire can be ignited with just a single spark or ember. For instance, the Ranch Fire of 2018 was ignited by a single spark that occurred when a hammer was used to drive a metal stake into the ground[92]; it resulted in one firefighter fatality and three firefighter injuries, and it spread rapidly, burned 410,203 acres, and destroyed 280 structures because it was a VHFHSZ and the spark event occurred during fireweather conditions. Even more surprising, a small (approximately 10 inch long) smoke bomb ignited the El Dorado Fire in 2020[93] which claimed the life of a firefighter and burned more than 23,000 acres; like the Ranch fire, this small incident quickly created an out-of-control wildfire because it occurred in a VHFHSZ during hot, dry, and windy conditions. There is no question that a BESS system in Acton poses a significant wildfire risk fire because a BESS fire such as that shown in Figure 14 is likely to spark a wildfire particularly if it occurs during "Fire Season" which, according to the Western Fire Chief's Association, is becoming a "year- round" condition[94].

Remarkably, both Stantec and DPW claim that the Humidor Project poses a *lower* fire risk than the paintball facility, truck storage, and electrical equipment storage uses that currently exist at the site[95]! This claim is *categorically false* as evidenced by the many BESS fires that have occurred in Southern California over the last few years; no similar number of fires have been triggered by any paintball facilities in Southern California. In fact, SORT could only identify one recent paintball facility fire in Southern California; it occurred in Santa Clarita in 2017 when a participant used an unauthorized smoke cannister. That fire caused limited evacuations and there were no reports of toxic gas emissions. SORT did not identify any fire events at outdoor electrical equipment storage or outdoor truck storage facilities. Despite these facts, Stantec and DPW claim that the Humidor Project is comparatively safer because it will be "remotely monitored" and comply with UL 9540A. These measures are meaningless because they do not reduce the incidence of BESS fires or render BESS "safe". As explained above, remote monitoring does nothing to prevent thermal runaway or a BESS fire and UL9540A certification procedure actually presume that BESS containers *will* ignite and explode. In short, everything that Stantec and Public Works says about the fire risks posed by the Humidor BESS is false and should be accorded no weight.

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92 https://www.kcra.com/article/cal-fire-investigators-release-cause-2018-ranch-mendocino-fire/27793658.

93 https://www.thebigredguide.com/insights/origin-california-wildfire-co-3023-ga.1600677267.html

94 https://wfca.com/wildfire-articles/california-fire-season-in-depth-guide/#pp-toc-6x9tjk18rl5u-anchor-0

95 See page 144 of Enclosure E in the referenced Board Letter.

UNCORROBORATED ALLEGATIONS REGARDING THE SAFETY OF THE HUMIDOR PROJECT DO NOT CONSTITUTE SUBSTANTIAL EVIDENCE.

During the Board of Supervisor's meeting convened October 8, 2024, several individuals commented that the Humidor Project is "safe", that it is in "the perfect location", and that the hazards it poses are no greater than other industrial uses permitted on site[96]. These statements were not corroborated; nonetheless, they must be addressed. Substantial evidence proves these statements to be completely erroneous.

The Humidor Project is Not "Safe".

The 544 MW BESS containers that will be installed with the Humidor Project are prone to explosion and toxic emissions which pose unique risks to the rural Community of Acton. The studies cited herein show that BESS facilities are not safe and cannot be designed to be safe; even the Electric Power Research Institute (EPRI) affirms that Lithium Ion BESS are "not intrinsically safe"[97]. The Humidor Project is susceptible to violent fires that can spontaneously ignite throughout a lengthy ignition window that can last days and even weeks; thus, it poses a unique wildfire risk within Acton's VHFHSZ. SORT understands that Hecate has written a letter to the Board of Supervisors stating that there is minimal risk of embers from the Humidor Project traveling elsewhere and igniting a fire[98]; it has been impossible for SORT to assess the efficacy and accuracy of this claim because the Board will not make the letter publicly available and Hecate will not share the letter with the Community. Nonetheless, and at a minimum, this is an admission that the Humidor Project does pose at least some wildfire risk from ember dispersal; this risk is magnified in Acton during "Santa Ana" fireweather conditions which can last for days and create sustained windspeeds that routinely exceed 50 miles per hour. Even under "normal" conditions in Acton, winds exceed 20+ mile per hour on a daily basis[99]. These conditions render UL9540A certification almost worthless because UL9540A test results are only valid when windspeeds are less than 12 miles per hour; this fact was proven in the Victoria BESS fire in which a UL9540A certified BESS container deflagrated and then ignited an adjacent UL9540A certified BESS container because the wind exceeded 23 miles per hour (see Attachment 24). In the "real world" of Acton, a BESS container fire at the Humidor Project is guaranteed to spread to other containers even if they are UL9540A

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96 Transcript of the October 8 Board of Supervisors Meeting https://file.lacounty.gov/SDSInter/bos/sop/transcripts/1169006_10-08-24.pdf.

97 *The Evolution of Battery Energy Storage Safety Codes and Standards*. EPRI White Paper published November, 2023. https://restservice.epri.com/publicdownload/000000003002028521/0/Product

98 A Heatmap News article states Hecate submitted a letter to the Board claiming there is minimal risk of embers traveling elsewhere and igniting grass or bushes. *A Battery Backlash Goes to Washington*. Jael Holzman. September 4, 2024.

99 Acton is in a valley between the San Gabriel and Sierra Pelona mountain ranges where wind continuously funnels between the high desert and the San Fernando Valley.

certified because Acton is a windy place; that means more fires and more toxic gas emissions. In other words, and contrary to what Hecate and DPW and Stantec claim, the Humidor Project BESS poses very real, very unique, and very significant wildfire risks to the Community of Acton and these risks are unmitigable.

SORT is also exceedingly troubled by the great lengths to which DPW, Regional Planning, Stantec and Hecate have gone to ignore the toxic conditions that are created during a BESS fire. It is bad enough that Stantec deliberately misstated data and conclusions in an outdated 2017 report pertaining to BESS fire toxicity and that DPW has now parroted these mendacities to the Board; what is far worse is the ruthless disregard that all have shown for the new studies, dispersion modeling results, and toxicity data that SORT and others members of the public have provided over the last year which *prove* that toxic releases from BESS fires are very dangerous. And it has all been ignored. To demonstrate that the toxic threat of BESS fires is very real, the Board is reminded that, just last month, hundreds of businesses were closed, several schools were closed and residents were evacuated for more than two days because a BESS container ignited at the 30 MW SDGE BESS yard in Escondido[100]. Dispersion modeling using EPA protocols and local conditions show that a single BESS container fire in Acton will create a lethal toxic cloud that is more than 2 miles long (as shown in Attachment 27). Toxic emissions from the inevitable BESS container fire at Humidor threaten both residents and animals in Acton; perhaps people will be able to quickly evacuate or "shelter in place", but the animals will not. Acton is home to many livestock ranches and animal facilities and it has the largest number of rescue operations in the county[101]; therefore, these facilities are uniquely threatened by the Humidor Project.

The referenced Board Letter makes it very clear that DPW and Stantec are committed to continuing the perpetuation of the false narrative that BESS facilities in Acton are "safe" despite a mountain of contrary evidence. The Board of Supervisors has an obligation to make sound and reasonable decisions based on facts and evidence and not be persuaded by unsupported claims about BESS safety that have become nothing more than a mindless, uncorroborated mantra. BESS are not safe in Acton and they cannot be rendered safe in Acton. Therefore, they do not belong in Acton.

The Humidor Project is Not in the "Perfect Location".

The Humidor Project is located in the northeast corner of Acton at the Soledad Pass which connects the Antelope Valley to the Santa Clara River Valley, and during fireweather conditions, high winds traveling west from the Antelope Valley funnel through the Soledad Pass and actually increase speed as they travel through Acton.

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100 https://www.nbcsandiego.com/news/local/lithium-ion-battery-fire-in-escondido-prompts-large-response/3615328/

101 https://animalcare.lacounty.gov/wp-content/uploads/2024/09/BUSINESS-LICENSE-LETTER-GRADES-9-17-24.pdf

Sustained wind speeds exceeding 50 miles are not uncommon in Acton during fireweather conditions (which is why Acton was the hardest hit community in Los Angeles County during SCE's "public safety power shutoff" events of 2019-2022). Any spark or ember that is released from a Humidor BESS fire during high wind conditions will be carried for miles into the chaparral west of the project site[102] and spark a conflagration that will first burn through Acton, then through Agua Dulce, and then threaten the City of Santa Clarita. In other words, the Soledad Pass area where the Humidor Project will be constructed is the ***worst*** location because it is in the Soledad Pass area where hot dry Santa Ana winds originate in Acton. The Humidor BESS *is not* in the "perfect location" and it does not belong in Acton.

The Humidor Project Poses a Much Greater Public Safety and Wildfire Risk Than Any Other Industrial Uses Permitted on the Site.

The Humidor Project site is zoned "Light Industrial", and the uses that are permitted on the site are clearly enumerated in Section 22.22.030 the Zoning Code and summarized in Attachment 9. It is clear from Attachment 9 that permitted uses in "Light Industrial" zone are benign and not susceptible to spontaneous explosion, deflagration, or toxic gas releases like the Humidor Project; therefore, they do not pose the same significant public safety risks. Yet, DPW and Stantec claim (without evidentiary support or factual citation) that the hazards posed by the Humidor Project are no greater than other industrial uses permitted on the site. These claims are materially false, as an inspection of Attachment 9 demonstrates. The Board has no basis to accord any weight to such unsupported claims by DPW and Stantec, particularly when they have been utterly controverted by facts.

THE HUMIDOR BESS PROJECT *WILL* HAVE SIGNIFICANT NOISE IMPACTS.

The Humidor Project will include hundreds of BESS containers, hundreds of inverters, transformers, mechanical ventilation systems, and other equipment which will operate continuously and generate a significant noise profile. According to the published noise study prepared for a 500 MW BESS Project in Washington (provided in Attachment 28), BESS facilities that are similar in size to the Humidor Project are a significant noise source. In fact, Figure 3 of this Washington report indicates that receptors within 1/4 of a mile (approximately 1,300 feet) of the Humidor BESS will routinely (and probably continuously) experience noise levels exceeding 50 decibels, and receptors within 3/8 of a mile (approximately 2,000 feet) will routinely (and probably continuously) experience noise levels exceeding 45 dBA. These noise levels exceed the County Code which restricts limits nighttime noise levels at the exterior of a residence to 45 dBA or less.

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[102] According to the Orange County Fire Authority, embers travel up to five miles depending on the strength of the wind. https://ocfa.org/Uploads/SafetyPrograms/OCFA%20RSG%20-%20Be%20Ember%20Aware.pdf

Perhaps more importantly, the Washington BESS noise study reveals that large BESS facilities like Humidor generate particularly high noise levels in the low frequency bands (less than 250 Hz); this BESS noise profile is reproduced here:

Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment Sound Source

Sound Power Level by Octave Band Frequency (dBL)								
31.5	63	125	250	500	1k	2k	4k	8k
109	94	101	95	88	82	75	68	63

Source: Hop Hill BESS Project Acoustic Assessment Report
https://www.efsec.wa.gov/sites/default/files/220356/001/HopHill_ASC_Attachment_Q_AcousticAssessment.pdf

The fact that BESS facilities generate significant noise levels in the low frequency bands is substantially troubling because low frequency noise it presents itself as a background hum or vibration that is physically very annoying even if is audibly undetectable; this is because low frequency noise is often "felt" as much or more than it is "heard". According to the National Institutes of Health and the National Library of Medicine, low frequency noise is recognized as a "special environmental noise problem, particularly to sensitive people in their homes". Worse yet, NIH reports that "conventional methods of assessing annoyance, typically based on [an] A-weighted equivalent level, are inadequate for low frequency noise and lead to incorrect decisions by regulatory authorities"[103].

The BESS noise profile presented above demonstrates that the Humidor BESS will generate exceedingly high sound levels (up to 109 dBA!) at the very lowest (and therefore the most disturbing) frequency bands. Furthermore, because the Humidor Project will be located in Acton's desert environment and surrounded by barren terrain, there is little ground cover vegetation available to absorb the noise and thereby reduce the noise impact (while trees and shrubs are not effective in dampening low frequency noise, a robust ground cover and "vegetation litter" does provide some low frequency dampening[104]). Accordingly, the low frequency noise generated by the Humidor Project will merely bounce off the barren ground and reverberate among the surrounding hillsides. Moreover, because of the propagation characteristics of low frequency noise,

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[103] Leventhall H. G. Low frequency noise and annoyance. Noise Health. 2004 Apr-Jun;6(23):59-72. Copy is provided in Attachment 29.

[104] Gaudon JM, McTavish MJ, Hamberg J, Cray HA, Murphy SD. Noise attenuation varies by interactions of land cover and season in an urban/peri-urban landscape. Urban Ecosyst. 2022;25(3):811-818. doi: 10.1007/s11252-021-01194-4. Epub 2022 Jan 16. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8761103/

there would still be very little attenuation of the noise generated by the Humidor Project even if it were surrounded by verdant vegetation[105] This means that residences and businesses within half a mile (or more) of the Humidor BESS will be exposed to ***continuous*** *low frequency noise levels of 85 dBA or higher*[106]. Furthermore, noise barriers are not effective in reducing low frequency noise[107]; this means that the significant noise impacts that will be generated in the low frequency range by the "whole" Humidor Project *cannot be mitigated*.

Acton residents who live within two miles of the Vincent Transmission substation in East Acton have firsthand knowledge of the extent to which continuously operating electrical equipment will generate a significant, low frequency noise insult that interrupts sleep patterns and interferes with normal activities. One resident who lives just over a mile from the Vincent substation has appeared at numerous community meetings begging for assistance to address this problem; the Health Department was contacted several times, but staff did nothing. SCE was contacted, and even came to the resident's home with a noise monitor; but, because the noise meter that SCE used was programed for an "A-weighted equivalent level", it returned a high-bias result that failed to even measure low frequency noise levels. This allowed SCE to dismiss the problem and claim that the noise was "not significant". These factual assertions can be corroborated by County staff[108].

SORT further notes that the methodologies and practices currently implemented by the County to assess and mitigate noise impacts are insufficient for the purposes of addressing Humidor Project noise effects. This is because the County's Noise Ordinance is based on conventional A-Weighted noise equivalent levels[109] which are inappropriate

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105 Leventhal, G., *What is infrasound?* Progress in Biophysics and Molecular Biology, Volume 93, Issues 1–3, January–April 2007. Elsevier. https://www.sciencedirect.com/science/article/pii/S0079610706000848/pdfft?md5=ea167098a2d725818492fe18b991154d&pid=1-s2.0-S0079610706000848-main.pdf page 135.

106 This assumes the low frequency noise levels reported in the table occur 10 feet from the edge of the BESS equipment and it employs a divergence rate (sound attenuation over distance) of 3 dBA per distance doubled. This divergence rate is reasonable, given that the unshielded noise is generated by hundreds of contiguous high volume sources concentrated on 20 acres.

107 Federal Railway Administration High-Speed Ground Transportation Noise and Vibration Impact Assessment Manual. Page 4-19. [https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/2680/20120220_FRA_HSR_NV_Manual_FINAL_102412.pdf].

108 For instance, Supervisor Barger's Field Deputy Charles Bostwick was present at several community meetings in which this resident described the situation and asked for help.

109 Noise standards established by County Ordinance are codified in Title 12, Chapter 12.08 which establishes specific exterior noise levels that cannot be exceeded by any project (Section 12.08.390); these standards are based on A-weighted equivalent levels and compliance with these standards is assessed using A-weighted sound level meters (Section 12.08.370).

for assessing and mitigating low frequency noise impacts and "lead to incorrect decisions by regulatory authorities". Therefore, the County's Noise Ordinance provides an insufficient basis for assessing noise impacts of the Humidor Project.

The General Plan also uses A-weighted noise metrics[110], so it is similarly unsuitable. Worse yet, the community noise metrics utilized by the General Plan are not based on *actual* A-weighted sound levels; rather, they are based on calculated values that are derived by averaging all sound events over 24 hours[111]. Because the noise metrics adopted by the General Plan are based on a 24 hour average noise value and do not address the *actual* noise effects caused by a project, they cannot be utilized to evaluate direct noise impacts in an Environmental Impact Report[112] (though they could perhaps be used to assess indirect noise effects). Finally, and insofar as SORT is aware, the applicable noise standards adopted by other (non-County) agencies are all based on an A-weighted noise standard and/or a 24 hour average noise metric; accordingly, none of them are sufficient for assessing noise impacts of the Humidor Project. Because the County's noise ordinance and adopted noise policies are all based on A-weighted measurements, they "miss" the substantial noise contribution in the low frequency bands and are therefore incapable of assessing or mitigating the significant noise effects of the Humidor Project.

Moreover, the methodology that DPW typically utilizes to assess project noise impacts is insufficient for the purposes of assessing the significance of the Humidor Project's noise effects. For example, DPW's "Initial Study Checklist" only considers the following for Noise Impacts[113]:

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110 *General Plan 2023*. Page 189. [https://planning.lacounty.gov/wp-content/uploads/2022/11/11.0_gp_final-general-plan-ch11.pdf].

111 Specifically, General Plan noise metrics are based on CNEL and L_{dn} values that provide a single noise value that represent an average of all A-weighted sound levels measured over a 24 hour period. *Id.*

112 CEQA requires Environmental Impact Reports to assess the "direct effects" of a project [CEQA Guidelines Section 15126.2], and it defines "direct effects" as "primary effects which are caused by the project and occur at the same time and place" [CEQA Guidelines Section 15358]. Accordingly, the "direct noise effect" of a project is, by definition, the *actual* noise generated by the project at the place and time that the noise occurs. Thus, the County can only utilize actual noise data when it addresses the direct noise effects in the Humidor Project EIR. It is noted however that noise standards based on a 24 hour averaging methodology may be appropriate for assessing "indirect noise effects" because CEQA defines "indirect effects" as "secondary effects which are caused by the project and are later in time or farther removed in distance".

113 These factors were obtained from the "Initial Study" that Public Works recently prepared for the proposed "North County Solid Waste Collection Services" Project. [https://pw.lacounty.gov/epd/NorthCountySolidWasteCollectionsvcs/doc/IS_North_County_Solid_Waste_Collection_Services_Project.pdf].

1. Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

2. Would the project result in Generation of excessive groundborne vibration or groundborne noise levels?

3. For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Factor 1 would appear to be relevant, but because it is limited to only considering "standards established in the local general plan or noise ordinance", it will only consider A-weighted standards which are entirely inappropriate for assessing BESS noise effects. Factor 2 focusses on vibration, not noise (though vibration is likely to be a concern because of the low frequency tendencies of BESS facilities). Factor 3 is inapplicable because the Humidor Project is not located near a private airstrip or public airport.

The technical and anecdotal evidence presented here clearly demonstrates that the low frequency noise effects of the Humidor Project are unique and significant; the evidence also demonstrates that the County will have to develop new impact assessment methodologies and adopt new standards to properly address these unique and significant effects. Therefore, the County is obligated to prepare an EIR which properly addresses the unique low frequency characteristics of the BESS and considers project alternatives (including alternative locations) that will reduce or avoid these significant effects.

THE HUMIDOR BESS PROJECT *WILL* HAVE SIGNIFICANT AESTHETIC IMPACTS.

When DPW assesses the aesthetic impacts of a proposed project, it considers the following issues:

1. Will the project have a substantial adverse effect on a scenic vista?

2. Will the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

3. In non-urbanized areas, will the project substantially degrade the existing visual character or quality of public views of the site and its surroundings (public views are those that are experienced from publicly accessible vantage point).

4. Will the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

The Humidor Project will create all of these significant impacts because of its location, its size, and its configuration.

The Location and Size of the Humidor Project:

The Humidor Project is an enormous project which is nearly 20 acres in size and located in a valley within full view of all travelers along 4 major commuter corridors (the 14 Freeway, the Sierra Highway, the Angeles Forest Highway, and the Metrolink railway); collectively, these commuter corridors accommodate more than 110,000 travelers per day[114]. The project itself consists of 660 large structures (consisting of large battery "shipping containers" and inverter units) and ancillary electrical facilities (including transmission lines). The project will be highly visible from all the transportation corridors because its unsightly industrial structures will be packed together and lined up next to each other in the open air; none of it will be camouflaged or concealed and it will have the appearance of an enormous container storage yard. The developer has asserted that the project will be "landscaped"; however, the project is located in a shallow valley and is visible from all the surrounding terraces and hillsides which means that landscaping will not conceal the industrial unattractiveness of this "open air" project. The developer has also indicated that trees will be planted as part of the landscape program, but prudence and safety demand that trees should not be placed anywhere near the project because of the fire risk that the project poses. Accordingly, any landscaping that is installed on the project site will be low growing and thus incapable of visually screening the Humidor Project. Taken together, these factors demonstrate that the significantly adverse aesthetic impacts created by the project *cannot be mitigated*. As proof of this, the developer has provided a simulation photograph that clearly shows the enormity and industrial unattractiveness of the Humidor Project (see Figure 16); SORT has labeled the commuter routes that surround the project.

It is also important to note that the Board of Supervisors has designated the 14 Freeway in Acton as a "Scenic Drive" and adopted Plan provisions to expressly protect the scenic vistas along this "Scenic Drive" from incompatible development (Policy COS 5.7)[115]. Among other things, the Plan goals and policies also seek to ensure development does not compromise rural character (Policy LU 6.2) and instead enhances it (Goal LU-1). It

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[114] Peak traffic count data collected by CalTrans in 2022 show 105,000 commuters per day along the 14 freeway; an additional 5,000 travelers are estimated for Sierra Highway, Soledad Canyon Road, the Angeles Forest Highway, and Metrolink. [https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/census/2022/2022-traffic-volumes-ca-v2.xlsx

[115] The Conservation and Open Space Element of the Antelope Valley Area Plan incorporates "Goal COS-5" to ensure that "The Antelope Valley's scenic resources, including *scenic drives*, water features, significant ridgelines, buttes, and Hillside Management Areas, are enjoyed by future generations (emphasis added).
[https://case.planning.lacounty.gov/assets/upl/project/tnc_ch_04_os-20150601.pdf .

Figure 16. Simulation photograph of the Humidor Project.

is facially obvious that the Humidor Project controverts all of these goals and policies. It does not enhance rural character; it destroys it. It is not compatible with the surrounding rural bucolic area; in fact, it is a contradictory negation of its rural surroundings. Its scale, size, and appearance *will* substantially blight the scenic viewshed along this Scenic Drive and *will* "have a substantial adverse effect on a scenic vista" and "substantially damage scenic resources". It must also be pointed out that the significant aesthetic impacts created by the Humidor Project will not be reduced or even addressed by the application of uniform policies or mitigation measures adopted by the EIRs that were certified for the General Plan and the AV Area Plan; this is because neither of these EIRs proposed any mitigation measures that address aesthetic impacts. Moreover, traditional remedies such as landscaping and buffering will not work either; buffering is not feasible because the Humidor BESS abuts a residential property and (as explained above) camouflaging the facility behind tall trees is not prudent.

The Configuration of the Humidor Project

Insofar as SORT is aware, the Humidor Project proponent submitted the first permit application to the County in April, 2021[116]. At that time, much of the site was covered in natural vegetation and it supported a low intensity, naturally surfaced recreational paint ball operation (although some unpermitted storage uses were also on the site); these uses generally "blend" into their surroundings as shown on the aerial imagery provided in Figure 17 which was captured on October 1, 2020 shortly before the application was submitted.

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[116] According to County "energov" reports, a site plan application and a Conditional Use Permit Application were filed on April 27, 2021 [PRJ2021-001666].

Figure 17. Aerial Image of the Humidor Project Site Just Before the Development Application was submitted.

Source: Google Earth Imagery

The Humidor Project will replace these existing, low intensity uses on the project site with the massive, unsightly, and uncamouflaged industrial facility shown in Figure 16; this will unequivocally and substantially degrade both the "existing visual character of the site" as well the "quality of public views of the site and its surroundings" from ***all*** accessible vantage points. Furthermore, the Humidor Project will introduce a massive new source of glare because it will result in the placement of nearly 20 acres of specular metal containers painted bright white that will all be brightly lit; the effect that this will have has on both daytime and nighttime views in the entire area is substantially adversely.

The substantial evidence presented here clearly demonstrates that the Humidor Project will unequivocally result in significant aesthetic impacts because it 1) Adversely effects a scenic vista to a significant degree; 2) Substantially damage scenic resources; 3) Significantly degrades the existing visual character and view quality from publicly

accessible vantage points; and 4) Creates a new source of substantial glare which will adversely affect daytime and nighttime views in the area. This evidence also conclusively demonstrates that the Humidor Project warrants the preparation of an EIR which considers and adopts feasible project alternatives (including alternative locations) that will reduce or avoid the significant and unmitigable aesthetic impacts that the project will create.

WATER QUALITY IMPACTS OF THE HUMIDOR PROJECT.

According to the information provided in the referenced letter, water will not be used to suppress the BESS container fires that will erupt at the Humidor Project and will only be used to cool surrounding BESS containers; this ostensibly implies that water will never come into contact with any burning BESS modules. By extension, DPW has apparently concluded that the Humidor Project will not generate any contaminated water runoff or cause any soil or groundwater contamination. SORT disputes this conclusion because the Fire Department will adopt different tactics when windspeeds exceed 20 miles per hour. This is because a fire in a single BESS container is highly likely to spread to surrounding containers when prevailing winds exceed 20 miles per hour (as explained above); the only way to prevent this is by putting water directly onto the burning BESS to "knock down" the flames and stop them from impinging on surrounding containers. Since prevailing winds in Acton almost always exceed 20 miles per hour, it is certain that water *will* be used to inundate a burning BESS in Acton, that the runoff will be contaminated, and that it will contaminate the soil and groundwater. These impacts must be fully analyzed and mitigated in a properly prepared Humidor Project EIR.

THE COUNTY VIOLATED THE ZONING CODE BY APPROVING THE HUMIDOR SITE PLAN WITHOUT A MINOR CONDITIONAL USE PERMIT.

The County acknowledges that a "Minor Conditional Use Permit" is required for any project in Acton that removes native vegetation exceeding 10 percent of the lot area within any 12-month period for any lot of one acre or greater (page 2 of Enclosure C of the Referenced Board Letter). One of the properties that will be developed for the Humidor BESS is APN 3056-004-058 which, as indicated in Figure 18 obtained from the County's Regional Planning GIS system, is a 9.8 acre parcel that currently has 4.77 acres of native juniper woodland. Accordingly, if the Humidor Project removes more than 0.98 acres of native juniper woodland, then the Humidor development cannot proceed without a Minor Conditional Use Permit. SORT has analyzed the disturbance area on APN 3056-004-058 based on the Humidor BESS Site Plan approved by Regional Planning (summarized in Figure 19) and concluded that more than two acres of Juniper woodland will be removed from this parcel as a result of the Humidor Project. Therefore, Hecate should have applied for and received a Minor CUP before the Humidor BESS site plan was approved. Because Regional Planning failed to require a Minor CUP before approving the Humidor Site Plan, the County failed to follow the law and thereby abused its discretion.

Figure 18. Property Information on APN 3056-004-058 and Aerial Imagery Showing There is 4.77 Acres of Juniper Woodland on the Site.

Description
Parcel Profile Report
Hyperlinks
•Assessor Map Book Page
•Assessor PAIS
•Assessor Portal Parcel Detail
•Building Permits Viewer (DPW)
•Metadata
Details
•AIN
3056004058
•Situs Full Address
VAC/COR ANGELES (PAV)/
VINCENT RD ACTON 91350
•Tax Rate Area
15210
•Tax Rate City
unincorporated

•Use Code
300V
•Use Type
Industrial
•Use Description
Industrial
•Design Type Building 1
N/A
•Year Built Building 1
•N/A
•Effective Year Building 1
N/A
•Units Building 1
N/A

•Bedrooms Building 1
N/A
•Bathrooms Building 1
N/A
•SQFT Building 1
N/A
•SQFT Building 2
N/A
•SQFT Building 3
N/A
•SQFT Building 4
N/A
•SQFT Building 5
N/A

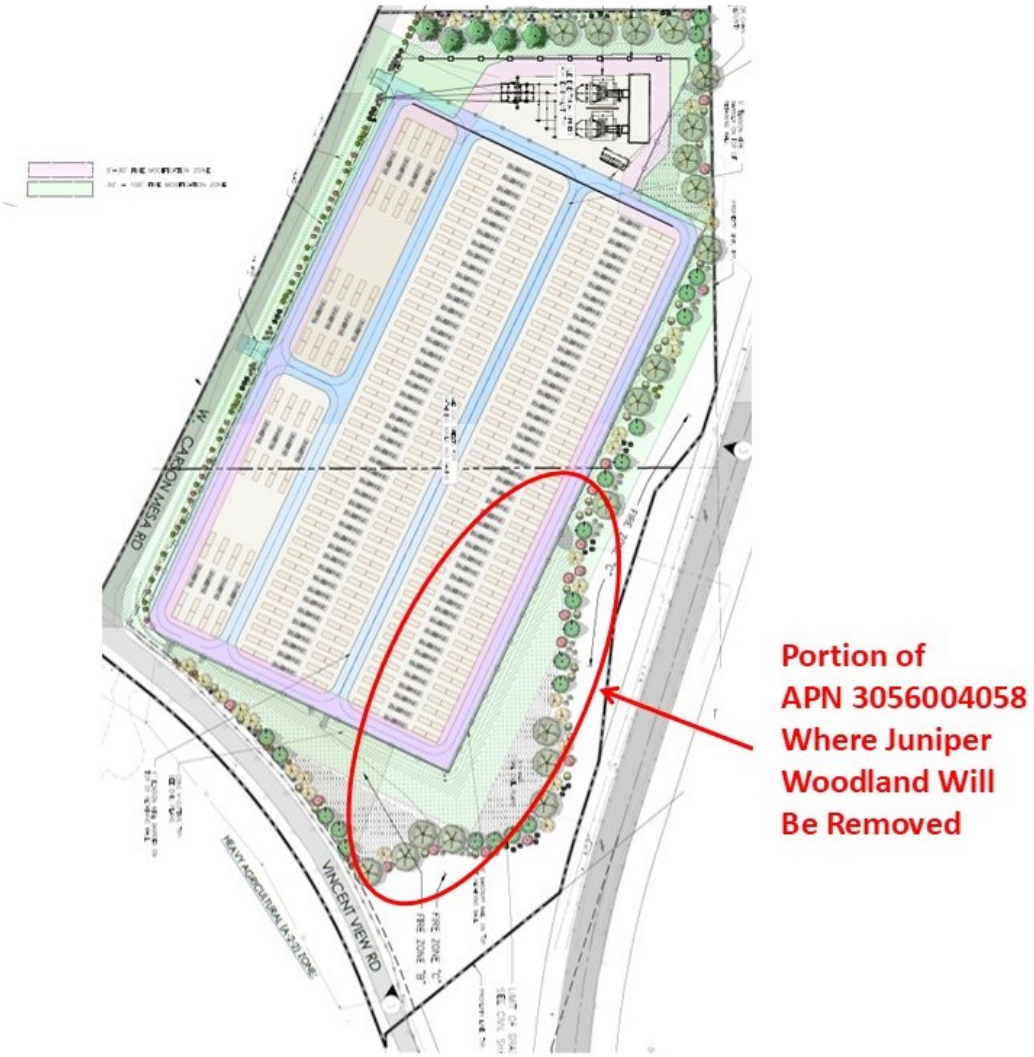
•Roll Year
2023
•Roll Land Value
246530
•Roll Improvement Value
0
•Roll Land Base Year
1993
•Roll Improvement Base Year
1993
•Legal Description
FOR DESC SEE ASSESSOR'S MAPS
POR OF SE 1/4 OF SEC 22 T5N R12W
•Lot Size Sq Ft 427,421.61
•Acres 9.8123

Boundary of APN 3056004058

Area of Juniper Woodland (4.77 acres)

Source: Los Angeles County Department of Regional Planning GIS System; Aerial dated 2023.
https://rpgis.isd.lacounty.gov/Html5Viewer/index.html?viewer=GISNET_Public.GIS-NET_Public

Figure 19. Excerpt of Approved Humidor BESS Site Plan Indicating Where Juniper Woodland will be Removed Eliminated by the Humidor Project.



REGIONAL PLANNING'S APPROVAL OF THE HUMIDOR BESS SITE PLAN VIOLATED THE COUNTY ZONING CODE.

The County is aware that the property where the Humidor BESS will be constructed (APN 3056-004-058 and APN 3056-004-044) is currently being used for storing trucks, storing electrical equipment, and as a recreational paintball facility [Page 7 of Enclosure C in the referenced Board Letter]; the County has been aware of these uses for years[117] and certainly knew of them before the Humidor BESS site plan was approved on August 1, 2023.

[117] In a project description report submitted by Hecate and dated April 18, 2022, Stantec confirmed that the site is being used for parking, staging, and a paintball facility.

Notably, the existing truck storage and electrical equipment storage uses on the site were established without authorization and without permits because the property owner failed to obtain the requisite site plans[118]; equally important, they violate key provisions of the Zoning Code that are intended to render such uses more aesthetic[119]. Therefore, these are unlawful nonconforming uses that are being purposefully maintained in direct violation of the Zoning Code. This fact was confirmed on October 25 when the SORT Director went to the Regional Planning Office in Lancaster and inspected all the developments that Regional Planning has ever approved for APN 3056-004-058 and 3056-004-044; the records show that the only approved uses on these properties are the paintball facility and the Humidor BESS[120].

An essential provision in the County Zoning Ordinance is Section 22.02.070, which prohibits the County from accepting any application for any project that is proposed on any parcel where there is an existing land use which was not previously authorized and is being maintained or operated in violation of any applicable provision of the Zoning Code; it also prohibits the County from approving any new uses or projects on any parcels where such unlawful and unpermitted uses are being maintained in violation of the Zoning Code[121]. The only way to "sidestep" this prohibition is for the Director of Regional Planning to issue a formal determination that the existing unauthorized or unlawful use is consistent with the General Plan or essential to the public convenience or welfare. Section 22.02.070 is critically important to the Community of Acton because it provides the only mechanism which prevents landowners who maintain unauthorized or unlawful uses on their property from establishing new uses until the unpermitted and unlawful uses are removed.

SORT notes that Regional Planning approved the Humidor Site Plan on August 1, 2023 despite knowing of the clear and unequivocal zoning violations maintained on the project site; it is also noted that, prior to approving the Humidor Site Plan, the Regional Planning Director *did not* make a determination that the existing unlawful and unpermitted uses on the Humidor Project site are essential to the public convenience or

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[118] Other than the Humidor BESS, the only use approved on the site is the Paint Ball recreational facility.

[119] Among other things, the Zoning Code requires outdoor storage uses to be surrounded by solid fencing and landscaping to mitigate significant aesthetic impacts (Section 22.140.430).

[120] A "Crops and Nursery" use was authorized in 1990 for APN 3056-004-044 [PP40009]; it appears however that this use was never developed.

[121] Section 22.02.070 of the County Code states "No application required pursuant to this Title 22 shall be accepted for processing or approved where an existing land use, not previously authorized by any statute or ordinance, is being maintained or operated in violation of any applicable provision of this Title 22, or any condition of approval of a land use permit. This provision applies to the operation of land uses only, and does not affect buildings or structures which do not conform to development standards."

welfare or consistent with the goals and policies in the General Plan[122]. Nor could the Director have ever made such a determination[123]. Therefore, the County violated Section 22.02.070 of the Zoning Code when it accepted and then approved the Humidor BESS site plan without first ordering the elimination of all existing unauthorized and unpermitted uses on the Humidor BESS project site. By failing to follow the law, the County abused its discretion when it approved the Humidor Site Plan.

ADDITIONAL ERRORS AND MISINFORMATION NOTED IN THE REFERENCED BOARD LETTER.

In the preceding pages, SORT has identified and discussed numerous errors and incorrect information pertaining to the Humidor Project that is presented in the referenced letter from DPW to the Board dated October 8. However, SORT has noted additional significantly erroneous information presented in the "Enclosure C" that is appended to the referenced letter; these errors are identified below.

Surrounding Land Uses – On page 1 of Enclosure C, DPW incorrectly describes the parcels lands surrounding the Humidor BESS facility as "vacant" when in fact they are developed with residences. For instance, DPW incorrectly asserts that APN 3056-007-007 is vacant when in fact it has an occupied home on it; the home is constructed partially on 3056-007-007 and partially on 3056-007-008. DPW also fails to identify a second home which actually abuts the east property boundary of the Humidor BESS site; it is located on APN 3056-007-006. DPW also fails to identify a ***third*** home which also abuts the east property boundary; it is located on APN 3056-004-034. These homes are shown in the aerial image presented in Figure 20 obtained from the County's GIS system. Shockingly, DPW presents an *incredibly deceptive* description of the lands surrounding the Humidor BESS site; this gives the false impression that the Humidor

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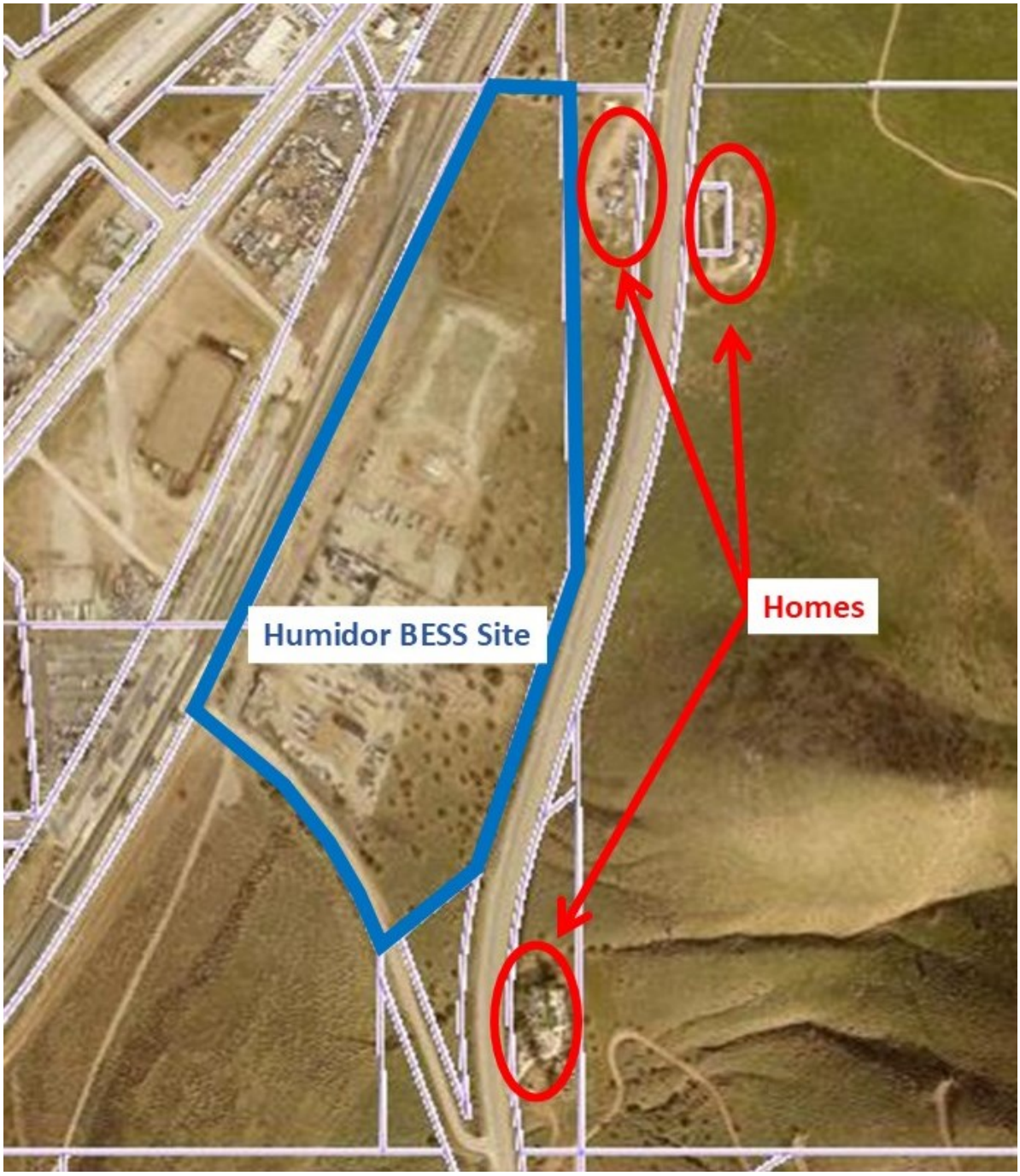
[122] In November, 2023, SORT submitted a "Public Records Act" request to the Department of Regional Planning for all records pertaining to the Humidor BESS project. SORT then carefully reviewed all the records that were provided in response to this request and found no determination issued pursuant to Section 22.02.070.

[123] The unlawful and unpermitted storage uses established on APN 3056-004-058 and APN 3056-004-044 are not "essential to the public convenience or welfare"; they are merely convenient for the property owner (who makes money off them and avoids the hassle of obtaining a permit and making the uses more aesthetic) and the owners of the trucks and electrical equipment (who can easily access their belongings without any regard or respect for the surrounding property owners and the Community who are forced to look at it). The unlawful and unpermitted storage uses established on APN 3056-004-058 and APN 3056-004-044 are also not consistent with the General Plan because they violate the Zoning Code; they are also inconsistent with General Plan Goals and Policies. For example, they are contrary to Policy LU 7.1 and Policy ED 2.2 which require light industrial uses like truck storage and electrical equipment storage to use buffering, design techniques, and other mechanisms (for example, solid walls and tall trees to visually screen the storage use). It is important to note that the existing storage uses on the Humidor site can be surrounded by attractive trees that provide visual screening because these uses *do not* pose a wildfire risk.

Figure 20. Aerial Image Indicating the Location of Homes that are Adjacent to the Humidor Project.



BESS is not in a residential area and will have no impacts on any sensitive sources. Nothing could be further from the truth and frankly, SORT is appalled by the misinformation that DPW presents which shows a callous disregard for the rural residents of Acton.

Maximum Height Limit – On page 2 of Enclosure C, DPW states that the Maximum Height Limit for the Humidor Project is 13 times the buildable area. This is incorrect. Page COMM-5 of the Antelope Valley Area Plan restricts all buildings on industrial lands in Acton to two stories in height and requires all such buildings to incorporate "Old West" design elements with earth tone colors at a pedestrian-oriented scale; it also requires such uses to be linked to surrounding rural town areas through trails and pedestrian routes. The Humidor Project fails to comply with any of these General Plan requirements.

The Humidor BESS Capacity – On page 3 of Enclosure C, DPW reports that "the Project includes the development of an up to 400-megawatt (MW) BESS system". This is incorrect. As explained above, the Humidor BESS Site Plan approved by Regional Planning actually authorizes a 544 MW BESS facility; because Hecate now has a vested right to construct all the infrastructure and facilities that Regional Planning expressly approved with the Humidor Site Plan, the Humidor Project is authorized for an operating capacity of 544 MW, not 400 MW.

The Number of Battery Cabinets – DPW states on page 3 that the Humidor BESS merely has "several battery storage cabinet series". This statement is categorically false. As indicated in the site plan approved by Regional Planning that is provided in Attachment 1 and indicated in Figure 19, the Humidor BESS consists of 440 enormous battery storage containers, each of which contains many battery cabinets consisting of thousands of battery cells. DPW's *incredibly deceptive* description of the number of "battery cabinets" that will be installed at the Humidor BESS site gives the false impression that the project involves only a few battery cabinets and limited battery cells. Nothing could be further from the truth and frankly, SORT is appalled by the manner in which DPW has deliberately misinformed the Board and the public regarding the true scope and scale of the Humidor Project.

The Length of the Humidor Transmission Line – On page 3, DPW reports that the Humidor Transmission Line connecting the Humidor BESS to the Vincent substation is 3,400 feet. This is incorrect. Because the 230 kV yard at the Vincent substation is located at the southernmost end of the property, the Humidor Transmission line will have to extend the entire length of the substation. Therefore, the actual length of the Humidor Transmission Line will exceed 4,500 feet. Notably, DPW does correctly report that the actual size of the Humidor BESS as 19 acres; SORT agrees and appreciates that DPW acknowledges this.

THE COUNTY HAS UNLAWFULLY WITHHELD PUBLIC RECORDS PERTAINING TO THE HUMIDOR PROJECT.

SORT had anticipated that this response letter would include much more definitive information regarding the Humidor Project and how it has been perceived by various County departments that advocate its approval because SORT had anticipated that these departments would be transparent and provide relevant project information on a publicly accessible website (such as the application that Hecate submitted for the Transmission Line Franchise). County departments have not done this and in fact have done all in their power to prevent access to information that is relevant to the Humidor Project. For example, SORT submitted a records request to Regional Planning in November, 2023 pursuant to the California Public Records Act (CPRA) which sought documents, reports, studies and communications that pertained to the Humidor project. In response, Regional Planning provided a limited number of documents consisting of three applications submitted by Hecate to Regional Planning in 2021, 2022, and 2023. SORT responded and pointed out that other relevant information should also be provided, including studies, reports, and communications; DRP merely responded "Note that there is no responsive communication records". This response is absurd, particularly given that SORT itself had communicated extensively with Regional Planning well before November, 2023.

SORT also notes that DPW has been similarly obstructive in granting public access to records pertaining to the Humidor Project. SORT understands that an Acton resident submitted a public records request to DPW pertaining to the Humidor Franchise in July, 2024; to date, DPW has provided only minimal information (nearly all of which is already publicly available[124] such as Board meeting transcripts, statements of proceedings) and, like Regional Planning, DPW has thus far not provided relevant agency communications or substantive information (such as the application that Hecate submitted for the Franchise).

In short, both DPW and Regional Planning have inexplicably *suppressed* public access to information pertaining to the Humidor Project and thwarted attempts by the public to become fully informed on substantive matters that will shed light on how and why approvals have been issued and why further approvals are recommended. As a direct result of this malfeasance, SORT has been prevented from presenting a more robust case regarding why the Humidor BESS Site Plan approval was unlawful, why it is ineligible for any CEQA exemptions, and why the Humidor Project "as a whole" has been impermissibly segmented in violation of CEQA.

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[124] Nearly all of the documents that DPW provided were already publicly available such as Board meeting transcripts, statements of proceedings, and public comment letters. It appears that the only non-publicly available information which DPW provided was a "Memo" from Stantec and an "excavation permit" to authorize a Hecate contractor to conduct soil borings.

CONCLUSION

For all the reasons set forth herein, Save Our Rural Town respectfully requests that the Board of Supervisors rescind the resolution adopted October 8, 2024, find that the Humidor Project "as a whole" is not exempt from CEQA and that the Humidor BESS is a "Heavy Industrial" use which was improperly approved in a "Light Industrial" zone, thereby deny the Franchise Ordinance.

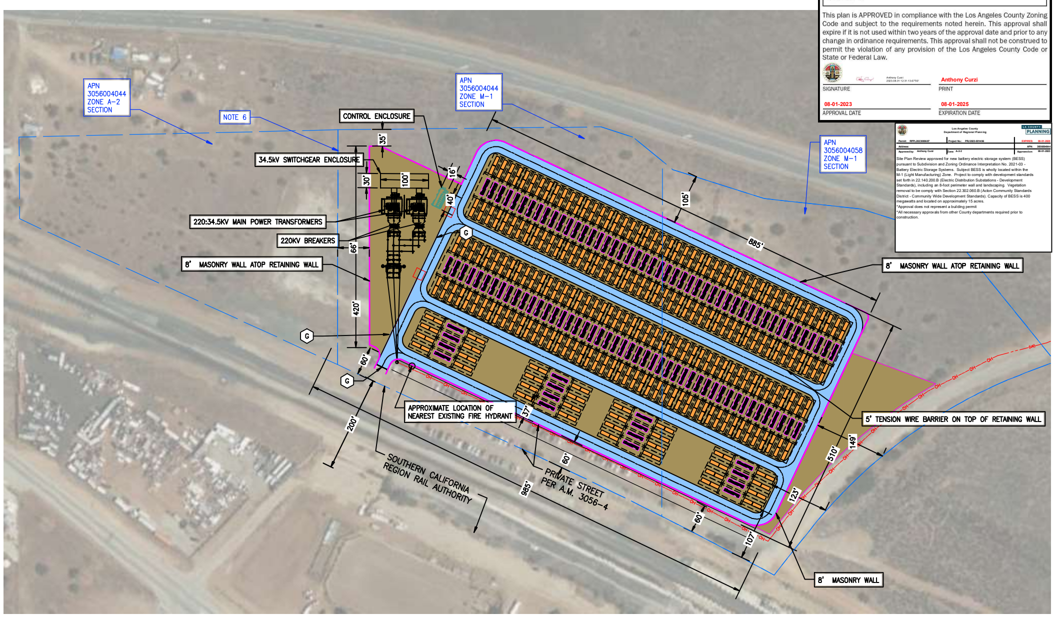
Respectfully submitted;

/S/ Jacqueline Ayer
Jacqueline Ayer, Director
Save Our Rural Town

ATTACHMENT 1

HUMIDOR BESS SITE PLAN APPROVED BY REGIONAL PLANNING ON AUGUST 1, 2023.

NORTH–SOUTH BASELINE



SITE PLAN REVIEW

PERMIT #: RPPL2023000687

PROJECT #: PRJ2023-001496

This plan is APPROVED in compliance with the Los Angeles County Zoning Code and subject to the requirements noted herein. This approval shall expire if it is not used within two years of the approval date and prior to any change in ordinance requirements. This approval shall not be construed to permit the violation of any provision of the Los Angeles County Code or State or Federal Law.

SIGNATURE: Anthony Curzi 2023.08.01 12:31:13-07'00'

PRINT: Anthony Curzi

APPROVAL DATE: 08-01-2023

EXPIRATION DATE: 08-01-2025

Los Angeles County
Department of Regional Planning

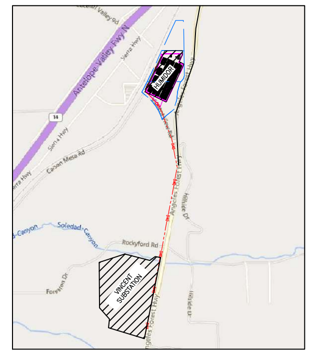
LA COUNTY PLANNING

Permit: RPPL2023000687	Project No.: PRJ2023-001496	EXPIRES: 08-01-2025
Address:		APN: 3056004044
Approved by: Anthony Curzi	Zone: A-2-2	Approved on: 08-01-2023

Site Plan Review approved for new battery electric storage system (BESS) pursuant to Subdivision and Zoning Ordinance Interpretation No. 2021-03 - Battery Electric Storage Systems. Subject BESS is wholly located within the M-1 (Light Manufacturing) Zone. Project to comply with development standards set forth in 22.140.200.B (Electric Distribution Substations - Development Standards), including an 8-foot perimeter wall and landscaping. Vegetation removal to be comply with Section 22.302.060.B (Acton Community Standards District - Community Wide Development Standards). Capacity of BESS is 400 megawatts and located on approximately 15 acres.

*Approval does not represent a building permit

*All necessary approvals from other County departments required prior to construction.



LEGEND

PROJECT AREA THIS PAGE: 523,493 SQFT, 12.018 ACRES

4-LITHIUM IRON PHOSHPATE (LFP) BATTERY CONTAINERS (1236kW/ 5365kWh PER BATTERY) WITH 2 INVERTERS AND 34.5KV GSU

QTY THIS PAGE: 110 (TOTAL BATTERY CONTAINERS: 440)

- PROPOSED SITE FENCE
- PROPOSED ROAD EDGES
- PROPOSED OVERHEAD ELECTRICAL
- PROPOSED UNDERGROUND ELECTRICAL
- ROAD CENTERLINE
- RETAINING WALL
- 8' MASONRY WALL
- PROPERTY LINES AND ZONING DEMARCATION
- (G) 26'-4" SLIDING ACCESS GATE (QTY:5)
- GRAVEL SUBSTATION YARD
- ALL-WEATHER FIRE ACCESS ROAD

SITE ADDRESS
440 W CARSON MESA RD
PALMDALE, CA 93550

ASSESSOR'S PARCEL NO:
3056004044 – 9.99 ACRES, M1 ZONE
3056004058 – 9.8 ACRES, M1 ZONE

NOTES

1. EQUIPMENT DEPICTED IS PRELIMINARY ONLY. MAXIMUM NAMEPLATE CAPACITY OF THE BESS IS 400MW.
2. BATTERY SYSTEM SIZED PER MANUFACTURER AUGMENTATION RECOMMENDATION OF 43% CELL ADDITION, ALLOWING FULL POWER OUTPUT AT END OF LIFE BASED ON A 20–YEAR LIFESPAN.
3. BATTERY SYSTEM SIZED UNDER FOLLOWING ASSUMPTIONS: 4 HOUR RUN TIME AT END OF LIFE.
4. RETAINING WALLS REQUIRED AS INDICATED ON DRAWING. EARTHWORK TO REMAIN UNDER 100,000 CY TOTAL.
5. LIGHTING WILL COMPLY WITH CHAPTER 22.80 (RURAL OUTDOOR LIGHTING DISTRICT) OF THE LOS ANGELES COUNTY CODE
6. PARCEL M1 ZONING BOUNDARY LOCATION PER L.A. COUNTY GIS.
7. SITE IS TO BE CONSTRUCTED PER CURRENT CALIFORNIA FIRE CODE (2022), NATIONAL FIRE PROTECTION AGENCY 855 (NFPA–2020), AND LA COUNTY FIRE CODE (2023).
8. ALL CONTAINERS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH UL 9450A.
12. ALL ROADS TO BE ALL–WEATHER ACCESS AND CONFORM TO LA COUNTY FIRE CODE (2023) 503 AND 501.4. INTERIOR RADIUS TO BE 19', CENTER RADIUS 45', AND EXTERIOR RADIUS 45'. WIDTH TO BE 26'.
13. ALL CONTAINERS TO BE SET BACK FROM LOT LINES A MINIMUM OF 10'.
14. PROPOSED LANDSCAPING VEGETATION TO BE COMPLIANT WITH LA COUNTY FIRE DEPARTMENT FUEL MODIFICATION REQUIREMENTS.

A — PROPOSED SITE LAYOUT
SCALE: 1"=100'-0"

VEGETATION REMOVAL

COMBINED PARCEL ACREAGE: 25.6 ACRES

NATIVE VEGETATION (JUNIPER WOODLAND) WITHIN THE FENCE LINE AND OUTSIDE THE 30-FOOT FIRE CLEARANCE BUFFER AROUND STRUCTURES: 0.62 ACRES

PROJECT RELATED STRUCTURES WITHIN NATIVE VEGETATION (JUNIPER WOODLAND) INSIDE THE 30-FOOT FIRE CLEARANCE BUFFER AROUND STRUCTURES: 0.54 ACRES

TOTAL NATIVE VEGETATION PROJECT IMPACTS: 1.16 ACRES (4.5% OF SITE)

APPLICANT / DEVELOPER:
HECATE GRID HUMIDOR STORAGE 1 LLC
621 W RANDOLPH STREET
CHICAGO, IL 30661

ESTIMATED EARTHWORK QUANTITIES:
MAX RETAINING HEIGHTS = 25'
APPX TOTAL CUT: 54,129 CY
APPX TOTAL FILL: 36,566 CY
APPX TOTAL EARTHWORK: 90,695 CY
APPX IMPORT 0 CY
APPX EXPORT 17,563 CY
EARTHWORK QUANTITIES TO BE FINALIZED PRIOR TO GRADING AND BUILDING PERMIT APPROVAL

0 100'-0" 200'-0"
SCALE: 1" = 100'-0"

Revision	Description	By	Appd.	YY.MM.DD
H	EXISTING HYDRANT ADDITION	ODR	LAM	23.07.12
G	EARTHWORK NOTE EDITS	ODR	LAM	23.06.29
F	NOTE ADDITIONS	ODR	LAM	23.06.16
E	FIRE ROAD UPDATES. SITE ADDRESS ADDED	ODR	LAM	23.06.02
D	AUGMENTATION ALIGNMENT	ODR	LAM	23.05.25
C	CODE NOTES. LEADER ADDITIONS. AUGMENT	ODR	LAM	23.05.15
B	M1 ZONES WALL AND LEGEND UPDATES	ODR	LAM	23.02.08
A	M1 ZONES CUBIC LAYOUT	ODR	LAM	23.01.25

Consultants

Stantec

9665 Granite Ridge Drive, Suite 220
San Diego, CA 92123, US
www.stantec.com

The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing – any errors or omissions shall be reported to Stantec without delay.

Client/Project
HECATE GRID HUMIDOR STORAGE 1 LLC

HUMIDOR
PROPOSED BESS AND SUBSTATION
California, USA

File Name: HUM_E200_REV-H — BMW/VAD (Dwn.) — ODR (Chkd.) — WAZ (Dsgn.) — 21.06.07 (YY.MM.DD)

Title
CONCEPTUAL - BESS & SUBSTATION LAYOUT

HUMIDOR

Project No.: 185805030 — Scale: 1"=100'-0"

Drawing No.: E200 — Sheet: 1 of 1 — Revision: H

DEPARTMENT OF REGIONAL PLANNING APPROVED

A.C.

ATTACHMENT 2

ZONING ORDINANCE INTERPRETATION NO. 2021-03

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Amy J. Bodek, AICP
Director of Regional Planning

Dennis Slavin
Chief Deputy Director,
Regional Planning

October 18, 2021

TO: Staff

FROM: Amy J. Bodek, AICP
Director of Regional Planning

SUBDIVISION AND ZONING ORDINANCE INTERPRETATION NO. 2021-03 – BATTERY ELECTRIC STORAGE SYSTEMS

PURPOSE

This memorandum provides an official interpretation of the Department of Regional Planning regarding the definition of utility-scale energy storage devices (Energy Storage Devices). This memorandum is intended to serve as interim guidance for staff until such interpretation is superseded by subsequent interpretations or is incorporated into Title 22 (Planning and Zoning) of the the Los Angeles County Code (County Code).

APPLICABILITY

This memorandum is applicable to all parcels within unincorporated Los Angeles County and is effective as of the date of this memo.

INTERPRETATION

County Code Section 22.14.050 defines "Electric Distribution Substation (EDS)" and "Electric Transmission Substation (ETS)." The primary difference between these uses pertains to the conveyance of energy to users, with ETS typically being larger in volume than EDS. For purposes of defining energy storage devices as a land use, energy storagage devices shall be considered most similar to EDS.

BACKGROUND

With the recent growth in renewable energy production, particularly utility-scale solar and wind resources, there has been an increased need in the development and deployment

of Battery Electric Storage Systems (BESS). These devices are essentially large battery systems with appurtenant equipment that store energy typically produced by renewable energy sources such as sunlight or wind. This energy is then released to the electrical grid during evening or peak periods, and can help even out imbalances that occur between the production and consumption of renewable energy.

BESS devices are similar in size, bulk, and use to EDS. These utility-like devices are typically comprised of 40-foot-by-8-foot steel containers on concrete pads to house battery systems, pad-mounted transformers, and switchgear.

JUSTIFICATION

EDS are allowed in all zones with either a Site Plan Review (SPR) or a Conditional Use Permit (CUP), except the Mixed Use Development Zone where it is prohibited. ETS are allowed only in commercial and industrial zones with a CUP and SPR respectively and in Open Space and Watershed Zones with an SPR. Unlike the conduit nature of transmission substations, BESS are more similar to EDS.

In conclusion, to regulate these facilities in a consistent manner and to properly regulate them for community compatibility, the use most closely associated with them shall be EDS. Development standards for EDSs, Section 22.140.200, shall apply to BESS.

AJB:DJD:MG:SD:lm

C: Starr Coleman, Assistant County Counsel
Elaine Lemke, Assistant County Counsel/Chief Advisor

K_CP_10132021_ SUB_ ZONING_ORDINANCE_INTERPRE_NO_2021-03_BATTERY_ELLECTRIC_STORAGE_SYSTEMS

ATTACHMENT 3

EXCERPTS OF SECTION 22.22.030 OF THE LOS ANGELES COUNTY ZONING CODE

C. Use Regulations.

1. Principal Uses. Table 22.22.030-B, below, identifies the permit or review required to establish each principal use.

TABLE 22.22.030-B: PRINCIPAL USE REGULATIONS FOR INDUSTRIAL ZONES					
	M-1	M-1.5	M-2	M-2.5	Additional Regulations
Agricultural and Resource-Based Uses					
Borrow pits to a depth of over three feet	-	-	CUP	CUP	
.					
.					
.					
Transportation, Electrical, Gas, Communications, Utilities, and Public Service Uses					
Air pollution sampling stations	SPR	SPR	SPR	CUP	
.					
.					
.					
Electric distribution substations, including related microwave facilities	SPR	SPR	SPR	SPR	Section 22.140.200
Electric transformer substations	SPR	SPR	SPR	SPR	
Electric transmission substations and generating plants, including related microwave facilities	CUP	SPR	SPR	SPR	
Fire stations	SPR	SPR	SPR	CUP	
.					
.					
.					

D. Additional Uses Not Listed. Any use not listed in Subsection C, above, and not listed in Subsection E, below, may be permitted:

1. Upon approval of a Ministerial Site Plan Review (Chapter 22.186) application, premises in Zone M-1.5 may be used for other industrial uses similar to any use permitted with a ministerial review in Zone M-1.5, as identified in Subsection C, above, that do not store hazardous or combustible materials, and are not listed in Subsection C, above, as requiring a discretionary review in Zone M-1.5.
2. Upon approval of a Ministerial Site Plan Review (Chapter 22.186) application, premises in Zone M-2 may be used for other industrial uses similar to any use permitted with a ministerial review in Zone M-2, as identified in Subsection C, above, that do not store hazardous or combustible materials, and are not listed in Subsection C, above, as requiring a discretionary review in Zone M-2.
3. Upon approval of a Conditional Use Permit (Chapter 22.158) application, premises in Zone M-2 may be used for any other industrial uses not listed in Subsection C, above, that may include heavy manufacturing processes or store hazardous materials.

ATTACHMENT 4

SORT ANALYSIS DEMONSTRATING THAT THE HUMIDOR TRANSMISSION BESS IS NOT “SIMILAR” TO AN ELECTRICAL DISTRIBUTION SUBSTATION.

SORT has conducted an extensive analysis of the Humidor Transmission BESS facility and also analyzed all the applicable Zoning Code provisions pertaining to "Electrical Distribution Substations" and concluded that there is extensive substantial evidence proving that the Humidor Transmission BESS is *not* similar to an "Electrical Distribution Substation" as that term is defined and applied by the Zoning Code. The fact that Regional Planning has nonetheless concluded that they are "similar" suggests that Regional Planning fails to grasp the critical technical and regulatory differences that exist between "transmission", "subtransmission", and "distribution" facilities; worse yet, Regional Planning has improperly conflated these facilities to such an appalling extent that its conclusion regarding a similarity between the Humidor Transmission BESS and an "Electrical Distribution Substation" is entirely without merit. To rectify this error, it is first necessary to understand the distinction between "transmission" facilities, "subtransmission" facilities, and "distribution" facilities; to wit:

- The California Public Utilities Commission ("CPUC") defines "Distribution" facilities as facilities that operate at under 50 kV [General Order 131-D Section I]; the sole purpose of these facilities is to provide "alternating current" or "AC" electrical service to residential, commercial, and industrial customers (also known as end users).

- The CPUC defines "Transmission" facilities as facilities that operate at or above 200 kV [General Order 131-D]. Nearly all the transmission facilities operated in California are controlled by the California Independent System Operator (CAISO) who defines transmission as the transfer of bulk power and wholesale electricity across high-voltage, long-distance power lines[1].

- The CPUC exclusively utilizes the term "subtransmission" when referring to systems with operating voltages between 50 kV and 200 kV[2]. CAISO also exclusively uses the term "subtransmission" when referring to systems with operating voltages between 50 kV and 200 kV[3]. Public utilities also define "subtransmission" to mean facilities that operate between 50 kV and 200 kV[4].

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[1] https://www.caiso.com/about/our-business

[2] CPUC's approval of the SCE Devers-Mirage 115 kV Subtransmission project [D.10-06-014 at https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/118975.PDF].

[3] Page 5 of CAISO's Alberhill project analysis: 115 kV lines are "subtransmission" [http://www.caiso.com/Documents/091216DecisiononAlberhillSubstationProject-Presentation.pdf]. CAISO's analysis of the EKWRA 66 kV subtransmission project on page 221 of the "2010 CAISO Transmission Plan"; CAISO does not make previous transmission plans available on its website; thus, no link can be provided. However, an electronic copy can be provided upon request.

[4] "SCE identifies electrical lines operated at voltages between 50 kilovolts (kV) and 200 kV as subtransmission lines or subtransmission circuits. Electrical lines operated at voltages at or greater than 200 kV are identified as transmission lines". Page 1, footnote 1 of SCE's Application to construct the Gorman-Kern River 66 kV subtransmission project [https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M454/K865/454865255.PDF].

- The Federal Energy Regulatory Commission ("FERC") only has jurisdiction over transmission facilities and not "facilities used in local distribution" [16 U.S. Code § 824(b)(1)] which are defined as local systems that deliver power to customers[5].

These facts demonstrate that public utilities, CAISO, and regulatory agencies with jurisdiction over electrical infrastructure clearly distinguish between "electrical transmission" facilities and "electrical distribution" facilities and recognize that the purpose, function, and operation of "transmission" facilities differ substantially from the purpose, function, and operation of "distribution" facilities. With this understanding, one can now correctly assess whether the Humidor Transmission BESS is "similar" to an "Electrical Distribution Substation".

The Zoning Code defines "Electrical Distribution Substation" as "A facility that contains an assembly of equipment that is part of a system for the distribution of electric power, where electric energy is received at a sub-transmission voltage and transformed to a lower voltage for distribution for general consumer use". Accordingly, for the Humidor Transmission BESS to be "similar" to an "Electrical Distribution Substation" as defined by the Zoning Code, it must exhibit at least *some* of the following characteristics:

1) The project must contain "an assembly of equipment that is part of a system for the distribution of electric power"; per the definition of "distribution" utilized by CPUC, the project only comports with this characteristic if the equipment that it consists of is part of a system that delivers AC power to customers at a voltage less than 50 kV.

2) The project must receive electric energy "at a subtransmission voltage"; per the definition of "subtransmission" utilized by CPUC, SCE, and CAISO, the project only comports with this characteristic if the voltage of the power that it receives is greater than 50 kV and less than 200 kV.

3) The project must transform the incoming voltage to a distribution voltage "for distribution for general consumer use" and "for distribution purposes"; per CPUC's definition, the project only comports with this characteristic if it uses a transformer to "step" the received subtransmission voltage down to <50 kV and then distributes it as AC power for "general consumer use" and for "distribution purposes".

The Humidor Transmission BESS does not exhibit ***any*** of these characteristics.

1) The "assembly of equipment" constituting the Humidor Transmission BESS is not connected to any distribution system and it does not deliver any AC power to any customers. Therefore, the Humidor Transmission BESS is not "part of a system for the distribution of electric power" and does not comport with the first characteristic of an "Electrical Distribution Substation".

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5 DOE "Electricity System Overview" [https://www.energy.gov/sites/prod/files/2017/02/f34/Appendix--Electricity%20System%20Overview.pdf]. Page A-7.

2) The Humidor BESS *does not* receive electricity at a subtransmission voltage; to the contrary, it is served by a 230 kV *transmission* line and only receives electricity at a 230 kV *transmission* voltage. Therefore, the Humidor Transmission BESS does not comport with the second characteristic of an Electrical Distribution Substation.

3) The Humidor Transmission BESS transforms the voltage of the electrical energy that it receives down to 34.5 kV and converts it from "Alternating Current AC" to "Direct Current DC"; the resulting 34.5 kV DC power is not distributed and instead remains onsite where it is stored in millions of battery cells. The 34.5 DC power stored by the Humidor batteries is not utilized for "distribution purposes" or for "distribution for general consumer use"; in fact, it could *never* be utilized for "distribution purposes" or "general consumer use" because distribution systems and consumers can only use AC power (typically at 12 kV). In other words, the Humidor Transmission BESS is configured to specifically ensure that transformed power is never utilized "for general consumer use". Therefore, the Humidor Transmission BESS does not comport with the third characteristic of an "Electrical Distribution Substation".

It is also critically important to understand that *Electrical Distribution Substations do not have any of the equipment identified in the approved Humidor BESS site plan.* For example, Electrical Distribution Substations *do not* have 230 kV transformers or 230 kV power lines because Electrical Distribution Substations operate at much lower voltages. Additionally, the circuit breakers, switchracks, connectors, busbars and other equipment at the Humidor BESS are not like equipment at an Electrical Distribution Substation because they have entirely different duty cycles and are designed and constructed to meet different standards (including NERC standards[6]). Finally, Electrical Distribution Substations only operate on "Alternating Current" (AC) and do not have any "Direct Current" (DC) facilities; this is an enormous distinction because almost all of the electrical equipment at the Humidor BESS operates on DC power, not AC power.

The foregoing analysis constitutes substantial evidence that the Humidor Transmission BESS is not "similar" to an "Electrical Distribution Substation" because it does not exhibit *any* of the characteristics of an "Electrical Distribution Substations" as defined by the Zoning Code. Additionally, the size and scale of the Humidor Transmission BESS is *nothing* like the size and scale of actual Electrical Distribution Substations (which are typically about an acre in size[7]).

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[6] Because Transmission BESS facilities are part of the "Bulk Electrical System", they are subject to FERC jurisdiction and must comply with adopted NERC standards. https://www.nerc.com/pa/comp/guidance/CMEPPracticeGuidesDL/CMEP%20Practice%20Guide%20%20Application%20of%20the%20BES%20Definition%20to%20BESS%20and%20Hybrid%20Resources.pdf

[7] According to the Regional Planning GIS System, the distribution substation serving the entire 100 square mile area of Acton is less than 1.25 acres.

ATTACHMENT 5

SORT ANALYSIS DEMONSTRATING THAT "ZONING ORDINANCE INTERPRETATION NO. 2021-03" IS NOT SUPPORTED BY SUBSTANTIAL EVIDENCE.

SORT has analyzed "Zoning Ordinance Interpretation No. 2021-03" ("Interpretation") adopted by the Department of Regional Planning and found that it includes only four statements and very little relevant information to support its conclusion that the use which is "most closely associated" with BESS facilities "shall be an Electrical Distribution Substation". As explained below, these four statements are so rife with technical errors that they suggest Regional Planning does not even have a rudimentary understanding of electrical grid and distribution system operations. This lack of knowledge has resulted in an "Interpretation" which make statements that are factually incorrect and draws inferences that are completely erroneous; accordingly, the conclusions it presents are without basis and not supported by substantial evidence.

Statement 1: "The primary difference between Electrical Distribution Substations and Electrical Transmission Substations pertains to the conveyance of energy to users". This statement is materially false. Electrical Transmission Substations are integrated high voltage (> 200 kV) energy nodes within the bulk power grid and are subject to the jurisdiction of the Federal Energy Regulatory Commission (FERC); they effect huge power transfers across the state and the nation and within California, they are controlled by the California Independent System Operator (CAISO). In contrast, Electrical Distribution Substations operate at low voltages, they are not part of the bulk power grid, they are locally controlled and operated by utilities, and FERC asserts no jurisdiction over them. The loss of an Electrical Transmission Substation can black out whole areas of the country, whereas the loss of an Electrical Distribution Substation will only affect a handful of circuits and the customers they serve.

Because it only has jurisdiction over transmission facilities and has no jurisdiction over distribution facilities, FERC has had to develop standard procedures for distinguishing between transmission facilities and distribution facilities. Toward this end, FERC has developed two tests for establishing the *actual* difference between an "Electrical Transmission Substation" and an "Electrical Distribution Substation", and contrary to what the "Interpretation" asserts, the answer *does not* hinge on "conveyance of energy to users". The first test is called the "5 factor Mansfield Test"[1] which assesses the fundamental characteristics of an electrical facility to determine whether it is "transmission" or "distribution"; the "5 factor Mansfield Test" definitively establishes that the Humidor Transmission BESS is a transmission asset[2] and therefore nothing

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[1] Opinion No. 454, 97 FERC ¶ 61,134 (2001); Opinion No. 454-A, 98 FERC ¶ 61,115 (2002).

[2] Opinion 454 establishes that electrical facilities are "transmission" if 1) They "loop back" into the transmission system and therefore provide power to the transmission system; 2) Power flows in two directions; 3) they serve transmission customers; 4) They provide benefits to the transmission grid in terms of reliability and whether the facilities can be relied on for coordinated operation of the grid; and 5) Whether an outage on the facilities would affect the transmission grid. FERC has determined that electrical facilities which meet any of these criteria are transmission facilities. The Humidor BESS meets ***all*** of these criteria. Humidor BESS puts power into the transmission system. Humidor BESS generates power *(continued)*

akin to an "Electrical Distribution Substation". The second test is called the "7 factor test"[3], and application of this test again definitively establishes that the Humidor Transmission BESS is nothing like an "Electric Distribution Substation[4]. In other words; adopted FERC orders prove that there is nothing accurate or honest in Regional Planning's statement that "The primary difference between Electrical Distribution Substations and Electrical Transmission Substations pertains to the conveyance of energy to users".

Statement 2: "Electrical Transmission Substations are typically larger in volume than Electrical Distribution Substations".
This statement does not even make sense: Electrical substations are not categorized based on "volume"; they are categorized based on their operational voltage and the purpose that they serve. This statement has no evidentiary basis.

Statement 3: "BESS devices are similar in size, bulk, and use to Electrical Distribution Substations".
This statement has *no* evidentiary basis because it is categorically false. BESS facilities can be enormous (for example, the Angeleno BESS proposed in Acton is more than a mile long); in contrast, Electrical Distribution Substations are quite small (Acton's

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(continued) flows in two directions (from the grid and to the grid). Humidor BESS serves transmission customers by putting power onto the transmission grid. Humidor BESS provides reliability and other transmission grid benefits (in fact, that is its core purpose). An outage of the Humidor BESS can affect the transmission grid because it would force curtailment of renewable resources.

3 FERC Order No. 888, FERC Stats. & Regs. ¶ 31,036 (1996) [https://www.ferc.gov/sites/default/files/2020-05/rm95-8-00w.txt at p. 402].

4 Order 888 establishes that electrical facilities are "distribution" if 1) they are in close proximity to retail customers; 2) they are radial in character; 3) power flows into the facilities and rarely (if ever) flows out; 4) Power that flows into the facilities are not transported to some other market; 5) Power flowing into the facilities is consumed in a comparatively restricted geographical area; 6) there are meters placed at the at the facility interface with the transmission grid to measure flows into the local distribution system; and 7) they operate at reduced voltage. To qualify as a distribution facility, ***all*** of these criteria must be met. The Humidor BESS does not meet any of these criteria. It is not located in close proximity to retail customers; in fact, it does not serve any retail customers at all. It does not have a radial configuration and is not "radial in character"; to the contrary, it is a single point user. Its power flow is bi-directional and significant power flows out of the Humidor BESS (in fact, that is its core purpose). The power that flows into the Humidor BESS storage facilities will be transported to some other market once it flows back out onto the transmission grid. Power flowing into the Humidor BESS is merely stored and not consumed at all; thus, it is not "consumed in a restricted geographical area". The Humidor BESS does not provide power flows into the local distribution system so it has no meters to measure flows into the local distribution system; in fact, it provides no "interface" at all between the transmission system and the distribution system. The Humidor BESS receives and emits power at a high voltage and while it *stores* power onsite at a low (34.5 kV) voltage, it does not *operate* at a low voltage.

occupies less than 1.25 acres). Moreover, BESS facilities are always very bulky because they consist of many large "storage containers" of battery cells that are all closely packed together (as shown in Figure 1). In contrast, Electrical Distribution Substations are low density open air facilities which, as shown in Figure 2, have considerably less "bulk" than a BESS. The reason Electrical Distribution Substations *are not* bulky like BESS facilities is because they must maintain large separation distances between electrical equipment to prevent electrical faults. Finally, the sole purpose of a BESS is to collect and store electrical energy when it is cheap and readily available and then discharge the energy onto a grid when energy is expensive and less available. In contrast, Electrical Distribution Substations continually accept power from the subtransmission grid and route it to distribution customers after transforming it to a low (< 50 kV) voltage. There are absolutely no similarities between a BESS use and an "Electrical Distribution Substation" use and this statement has no basis in fact.

Figure 1: Humidor Transmission BESS Facility.

Source: Simulation provided by Hecate.

Figure 2: Electrical Distribution Substation that serves the Community of Acton

Source: Google Earth.

Statement 4: "Electrical Transmission Substations are allowed only in commercial and industrial zones with a Conditional Use Permit and Site Plan Review respectively". This statement is incorrect. Electrical Transmission Substations *are not* allowed in "Light Industrial" Zones with just a Site Plan Review; to the contrary, they require a Conditional Use Permit (see Zoning Code Section 22.22.030.C).

As explained here, none of the explanations or justifications that Regional Planning provided in the "Interpretation" are substantive; in fact, they are all factually inaccurate. Accordingly, the Interpretation" is not supported by any evidence, let alone substantial evidence. There are other fatal errors noted in the "Interpretation". For instance, it fails to recognize that there are different types of BESS which are integrated and utilized differently; for instance, there are Transmission BESS (such as the Humidor project), subtransmission BESS, and distribution BESS. Even more troubling, the County appears to misclassify "behind the meter" battery units[5] as BESS[6] even though they *are not BESS* because they *do not* put power onto the grid.

Another troubling aspect of the "Interpretation" is that *it is not actually based on a "similarity" standard*; rather it is based on a "most closely associated with" standard. Specifically, the last paragraph states that BESS shall be subject to the same approval thresholds and development standards as Electrical Distribution Substations because an Electrical Distribution Substation is "the use most closely associated with" BESS. Being "closely associated with" a use is not the same thing as being "similar to" that use.

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[5] A "behind the meter" or "BTM" battery is used to serve onsite load or for "peak shaving" and does not inject power onto any grid. That is why they are placed "behind" the electric meter that serves their location. BTM batteries are *not* BESS.

[6] For example, on page 9 of Enclosure C of the Board Letter dated October 8, 2024, County identifies a very small (1.37 MW) storage unit at Magic Mountain as a BESS even though the unit appears to be a Behind the Meter battery unit that does not put power onto the grid.

ATTACHMENT 6

LETTER FROM THE DEPARTMENT OF REGIONAL PLANNING DATED AUGUST 1, 2024.

LA COUNTY PLANNING EST. 1923

AMY J. BODEK, AICP
Director,
Regional Planning

DENNIS SLAVIN
Chief Deputy Director,
Regional Planning

Sent Via U.S. Mail and Electronic Mail to: atc@actontowncouncil.org

August 1, 2023

Acton Town Council
Jeremiah Owen, President
Jacqueline Ayer, Correspondence Secretary
P.O. Box 810
Acton, CA 93510

Mr. Owen and Ms. Ayer:

HECATE HUMIDOR BESS (APNs 3056004058 and 3056004044)

Thank you once again for hosting staff from the LA County Department of Regional Planning ("LA County Planning") on an extensive tour of Acton a couple months ago. We took note of various community issues, and sincerely appreciate the input of the Action Town Council ("ATC"). We have made strides internally within LA County Planning and the County family in addressing many of these concerns.

This letter specifically addresses the concerns in writing, in meetings and during our tour about the proposed Humidor Battery Energy Storage System ("Humidor BESS"), located off W. Carson Mesa Road. As you know, several months ago LA County Planning staff initially approved the Humidor BESS through a Site Plan Review ("SPR") on a 15-acre site zoned M-1 (Light Manufacturing) and A-2-2 (Heavy Agricultural -Two Acre Minimum Required Lot Area). Based in part on concerns raised by ATC in writing and at meetings, and to confirm the accuracy of LA County Planning's original position, staff rescinded SPR RPPL2022008009 on February 9, 2023. The applicant Hecate then requested the County reconsider its rescission of the application and affirm its original approval.

After additional review and consideration, LA County Planning stands by its original determination, which was informed in part by the information presented below.

As you know, there is an increased need for utility-scale energy battery storage systems ("BESS") to improve grid stability and integrate intermittent renewable energy sources (such as solar and wind power) into the grid by providing energy when these sources are not available. BESS, however, is not expressly listed as an allowed use in the Zoning Code. In such cases, LA County Planning reviews allowable uses identified in the Zoning Code to determine whether there is an allowable use most similar to the proposed use. Subdivision and Zoning Ordinance Interpretation Memorandum No. 2021-03 ("Memo"), pursuant to the authority provided by Section 22.234.020 under Title 22 ("Zoning Code") of the Los Angeles County Code ("County Code"), provides LA County Planning's official interpretation of the definition of utility-scale energy storage devices. It determined the use most similar to a BESS to be an electric distribution substation ("EDS"), as described in County Code Section 22.14.050.

During meetings with County staff on February 6 and February 7, 2023, ATC raised questions whether a BESS was consistent with the Zoning Code definition of an EDS as it relates to the connection voltage between Humidor BESS and the nearby Southern California Edison substation ("Vincent Substation"). ATC contended a BESS is more similar to an electric transmission substation ("ETS") as defined in the Zoning Code, and therefore a conditional use permit would be required instead of a ministerial Site Plan Review. ATC also noted that the Humidor BESS is considered a power generating use by California Independent System Operator ("CAISO") and the applicant executed a Large Generator Interconnection Agreement ("Agreement") with CAISO, which would make the Humidor BESS part of the transmission infrastructure. ATC asserted that because the Humidor BESS is considered a power generator and subject to an Agreement with CAISO, it is similar to an ETS.

The Zoning Code defines an EDS as "*a facility that contains an assembly of equipment that is part of a system for the distribution of electric power, where electric energy is received at a sub-transmission voltage and transformed to a lower voltage for distribution for general consumer use* (emphasis added)." This describes a facility that receives electricity at sub-transmission voltage, and then transforms the electricity (via a transformer component) to an appropriate voltage for distribution purposes.

This contrasts with the Zoning Code definition of an ETS, which is a *"a facility that contains an assembly of equipment that is part of a system for the transmission of electric power where electric energy is received at a very high voltage from its generating source. The facility then transforms the energy to a lower sub-transmission voltage to supply or distribute electric power to large-scale users, to interchange connections with other power producing agencies, or to supply such power to electric distribution substations for transformation to a lower voltage for distribution to small-scale users* (emphasis added)." This describes a facility that transmits large amounts of electricity from the generating source to multiple users.

Energy storage facilities like the Humidor BESS are regarded as "Non-Generator Resources" by the CAISO and not regarded as a generator. An Agreement is a type of contract long used by CAISO for interconnection purposes and was recently adapted to apply to the interconnection of energy storage systems, which would allow the Humidor BESS to connect to the Vincent Substation. Using an Agreement to interconnect a Non-Generator Source such as the Humidor BESS to the electric grid does not push a BESS into the definitions of a power generating use or an ETS. The fact that the Agreement is labeled as a Large Generator Interconnection Agreement does not mean that it is used only for generators, nor does it make a BESS facility a power generator. The Humidor BESS is subject to CAISO oversight due to its point of interconnection to the CAISO-controlled grid via the Vincent Substation. With respect to land use and permitting, the Humidor BESS is on an M-1 zoned parcel, which is separate and distinct from the Vincent Substation.

The stored energy at the Humidor BESS is proposed to come directly from the Vincent Substation and be redistributed back to the Vincent Substation for general consumer use. The Humidor BESS will not receive electricity from a generating source (e.g., power plant). The Humidor BESS also will not have interchange connections with other power-producing agencies, nor will it convey electrical power to multiple users (CAISO oversight is limited to

Humidor's point of interconnection within the Vincent Substation, and the Humidor BESS would not be considered part of the transmission network). Moreover, the Humidor BESS will not be designed nor be capable of having interconnections with other power producers to distribute power to multiple users.

Humidor BESS proposes to connect to Vincent Substation to receive electricity at 230 kV. The on-site transformer would step down the receiving voltage to 34.5kV to energize the batteries. Only when the voltage is redistributed back to the Vincent Substation is its outflowing voltage stepped back up to 230 kV. Sub-transmission voltage is not specifically stated in the Zoning Code but is generally less than 110 kV per the California Energy Commission, 70kV per CAISO, and 50kV per California Public Utilities Commission. While the Humidor BESS's 230kV interconnection voltage would not typically be considered sub-transmission voltage, its operating voltage would be at 34.5kV or lower and its primary purpose is to store and distribute electricity for consumer use.

As the Memo did not exclusively rely on the literal EDS definition in the Zoning Code, it provides an interpretation of a use not identified in the Zoning Code by drawing similarities to a comparable use for clarification. This interpretation is appropriate and was properly applied to the Humidor BESS project. Furthermore, per Section 22.22.010 of the County Code, the M-1 zone is appropriate for "light industry, repair, wholesale, and packaging, including the manufacture, assembly, distribution, and storage of goods that have low nuisance impacts, but excluding raw materials production, processing or bulk handling." The Humidor BESS is a low nuisance, light industrial use appropriate for the M-1 zone.

LA County Planning has determined the Humidor BESS project is more closely associated with an EDS and may be approved through the SPR process. Hecate submitted a new SPR application to LA County Planning (RPPL2023000687) for the project. The new application relocates all associated development for the Humidor BESS outside the A-2 zone on Assessor's Parcel Number 3056-004-044. While the Los Angeles County Fire Department ("LACoFD") provided preliminary review and comments on the SPR application, LA County Planning's entitlement approval was not contingent upon approval by LACoFD.

The Humidor BESS site plan layout has been designed per the LA County Fire Code, which in turn refers to and incorporates by reference the California Fire Code. The California Fire Code has specific detailed design requirements for stationary electrical energy storage systems such as the Humidor BESS to ensure fire safety during construction, operation, and decommissioning. The Humidor BESS's equipment and design will undergo further design review with the LACoFD for conformance with applicable provisions of the LA County Fire Code and the California Fire Code. The project cannot move forward without full compliance with applicable codes, including the LA County Fire Code and the California Fire Code (by reference) and applicable building codes.

We sincerely hope this letter addressed the concerns raised by the ATC. If you have any questions, you may contact me or Samuel Dea at sdea@planning.lacounty.gov or at (213) 893-7014.

Sincerely,

AMY J. BODEK, AICP
Director of Regional Planning

AJB:EL

c: County Counsel
Public Works (Land Development)
Samuel Dea, Supervising Regional Planner

S_EO_08_01_2023_M__HUMIDOR_BESS

ATTACHMENT 7

SORT ANALYSIS DEMONSTRATING THAT THE REGIONAL PLANNING LETTER DATED AUGUST 1, 2024 IS NOT SUPPORTED BY SUBSTANTIAL EVIDENCE.

SORT has analyzed the letter from Regional Planning dated August 1, 2024 which sets forth the reasons why Regional Planning ministerially approved the Humidor Transmission BESS facility with a site plan and found that none of the claims and assertions it presents are supported by substantial evidence. In fact, the letter is rife with error and indicates that Regional Planning lacks a fundamental understanding of electrical transmission facilities and how the transmission grid operates. The letter however does include one acknowledgement on the first page which is both correct and critically important; namely, that a transmission BESS facility like Humidor *is not* "listed as an allowed use in the Zoning Code". This one revealing statement controverts all the claims made by Public Works in the referenced Board Letter dated October 8, 2024 and also supports SORT's argument that, because transmission BESS is not a listed use, the Zoning Code precludes the County from approving such a use on "Light Industrial M-1" lands.

All other claims made by Regional Planning in the August 1, 2023 letter are either patently incorrect or not supported by any evidence; towit:

Claim 1: LA County Planning reviews allowable uses identified in the Zoning Code to determine whether there is an allowable use most similar to the proposed use. Subdivision and Zoning Ordinance Interpretation Memorandum No. 2021-03 ("Memo"), pursuant to the authority provided by Section 22.234.020 under Title 22 ("Zoning Code") of the Los Angeles County Code ("County Code"), provides LA County Planning's official interpretation of the definition of utility-scale energy storage devices. It determined the use most similar to a BESS to be an electric distribution substation ("EDS"), as described in County Code Section 22.14.050.
This is an open admission that Regional Planning approves uses that are not listed in the Zoning Code; remarkably, Regional Planning seems unaware that the Zoning Code authorizes the use of a "similarity determination" to approve unlisted uses only in certain specific zones and *not* in the "Light Industrial M-1" zone where Regional Planning has nonetheless approved the Humidor BESS. Moreover, and as explained in Attachment 5, "Zoning Ordinance Interpretation Memorandum No. 2021-03" is itself rife with technical error and unsupported by evidence; therefore, its erroneous conclusion that "the use most similar to a BESS to be an electric distribution substation" is irrelevant.

Regional Planning's citation to Section 22.234.020 of the Zoning Code as a provision that grants authority to issue an "Official Interpretation" and approve an unlisted use by declaring it to be similar to a listed use is substantially troubling because *Section 22.234.020 grants no such authority*. Specifically, Section 22.234.020 only authorizes Regional Planning to interpret the meaning or applicability of Zoning Code provisions[1];

[1] Section 22.234.020 states "When the Director determines that the meaning or applicability of any provision of this Title 22 is subject to interpretation, the Director may issue a written interpretation.

it *does not* authorize Regional Planning to approve uses that are not allowed by the Zoning Code and it *certainly does not* authorize the approval of a disallowed use simply based on a mistaken belief that the disallowed use has some attributes of an allowed[2]. Claim 1 is not rooted in either fact or law because the Zoning Code provisions it cites *do not* grant the authority that is asserted and because a BESS *is not* is not similar to an "Electrical Distribution Substation".

Claim 2: *An Electrical Transmission Substation is merely "a facility that transmits large amounts of electricity from the generating source to multiple users".*
Regional Planning offers this statement as a summary of the Zoning Code definition of "Electrical Transmission Substation"; however, this summary does not accurately reflect the Zoning Code definition and it fails to accurately portray what an Electrical Transmission Substation actually is. For instance, the Vincent Transmission Substation effects large (>4,000 MW) power transfers between Northern and Southern California and it is in fact the southern terminus of WECC Path 26[3]. In other words, Vincent does not transmit electricity "to multiple users"; rather, it accommodates bulk power transfers across the state on the CAISO-controlled transmission grid. Also, Vincent does not "transmit large amounts of energy from the generating source"; in fact, according to the CAISO Generation Interconnection Queue, less than 140 MW of generation resources are connected to the Vincent substation, and all new generation projects that are proposed for connection to the Vincent substation are BESS projects. Thus, and contrary to what Regional Planning asserts, Electrical Transmission Substations do not merely "transmit large amounts of electricity from generation sources to multiple users"; as the Zoning Code indicates, they are part of a high voltage system for the transmission of large quantities of power for different purposes, including the purpose of interchange (which is how the Vincent substation is used), the purpose of providing subtransmission power that is then transmitted to Electrical Distribution Substations (which is how the Antelope Substation is used because it is the source of the 66 kV subtransmission line that serves the Community of Acton 13 miles away), and the purpose of supplying a "large scale user" (which is how the Humidor BESS will operate because the 230kV transmission power that is delivered to the Humidor BESS will be transformed and then utilized by the onsite battery "user"). While SORT takes no position regarding the efficacy or accuracy of the Zoning Code definition of "Electrical Transmission Substation", SORT finds that it is certainly more accurate than this Regional Planning summary of the Zoning Code definition.

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[2] As explained in Attachment 4, the Humidor transmission BESS is nothing like an "Electrical Distribution Substation".

[3] Major electrical energy transmission corridors in the western United States coordinated by the Western Electricity Coordinating Council (WECC) https://www.wecc.org/sites/default/files/documents/meeting/2024/2024%20Path%20Rating%20Catalog%20Public_v2.pdf . Page 27.

Claim 3: "*Using an Agreement to interconnect a Non-Generator Source such as the Humidor BESS to the electric grid does not push a BESS into the definitions of a power generating use or an Electrical Transmission Substation. The fact that the Agreement is labeled as a Large Generator Interconnection Agreement does not mean that it is used only for generators, nor does it make a BESS facility a power generator".* Regional Planning offers no citations or support for this claim, so it is not substantive. Also, no public comments that have been submitted regarding the Humidor BESS matter have ever said or even suggested that the Humidor BESS meets the definition of an "Electrical Transmission Substation"; public comments have only stated that the Humidor BESS is more related to an "Electrical Transmission Substation" than it is to an "Electrical Distribution Substation". This strawman argument suggests that Regional Planning is very confused on the issue; accordingly, SORT offers the following clarification: No BESS (including the Humidor BESS) is similar to an "Electrical Transmission Substation" and no BESS (including the Humidor BESS) fits the definition of an "Electrical Transmission Substation". The other elements of this claim are odd and almost nonsensical; for instance, Regional Planning appears to argue that a BESS facility which is subject to a "Large Generator Interconnection Agreement" is not an actual generating facility. Nothing could be further from the truth because "Large Generator Interconnection Agreements" *only* apply to generators; in fact, that is their whole purpose. The very fact that the Humidor BESS *is* subject to a Large Generator Interconnection Agreement means that it is a generator by definition. Regional Planning appears to be unaware that "Large Generator Interconnection Agreements" are mandated for generating facilities by CAISO's FERC-approved tariff[4] and one of the first "whereas" clauses in the agreement expressly asserts that the agreement pertains to a generation facility[5].

Claim 4: *The Humidor BESS is subject to CAISO oversight due to its point of interconnection to the CAISO-controlled grid via the Vincent Substation.* This statement is grossly inaccurate. The Humidor Transmission BESS is not subject to CAISO oversight because it connects to the Vincent Substation. The Humidor Transmission BESS is subject to CAISO oversight because it a large generation facility that will be controlled by CAISO under the CAISO Tariff which was approved by the FERC[6], because CAISO will control the power that is dispatched from it, and because it is a transmission grid asset that is subject to the jurisdiction of the FERC and must comply with adopted NERC standards.

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4 https://www.caiso.com/documents/appendixbb-standardlargegeneratorinterconnectionagreement-asof-sep1-2022.pdf

5 The Clause states "WHEREAS, Interconnection Customer intends to own, lease and/or control and operate *the Generating Facility* identified as *a Large Generating Facility* in Appendix C to this LGIA" (emphasis added). Id at 8.

6 FERC Order 841 required CAISO to revise its tariff to remove barriers to the participation of electric storage resources in the RTO/ISO markets; therefore, transmission BESS like Humidor are transmission assets subject to CAISO control and the CAISO Tariff. 162 FERC ¶ 61,127.

Claim 5: *With respect to land use and permitting, the Humidor BESS is on an M-1 zoned parcel, which is separate and distinct from the Vincent Substation.*
This "strawman" claim addresses an argument that has never been made. Insofar as SORT is aware, no public comments on the Humidor BESS matter have ever alleged that the Humidor BESS is part of the Vincent substation. This claim is inapposite and irrelevant.

Claim 6: *The stored energy at the Humidor BESS is proposed to come directly from the Vincent Substation and be redistributed back to the Vincent Substation for general consumer use.*
This statement is categorically false. The Humidor BESS will neither "redistribute" nor "distribute" energy because it is not connected to any distribution system. Additionally, the 230 kV energy that Humidor BESS supplies to Vincent will never be distributed "for general consumer use" because the voltage is too high and it cannot be accommodated by distribution circuits. Furthermore, the Vincent substation *does not serve any consumers or customers*; as explained above, it effectuates bulk power transfers from Northern and Southern California. Thus, any power delivered to Vincent from the Humidor BESS is placed on the CAISO transmission grid and directed to other transmission substations; it is not directed to consumers or to any distribution systems.

Claim 7: *The Humidor BESS also will not have interchange connections with other power-producing agencies, nor will it convey electrical power to multiple users (CAISO oversight is limited to Humidor's point of interconnection within the Vincent Substation, and the Humidor BESS would not be considered part of the transmission network). Moreover, the Humidor BESS will not be designed nor be capable of having interconnections with other power producers to distribute power to multiple users.*
This is another "strawman" claim that addresses arguments which have never been raised. Insofar as SORT is aware, no comments submitted on the Humidor BESS matter have argued that the Humidor BESS will have "interchange connections with other power-producing agencies" or "convey electrical power to multiple users". This claim is inapposite and irrelevant.

Claim 8: *Humidor BESS proposes to connect to Vincent Substation to receive electricity at 230 kV. The on-site transformer would step down the receiving voltage to 34.5kV to energize the batteries. Only when the voltage is redistributed back to the Vincent Substation is its outflowing voltage stepped back up to 230 kV.*
This claim misrepresents Humidor BESS operations and it does not make any sense from a technical perspective. To be clear, "voltage" is never "redistributed" and the 230 kV Humidor Transmission Line does not and will not "redistribute" voltage or current or anything else.

Claim 9: *Sub-transmission voltage is not specifically stated in the Zoning Code but is generally less than 110 kV per the California Energy Commission, 70kV per CAISO, and 50kV per California Public Utilities Commission.*

This claim is categorically false. "Subtransmission" facilities operate at below 200 kV (which is the threshold for transmission facilities) and above 50 kV (which is the threshold for distribution facilities).

Claim 10: *The "primary purpose" of the Humidor BESS operating voltage at 34.5kV or less is "to store and distribute electricity for consumer use*".
This statement is categorically false. The primary purpose of the 34.5 kV operating voltage of the Humidor BESS is not to "distribute electricity for consumer use" because the project's 34.5 kV operating voltage utilizes DC current and can therefore never be used "for consumer use" since "consumer use" requires AC current. In other words, because the 34.5 kV DC operating voltage of the Humidor BESS is intrinsically incompatible with all surrounding SCE distribution circuits, it will *never* 1) be distributed; 2) provide electricity for consumer use; 3) be connected to any distribution systems; or 4) be connected to any consumers. Finally, because the 34.5 kV operating voltage of the Humidor BESS does not supply any distribution customers, its primary purpose is not "to store and distribute electricity for consumer use".

Claim 11: "*This [Zoning Ordinance Interpretation No. 2021-03] is appropriate and was properly applied to the Humidor BESS project"*.
This statement is incorrect. As explained in detail in Attachment 5, "Zoning Ordinance Interpretation No. 2021-03 is technically deficient and not supported by substantial evidence. Therefore, it was not "properly applied" to the Humidor Transmission BESS.

Claim 12: "*Per Section 22.22.010 of the County Code, the M-1 zone is appropriate for 'light industry, repair, wholesale, and packaging, including the manufacture, assembly, distribution, and storage of goods that have low nuisance impacts, but excluding raw materials production, processing or bulk handling.' The Humidor BESS is a low nuisance, light industrial use appropriate for the M-1 zone"*.
The Humidor Transmission BESS is not a "low nuisance, light industrial use appropriate for the M-1 zone"; in fact, as explained in SORT's letter, the Humidor Transmission BESS is prone to explosion, fire, and toxic gas emissions and will result in significant noise and aesthetic impacts (among other things).

Claim 13: "*The California Fire Code has specific detailed design requirements for stationary electrical energy storage systems such as the Humidor BESS to ensure fire safety during construction, operation, and decommissioning. The Humidor BESS's equipment and design will undergo further design review with the LACoFD"*.
This statement is categorically false because no California Fire Code or design requirement is capable of ensuring "fire safety" during operation. As explained in SORT's letter, one need only look at all the recent BESS fires that have occurred in Southern California over the last few months (all of which have complied with the California Fire Code and design requirements) to understand that it is impossible to design lithium-based BESS facilities that are "firesafe".

Together, the forementioned facts demonstrate that the Regional Planning letter dated August 1, 2023 which justifies the ministerial site plan approval for the Humidor Transmission BESS is not supported by substantial evidence and should be accorded no weight.

ATTACHMENT 8

CAISO STATISTICS.

California ISO

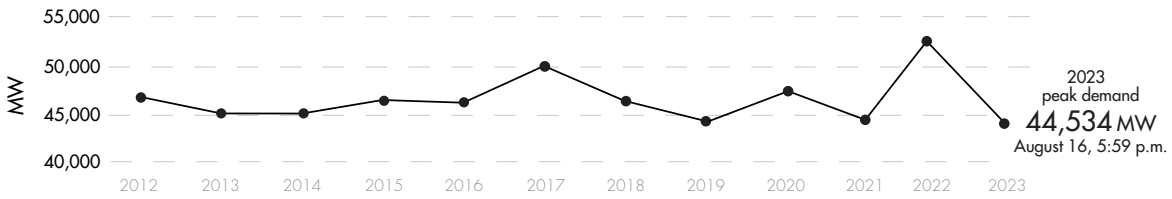
KEY STATISTICS

Peaks for June 2024

Peak demand[1]	Solar peak[1]	Wind peak[1]	Peak demand served by renewables[1,2]	Peak net imports
39,380 MW	**19,368 MW**	**6,001 MW**	**17,847 MW**	**8,590 MW**
June 24, 6:08 p.m.	June 20, 12:07 p.m.	June 16, 4:11 p.m.	June 26, 6:12 p.m.	June 4, 12:13 a.m.
Previous month: 30,585 MW	**Previous month:** 18,933 MW	**Previous month:** 6,322 MW	**Previous month:** 19,786 MW	**Previous month:** 9,081 MW

Annual peak demand

[Peak load history]



Historical statistics and records *(as of 07/09/2024)*

Solar peak NEW!
19,368 MW
June 20, 2024 at 12:07 p.m.
Previous record:
18,998 MW, June 12, 2024

Wind peak
6,465 MW
May 28, 2022 at 5:39 p.m.
Previous record:
6,265 MW, March 4, 2022

Peak net imports
11,894 MW
Sept. 21, 2019 at 6:53 p.m.

Peak demand
52,061 MW
Sept. 6, 2022 at 4:57 p.m.
Second highest:
50,270 MW, July 24, 2006

Steepest 3-hour average ramp
21,505 MWh
Feb. 10, 2024 starting at 3 p.m.
Second highest:
21,153 MWh, Jan. 7, 2024

[1] Based on 1-minute averages, and includes dynamic transfers. Values are subject to revision as data is refined.
[2] Indicates the highest amount of renewables serving peak electricity demand on any given day.

California ISO

KEY STATISTICS

Western Energy Imbalance Market (WEIM) benefits: Q1 2024 *Read report*

Benefits
$436.30 million
Previous quarter:
$391.82 million

ISO avoided curtailments
60,285 MWh
Previous quarter:
49,880 MWh

ISO GHG savings[3]
25,802 $MTCO_2$
Previous quarter:
21,349 $MTCO_2$

WEIM benefits since 2014 *Visit WEIM website*

Benefits
$5.49 billion

ISO avoided curtailments
2,223,015 MWh

ISO GHG savings[3]
951,370 $MTCO_2$

Active participants
22

Future participants
1

Number of states
11

Resources

Resource adequacy net qualifying capacity (NQC) = 52,633 MW

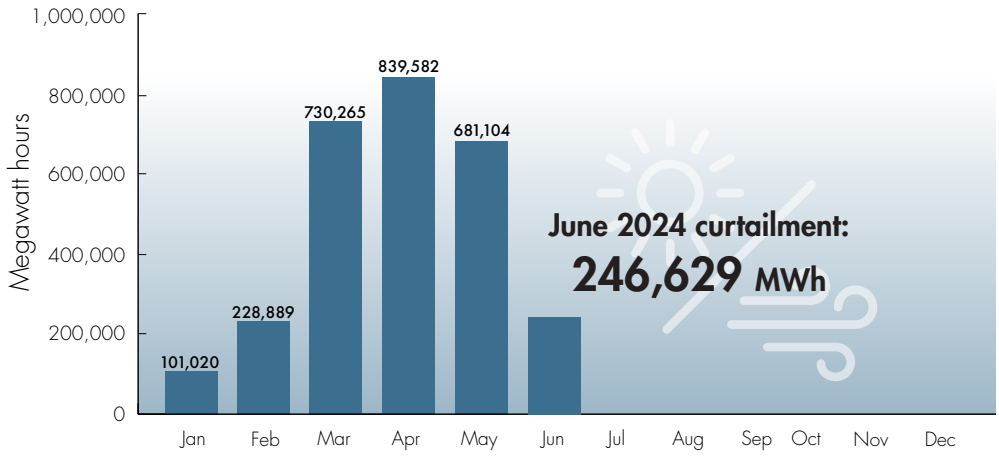
As of 07/01/24. Does not include current outages.

Installed battery capacity[4]
9,080 MW

As of 07/10/24; subject to change.

Wind and solar curtailment totals

Learn about curtailment and managing the evolving grid.

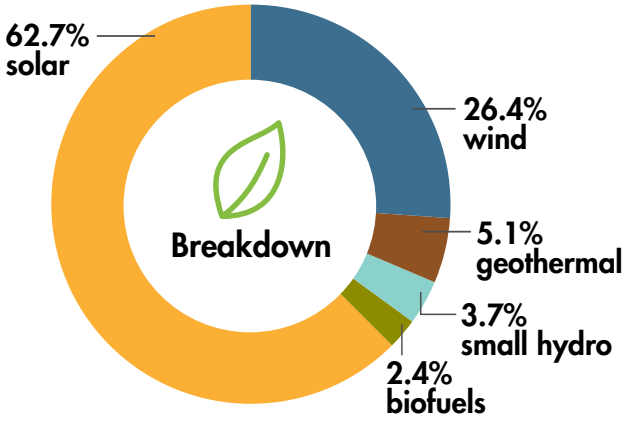


[3] The GHG emission reduction is associated with the avoided curtailment only.
[4] Includes storage resources that have achieved commercial operation date, and does not include pumped storage.

California ISO

KEY STATISTICS

Installed renewable resources *(as of 07/09/2024)*



	Megawatts
Solar	19,628
Wind	8,352
Geothermal	1,610
Small hydro	1,180
Biofuels	779
TOTAL	**31,549**

See Today's Outlook

NOTE — The ISO is using updated methodology to generate data. Only fully commercial units are now counted; units that are in test mode or partially online are excluded. For that data, view the Master Control Area Generating Capability List in the Master Generating File on OASIS under "Atlas Reference."

Other facts

- 32 million consumers
- Serve ~80% of California demand
- Serve ~33% of WECC demand within the ISO balancing authority
- 1 MW serves about 750-1,000 homes (1 MWh = 1 million watts used for one hour)
- 237.5 million megawatt-hours of load served (2023)
- 245.8 million megawatts of total electricity delivered (2023)
- 37,751MW average market transactions per day (2023)
- 22 participating transmission owners
- ~26,000 circuit miles of transmission
- 319 market participants
- RC West is the reliability coordinator for 42 entities across 10 western states and northern Mexico

See the 2023 Annual Statistics

See previous Key Statistics

ATTACHMENT 9

LIGHT INDUSTRIAL USES THAT ARE MINISTERIALLY PERMITTED BY THE LOS ANGELES COUNTY ZONING CODE.

The Los Angeles County Zoning Code Permits the following uses “by right” and without discretionary review.

Community gardens; crops; greenhouses; Animal research institutes; animal hospitals; animal shelters; dog breeding, training, and kennels; Grazing of animals; hogs or pigs; humane societies; raising and training horses and other animals; raising of poultry and other animals, riding academies, stables for the raising and training of racehorses, veterinary clinics, hospitals, and consulting offices; wild animal keeping; arboretums, churches and temples; community centers; disability rehabilitation training centers, libraries; museums; observatories; assaying services, earthen products (ceramic) manufacturing; the manufacture of some food products; jewelry production; the assembly, manufacture, packaging, and storage of agricultural products, clothing, some cosmetics, craft products, drug and biomedical products, electric products, some glass products, some metal products, paper, plastic, rubber, and wood products; farm equipment and machinery repair shops; film laboratories; bakeries and bakery good distributors; breweries; candy production; dairy product depots; frozen food lockers; slaughtering, dressing and packaging of small animals; starch mixing; some wineries; fumigation contractors; laboratories; linen, laundry, cleaning, and dyeing establishments; blacksmithing; boat building; bottling plants; box factories; carpenter and cabinet making shops; very small concrete batch plants; engraving; some fabrication facilities (no foundries, forges, or perchloric acid uses); small glass production operations; ice operations; incinerators; small lubricating oil canning operations; some lumberyards; machine shops; paint mixing; plumbing contractors; presses; refrigeration plants; sand and sand washing for sandblasting; sheet metal shops; stone, marble, and granite operations; motion picture processing, studios, and indoor sets; roofing contractors; some acetylene and oxygen storage tanks; cold storage plants; the storage of barrels, buses, building materials, cars, streetcars, furniture, household goods, machinery, rental plow, truck, moving van, plaster, contractors equipment; distributing plants; draying yards; fuel yards; produce yards; warehouse; wood yards; tire retreading; trade or commercial schools; valve storage and repair; welding; structure mounted solar facilities; athletic fields (non-stadiums); sports courts, swimming pools, and baseball parks; carnivals; golf courses; parks, playgrounds, and commercial recreation clubs; trails; shooting galleries; outdoor skating rinks; vermiculture composting; agricultural contractor equipment yards and sales; art galleries; mobilehome sales; auction houses; recording studios; antique, appliance, art supply, bakery, bicycle, book, ceramic, clothing, candy, delicatessen, dress, department, drug, farm equipment, feed and grain, florist, fruit, furniture, furrier, gift, glass, grocery, hardware, health food, hobby, ice cream, ice, jewelry, lapidary, leather, meat, mail order, millinery, music, novelty, office machine, paint, pawn, barber, beauty, blueprint, pet, photography, electronics, retail, repair, secondhand, electrician, shoe, silver, sporting goods, stamp, tobacco, toy, yarn, auto parts’ tailor, taxidermy, watch repair, and stationary shops/stores; financial services; sightseeing agencies; banks; book binderies; rug cleaners; catering services; septic and cesspool pumping; domestic violence and emergency shelters; employment agencies; interior decorating studios; locksmith shops, marine oil service stations; mortuaries; ambulance, mimeographic and photocopying, packaging, parcel delivery, pest control, printing, shoeshine, and pet grooming services; medical and dental clinics and laboratories; first aid stations; bicycle, costume,

furniture, hospital equipment, party equipment, and tool rental; some restaurants; reupholsterers; self-serve storage facilities; wedding chapels; air pollution sampling stations; comfort stations and restrooms; communications equipment; electrical distribution and transformer substations; fire stations, microwave and gas metering stations; police stations; post offices; utility service centers; radio and television broadcasting studios; bus, taxi, and railroad stations; telephone repeater stations; wharves; some wireless facilities; car wash; vehicle, RV, truck, motorcycle, and trailer rentals and sales; automobile battery service, muffler, radiator, body, and brake repair shops and garages; auto painting; accessory safe parking and emergency shelters; some amateur radio antennas; short term caretaker residences; accessory produce stands, display, outdoor storage, and cargo shipping containers; some accessory live entertainment; accessory biomass conversion, anaerobic digester, in vessel, and greenwaste composting facilities; and accessory recycling collection.

ATTACHMENT 10

2017 STUDY ANALYZING TOXICITY OF GASES RELEASED FROM SMALL LITHIUM BATTERIES DURING THERMAL RUNAWAY.

DNV·GL

Final Report

Considerations for ESS Fire Safety

Consolidated Edison and NYSERDA
New York, NY

Report No.: OAPUS301WIKO(PP151894), Rev. 4
February 9th, 2017

Consolidated Edison
Considerations for ESS Fire Safety

Project Name:	Considerations for ESS Fire Safety
Customer:	Consolidated Edison and NYSERDA
Contact Person:	Britt Reichborn-Kjennerud
Date of Issue:	February 9th, 2017
Project No.:	PP151894
Organization Unit:	O&G Corrosion Control/Energy
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Task and Objective:

Please see Executive Summary.

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☐ Secret

Keywords
Battery safety, fire testing, FTIR, thermal runaway, toxic gas, fire extinguishing, ventilation

Reference to part of this report, which may lead to misinterpretation, is not permissible.

Rev. No.	Date	Reason for Issue:	Prepared by:	Verified by:	Approved by:
0	2016-11-01	First Issue	Davion Hill		
1	2016-11-14	Second Issue	Davion Hill		
2	2016-11-29	Third Issue	Davion Hill		
3	2017-1-18	Final Issue	Davion Hill	Nick Warner	William Kovacs
4	2017-2-09	Clarification			

Executive Summary

This report summarizes the main findings and recommendations from extensive fire and extinguisher testing program that evaluated a broad range of battery chemistries[1]. The testing was conducted through much of 2016 on behalf of the New York State Energy Research & Development Authority (NYSERDA) and Consolidated Edison, as they engaged the New York City Fire Department (FDNY) and the New York City Department of Buildings (NY DOB) to address code and training updates required to accommodate deployment of energy storage in New York City. This executive summary can be read as a standalone summary of the main project findings and recommendations.

The main conclusion from the program is that installation of battery systems into buildings introduces risks, though these are manageable within existing building codes and fire fighting methods when appropriate conditions are met. This statement comes with caveats. There is a need to clarify a universal finding in this program: in the case of heating by fire or thermal abuse all batteries tested emitted toxic gases. It should also be noted that the average emissions rates of equivalent masses of plastics exceed those of batteries. Every battery tested emitted toxic gases (Table 3 on page 29); however, this can be expected from most fires.

The toxicity of the battery fires was found to be mitigated with ventilation rates common to many occupied spaces. While it was found that all batteries tested emitted toxic fumes, the toxicity is similar to a plastics fire and therefore a precedent exists. The batteries exhibited complex fire behaviors that led to abundant water use; however, it was found that the extinguishing requirements for batteries need not be excessive if an intelligent, system-level approach is taken that includes external fire ratings, permits direct water contact, and implements internal cascading protections. The general outcome of the work is that fire safety considerations are applicable to all the batteries tested in this program, even though vanadium redox and lead acid electrolytes were not observed to be flammable. The data presented in this report supports these findings.

All energy systems carry with them a risk in their deployment; however, the risks identified in this study are manageable within the limits of today's engineering controls for safety when appropriate conditions are met. The resulting requirements in codes, if implemented, are within the boundaries of the typical built environment.

The batteries tested in this program are as follows:

1. Li-ion NCM (4 vendors)
2. Li-ion $LiFePO_4$ (2 vendors)
3. Li-ion LTO
4. Lead Acid
5. Vanadium Redox
6. An additional Li-ion chemistry described as BM-LMP

[1] Chemistries are listed in the Appendix on page 107

In addition, at the request of FDNY the following extinguishing agents were tested:

1. Water
2. Pyrocool
3. F-500
4. FireIce
5. An aerosol agent

Greater detail is found within the report. It is suggested the reader use cross references provided in the report to see where technical information can be found that supports these findings. This report extensively uses cross references so that the reader can begin reading at any point in the document and quickly find relevant supporting information in other sections of the document, similar to a handbook.

Sections Directly Informing Code Development and Training

1. Locations (see Locations and Ventilation on page 48)
2. Ventilation rate (see Locations and Ventilation on page 48, as well as the Appendix, page 65)
3. Enclosures, fire rating (see Fire Rating, page 40)
4. Capacity limitation dependent on space (see Room Capacity Limitations on page 56)
5. Clearances (see Clearances page 55)
6. Monitoring, Detection, and Alarms (see page 55)
7. Fire suppression and Water Requirements (see Extinguishing, page 45 as well as the Appendix, page 68)
8. Emergency Response (see Guidance for First Responders on page 34 and Frequently Asked Questions, page 8)

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FINAL REPORT: NYSERDA / Consolidated Edison BESS Program

Considerations for ESS Fire Safety

Work conducted by:

Consolidated Edison and NYSERDA Disclaimer
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1.0 ACKNOWLEDGEMENTS

The battery and extinguishing companies identified below all donated their products for testing in this project. The Con Edison - NYSERDA team and DNV-GL are extremely grateful for the generosity and engagement with this project by these companies. We also thank the key stakeholders for their significant contributions to this effort.

NCM 1: LG Chem
NCM 2HE and NCM 2HP: Samsung SDI
NCM 3: Kokam (donated by Sunverge)
NCM 4: Electrovaya
LFP 1: BYD
LFP 2: XO Genesis
T 1: Toshiba
BM-LMP: C4V
VR 1: UET
PBA 1: EnerSys
Aerosol agent: Fireaway Inc. (product Stat-X)

2.0 ACRONYMS

ACH – Air Changes per Hour
AHJ – Authority Having Jurisdiction
BESS – Battery Energy Storage Safety
BIC – Building Information Card
BMS – battery management system
BM-LMP – Bio-mineralized Lithium Mix-Metal Phosphate
BSCAT – Barrier-Based Systematic Cause Analysis Technique
BTM – Behind the Meter
CFM – Cubic Feet per Minute
CFR – Code of Federal Regulations
CHP – Combined Heat and Power
CID – Current Interrupt Device
CO – Carbon Monoxide
COF – Certificate of Fitness
C-rate – charge rate
DCE – Duty Cycle Eccentricity
DMC – Dimethyl Carbonate
DOB – New York City Department of Buildings
DOD – depth of discharge
EC – Ethylene Carbonate
EDS – energy dispersive spectroscopy
ERPG – Emergency Response Planning Guidelines
ESS – Energy Storage System
FAQ – Frequently Asked Questions
FID – Flame Ionization Detector
FDNY – New York City Fire Department
FEA – Finite Element Analysis
FMEA – Failure Mode Effects Analysis (sometimes FMECA to include "Criticality")
FTA – Fault Tree Analysis
FTIR – Fourier Transform Infrared Spectroscopy
GPM – Gallons Per Minute
HAZID – Hazard Identification
HCl – Hydrochloric Acid
HRR – Heat Release Rate
HCN – Hydrogen Cyanide
HF – Hydrofluoric Acid
HVAC – Heating, Ventilation, and Air Conditioning
IDLH – Immediately Dangerous to Life and Health
IE – Independent Engineer(ing)
IEC – International Electrotechnical Commission
IFC – International Fire Code
IPP – Independent Power Producer
LEL – Lower Explosion Limit
LMO – Lithium Manganese Oxide
LTO – Lithium Titanium Oxide
NYSERDA – New York State Energy Research and Devlopment Authority
NAVSEA – Naval Sea Systems Command
NCA – Nickel Cobalt Aluminum
NCM – Nickel Cobalt Manganese

NIOSH – National Institutes for Occupational Safety and Health
NFPA – National Fire Protection Association
NHTSA – National Highway and Traffic Safety Administration
NRTL – Nationally Recognized Test Laborator
PBA – Lead Acid
PC – Polypropylene Carbonate
PID – Photo Ionization Detector
PPE – Personal Protective Equipment
PVC – Polyvinyl Chloride
SCBA – self contained breathing apparatus
SEI – Solid Electrolyte Layer
SOC – State of Charge
SOP – Standard Operating Procedures
SME – Subject Matter Expert
UL – Underwriter's Laboratories
UN – United Nations
UPS – Uninterruptible Power Supply
VOC – Volatile Organic Compounds
VRLA – Valve Regulated Lead Acid

3.0 HOW TO USE THIS DOCUMENT

This document is designed to inform codes writing procedures and first responder training. It can be considered a reference and handbook for this purpose. To that end, the document is structured around key ingredients to codes as determined by a survey of building and fire codes for energy-related machinery and devices.

Executive Summary: This section can be considered the consolidated list of findings and recommendations from the NYSERDA/Con Edison Battery Energy Storage System (BESS) Program.

Frequently Asked Questions (FAQ): This may be considered the main guide of the document, cross referencing to relevant sections of the report, and also serving as an introduction to the topic.

Recommendations: This is the main deliverable of the document. Essential data is provided to support recommendations, detail is left to the appendix. Recommendations and main findings are within the document text in **bold**.

Appendix: Supplementary reference data needed to communicate the recommendations, but as useful reference for detailed background. The Appendix begins on page 65. The appendix is separated in two parts that represent supporting information: a literature review on past fire incidents and data, and a confidential appendix which can be omitted for the public version of the report.

Literature References: Whenever possible, literature references are provided for independent confirmation of facts, figures, or assertions. Literature references are found in "References" on page 62.

Cross references: Whenever possible, cited data or key conclusions that are relevant to other sections of the report are cross referenced by section title and page number.

4.0 TESTING METHODOLOGY

Four different lithium chemistries (LTO, LFP, NCM, BM-LMP), lead acid, and vanadium redox batteries represented by nine unique battery types from eight different manufacturers were tested. For the Li-ion batteries, these included prismatic cells as well as pouch cells, but no cylindrical cells. For the lead acid and vanadium redox batteries, testing was largely focused on the battery electrolytes. Modules were also provided for large scale burn testing. A more explicit description of the test plan is included in the Appendix.

4.1 Cell Testing

The cells tested ranged from 1.2 to 200 Ah with an average of 52 Ah, excluding the electrolytes from vanadium redox and Pb acid cells that were tested separately. All cells were heated with 4 kW of radiant electric heat in DNV GL's Large Battery Destructive Testing Chamber (see Figure 1). All cells were placed inside the chamber and exposed to heat until they vented. Upon venting, some cells self ignited. For those that did not, hot point ignitors were placed in the upper half of the chamber and were activated once lower explosive limit (LEL) reached 50% to prevent an explosion. Many cells vented enough gas to lead to a flashover in the chamber upon activation of ignitors. In addition to heaters and ignitors, the chamber also contained ambient and inlet air temperature thermocouples, two thermocouples on each cell (top and bottom) and eight thermocouples in a cube shape around the cell to act as a thermopile for Heat Release Rate (HRR) calculations; four were level with the cell while four more were eight inches above the cell. There was one additional thermocouple in the center exhaust stack of the abuse chamber. In addition, swatches of Morning Pride personal protective equipment (PPE) material were placed in the unit above the cell to assess the effect of the fire and offgas on firefighter PPE. Cells were tested at 25, 50, 75 and 100% state of charge (SOC).

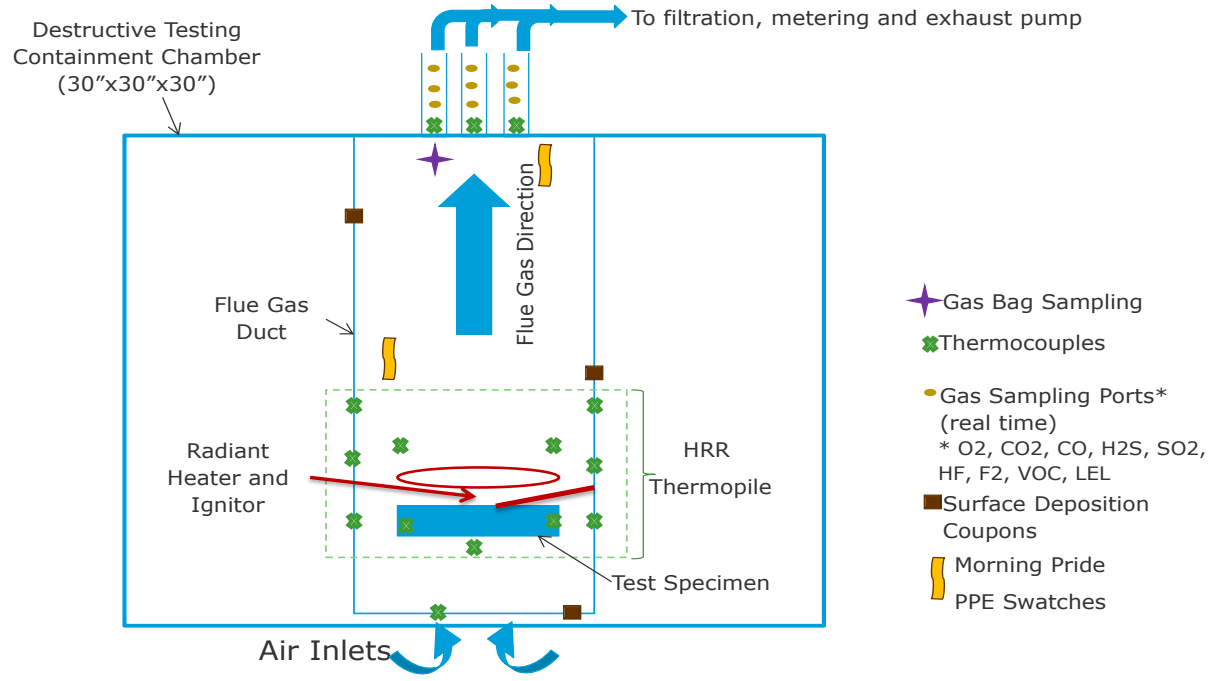


Figure 1 **Diagram of the abuse chamber used for fire testing of batteries in the BESS program.**

Finally, gas sampling was performed by a Gasmet DX4000 Fourier transform infrared spectroscopy (FTIR) gas analyzer. This analyzer monitored HCl, HF, HCN, CO, CO_2, O_2, SO_2, NO, NO_2, and a range of hydrocarbons including methane, ethane, ethylene, benzene, toluene, and others. In line with the FTIR analyzer were MSA Ultima sensors for O_2 (redundant measurement), H_2, and F_2/Cl_2. A final MSA sensor was placed directly off the chamber for flammability measurements. The sensor was of the catalytic bead type and was factory calibrated to non-specific gas for total LEL measurement. This was deemed suitable as a range of flammable gases were expected and calibration to one may show improper bias. In addition to the gas sensors, gas capture bags were set up off of the exhaust stacks. Select gas bag samples were taken periodically and were used to verify the FTIR measurement.

For extinguishing, the abuse chamber was fitted with a 2.5-gallon water can with an extinguishing trigger. The can was pressurized and engaged by a temperature trigger, with an in-line electronic solenoid valve for actuation. Once a single temperature exceeded 350°C, the solenoid was opened and the extinguisher released. The can was typically filled with 1 gallon of liquid and the entirety of the can was emptied. In one test, an 8-second pulse of water was used and the solenoid reclosed. The extinguisher nozzle was fixed approximately 10 inches from the battery, to the side and about 3 inches above. The nozzle was a fogging mist nozzle, and because of proximity, tank pressure was reduced to 75 psi to allow better saturation. All cells for extinguisher testing were tested at 90% SOC.

For large scale testing, a purpose built propane torch was constructed by Fire Force Inc, a builder of aircraft fire simulators. This torch was used to apply a direct propane flame to battery modules which were placed in a walled off shipping container shown in Figure 2 and Figure 24. The "room" was approximately 10 feet into the trailer, with one end being the trailer door and having a man door installed into a double sheeted drywall wall on the interior wall. A series of ventilation ports were cut into the room to allow for ventilation testing (two high, two low, one roof) and positive and negative ventilation were tested. In addition, two sprinklers were piped into the room for suppression testing. Most tests were conducted with doors open; however, two tests were conducted with the container closed to test ventilation. In addition to the sprinklers, hose suppression was used at times as well to assess effectiveness.

4.2 Module Testing

DNV GL and Rescue methods constructed a partially enclosed outdoor burn facility for module testing for all Li-ion battery types where modules were provided. The module sizes ranged from 7.5 to 55 kWh. Burns were conducted directly with a propane torch. A steel grate was hung from the ceiling of the burn enclosure at a height of approximately 4 feet. Below the grate a pan was constructed to catch water runoff from extinguishing. Two sprinkler heads were installed above the burn location and were fed with a 2.5-inch line reduced to a ½-inch pipe from a hydrant and pumper truck at the burn site.

Venting ports were constructed above and below the burn platform to control ventilation and also provide sampling locations. The doors to the burn chamber could be opened or closed to test the effect on oxygen, toxicity, and heat release of the fire (Figure 2).

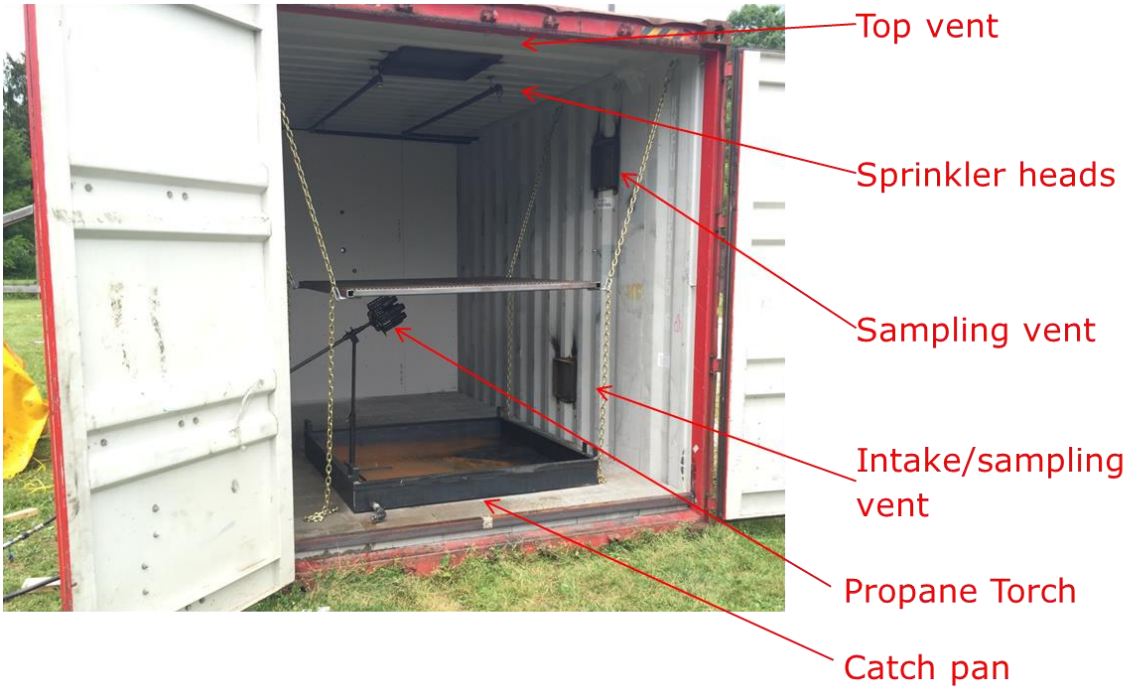


Figure 2 **Configuration of module burn site.**

5.0 CONSIDERATIONS FOR SYSTEM TYPES AND LOCATIONS

As of 2016, energy storage systems to be deployed in the near-term market will have differentiating characteristics dependent on size and location.

5.1 Large versus Small Systems

The testing results have been translated to scalable metrics for ventilation and fire suppression such as cubic feet per minute of air flow per kilogram of battery mass (CFM/kg), and gallons per minute of water flow per kilogram of battery mass (GPM/kg).

The reasons for this are several:

- Large systems and small systems should have an intelligent means of addressing ventilation and fire suppression with a scalable metric that correlates to size or mass is preferable to meet this challenge, rather than an arbitrary kW, kg, or kWh number as what is proposed in some codes as shown in Table 5.
- Energy and power densities for systems are perpetually evolving and improving. Arbitrarily prescribing a kW, kWh, or kg number to limit system installation threatens the value proposition of energy storage as energy density increases in the future
- With an energy density metric, it is possible to translate CFM/kg or GPM/kg to CFM/kWh or GPM/kWh with a single calculation. The same can be done for power density such as CFM/kW or GPM/kW. Lastly, it is possible to translate these numbers to CFM/ft^3 or GPM/ft^3 as is used by the fire service. All of these metrics are scalable and can be calculated depending on context. Because battery mass and energy

density will continue to evolve, these metrics will capture that evolution as codes follow the market.
- Many small systems are dependent on the ventilation and fire suppression in the space, and there should be a means to check if the host-infrastructure is adequate.
- Large systems may have standalone ventilation and fire suppression equipment.
- One of the main stakeholders of this report is the New York Fire Department (FDNY) and consequently most United States (US) fire departments, and they are familiar with GPM and CFM units of measure for firefighting and codes.

5.2 Occupied versus Non-Occupied Spaces

As discussed, the proposed codes in many standards organizations shown in Table 5 become increasingly prescriptive as energy equipment becomes installed in occupied spaces. Non-occupied spaces (such as outdoor energy storage containerized systems, for example) may have less restrictive codes for ventilation or clearance.

The water flow calculations presented in this document are addressing a key issue in battery safety. Over-reaction to the threat of thermal runaway has led to recommendations for "copious amounts of water" [12] for the extinguishing of Li-ion battery systems. Such recommendations inflate the perceived water requirement. The reasoning for this is logical; it is better to err on the side of caution and advise first responders to use as much water as possible to indirectly cool the battery system.

This work has demonstrated that excessive water need not be the design criteria but should instead be considered part of an intelligent set of safety systems including external fire ratings, internal cascading protections, and fixed suppression systems to slow the propagation of heat in a combined manner such as in Figure 3. If a systems approach to safety is taken, the water requirements may be far less severe. If and when first responders need to react to a system fire, it may be the case that these systems be overridden or overcome, and a "copious amounts of water" approach may be desired. **Therefore water requirements for the codes and water requirements for first responders are separate issues.**

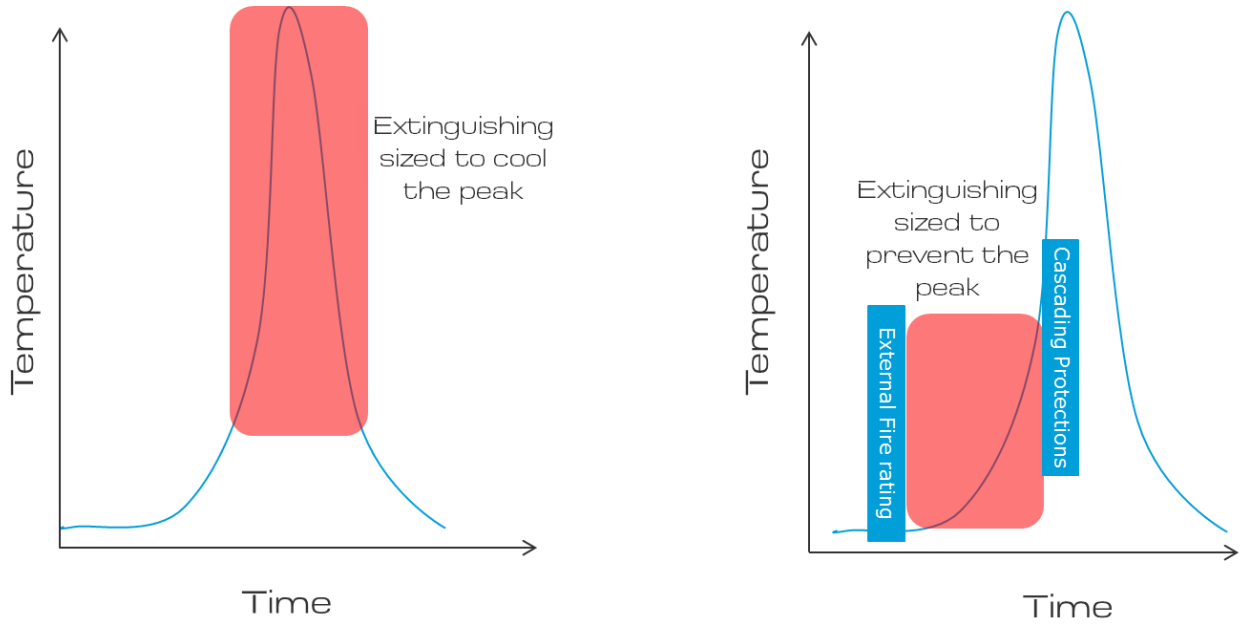


Figure 3 **A proactive, system level approach to extinguishing need not prescribe excessive levels of water if the system also contains a high external fire rating as well as internal barriers to prevent cascading.**

5.3 Challenges with Proposed Codes

The findings from this program indicate that scalable metrics are appropriate for sizing ventilation and water requirements for building sites. A summary of proposed codes is shown in Table 5. For example, in proposed changes to the International Fire Code IFC 608, 20 kWh is cited as a threshold for battery sizes or 600 kWh in a room. The code also proposes 3 feet of clearance between battery arrays. Such prescription threatens the value proposition of energy storage as energy and power density metrics have been increasing rapidly over the last 5-8 years. Limitations placed on kWh or kW will directly limit the energy service function of the device and will therefore limit the market. Providing scalable safety metrics, however, will allow the market to be flexible within safety limits.

6.0 NEW FINDINGS AND ANSWERS TO FREQUENTLY ASKED QUESTIONS IN BATTERY SAFETY

The findings of this program directly address some common misperceptions in battery safety. It is therefore helpful to address some of them directly in this section. These questions are an aggregation of questions posed during the testing program by FDNY, battery vendors, and other stakeholders. Reading through this section may serve as an adequate introduction to the topic and will also guide the reader through the report and its logic.

Question: Are the commonly cited battery fires in the media due to spontaneous ignition events?
Finding: No. The Literature Review (an addendum to this report) covers several incidents in detail. In the context of fire risk and firefighting for batteries, it is helpful to summarize the abuse tests that are performed in United Nations (UN) 38.3, the required testing scope in order to ship and transport Li-ion batteries. The eight separate tests in UN 38.3 are a checklist of nearly all physically conceivable abuses that could cause a Li-ion battery to catch fire. These abuse events are:

1. Low ambient pressure
2. Overheating
3. Vibration
4. Shock
5. External short circuit
6. Impact
7. Overcharge
8. Forced discharge

All of the safety incidents commonly reported in the general media can be traced to one of these abuse mechanisms. In some cases, contaminants in the battery (as a result of manufacturing defects) weaken the ability of the battery to withstand instances of these eight abuse factors. In general it is good practice to avoid any scenario that may introduce the threat of any action on the above list. Three items in particular (overheating, external short circuit, and impact) are the abuse mechanisms that have increased probability of occurring to a battery during and after a fire. The fire is the most obvious heat source, but subsequent heating may occur internally once batteries reach critical temperatures (typically > 120°C). Short circuiting may occur by contact with tools or equipment or by water. Items #7 and #8 are electrical stimuli that are typically monitored and controlled by active safety barriers in the battery management system (BMS).

Question: How is the battery industry handling safety today?
Finding: For most energy storage projects that are not paid for on the "balance sheet", the typical independent engineering (IE) verifications that are required in the wind and solar industries apply to energy storage projects as well. During the technology review, performance and safety analyses are performed. This may include a review of accredited testing, certifications, and other hazard-consequence analyses. DNV GL routinely supports this with risk analysis to look at the overlap between energy storage system (ESS) safety functions and the site (see "Why Bowtie Models?" on page 74); particularly for energy storage projects that are a portfolio of behind-the-meter devices deployed across a geography in a mix of commercial and industrial applications. In some cases for larger installations a heat and plume study is performed to determine clearances. Such practices are common to energy and petrochemical sectors prior to the commissioning of any new project. IE practices are described in "Present Day Industry-Accepted Safety Practices for Energy Storage Projects" on page 31.

Question: Are battery fires more toxic than plastics fires?
Finding: In general, no, with conditional exceptions. The average emissions rate[2] of a battery during a fire condition is lower per kilogram of material than a plastics fire, as shown in Figure 5. However, the peak emissions rate (during thermal runaway of a Li-ion

[2] Emissions concentration in ppm averaged over total minutes of burn time

battery, for example) is higher per kilogram of material than a plastics fire, as shown in Figure 4. This illustrates that a smoldering Li-ion battery on a per kilogram basis can be treated with the same precautions as something like a sofa, mattress, or office fire in terms of toxicity, but during the most intense moments of the fire (during the 2-3 minutes that cells are igniting exothermically) precautions for toxicity and ventilation should be taken. It should be noted that if Li-ion battery modules are equipped with cascading protections, the cell failure rate may be randomized and staggered. The randomized failure rate limits the toxicity and heat release rate of the fire.

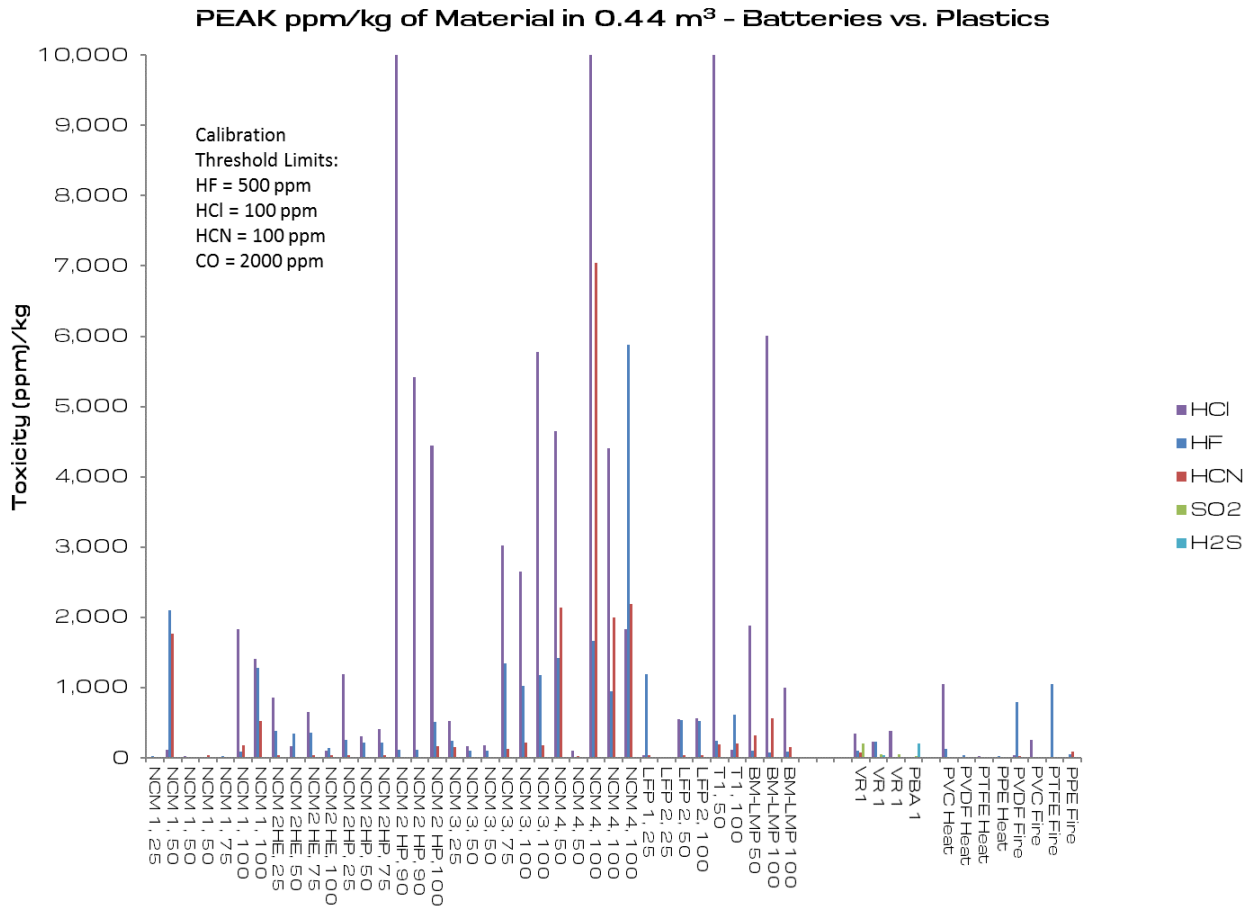


Figure 4 **Peak ppm per kg (in a 0.44 m³ volume) for all batteries tested as compared to plastics.**

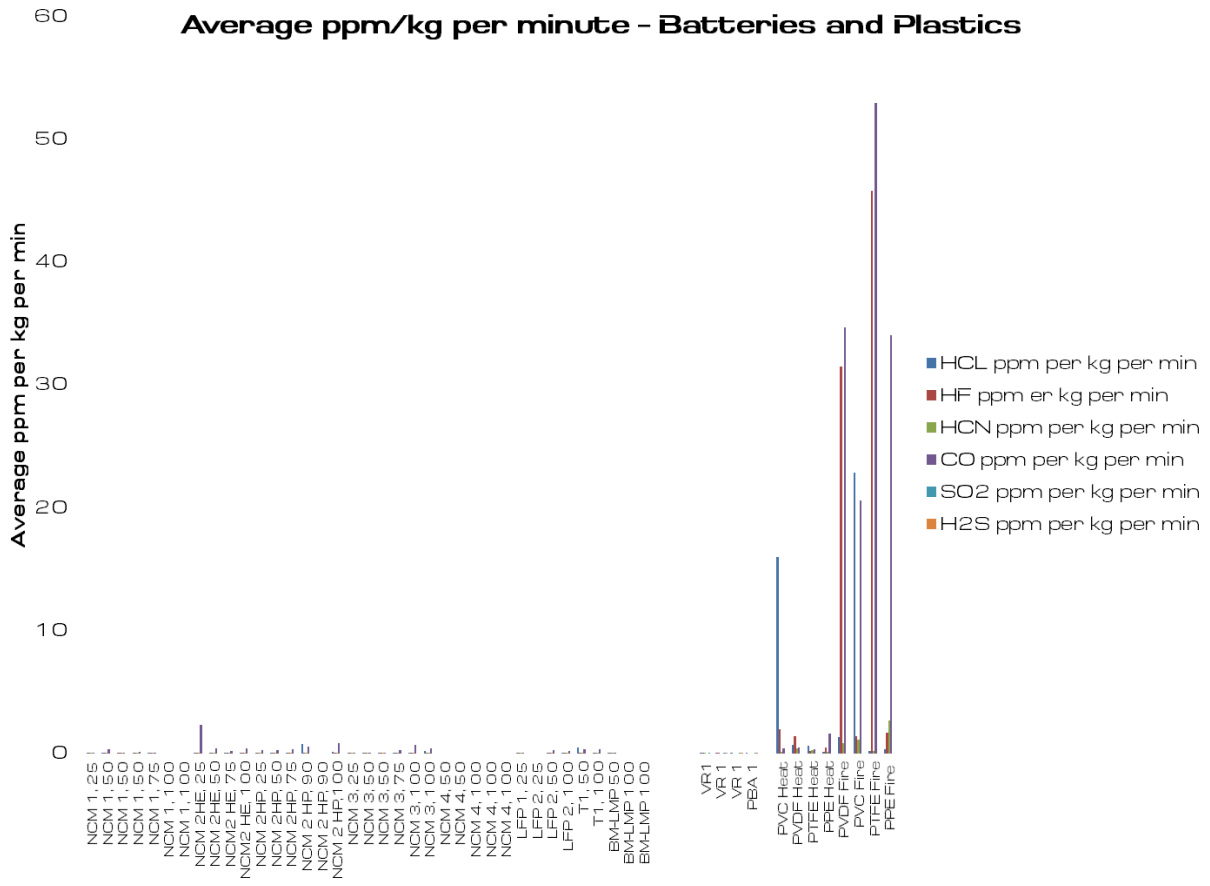


Figure 5 **Average emissions per kg per minute of test mass for plastics vs. batteries.**

Question: Is standard firefighter turnout gear adequate protection from a battery fire?
Finding: DNV GL and the provider of turnout gear (Honeywell Morning Pride) did not note any degradation in PPE as a result of exposure to fire test conditions when the gear was fit on a mannequin and exposed to the fire directly. Therefore first responders equipped with standard issue turnout gear may have protection against the toxic gas species observed under these tested conditions. Limited electrical protection was also observed without modifications to PPE, based on the conditions tested. Rescue Methods used common MSA Altair four- and five-gas sensors during full scale testing. Rescue Methods worked with Honeywell to test turnout gear, and one recommendation from Honeywell was that the general materials integrity of the jacket should withstand most species measured in this testing, cautioning that sustained exposure to Chlorine can have a degrading impact on Kevlar. It should be noted that HCl was observed in the battery fire testing and is also a common byproduct from combustion of most plastics in similar or greater volumes per kilogram of burning material.

Question: Are any batteries excluded from the ventilation requirement?
Finding: Because the volume of the room plays a key role in dictating the ventilation rate, batteries in larger rooms will have lower air changes per hour (ACH) requirements and the size of the room will have a buffering effect on the peak emission rate. The vanadium redox and lead acid batteries tested both emitted HCl upon heating, starting as low level emission around 100-150^{O}C (see Figure 6 for vanadium redox and Figure 8 for lead acid). The findings in this program demonstrate that HCl plays a dominating role in ventilation rates for battery systems in enclosed spaces, and because it is common for all battery types tested, ventilation recommendations (in section "Locations and Ventilation" on page 48) are universal for all battery types. **However, it should be noted that in the smallest unit of failure scenarios, the recommended ventilation rate of 0.25 ACH is well below the typical rating of 3-4 for most general spaces which means that vanadium redox and Pb acid batteries, as well as single cell failure modes for Li-ion, are already within the implied code requirements** [27]. Laboratories and server rooms can have ACH ratings > 10. Therefore the DNV GL recommendation for air change rates > 0.25 ACH is already exceeded by the building code in most instances.

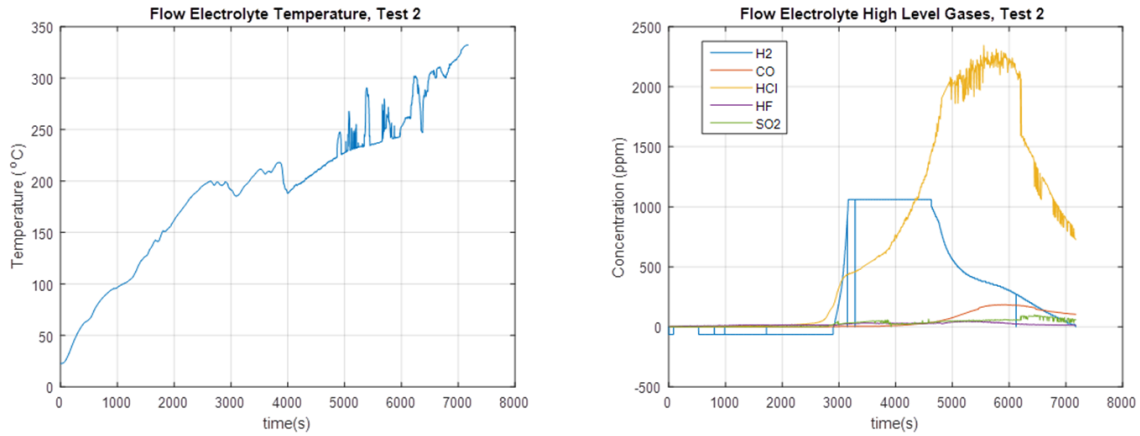


Figure 6 **Emission of HCl was observed from the vanadium redox flow electrolyte.**

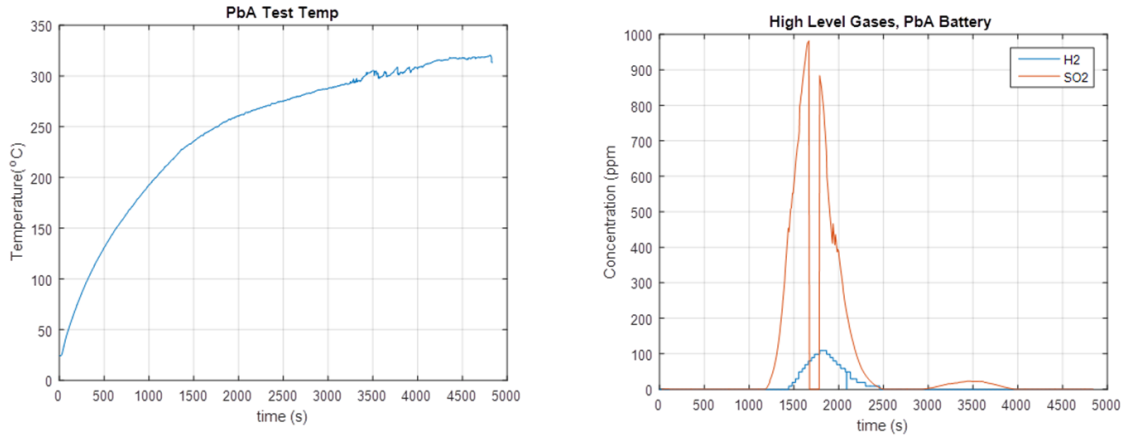


Figure 7 **Heating of Pb acid electrolytes yielded SO_2.**

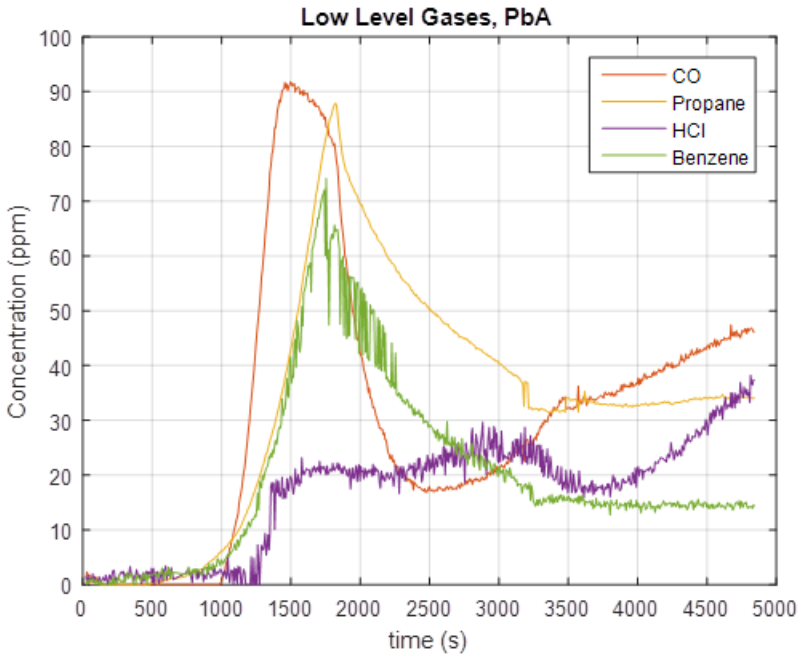


Figure 8 **Heating of Pb acid electrolytes also yielded HCl.**

Question: What kind of testing is required to certify the safety of battery systems?
Finding: The most commonly referenced system level safety testing the US is Underwriters' Laboratories (UL) 1973. For marine and automotive applications, International Electrotechnical Commission (IEC) 62619 covers many of the same requirements and has a more stringent pass/fail criteria to demonstrate limited cascading between cells. The US market appears to be moving toward UL 9540 which includes aspects of UL 1973 and UL 1642 (for cell safety) in addition to an up-front failure mode effects analysis (FMEA) on the system. As mentioned, such a risk analysis should also include the site under unique circumstances. It is also conventional to have a third party inspect the field installation and provide a sign-off for the local authority having jurisdiction (AHJ). Globally, UN 38.3 is the most widely recognized safety testing for Li-ion battery cells and is a requirement for transport. The results of accredited safety testing are an indicator of the strength of the barriers in a risk model.

Question: Do battery systems have an external display of error or health?
Finding: Yes, in a limited way. The present codes in NYC for uninterruptible power supplies (UPS) require a system health display panel. A primary concern for first responders is lack of knowledge about what is happening inside the battery system upon being called to the scene, which impacts their ability to deem a site under control and then hand off control of the site to the property owner. Some engagement between the systems integration, project development, and first responder community is needed to discuss viable solutions for such a panel, or whether the intent of the panel is met through other means (such as an emergency hotline or remote data access by phone or other means).

Question: Do battery fires re-ignite?
Finding: The term "re-ignition" is a misnomer due to the factors described in the incident history of Li-ion battery fires. Upon extinguishing, great care must be taken to assure that **all electrical, thermal, and mechanical abuse factors** are neutralized. If any remain, it

poses a hazard for *continuing* (not reigniting) the fire. Therefore, it is technically inaccurate to classify this as re-ignition if the primary cause of the hazard is never removed. After a fire, a battery module or system may contain intact cells that still have DC voltage, meaning there is a persisting electrical hazard (Figure 11). Water shorting out cells, for example, is a genuine risk (such as was witnessed in the Chevrolet Volt crash test or the flooded Fisker cars [15,17]). In addition, if the heat deep within the module has not been removed, that heat poses a continued thermal hazard. DNV GL and Rescue Methods witnessed this effect during testing as shown in Figure 9, the cause of which was lack of thermal barriers between cells. DNV GL replicated this effect in more controlled laboratory tests in Figure 10 and observed that temperatures between battery cells can be 300°C higher than the exterior during extinguishing unless there is a means to remove internal heat or prevent its transfer between cells. First responders should be cognizant that all electrical, thermal, and mechanical hazards have been mitigated before deeming a battery fire fully extinguished.

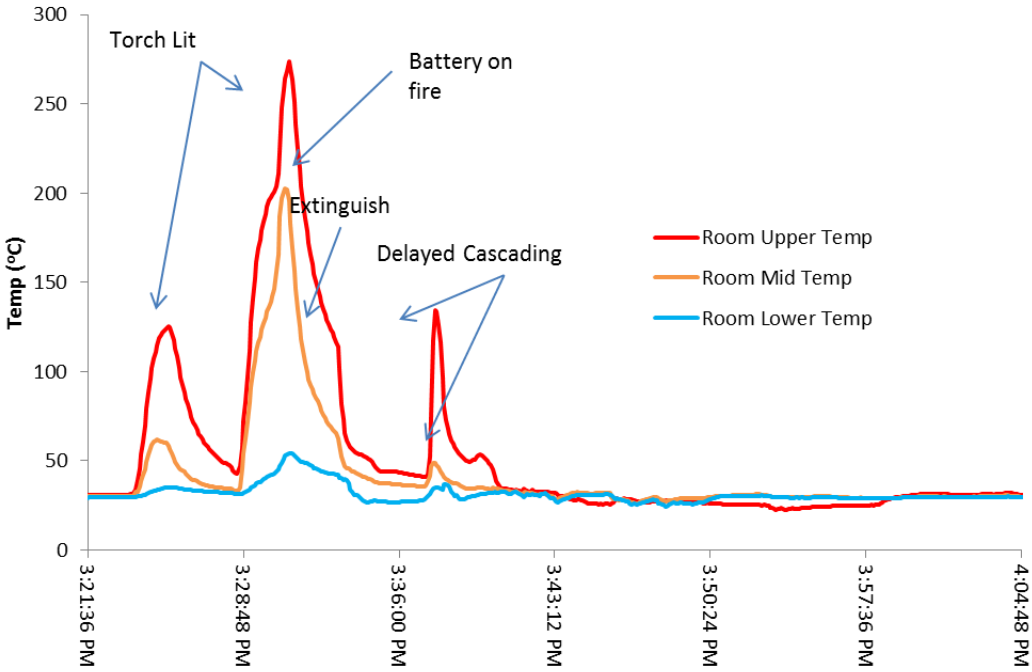


Figure 9 **Observation of delayed cascading during extinguishing in a module without cascading protections.**

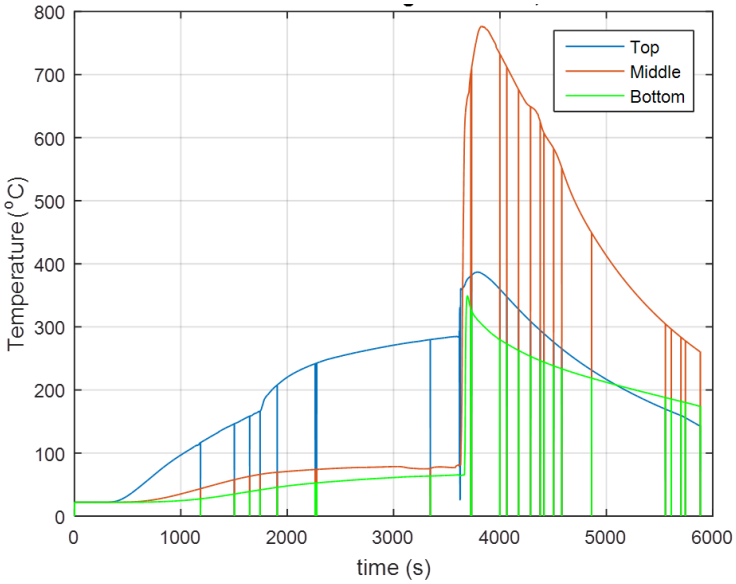


Figure 10 **Internal temperatures between two sandwiched pouch cells remained 300°C higher than external faces after aerosol extinguishing.**

Question: What is the time frame for delayed ignition?
Finding: As mentioned previously, this is entirely dependent on whether the residual hazard is electrical, thermal, or mechanical. If these measures are successfully taken then no delayed ignition should occur. In the case of thermal abuses, DNV GL witnessed the residual heat cause a delayed cascading event within 10 minutes (Figure 9). In the case of the Chevrolet Volt that shorted across the battery pack terminals after the National Highway and Traffic Safety Administration (NHTSA) crash test, the shorting event occurred 3 weeks later and was a separate hazard event.[15] Again, the delay was due to the time it took for the coolant to leak and eventually short the battery; it is not the battery that caused this event but the electrical short hazard introduced by the coolant. Therefore if all electrical, thermal, and mechanical hazards are monitored, controlled, or mitigated, first responders should be able to assess the risk of delayed cascading during the first encounter and the minutes or hours after extinguishing. The signature of any abuse due to shorting, crush or penetration, or residual heating is climbing temperature on the battery, which can be monitored by the system thermocouples (if they are still intact and the data is provided remotely) or by handheld thermal sensors or infrared (IR) monitors.

Question: How long does it take for a Li-ion battery to go into thermal runaway if it is being heated?
Finding: This is entirely dependent on the rate of heat absorption into the cell. DNV GL observed in this work and other projects that a Li-ion cell can smolder for more than an hour if the heat transfer rate is slow. By the time temperatures near 120°C (248°F) were reached, all Li-ion batteries tested (including $LiFePO_4$ and LTO chemistries) offgassed and/or ruptured. If the threshold near 120°C is never crossed, the battery may smolder and gas but never ignite unless an external spark ignites the flammable gases emitted from it. It was common for $LiFePO_4$, LTO, and the BM-LMP cells to offgas without flame, but their offgas composition contains the same flammable and toxic constituents as batteries with higher temperature failures.

Question: Are there risks of electric shock?
Finding: During extinguishing, Rescue Methods did not observe transfer of electricity from the battery system to the first responder through the water stream. Some sparks were observed to be thrown during the active burning of some modules. Arcing was also observed when the batteries were disturbed, such as when they shorted to metal tools or the metal support structure upon which they sat. The turnout gear worn by the firefighters provided adequate protection such that no evidence of shock was observed in the conditions of this test program. The shock hazard, as shown in Figure 11, is presented by stranded energy in the form of DC voltage in the remaining intact cells.

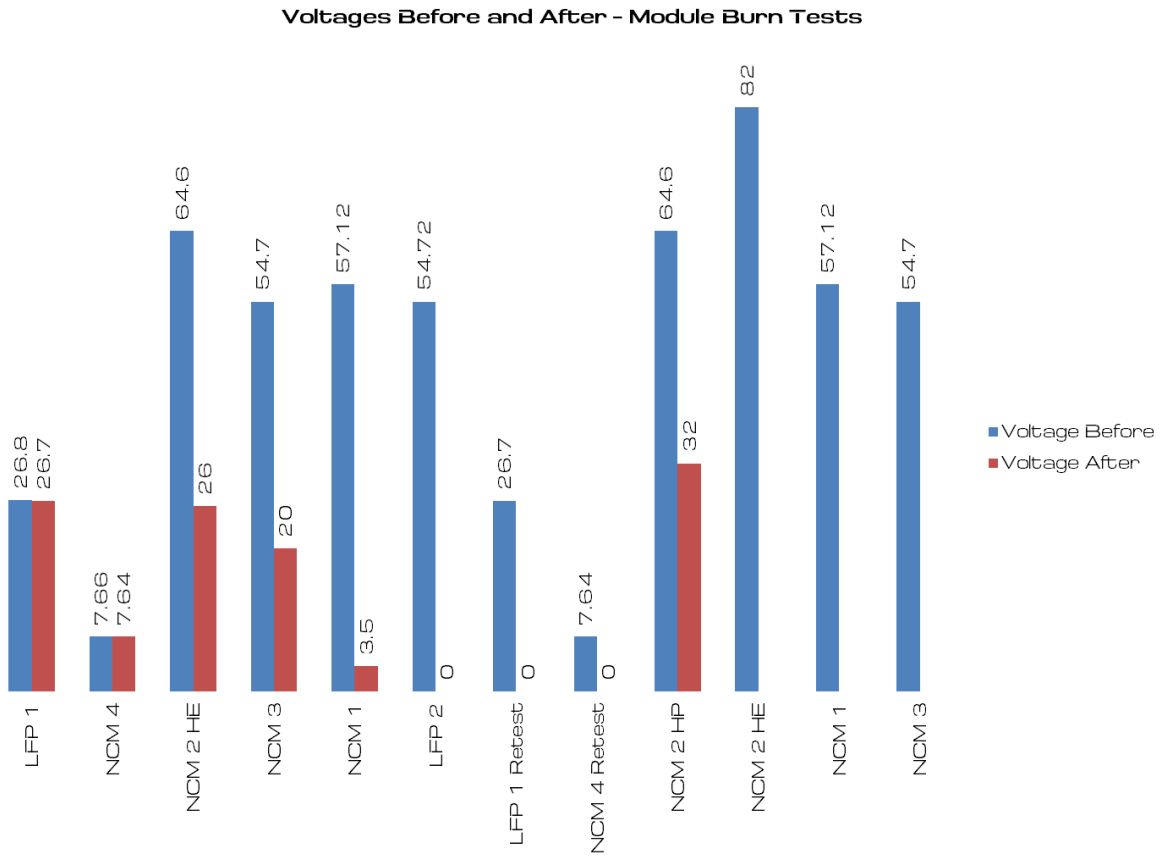


Figure 11 **Some battery modules still had residual voltage after fire testing.**

Question: Is water a sufficient extinguisher?
Finding: DNV GL's testing indicates that all extinguishers have benefits and drawbacks, including water. Every extinguisher that DNV GL tested put out the flame on battery cells, including the aerosol. During module testing, all extinguishers tested knocked out the flame but in some cases the flame rekindled once the stream was removed because the battery was still hot enough to ignite the remaining fuel. The ideal battery fire extinguisher would be both highly thermally conductive and highly electrically insulating. Water is the former but not the latter. Deionized water is both until it dissolves contaminants from the fire, including ash and soot. In DNV GL's testing, it was found that other extinguisher types could have equal or poorer heat removal capability to water, but all were electrically conducting due to their reliance on water as a dispersion medium. (Figure 29) Gases or aerosols—due

to lack of thermal mass, poorer thermal conductivity, and restricted access to the deep seated heat source—were not observed to cool as quickly as water can. Water has been historically recommended because of its ability to cool. It was found in this program that water cools best, with the potential unwanted side effect of shorting other cells.

Question: Do battery fires require "copious amounts of water" to be extinguished?
Finding: If appropriate precautions are not taken to limit propagation between cells in the module design, then the water requirement could be described as "copious" as NHTSA coined in 2012. [12] The total content of water is entirely dependent on the water contact efficiency with the battery cells (see the regression coefficients in Figure 36 and the GPM example calculation in Figure 31). This language is anecdotal, however, and requires some quantification. As mentioned previously, lack of barriers between cells results in a deep seated and inaccessible fire (Figure 10). In practice, this would result in the use of more water to cool and contain a battery fire. The use of "copious amounts of water" potentially introduces the unwanted effect of shorting out other cells, thereby perpetuating the fire. The water amount need not be so excessive if heat can be removed from the between cells, and cells have limited ability to transfer heat to nearest neighbors. DNV GL found through testing that this water amount could be increasingly reduced as strategies to direct cooling were learned (Figure 12).

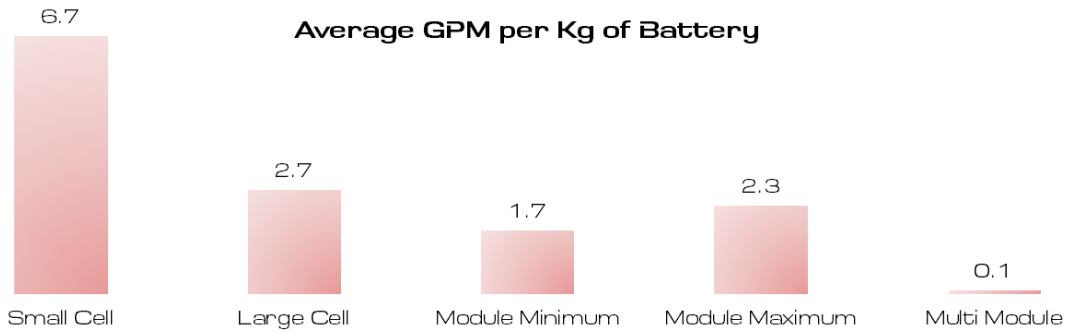


Figure 12 **Progression toward lower water requirements as testing progressed.**

Question: What about fire suppressants other than water?
Finding: DNV GL found that all suppressants put out the fire including an aerosol. The most effective agent for cooling the fire is water. (Figure 29)

Question: Is FM-200 sufficient as an extinguisher?
Finding: FM-200 was not included in the test scope of this program. DNV GL did, however, obtain permission from an aerosol manufacturer to test their product, which succeeded in putting out the cell fire. The testing demonstrated that the cooling rate for the aerosol is less than the liquids (a direct consequence of less thermal mass in a gas versus a liquid, and a reduced effect from latent heat of vaporization). If gases have less thermal mass to take heat from the batteries, then it is the assumption that all gas-based agents are likely to cool less effectively than water. For this reason DNV GL recommends a staged extinguishing approach as demonstrated in "Extinguishing" on page 45.

Question: Do the other extinguishing agents produce slippery conditions?
Finding: DNV GL and Rescue Methods did not observe slippery conditions with the use of the other agents during full scale testing.

Question: Is a 2 ½" hose line with 250 GPM sufficient to put out a battery fire?
Finding: This is dependent on the battery size. DNV GL translated the findings to both GPM/kg and GPM/kWh of battery mass (Table 9). In general, however, if the water can be targeted at the deep seated, highest temperature areas of the fire, it will be most effective and the water requirement will be reduced. It is demonstrated as an example in Table 7 that 250 GPM is more than sufficient for typical battery systems on the market, provided that cascading protections and external fire rating requirements are also met.

Question: How much water is required?
Finding: DNV GL found in Table 17 and Table 9 that a minimum of 0.07-0.1 GPM/kg of battery mass can accomplish both extinguishing and cooling for a battery fire. Accommodation for increasing energy density can be accomplished by dividing this number by the energy density (in Wh/kg) and multiplying by 1000 Wh/kWh.

Question: Is the water extinguisher requirement for batteries significantly larger than what is already prescribed in the built environment?
Finding: This need not be the case if battery firefighting is considered at a system level. Residual heat within a battery module was observed in this program, demonstrating that **battery modules equipped with cascading protections will have a reducing effect on water flow rate requirements because less water will be needed to cool them.** This has direct economic impacts on the overall system installation cost. In Figure 3 it is demonstrated how the combined effect of external fire rating and internal cascading protections works to limit the heat transfer rate, thereby reducing the overall water requirement. Overall, DNV GL found that it is conceivable that water flow requirements would not exceed what is already seen in the built environment when appropriate room volumes are considered (compare Table 10 with Table 8).

Question: Will the ventilation rates for battery systems be excessive?
Finding: They need not be excessive if the appropriate room volume is considered. (Compare Table 10 with Table 8.)

Question: What are the differences in safety considerations for outdoor vs. indoor systems?
Finding: Please cross reference to "considerations for System Types and Locations". Outdoor systems may have standalone safety equipment such as fixed suppression systems and self-contained heating, ventilation, and air conditioning (HVAC). The risk to the site should be considered in all cases, which is intended to be addressed in the FMEA required by UL 9540. A risk analysis should guide stakeholders toward a probable risk consideration during project commissioning. This probability-driven analysis helps avoid over- or under-prescribing safety systems. Outdoor systems may have different or lower ventilation requirements, but their size and proximity to inhabited structures may dictate heat or plume considerations in the event of fire (see Figure 25 and considerations in" Present Day Industry-Accepted Safety Practices for Energy Storage Project" on page 31). Indoor systems may be dependent on the building infrastructure for ventilation and fire suppression. If that is the case, the risk analysis should identify if these systems are adequately sized, using the guidance identified in Table 9.

Question: Are residues left behind after a battery burns?
Finding: There is potential for residues. DNV GL found traces of vanadium after boiling the vanadium redox electrolyte. In the EDS (energy dispersive spectroscopy) scan from the scanning electron microscope, coincident detection of both V and O could indicate vanadium oxide dust (Figure 13). The vanadium peak is low; however, there is no other component of the test that would contribute it other than the vanadium redox electrolyte. Oxygen can also be sourced from various oxides that form on metals. In addition, some Pb residue was swabbed from the burn container where Pb acid batteries were tested, but it was in low amounts and limited to immediate proximity of the burn specimen. Traces of metals were observed in the interior of the battery abuse chamber after Li-ion testing. In addition, the pH of runoff water from the module burn tests was measured to be anywhere from pH 6 to pH 11. However, many of the same contaminants found from plastics fires were common to those found from battery fires. In any case, the precautions recommended for PPE and self-contained breathing apparatus (SCBA) during overhaul apply to solids residues and dusts as well. Bare skin contact with residues should be avoided, as is good practice in the aftermath of most fires.

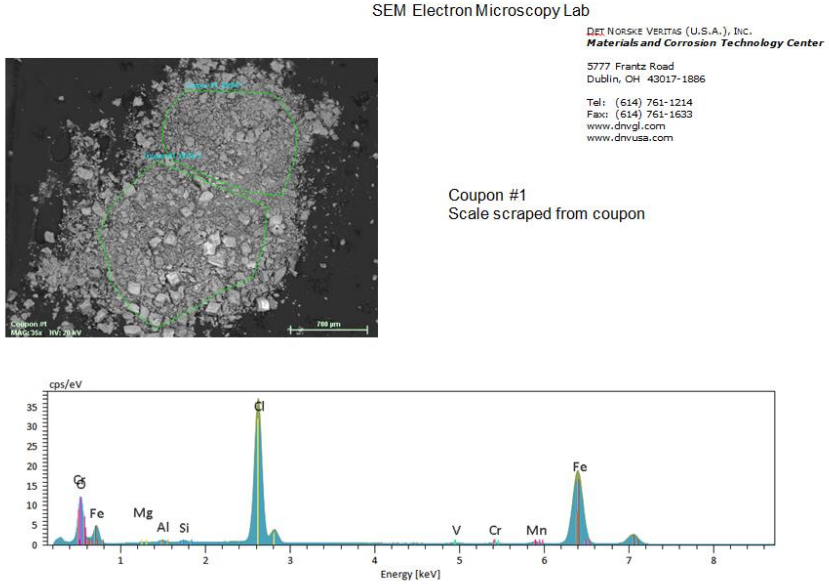


Figure 13 **Residue analysis from a coupon hung in the headspace of the vanadium redox boiling test.**

Question: Are certain form factors of cells safer than others?
Finding: DNV GL saw that unconstrained pouch cells, if given the opportunity, will inflate and then burst catastrophically under extreme heating conditions (Figure 14). However, pouch cells are compressed when engineered into modules, so a free-floating pouch cell is not a realistic representation of a field system. DNV GL did notice, however, that controlled venting of cells is necessary to reduce their volatility. The ability to vent and relieve pressure is critical to whether the cell's failure is benign or sudden. **This illuminates the fact that trapped gases are the cause of explosive failure.** It should be noted that DNV GL did not directly witness any exploding battery cells during testing. However, flashovers of the contained gases within the test chamber were a frequent occurrence for all Li-ion batteries tested.

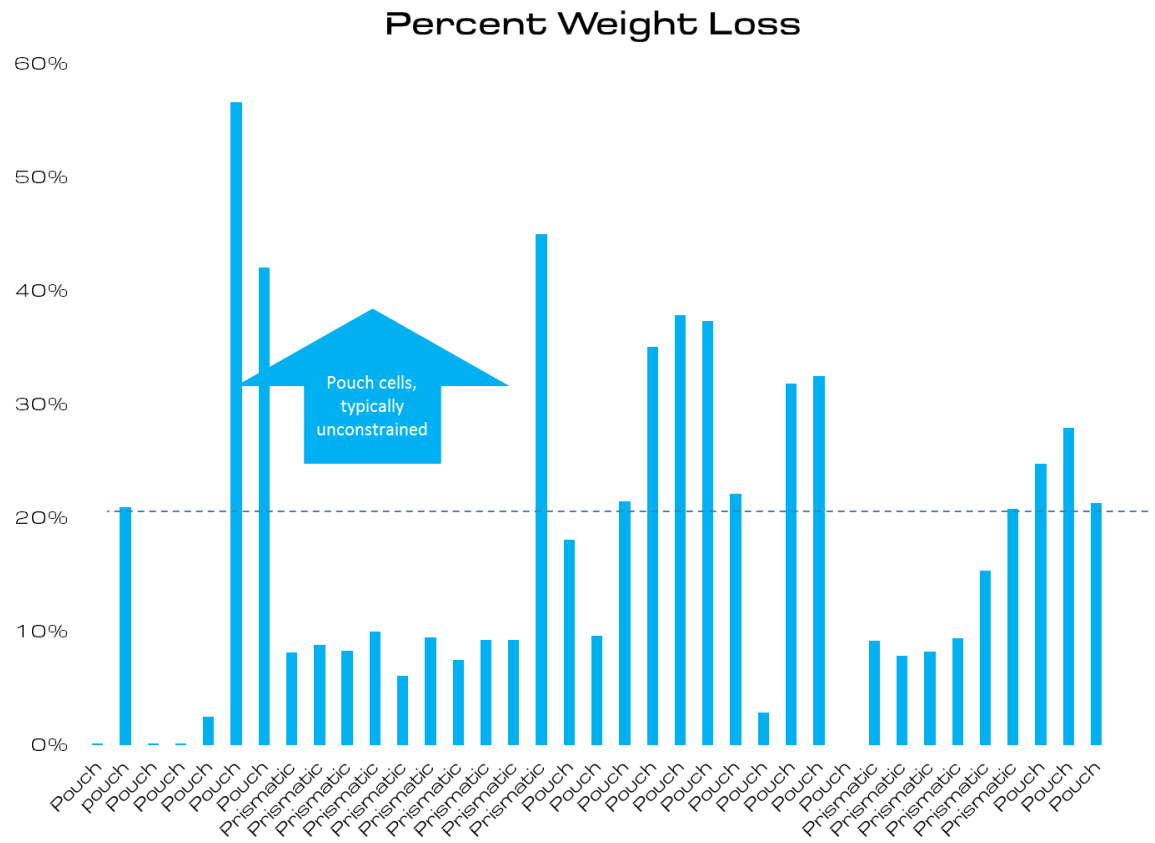


Figure 14 **Percent of mass loss as a function of cell form factor.**

Question: Will Li-ion batteries explode?
Finding: In this program DNV GL tested dozens of Li-ion batteries and could not conclusively say that any of them "exploded." DNV GL has conducted hundreds of abuse tests on cells in other programs and has not conclusively observed an event where a battery exploded or was the source of a rapid energy event. What is a highly repeatable condition, however, is the degree to which the test chamber fills with flammable gases before those gases ignite. The flashover event could be very rapid. The explosion hazard is not the battery itself, but the gases it may generate. Therefore the requirements for stress-relief by venting of the cells (described above) and the ventilation of the space are emphasized throughout this report.

Question: How long would it take for flammable gases to explode?
Finding: This is entirely dependent on the emissions rate and the ventilation of the surrounding area. It is shown in Figure 5 that the emissions rate varies for all batteries but the diagram indicates the upper and lower boundaries of emissions limits. The emissions rates corresponded to 0-57% mass loss over a period of 13-83 minutes. CO is the primary signature of flammable gases. Sensors detecting CO may be cross-sensitive to hydrogen. Many flammable gas sensors are non-equally cross sensitive across a family of hydrocarbons and provide a general "LEL" audible warning. The emissions rates observed from batteries are included in Table 1.

Table 1 **Statistics on cell failure rates for the entire test program including all Li-ion variants.**

		Single Cell Emissions Statistics			
		Average	*Std Dev*	*Min*	*Max*
	Mass Loss	18%	14%	0%	57%
	Duration (min)	41.7	17.1	13.0	83.0
Average ppm per kg per min in 1 m^3	**HCl**	0.057	0.150	0.000	0.719
	HF	0.009	0.010	0.000	0.032
	HCN	0.003	0.005	0.000	0.027
	CO	0.279	0.440	0.000	2.341

Question: What is the energy of the explosions from battery offgas?
Finding: DNV GL did not observe batteries exploding directly, but did observe the energy of flammable gas flashovers. The energy of these events is proportional to the concentration of gases in the enclosed volume. The power of these events (or the heat release rate) is significantly variable depending on the volumes of gases, the duration of their release, the resulting mixture, and the rates of their ignition, DNV GL observed considerable scatter in the HRR (Figure 15). The HRR was observed to be anywhere from 2-8 kW with 100-800 g of released materials. This brackets the value from 2.5-80 kW/kg. By comparison, burned specimens of common furniture items have demonstrated a mass weighted HRR of 32-260 kW/kg. [51] It was found during testing that long periods of smoldering for the batteries resulted in reduction in mass prior to the peak event, which likely produced much of the scatter observed in the measurements.

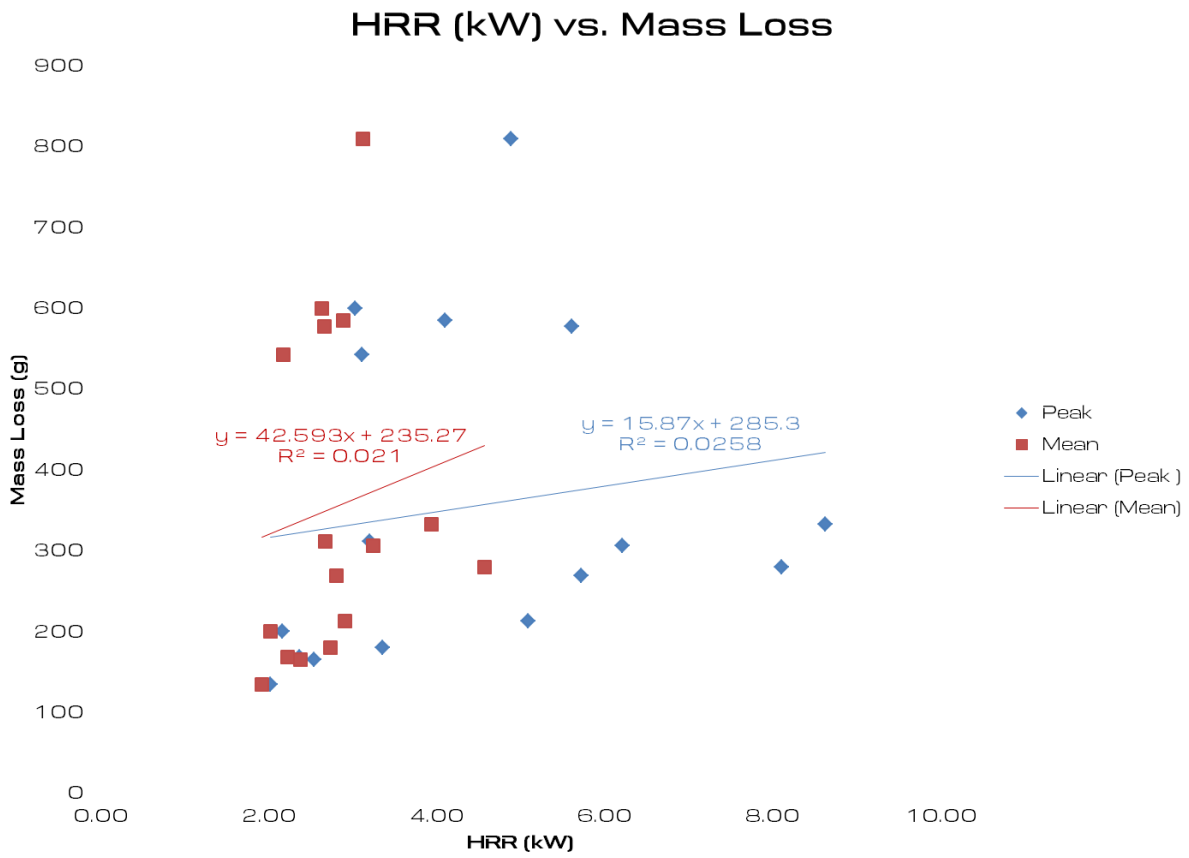


Figure 15 **Relationship of heat release rate (kW) per gram of mass lost.**

Question: Is the ventilation rate governed by the LEL or Immediately Dangerous to Life and Health (IDLH) limits ?
Finding: IDLH. The concentrations of HCl reach a threatening level much faster than the concentrations of flammable gases. Therefore by sizing the ventilation requirement to the IDLH of HCl, the flammability concern is also mitigated. See Figure 16 and related figures starting on page 23.

Question: What are the ventilation requirements for batteries?
Finding: DNV GL quantified and produced suggested ventilation rates in Table 9. The suggested ventilation rates range from 0.02-0.03 CFM/kg or 0.2-0.32 CFM/kWh. This translates to roughly 0.25 ACH in many cell failure scenarios, climbing to as high at 10-14 ACH in the worst case (see Figure 16 on page 23 and related figures). It should be noted that laboratory spaces, pharmacies, or some manufacturing environments can also have an ACH of 10 or higher (compare Table 15 and Table 8). Therefore, the ventilation rates in most buildings will meet or exceed the ventilation required for the battery system in single cell or low mass failure modes.

Table 2 **Average release rate for battery materials over a 30 minute time period.**

Materials	30 min Release Rate (kg/s)
HCl	2.36E-07
HF	1.74E-07
HCN	1.74E-07
CO	2.00E-07

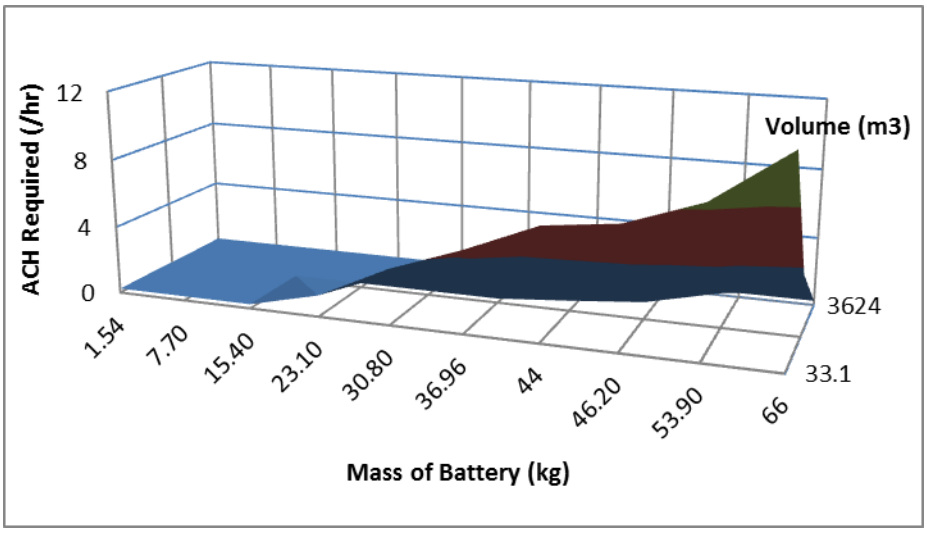


Figure 16 **Estimated ventilation rates (air changes per hour) as a function of room volume and mass of battery undergoing failure for HCl.**

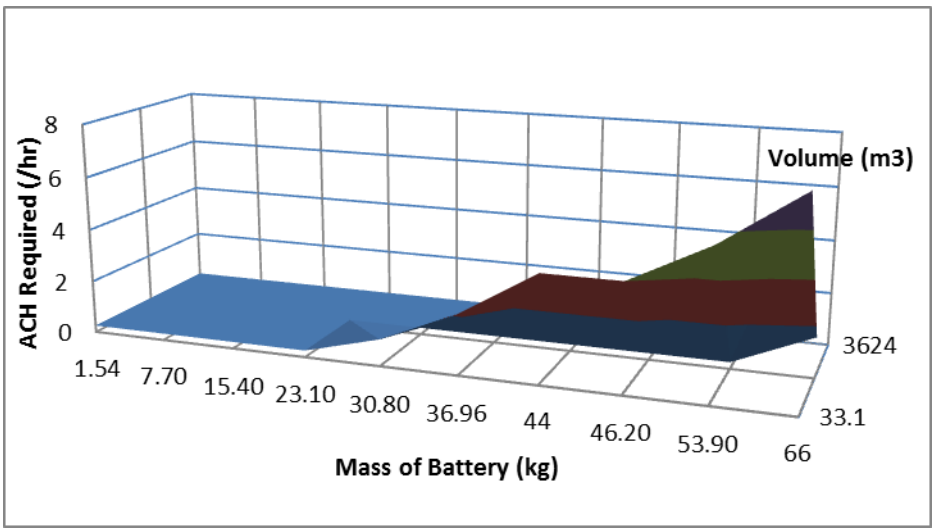


Figure 17 **Estimated air changeover rate (air changes per hour) as a function of room volume and battery mas undergoing failure for HCN.**

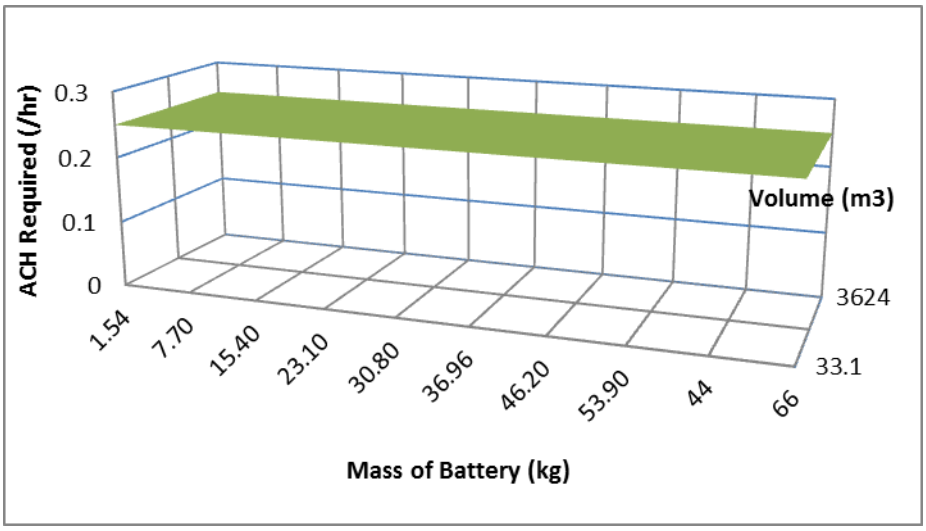


Figure 18 **Estimated air change over rate (air changes per hour) as a function of room volume and battery mass undergoing failure for CO. Because the IDLH of CO is much higher, there is little dependency on battery masses at these scales.**

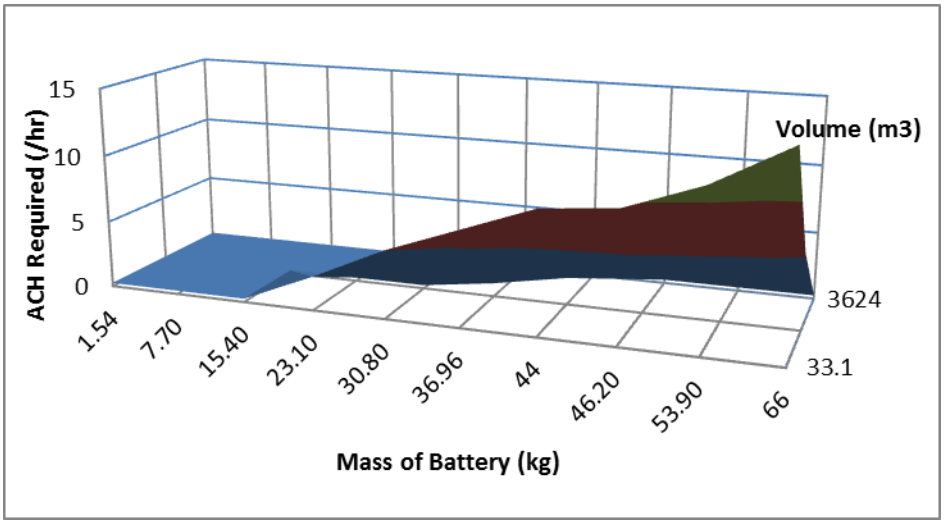


Figure 19 **Estimated air change rate (ACH) as a function of room volume and battery mass during failure for HF.**

Question: Is HF emitted from batteries?
Finding: Yes. HF was observed in all of the Li-chemistries. Vanadium redox also demonstrated HF emissions in 2 out of 3 tests, even after a complete overhaul of the test equipment to remove the possibility of contaminants affecting the result (see Figure 20 as well as Figure 5). However, it is HCl, not HF, that governs the ventilation and toxicity consideration. It was found that on a per kilogram basis, the average emission rate of HF in a plastics fire can be higher than the average emission rate of a battery fire (compare Figure 4 to Figure 5). From this study it was found that the ventilation requirements for

anything less than 15 simultaneously burning battery cells are the same for HCl and HF (see Figure 16 and related figures starting on page 23).

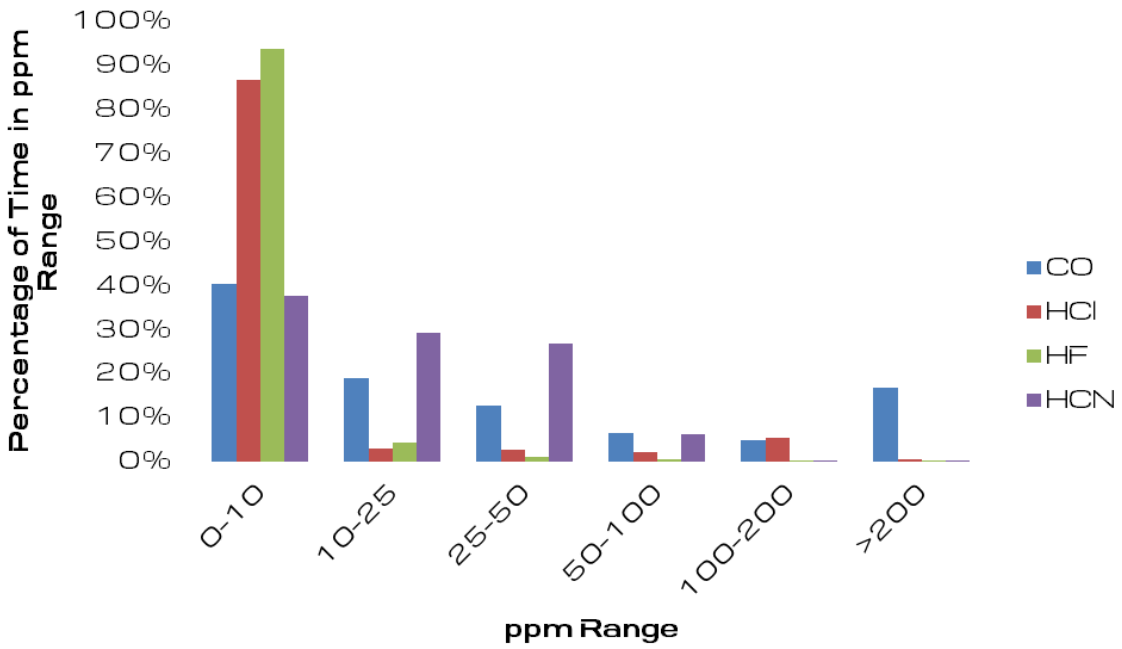


Figure 20 **Representative emissions histogram from a Li-ion battery.**

Question: Is the combined LEL of the flammable gases lower than any of the gases alone?
Finding: Yes. This phenomenon is described by Le Chatelier's Mixing Rule which states that the combined LEL of a mixture of gases is the sum of the weighted ratios of volume to LEL for each individual gas species. Because the emissions rates are constantly varying and therefore never in a prolonged chemical equilibrium such that this simplified textbook solution may apply, DNV GL was able to observe that ignitions occurred as low as 400°C at CO concentrations as low as 3,000 ppm. (Figure 21) Frequently observed gases of C_2H_4, CO, and CH_4, if coexisting in a mixture, have the lowest autoignition temperature of 490°C and 100,000 ppm, respectively (see below):

- C_2H_4 = 2.7% (27,000), 490°C
- CH_4 = 5% (50,000), 537°C
- CO = 10% (100,000), 609°C

As expected the combined LEL is indeed lower than the individual components but as mentioned above, **the ventilation requirements should be set by the IDLH, which should exceed and override LEL considerations. Therefore LEL is less of an immediate concern than IDLH.**

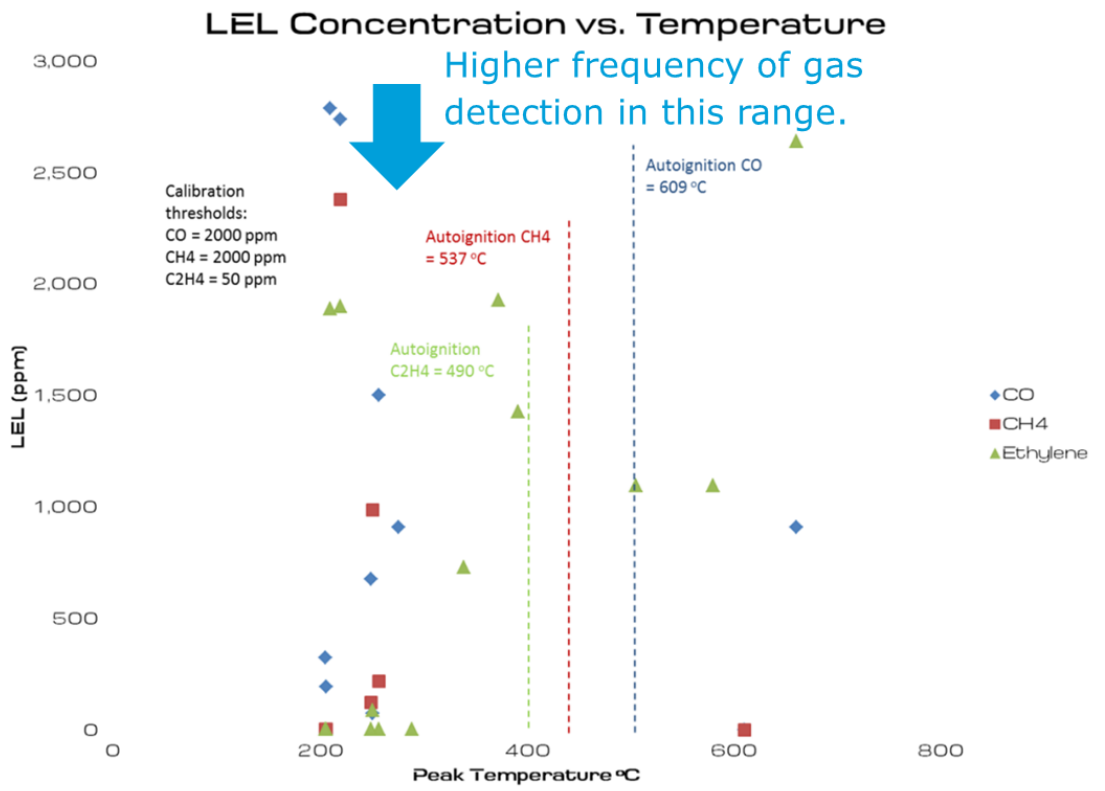


Figure 21 **The combined LEL and autoignition temperature of mixed gases emitted from Li-ion batteries may be as low as 3,000 ppm and less than 400°C, as flammable gases were ignited and burned off above this temperature.**

Question: What is the explosion risk?
Finding: The battery is not the source of an explosion risk, but the flammable gases generated from it are. These gases need to be vented to reduce the risk. Because the ventilation rates are dictated by the lower IDLH thresholds than the LEL thresholds, ventilation sized to the IDLH should exceed the ventilation requirement for explosion hazards.

Question: Are Li-ion batteries more volatile with higher states of charge?
Finding: Yes. There is a very direct increasing relationship between mass lost and the SOC before failure as shown in Figure 22. However, the BMS limits the SOC of the battery intentionally for both longevity and safety reasons. As shown in the figure, the decline in mass loss is significant as the SOC of the battery is decreased from 100% to 90% or 80%. As many battery systems limit the upper electrochemical SOC range to 80-90%, a significant safety precaution has already been made. It should be noted that the GPM/kg and CFM/kg metrics found in this program are inherently conservative because they include the peak emission rates observed at 100 % SOC and they also capture the short lived peak emission events. In reality, a system fire spends most of its time smoldering, and if the BMS is properly functioning, no cells should be at 100% SOC.

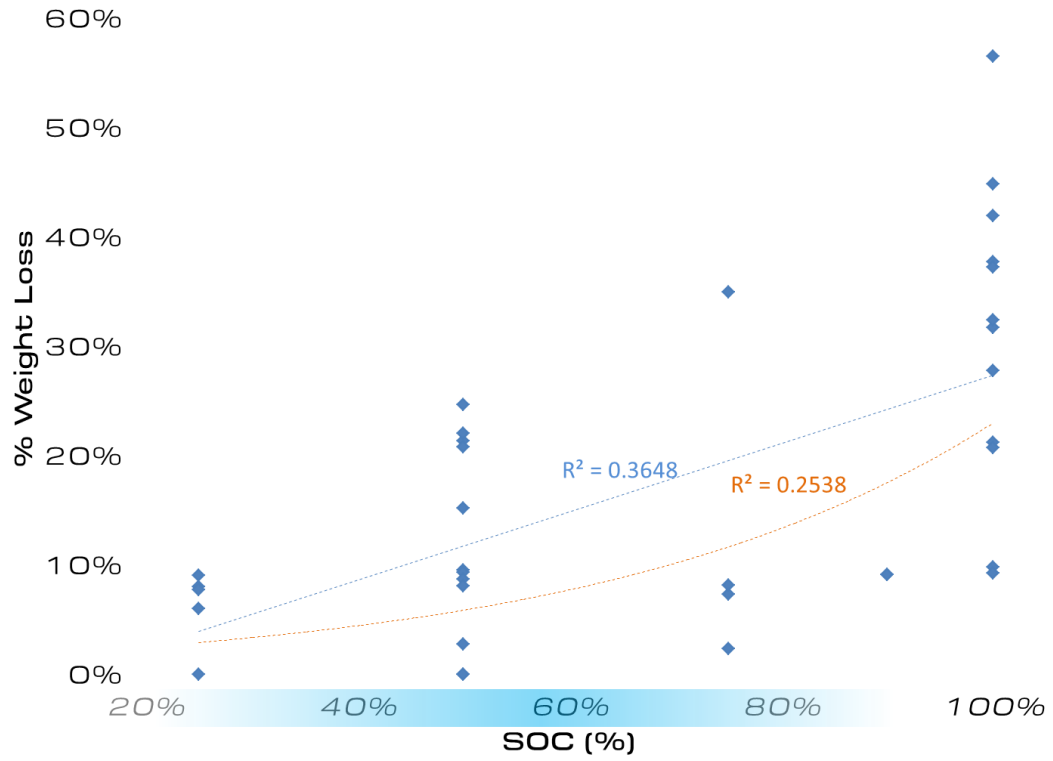


Figure 22 **For Li-ion batteries, the mass loss is directly proportional to the state of charge prior to failure.**

Question: Are some battery chemistries safer than others?
Finding: No battery tested in this program is excluded from toxicity concerns in a fire. In general, it is good advice to treat a battery like any fuel should be treated, and make note that risk is context specific and weighted. In Figure 23 it is evident that iron phosphate, BM-LMP, and titanate batteries have lower heat release rates and less flammability, as does vanadium redox and lead acid which did not exhibit flammability. However, it was shown in Figure 5 that all batteries have varying degrees of emissions of HCl, HF, CO, HCN, and potential SO_2 and H_2S. Because many of them have plastic casing, the plastic itself is a toxicity and flammability hazard. Therefore, there is no single battery chemistry in this testing program that should be excluded from toxicity considerations in an enclosed space or near a populated building. Furthermore, the source of toxicity may be as much plastic componentry as it may be attributed to electrolytes. **Because the toxicity risk is similar to plastics, it is DNV GL's recommendation that toxicity be treated equally across chemistries.** In the case of batteries with non-flammable electrolytes, adequate precautions should be demonstrated that polymer cases or other flammable materials are sufficiently protected against external fire in order to warrant any reduction in the water requirement, if any. It should also be noted that the water requirements for Li-ion batteries need not be excessive if the fire safety measures are viewed as a system rather than standalone requirements. Lastly, it should also be noted that the low level ACH requirements for vanadium redox and Pb acid are well below the typical 2-4 ACH ventilation requirement in most occupied spaces, so the existing infrastructure may be adequate in many instances.

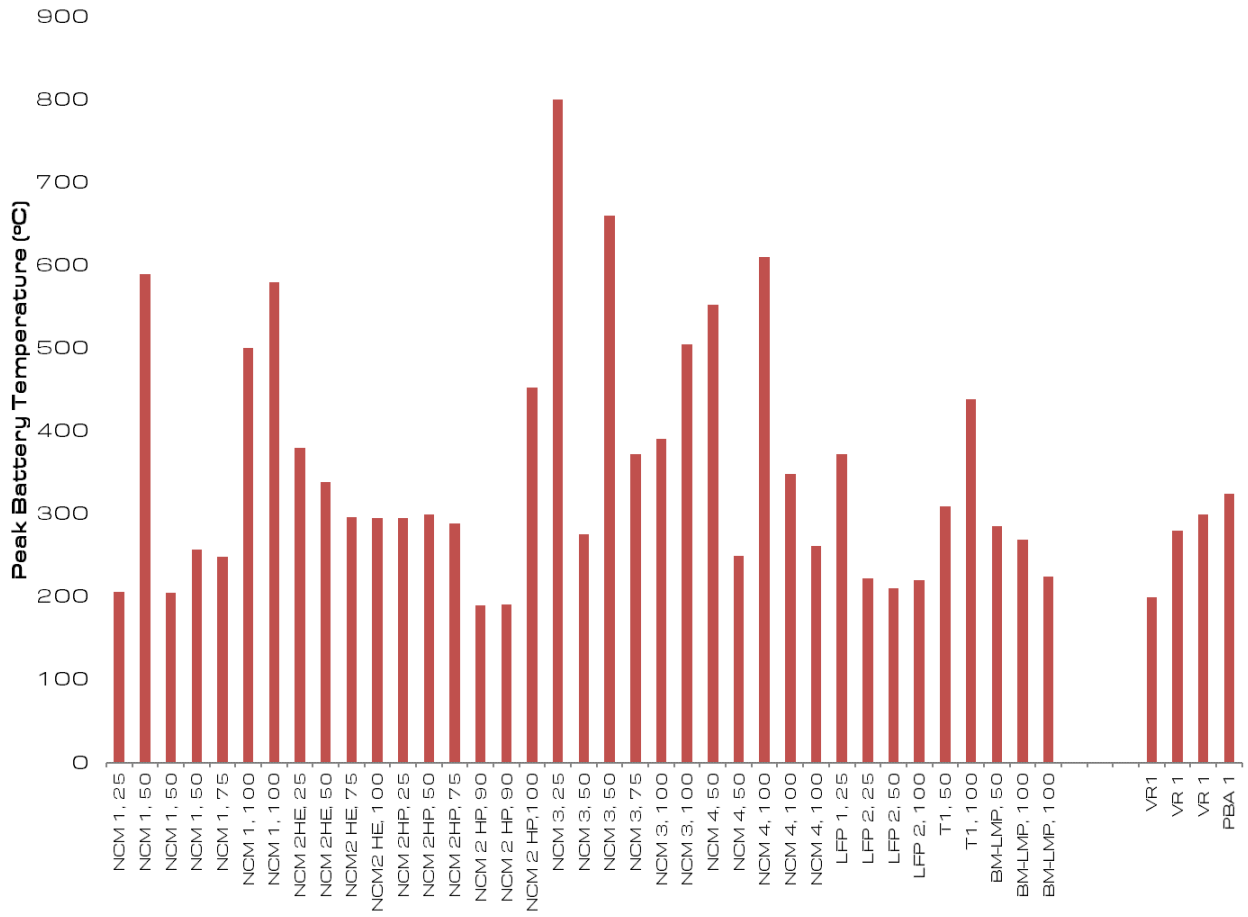


Figure 23 **It is generally true that LiFePO4, LTO, and BM-LMP batteries demonstrate lower than average temperatures during failure. The temperatures indicated for Pb acid and vanadium redox batteries is the peak heating temperature, as these electrolytes did not demonstrate flammable or exothermic properties as they were tested.**

Question: What is the solubility of liberated gases, and are some of them consumed by fire?
Finding: The solubility of the gases observed is shown in Table 3. Those consumed by fire have an indicated flammability limit and autoignition temperature.

Table 3 **Inventory of Toxic and Flammable Hazards found in this Study**

				Concentration (ppm unless otherwise noted)				NFPA Codes (F=flammability, H=health, R=reactivity, S=special)				
	Chemistry	**Relevant Batteries**	**Detected State**	**LEL (Lower Explosion Limit)**	**IDLH (Immediately Dangerous to Life and Health)**	**Solubility in Water (mg/L)**	**Auto Ig. Temp (°C)**	**F**	**H**	**R**	**S**	**Ref.**
Methane	CH_4	Li-ion	Gas	50,000	5,000	22.7	537	4	1	0		NJ DOH
Carbon Monoxide	CO	All	Gas	12,500	1,500	27.6	609	4	2	0		CDC.gov
Benzene		All except PbA	Gas	12,000	3,000			3	2	0		CDC.gov
Ethane		Vanadium Redox	Gas	30,000				4	1	0		CDC.gov
Ethylene	C_2H_4	Li-ion	Gas	27,000	-	2.9	490	4	2	2		Matheson MSDS
Hydrogen	H2S	Pb Acid, Li-ion	Gas	40,000	-			4	0	0		CDC.gov
Hydrogen Sulfide	H2S	VR, PbA	Gas	4,000	300	4,000.0	260	4	4	0		CDC.gov
Hydrogen Fluoride	HF	All except PbA	Gas	-	30	miscible	-	0	4	0		CDC.gov
Hydrogen Chloride	HCl	All	Gas	-	100	720.0	-	0	3	1		CDC.gov
SO2	SO2	VR, PbA	Gas	-	100	94,000.0	-	0	3	0		CDC.gov
Hydrogen Cyanide	HCN	All except PbA	Gas	-	50	miscible	-	4	4	2		CDC.gov
Nickel	Ni	Li-ion	Residue / Powder					1	3	0		
Manganese	Mn	Li-ion	Residue / Powder					3	3	3		
Cobalt	Co	Li-ion	Residue / Powder	-	-	Insoluble		0	1	0		
Lithium	Li	Li-ion	Residue / Powder					2	3	2	~~W~~	
V2O5 Dust	V2O5	VR	Residue (V)	-	35 mg/m^3	0.8	-	0	3	0		CDC.gov
Pb Vapor, salts, dust	Pb	PbA	Residue	-	700 mg/m^3	10^-5 to 4400	-	0	2	0		CDC.gov

Question: Can batteries be "neutralized" by immersing them in water after an incident?

Finding: Partially. Immersion in water provides adequate cooling to prevent violent thermal runaway, but it may not neutralize voltage. DNV GL found the following results should be considered prior to doing so:

- Batteries may have residual voltage on damaged and exposed terminals. (Figure 11) Handling of the battery may produce a shock hazard.
- Batteries persistently gassed even under water. The primary measured component of that gas was CO, though the handheld CO sensors are cross sensitive to H_2.

- For most tests the water runoff was slightly acidic measuring pH 6-7. In one case, however, the water became alkaline climbing to pH 10-11 after a few hours of submersion. This case was observed for a battery that was highly consumed in the fire.
- Batteries did not climb in temperature after submersion, indicating that even if cells short circuited, their temperature was never permitted to climb to thermal runaway conditions.
- Some battery cells still had voltage on them after 24 hours of submersion. While some cells may have shorted, not all shorted. The water did not have any additives such as salt to make it more conductive.

Question: Was hydrogen generated as a result of electrolysis during submersion?
Finding: Possibly, high levels of CO (10-100ppm) were detected on the four and five gas meters right above the submersion pools. These electrochemical sensors are cross sensitive to H_2. High levels of CO were also detected on the FTIR during and after testing though, suggesting that CO generation is real and any cross sensitivity from H_2 is low as CO is the dominant gas. This was further supported by data from cell testing not involving submersion.

Question: How much hydrogen was emitted?
Finding: During cell testing DNV GL witnessed > 1000 ppm (sensor max value) on a few occasions. Hydrogen was not observed directly during submersion, though CO was measured. CO sensors can be cross sensitive to hydrogen. The lower flammability limit for ethylene and related species is 3.6%, which is lower than hydrogen at 4%. Therefore the greater flammability risk is presented by ethylene carbonate decomposition due to its greater volumes, higher emissions rates, and similar volatility. This is supported by gas bag sampling, which showed far higher levels of hydrocarbon gases than H_2, which was still well below the LEL.

Question: Are the liberated gases lighter or heavier than air?
Finding: The molecular weight of air is generalized at 29 g/mol. By comparison the molecular weights of the main gases observed from battery fires are shown below (in g/mol). It can be seen that HCl is heavier than air. Another observation from testing is that the gases are typically hot, which means they are rising as part of the plume.

- CO: 28.01
- HF: 20.01
- HCl: 36.4
- HCN: 27.02

Question: Should exhaust fans be intrinsically safe or grounded?
Finding: DNV GL used an exhaust fan during module testing (Figure 24). After several consecutive fire tests the heat and smoke eventually overstressed the fan. However, it was not observed that the fan ignited the gases. Consideration of intrinsically safe fans may be necessary in sensitive locations.

Figure 24 **Smoke plume rising through door gaps and out of top vents in the burn container.**

Question: Should exhaust fans be variable speed?
Finding: Based on the nonlinear behavior of emitted gases (Figure 16 and related figures) a variable speed fan should be a consideration. This may be a more cost effective solution than a highly rated fan running continuously which may exceed the minimum ventilation requirement of ~0.25 ACH. A variable speed fan can accommodate the low level ventilation rate for the majority of the time, with the capability to ramp up in the event of failure.

Question: How were gases measured in this testing?
Finding: DNV GL used a Gasmet DX4000 FTIR gas analyzer during cell testing supported by MSA Ultima sensors for IR transparent gases and LEL. The FTIR was used again for module testing. In addition, for module testing, Rescue Methods used MSA Altair handheld four- and five-gas sensors. These tools were used for both LEL and toxicity monitoring. LEL was measured via a photo ionization detector (PID) (10.6eV bulb) on the handheld sensors.

7.0 PRESENT DAY INDUSTRY-ACCEPTED SAFETY PRACTICES FOR ENERGY STORAGE PROJECTS

It is important to place this report in the context of what is actually occurring in energy storage project development today. Presently there are over 400 stationary storage systems comprising 1,200 MW operating around the world, with 600 MW of electrochemical energy storage in the United States [5].

The types of battery energy storage systems being deployed are both utility solutions at the multi-MW scale in consolidated sites, typically with energy storage batteries housed in

shipping-container like systems with integrated BMS, ventilation and cooling, and fixed fire suppression. Smaller, behind the meter energy storage systems are designed to be deployed near the customer and controlled as an aggregate fleet. These smaller systems have a BMS and may have active cooling, but rarely have integrated fire suppression. Shipping container systems are typically located outdoors and are MW scale, whereas behind the meter systems are typically sited at a commercial site (or potentially residential) and may be indoors, and will have ratings in 10's of kW.

Energy storage can be utility owned or it can be owned by an independent power producer (IPP). Much of the US energy storage market is presently being driven by IPPs. The IPP may monetize the energy storage asset through utility contracts or a commercial power purchase agreement. Some IPPs have the balance sheet to pay for energy storage projects themselves, but many seek financing. With financing comes insurance to underwrite risk in both the finance and safety of the project. **Because of these additional parties that are exposed to financial risk, a performance and safety review are a critical piece for financing an energy storage project, which is performed by an independent engineer (IE).**

Independent Engineering is a field of service where independent third-party engineers review the technical specifications of energy projects and provide an assessment of financial or technical project risk. The practice of hiring an IE is common in the wind and solar industries and is now industry practice for energy storage projects. Many insurers and lenders require an IE report – and must feel comfortable with the findings of the report – in order to finance or underwrite an energy storage project. The first step in most IE reports on storage is a review of the technology which will include performance and safety aspects. The IE functions are typically performed during or prior to permitting and before project commissioning, as shown in Figure 25.

In the context of safety the IE is tasked with independently evaluating the adequacy of safety systems appropriate to the project. With the business case and project site(s) identified, the AHJ is likely to become aware of the project when the project developer is seeking permit(s). The AHJ will typically respond with requirements, which may be few or many, at which point the project developer takes actions to fulfill them in order to secure the sites as quickly as possible. Project finance may be secured or will be sought in parallel to this process. Because the project developer is encouraged to obtain the IE report by the financial stakeholders, it is most cost effective for the project developer to use the IE report to simultaneously satisfy requirements for the AHJ and the financial parties. The objectivity of the report should increase comfort in the transaction(s) between parties. Therefore at the request of the project developer, the IE report is written in the context of generalized project specifications so that it may enable as many transactions as possible. Therefore it is never the case that more than one IE report is generated for identical projects because it is a cost that can be practically avoided. It is also common practice for large aggregated projects of similar system types to have inspections performed on a subset of sites.

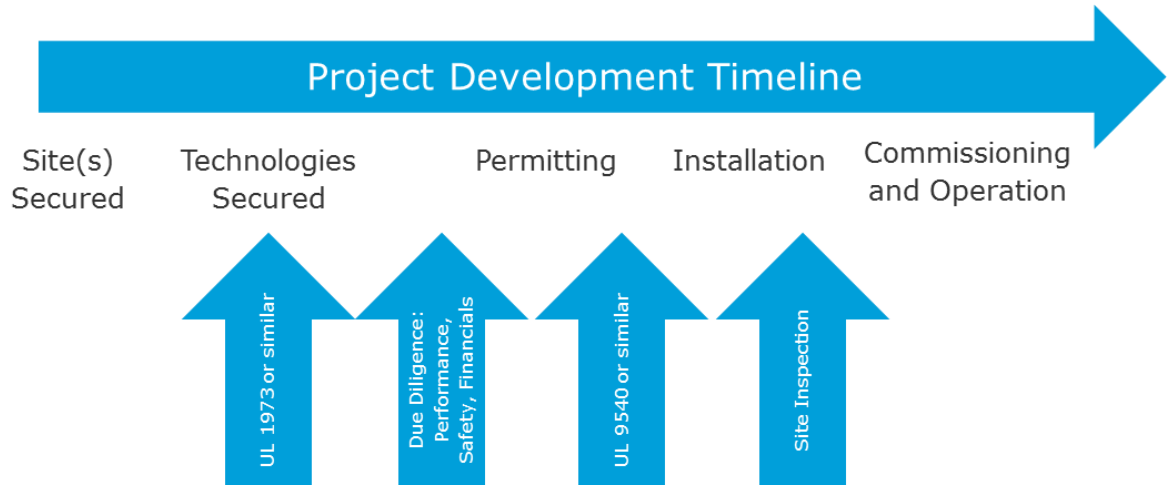


Figure 25 **Project development timeline and the implementation of FMEA or other safety review for the site.**

For an outdoor container system, the IE may provide the following services related to safety:

- Assessment of the adequacy of the safety systems
- Assessment of the safe perimeter around the site
- Emergency response plans
- Review or recommendations of materials to be provided to the local AHJ for permitting or code review
- Adequacy of firefighting equipment
- Impact of a fire scenario on the site or surrounding area, which may include a plume study if residential or populated areas are nearby
- Risk model for the site

For an indoor system, the following IE services related to safety may be requested:

- Review of safety testing
- Assessment of the adequacy of safety systems
- Recommendations on the requirements for indoor room locations
- Adequacy of cooling and venting
- Review of fire ratings
- Inspection of installation
- Risk analysis related to the system and its site(s)

In the case of behind the meter systems, this review is usually done at the **project portfolio level** unless specific site considerations require local review.

8.0 GUIDANCE FOR FIRST RESPONDERS

Many of the questions in the FAQ were intended for first responders, who wish to know what should be done upon encountering a fire that involves a battery.

The first and foremost finding from this report is that the **equipment available to present day first responders can be considered adequate for battery fire fighting** with additional considerations.

8.1 Considerations for Permitting and Siting

If a building or site information summary is available, it should state whether there is a battery on site and its chemistry. The primary concern upon approaching the scene should be HCl toxicity and rising temperatures, and the potential for the fire to expand if it has not already.

- **FMEA, siting, and standard operating procedure (SOP) development:** UL 9540 requires an FMEA for ESS permitting and siting. In addition, DNV GL recommends an FMEA be performed on any system or project portfolio, particularly for behind-the-meter applications.
    - A risk analysis involves review of all potential failure modes for their likelihood of failure and the resulting consequence to determine the total risk. As this process serves as a deep dive into the design and operation of the unit, this process would provide valuable insight for code officials and first responders to better understand the risks and potential faults they may be dealing with during emergency situations.
    - Requesting participation in this process would serve as the best opportunity to become involved in the development process and would allow AHJs and the fire service to best understand the system in the least intrusive way to the project developer (since an FMEA may be required regardless of AHJ participation).
    - In addition to FMEA involvement, DNV GL recommends all AHJs and fire departments perform a walk through for all large ESS in their jurisdictions and develop SOPs according to their level of comfort with the electrical risks. Though small home systems may not exceed 48 VDC and be easily disconnected from the AC source, larger utility scale systems may exceed 1,000 VDC and 10,000 VAC. Again, even prompt disconnect of AC voltage does not eliminate voltage on the DC side.
    - DNV GL recommends all fire departments with large ESSs or ESS portfolios in their jurisdictions work with project developers or system manufacturers to provide emergency contacts and readily available subject matter experts (SME) who can quickly advise fire departments on system status and risks associated with the current fire environment.
    - Finally, DNV GL recommends fire departments and first responders work with system and project developers to understand the level of risk and their appropriate response. A single cell failure in a large containerized system need not require the entire system be destroyed with water. However, a

system with an unknown internal hazard may pose risks to the surrounding environment or to fire fighters and may be better handled via a defensive posture than entry and attack.

8.2 Considerations for Operations at the Scene

Upon arriving at a fire scene, the following considerations should be made:

- Has on-site extinguishing already been triggered?
- Is the system gassing?
- Is the temperature of the system rising?
- Are flames visible?
- Is there a site representative or SME available?

Answers to the above questions will indicate whether the system fire has already peaked or if it is expanding. Support from an SME, an information display panel, or other form of emergency contact will greatly aid in assessing the risk.

If the system is gassing but onboard suppression (if any) has already triggered, and temperatures are remaining stable, it is likely that a single cell or module fire has occurred and been isolated, and may have been managed by the onboard system. Additional suppression may not be required in this case. Eventually, the system will need to be ventilated to remove the internal atmosphere, but only if temperatures have remained stable for approximately 60 minutes.

The list below summarizes key points from this study that are directly relevant to firefighters and other first responders. This section may stand on its own as an independent part of this report and may be distributed to fire departments and first responders nationwide independent of this document. It is not intended to serve as an SOP on its own, but should inform the response and development of SOPs for situations involving ESS. There has been much said about ESS fires in the past which has led to several myths about these fires. DNV GL wishes to dispel the falsehoods while promoting real world, data driven facts when dealing with these systems. Ultimately, findings suggest that while these systems are unique in the combination of threats posed, none of the threats on their own are unfamiliar to firefighters, and they remain manageable so long as certain points are known and followed.

- **Toxicity:** In general, battery fires resemble plastic fires in terms of emission of toxic gases including CO, HCl, HF, HCN, Benzene, and Toluene
  - The average toxicity of the fire is equivalent to many plastics on a per mass basis. Li-ion fires will have short peaks of toxicity as individual cells randomly fail.
  - However, battery fires, even once extinguished, continue to emit CO as long as the batteries remain hot.
  - DNV GL and Rescue Methods (RM) recommend continued monitoring of CO from ESS fires, especially in enclosed spaces, and the continued use of personal protective equipment (PPE), including self-contained breathing apparatus (SCBA), until CO levels are shown to be at normal levels. These practices may include monitoring for HCl, if applicable or possible.

- **Ventilation:** Though integrated ventilation will be recommended for indoor systems, it may not always exist or prove adequate to remove heavy smoke, especially in cases where the surrounding environment is fully involved or the battery is rapidly overtaken.
    - DNV GL and RM recommend sufficient firefighting ventilation, ideally negative pressure, to remove fire gases from enclosed areas.
    - The batteries themselves emit flammable gas and fully involved or improperly ventilated systems may pose a lower explosive limit (LEL) or flash hazard.
    - DNV GL and RM recommend monitoring of LEL levels in the fire ground and surrounding environment to determine if intrinsically safe ventilation is required.
    - Partially burned systems may continue to emit flammable gas even after the fire is extinguished as long as the cells remain hot. Proper cooling of the system is key to remove prolonged fire risks.
- **Temperature:** Climbing temperature is an indicator of increasing risk.
    - If flames are visible and temperature is rising, the system may have more than one battery cell or module engulfed.
    - If temperatures are rising rapidly (>1 ˚F per minute) and temperatures on the battery are approaching anywhere near 100 ˚C (212 ˚F), cooling will be required with water.
    - Monitoring with handheld infrared (IR) thermometers, if available, should provide an assessment of risk.
- **Delayed Cascading Ignition:** On site responders should assess that all thermal, electrical, or mechanical stimuli that may act on the system have been mitigated.
    - In the short term, when cells appear to "reignite" after seconds or minutes, it is almost always a result of incomplete removal of heat from the system, or an electrical short due to liquids or water. Prevention of cascading between cells may be addressed by proper cascading protections in the system, which may retard extinguishing and external cooling but also mitigates the free movement of heat internally in the batteries which can ignite previously undamaged cells. DNV GL refers to this phenomena as delayed ignition.
    - In some cases, the only way to halt this process is to let the system burn itself out (but this may not be practical) or continue to drown the battery until this process stops as the battery finally cools. This decision should be made based on the circumstances of the fire ground.
- **Shock Hazards**: Cells that have not been burned may remain intact in systems and modules.
    - Shock during water suppression (via conduction into the water spray) was not observed in this program.
    - Beware of arcing if batteries are disturbed. Turnout gear was observed to provide shock protection under the conditions tested in this program, but do not touch arcing equipment.
    - Stranded energy in partially burned batteries will likely remain an issue in any system that is extinguished unless it has consumed itself entirely. DNV GL

found that even in systems that appeared thoroughly damaged, live cells and stranded energy can remain. These cells may pose a shock/arcing risk and can reignite if physically damaged, reheated, or allowed to short.

- **Extinguishing:** DNV GL tested several water based extinguishing agents and found none to be as effective for cooling as water. These included PyroCool, F500, and FireIce.
    - The most challenging aspect of the battery fire is its deep-seated nature. Access to the heat source is necessary to provide adequate cooling.
    - Cooling the battery once flames are knocked down is the most important aspect of containing battery fires. The tested agents proved slightly less effective than water at cooling the cells. On a module level, there was no evidence to suggest these agents perform better than water.
    - Because many encapsulating agents, including foam (AFFF) are intended to blanket the fire, and a battery fire needs to have heat removed as quickly as possible, DNV GL generally recommends against using foam for ESS fires. Foam has been tested in other projects and used in real world ESS fires. In testing in other projects, it failed to perform better than other agents.
    - The aerosol may prove effective at knocking down flames from ESS. Gas based agents may suppress the flammability of contained atmospheres with high explosive gas content; however, in the case of severe ESS fires where these agents would be tasked to suppress flammability, cells may be producing heat above the autoignition temperature of their flammable gases. This may result in fire if oxygen were reintroduced to the system. DNV GL recommends gas-based systems be backed up by water-based suppression when cooling becomes a necessity, in combination with cascading protections in the modules and systems.
    - Though water proved most effective for cooling, water and any water-based agent introduces shorting risks when applied on a full system. This may exacerbate the situation in addition to presenting a collateral damage risk.
    - Several entities, including DNV GL, have advised that class D fire extinguishers and agents be investigated for use during the incipient stage of the fire. Based on the findings from this program, DNV GL views the deployment of classical class D agents as impractical due to the short lived peak of a cell fire and its deep seated nature, which prevents direct access.
    - RM's experience during suppression testing suggests forced access to the interior of battery systems may be difficult or inadvisable for first responders. In this case, water should be used to provide indirect cooling on the outside of the system to prevent spreading.
    - Water use inside the system, if applicable, should be done with care to avoid shorting neighboring and surviving cells, i.e., the failing module should be isolated and targeted. Fully involved systems may be compromised enough to allow better water penetration. Fully involved systems posing a risk to surrounding life and property, or neighboring systems, should be suppressed immediately and heavily to avoid spreading.

- If the fire appears to be stable and not expanding, periodically stop water flow and monitor temperatures. Note that the temperature may "spring back" after water extinguishing stops, but it should plateau and stabilize if the fire fuel has been consumed.
- Observe for water shorting other cells. They may begin to heat, meaning the deep seated heat remains.
- Repeat extinguishing process as needed, while ventilating the area as much as possible.
- If the battery system has closed doors, do not open them unless absolutely necessary or it has been determined that opening the doors will not introduce new hazards. Forced entry is discouraged unless a prior access plan has been described.
- Suppression of large, fully involved systems may take more time than fires of similar size with different fuels. It is recommend fire service personnel continue to suppress with water for as long as required and then ensure the system is fully cooled throughout once suppression appears complete.

8.3 Guidance for Isolation and Overhaul

After burning, the removal and isolation of the batteries demonstrated real-world hazards that may be encountered in the overhaul stages of fighting a battery fire. Residual live DC voltages in intact battery cells, and damaged but still live bus bars within modules after a fire represent an electrical shock hazard (see Figure 11). During testing, it was found that firefighters were not shocked while wearing standard turnout gear when arcs and sparks resulted from disturbance of the debris. **For this reason it is recommended that whenever possible, first responders need not open or otherwise disperse burned battery modules and wait for an experienced liaison to arrive on site and take ownership of the site after extinguishing has been achieved.**

As shown in Figure 26, submerging battery modules in water provided adequate cooling to slow and prevent delayed cascading thermal runaway in the remaining battery cells; however, the batteries persistently off-gassed even under water. The primary gases detected in the bubbles generated were CO and possibly hydrogen. The figure demonstrates the bubbles observed even after submersion for over 30 minutes.

Even after submerging, some batteries generated a severely alkaline solution climbing to pH 10-11. Other solutions gradually became slightly acidic (pH 6). There was not a clear explanation for the pH behavior of the solutions, other than one of the most severely burned batteries created the most basic solution. **Therefore, if water submersion is used by first responders for isolating spent modules, preparation to deal with alkaline or basic water for disposal should be a consideration.**

Lastly, it was found that after extinguishing the persistent emission of CO was sometimes in quantities large enough to trigger threshold alarms on the gear worn by fire fighters. The persistent emission is perhaps a more insidious risk than the emissions during the fire, as the apparent climax of the fire has passed, and first responders may be inclined to remove their masks. **After extinguishing, continued ventilation and monitoring of the area with gas monitors is highly recommended.**

Figure 26 **Submerging batteries in water resulted in cooler temperatures, but slow shorting and persistent CO generation (bubbles).**

As the climax of the fire has concluded, but continued ventilation and monitoring is underway, first responders are left with the final challenge of determining when they can relinquish control of the area. There are several risks that first responders wish to avoid and they are prioritized by the list demonstrated on page 57. **It is highly recommended that battery systems installed within buildings have an established emergency contact list and a SME who can arrive on the scene to take over containment, cleanup, and eventual disposal of damaged battery equipment. This recommendation requires involvement from the project development and systems integration community.** This is a necessary risk transfer procedure to mitigate the first responder concern that they are responsible for damaged battery systems for hours or days after they have been involved in a fire or catastrophic safety event.

The following summarizes recommendations for overhaul procedures:

- **Overhaul and Stranded Energy:** As mentioned, stranded energy in the surviving cells remains a risk to first responder during overhaul and post fire operations.
    - Live or damaged but surviving cells may contain voltage that will cause arcing when shorted by debris or metal tools. This arcing may also serve as an ignition source to localized gases if hot batteries are still venting.
    - Firefighters should thoroughly avoid penetrating, cutting, or otherwise damaging batteries in the ESS, especially during overhaul, as live cells that are physically damaged or penetrated are subject to rapid venting.
    - Firefighters should avoid blindly reaching into cabinets to remove damaged batteries as DC energy may still remain active even if AC and site power is cut. It was observed that typical turnout gear provided adequate protection

against shocks in this testing; however, high voltage DC may penetrate PPE in cases where it is damaged or otherwise compromised, such as a torn glove or a exposure to sharp metals. These kinds of hazards were not studied in this testing program.

- DNV GL and RM recommend fire fighters continue to wear PPE and SCBA even during overhaul as CO levels may remain elevated even after flames are extinguished as batteries remain hot and continue to offgas. DNV GL recommends CO levels, especially in enclosed or unventilated spaces be monitored and SCBA worn until levels are shown to be safe.
- Complete submersion of damaged batteries in water provides cooling for damaged batteries; however, batteries continued to offgas CO. Because handheld sensors are cross sensitive to CO, H2 may have also been emitted while submerged. In addition, this did not always entirely neutralize the voltage on surviving cells. However, cells seem to remain stable once pulled from water and dried. Caution should be exercised when removing damaged batteries from enclosure/containment per the risks discussed above. Whenever possible, a relevant subject matter expert from the site, project owner, or manufacturer should provide guidance or control of removal.

9.0 FINDINGS RELATED TO CODES AND TRAINING

The following summarizes key recommendations from the report study. The findings are sorted in their relevance to sections of precedent codes.

9.1 Fire Rating

DNV GL testing has shown that naked cells[3] and modules exposed to direct fire are susceptible to failure within 10 minutes. However, systems deployed in the field, when exposed to external flame, are likely to sustain much longer durations because of the shielding and air gap provided by the enclosure since the cells and modules are not likely to be installed "naked" in an installed system. **Because many code precedents such as those shown in** Table 4 **and** Table 5 **require 1-hour fire ratings, and more conservative precedents require 2-hour fire ratings dependent on height above the ground floor, DNV GL recommends a minimum 1-hour fire rating with a 2-hour rating in areas with critical population density, and that the fire rating be considered as part of a system level approach to avoid cascading fires.** Exceptions to this general rule may include 1-hour requirement for outdoor locations, similar to combined heat and power (CHP) and backup generator requirements. The finite element analysis (FEA) model in Figure 28 demonstrates an Abaqus FEA model of a fire impinging on a generic battery system.

[3] Cells not integrated into modules or systems

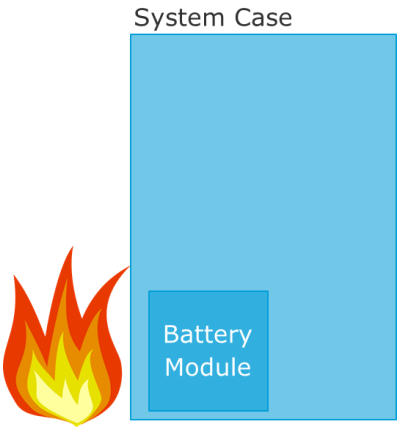


Figure 27 **Simplified diagram of fire impinging on the external wall of a battery energy storage system.**

The model demonstrates the heating effect on a battery module after 60 minutes of a 1000°F fire (811K or 537°C) impinging on a steel wall of 1/16" thickness, with a 1" air gap between the wall and the nearest inner battery module. For simplicity, the battery is assumed to be constructed of entirely aluminum or polypropylene in order to bracket the low and high temperature scenarios, because many battery modules are a composite of these or similar materials. After 60 minutes of exposure the model predicts the battery temperature to be 84°C for the aluminum and 231°C for the polypropylene[4]. Because a critical temperature for Li-ion batteries is ~120°C, a conservative 2-hour rating on the system metal enclosure would slow heat absorption for the worst case polypropylene estimation.

The boundary conditions are a fixed wall temperature of 811K (537°C or 1000°F). Model components are a steel wall with temperature-dependent conductivity, an air gap (1 in) with temperature-dependent conductivity, and a composite battery case made of aluminium with fixed conductivity and polypropylene with fixed conductivity. The heat transfer modes are natural convection and conduction.

[4] This may seem counterintuitive; the aluminum conducts heat away faster and therefore maintains a lower temperature than polypropylene.

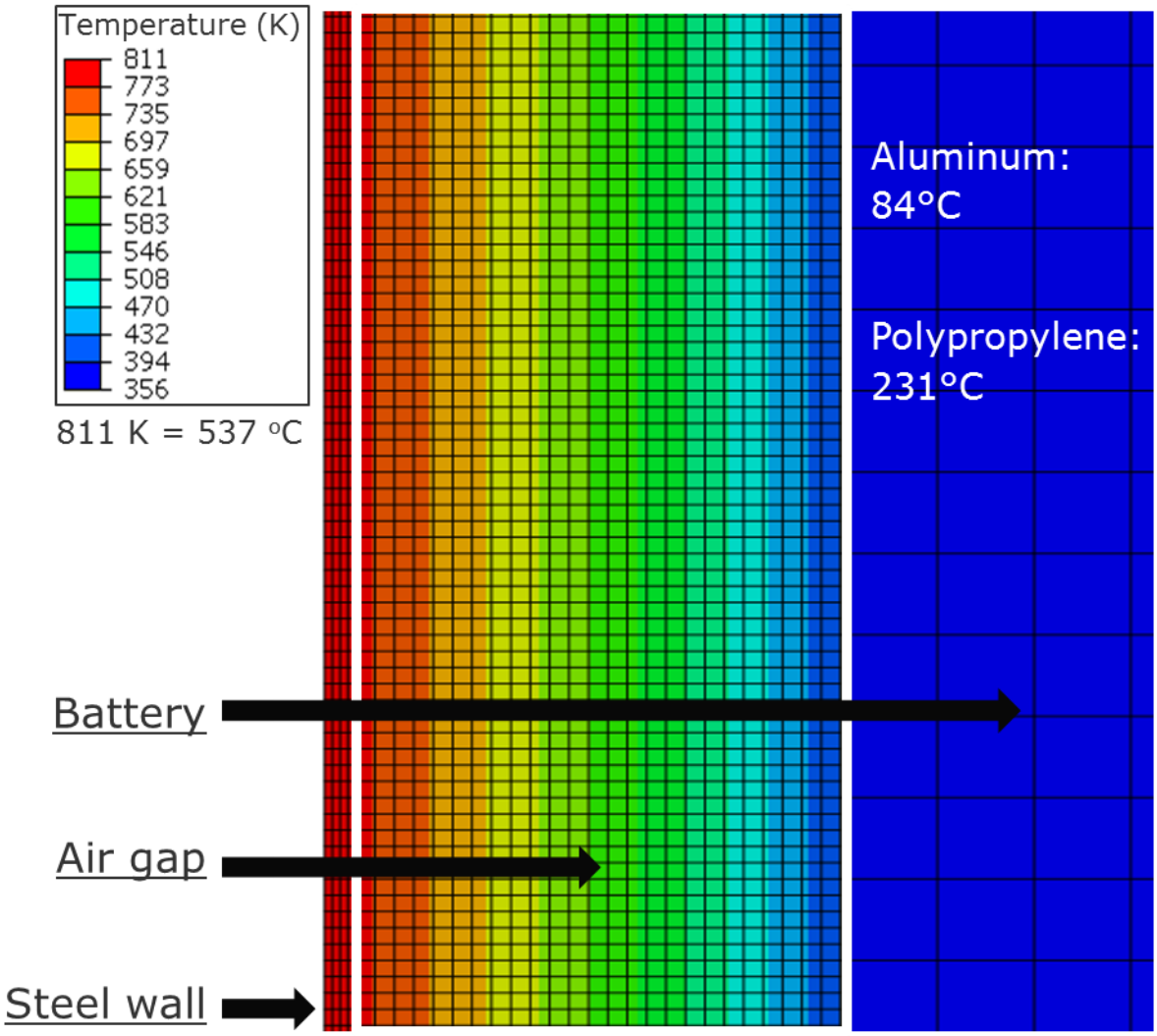


Figure 28 **Direct fire exposure model to a steel wall with a 1/16" thickness and 1" air gap between the wall and battery modules.**

Table 4 **Non-battery related codes for energy systems in buildings.**

	Non-Battery Codes			
Code Item	**CHP**	**Backup Diesel Generator**	**Confined Spaces**	**OSHA Flammable Liquids 1926.152**
Ventilation	Rated to maintain gas concentrations below 25% LEL of the fuel gas, or at an exhaust or makeup rate equal to 80 times the maximum leakage rate		Effective engineering controls required rather than dependence on respirators	Should be constructed to keep vapor at or below 10% of the LFL. Shall have pressure release capability to relieve pressure during a fire.
Fire suppression	Fully sprinklered	Automatic fire sprinkler system		Sprinkler, water spray, or CO2 or other system approved by nationally recognized test laboratory (NRTL).
Monitoring: Detection, alarm, display	Gas detection and alarm in supervised location		Monitor and display that potential hazardous atmosphere can be mitigated by forced ventilation	
Capacity limitation dependent on space	1 MW in dedicated room, 0.5 MW in boiler room	Fuel stored limited to 10 gallons		25 gallons outside storage cabinet, 60 or 120 gallons in cabinet depending on flammability category
Clearance		5 ft from other structures		3 ft wide aisle access
Thermal runaway protection	NA	NA	NA	NA
Fire rating	If indoors or in a dedicated room, 2-hour fire rating on external walls	Up to 2 hours		Compatible with NFPA 251-1969, 1-2 hour rating
Location	Outdoor, penthouse, boiler room, dedicated room	Outdoor, penthouse, boiler room, dedicated room		Electrical rated for Class I, Division I Hazardous Locations
Seismic rating	Appropriate for zone	Appropriate for zone	Appropriate for zone	
Accountable parties				
FMEA/HMA				
Inspections				
Signage				Flammable, keep away from open flames

Table 5 **Battery specific codes for battery systems in buildings, existing and proposed.**

	Battery Related Codes			
Code Item	**IBC**	**IFC 608**	**NFPA 1 Chapter 52**	**FDNY Certificate of Fitness (COF) B-29 (Uninterruptible Power Supply)**
Ventilation	307.1.1 Rooms shall have ventilation, batteries shall have venting caps	None for Li-ion		Required for Valve Regulated Lead Acid (VRLA) only, designed to limit H2 buildup to 1% of the entire room volume; Continuous ventilation = 1 CFM per ft^2 of room
Fire suppression	403.3 and 903.2 Not required in external structures with fire detection	**Proposed** Chapter 5 of NFPA 13.		Sprinklers not required but recommended. Portable Class ABC on hand.
Monitoring: Detection, alarm, display	907.2.23 Smoke detection system			Hydrogen monitoring or handheld detector for COF holder, system health status
Capacity limitation dependent on space		> 50 gallons electrolyte or 1000 lbs. Li-ion. **Proposed 20 kWh limit for single units, 600 kWh limit for total in a room.**	100 gallons of electrolyte (sprinklered) or 50 gal electrolyte (unsprinklered) or 1000 lb. Li-ion	50 gallons of electrolyte for Pb acid, VRLA, NiCd, or 1000 lbs. for Li-ion
Clearance		**Proposed** 3 ft between arrays no larger than 50 kWh. 5 ft from lot lines for outdoor.		
Thermal runaway protection			Required	Required for both VRLA and Li-ion
Fire rating	Table 509 1 and 2 hour ratings			
Location		**Proposed** no more than 75 ft above or 30 ft below fire access, exceptions on non-combustible rooftops		
Seismic rating	Appropriate for zone	Required for zone	Appropriate for zone	Appropriate for zone
Accountable parties				Equipment shall be under "general supervision" of certificate holder, in case of emergency there shall be a hazardous materials liaison, contact info available to fire command center
FMEA/HMA		HMA required		
Inspections				Performed by COF holder. Record keeping on site.
Signage				Warning against electrolyte or voltage. Battery information on Building Information Card.

9.2 Extinguishing

DNV GL tested a number of extinguishers during cell and module testing. During testing, DNV GL found that all extinguishers tested[5] could put out the fire if applied immediately upon detection of a thermal spike (indicating the immediate onset of thermal runaway). While extinguishing was accomplished with all extinguishers, water demonstrated the best ability to cool and maintain cool temperatures on the battery.

9.2.1 Class D and Deep Seated Fires

During testing, DNV GL witnessed firsthand how residual heat between batteries can lead to delayed cascading and prolonged extinguishing for battery modules. This highlights the importance of cascading protections between cells and inter-cell cooling in battery modules. Cascading protections can be tested by the UL 1973 internal fire test, the IEC 62619 internal propagation test, SAE J2929 propagation test, or similar standards. DNV GL recommends more stringent criteria such that a single cell failure cannot propagate to neighboring cells, with the intent of maintaining manageable heat release rates that can be otherwise managed by the water extinguisher flow rate and/or the system's external fire rating enclosure. This recommendation illuminates that the extinguishing solution and the module design are interlinked; a module with adequate cascading protection is more likely to be appropriately designed with a gas-based suppression system.

Because the consumption of a single cell is rapid, the metal fire fuels (Class D) are rapidly consumed and the fire evolves to Class A, B, or C quickly. **Because of the rapid evolution of a cell fire, DNV GL does not see an advantage to using a Class D extinguisher on a single cell or system fire.** This has direct implications for first responders who are accustomed to using water as their primary extinguishing agent. In the event of a single cell fire, cascading protections should limit propagation to other cells. First responders may still respond to a call reporting smoke, but in the best case scenario the fire has consumed itself and burned out. If a fixed suppression agent is installed within an enclosed environment containing the single failed battery cell, it may suppress flammability in the enclosed space. The use of water may be unnecessary at this point unless the fire has progressed. A key issue to be addressed in later sections is how the first responder is able to determine if this single cell fire has been mitigated or if further action (and water extinguishing) is needed, and hence some system health information, an emergency response phone line, or some other means to gain information on system health is a need that requires industry engagement to overcome. The first responder is not comfortable deeming the site extinguished and is technically responsible for the scene until this information allows them to make the decision to leave the control of the scene with a responsible party.

9.2.2 Cooling and Collateral Damage

Cooling is a secondary component of extinguishing that has not been previously discussed in the literature. In 2011, the NHTSA recommended "copious amounts of water" in an official release concerning the extinguishment of battery fires in hybrid and electric vehicles. [12] The intent and purpose of this recommendation was to introduce cooling to the fire.

DNV GL found that water extinguishes, cools, and maintains lower temperatures on a battery fire than other tested agents. As shown in Figure 29, water consistently maintained a 50-100°C sustained cooling advantage over equivalent volumes of other water borne

[5] For the complete list of extinguishers tested, see the Appendix, page 82.

agents in the seconds and minutes following extinguishing. The behavior demonstrated in the figure is consistent for all battery types, with the heat decay duration, "reheat" period, and peak temperatures varying as a function of cell mass.

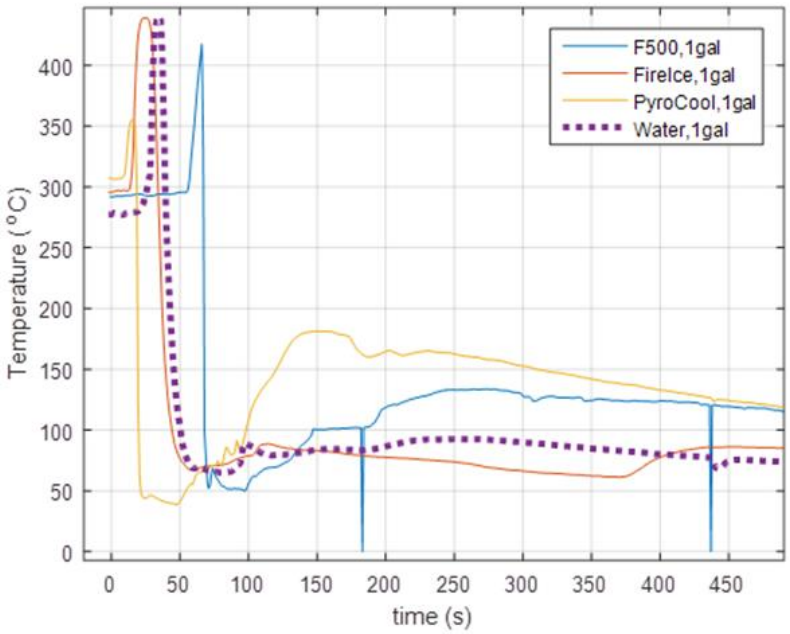


Figure 29 **Performance of water compared to other agents as water additives, top temperature of battery cell.**

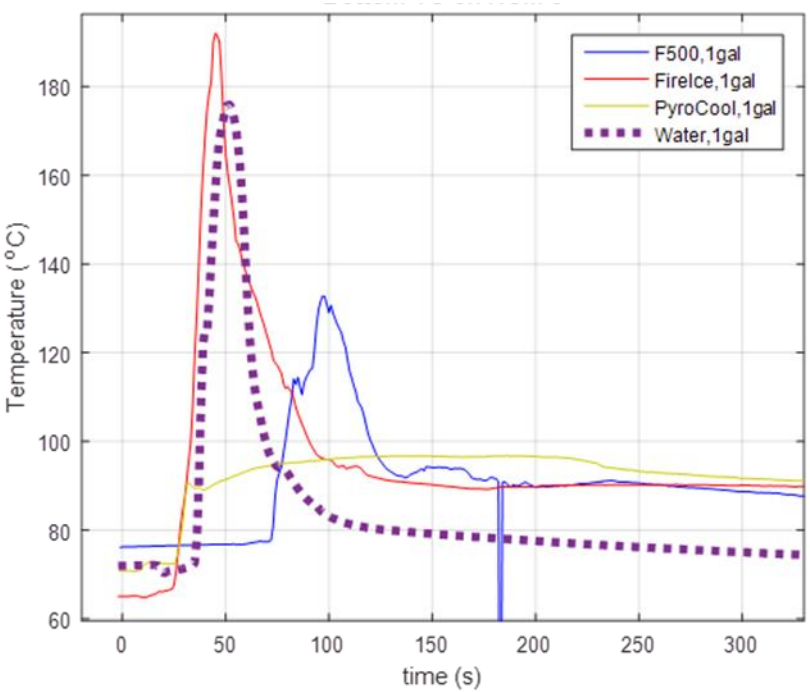


Figure 30 **Cooling performance of water compared to other extinguisher types, bottom temperature of cell.**

The initial cooling rate is nearly equivalent for all extinguisher types, but the thermal mass of the battery causes the extinguishing agent to evaporate as temperatures climb back to 250-275°C. Extinguishers were triggered the moment the battery fire climbed above 350°C. In each case 1 gallon of water was applied. In all instances the total extinguishing time spanned less than 60 seconds, or about 1 GPM.

The duration of this "reheating" is approximately 200s for non-water agents, whereas water is shown to reheat for about 100 seconds. Therefore, DNV GL saw no particular cooling advantage of water borne agents such as F-500, FireIce, or Pyrocool over water alone. (Figure 29) Some of these agents are encapsulators, which are designed to blanket a fire and insulate surrounding areas from heat; in an exothermic battery fire, trapping heat is undesirable. The figure demonstrates that cooling with water persistently achieves lower sustained temperatures after extinguishing, with as much as a 50-100°C advantage within 1-2 minutes of extinguishing (See appendix on page 76). This data demonstrates that water and all water borne agents reduce cell temperatures from > 400°C to near 50°C within 10-30 seconds. Water can maintain cell temperatures after extinguishing below 100°C even as the initial mass of water evaporates.

An additional vendor provided an aerosol agent to be tested. The aerosol was observed to extinguish the cell fire. The aerosol provides some initial cooling but does not reduce cell temperature until the exothermic reactions of the battery begin to decay. It was shown that the cooling ability of the aerosol was significantly less than water.

Because cooling is an inevitable need, a fixed suppression gas agent may reduce or mitigate flammability in an environment until ventilation and/or cooling strategies are implemented.

While the use of water demonstrates excellent cooling capability, it also potentially shorts out undamaged cells or neighboring modules. The use of water is a fully committed extinguishing tactic that is highly likely to result in a total loss of the asset.
Because it was noted that the aerosol test demonstrated extinguishment of the fire upon execution, aerosols can potentially serve as an initial attack for the fire followed by water as a backstop.

Therefore, DNV GL recommends the following:

- **Stage 1: If a system can limit cell cascading, a gas based suppression system may be considered for the first stage of fire fighting to extinguish a single cell fire and prevent flashover in a contained environment.**
- **Stage 2: If temperatures continue to rise or if an increasing level of smoke and gas is detected, forced ventilation and water extinguishing should be considered to cool the system and prevent further propagation of fire.**

Stage 1 provides an opportunity for avoiding collateral damage and total asset loss. Stage 2 provides a backstop for a situation when more than one battery cell is on fire. Both stages may also include some form of alarm or notification external to the battery system that notifies first responders of elevated risk.

9.3 Locations and Ventilation

DNV GL quantified that the gases emitted from a battery fire have somewhat differing toxicity and flammability risks across chemistries. However, mitigation of toxic or flammable gases is addressed with ventilation in all cases.

9.3.1 Outdoor Locations

Toxicity of the fire should be modeled to account for the impact on neighboring areas. The fire may be modeled in scenarios of increasing severity, such as a single cell fire of short duration, a module fire of short and long duration, and a total system fire.
The probability of fire, size of the system, plume contents, proximity of nearby buildings, wind direction, and duration of the fire will have an impact on the location of fencing and safety perimeters. It is the discretion of the project owner to consider these hazards.
DNV GL deploys a tool called PHAST for plume models [58] and uses the output to inform the risk analysis. This model directly impacts a FMEA, Bowtie, HAZID, or other hazard analysis as required by UL 9540 or standards with the same intent. It is implied by ANSI and IEEE 1547 updates that UL 9540 will be a requirement for energy storage projects, which includes FMEA for the system and related ancillary equipment. [25] As shown in Figure 25, it is common practice for a safety review to occur during permitting and prior to installation. This review may include the FMEA as required by UL 9540, or it can be part of an independent engineering review on behalf of the lender, project developer, or insurer.

9.3.2 Indoor Locations (Penthouse or Dedicated Room)

Emissions from batteries are simultaneously flammable and toxic during failure. The emissions characteristics of a Li-ion battery are shown in Figure 20. In all of the tests conducted in this program, this behavior was consistent among all Li-ion batteries. The figure indicates that 40-90% of the time, a single battery cell emissions rate corresponds to less than 10 ppm in a 0.44 m^3 volume. The peak event can exceed 200 ppm in this volume for a single cell, and it is short lived (2-3 minutes).

Similarly, it was found that vanadium oxide electrolytes emit HCl and HF, with HCl occurring in greatest quantities (see Figure 6 on page 12). Lead acid battery electrolytes emit SO_2 and HCl when heated (see page 12, Figure 7, and Figure 8). The mass and volume equivalent concentrations of emissions from all battery types are included in Figure 4 (peaks) and Figure 5 (average ppm per kg per minute).

A common toxic emission from all battery types was HCl. This is also common with plastics fires. Because the IDLH rating for HCl is low and the quantity of HCl emission is typically largest among the four toxic constituents monitored, the ACH rating is therefore governed by HCl. As shown in Figure 5 all battery types average lower than 2 ppm per kilogram per minute in the categories of CO, HF, HCN, and HCl emissions.

IDLH and Emergency Response Planning Guidelines (ERPG) values for HCl, HF, HCN, and CO are shown in Table 6. The term immediately dangerous to life or health (IDLH) is defined by the US National Institute for Occupational Safety and Health (NIOSH) as exposure to airborne contaminants that is "likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment."

- ERPG-1 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing more than mild, transient adverse health effects or without perceiving a clearly defined objectionable odor.

- ERPG-2 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action.
- ERPG-3 is the maximum airborne concentration below which nearly all individuals could be exposed for up to 1 hour without experiencing or developing life-threatening health effects.

Table 6 **Immediately Dangerous to Life and Health (IDLH) for the emphasized toxic gases identified in the testing work.**

	IDLH (ppm)	ERPG-1	ERPG-2	ERPG-3
HCl	50	3	20	150
HF	30	2	20	50
HCN	50	n/a	10	25
CO	1200	200	350	500
SO_2	100	0.3	3	25

This dynamic and varying emissions rate was time-averaged and then charted as a function of air change over rate (air changes per hour, or ACH), of the battery mass undergoing failure, and the room volume. Because this time averaged calculation includes the nonlinear effect of higher emissions during the peak, this ACH calculation is overly conservative for 40-90% of the duration of the battery failure event. As mentioned previously and as shown below, HCl (Figure 16) governs the dominating air change over requirement because of the low IDLH value. The chart in Table 15 on page 67 converts ACH to CFM based on room size and approximate room footprint. In all cases the ACH rate is calculated to maintain gas concentrations below IDLH.

An air change rate of 0.25 ACH is sufficient for limited cell failure scenarios to mitigate HCl in the room sizes considered (see Figure 16). The peak emissions rate for up to 1.5 Li-ion modules (typical masses assumed) would require up to 11.5 ACH. This is within normal laboratory building ACH requirements, by comparison (Table 8 on page 51), and ASHRAE notes that 1 – 4.4 ACH is common in residential and commercial environments. [26] **This clarifies DNV GL's recommendation that ventilation requirements are within established limits of the built environment as long as the system demonstrates it can limit propagation of cell failures with cascading protections**

- CO (Figure 18 and Table 13 on page 66) can be mitigated in all scenarios with only 0.25 ACH.
- HF (Figure 19 and Table 14 on page 66) can be mitigated with 0.25 ACH in the most probable failure scenarios and may require up to 14.5 ACH in the smallest room considered.
- HCN emissions rates can be mitigated for the most probable failure scenarios (a single or multiple cells) with only a 0.25 ACH. In the worst case scenario of 1.5 failing modules, the ACH is 7.5.

Note that **HCl and HF govern the ventilation requirements, which implies that the ventilation requirement is determined by toxicity, not flammability**. This is because toxic gas IDLH limits are between 30-50 ppm, while flammability limits for many gases are in the 1,000-10,000+ ppm range. The assumptions used in this calculation are shown below. The emissions rates assumed for the ACH calculations are the average of the emissions measured during cell testing. A 30-minute release rate is conservative, and accounts for an average of emissions rate that is higher than the low level emissions leading up to peak failure, and lower than the peak emissions.

9.3.3 GPM and CFM Requirement

It is shown in Figure 15 that the heat release rate has a weak positive correlation to mass lost because the linear fit has a positive slope but the R^2 is low due to scatter in the data. As discussed on page 4, the scatter is due to the nonlinear behavior of battery fires. As shown in Figure 20 the battery spends between 40-90% of the time in a smoldering state, meaning that the exothermic contribution to the fire is low during this period and much of the battery mass is lost during this time, which means there is less to contribute to the peak HRR event. It was also shown in Figure 12 that it was possible to reduce the water requirement as testing progressed on modules and systems. This data was directly measured from the masses of the cells and modules and the water used.

The theoretical minimum water requirement *for the battery mass* (not the system mass) is calculated in Table 7. It should be noted that the water calculation is determined in units of GPM/kg; dividing this number by the energy density (commonly given in Wh/kg) will convert the result to GPM/Wh, and multiplying by 1000 Wh/kWh will convert the result to GPM/kWh. A cross check for these conversions will be needed as energy density of batteries will inevitably increase over time.

For context and benchmarking, typical ventilation and water sprinkler requirements are shown in Table 8 on page 51. The range of possible values for the GPM/kg of battery are shown in Figure 31 on page 54. Table 15 on page 67 shows conversion factors between ACH, CFM, and CFM/ft^2.

The aggregate of such data is shown on page 67, which demonstrates the means to estimate water flow and ventilation flow requirements based on system size. In some cases it can be seen that the ventilation rates and GPM requirements are within the norm of building codes. This is translated in Table 10 on page 53. However, the factors that affect this most are the mass of batteries, their energy density, and the volume of the room where they are installed. The air volume in larger rooms will dilute emissions, resulting in lower requirements for air change.

DNV GL and Rescue Methods found that the water requirement per kg of battery material decreased as the quantity of modules became larger (Figure 31). It is acknowledged that initial testing began with an arbitrary water volume at the cell level, and it was found that this quantity was more than sufficient—and is therefore excessive—for a practical application. **DNV GL recommends that further study be considered to find the minimum water requirement for extinguishing and measure the physical parameters impacting water contact efficiency**

Because outdoor systems are likely containerized they are also likely to include on-board gas-based fixed suppression systems. As recommended by DNV GL in the extinguishing section (see page 45), a gas based suppression system may serve as a first line of extinguishing. Adequate sizing of nearby fire hydrants should be considered in the context of the maximum possible heat load during a system fire.

Table 7 **Example calculation to determine the minimum water requirement per kg of burning cell.**

Theoretical Minimum Water Requirement to Cool a Battery	
Battery burn time (min)	42.25
water density (kg/gal)	3.7
m battery (kg)	2.87
c water (kJ/kgC)	4.1
c battery (kJ/kgC)[6]	1.4
ΔT battery (deg C)	525
ΔT water (deg C)	75
Q battery (kJ)	2,107.0
m water (kg)	6.9
vol water (gal)	1.9
GPM	0.044
Theoretical Minimum GPM/kg	0.015

Table 8 **Benchmarks for airflow and water flow for typical structures.**

Benchmarks	CFM/ft^2	GPM/ft^2	Sources
Libraries	0.12	0.05-0.3	*ASHRAE Addendum n to ANSI/ASHRAE Standard 62-2001 "Ventilarion for Acceptable Indoor Air Quality" and NFPA 13 Area Density Curves*
Warehouses	0.06	0.05-0.3	
Pharmacy	0.18	0.05-0.3	
Laboratories	0.18	0.05-0.3	

Based on the known test data, DNV GL is able to recommend the following across the aggregate of battery chemistries. The values in Table 9 are derived from Table 16. These are converted to example CFM/ft^2 and GPM/ft^2 values in Table 10 on page 53.

[6] Estimated by phenolic, given that the battery is a composite of multiple polymers, liquids, and some metals.

Table 9 **Values derived from probabilistic analysis of water flow rates (GPM) and air flow rates (CFM) per system energy (kWh) or mass (kg).**

Scalable Metrics for Systems based on Electrochemical Battery Mass and Energy Content

	25th Percentile	Mean	75th Percentile
Water Flow Rate GPM/kg	0.07	0.10	0.20
Water Flow Rate GPM/kWh	0.70	0.99	2.09
Air Flow Rate CFM/kg	0.01	0.02	0.03
Air Flow Rate CFM/kWh	0.11	0.18	0.31

A sensitivity analysis is demonstrated with calculated regression coefficients. The uncertainty in the calculation is captured by triangular probability distributions created in Table 16. In regression analysis, the coefficients calculated for each input variable measure the sensitivity of the output to that particular input distribution. The sensitivity of the calculation of the ventilation rate is shown in Figure 35.

The energy density, cell mass, and emissions rate from the cell are the greatest influencing factors in 90% of the calculated outcomes. **DNV GL recommends that when calculating the air flow and water extinguishing rate, one must account for battery energy density (only the battery cells, not the entire system) as well as the duration of the event.** The sensitivity of the calculation of the water flow rate is shown in Figure 36. The two main factors influencing the calculation are the range of flow rates found during testing and the range of possible energy densities of the battery system.
These uncertainties demonstrate the following:

- Energy density and the emissions duration should dictate the ventilation requirement
- Energy density and the duration of the event affect the extinguishing requirement

In Table 10 some example ventilation and water extinguisher ratings are calculated based on hypothetical systems. The values in Table 10 are calculated from Table 7 and demonstrate the mean of probability distributions generated from Table 16. The distributions of the water requirement is skewed to the left, as shown in Figure 31. The table demonstrates how these findings translate to codes development via examples. The table demonstrates that the ventilation and water requirements are within the scope of present requirements for the built environment when the system is placed within adequate room volumes (compare with Table 8). Considerations of whether the spaces are occupied or whether they are outdoors apply.

In practice, these results will depend on the actual system weight and room size on a per project basis. When considering a containerized system, the following additional considerations may occur:

- A containerized system may not be considered a livable or occupied space and therefore may have different code considerations.
- The water requirement in Table 10 is equivalent to about 4-5 garden hoses and is less than half the GPM rating of a typical 2.5” line (250 GPM). If the system is already equipped with a gas-based fixed suppression system, a parallel water

connection on the exterior would accomplish the goal for first responders to create a cost effective internal sprinkler system as a backup to the fixed suppression system.

The calculated airflow requirement can be oversized with a variable speed fan that meets the minimum air change requirement and may peak upon detection of smoke or particulates.

The leftward skewness of the distributions for both the GPM requirement and the ACH requirement is demonstrated in Figure 31 and Figure 32.

Table 10 **Example implications based on extrapolated findings from testing. It can be seen that the calculated water requirement is within the bounds of what was described for libraries, pharmacies, warehouses, and laboratories; similarly the air flow requirements can be at or below unless the room volume is too small.**

Example Code Requirements

System Size (kWh)	System Chemistry	Estimated Mass (kg)	Estimated Room Size (ft^2)	Ventilation Requirement (CFM)	Theoretical Minimum GPM Requirement	Median GPM Requirement	GPM Requirement at 0.1 GPM/kg	CFM/ft^2	Min GPM/ft^2	Median GPM/ft^2
20	Li-ion	133.3	100	2.3	2.0	2.2	13.3	0.02	0.02	0.02
100	Li-ion	666.7	146	11.7	9.8	11.2	66.7	0.08	0.07	0.08
100	Pb Acid	3,333.3	200	58.4	*UPS Requirement*			0.29		
1000	Li-ion	6,666.7	300	116.8	98.1	111.8	666.7	0.39	0.33	0.37
1000	Vanadium Redox	20,000.0	1500	350.4	*Standard Commercial*			0.23		

Note: Fire flows in excess of 3,000 GPM per buildings are considered impractical for many state fire codes. Consideration of battery flammability, cascading protections, and building water supply should be considered. For containerized systems, a parallel system may be fed externally by fire hose.

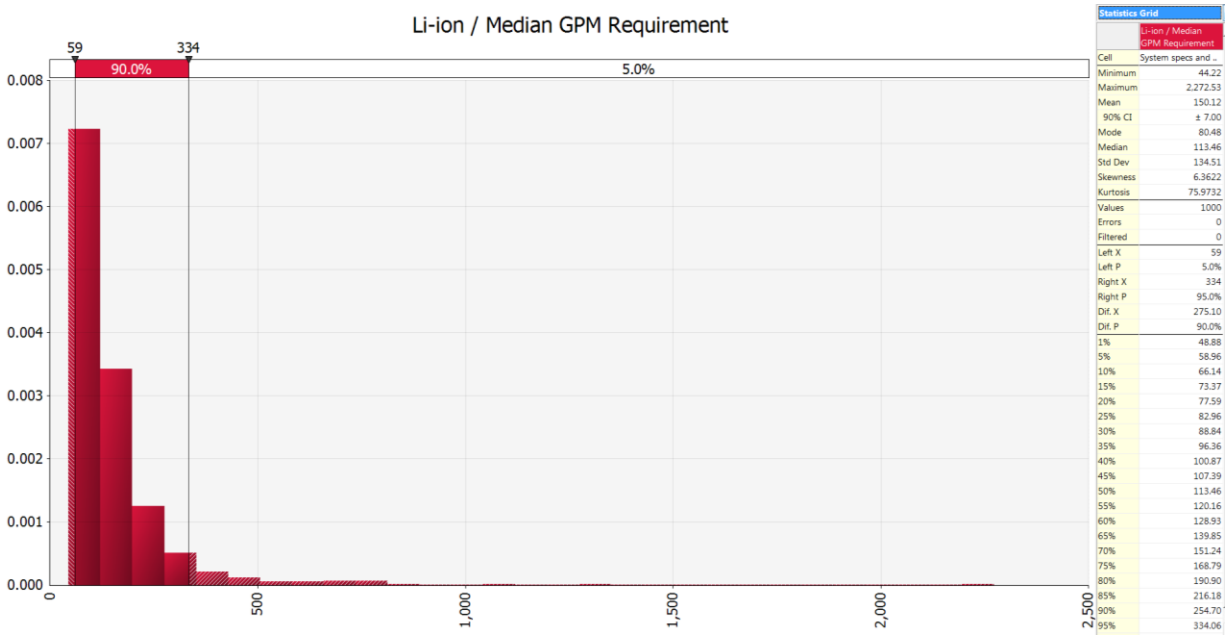


Figure 31 **Distribution of gallons per minute for a 1 MWh battery, calculated from cell testing and extrapolating with the latent heat value, which demonstrates that the 0.1 GPM/kg estimation is highly conservative.**

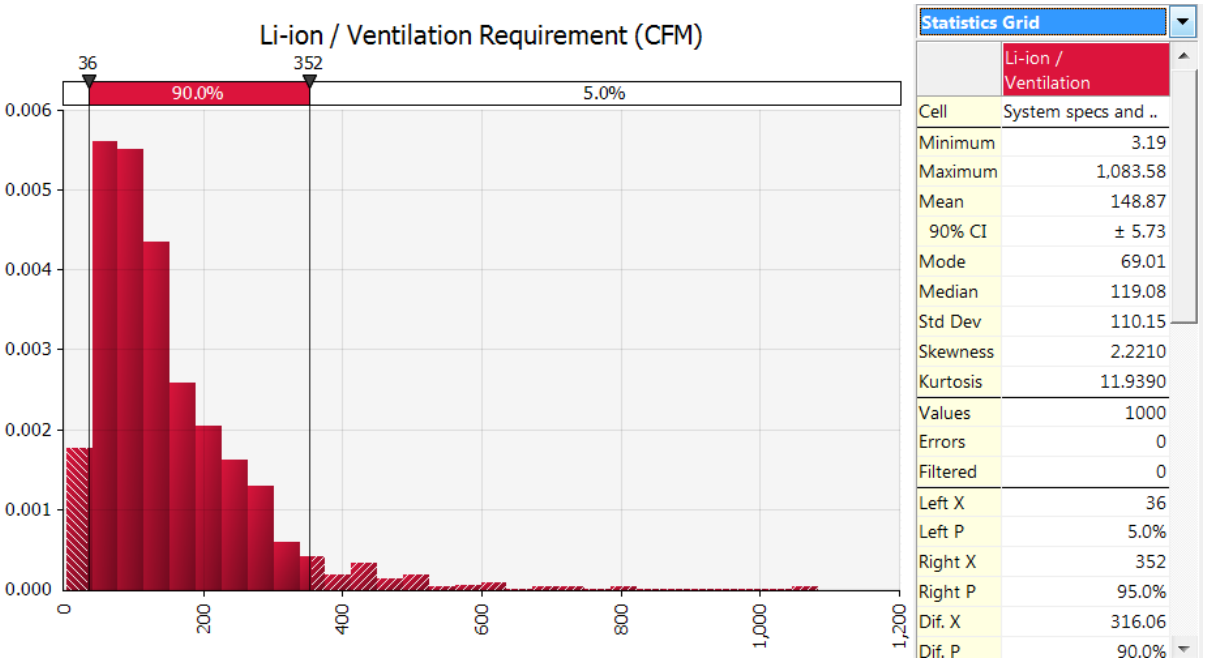


Figure 32 **Example of the air flow requirement for a 1 MWh Li-ion system, demonstrating that the distribution of values is strongly skewed leftward.**

9.4 Inspection and Monitoring

DNV GL's testing revealed that, besides lingering offgases such as CO, lingering (unseen) internal temperatures and residual voltages on unburned cells presented a hazard to first responders.

Similar to the code for uninterruptible power supplies, which recommends hydrogen monitoring and a system health status display (see Table 5), **DNV GL recommends at a minimum that an error status panel, emergency response contact, or other form of error notification be available to first responders, and that the energy storage supply chain engage with first responders to propose a viable solution.** Current codes for UPSs include a display panel for inspection and error notification purposes.

If a system has been in a fire which has been contained by internal fire suppression, such a display panel is enough to alert first responders that the system has sustained damage. They may be able to call in a specialist to handle the hazard and relieve FDNY of their responsibility for the site.

There are technical parameters that have direct impact on the volatility of the system, though it is debatable whether they should be the responsibility of the first responder. Recall that the ultimate objective of the first responder is to protect life, preserve property, and ultimately secure the scene. The intent of system health notifications or an emergency response network is to alleviate the concern of the first responder that he/she will somehow be obligated to own an unknown hazard. The project development community would serve its own interest to support first responders in creating a means to facilitate a hand-off from the first responder to a project owner with good certainty that the hazard is under control.

9.5 Clearances

As referenced in Table 4 and Table 5, the majority of codes identify a 3-5ft clearance on energy devices within enclosed spaces. [4]

In addition, from an economic and technical standpoint, limitation of footprint of energy storage systems directly undermines one of the key value propositions of energy storage, i.e., high density stored electrical energy in a small space where it is most needed. Therefore there is a need to weigh overly prescriptive recommendations against the actual hazard. Recall that in DNV GL's model (also supported by testing) a system could withstand 60 minutes of direct fire at 1000°F with only a metal barrier and an air gap (see Figure 28 on page 42).

The current rule structures (NFPA 855, IBC, and IFC updates may allow for local AHJ exceptions for the spacing and quantity of energy storage systems provided they pass a risk analysis).

With these considerations, DNV GL recommends that all system installations undergo a risk analysis, with particular attention paid to:

- **Cascading protections between cells and modules**
- **Clearances to structures above the energy storage systems**
- **Fire rating of the enclosure**
- **Most probable expected failure mode**

This recommendation is consistent with the IEEE 1547 and ANSI recognition of UL 9540 because of its FMEA process. Because cascading protections have been overlooked in safety incidents (see Literature Review) it is highly important that this consideration be emphasized in the up-front risk analysis. Clearances to nearby structures are presently being recommended on a kWh basis, which may inadvertently limit the effectiveness of energy storage by artificially increasing its footprint and therefore its effective functional power and energy density. The risk analysis should provide a foundation for stakeholder agreement on when the risks are deemed acceptable to exceed these requirements. Similarly, the fire rating of the enclosure, if exceeding specification, may create opportunities to reduce spacing or clearances. And the most probable failure mode is the most important part of the risk analysis; it helps differentiate risks that seem significant but are actually low probability, versus risks that are probable and measurable, and then design with cost effectiveness and practicality.

9.6 Room Capacity Limitations

The holding capacity of an enclosed space is dependent on a number of factors:

- As shown Figure 20 the total quantity of emissions from burning batteries is dependent on the mass available and the nonlinearity of its emissions rate.
- As shown in Figure 20, the battery fire is largely a smoldering event until a 2-3 minute peak.
- It was also mentioned in "Extinguishing" on page 45 that cascading protections between cells have a direct impact on the propagation of the event to the entire system.
- It was also found in this work that peak room temperatures in a fire are directly correlated to the mass of the battery (see Figure 38 on page 76).

Present guidance is suggesting limitations on battery systems as a function of kWh capacity. It should be noted that energy density (kWh/kg) in battery cells is continually increasing as new generations are released. Prescribing a code based on mass (kg), would present the challenge of increasingly higher amounts of energy being deployed under the same mass constraint. The precedent is a limitation of 1000 lbs. (453 kg) of Li-ion batteries in a space without suppression, which at today's typical Li-ion energy density of ~150 Wh/kg, corresponds to about 67.9 kWh. Proposed IFC language will reduce this to 20 kWh for single units with a total limit of 600 kWh in an enclosed space.

As previously stated, DNV GL recommends that a risk analysis be performed on any basis where battery systems larger than 20 kWh and assembled in aggregate shall be installed in an enclosed space, with the intent of answering these questions:

- **Is the system functionally limited by the code rating?**
- **Does the system have design features that prevent cascading failure between cells and modules? (See fire test, UL 1973 test, or IEC 62619 test data.)**
- **Is the baseline and peak ventilation capacity adequate for the potential off gas? (Example, Figure 16)**
- **Is the sprinkler system adequately designed for the potential heat load and battery chemistry? (Example, Figure 29)**

- **Does the protective casing provide adequate insulation and fire blocking? (Example, Figure 28)**

The output of this analysis should determine if the rules are too prescriptive for the case being considered, or alternatively, if the rules have not adequately captured a safety risk.

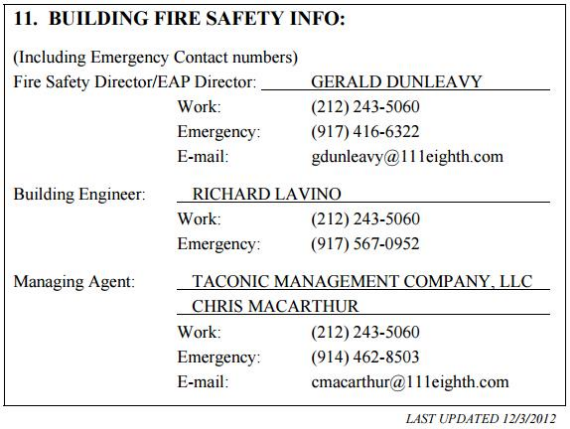
9.7 Project Development Considerations for Interaction with First Responders and AHJs

DNV GL surveyed several handbooks for fire departments in large cities across the country and found a universal theme in fire fighter training concerning extinguishing. Fire fighters are trained to achieve the following objectives when arriving at the scene:

- **Objective 1:** Remove endangered person(s) and treat the injured.
- **Objective 2:** Stabilize the incident and provide for life safety.
- **Objective 3:** Provide for the safety, accountability, and welfare of personnel (this priority is ongoing throughout the incident).
- **Objective 4:** Protect the environment.
- **Objective 5:** Property conservation.

Note that Objective 5 is often the primary concern of the property owner. It is on the priority list of the first responder, *but safety of life at the scene takes precedence.* The following recommendations for emergency response specific to batteries refer to these objectives. These are based on the UPS battery system precedent that already exists in New York City.

- Battery systems should be described in the Building Information Card (BIC) (see example, Figure 33). This greatly aids in first responders meeting **Objective 2**.
- A building should have an assigned liaison who works with FDNY to update emergency response plans. This liaison may be the same as the certificate of fitness (COF) holder for the battery system, or may be a different individual. This Liaison should be listed in the BIC. **This aids first responders in meeting Objectives 2 and 3, and also protects the property owner's interest relating to Objective 5.**
- Battery systems should have a COF similar to what is required for UPS systems. Again, this aids in **Objectives 2, 3 and 5.**
- The recommendations for monitoring and system health display are consistent for codes for uninterruptible power supplies. The method of system health display and monitoring should be proposed by the system integrator or project owner.



11. BUILDING FIRE SAFETY INFO:

(Including Emergency Contact numbers)

Fire Safety Director/EAP Director:	GERALD DUNLEAVY	
	Work:	(212) 243-5060
	Emergency:	(917) 416-6322
	E-mail:	gdunleavy@111eighth.com
Building Engineer:	RICHARD LAVINO	
	Work:	(212) 243-5060
	Emergency:	(917) 567-0952
Managing Agent:	TACONIC MANAGEMENT COMPANY, LLC	
	CHRIS MACARTHUR	
	Work:	(212) 243-5060
	Emergency:	(914) 462-8503
	E-mail:	cmacarthur@111eighth.com

LAST UPDATED 12/3/2012

Figure 33 **The FDNY Building Information Card (actual example) contains emergency contact information for fire safety and building engineers.**

9.8 Considerations for Battery Chemistries that are not Li-ion

Much of the data in this report pertains to Li-ion because the majority of battery cells tested are variants of that chemistry. However, the data contained in this report should concisely demonstrate the following:

- Vanadium redox and Pb acid electrolytes are not flammable.
- Vanadium redox and Pb acid electrolytes do represent a toxicity hazard when heated.
- Polymer cases for any battery are flammable and will contribute to a fire as fuel and a source of toxic emissions.

While not tested explicitly in this study, it is also worth mentioning that under rare circumstances lead acid batteries are also capable of so-called thermal runaway, i.e., an exothermic failure. Because the members of the battery industry have taken great care to differentiate themselves in the area of safety, with nearly all chemistries that are *not* Li-ion using marketing language such as "safe", "nonflammable", "thermally stable", "environmentally benign" or "incapable of thermal runaway", there is a need to clarify a universal finding in this program: in the case of external fire, all batteries emit toxic gases. It should also be noted that the average emissions rates of equivalent masses of plastics exceed those of batteries. Every battery tested either emitted a gas or left a residue that has a varying degree of hazard (Table 3 on page 29); however, this can be expected from most fires. The general findings of this work conclude that water and ventilation requirements are within the technical limitations of legacy building codes, i.e., there are precedents for managing these hazards.

All of the batteries tested carry with them a risk in their deployment; however, all of the risks identified are manageable within the realm of today's engineering controls for safety. In addition, the toxicity and flammability risks identified are not insurmountable or highly unique when compared to the challenges of burning hydrocarbons or plastics, and the resulting requirements in codes, if implemented, are within the boundaries of the typical built environment.

DNV GL's recommendations are the following:

- **If a battery is demonstrated to have a non-flammable electrolyte, there may be considerations for a reduced water extinguisher requirement, or at a**

minimum a water requirement equivalent to that required for the space without battery systems installed.

- **The ventilation requirements should be the same for all battery chemistries tested in this program because they all have varying degrees of HCl or similar toxic emission upon heating.**

Lastly, the emissions rates of equivalent amounts of plastics during a fire, including common every day materials that are found in office environments, commercial and industrial settings, and even residential homes, can exceed the quantity of emissions from a battery fire and will emit HCl as well.

10.0 SUMMARY OF MAIN FINDINGS AND RECOMMENDATIONS

The below directly summarizes key findings and recommendations from this study. These are placed in list form up front in the document for access and readability. The reader is strongly encouraged to use the cross references in the report to learn the reasoning behind the recommendations, or read the FAQ section for clarifications.

- The toxic emissions from fires in this study are not necessarily excessive in content or quantity, and can be managed by today's engineering controls.
- The code requirements for battery systems have the potential to fall within the boundaries of legacy codes, provided that technical and practical engineering considerations are made concerning room volume and battery size.
- DNV GL recommends a minimum 1-hour fire enclosure rating with a 2-hour rating in areas with critical population density.
- For the intent of delaying the escalation of the fire, all systems with individual cells as part of their assembly should either demonstrate that a single cell failure cannot propagate to neighboring cells in a module design or demonstrate that a module design contains adequate external fire protection to contain the heat and flames to that module, which may exceed the acceptance criteria for UL 1973 or the IEC 62619 internal propagation test.
- Because of the rapid evolution of a cell fire, DNV GL does not see an advantage to using a Class D extinguisher on a single cell fire, given the difficulties of access and timing. While technically appropriate, the deep seated nature and window for access present technical challenges; the need for cooling should be prioritized.
- Fixed suppression gas agents may reduce or mitigate flammability in an environment until ventilation and/or cooling strategies are implemented, though their actual cooling capability should be scrutinized in comparison to water.
- DNV GL recommends the following for extinguishing:
    - Stage 1: If a system can limit cell cascading, a gas based suppression system may be considered for the first stage of fire fighting to extinguish a single cell fire and prevent flashover in a contained environment.
    - Stage 2: If temperatures continue to rise or if an increasing level of smoke and gas is detected, water extinguishing accompanied by forced ventilation should be considered to cool the system and prevent further propagation of fire.

- For nearly all chemistries, the ventilation of HCl, CO, and HF govern the ACH requirements, i.e., toxicity considerations dominate the ventilation need rather than flammability.
- The gases emitted are also found in plastics fires in greater time-averaged quantities. This should be considered in the context of prescriptive codes because these hazards are likely to already exist in the built environment.
- DNV GL recommends that the lowest level ventilation rate - if prescribed - be continuous under normal systems operation. The study concludes this may be as low as 0.25 ACH, which is lower than what is required for most occupied spaces.
- Regardless of chemistry, DNV GL recommends sizing for ventilation and extinguisher systems as the following (these may be translated to GPM/ft^2 and CFM/ft^2 or ACH starting on page 50).
- DNV GL recommends that minimizing the water requirement be an area of further study as it has likely been overstated in these recommendations for conservativeness.
- DNV GL recommends at a minimum that an error status from an operating energy storage system be readily apparent to first responders for the following parameters, and recommends **that a dialog be opened with system integrators to determine the most effective and economic way to address this need**:
    - Internal atmosphere (normal or gas detected)
    - Temperature (above normal or normal)
    - Current (normal or threshold exceeded)
    - Voltage (normal or threshold exceeded)
- During and after fire extinguishing, it is recommended that if first responders choose to use water submersion to cool and isolate battery modules, that preparation to deal with alkaline or acidic water be considered.
- After extinguishing, continued ventilation and monitoring of the area is highly recommended to protect first responders from continued toxic and flammable gas emissions. The first responder team can monitor the area with handheld sensors to determine the appropriate time to stop ventilation.
- It is highly recommended that an emergency contact list and/or subject matter expert be available for all battery systems installed in buildings in order to introduce the opportunity for first responders to relinquish control of the scene to the system developer or a designate after the site has been secured and extinguishing has been completed. This is likely to require involvement from the project development and systems integration community.
- If a battery is demonstrated to have a non-flammable electrolyte, there may be considerations for a reduced water extinguisher requirement, or at a minimum, a water requirement equivalent to that required for the space without battery systems installed.
- The ventilation requirements—if prescribed—should be the same for all battery chemistries tested in this program because they all emit similar HCl levels.
- In order to meet or exceed UL 9540 requirements, DNV GL recommends that a risk analysis be performed on any basis where a battery system or portfolio of systems

shall be installed in an enclosed space near occupants. The analysis should look at the general safety picture of the project(s) —in aggregate if possible—with a focus on these risks:

- Does the system have design features that prevent cascading failure between cells and modules? (See fire test, UL 1973 test, or IEC 62619 test data.)
- Are ventilation systems at the intended site(s) adequately rated to handle the most probable failure mode? (Example: Table 7)
- Are sprinkler systems at the intended site(s) adequately designed for the potential heat load and battery chemistry? (Example: Figure 29 and Table 7)
- Does the protective casing provide adequate insulation and fire blocking? (Example: Figure 28)

10.1 Conclusions

- Many historic battery incidents are due to external damage factors which have created confusion and overreaction to the topic of battery safety.
- Existing building codes and engineering controls can be adequate in many cases to handle battery safety issues.
- The toxic emissions from fires in this study can be managed by today's engineering controls and are not anomalous or excessive when compared to a plastics fire. Plastics fires can generate similar gases in larger quantities over the average emissions duration on an equivalent mass basis.
- The water requirements from this study can be lessened for building fire extinguisher systems when combined system-level safety approaches are implemented.
- Legacy codes could provide insightful interim requirements for battery systems used in energy management, provided that technical and practical engineering considerations are made.
- Gas-based agents that can reduce flammability in an enclosed environment can put out single battery fires, but should not be considered an adequate cooling measure.
- Water demonstrated the highest cooling efficacy of all extinguishing agents tested. The use of water should only be considered if there is an acceptable risk of shorting additional cells or collateral damage to the remainder of the system.
- Water volumes for cooling can be minimized based on the expected duration of a failure event. Systems with adequate internal cascading protections will minimize the water volumes required for extinguishing.
- Staged extinguishing with fixed aerosol or gas suppression agents first, followed by water in the event of a cooling need, is recommended. It may be possible to use parallel water inputs on fixed suppression systems for containerized battery systems.
- Forced ventilation is recommended for first responders, even after the fire has been extinguished.
- The historical legacy of safety concerns has validity, though understanding of the root causes and failure modes is necessary in order to understand the true threats and failure modes.

Appropriate mitigation of risk shall include a pre-commissioning design review per accepted industry practices that are presently being used in California and other states. Overall DNV GL's findings are that these hazards are manageable for building code officials and first responders. No significant technology barrier exists that prevents code officials or first responders from doing their duty when encountering battery energy storage systems.

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12.0 APPENDIX 1: REFERENCED DATA

12.1 Assumptions for Air Changes per Hour (ACH) Calculations

Statistics for mass loss, duration of failure, and HCl, HCN, HF, and CO emissions are shown in Table 1. This data is taken directly from all of the cell tests. It can be seen from the data that the mass loss ranges from 0-57%, the duration of the event lasts from 13-83 minutes, and the emissions rate (in ppm per kg per min) in the 0.44 m^3 chamber ranges from zero to 0.719 for HCl, 0.032 for HF, 0.027 for HCN, and 2.341 for CO. This data demonstrates that CO is emitted in greatest quantity and HCl is emitted in the second greatest quantity, but because HCl has a lower IDLH this threshold is met first in most scenarios.

The following tables demonstrate the calculated ACH as a function of burning battery mass and room size. The tables below are the same data that is visually presented in Figure 16 and related figures. It is clear from the visual representation of the data that these relationships are nonlinear. The estimations limit the failure to 1.5 modules, with the presumption that the system should demonstrate adequate separations, cascading protections, and suppression systems to limit failure to a single cell or at least a single module. The probability of failure for multiple modules should be very low for systems with these active and passive barriers to catastrophic failure. Catastrophic failure scenarios can be examined by risk analysis to determine which barriers are in place to prevent it and the relative strength of those barriers. The risk analysis places practical boundaries on the probability of high consequence events, and should either 1) tame the deployment of extreme safety measures with a low probability of utilization or 2) identify likely failure scenarios that have been overlooked in the context of the site and system.

Table 11 **Air change rates based on HCl emissions as a function of room size and quantity of failing cells.**

		20 ft container	40 ft container	80 ft X 80 ft room
	HCl	**33.1**	**67.6**	**3624**
1 cell	**1.54**	0.25	0.25	0.25
5 cells	**7.70**	0.25	0.25	0.25
10 cells	**15.40**	0.25	0.25	0.25
15 cells	**23.10**	1.25	0.25	0.25
20 cells	**30.80**	3.25	0.25	0.25
24 cells	**36.96**	4.75	0.25	0.25
1 module	**44**	6.5	0.6	0.25
30 cells	**46.20**	7	1	0.25
35 cells	**53.90**	8.5	2	0.25
1.5 modules	**66**	11.5	3.5	0.25

Table 12 **Air change rates based on HCN emissions as a function of room size and quantity of failing cells.**

	20 ft container	40 ft container	80 ft X 80 ft room
HCN	**33.1**	**67.6**	**3624**
1 cell	**1.54**	0.25	0.25	0.25
5 cells	**7.70**	0.25	0.25	0.25
10 cells	**15.40**	0.25	0.25	0.25
15 cells	**23.10**	0.25	0.25	0.25
20 cells	**30.80**	1	0.25	0.25
24 cells	**36.96**	2.25	0.25	0.25
1 module	**44**	4	0.25	0.25
30 cells	**46.20**	4	0.25	0.25
35 cells	**53.90**	5.5	0.25	0.25
1.5 modules	**66**	7.5	1.5	0.25

Table 13 **Air change rates based on CO emissions as a function of room size and quantity of failing cells.**

	20 ft container	40 ft container	80 ft X 80 ft room
CO	**33.1**	**67.6**	**3624**
1 cell	**1.54**	0.25	0.25	0.25
5 cells	**7.70**	0.25	0.25	0.25
10 cells	**15.40**	0.25	0.25	0.25
15 cells	**23.10**	0.25	0.25	0.25
20 cells	**30.80**	0.25	0.25	0.25
24 cells	**36.96**	0.25	0.25	0.25
1 module	**46.20**	0.25	0.25	0.25
30 cells	**53.90**	0.25	0.25	0.25
35 cells	**44**	0.25	0.25	0.25
1.5 modules	**66**	0.25	0.25	0.25

Table 14 **Air change rates based on HF emissions as a function of room size and quantity of failing cells.**

	20 ft container	40 ft container	80 ft X 80 ft room
HF	**33.1**	**67.6**	**3624**
1 cell	**1.54**	0.25	0.25	0.25
5 cells	**7.70**	0.25	0.25	0.25
10 cells	**15.40**	0.25	0.25	0.25
15 cells	**23.10**	2.5	0.25	0.25
20 cells	**30.80**	5	0.25	0.25
24 cells	**36.96**	7	1	0.25
1 module	**44**	9	2	0.25
30 cells	**46.20**	9.5	2.5	0.25
35 cells	**53.90**	11.5	4	0.25
1.5 modules	**66**	14.5	5.5	0.25

Table 15 shows conversion factors from air changes per hour to CFM and CFM/ft^2 for the modeled energy storage rooms and enclosures.

Table 15 **Conversions from ACH to CFM based on the example room volumes for energy storage systems.**

				ACH (row) to CFM (column)					CFM/ft^2 @ ACH				
	m^3	ft^3	ft^2	***0.25***	***1***	***5***	***10***	***30***	***0.25***	***1***	***5***	***10***	***30***
Shipping Container, 20 ft	33	1,168	146	*5*	*19*	*97*	*195*	*584*	*0.03*	*0.13*	*0.67*	*1.33*	*4.00*
Shipping Container, 40 ft	68	2,407	301	*195*	*781*	*3,906*	*7,811*	*23,434*	*0.65*	*2.60*	*12.98*	*25.96*	*77.88*
Room, 80x80 ft	3,624	128,290	16,036	*417,549*	*1,670,195*	*8,350,973*	*16,701,946*	*50,105,838*	*26.04*	*104.15*	*520.76*	*1041.52*	*3124.55*
Notes: Occupied laboratories = 4-12 ACH, emergency ventilation ~ 30 ACH.													

In Table 16, useful metrics derived directly from testing are provided. As mentioned previously these values are input into a probabilistic model[7] to generate the sensitivity analysis demonstrated in Figure 35 and related figures. The min, average, and max values are used to generate triangular probability distributions. The GPM/kg measurement is a direct measure of the water used to extinguish fires across the entire spectrum of cell to module testing. The cell masses, mass loss, emissions range, HRR, and duration are the ranges of values observed from cell testing. The energy density is calculated directly from the cells. The estimated peak cell temperature is directly sourced from the cell data. The fraction of cells simultaneously burning is a factor used to estimate the impact of total emissions rate and account for the observed fact during module testing that cell failures were rarely simultaneous and occurred as discrete events. It should be noted in the table that the water contact efficiency averages 1-2%. This highly conservative number greatly drives the water requirement estimation. Any method by which a battery manufacturer or system integrator can demonstrate that the water contact efficiency is higher will reduce the water requirement overall.

[7] Palisade @Risk

Table 16 **Aggregation of data regarding battery fires, extinguishing, emissions rates, and extinguishing. Distributions in the column labeled "Dist" are triangular; the mean is shown.**

Probabilistic Inputs					
Parameter	**min**	**avg**	**max**	**Dist**	**Notes**
Cell Mass kg	0.5	1.6	6.5	2.867	From cell test data
Peak Cell Temperature (˚C)	350	525	700	525	From cell test data
Duration (min)	2	47	83	43.882	From cell test data
Water Contact Efficiency	0.001	0.01	0.04	0.017	Estimated
Energy Density (Wh/kg)	30	120	150	100	Pb Acid to Li-ion
Probabilistic Outputs					
Delta T to Cool Battery to 25 C	325	500	675	500	Calculated from Above
Energy to cool battery (kJ)	227.50	1120.00	6142.50	2006.67	mcdT
Required Water Mass including heat of vaporization (kg)	0.09	0.44	2.39	0.78	Q battery = Q water, m_water = Q battery / (energy to heat water to 100 C + dHv)
Required Water Volume (gal)	0.02	0.12	0.65	0.21	divide by 3.7 kg/gal
GPM	0.012	0.003	0.008	0.005	divide gal by duration
GPM/kg	0.024	0.002	0.001	0.002	divide GPM by battery mass
GPM/kg with water contact efficiency	23.916	0.158	0.030	0.099	Divide by water contact efficiency
Additional Probabilistic Parameters					
Testing GPM/kg	0.105	0.881447	1.65789474	0.881	From cell, module, and system test data
Emissions range kg/min per cell	0.0002	0.0077	0.0152	0.0077	From cell test data
HRR kW/kg (of mass lost)	17	31	45	31	From cell test data
Fraction of cells simultaneously burning	0.12	0.16	0.2	0.16	From module testing, 1-3 out of 8-15

12.2 Water Mass Requirement Calculation

There are two ways to calculate the water mass requirement. One method is to calculate the rate of energy released, which assumes that the extinguishing event is perfectly timed with the peak energy release of the cell. The other method is to size the water requirement to the battery mass, acknowledging that the cell failure event is not a single peak event, but is instead characterized by long periods of smoldering (40-90% of the total event duration) and a 2-3 minute peak event (accounting for 1-15% of the event duration).

The latter method was observed to be effective during testing as the water use in DNV GL and Rescue Methods' testing became progressively smaller (on a GPM/kg basis) as the timing of the extinguishing event became decoupled with the peak HRR. In other words,

extinguishing the module or large pack was an exercise of removing distributed heat and preventing perpetuating failure modes.

12.2.1 Sizing the Water Requirement to Peak HRR

Sizing the water requirement to the peak HRR involves the calculation of the amount of energy required to raise the temperature of 1 kg of battery[8] by 500 degrees Celsius. Using the average HRR in Table 16, 1 kg of battery emits 31 KJ/second. This would be the heat release rate $\dot{Q}$ and the formula used to calculate the mass flow rate of water is $\dot{Q} = \dot{m}c_p\Delta T$. This results in a flow rate of **1.7 GPM per kg of battery. This is an oversized water requirement, as shown below.**

12.2.2 Alternative Strategy for Sizing the Water Requirement: Preventing the Peak HRR Altogether

There are minutes of opportunity to simply cool the cell and avoid the peak event altogether. Recall from Figure 20 that a Li-ion battery smolders for minutes before eventually failing. Also recall from Figure 28 that the metal enclosure around a battery system can provide a window as long as 60 minutes to respond to a fire. Thermal runaway risk builds, but can be arrested by cooling and preventing the battery from reaching temperatures near 120°C. A strategy in the marine sector is exactly this: cool the battery and prevent thermal runaway temperatures from ever being reached, resulting in very benign cell failure even during aggressive overcharge. [33]

Therefore the extinguishing strategy should be arrest the climbing temperatures before they reach the transition temperature at 120°C. This more practical approach takes into account that automatic fixed suppression systems typically lack the intelligence to sense and trigger according to specific gas species or gas emission rates; i.e., they are discharged upon detection of smoke via a sensor that is generally sensitive to multiple particulate and hydrocarbon species. As a result, fixed suppression will trigger very early in the cell failure process. *This would be the case for all battery types tested*, as smoldering and gaseous emissions from the plastics used for containment began as early as 60°C. Just the fumes from the plastics may be enough to trigger a smoke alarm.

If the module has adequate cascading protections and a 1-hour fire rating, there is an opportunity to contain the cell failure and avoid the issue of oversizing the water requirement to the peak and instead size the water requirement to the battery mass.

As a result the water calculation is simplified by sizing the water flow to the battery mass rather than the HRR at thermal runaway. This strategy is only valid if the cascading protections are demonstrated to contain single cell failures and prevent cascading from cell to cell and module to module, and the fire rating of the system provides adequate time to address an external fire.

Following this method, the energy to be removed from the system is:

$$Q = mc\Delta T$$

[8] Simulated as phenolic due to its specific heat which is near the average of the battery composition by material

And thus the thermal equilibrium requirement is:

$$Q_{water} = Q_{cell}$$

For a 1 kg battery cell with an estimated composite specific heat similar to phenolic (1.4 kJ/kg˚C), and a temperature change of 525ºC – 25ºC = 500ºC, the energy of heat transferred is 700 kJ. This calculation neglects the additional removal of heat by water from the heat of vaporization, which is addressed below.

The specific heat of water is 4.1 kJ/kg˚C. The objective is to use the minimum amount of water before water flashes into steam. If we target a volume of room temperature water necessary to prevent the water from flashing off into steam, we assume ΔT = 70ºC (70+25 = 95ºC, or just under the boiling point). This translates to

$$m_{water} = 700\ kJ\ /\ (4.1\ kJ/kg^oC * 70^oC) = 2.43\ kg$$

This states that 2.43 kg of water is required to cool a 1 kg battery from 500ºC to 25ºC, and the water will have risen in temperature to 95ºC. This calculation should be very conservative, as it neglects the vaporization of water into steam and assumes the entire mass of the battery is contributing to the heat.

The density of water is 3.7 kg/gal, and therefore the theoretical conservative minimum volume of water required is **0.65 gal**. However recall that this reaction occurs over 1-3 minutes during the peak, and up to 40 minutes over a slow duration, and therefore the **gallons per minute required is 0.02-0.6 GPM/kg with the latter being conservatively sized to still address the peak.** The major factors driving the GPM/kg requirement are the battery mass and the duration of the event.

The water requirements need not be excessive if the battery system employs simple, industry proven safety measures such as an external fire rating and cascading protections between cells and modules. Most of the batteries tested had masses from 0.5-1.5 kg, with one battery being particularly large at 6 kg, which skews the average to 2.8 kg and therefore makes this calculation more conservative. The values in the table are probabilistic and the resulting distribution of water flows is shown in Figure 31. The skewness of the distribution demonstrates that **the theoretical minimum water requirement mean is actually 0.019 GPM/kg**, or very near the minimum.

12.2.3 Additional Consideration: Heat of Vaporization

When the heat of vaporization of water is included, the water volume requirement is further reduced. The latent heat of vaporization is the energy required to accomplish the phase change from liquid to gas. This property is given in kJ/kg and there is no change of temperature to make the transition at 100º C at atmospheric pressure. This factor is important is because the latent heat of vaporization is larger than the energy required to heat water from 25 to 100º C.

The required energy to heat water from 25º C and then vaporize to steam at 100ºC is:

$$E = mC\Delta T + m\Delta H_v$$

The specific heat of water C is 4.187 kJ/kgC and the latent heat of vaporization ΔH_v is 2257kJ/kg. Using these numbers, the energy required to heat and boil one kilogram of water from 25° C is:

$$E = 1kg * 4.187 * (100 - 25) + 1 * 2257$$

$$314kJ + 2{,}257kJ = 2{,}571kJ$$

It can be seen from the calculation that the latent heat of vaporization is 7x greater than the energy required to heat from 25-100° C. This is important for cooling considerations because the heat energy of the fire is transferred from the fire to the heating and boiling of water; water withdraws energy from the fire, reducing its destructive power and energy. Every kilogram of room temperature water that that is heated and flashed into steam draws 2,571 kJ from the fire.

Energy is most efficiently drawn from the fire when water contact is as complete as possible. The method of delivery for the water will affect this contact efficiency such as mist, spray, and jet. Access to the deepest seated batteries will govern the water contact efficiency as well. When more water is in contact with the hot surfaces of the battery, the rate of the water-to-steam conversion process increases, which saps energy from the fire and reduces overall temperature as a result.

Expanding on the prior section, if the following assumptions are reconsidered with the inclusion of latent heat of vaporization, the calculation follows:

$$mc\Delta T + m\Delta H_v = Q_{cell}$$

Where Q_{cell} = 700 kJ. Therefore for 1 kg of battery cell:

$$m_{H2O} = Q_{cell} / (c\Delta T + \Delta H_v) = 700\ kJ / (4.1\ kJ/kg\ ^oC * 75\ ^oC + 2257\ kJ/kg)$$

$$= 700\ kJ / (307.5\ kJ/kg + 2257\ kJ/kg) = \mathbf{0.27\ kg}$$

Using the conversion factor 3.7 kg/gal, the resulting water volume is 0.07 gal. Again assuming 1-3 minutes of battery burn duration, and up to 40 minutes for a slow duration failure, the water requirement is 0.07 gal over 1-40 minutes or **0.001-0.07 GPM per kilogram of battery. Note that this requirement is nearly 10x less than the thermal mass balance calculation in the previous section.** The latent heat of vaporization is therefore a significant contributor to the cooling of the battery fire.

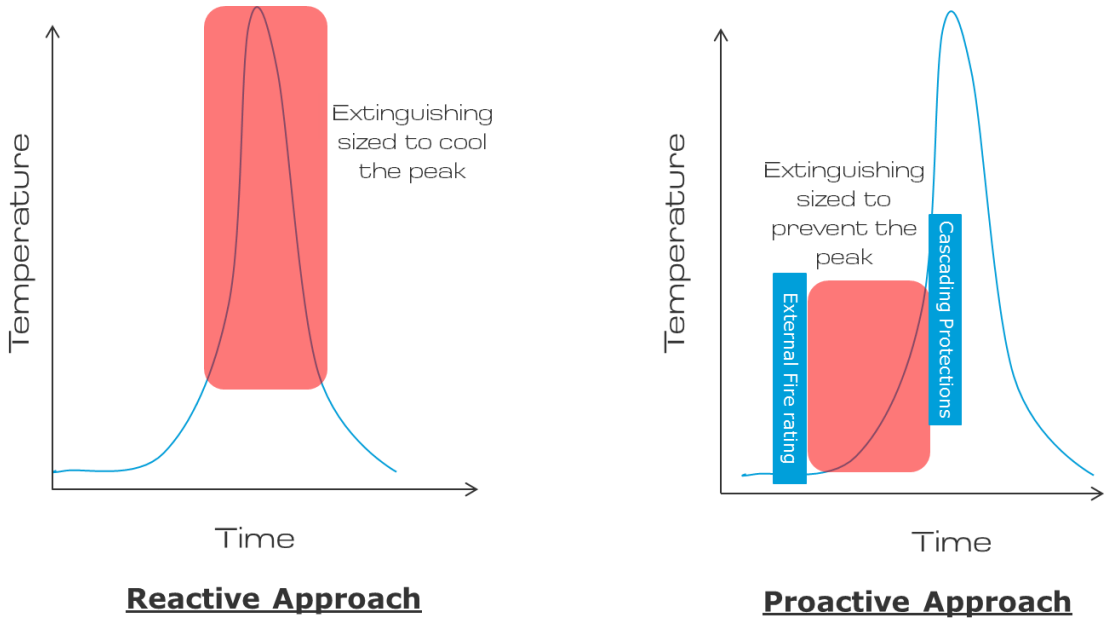


Figure 34 **A reactive cooling approach requires an oversized water flow requirement; whereas a system-level proactive approach enables a reduced water requirement.**

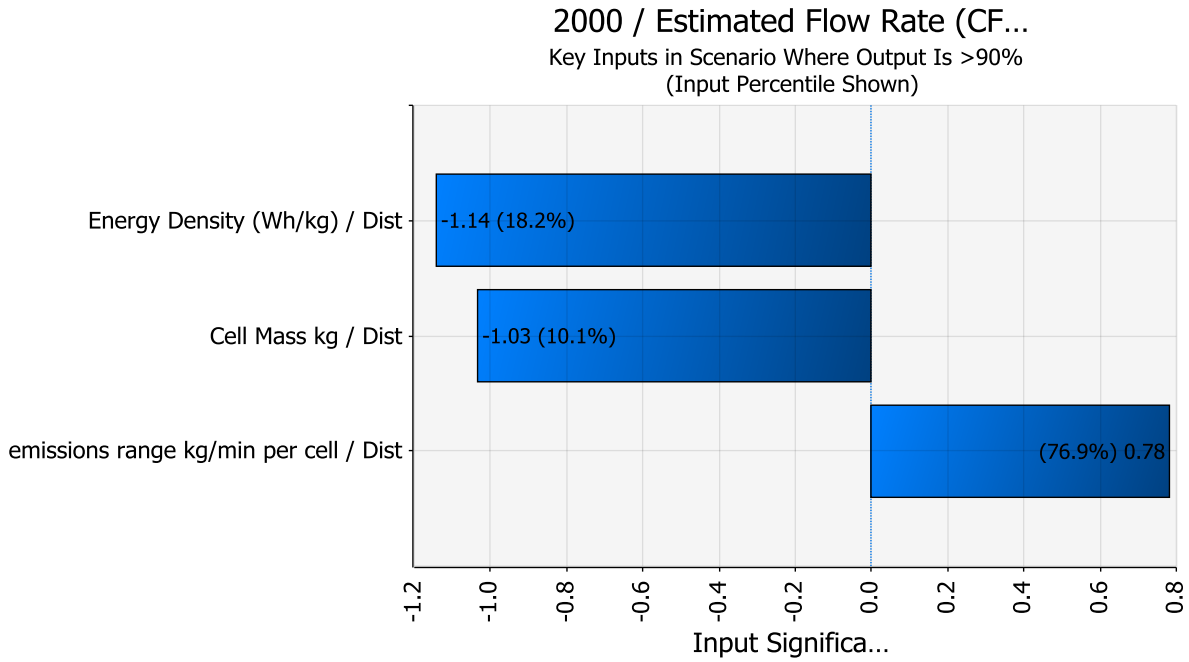


Figure 35 **Regression coefficients of the ventilation requirement.**

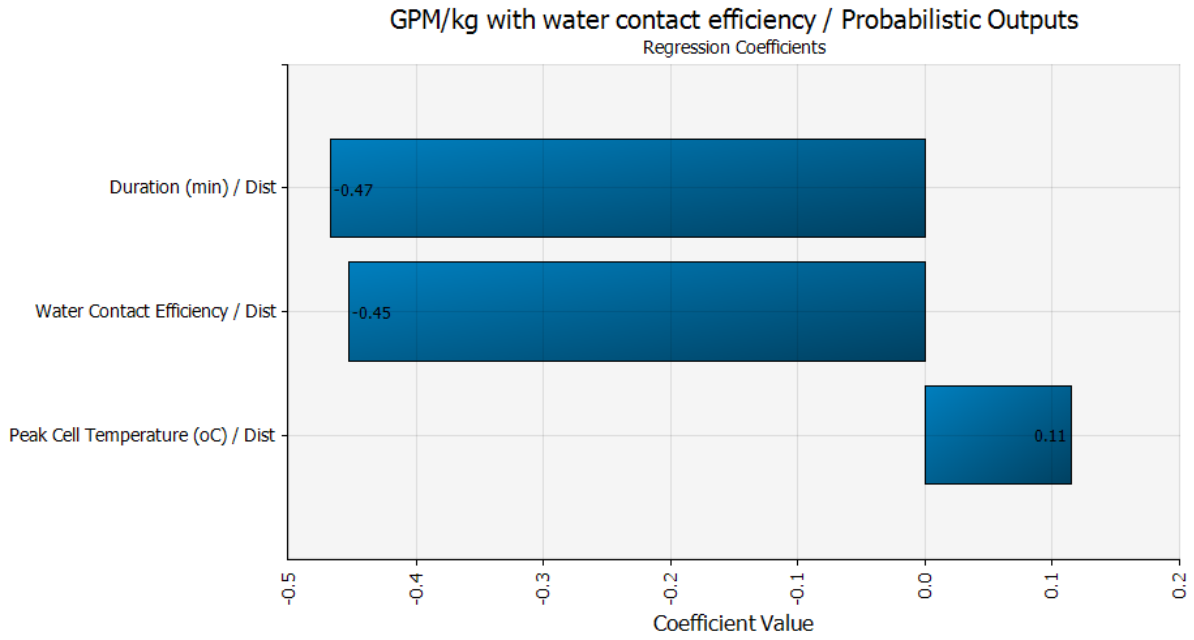


Figure 36 **Regression coefficients for the water flow rate in GPM/kg demonstrate that the duration of the event and the water contact efficiency are the strongest drivers in reducing the water requirement.**

12.2.4 Summary of Water Extinguishing Calculations

It can be seen in Table 17 that sizing the water requirement to the peak HRR leads to a 4-170x oversizing of the water extinguishing system, when proactive and integrated safety approaches are more efficient and reduce the water requirement.

The water contact efficiency of the extinguishing method is highly relevant to the overall cooling effectiveness. The calculations demonstrate physically possible water flow rates, however the testing is the most telling. As testing progressed, DNV GL was able to reduce the water requirement from 1.7 GPM/kg at the module level to 0.1 GPM/kg. Conservative factors accounting for water contact efficiency have resulted in DNV GL's recommendations in Table 9.

Table 17 **Summary of methodologies and results of the water requirement calculation.**

Method	Water Requirement (GPM/kg)	Cross Reference
Module Testing	0.1 – 1.7	Figure 12 on page 17
Calculated by Peak HRR	1.7	Page 69
Calculated Minimum Static Thermal Mass Balance	0.015	Page 51, Table 7
Calculated Time-Dependent Thermal Mass Balance	0.02 - 0.6	Page 69
Calculated by Thermal Mass Balance and the Latent Heat of Vaporization of Water	0.001 – 0.07	Page 70

Based on the testing results and the calculations, 0.07 GPM/kg (including latent heat of vaporization) and 0.1 GPM/kg (observed in testing a multi-module configuration) brackets a significant range in heating and cell failure rate scenarios. A value of 0.1 GPM/kg appears to be a highly conservative extinguishing rate as it does not account for the added benefit of latent heat of vaporization and it provides a substantial compensation for water contact efficiency.

12.3 Why Bowtie Models?

Cell level safety and system level safety are two different things. Assessing the risk of external abuse factors can be accomplished with a risk analysis at the site. This technique permits the visualization of all possible threats that may cause a top event, such as battery failure, to occur. Putting barriers in place to prevent such events may increase safety of the system overall. The diagram illustrates a generic battery failure model, illustrating that a number of threats (left side of the diagram) can be prevented from leading to the top event – which is loss of battery control – with barriers in place such as active monitoring and proactive controls.

An example shown is mechanical damage by the red arrows progressing from the left of the diagram to the right. In this example, there may be monitoring methods in place that did not react quickly enough to identify and prevent consequences of mechanical damage, and other barriers (such as physical barriers) may have failed. If these barriers are breached and the top event occurs, then a possible consequence is thermal runaway. There may also be reactive controls such as fire alarms, automatic module disconnects, or emergency cooling systems to draw heat from the battery before the thermal runaway threshold is reached. Either side of the Bowtie model may be expanded into multiple threat or consequence layers, depending on the detail of the model.

The Bowtie model is the highest level analysis that can be done and may be performed in tandem with or in lieu of a failure mode effects and criticality analysis (FMECA). The FMECA process involves a listing of all possible failure modes and a relative ranking of the probability of their occurrence. The Bowtie model adds a visual representation of the incident paths, the consequence of their occurrence, the barriers that are in place to prevent

the occurrence, and the escalation factors that can either defeat barriers or increase the probability of the event occurring. Escalation factors are typically included on the left hand side of a Bowtie model and demonstrate how outside factors increase the likelihood of a barrier failure. Barrier defeating mechanisms can occur on either side of the top event in the figure, but are more commonly included in the right hand side. The list of possible failure modes in the FMECA analysis is a rank order list of all possible incident pathways diagramed in the Bowtie model. Thus the Bowtie model is descriptive and qualitative in nature, while the FMECA analysis is more quantitative. The Bowtie output can easily be converted to a FMEA output and vice versa. Together, the Bowtie and the FMECA listing can be used to address risks and outline recommendations for improvement in safety systems.

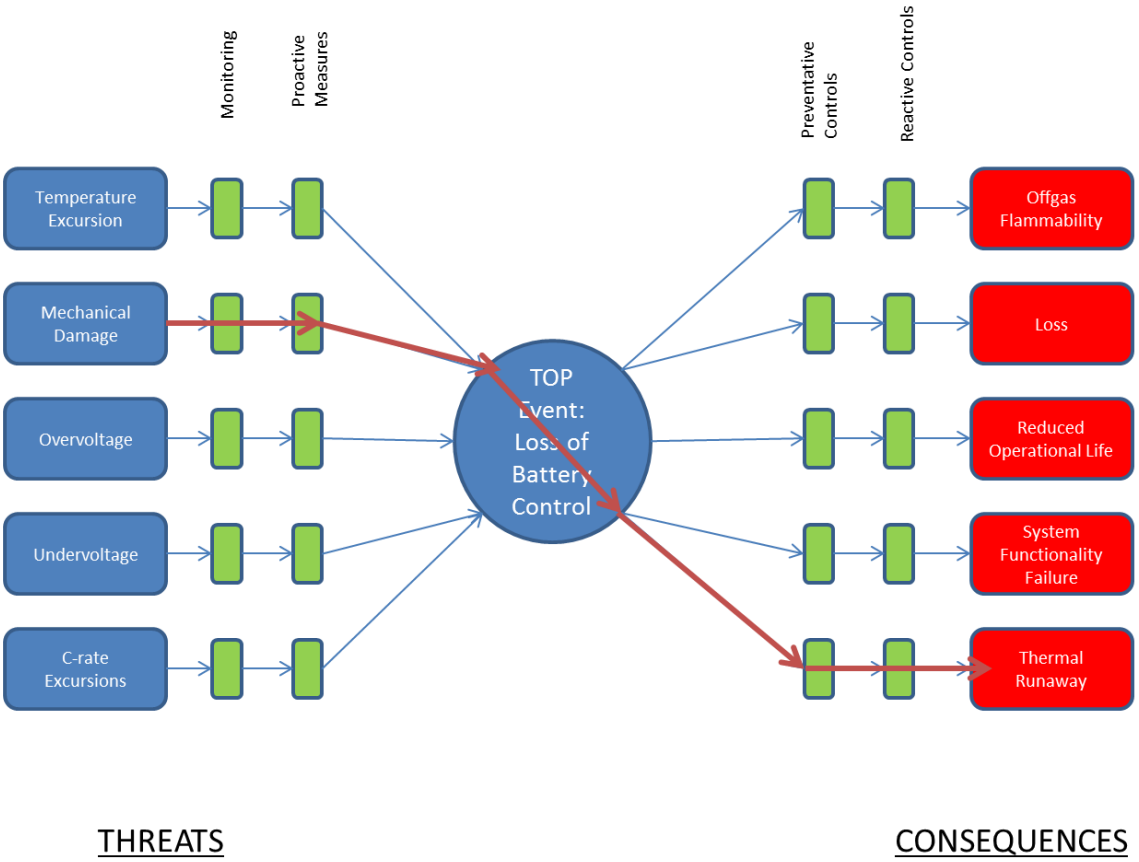


Figure 37 **BowTie analysis permits the visualization of threats to a top event, such as loss of battery control, and ties these threats to consequences.**

12.4 Heat Load from Li-ion Battery Failures

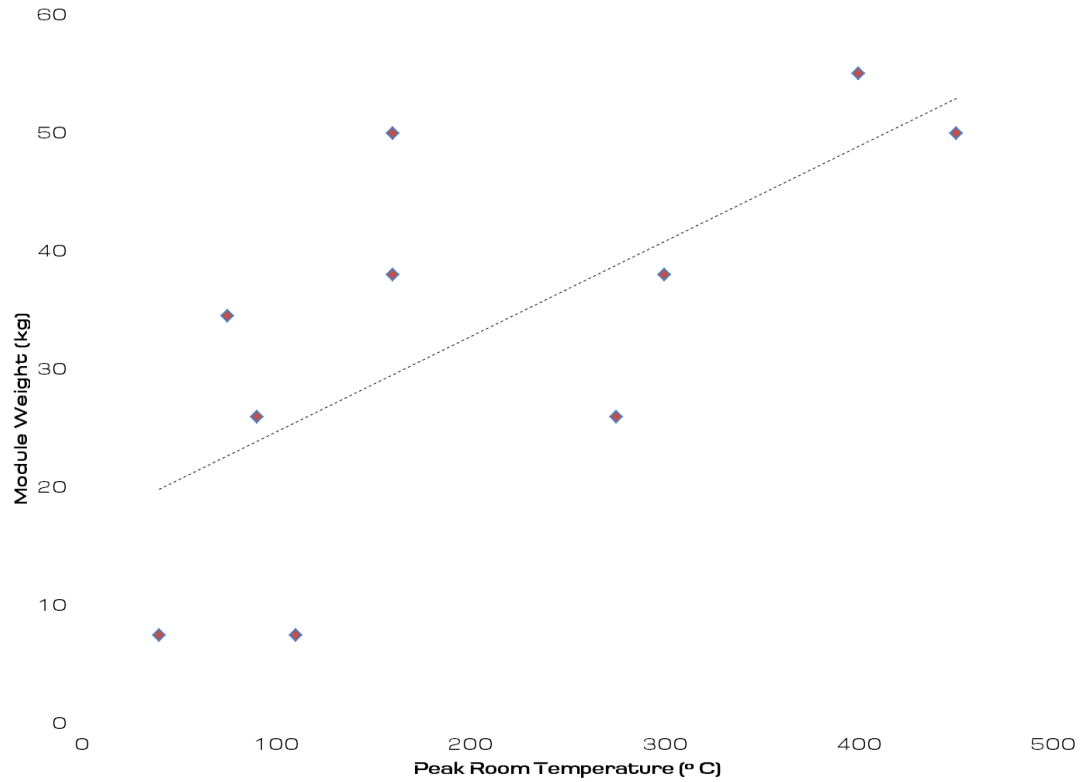


Figure 38 **Battery weight and the peak room temperature are positively correlated.**

13.0 APPENDIX 3: TESTING PLAN AND APPROACH

The total project scope for the Consolidated Edison-New York State Energy Research and Development Authority (NYSERDA) BESS program is shown below. It includes four project tasks with a final report, which also includes the development of guidelines and training materials.

Literature Review

A literature review concisely summarizing the findings from previous safety testing conducted on the specific battery chemistry families tested in this scope of work. Additionally, a review of sodium sulfur and nickel sodium chloride batteries, not being tested in this scope of work, was completed.

Chemistries Participating in the Program

1. **NCM (4 vendors)**
2. **$LiFePO_4$ (2 vendors)**
3. **LTO**
4. **Lead Acid**
5. **Vanadium Redox**
6. **An additional Li-ion chemistry described as BM-LMP**

Small Scale Testing Parameters Measured

1. Heat release rate
2. Species and rate of release of gasses liberated during a burn and as a result of application of suppression agents
3. Species and volume of liquids or solids released during a burn and as a result of application of suppression agents
4. Perform limited suppression agent testing of a small number of suppressants: Water, F-500, FireIce®, and PyroCool®. Testing of suppression release rates for water, or if water is deemed ineffective or unsafe the next best candidate suppressant identified, will also be performed.
5. Observe for presence of electrical arcing or mini-explosions and post burn re-ignition

Computer Modeling

Computer modeling was used to extrapolate small scale burn test results to larger scale fire scenarios involving battery racks. A model at the system scale (rack level) was constructed for each of the chemistries tested. Model predictions were validated through comparison with burn testing of small units.

Final Report

The final report (this document) includes the following for each family of chemistries: findings from the literature review, results from the small scale cell level tests, results of the system size modeling, an assessment of risk at the system scale, effectiveness of extinguishers and techniques, and any other code relevant findings that emerge. First responder training materials and guidelines are also a deliverable from this report.
The testing program is designed to address two hazards: 1) toxic or flammable off gases as well as solids and liquids released during the burn and during fire suppression, and 2) heat load and release rate. The testing program is designed to determine what toxic and flammable gases are present as a function of chemistry and when they are released during the fire. The heat release data provides scalable data as a function of chemistry to determine passive fire protection requirements (as part of container or room design), as well as the quantity and duration of release for fire extinguishers.

13.1 Design of Experiments

Extinguisher tests were performed on cells that demonstrated the best burn properties for testing. All module tests were also subject to extinguishing. Vanadium redox and lead acid electrolyte tests were performed in an autoclave (without direct fire) to examine the volatility of the electrolyte in high heat conditions. There were seven donated battery chemistries to the program as well as two volunteer participants.

13.2 Combustion Gas and Particulate Matter Analysis

Of chief concern to the fire services and first responders are CO, O_2, H_2S and LEL/combustible values. There are additional risks of fluoridated compounds (F_2 and HF), SO_2, VOCs and H_2. DNV GL monitored these during the tests using an *FTIR* gas analyzer from Gasmet (Figure 39) as well as gas chromatography bags for post-test analysis. Additionally, coupon sampling was performed to measure ash, soot and particulate matter emitted and deposited during the fire, in addition to analysis of the battery debris. These coupons and debris measurements will inform hazmat risks during overhaul and after fire ground operations.

13.3 Heat Release Rate

ASTM[9] tests were modified and combined to measure the heat release rate of the batteries. Heat release rates as a function of time and fire stage were calculated using a thermopile built around the battery as well as thermocouples around the chamber including at inlet and outlet. DNV GL was able to quantify *heat release rate* (kJ/s or kW or BTU/min) and *fire load per mass of battery (BTU/lb. or kWh/kg)*. As standardized sizes and footprints do not yet exist, these parameters provide better insight into the fire hazard than the typical ASTM approach per unit area (per ft^2 or per m^2).
The power and energy of the fire per unit mass of battery provided data to estimate the required extinguisher flow rates or mass. The heat removal potential of the extinguisher was estimated by calculation prior to the extinguisher test by matching the battery mass to the required extinguisher mass ($mc\Delta T$) with an added safety margin.

13.4 Procedure

The setup for all tests is depicted in the figure below. Additionally, all batteries underwent multiple tests and state of charge (SOC) was varied to account for differences in energy levels[10]. Battery voltages were measured during and after each test to determine their potential for re-ignition, if any.

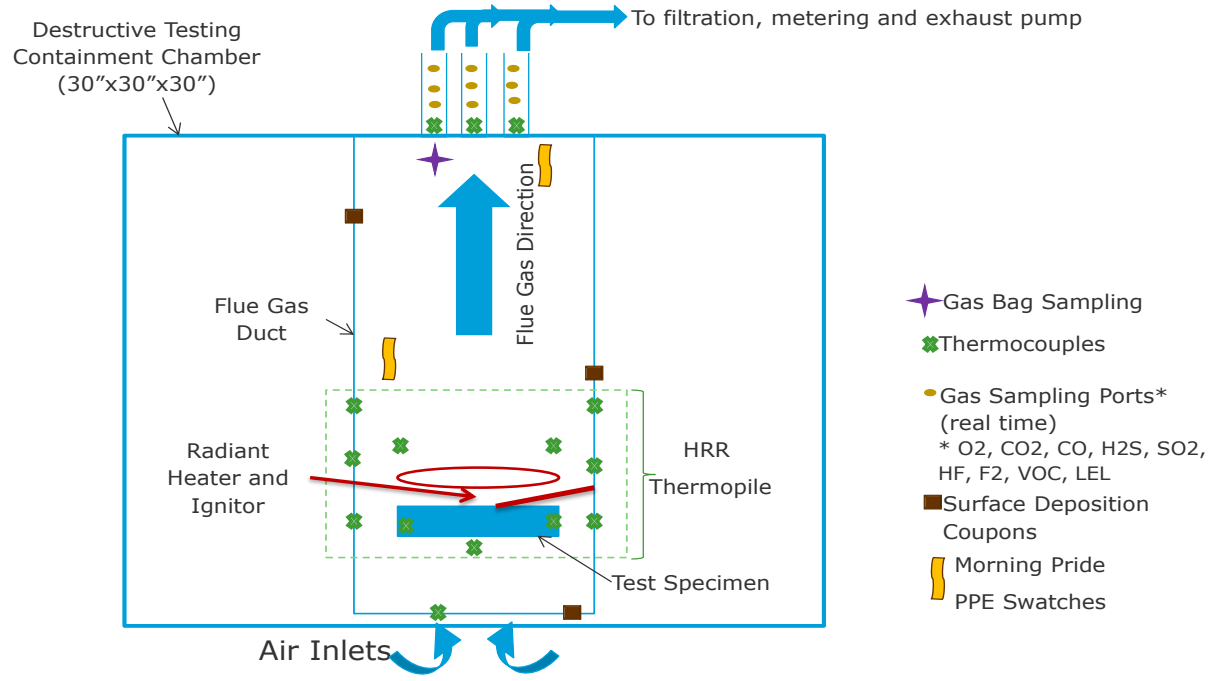


Figure 39 **Large abuse test chamber design for battery fire and extinguishing testing.**

[9] ASTM 906: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using a Thermopile Method, ASTM 1354: Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter, and ASTM E1623: Standard Test Method for Determination of Fire and Thermal Parameters of Materials, Products, and Systems Using an Intermediate Scale Calorimeter (ICAL)
[10] Current plan is for testing at 50% and 100% SOC

13.4.1 Testing Procedure: Lithium Battery Gas Sampling, No Extinguishing[11]

Heating was accomplished with a radiative electrical heating element and hot point ignitor to heat the lithium batteries to the point of sublimation or off gassing and ignite any flammable gases produced or released. Testing was recorded with regular image and thermal video.

- Step 1: Put battery in chamber, verify function of all sensors. Begin filming.
- Step 2: Compile gas sensor baselines, capture ambient **gas bag** for baseline
- Step 3: Initiate radiative heating element. Monitor temperature battery.
- Step 4: **Gas bag** sample. Monitor temperature and gas sensors. Heat rise may last 10 minutes to one or more hours. Monitor for flammables such as hydrogen and VOCs.
- Step 5: Record increasing heat with thermocouple measurements. **Gas bag sample** as appropriate
- Step 6: Monitor for peaking heat. **Gas bag sample** as appropriate. Monitor gas sensor and thermocouples. This may occur in durations < 5 minutes.
- Step 7: Monitor decaying heat. **Gas bag sample** as appropriate. Monitor and record gas sensor and thermocouple data.
- Step 8: Monitor decaying heat until temperatures reach safe levels. May take hours or overnight.
- Step 9: Once battery remains are deemed safe, collect surface swabs, coupons, PPE swabs, and secure battery in flame resistant enclosure for posttest observation.
- Step 10: Battery remains will be secured and monitored (video and temperature) for 24 hours. If re-ignition does not occur, batteries will be observed and intentionally re-ignited the following day to observe remaining fire load.[12]

13.4.2 Testing Procedure: Lithium Battery Gas Sampling With Extinguishing[13]

With basic off gas testing complete, a range of extinguishing agents as well as water were tested for effectiveness and reaction. Heat release rates were used to estimate required extinguisher flow rates and volumes. Battery remains were stored in flame resistant enclosures for 24 hours and monitored with video and thermocouples for re-ignition. Testing was video recorded with regular image and thermal video.

- Step 1: Put battery in chamber, verify function of all sensors. Begin filming.
- Step 2: Compile gas sensor baselines, capture ambient **gas bag** for baseline
- Step 3: Initiate radiative heating element. Monitor temperature battery.
- Step 4: **Gas bag** sample. Monitor temperature and gas sensors. Heat rise may last 10 minutes to one or more hours. Monitor for flammables such as hydrogen and VOCs.
- Step 5: Record increasing heat with thermocouple measurements. **Gas bag sample** as appropriate

[11] Items in bold are actions to be determined as a function of testing progress – requires attentive monitoring by technician.
[12] No such events were observed.
[13] Items in bold are actions to be determined as a function of testing progress – requires attentive monitoring by technician.

- Step 6: *Execute extinguisher based on recommended extinguisher use*[14]*. Monitor and record temperature and gas sensors.* **Gas bag sample** *immediately after.*
- Step 7: Monitor decaying heat. **Gas bag sample** as appropriate. Monitor and record gas sensor and thermocouple data.
- Step 8: Monitor decaying heat until temperatures reach safe levels. May take hours or overnight.
- Step 9: Once battery remains are deemed safe, collect surface swabs, coupons, PPE swabs, and secure battery in flame proof enclosure.
- Step 10: Battery remains will be secured and monitored (video and temperature) for 24 hours. If re-ignition does not occur, batteries will be observed and intentionally re-ignited the following day to observe remaining fire load. Battery will be allowed to burn out on its own to ensure complete destruction and remove change of re-ignition.

13.4.3 Testing Procedure: Flow and Lead Acid Battery Electrolyte (liquid)

A sealed autoclave with heater was used to contain the test. A sample of either liquid (vanadium redox) or acid soaked glass mat (Pb AGM) was placed in a smaller container within the autoclave. The autoclave was heated and off gases measured.

- Step 1: Put electrolyte (liquid or wet glass mat) in autoclave, verify function of all sensors. Electrolyte for each test will be taken from batteries charged to different SOCs to maintain SOC variance in testing.
- Step 2: Compile gas sensor baselines, capture ambient **gas bag** for baseline before heating
- Step 3: Initiate radiative heating element. Monitor liquid and ambient temperature.
- Step 4: **Collect gas bag sample**. Monitor temperature and gas sensors. If electrolyte is not expected to heat exothermically, monitor that heat rise is consistent with controller setting. Monitor for flammables such as hydrogen, VOCs, and sulfuric gases (SO_2 and H_2S).
- Step 5: Record increasing heat with thermocouple measurements. **Gas bag sample** as appropriate
- Step 6: Continue heating to predetermined temperature[15]. **Collect gas bag sample** as appropriate. Monitor gas sensor and thermocouples. This may occur in durations < 5 minutes.
- **Option Step 7A:** *Attempt spark ignition. If fluid vapor is known to be inert, this step shall be skipped.*
- **Option Step 7B:** *Execute extinguisher. Monitor and record temperature and gas sensors*. **Gas bag sample** *immediately after.*
- Step 8: Monitor decaying heat. Gas bag sample as appropriate. Monitor and record gas sensor and thermocouple data.

[14] Different extinguishers, including automated extinguishers, have different guidelines for use and deployment. Execution of extinguisher will be based on FDNY recommendations and use cases.
[15] Peak temperature for flow batteries may vary. Temperature may be based on common class A/B/C/D fire temperatures to determine fluid behavior during boiling or combustion. Max testing temperature may specified by NYSERDA or Con Ed.

- Step 9: Monitor decaying heat until temperatures reach safe levels. May take hours or overnight.

13.4.4 Testing Procedure: Lead Acid Battery Lead (solid)[16]

As multiple risks exist with burning lead and lead oxides, a different approach was taken to test the lead acid batteries. This test involved burning a small amount of lead in a simple, class "A" fire[17] to determine the amount of lead vaporized and deposited on the surrounding surfaces. This testing took place in a tightly contained enclosure to minimize lead contamination. As class "A" fires are not uncommon to the fire service, the focus was to quantify the risk posed by lead and lead oxides.

- Step 1: Place small, known quantity of lead plate and lead oxide in class A material. Material will be taken from batteries charged to different SOCs to maintain SOC variance in testing.
- Step 2: Place coupons and ensure swab areas are clean, ensure container sealed except for air inlets
- Step 3: Ignite class "A" materials
- Step 4: **Collect gas bag sample**, monitor temperature. Allow fire to burn out on its own.
- Step 5: Let container sit, allowing lead vapor to settle
- Step 6: Open container with appropriate PPE, collect sample coupons, all solid waste, and surface swabs.
- Step 7: Reseal container for disposal or re-use.

[16] No HRR will be performed on the lead acid or flow components as the energy storage portions of these technologies are non flammable, only the balance of system will add to the fire load.
[17] Likely PTFE or PET plastic or basic construction materials (wood).

Table 18 **Battery burn tests without extinguishing, combustible batteries only[18]**

Stage of Fire	Gases Analyzed	Information Gained From Gas Analysis	Information from Coupons and PPE samples	Information from Heat Release Rate	Testing Standards used
Before fire	(Background)	Background gases, baseline measurement. Coupon and turnout gear prior to damage.	Turnout gear "as is" condition. Bare coupons before contamination		
Incipient/ Ignition	Sensors: CO, CO_2, O_2, H_2S, HF, F_2, SO_2, VOCs, H_2, LEL Gas Chromatography Bags, post test analysis: VOCs, fluoride compounds, CO, CO2, heavy metals[19]	Toxic or flammable gases during fire incipient stage.		Early stage heat release rate, potential combustibility of radiantly heated batteries	Modified ASTM 906 (thermopile); modified ASTM 1354 (O2 consumption calorimetry) ; modified ASTM 1623 (intermediate scale calorimetry)
Rising heat	Same	Evolution of gases as fire climaxes		Accelerating heat release rate, O2 consumption, CO production[20], thermopile temperatures	Same
Heat Climax	Same	Gas composition during fire climax		Peak heat loads, O_2 consumption	Same
Decaying fire	Same	Gas composition as fire evolves and decays		Heat decay rate	Same
Fully decayed fire	Same	Background gases after fire has decayed completely		Determination of potential for re-ignition	Same
Debris	(Background)	Residues and HAZMAT conditions.	Residues and HAZMAT considerations, degradation to PPE	Turnout gear after exposure. Coupons for SEM/EDAX/XRD. Ion chromatography may be performed with swabs from turnout gear.	

[18] See below test procedures for flow battery electrolytes
[19] If contained within battery, based on MSDS
[20] Compliments gas analysis

Table 19 **Battery burn or heat[21] tests with extinguishing**

Stage of Fire	**Gases Analyzed**	**Information Gained From Gas Analysis**	**Coupons and PPE samples**	**Heat Release Rate**	**Testing Standards Used**
Before fire	(Background)	Background gases, baseline measurement. Coupon and turnout gear prior to damage.	Turnout gear "as is" condition. Bare coupons before contamination		
Incipient	Sensors: CO, CO_2, O_2, H_2S, HF, F_2, SO_2, VOCs, H_2, LEL Gas Chromatography Bags, post test analysis: VOCs, fluoride compounds, CO, CO2	Toxic or flammable gases during fire incipient stage.		Early stage heat release rate, potential combustibility of radiantly heated batteries	Modified ASTM 906 (thermopile); modified ASTM 1354 (O2 consumption calorimetry) ; modified ASTM 1623 (intermediate scale calorimetry)
Rising heat	Same	Evolution of gases as fire climaxes		Accelerating heat release rate, O2 consumption, CO production[22]	Same
Heat Climax	Same	Gas composition during fire climax		Peak heat loads, O_2 consumption	Same
Extinguisher Deployment	**Same[23]**	**Changes in gas composition as a result of extinguishing**	**Changes in residues as a result of extinguishing, HAZMAT impact**	**Heat removal rate[24] achieved with extinguisher**	Same
Decaying fire	Same	Gas composition as fire evolves and decays. **Changes in gas composition as a result of extinguishing**		Heat decay rate, **ability to sustain cooling with extinguisher**	Same
Fully decayed fire	Same	Background gases after fire has decayed completely. **Changes in gas composition as a result of extinguishing.**		**Accelerated cool down rate with extinguisher**	
Debris	(Background)	Residual fumes. **Changes in gas composition as a result of extinguishing.**	Residues and HAZMAT considerations. **Changes in residues as a result of**	Turnout gear after exposure. Coupons for SEM/EDAX/XRD.	

[21] Flow battery electrolytes may be heated to achieve the simulation of external heating due to a fire. Some flow battery electrolytes are not expected to be exothermic.
[22] Complements gas analysis
[23] To be compared against benchmark "without extinguishing"
[24] Evaluation of heat management as a result of extinguishing will inform firefighter extinguisher guidelines

			extinguishing, HAZMAT impact, degradation to PPE	Ion chromatography may be performed with swabs from turnout gear. **Change in residues as a result of extinguishing. Liquid samples for IC will determine if extinguisher liquid residues are toxic.**	

13.5 Large Scale Burns

Upon completion and evaluation of the small scale burn tests, and following or in parallel to the modeling of the data from those tests, large scale tests, at the module or pack level or bigger, were conducted to verify modeling results and determine unforeseen risks posed by larger systems. This phase of testing was performed in conjunction with Rescue Methods (RM) and involved the complete ignition of a full system or subsystem of an energy storage unit comprised of cells of the previously tested chemistries. These tests took place in a designated burn trailer used for the development of guidelines and training material for first responders as well as testing the effectiveness of extinguishing agents on a larger scale. Test units were secured overnight for observation of re-ignition and then intentionally re-ignited 24 hours later to determine remaining fire load as well as to ensure complete destruction for safe disposal. Samples of the remaining battery, as well as residual run-off from the extinguisher and coupon samples from within the burn area were collected after each test. Thermal and regular video was taken.

About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification, technical assurance, software and independent expert advisory services to the maritime, oil & gas and energy industries. We also provide certification services to customers across a wide range of industries. Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. Operating in more than 100 countries, our professionals are dedicated to helping customers make the world safer, smarter and greener.

ATTACHMENT 11

DESCRIPTION AND LOCATION OF THE ANGELENO BESS PROJECT PROVIDED BY AVANTUS CORPORATION.

Angeleno Battery Energy Storage System Project

April 21, 2023

Project Location

- Avantus proposes to construct the Angeleno Battery Energy Storage System (BESS) on up to 68 acres of private property located along Soledad Canyon Road, approximately one mile west of the Southern California Edison (SCE) Vincent substation, within unincorporated Los Angeles County, California.

Project Size and Capacity

- The BESS would be constructed with up to 1,150 Megawatts (MW) of Battery Storage
- The BESS would likely have a 4-hour duration -- 4,600 Megawatt hours (MWh) of Capacity

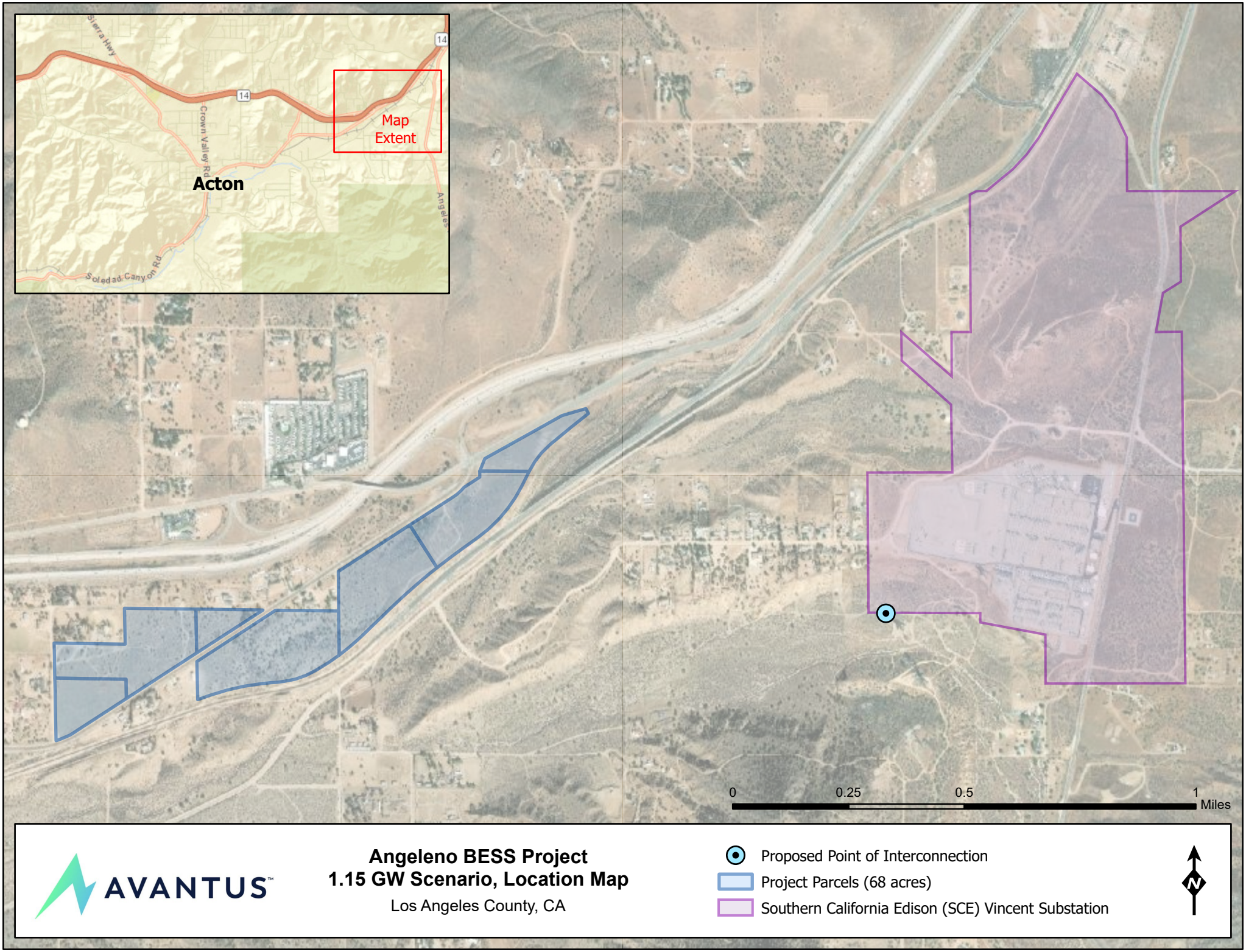
Interconnection and Major Project Components

- The BESS would connect to the SCE Vincent Substation with a 500kV Transmission Line
- The BESS would include batteries, transformers, inverters, a project switchyard, and appurtenant facilities (e.g., access roads and gates, water tanks, etc.).

Current Project Status

- Conducting baseline technical studies
- Preparing draft project application materials
- Initiated coordination with:
    - Los Angeles County Planning Department
    - Los Angeles County Fire Department

1801 Century Park East, Suite 700
Los Angeles, CA, 90067
+1 (323) 525-0900
www.avantus.com



AVANTUS™

Angeleno BESS Project
1.15 GW Scenario, Location Map
Los Angeles County, CA

Proposed Point of Interconnection
Project Parcels (68 acres)
Southern California Edison (SCE) Vincent Substation

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ATTACHMENT 12

ANGELENO BESS LARGE GENERATOR INTERCONNECTION AGREEMENT.

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LARGE GENERATOR INTERCONNECTION AGREEMENT AMONG

16DO 8ME LLC
AND

SOUTHERN CALIFORNIA EDISON COMPANY
AND

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

PROJECT: Angeleno Solar Farm - TOT903 (Q1625)

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LARGE GENERATOR INTERCONNECTION AGREEMENT

16DO 8me LLC

SOUTHERN CALIFORNIA EDISON COMPANY

CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

THIS LARGE GENERATOR INTERCONNECTION AGREEMENT ("LGIA") is made and entered into this 28th day of January 2022, by and among 16DO 8me LLC, a limited liability company organized and existing under the laws of the State/Commonwealth of Delaware ("Interconnection Customer" with a Large Generating Facility), Southern California Edison Company, a corporation organized and existing under the laws of the State of California ("Participating TO"), and California Independent System Operator Corporation, a California nonprofit public benefit corporation organized and existing under the laws of the State of California ("CAISO"). Interconnection Customer, Participating TO, and CAISO each may be referred to as a "Party" or collectively as the "Parties."

RECITALS

WHEREAS, CAISO exercises Operational Control over the CAISO Controlled Grid; and

WHEREAS, the Participating TO owns, operates, and maintains the Participating TO's Transmission System; and

WHEREAS, Interconnection Customer intends to own, lease and/or control and operate the Generating Facility identified as a Large Generating Facility in Appendix C to this LGIA; and

WHEREAS, Interconnection Customer, Participating TO, and CAISO have agreed to enter into this LGIA for the purpose of interconnecting the Large Generating Facility with the Participating TO's Transmission System;

NOW, THEREFORE, in consideration of and subject to the mutual covenants contained herein, it is agreed:

When used in this LGIA, terms with initial capitalization that are not defined in Article 1 shall have the meanings specified in the Article in which they are used.

ARTICLE 1. DEFINITIONS

ADNU shall mean Area Delivery Network Upgrade.

Adverse System Impact shall mean the negative effects due to technical or operational limits on conductors or equipment being exceeded that may compromise the safety and reliability of the electric system.

Affected System shall mean an electric system other than the CAISO Controlled Grid that may be affected by the proposed interconnection, including the Participating TO's electric system that is not part of the CAISO Controlled Grid.

Affiliate shall mean, with respect to a corporation, partnership or other entity, each such other corporation, partnership or other entity that directly or indirectly, through one or more intermediaries, controls, is controlled by, or is under common control with, such corporation, partnership or other entity.

Applicable Laws and Regulations shall mean all duly promulgated applicable federal, state and local laws, regulations, rules, ordinances, codes, decrees, judgments, directives, or judicial or administrative orders, permits and other duly authorized actions of any Governmental Authority.

Applicable Reliability Council shall mean the Western Electricity Coordinating Council or its successor.

Applicable Reliability Standards shall mean the requirements and guidelines of NERC, the Applicable Reliability Council, and the Balancing Authority Area of the Participating TO's Transmission System to which the Generating Facility is directly connected, including requirements adopted pursuant to Section 215 of the Federal Power Act.

Area Deliverability Constraint shall mean a previously identified transmission system operating limit, based on a CAISO interconnection study or transmission planning study and listed on the CAISO website, that would constrain the deliverability of a substantial number of generators if the CAISO were to assign full capacity or partial capacity deliverability status to additional generating facilities in one or more specified geographic or electrical areas of the CAISO Controlled Grid in a total amount that is greater than the TP Deliverability for those areas. May also be a transmission system operating limit that constrains all or most of the same generation already constrained by a previously identified Area Deliverability Constraint.

Area Delivery Network Upgrade shall mean a transmission upgrade or addition identified by the CAISO to relieve an Area Deliverability Constraint.

Area Off-Peak Constraints shall mean a transmission system operating limit that would cause excessive curtailment to a substantial number of Generating Facilities

during Off-Peak Load conditions, as described in Section 6.3.2.2 of Appendix DD and the CAISO Off-Peak Deliverability Assessment posted on the CAISO Website.

Area Off-Peak Network Upgrades (AOPNUs) shall mean a transmission upgrade or addition the CAISO identifies in the Transmission Planning Process to relieve an Area Off-Peak Constraint.

Assigned Network Upgrade (ANU) shall mean Reliability Network Upgrades, Local Off-Peak Network Upgrades, and Local Delivery Network Upgrades currently assigned to the Interconnection Customer. Assigned Network Upgrades exclude Conditionally Assigned Network Upgrades unless they become Assigned Network Upgrades.

Asynchronous Generating Facility shall mean an induction, doubly-fed, or electronic power generating unit(s) that produces 60 Hz (nominal) alternating current.

Balancing Authority shall mean the responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

Balancing Authority Area shall mean the collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.

Base Case shall mean the base case power flow, short circuit, and stability databases used for the Interconnection Studies.

Breach shall mean the failure of a Party to perform or observe any material term or condition of this LGIA.

Breaching Party shall mean a Party that is in Breach of this LGIA.

Business Day shall mean Monday through Friday, excluding federal holidays and the day after Thanksgiving Day.

CAISO Controlled Grid shall mean the system of transmission lines and associated facilities of the parties to the Transmission Control Agreement that have been placed under the CAISO's Operational Control.

CAISO Tariff shall mean the CAISO's tariff, as filed with FERC, and as amended or supplemented from time to time, or any successor tariff.

Calendar Day shall mean any day including Saturday, Sunday or a federal holiday.

Commercial Operation shall mean the status of an Electric Generating Unit or project phase at a Generating Facility that has commenced generating electricity for sale, excluding electricity generated during Trial Operation.

Commercial Operation Date of an Electric Generating Unit or project phase shall mean the date on which the Electric Generating Unit or project phase at the Generating Facility commences Commercial Operation as agreed to by the applicable Participating TO, the CAISO, and the Interconnection Customer pursuant to Appendix E to this LGIA, and in accordance with the implementation plan agreed to by the Participating TO and the CAISO for multiple individual Electric Generating Units or project phases at a Generating Facility where an Interconnection Customer intends to establish separate Commercial Operation Dates for those Electric Generating Units or project phases.

Conditionally Assigned Network Upgrade (CANU) shall mean Reliability Network Upgrades, Local Off-Peak Network Upgrades, and Local Delivery Network Upgrades currently assigned to an earlier Interconnection Customer, but which may be assigned to the Interconnection Customer.

Confidential Information shall mean any confidential, proprietary or trade secret information of a plan, specification, pattern, procedure, design, device, list, concept, policy or compilation relating to the present or planned business of a Party, which is designated as confidential by the Party supplying the information, whether conveyed orally, electronically, in writing, through inspection, or otherwise, subject to Article 22.1.2.

Current Cost Responsibility (CCR) shall mean the Interconnection Customer's current allocated costs for Assigned Network Upgrades, not to exceed the Maximum Cost Responsibility. This cost is used to calculate the Interconnection Customer's Interconnection Financial Security requirement.

Deliverability shall mean (1) The annual Net Qualifying Capacity of a Generating Facility, as verified through a Deliverability Assessment and measured in MW, which specifies the amount of resource adequacy capacity the Generating Facility is eligible to provide. (2) The annual Maximum Import Capability of an Intertie which specifies the amount of resource adequacy capacity measured in MW, that load-serving entities collectively can procure from imports at that Intertie to meet their resource adequacy requirements.

Default shall mean the failure of a Breaching Party to cure its Breach in accordance with Article 17 of this LGIA.

Distribution System shall mean those non-CAISO-controlled transmission and distribution facilities owned by the Participating TO.

Distribution Upgrades shall mean the additions, modifications, and upgrades to the Participating TO's Distribution System. Distribution Upgrades do not include Interconnection Facilities.

Effective Date shall mean the date on which this LGIA becomes effective upon execution by all Parties subject to acceptance by FERC, or if filed unexecuted, upon the date specified by FERC.

Electric Generating Unit shall mean an individual electric generator and its associated plant and apparatus whose electrical output is capable of being separately identified and metered.

Emergency Condition shall mean a condition or situation: (1) that in the judgment of the Party making the claim is imminently likely to endanger life or property; or (2) that, in the case of the CAISO, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the CAISO Controlled Grid or the electric systems of others to which the CAISO Controlled Grid is directly connected; (3) that, in the case of the Participating TO, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Participating TO's Transmission System, Participating TO's Interconnection Facilities, Distribution System, or the electric systems of others to which the Participating TO's electric system is directly connected; or (4) that, in the case of the Interconnection Customer, is imminently likely (as determined in a non-discriminatory manner) to cause a material adverse effect on the security of, or damage to, the Generating Facility or Interconnection Customer's Interconnection Facilities. System restoration and black start shall be considered Emergency Conditions; provided, that Interconnection Customer is not obligated by this LGIA to possess black start capability.

Environmental Law shall mean Applicable Laws or Regulations relating to pollution or protection of the environment or natural resources.

Federal Power Act shall mean the Federal Power Act, as amended, 16 U.S.C. §§ 791a et seq.

FERC shall mean the Federal Energy Regulatory Commission or its successor.

Force Majeure shall mean any act of God, labor disturbance, act of the public enemy, war, insurrection, riot, fire, storm or flood, explosion, breakage or accident to machinery or equipment, any order, regulation or restriction imposed by governmental, military or lawfully established civilian authorities, or any other cause beyond a Party's control. A Force Majeure event does not include acts of negligence or intentional wrongdoing by the Party claiming Force Majeure.

General Reliability Network Upgrade (GRNU) shall mean Reliability Network Upgrades that are not Interconnection Reliability Network Upgrades.

Generating Facility shall mean the Interconnection Customer's Electric Generating Unit(s) used for the production and/or storage for later injection of electricity identified in the Interconnection Customer's Interconnection Request, but shall not include the Interconnection Customer's Interconnection Facilities.

Generating Facility Capacity shall mean the net capacity of the Generating Facility and the aggregate net capacity of the Generating Facility where it includes multiple energy production devices.

Generator Interconnection and Deliverability Allocation Procedures (GIDAP) shall mean the CAISO protocol that sets forth the interconnection and allocation procedures applicable to an Interconnection Request pertaining to a Large Generating Facility that is included in CAISO Tariff Appendix DD.

Generator Interconnection Study Process Agreement shall mean the agreement between the Interconnection Customer and the CAISO for the conduct of the Interconnection Studies.

Good Utility Practice shall mean any of the practices, methods and acts engaged in or approved by a significant portion of the electric utility industry during the relevant time period, or any of the practices, methods and acts which, in the exercise of reasonable judgment in light of the facts known at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition. Good Utility Practice is not intended to be any one of a number of the optimum practices, methods, or acts to the exclusion of all others, but rather to be acceptable practices, methods, or acts generally accepted in the region.

Governmental Authority shall mean any federal, state, local or other governmental, regulatory or administrative agency, court, commission, department, board, or other governmental subdivision, legislature, rulemaking board, tribunal, or other governmental authority having jurisdiction over the Parties, their respective facilities, or the respective services they provide, and exercising or entitled to exercise any administrative, executive, police, or taxing authority or power; provided, however, that such term does not include the Interconnection Customer, CAISO, Participating TO, or any Affiliate thereof.

Governing Independent Study Process Interconnection Studies shall mean the engineering study(ies) conducted or caused to be performed by the CAISO, in coordination with the applicable Participating TO(s), that evaluates the impact of the proposed interconnection on the safety and reliability of the Participating TO's Transmission System and, if applicable, an Affected System, which shall consist primarily of a Facilities Study as described in Section 4.5 of the Generation Interconnection Procedures, a System Impact Study as described in Section 4.4 of the

Generation Interconnection Procedures, or a system impact and facilities study as described in Section 4.4 of the GIDAP.

Hazardous Substances shall mean any chemicals, materials or substances defined as or included in the definition of "hazardous substances," "hazardous wastes," "hazardous materials," "hazardous constituents," "restricted hazardous materials," "extremely hazardous substances," "toxic substances," "radioactive substances," "contaminants," "pollutants," "toxic pollutants" or words of similar meaning and regulatory effect under any applicable Environmental Law, or any other chemical, material or substance, exposure to which is prohibited, limited or regulated by any applicable Environmental Law.

Initial Synchronization Date shall mean the date upon which an Electric Generating Unit is initially synchronized and upon which Trial Operation begins.

In-Service Date shall mean the date upon which the Interconnection Customer reasonably expects it will be ready to begin use of the Participating TO's Interconnection Facilities to obtain back feed power.

Interconnection Customer's Interconnection Facilities shall mean all facilities and equipment, as identified in Appendix A of this LGIA, that are located between the Generating Facility and the Point of Change of Ownership, including any modification, addition, or upgrades to such facilities and equipment necessary to physically and electrically interconnect the Generating Facility to the Participating TO's Transmission System. Interconnection Customer's Interconnection Facilities are sole use facilities.

Interconnection Facilities shall mean the Participating TO's Interconnection Facilities and the Interconnection Customer's Interconnection Facilities. Collectively, Interconnection Facilities include all facilities and equipment between the Generating Facility and the Point of Interconnection, including any modification, additions or upgrades that are necessary to physically and electrically interconnect the Generating Facility to the Participating TO's Transmission System. Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Interconnection Financial Security (IFS) shall mean any of the financial instruments listed in Section 11.1 of the GIDAP that are posted by an Interconnection Customer to finance the construction of facilities or Network Upgrades.

Interconnection Handbook shall mean a handbook, developed by the Participating TO and posted on the Participating TO's web site or otherwise made available by the Participating TO, describing technical and operational requirements for wholesale generators and loads connected to the Participating TO's portion of the CAISO Controlled Grid, as such handbook may be modified or superseded from time to time. Participating TO's standards contained in the Interconnection Handbook shall be deemed consistent with Good Utility Practice and Applicable Reliability Standards. In

the event of a conflict between the terms of this LGIA and the terms of the Participating TO's Interconnection Handbook, the terms in this LGIA shall apply.

Interconnection Reliability Network Upgrades (IRNU) shall mean Reliability Network Upgrades at the Point of Interconnection to accomplish the physical interconnection of the Generating Facility to the CAISO Controlled Grid. IRNUs are treated as Reliability Network Upgrades unless otherwise noted.

Interconnection Request shall mean a request, in the form of Appendix 1 to the GIDAP, in accordance with the CAISO Tariff.

Interconnection Service shall mean the service provided by the Participating TO and CAISO associated with interconnecting the Interconnection Customer's Generating Facility to the Participating TO's Transmission System and enabling the CAISO Controlled Grid to receive electric energy and capacity from the Generating Facility at the Point of Interconnection, pursuant to the terms of this LGIA, the Participating TO's Transmission Owner Tariff, and the CAISO Tariff.

Interconnection Study shall mean

(i) For Interconnection Requests processed under the cluster study process described in the GIDAP, any of the following: the Phase I Interconnection Study conducted or caused to be performed by the CAISO, the reassessment of the Phase I Interconnection Study Base Case conducted or caused to be performed by the CAISO prior to the commencement of the Phase II Interconnection Study, or the Phase II Interconnection Study conducted or caused to be performed by the CAISO, pursuant to the GIDAP.

(ii) For Interconnection Requests processed under the Independent Study Process described in the GIDAP, the governing study(ies) conducted or caused to be performed by the CAISO, in coordination with the applicable Participating TO(s), pursuant to the GIDAP, which shall consist primarily of a system impact and facilities study as described in Section 4.4 of the GIDAP.

IRS shall mean the Internal Revenue Service.

Large Generating Facility shall mean a Generating Facility having a Generating Facility Capacity of more than 20 MW.

LDNU shall mean Local Delivery Network Upgrades.

Local Deliverability Constraint shall mean a transmission system operating limit modeled in the GIDAP study process that would be exceeded if the CAISO were to assign full capacity or partial capacity deliverability status to one or more additional generating facilities interconnecting to the CAISO Controlled Grid in a specific local area, and that is not an Area Deliverability Constraint.

Local Delivery Network Upgrade shall mean a transmission upgrade or addition identified by the CAISO in the GIDAP study process to relieve a Local Deliverability Constraint.

Local Off-Peak Constraints shall mean a transmission system operating limit modeled in the generator interconnection study process that would be exceeded or lead to excessive curtailment, as described in the Off-Peak Deliverability Assessment methodology, if the CAISO were to assign Off-Peak Deliverability Status to one or more Generating Facilities interconnecting to the CAISO Controlled Grid in a specific local area, and that is not an Area Off-Peak Constraint.

Local Off-Peak Network Upgrades (LOPNUs) shall mean a transmission upgrade or addition the CAISO identifies in the generator interconnection study process to relieve a Local Off-Peak Constraint.

Loss shall mean any and all damages, losses, and claims, including claims and actions relating to injury to or death of any person or damage to property, demand, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties.

Material Modification shall mean those modifications that have a material impact on the cost or timing of any Interconnection Request or any other valid interconnection request with a later queue priority date.

Maximum Cost Exposure (MCE) shall mean, pursuant to Appendix DD, the sum of (1) the Interconnection Customer's Maximum Cost Responsibility and (2) the Conditionally Assigned Network Upgrades from its Phase I or Phase II Interconnection Study.

Maximum Cost Responsibility (MCR) shall mean, pursuant to Appendix DD, the lower sum of the Interconnection Customer's (1) full cost of assigned Interconnection Reliability Network Upgrades and (2) allocated costs for all other Assigned Network Upgrades, from its Phase I or Phase II Interconnection Studies, not to exceed the Maximum Cost Exposure.

Merchant Network Upgrades – Network Upgrades constructed and owned by an Interconnection Customer or a third party pursuant to Article 5.1.5 of this LGIA, Section 14.3 of the GIDAP, and Sections 24.4.6.1 and 36.11 of the CAISO Tariff.

Metering Equipment shall mean all metering equipment installed or to be installed for measuring the output of the Generating Facility pursuant to this LGIA at the metering points, including but not limited to instrument transformers, MWh-meters, data acquisition equipment, transducers, remote terminal unit, communications equipment, phone lines, and fiber optics.

NERC shall mean the North American Electric Reliability Corporation or its successor organization.

Net Scheduled Generating Unit shall mean an Electric Generating Unit identified in a Net Scheduled PGA operated as a single unit such that the energy bid or self-schedule with the CAISO is the net value of the aggregate electrical net output of the Electric Generating Unit and the self-provided load.

Net Scheduled PGA shall mean a Net Scheduled Participating Generator Agreement specifying the special provisions for the operating relationship between a Net Scheduled Generating Unit and the CAISO, a pro forma version of which is set forth in Appendix B.3 of the CAISO Tariff.

Network Upgrades shall be Participating TO's Delivery Network Upgrades and Participating TO's Reliability Network Upgrades.

Off-Peak Deliverability Constraints shall mean a transmission system operating limit that constrains Generating Facilities in an area, leading to the excessive curtailment of expected Energy.

Off-Peak Network Upgrades shall mean Network Upgrades needed to relieve Off-Peak Deliverability Constraints. Area Off-Peak Network Upgrades address Area Off-Peak Constraints. Local Off-Peak Network Upgrades address Local Off-Peak Constraints.

Operational Control shall mean the rights of the CAISO under the Transmission Control Agreement and the CAISO Tariff to direct the parties to the Transmission Control Agreement how to operate their transmission lines and facilities and other electric plant affecting the reliability of those lines and facilities for the purpose of affording comparable non-discriminatory transmission access and meeting applicable reliability criteria.

Option (A) Generating Facilities shall mean a Generating Facility for which the Interconnection Customer has selected Option (A) as the Deliverability option under Section 7.2 of the GIDAP.

Option (B) Generating Facilities shall mean a Generating Facility for which the Interconnection Customer has selected Option (B) as the Deliverability option under Section 7.2 of the GIDAP.

Participating TO's Delivery Network Upgrades shall mean the additions, modifications, and upgrades to the Participating TO's Transmission System at or beyond the Point of Interconnection, other than Reliability Network Upgrades, identified in the Interconnection Studies, as identified in Appendix A, to relieve constraints on the CAISO Controlled Grid. Participating TO Delivery Network Upgrades can be either ADNU or LDNU.

Participating TO's Interconnection Facilities shall mean all facilities and equipment owned, controlled or operated by the Participating TO from the Point of Change of Ownership to the Point of Interconnection as identified in Appendix A to this LGIA, including any modifications, additions or upgrades to such facilities and equipment. Participating TO's Interconnection Facilities are sole use facilities and shall not include Distribution Upgrades, Stand Alone Network Upgrades or Network Upgrades.

Participating TO's Reliability Network Upgrades shall mean the additions, modifications, and upgrades to the Participating TO's Transmission System at or beyond the Point of Interconnection, identified in the Interconnection Studies, as identified in Appendix A, necessary to interconnect the Large Generating Facility safely and reliably to the Participating TO's Transmission System, which would not have been necessary but for the interconnection of the Large Generating Facility, including additions, modifications, and upgrades necessary to remedy short circuit or stability problems resulting from the interconnection of the Large Generating Facility to the Participating TO's Transmission System. Participating TO's Reliability Network Upgrades also include, consistent with Applicable Reliability Standards and Applicable Reliability Council practice, the Participating TO's facilities necessary to mitigate any adverse impact the Large Generating Facility's interconnection may have on a path's Applicable Reliability Council rating. Participating TO's Reliability Network Upgrades do not include any Participating TO's Delivery Network Upgrades.

Participating TO's Transmission System shall mean the facilities owned and operated by the Participating TO and that have been placed under the CAISO's Operational Control, which facilities form part of the CAISO Controlled Grid.

Party or Parties shall mean the Participating TO, CAISO, Interconnection Customer or the applicable combination of the above.

Phase I Interconnection Study shall mean the engineering study conducted or caused to be performed by the CAISO, in coordination with the applicable Participating TO(s), that evaluates the impact of the proposed interconnection on the safety and reliability of the Participating TO's Transmission System and, if applicable, an Affected System. The study shall identify and detail the system impacts that would result if the Generating Facility(ies) were interconnected without identified project modifications or system modifications, as provided in the On-Peak Deliverability Assessment (as defined in the CAISO Tariff), and other potential impacts, including but not limited to those identified in the Scoping Meeting as described in the GIDAP. The study will also identify the approximate total costs, based on per unit costs, of mitigating these impacts, along with an equitable allocation of those costs to Interconnection Customers for their individual Generating Facilities.

Phase II Interconnection Study shall mean an engineering and operational study conducted or caused to be performed by the CAISO in coordination with the

applicable Participating TO(s), to determine the Point of Interconnection and a list of facilities (including the Participating TO's Interconnection Facilities, Network Upgrades, Distribution Upgrades, and Stand Alone Network Upgrades), the cost of those facilities, and the time required to interconnect the Generating Facility(ies) with the Participating TO's Transmission System.

Phased Generating Facility shall mean a Generating Facility that is structured to be completed and to achieve Commercial Operation in two or more successive sequences that are specified in this LGIA, such that each sequence comprises a portion of the total megawatt generation capacity of the entire Generating Facility.

Point of Change of Ownership shall mean the point, as set forth in Appendix A to this LGIA, where the Interconnection Customer's Interconnection Facilities connect to the Participating TO's Interconnection Facilities.

Point of Interconnection shall mean the point, as set forth in Appendix A to this LGIA, where the Interconnection Facilities connect to the Participating TO's Transmission System.

Precursor Network Upgrades (PNU) shall mean Network Upgrades required for the Interconnection Customer consisting of (1) Network Upgrades assigned to an earlier Interconnection Customer in an earlier Queue Cluster, Independent Study Process, or Fast Track Process, that has executed its GIA pursuant to Section 14.2.2 of the GIDAP; and (2) Network Upgrades in the approved CAISO Transmission Plan.

Reasonable Efforts shall mean, with respect to an action required to be attempted or taken by a Party under this LGIA, efforts that are timely and consistent with Good Utility Practice and are otherwise substantially equivalent to those a Party would use to protect its own interests.

RNU shall mean Reliability Network Upgrades.

Reliability Network Upgrades (RNU) shall mean the transmission facilities at or beyond the Point of Interconnection identified in the Interconnection Studies as necessary to interconnect one or more Generating Facility(ies) safely and reliably to the CAISO Controlled Grid, which would not have been necessary but for the interconnection of one or more Generating Facility(ies), including Network Upgrades necessary to remedy short circuit or stability problems, or thermal overloads. Reliability Network Upgrades shall only be deemed necessary for system operating limits, occurring under any system condition, which cannot be adequately mitigated through Congestion Management, Operating Procedures, or Special Protection Systems based on the characteristics of the Generating Facilities included in the Interconnection Studies, limitations on market models, systems, or information, or other factors specifically identified in the Interconnection Studies. Reliability Network Upgrades also include, consistent with WECC practice, the facilities necessary to mitigate any adverse impact the Generating Facility's interconnection may have on a path's WECC rating.

Reliability Network Upgrades include Interconnection Reliability Network Upgrades and General Reliability Network Upgrades.

Scoping Meeting shall mean the meeting among representatives of the Interconnection Customer, the Participating TO(s), other Affected Systems, and the CAISO conducted for the purpose of discussing alternative interconnection options, to exchange information including any transmission data and earlier study evaluations that would be reasonably expected to impact such interconnection options, to analyze such information, and to determine the potential feasible Points of Interconnection.

Stand Alone Network Upgrades shall mean Network Upgrades that are not part of an Affected System that the Interconnection Customer may construct without affecting day-to-day operations of the CAISO Controlled Grid or Affected Systems during their construction. The Participating TO, the CAISO, and the Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify them in Appendix A to this LGIA. If the CAISO, the Participating TO, and the Interconnection Customer disagree about whether a particular Network Upgrade is a Stand Alone Network Upgrade, the CAISO or Participating TO must provide the Interconnection Customer a written technical explanation outlining why it does not consider the Network Upgrade to be a Stand Alone Network Upgrade within 15 days of its determination.

Surplus Interconnection Service shall mean any unneeded portion of Interconnection Service Capacity established herein, such that if Surplus Interconnection Service is utilized the total amount of Interconnection Service Capacity at the Point of Interconnection would remain the same.

System Protection Facilities shall mean the equipment, including necessary protection signal communications equipment, that protects (1) the Participating TO's Transmission System, Participating TO's Interconnection Facilities, CAISO Controlled Grid, and Affected Systems from faults or other electrical disturbances occurring at the Generating Facility and (2) the Generating Facility from faults or other electrical system disturbances occurring on the CAISO Controlled Grid, Participating TO's Interconnection Facilities, and Affected Systems or on other delivery systems or other generating systems to which the CAISO Controlled Grid is directly connected.

TP Deliverability shall mean the capability, measured in MW, of the CAISO Controlled Grid as modified by transmission upgrades and additions identified in the annual Transmission Plan to support the interconnection with Full Capacity Deliverability Status or Partial Capacity Deliverability Status of additional Generating Facilities in a specified geographic or electrical area of the CAISO Controlled Grid.

Transmission Control Agreement shall mean CAISO FERC Electric Tariff No. 7.

Trial Operation shall mean the period during which the Interconnection Customer is engaged in on-site test operations and commissioning of an Electric Generating Unit prior to Commercial Operation.

Variable Energy Resource shall mean a device for the production of electricity that is characterized by an Energy source that: (1) is renewable; (2) cannot be stored by the facility owner or operator; and (3) has variability that is beyond the control of the facility owner or operator.

ARTICLE 2. EFFECTIVE DATE, TERM AND TERMINATION

2.1 Effective Date. This LGIA shall become effective upon execution by all Parties subject to acceptance by FERC (if applicable), or if filed unexecuted, upon the date specified by FERC. The CAISO and Participating TO shall promptly file this LGIA with FERC upon execution in accordance with Article 3.1, if required.

2.2 Term of Agreement. Subject to the provisions of Article 2.3, this LGIA shall remain in effect for a period of forty (40) years from the Effective Date (Term Specified in Individual Agreements to be ten (10) years or such other longer period as the Interconnection Customer may request) and shall be automatically renewed for each successive one-year period thereafter.

2.3 Termination Procedures.

2.3.1 Written Notice. This LGIA may be terminated by the Interconnection Customer after giving the CAISO and the Participating TO ninety (90) Calendar Days advance written notice, or by the CAISO and the Participating TO notifying FERC after the Generating Facility permanently ceases Commercial Operation.

2.3.2 Default. A Party may terminate this LGIA in accordance with Article 17.

2.3.3 Suspension of Work. This LGIA may be deemed terminated in accordance with Article 5.16, if applicable.

2.3.4 Notwithstanding Articles 2.3.1, 2.3.2, and 2.3.3, no termination shall become effective until the Parties have complied with all Applicable Laws and Regulations applicable to such termination, including the filing with FERC of a notice of termination of this LGIA (if applicable), which notice has been accepted for filing by FERC, and the Interconnection Customer has fulfilled its termination cost obligations under Article 2.4.

2.4 Termination Costs. Immediately upon the other Parties' receipt of a notice of the termination of this LGIA pursuant to Article 2.3 above, the CAISO and the Participating TO will determine the total cost responsibility of the Interconnection Customer. If, as of the date of the other Parties' receipt of the notice of termination, the Interconnection Customer has not already paid its share of

Network Upgrade costs, as set forth in Appendix G to this LGIA, the Participating TO will liquidate the Interconnection Customer's Interconnection Financial Security associated with its cost responsibility for Network Upgrades, in accordance with Section 11.4 of the GIDAP.

The Interconnection Customer will also be responsible for all costs incurred or irrevocably committed to be incurred in association with the construction of the Participating TO's Interconnection Facilities (including any cancellation costs relating to orders or contracts for Interconnection Facilities and equipment) and other such expenses, including any Distribution Upgrades for which the Participating TO or CAISO has incurred expenses or has irrevocably committed to incur expenses and has not been reimbursed by the Interconnection Customer, as of the date of the other Parties' receipt of the notice of termination, subject to the limitations set forth in this Article 2.4. Nothing in this Article 2.4 shall limit the Parties' rights under Article 17. If, as of the date of the other Parties' receipt of the notice of termination, the Interconnection Customer has not already reimbursed the Participating TO and the CAISO for costs incurred to construct the Participating TO's Interconnection Facilities, the Participating TO will liquidate the Interconnection Customer's Interconnection Financial Security associated with the construction of the Participating TO's Interconnection Facilities, in accordance with Section 11.4 of the GIDAP. If the amount of the Interconnection Financial Security liquidated by the Participating TO under this Article 2.4 is insufficient to compensate the CAISO and the Participating TO for actual costs associated with the construction of the Participating TO's Interconnection Facilities contemplated in this Article, any additional amounts will be the responsibility of the Interconnection Customer, subject to the provisions of Section 11.4 of the GIDAP. Any such additional amounts due from the Interconnection Customer beyond the amounts covered by its Interconnection Financial Security will be due to the Participating TO immediately upon termination of this LGIA in accordance with Section 11.4 of the GIDAP.

If the amount of the Interconnection Financial Security exceeds the Interconnection Customer's cost responsibility under Section 11.4 of the GIDAP, any excess amount will be released to the Interconnection Customer in accordance with Section 11.4 of the GIDAP.

2.4.1 Notwithstanding the foregoing, in the event of termination by a Party, all Parties shall use commercially Reasonable Efforts to mitigate the costs, damages and charges arising as a consequence of termination. With respect to any portion of the Participating TO's Interconnection Facilities that have not yet been constructed or installed, the Participating TO shall to the extent possible and with the Interconnection Customer's authorization cancel any pending orders of, or return, any materials or equipment for, or contracts for construction of, such facilities; provided that in the event the Interconnection Customer elects not to authorize such cancellation, the Interconnection Customer shall assume all payment

obligations with respect to such materials, equipment, and contracts, and the Participating TO shall deliver such material and equipment, and, if necessary, assign such contracts, to the Interconnection Customer as soon as practicable, at the Interconnection Customer's expense. To the extent that the Interconnection Customer has already paid the Participating TO for any or all such costs of materials or equipment not taken by the Interconnection Customer, the Participating TO shall promptly refund such amounts to the Interconnection Customer, less any costs, including penalties, incurred by the Participating TO to cancel any pending orders of or return such materials, equipment, or contracts.

2.4.2 The Participating TO may, at its option, retain any portion of such materials, equipment, or facilities that the Interconnection Customer chooses not to accept delivery of, in which case the Participating TO shall be responsible for all costs associated with procuring such materials, equipment, or facilities.

2.4.3 With respect to any portion of the Interconnection Facilities, and any other facilities already installed or constructed pursuant to the terms of this LGIA, Interconnection Customer shall be responsible for all costs associated with the removal, relocation or other disposition or retirement of such materials, equipment, or facilities.

2.5 Disconnection. Upon termination of this LGIA, the Parties will take all appropriate steps to disconnect the Large Generating Facility from the Participating TO's Transmission System. All costs required to effectuate such disconnection shall be borne by the terminating Party, unless such termination resulted from the non-terminating Party's Default of this LGIA or such non-terminating Party otherwise is responsible for these costs under this LGIA.

2.6 Survival. This LGIA shall continue in effect after termination to the extent necessary to provide for final billings and payments and for costs incurred hereunder, including billings and payments pursuant to this LGIA; to permit the determination and enforcement of liability and indemnification obligations arising from acts or events that occurred while this LGIA was in effect; and to permit each Party to have access to the lands of the other Parties pursuant to this LGIA or other applicable agreements, to disconnect, remove or salvage its own facilities and equipment.

ARTICLE 3. REGULATORY FILINGS AND CAISO TARIFF COMPLIANCE

3.1 Filing. The Participating TO and the CAISO shall file this LGIA (and any amendment hereto) with the appropriate Governmental Authority(ies), if required. The Interconnection Customer may request that any information so provided be subject to the confidentiality provisions of Article 22. If the Interconnection Customer has executed this LGIA, or any amendment thereto, the

Interconnection Customer shall reasonably cooperate with the Participating TO and CAISO with respect to such filing and to provide any information reasonably requested by the Participating TO or CAISO needed to comply with applicable regulatory requirements.

3.2 Agreement Subject to CAISO Tariff. The Interconnection Customer will comply with all applicable provisions of the CAISO Tariff, including the GIDAP.

3.3 Relationship Between this LGIA and the CAISO Tariff. With regard to rights and obligations between the Participating TO and the Interconnection Customer, if and to the extent a matter is specifically addressed by a provision of this LGIA (including any appendices, schedules or other attachments to this LGIA), the provisions of this LGIA shall govern. If and to the extent a provision of this LGIA is inconsistent with the CAISO Tariff and dictates rights and obligations between the CAISO and the Participating TO or the CAISO and the Interconnection Customer, the CAISO Tariff shall govern.

3.4 Relationship Between this LGIA and the Net Scheduled PGA. With regard to the rights and obligations of a Net Scheduled Generating Unit that has entered into a Net Scheduled PGA with the CAISO and has entered into this LGIA, if and to the extent a matter is specifically addressed by a provision of the Net Scheduled PGA that is inconsistent with this LGIA, the terms of the Net Scheduled PGA shall govern.

ARTICLE 4. SCOPE OF SERVICE

4.1 Interconnection Service. Interconnection Service allows the Interconnection Customer to connect the Large Generating Facility to the Participating TO's Transmission System and be eligible to deliver the Large Generating Facility's output using the available capacity of the CAISO Controlled Grid. To the extent the Interconnection Customer wants to receive Interconnection Service, the Participating TO shall construct facilities identified in Appendices A and C that the Participating TO is responsible to construct.

Interconnection Service does not necessarily provide the Interconnection Customer with the capability to physically deliver the output of its Large Generating Facility to any particular load on the CAISO Controlled Grid without incurring congestion costs. In the event of transmission constraints on the CAISO Controlled Grid, the Interconnection Customer's Large Generating Facility shall be subject to the applicable congestion management procedures in the CAISO Tariff in the same manner as all other resources. Full Capacity Deliverability Status, Partial Capacity Deliverability Status, and Off-Peak Deliverability Status do not confer any priority over other Generating Facilities to deliver Energy; nor provide any warranty or guarantee to deliver any amount of Energy or avoid curtailment at any time.

4.2 Provision of Service. The Participating TO and the CAISO shall provide Interconnection Service for the Large Generating Facility.

4.3 Performance Standards. Each Party shall perform all of its obligations under this LGIA in accordance with Applicable Laws and Regulations, Applicable Reliability Standards, and Good Utility Practice, and to the extent a Party is required or prevented or limited in taking any action by such regulations and standards, such Party shall not be deemed to be in Breach of this LGIA for its compliance therewith. If such Party is the CAISO or Participating TO, then that Party shall amend the LGIA and submit the amendment to FERC for approval.

4.4 No Transmission Service. The execution of this LGIA does not constitute a request for, nor the provision of, any transmission service under the CAISO Tariff, and does not convey any right to deliver electricity to any specific customer or point of delivery.

4.5 Interconnection Customer Provided Services. The services provided by Interconnection Customer under this LGIA are set forth in Article 9.6 and Article 13.5.1. Interconnection Customer shall be paid for such services in accordance with Article 11.6.

4.6 TP Deliverability. To the extent that an Interconnection Customer is eligible for and has been allocated TP Deliverability pursuant to Section 8.9 of the GIDAP, the Interconnection Customer's retention of such allocated TP Deliverability shall be contingent upon satisfying the obligations set forth in Section 8.9.3 of the GIDAP. In the event that the Interconnection does not retain allocated TP Deliverability with regard to any portion of the Generating Facility, such portion of the Generating Facility shall be deemed to receive Interconnection Service under this LGIA as Energy Only Deliverability Status.

ARTICLE 5. INTERCONNECTION FACILITIES ENGINEERING, PROCUREMENT, AND CONSTRUCTION

Interconnection Facilities, Network Upgrades, and Distribution Upgrades shall be studied, designed, and constructed pursuant to Good Utility Practice. Such studies, design and construction shall be based on the assumed accuracy and completeness of all technical information received by the Participating TO and the CAISO from the Interconnection Customer associated with interconnecting the Large Generating Facility.

5.1 Options. Unless otherwise mutually agreed among the Parties, the Interconnection Customer shall select the In-Service Date, Initial Synchronization Date, and Commercial Operation Date; and either the Standard Option, Alternate Option, or, if eligible, Merchant Option, set forth below, Interconnection Facilities, Network Upgrades, and Distribution Upgrades, and such dates and selected option shall be set forth in Appendix B, Milestones. At the same time, the

Interconnection Customer shall indicate whether it elects the Option to Build set forth in Article 5.1.3 below. If the dates designated by the Interconnection Customer are not acceptable to the CAISO and Participating TO, they shall so notify the Interconnection Customer within thirty (30) calendar days. Upon receipt of the notification that the Interconnection Customer's designated dates are not acceptable to the CAISO and Participating TO, the Interconnection Customer shall notify the CAISO and Participating TO within thirty (30) calendar days whether it elects to exercise the Option to Build if it has not already elected to exercise the Option to Build.

5.1.1 Standard Option. The Participating TO shall design, procure, and construct the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades, using Reasonable Efforts to complete the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades by the dates set forth in Appendix B, Milestones. The Participating TO shall not be required to undertake any action which is inconsistent with its standard safety practices, its material and equipment specifications, its design criteria and construction procedures, its labor agreements, and Applicable Laws and Regulations. In the event the Participating TO reasonably expects that it will not be able to complete the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades by the specified dates, the Participating TO shall promptly provide written notice to the Interconnection Customer and the CAISO and shall undertake Reasonable Efforts to meet the earliest dates thereafter.

5.1.2 Alternate Option. If the dates designated by the Interconnection Customer are acceptable to the Participating TO, the Participating TO shall so notify the Interconnection Customer within thirty (30) Calendar Days, and shall assume responsibility for the design, procurement and construction of the Participating TO's Interconnection Facilities by the designated dates.

If the Participating TO subsequently fails to complete the Participating TO's Interconnection Facilities by the In-Service Date, to the extent necessary to provide back feed power; or fails to complete Network Upgrades by the Initial Synchronization Date to the extent necessary to allow for Trial Operation at full power output, unless other arrangements are made by the Parties for such Trial Operation; or fails to complete the Network Upgrades by the Commercial Operation Date, as such dates are reflected in Appendix B, Milestones; the Participating TO shall pay the Interconnection Customer liquidated damages in accordance with Article 5.3, Liquidated Damages, provided, however, the dates designated by the Interconnection Customer shall be extended day for day for each day that the CAISO refuses to grant clearances to install equipment.

5.1.3 Option to Build. The Interconnection Customer shall have the option to assume responsibility for the design, procurement and construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades. The Participating TO, CAISO, and Interconnection Customer must agree as to what constitutes Stand Alone Network Upgrades and identify such Stand Alone Network Upgrades in Appendix A to this LGIA. Except for Stand Alone Network Upgrades, the Interconnection Customer shall have no right to construct Network Upgrades under this option.

5.1.4 Negotiated Option. If the dates designated by the Interconnection Customer are not acceptable to the CAISO and Participating TO, the Parties shall in good faith attempt to negotiate terms and conditions, including revision of the specified dates and liquidated damages, the provision of incentives, or the procurement and construction of all facilities other than the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build under Article 5.1.3. If the Parties are unable to reach agreement on such terms and conditions, then, pursuant to Article 5.1.1 (Standard Option), the Participating TO shall assume responsibility for the design, procurement and construction of all facilities other than the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades if the Interconnection Customer elects to exercise the Option to Build.

5.1.5 Merchant Option. In addition to any Option to Build set forth in Article 5.1.3 of this LGIA, an Interconnection Customer having an Option (B) Generating Facility may elect to have a party other than the applicable Participating TO construct some or all of the LDNU and ADNU for which the Interconnection Customer has the obligation to fund and which are not subject to reimbursement. Such LDNU and ADNU will be constructed and incorporated into the CAISO Controlled Grid pursuant to the provisions for Merchant Transmission Facilities in CAISO Tariff Sections 24.4.6.1 and 36.11.

5.2 General Conditions Applicable to Option to Build. If the Interconnection Customer assumes responsibility for the design, procurement and construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades, or assumes responsibility for any stand-alone task, such as telecommunications, environmental, or real-estate related work:

(1) within six (6) months of the execution of this LGIA, or at a later date agreed to by the Parties, the Interconnection Customer will submit to the CAISO and the Participating TO a milestone schedule for the design, procurement, and construction of the Stand Alone Network Upgrades, or any stand-alone task assumed by the Interconnection Customer. The milestone schedule will be required to support the Interconnection

Customer's Commercial Operation Date, and any Appendix B Milestones will be amended to include the milestone schedule for the Stand Alone Network Upgrades;

(2) the Interconnection Customer shall engineer, procure equipment, and construct the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades (or portions thereof) using Good Utility Practice and using standards and specifications provided in advance by the Participating TO;

(3) The Interconnection Customer's engineering, procurement and construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades shall comply with all requirements of law to which the Participating TO would be subject in the engineering, procurement or construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades;

(4) the Participating TO shall review, and the Interconnection Customer shall obtain the Participating TO's approval of, the engineering design, equipment acceptance tests, and the construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades, which approval shall not be unreasonably withheld, and the CAISO may, at its option, review the engineering design, equipment acceptance tests, and the construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades;

(5) prior to commencement of construction, the Interconnection Customer shall provide to the Participating TO, with a copy to the CAISO for informational purposes, a schedule for construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades, and shall promptly respond to requests for information from the Participating TO;

(6) at any time during construction, the Participating TO shall have the right to gain unrestricted access to the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades and to conduct inspections of the same;

(7) at any time during construction, should any phase of the engineering, equipment procurement, or construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades not meet the standards and specifications provided by the Participating TO, the Interconnection Customer shall be obligated to remedy deficiencies in that portion of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades;

(8) the Interconnection Customer shall indemnify the CAISO and Participating TO for claims arising from the Interconnection Customer's construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades under the terms and procedures applicable to Article 18.1 Indemnity;

(9) The Interconnection Customer shall transfer control of the Participating TO's Interconnection Facilities to the Participating TO and shall transfer Operational Control of Stand Alone Network Upgrades to the CAISO;

(10) Unless the Parties otherwise agree, the Interconnection Customer shall transfer ownership of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades to the Participating TO. As soon as reasonably practicable, but within twelve months after completion of the construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades, the Interconnection Customer shall provide an invoice of the final cost of the construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades to the Participating TO, which invoice shall set forth such costs in sufficient detail to enable the Participating TO to reflect the proper costs of such facilities in its transmission rate base and to identify the investment upon which refunds will be provided;

(11) the Participating TO shall accept for operation and maintenance the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades to the extent engineered, procured, and constructed in accordance with this Article 5.2; and

(12) The Interconnection Customer's engineering, procurement and construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades shall comply with all requirements of the "Option to Build" conditions set forth in Appendix C. Interconnection Customer shall deliver to the Participating TO "as-built" drawings, information, and any other documents that are reasonably required by the Participating TO to assure that the Interconnection Facilities and Stand-Alone Network Upgrades are built to the standards and specifications required by the Participating TO.

(13) If the Interconnection Customer exercises the Option to Build pursuant to Article 5.1.3, the Interconnection Customer shall pay the Participating TO the agreed upon amount of $n/a for Participating TO to execute the responsibilities enumerated to it under Article 5.2. The Participating TO will invoice the Interconnection Customer for this total amount to be divided on a monthly basis pursuant to Article 12.

5.3 Liquidated Damages. The actual damages to the Interconnection Customer, in the event the Participating TO's Interconnection Facilities or Network Upgrades are not completed by the dates designated by the Interconnection Customer and accepted by the Participating TO pursuant to subparagraphs 5.1.2 or 5.1.4, above, may include Interconnection Customer's fixed operation and maintenance costs and lost opportunity costs. Such actual damages are uncertain and impossible to determine at this time. Because of such uncertainty, any liquidated damages paid by the Participating TO to the Interconnection Customer in the event that the Participating TO does not complete any portion of the Participating TO's Interconnection Facilities or Network Upgrades by the applicable dates, shall be an amount equal to ½ of 1 percent per day of the actual cost of the Participating TO's Interconnection Facilities and Network Upgrades, in the aggregate, for which the Participating TO has assumed responsibility to design, procure and construct.

However, in no event shall the total liquidated damages exceed 20 percent of the actual cost of the Participating TO's Interconnection Facilities and Network Upgrades for which the Participating TO has assumed responsibility to design, procure, and construct. The foregoing payments will be made by the Participating TO to the Interconnection Customer as just compensation for the damages caused to the Interconnection Customer, which actual damages are uncertain and impossible to determine at this time, and as reasonable liquidated damages, but not as a penalty or a method to secure performance of this LGIA. Liquidated damages, when the Parties agree to them, are the exclusive remedy for the Participating TO's failure to meet its schedule.

No liquidated damages shall be paid to the Interconnection Customer if: (1) the Interconnection Customer is not ready to commence use of the Participating TO's Interconnection Facilities or Network Upgrades to take the delivery of power for the Electric Generating Unit's Trial Operation or to export power from the Electric Generating Unit on the specified dates, unless the Interconnection Customer would have been able to commence use of the Participating TO's Interconnection Facilities or Network Upgrades to take the delivery of power for Electric Generating Unit's Trial Operation or to export power from the Electric Generating Unit, but for the Participating TO's delay; (2) the Participating TO's failure to meet the specified dates is the result of the action or inaction of the Interconnection Customer or any other interconnection customer who has entered into an interconnection agreement with the CAISO and/or Participating TO, action or inaction by the CAISO, or any cause beyond the Participating TO's reasonable control or reasonable ability to cure; (3) the Interconnection Customer has assumed responsibility for the design, procurement and construction of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades; or (4) the Parties have otherwise agreed.

In no event shall the CAISO have any responsibility or liability to the Interconnection Customer for liquidated damages pursuant to the provisions of this Article 5.3.

5.4 Power System Stabilizers. The Interconnection Customer shall procure, install, maintain and operate Power System Stabilizers in accordance with Applicable Reliability Standards, the guidelines and procedures established by the Applicable Reliability Council, and the provisions of Section 4.6.5.1 of the CAISO Tariff. The CAISO reserves the right to establish reasonable minimum acceptable settings for any installed Power System Stabilizers, subject to the design and operating limitations of the Large Generating Facility. If the Large Generating Facility's Power System Stabilizers are removed from service or not capable of automatic operation, the Interconnection Customer shall immediately notify the CAISO and the Participating TO and restore the Power System Stabilizers to operation as soon as possible. The CAISO shall have the right to order the reduction in output or disconnection of the Large Generating Facility if the reliability of the CAISO Controlled Grid would be adversely affected as a result of improperly tuned Power System Stabilizers. The requirements of this Article 5.4 shall apply to Asynchronous Generating Facilities in accordance with Appendix H.

5.5 Equipment Procurement. If responsibility for construction of the Participating TO's Interconnection Facilities or Network Upgrades is to be borne by the Participating TO, then the Participating TO shall commence design of the Participating TO's Interconnection Facilities or Network Upgrades and procure necessary equipment as soon as practicable after all of the following conditions are satisfied, unless the Parties otherwise agree in writing:

5.5.1 The CAISO, in coordination with the applicable Participating TO(s), has completed the Phase II Interconnection Study or Governing Independent Study Interconnection Study pursuant to the applicable Generator Interconnection Study Process Agreement or other applicable study process agreement;

5.5.2 The Participating TO has received written authorization to proceed with design and procurement from the Interconnection Customer by the date specified in Appendix B, Milestones; and

5.5.3 The Interconnection Customer has provided security to the Participating TO in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.6 Construction Commencement. The Participating TO shall commence construction of the Participating TO's Interconnection Facilities and Network Upgrades for which it is responsible as soon as practicable after the following additional conditions are satisfied:

5.6.1 Approval of the appropriate Governmental Authority has been obtained for any facilities requiring regulatory approval;

5.6.2 Necessary real property rights and rights-of-way have been obtained, to the extent required for the construction of a discrete aspect of the Participating TO's Interconnection Facilities and Network Upgrades;

5.6.3 The Participating TO has received written authorization to proceed with construction from the Interconnection Customer by the date specified in Appendix B, Milestones; and

5.6.4 The Interconnection Customer has provided payment and security to the Participating TO in accordance with Article 11.5 by the dates specified in Appendix B, Milestones.

5.7 Work Progress. The Parties will keep each other advised periodically as to the progress of their respective design, procurement and construction efforts. Any Party may, at any time, request a progress report from another Party. If, at any time, the Interconnection Customer determines that the completion of the Participating TO's Interconnection Facilities will not be required until after the specified In-Service Date, the Interconnection Customer will provide written notice to the Participating TO and CAISO of such later date upon which the completion of the Participating TO's Interconnection Facilities will be required.

5.8 Information Exchange. As soon as reasonably practicable after the Effective Date, the Parties shall exchange information regarding the design and compatibility of the Interconnection Customer's Interconnection Facilities and Participating TO's Interconnection Facilities and compatibility of the Interconnection Facilities with the Participating TO's Transmission System, and shall work diligently and in good faith to make any necessary design changes.

5.9 Limited Operation. If any of the Participating TO's Interconnection Facilities or Network Upgrades are not reasonably expected to be completed prior to the Commercial Operation Date of the Electric Generating Unit, the Participating TO and/or CAISO, as applicable, shall, upon the request and at the expense of the Interconnection Customer, perform operating studies on a timely basis to determine the extent to which the Electric Generating Unit and the Interconnection Customer's Interconnection Facilities may operate prior to the completion of the Participating TO's Interconnection Facilities or Network Upgrades consistent with Applicable Laws and Regulations, Applicable Reliability Standards, Good Utility Practice, and this LGIA. The Participating TO and CAISO shall permit Interconnection Customer to operate the Electric Generating Unit and the Interconnection Customer's Interconnection Facilities in accordance with the results of such studies.

5.10 Interconnection Customer's Interconnection Facilities. The Interconnection Customer shall, at its expense, design, procure, construct, own and install the Interconnection Customer's Interconnection Facilities, as set forth in Appendix A.

5.10.1 Large Generating Facility and Interconnection Customer's Interconnection Facilities Specifications. In addition to the Interconnection Customer's responsibility to submit technical data with its Interconnection Request as required by Section 3.5.1 of the GIDAP, the Interconnection Customer shall submit all remaining necessary specifications for the Interconnection Customer's Interconnection Facilities and Large Generating Facility, including System Protection Facilities, to the Participating TO and the CAISO at least one hundred eighty (180) Calendar Days prior to the Initial Synchronization Date; and final specifications for review and comment at least ninety (90) Calendar Days prior to the Initial Synchronization Date. The Participating TO and the CAISO shall review such specifications pursuant to this LGIA and the GIDAP to ensure that the Interconnection Customer's Interconnection Facilities and Large Generating Facility are compatible with the technical specifications, operational control, safety requirements, and any other applicable requirements of the Participating TO and the CAISO and comment on such specifications within thirty (30) Calendar Days of the Interconnection Customer's submission. All specifications provided hereunder shall be deemed confidential.

5.10.2 Participating TO's and CAISO's Review. The Participating TO's and the CAISO's review of the Interconnection Customer's final specifications shall not be construed as confirming, endorsing, or providing a warranty as to the design, fitness, safety, durability or reliability of the Large Generating Facility, or the Interconnection Customer's Interconnection Facilities. Interconnection Customer shall make such changes to the Interconnection Customer's Interconnection Facilities as may reasonably be required by the Participating TO or the CAISO, in accordance with Good Utility Practice, to ensure that the Interconnection Customer's Interconnection Facilities are compatible with the technical specifications, Operational Control, and safety requirements of the Participating TO or the CAISO.

5.10.3 Interconnection Customer's Interconnection Facilities Construction. The Interconnection Customer's Interconnection Facilities shall be designed and constructed in accordance with Good Utility Practice. Within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Participating TO and Interconnection Customer agree on another mutually acceptable deadline, the Interconnection Customer shall deliver to the Participating TO and CAISO "as-built" drawings, information and documents for the Interconnection Customer's Interconnection Facilities and the Electric Generating Unit(s), such as: a one-line diagram, a site plan showing the Large Generating Facility and the Interconnection

Customer's Interconnection Facilities, plan and elevation drawings showing the layout of the Interconnection Customer's Interconnection Facilities, a relay functional diagram, relaying AC and DC schematic wiring diagrams and relay settings for all facilities associated with the Interconnection Customer's step-up transformers, the facilities connecting the Large Generating Facility to the step-up transformers and the Interconnection Customer's Interconnection Facilities, and the impedances (determined by factory tests) for the associated step-up transformers and the Electric Generating Units. The Interconnection Customer shall provide the Participating TO and the CAISO specifications for the excitation system, automatic voltage regulator, Large Generating Facility control and protection settings, transformer tap settings, and communications, if applicable. Any deviations from the relay settings, machine specifications, and other specifications originally submitted by the Interconnection Customer shall be assessed by the Participating TO and the CAISO pursuant to the appropriate provisions of this LGIA and the GIDAP.

5.10.4 Interconnection Customer to Meet Requirements of the Participating TO's Interconnection Handbook. The Interconnection Customer shall comply with the Participating TO's Interconnection Handbook.

5.11 Participating TO's Interconnection Facilities Construction. The Participating TO's Interconnection Facilities shall be designed and constructed in accordance with Good Utility Practice. Upon request, within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless the Participating TO and Interconnection Customer agree on another mutually acceptable deadline, the Participating TO shall deliver to the Interconnection Customer and the CAISO the following "as-built" drawings, information and documents for the Participating TO's Interconnection Facilities [include appropriate drawings and relay diagrams].

The Participating TO will obtain control for operating and maintenance purposes of the Participating TO's Interconnection Facilities and Stand Alone Network Upgrades upon completion of such facilities. Pursuant to Article 5.2, the CAISO will obtain Operational Control of the Stand Alone Network Upgrades prior to the Commercial Operation Date.

5.12 Access Rights. Upon reasonable notice and supervision by a Party, and subject to any required or necessary regulatory approvals, a Party ("Granting Party") shall furnish at no cost to the other Party ("Access Party") any rights of use, licenses, rights of way and easements with respect to lands owned or controlled by the Granting Party, its agents (if allowed under the applicable agency agreement), or any Affiliate, that are necessary to enable the Access Party to obtain ingress and egress to construct, operate, maintain, repair, test (or witness testing), inspect, replace or remove facilities and equipment to: (i)

interconnect the Large Generating Facility with the Participating TO's Transmission System; (ii) operate and maintain the Large Generating Facility, the Interconnection Facilities and the Participating TO's Transmission System; and (iii) disconnect or remove the Access Party's facilities and equipment upon termination of this LGIA. In exercising such licenses, rights of way and easements, the Access Party shall not unreasonably disrupt or interfere with normal operation of the Granting Party's business and shall adhere to the safety rules and procedures established in advance, as may be changed from time to time, by the Granting Party and provided to the Access Party.

5.13 Lands of Other Property Owners. If any part of the Participating TO's Interconnection Facilities and/or Network Upgrades are to be installed on property owned by persons other than the Interconnection Customer or Participating TO, the Participating TO shall at the Interconnection Customer's expense use efforts, similar in nature and extent to those that it typically undertakes on its own behalf or on behalf of its Affiliates, including use of its eminent domain authority, and to the extent consistent with state law, to procure from such persons any rights of use, licenses, rights of way and easements that are necessary to construct, operate, maintain, test, inspect, replace or remove the Participating TO's Interconnection Facilities and/or Network Upgrades upon such property.

5.14 Permits. Participating TO and Interconnection Customer shall cooperate with each other in good faith in obtaining all permits, licenses and authorization that are necessary to accomplish the interconnection in compliance with Applicable Laws and Regulations. With respect to this paragraph, the Participating TO shall provide permitting assistance to the Interconnection Customer comparable to that provided to the Participating TO's own, or an Affiliate's generation.

5.15 Early Construction of Base Case Facilities. The Interconnection Customer may request the Participating TO to construct, and the Participating TO shall construct, using Reasonable Efforts to accommodate Interconnection Customer's In-Service Date, all or any portion of any Network Upgrades required for Interconnection Customer to be interconnected to the Participating TO's Transmission System which are included in the Base Case of the Interconnection Studies for the Interconnection Customer, and which also are required to be constructed for another interconnection customer, but where such construction is not scheduled to be completed in time to achieve Interconnection Customer's In-Service Date.

5.16 Suspension. The Interconnection Customer may request to suspend at any time all work associated with the construction and installation of the Participating TO's Interconnection Facilities, Network Upgrades, and/or Distribution Upgrades required under this LGIA, other than Network Upgrades identified in the Phase II Interconnection Study as common to multiple generating facilities. Interconnection Customers seeking to suspend construction will provide the

CAISO and Participating TO a request for assessment pursuant to Section 6.7.2 of the GIDAP, a modification assessment deposit, and an anticipated end date of the suspension. Interconnection Customers may request a suspension for the maximum amount of time in lieu of providing an anticipated end date. The CAISO and Participating TO will approve suspension requests where:

(a) the Participating TO's electrical system and the CAISO Controlled Grid can be left in a safe and reliable condition in accordance with Good Utility Practice, the Participating TO's safety and reliability criteria, and Applicable Reliability Standards; and

(b) the CAISO and Participating TO determine the suspension will not result in a Material Modification.

During suspension, the Interconnection Customer may request to extend or shorten their suspension period, consistent with the maximum period provided in this Article. The CAISO and Participating TO will approve such requests where they meet criteria (a) and (b), above. Requests to extend or shorten extensions will require a new modification assessment request and deposit. The Interconnection Customer shall be responsible for all reasonable and necessary costs for suspension for which the Participating TO (i) has incurred pursuant to this LGIA prior to the suspension and (ii) incurs in suspending such work, including any costs incurred to perform such work as may be necessary to ensure the safety of persons and property and the integrity of the Participating TO's electric system during such suspension and, if applicable, any costs incurred in connection with the cancellation or suspension of material, equipment and labor contracts which the Participating TO cannot reasonably avoid; provided, however, that prior to canceling or suspending any such material, equipment or labor contract, the Participating TO shall obtain Interconnection Customer's authorization to do so.

Network Upgrades common to multiple generating facilities, and to which the Interconnection Customer's right of suspension shall not extend, consist of Network Upgrades identified for:

(i) generating facilities which are the subject of all Interconnection Requests made prior to the Interconnection Customer's Interconnection Request;
(ii) generating facilities which are the subject of Interconnection Requests within the Interconnection Customer's queue cluster; and
(iii) generating facilities that are the subject of Interconnection Requests that were made after the Interconnection Customer's Interconnection Request but no later than the date on which the Interconnection Customer's Phase ll Interconnection Study Report is issued, and have been modeled in the Base Case at the time the Interconnection Customer seeks to exercise its suspension rights under this Article.

The Participating TO shall invoice the Interconnection Customer for such costs pursuant to Article 12 and shall use due diligence to minimize its costs. In the event Interconnection Customer suspends work required under this LGIA pursuant to this Article 5.16, and has not requested the Participating TO to recommence the work or has not itself recommenced work required under this LGIA in time to ensure that the new projected Commercial Operation Date for the full Generating Facility Capacity of the Large Generating Facility is no more than three (3) years from the Commercial Operation Date identified in Appendix B hereto, this LGIA shall be deemed terminated and the Interconnection Customer's responsibility for costs will be determined in accordance with Article 2.4 of this LGIA. The suspension period shall begin on the date the Interconnection Customer provides in its request, if approved. Ninety (90) days before the anticipated end date of the suspension, the Participating TO and the CAISO will tender an amended draft LGIA with new construction milestones. The Parties agree to negotiate the amended draft LGIA in good faith such that it can be executed by the end of the suspension.

Interconnection Customer subject to Section 8.9.2.2 of Appendix DD may not request suspension.

5.17 Taxes.

5.17.1 Interconnection Customer Payments Not Taxable. The Parties intend that all payments or property transfers made by the Interconnection Customer to the Participating TO for the installation of the Participating TO's Interconnection Facilities and the Network Upgrades shall be non-taxable, either as contributions to capital, or as a refundable advance, in accordance with the Internal Revenue Code and any applicable state income tax laws and shall not be taxable as contributions in aid of construction or otherwise under the Internal Revenue Code and any applicable state income tax laws.

5.17.2 Representations And Covenants. In accordance with IRS Notice 2001-82 and IRS Notice 88-129, the Interconnection Customer represents and covenants that (i) ownership of the electricity generated at the Large Generating Facility will pass to another party prior to the transmission of the electricity on the CAISO Controlled Grid, (ii) for income tax purposes, the amount of any payments and the cost of any property transferred to the Participating TO for the Participating TO's Interconnection Facilities will be capitalized by the Interconnection Customer as an intangible asset and recovered using the straight-line method over a useful life of twenty (20) years, and (iii) any portion of the Participating TO's Interconnection Facilities that is a "dual-use intertie," within the meaning of IRS Notice 88-129, is reasonably expected to carry only a de minimis amount of electricity in the direction of the Large Generating Facility. For this

purpose, “de minimis amount” means no more than 5 percent of the total power flows in both directions, calculated in accordance with the “5 percent test” set forth in IRS Notice 88-129. This is not intended to be an exclusive list of the relevant conditions that must be met to conform to IRS requirements for non-taxable treatment.

At the Participating TO’s request, the Interconnection Customer shall provide the Participating TO with a report from an independent engineer confirming its representation in clause (iii), above. The Participating TO represents and covenants that the cost of the Participating TO's Interconnection Facilities paid for by the Interconnection Customer without the possibility of refund or credit will have no net effect on the base upon which rates are determined.

5.17.3 Indemnification for the Cost Consequence of Current Tax Liability Imposed Upon the Participating TO. Notwithstanding Article 5.17.1, the Interconnection Customer shall protect, indemnify and hold harmless the Participating TO from the cost consequences of any current tax liability imposed against the Participating TO as the result of payments or property transfers made by the Interconnection Customer to the Participating TO under this LGIA for Interconnection Facilities, as well as any interest and penalties, other than interest and penalties attributable to any delay caused by the Participating TO.

The Participating TO shall not include a gross-up for the cost consequences of any current tax liability in the amounts it charges the Interconnection Customer under this LGIA unless (i) the Participating TO has determined, in good faith, that the payments or property transfers made by the Interconnection Customer to the Participating TO should be reported as income subject to taxation or (ii) any Governmental Authority directs the Participating TO to report payments or property as income subject to taxation; provided, however, that the Participating TO may require the Interconnection Customer to provide security for Interconnection Facilities, in a form reasonably acceptable to the Participating TO (such as a parental guarantee or a letter of credit), in an amount equal to the cost consequences of any current tax liability under this Article 5.17. The Interconnection Customer shall reimburse the Participating TO for such costs on a fully grossed-up basis, in accordance with Article 5.17.4, within thirty (30) Calendar Days of receiving written notification from the Participating TO of the amount due, including detail about how the amount was calculated.

The indemnification obligation shall terminate at the earlier of (1) the expiration of the ten year testing period and the applicable statute of limitation, as it may be extended by the Participating TO upon request of the IRS, to keep these years open for audit or adjustment, or (2) the

occurrence of a subsequent taxable event and the payment of any related indemnification obligations as contemplated by this Article 5.17.

5.17.4 Tax Gross-Up Amount. The Interconnection Customer's liability for the cost consequences of any current tax liability under this Article 5.17 shall be calculated on a fully grossed-up basis. Except as may otherwise be agreed to by the parties, this means that the Interconnection Customer will pay the Participating TO, in addition to the amount paid for the Interconnection Facilities and Network Upgrades, an amount equal to (1) the current taxes imposed on the Participating TO ("Current Taxes") on the excess of (a) the gross income realized by the Participating TO as a result of payments or property transfers made by the Interconnection Customer to the Participating TO under this LGIA (without regard to any payments under this Article 5.17) (the "Gross Income Amount") over (b) the present value of future tax deductions for depreciation that will be available as a result of such payments or property transfers (the "Present Value Depreciation Amount"), plus (2) an additional amount sufficient to permit the Participating TO to receive and retain, after the payment of all Current Taxes, an amount equal to the net amount described in clause (1).

For this purpose, (i) Current Taxes shall be computed based on the Participating TO's composite federal and state tax rates at the time the payments or property transfers are received and the Participating TO will be treated as being subject to tax at the highest marginal rates in effect at that time (the "Current Tax Rate"), and (ii) the Present Value Depreciation Amount shall be computed by discounting the Participating TO's anticipated tax depreciation deductions as a result of such payments or property transfers by the Participating TO's current weighted average cost of capital. Thus, the formula for calculating the Interconnection Customer's liability to the Participating TO pursuant to this Article 5.17.4 can be expressed as follows: (Current Tax Rate x (Gross Income Amount – Present Value of Tax Depreciation))/(1-Current Tax Rate). Interconnection Customer's estimated tax liability in the event taxes are imposed shall be stated in Appendix A, Interconnection Facilities, Network Upgrades and Distribution Upgrades.

5.17.5 Private Letter Ruling or Change or Clarification of Law. At the Interconnection Customer's request and expense, the Participating TO shall file with the IRS a request for a private letter ruling as to whether any property transferred or sums paid, or to be paid, by the Interconnection Customer to the Participating TO under this LGIA are subject to federal income taxation. The Interconnection Customer will prepare the initial draft of the request for a private letter ruling, and will certify under penalties of perjury that all facts represented in such request are true and accurate to the best of the Interconnection Customer's knowledge. The

Participating TO and Interconnection Customer shall cooperate in good faith with respect to the submission of such request, provided, however, the Interconnection Customer and the Participating TO explicitly acknowledge (and nothing herein is intended to alter) Participating TO's obligation under law to certify that the facts presented in the ruling request are true, correct and complete.

The Participating TO shall keep the Interconnection Customer fully informed of the status of such request for a private letter ruling and shall execute either a privacy act waiver or a limited power of attorney, in a form acceptable to the IRS, that authorizes the Interconnection Customer to participate in all discussions with the IRS regarding such request for a private letter ruling. The Participating TO shall allow the Interconnection Customer to attend all meetings with IRS officials about the request and shall permit the Interconnection Customer to prepare the initial drafts of any follow-up letters in connection with the request.

5.17.6 Subsequent Taxable Events. If, within 10 years from the date on which the relevant Participating TO's Interconnection Facilities are placed in service, (i) the Interconnection Customer Breaches the covenants contained in Article 5.17.2, (ii) a "disqualification event" occurs within the meaning of IRS Notice 88-129, or (iii) this LGIA terminates and the Participating TO retains ownership of the Interconnection Facilities and Network Upgrades, the Interconnection Customer shall pay a tax gross-up for the cost consequences of any current tax liability imposed on the Participating TO, calculated using the methodology described in Article 5.17.4 and in accordance with IRS Notice 90-60.

5.17.7 Contests. In the event any Governmental Authority determines that the Participating TO's receipt of payments or property constitutes income that is subject to taxation, the Participating TO shall notify the Interconnection Customer, in writing, within thirty (30) Calendar Days of receiving notification of such determination by a Governmental Authority. Upon the timely written request by the Interconnection Customer and at the Interconnection Customer's sole expense, the Participating TO may appeal, protest, seek abatement of, or otherwise oppose such determination. Upon the Interconnection Customer's written request and sole expense, the Participating TO may file a claim for refund with respect to any taxes paid under this Article 5.17, whether or not it has received such a determination. The Participating TO reserve the right to make all decisions with regard to the prosecution of such appeal, protest, abatement or other contest, including the selection of counsel and compromise or settlement of the claim, but the Participating TO shall keep the Interconnection Customer informed, shall consider in good faith suggestions from the Interconnection Customer about the conduct of the

contest, and shall reasonably permit the Interconnection Customer or an Interconnection Customer representative to attend contest proceedings.

The Interconnection Customer shall pay to the Participating TO on a periodic basis, as invoiced by the Participating TO, the Participating TO's documented reasonable costs of prosecuting such appeal, protest, abatement or other contest, including any costs associated with obtaining the opinion of independent tax counsel described in this Article 5.17.7. The Participating TO may abandon any contest if the Interconnection Customer fails to provide payment to the Participating TO within thirty (30) Calendar Days of receiving such invoice.

At any time during the contest, the Participating TO may agree to a settlement either with the Interconnection Customer's consent or, if such consent is refused, after obtaining written advice from independent nationally-recognized tax counsel, selected by the Participating TO, but reasonably acceptable to the Interconnection Customer, that the proposed settlement represents a reasonable settlement given the hazards of litigation. The Interconnection Customer's obligation shall be based on the amount of the settlement agreed to by the Interconnection Customer, or if a higher amount, so much of the settlement that is supported by the written advice from nationally-recognized tax counsel selected under the terms of the preceding paragraph. The settlement amount shall be calculated on a fully grossed-up basis to cover any related cost consequences of the current tax liability. The Participating TO may also settle any tax controversy without receiving the Interconnection Customer's consent or any such written advice; however, any such settlement will relieve the Interconnection Customer from any obligation to indemnify the Participating TO for the tax at issue in the contest (unless the failure to obtain written advice is attributable to the Interconnection Customer's unreasonable refusal to the appointment of independent tax counsel).

5.17.8 Refund. In the event that (a) a private letter ruling is issued to the Participating TO which holds that any amount paid or the value of any property transferred by the Interconnection Customer to the Participating TO under the terms of this LGIA is not subject to federal income taxation, (b) any legislative change or administrative announcement, notice, ruling or other determination makes it reasonably clear to the Participating TO in good faith that any amount paid or the value of any property transferred by the Interconnection Customer to the Participating TO under the terms of this LGIA is not taxable to the Participating TO, (c) any abatement, appeal, protest, or other contest results in a determination that any payments or transfers made by the Interconnection Customer to the Participating TO are not subject to federal income tax, or (d) if the Participating TO receives a refund from any taxing authority for any overpayment of tax attributable

to any payment or property transfer made by the Interconnection Customer to the Participating TO pursuant to this LGIA, the Participating TO shall promptly refund to the Interconnection Customer the following:

(i) any payment made by Interconnection Customer under this Article 5.17 for taxes that is attributable to the amount determined to be non-taxable, together with interest thereon,

(ii) interest on any amounts paid by the Interconnection Customer to the Participating TO for such taxes which the Participating TO did not submit to the taxing authority, calculated in accordance with the methodology set forth in FERC's regulations at 18 C.F.R. §35.19a(a)(2)(iii) from the date payment was made by the Interconnection Customer to the date the Participating TO refunds such payment to the Interconnection Customer, and

(iii) with respect to any such taxes paid by the Participating TO, any refund or credit the Participating TO receives or to which it may be entitled from any Governmental Authority, interest (or that portion thereof attributable to the payment described in clause (i), above) owed to the Participating TO for such overpayment of taxes (including any reduction in interest otherwise payable by the Participating TO to any Governmental Authority resulting from an offset or credit); provided, however, that the Participating TO will remit such amount promptly to the Interconnection Customer only after and to the extent that the Participating TO has received a tax refund, credit or offset from any Governmental Authority for any applicable overpayment of income tax related to the Participating TO's Interconnection Facilities.

The intent of this provision is to leave the Parties, to the extent practicable, in the event that no taxes are due with respect to any payment for Interconnection Facilities and Network Upgrades hereunder, in the same position they would have been in had no such tax payments been made.

5.17.9 Taxes Other Than Income Taxes. Upon the timely request by the Interconnection Customer, and at the Interconnection Customer's sole expense, the CAISO or Participating TO may appeal, protest, seek abatement of, or otherwise contest any tax (other than federal or state income tax) asserted or assessed against the CAISO or Participating TO for which the Interconnection Customer may be required to reimburse the CAISO or Participating TO under the terms of this LGIA. The Interconnection Customer shall pay to the Participating TO on a periodic basis, as invoiced by the Participating TO, the Participating TO's documented reasonable costs of prosecuting such appeal, protest, abatement, or other contest. The Interconnection Customer, the CAISO,

and the Participating TO shall cooperate in good faith with respect to any such contest. Unless the payment of such taxes is a prerequisite to an appeal or abatement or cannot be deferred, no amount shall be payable by the Interconnection Customer to the CAISO or Participating TO for such taxes until they are assessed by a final, non-appealable order by any court or agency of competent jurisdiction. In the event that a tax payment is withheld and ultimately due and payable after appeal, the Interconnection Customer will be responsible for all taxes, interest and penalties, other than penalties attributable to any delay caused by the Participating TO.

5.18 Tax Status. Each Party shall cooperate with the others to maintain the other Parties' tax status. Nothing in this LGIA is intended to adversely affect the CAISO's or any Participating TO's tax exempt status with respect to the issuance of bonds including, but not limited to, Local Furnishing Bonds.

5.19 Modification.

5.19.1 General. The Interconnection Customer or the Participating TO may undertake modifications to its facilities, subject to Section 25.1(c) and Section 25 of the CAISO Tariff if the Interconnection Customer has achieved its Commercial Operation Date, and subject to Section 6.7.2 of Appendix DD if it has not.

If a Party plans to undertake a modification that reasonably may be expected to affect the other Parties' facilities, that Party shall provide to the other Parties sufficient information regarding such modification so that the other Parties may evaluate the potential impact of such modification prior to commencement of the work. Such information shall be deemed to be confidential hereunder and shall include information concerning the timing of such modifications and whether such modifications are expected to interrupt the flow of electricity from the Large Generating Facility. The Party desiring to perform such work shall provide the relevant drawings, plans, and specifications to the other Parties at least ninety (90) Calendar Days in advance of the commencement of the work or such shorter period upon which the Parties may agree, which agreement shall not unreasonably be withheld, conditioned or delayed.

Notwithstanding Section 7.5 of Appendix DD, at any time after achieving its Commercial Operation Date, the Interconnection Customer may reduce the megawatt generating capacities of its Generating Facilities, subject to Section 25.1(c) of the CAISO Tariff. Section 7.5.11 of Appendix DD will still apply to such requests to reduce capacity.

5.19.2 Standards. Any additions, modifications, or replacements made to a Party's facilities shall be designed, constructed and operated in accordance with this LGIA and Good Utility Practice.

5.19.3 Modification Costs. The Interconnection Customer shall not be directly assigned the costs of any additions, modifications, or replacements that the Participating TO makes to the Participating TO's Interconnection Facilities or the Participating TO's Transmission System to facilitate the interconnection of a third party to the Participating TO's Interconnection Facilities or the Participating TO's Transmission System, or to provide transmission service to a third party under the CAISO Tariff. The Interconnection Customer shall be responsible for the costs of any additions, modifications, or replacements to the Interconnection Facilities that may be necessary to maintain or upgrade such Interconnection Facilities consistent with Applicable Laws and Regulations, Applicable Reliability Standards or Good Utility Practice.

5.20 Annual Reassessment Process. In accordance with Section 7.4 of the GIDAP, the CAISO will perform an annual reassessment, as part of a queue cluster interconnection study cycle, in which it will update certain base case data prior to beginning the GIDAP Phase II Interconnection Studies. As set forth in Section 7.4, the CAISO may determine through this assessment that Delivery Network Upgrades and Off-Peak Network Upgrades already identified and included in executed generator interconnection agreements should be modified in order to reflect the current circumstances of interconnection customers in the queue, including any withdrawals therefrom, and any additions and upgrades approved in the CAISO's most recent TPP cycle. To the extent that this determination modifies the scope or characteristics of, or the cost responsibility for, any Delivery Network Upgrades and Off-Peak Network Upgrades set forth in Appendix A to this LGIA, such modification(s) will be reflected through an amendment to this LGIA.

ARTICLE 6. TESTING AND INSPECTION

6.1 Pre-Commercial Operation Date Testing and Modifications. Prior to the Commercial Operation Date, the Participating TO shall test the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades and the Interconnection Customer shall test the Large Generating Facility and the Interconnection Customer's Interconnection Facilities to ensure their safe and reliable operation. Similar testing may be required after initial operation. Each Party shall make any modifications to its facilities that are found to be necessary as a result of such testing. The Interconnection Customer shall bear the cost of all such testing and modifications. The Interconnection Customer shall not commence initial parallel operation of an Electric Generating Unit with the Participating TO's Transmission System until the Participating TO provides prior

written approval, which approval shall not be unreasonably withheld, for operation of such Electric Generating Unit. The Interconnection Customer shall generate test energy at the Large Generating Facility only if it has arranged for the delivery of such test energy.

6.2 Post-Commercial Operation Date Testing and Modifications. Each Party shall at its own expense perform routine inspection and testing of its facilities and equipment in accordance with Good Utility Practice as may be necessary to ensure the continued interconnection of the Large Generating Facility with the Participating TO's Transmission System in a safe and reliable manner. Each Party shall have the right, upon advance written notice, to require reasonable additional testing of the other Party's facilities, at the requesting Party's expense, as may be in accordance with Good Utility Practice.

6.3 Right to Observe Testing. Each Party shall notify the other Parties at least fourteen (14) Calendar Days in advance of its performance of tests of its Interconnection Facilities or Generating Facility. The other Parties have the right, at their own expense, to observe such testing.

6.4 Right to Inspect. Each Party shall have the right, but shall have no obligation to: (i) observe another Party's tests and/or inspection of any of its System Protection Facilities and other protective equipment, including Power System Stabilizers; (ii) review the settings of another Party's System Protection Facilities and other protective equipment; and (iii) review another Party's maintenance records relative to the Interconnection Facilities, the System Protection Facilities and other protective equipment. A Party may exercise these rights from time to time as it deems necessary upon reasonable notice to the other Party. The exercise or non-exercise by a Party of any such rights shall not be construed as an endorsement or confirmation of any element or condition of the Interconnection Facilities or the System Protection Facilities or other protective equipment or the operation thereof, or as a warranty as to the fitness, safety, desirability, or reliability of same. Any information that a Party obtains through the exercise of any of its rights under this Article 6.4 shall be deemed to be Confidential Information and treated pursuant to Article 22 of this LGIA.

ARTICLE 7. METERING

7.1 General. Each Party shall comply with any Applicable Reliability Standards and the Applicable Reliability Council requirements. The Interconnection Customer and CAISO shall comply with the provisions of the CAISO Tariff regarding metering, including Section 10 of the CAISO Tariff. Unless otherwise agreed by the Participating TO and the Interconnection Customer, the Participating TO may install additional Metering Equipment at the Point of Interconnection prior to any operation of any Electric Generating Unit and shall own, operate, test and maintain such Metering Equipment. Power flows to and from the Large Generating Facility shall be measured at or, at the CAISO's or Participating TO's

option for its respective Metering Equipment, compensated to, the Point of Interconnection. The CAISO shall provide metering quantities to the Interconnection Customer upon request in accordance with the CAISO Tariff by directly polling the CAISO's meter data acquisition system. The Interconnection Customer shall bear all reasonable documented costs associated with the purchase, installation, operation, testing and maintenance of the Metering Equipment.

7.2 Check Meters. The Interconnection Customer, at its option and expense, may install and operate, on its premises and on its side of the Point of Interconnection, one or more check meters to check the CAISO-polled meters or the Participating TO's meters. Such check meters shall be for check purposes only and shall not be used for the measurement of power flows for purposes of this LGIA, except in the case that no other means are available on a temporary basis at the option of the CAISO or the Participating TO. The check meters shall be subject at all reasonable times to inspection and examination by the CAISO or Participating TO or their designees. The installation, operation and maintenance thereof shall be performed entirely by the Interconnection Customer in accordance with Good Utility Practice.

7.3 Participating TO Retail Metering. The Participating TO may install retail revenue quality meters and associated equipment, pursuant to the Participating TO's applicable retail tariffs.

ARTICLE 8. COMMUNICATIONS

8.1 Interconnection Customer Obligations. The Interconnection Customer shall maintain satisfactory operating communications with the CAISO in accordance with the provisions of the CAISO Tariff and with the Participating TO's dispatcher or representative designated by the Participating TO. The Interconnection Customer shall provide standard voice line, dedicated voice line and facsimile communications at its Large Generating Facility control room or central dispatch facility through use of either the public telephone system, or a voice communications system that does not rely on the public telephone system. The Interconnection Customer shall also provide the dedicated data circuit(s) necessary to provide Interconnection Customer data to the CAISO and Participating TO as set forth in Appendix D, Security Arrangements Details. The data circuit(s) shall extend from the Large Generating Facility to the location(s) specified by the CAISO and Participating TO. Any required maintenance of such communications equipment shall be performed by the Interconnection Customer. Operational communications shall be activated and maintained under, but not be limited to, the following events: system paralleling or separation, scheduled and unscheduled shutdowns, equipment clearances, and hourly and daily load data.

8.2 Remote Terminal Unit. Prior to the Initial Synchronization Date of each Electric Generating Unit, a Remote Terminal Unit, or equivalent data collection and transfer equipment acceptable to the Parties, shall be installed by the Interconnection Customer, or by the Participating TO at the Interconnection Customer's expense, to gather accumulated and instantaneous data to be telemetered to the location(s) designated by the CAISO and by the Participating TO through use of a dedicated point-to-point data circuit(s) as indicated in Article 8.1.

Telemetry to the CAISO shall be provided in accordance with the CAISO's technical standards for direct telemetry. For telemetry to the Participating TO, the communication protocol for the data circuit(s) shall be specified by the Participating TO. Instantaneous bi-directional real power and reactive power flow and any other required information must be telemetered directly to the location(s) specified by the Participating TO.

Each Party will promptly advise the other Parties if it detects or otherwise learns of any metering, telemetry or communications equipment errors or malfunctions that require the attention and/or correction by another Party. The Party owning such equipment shall correct such error or malfunction as soon as reasonably feasible.

8.3 No Annexation. Any and all equipment placed on the premises of a Party shall be and remain the property of the Party providing such equipment regardless of the mode and manner of annexation or attachment to real property, unless otherwise mutually agreed by the Parties.

8.4 Provision of Data from a Variable Energy Resource. The Interconnection Customer whose Generating Facility is a Variable Energy Resource shall provide meteorological and forced outage data to the CAISO to the extent necessary for the CAISO's development and deployment of power production forecasts for that class of Variable Energy Resources. The Interconnection Customer with a Variable Energy Resource having wind as the energy source, at a minimum, will be required to provide the CAISO with site-specific meteorological data including: temperature, wind speed, wind direction, and atmospheric pressure. The Interconnection Customer with a Variable Energy Resource having solar as the energy source, at a minimum, will be required to provide the CAISO with site-specific meteorological data including: temperature, atmospheric pressure, and irradiance. The CAISO and Interconnection Customer whose Generating Facility is a Variable Energy Resource shall mutually agree to any additional meteorological data that are required for the development and deployment of a power production forecast. The Interconnection Customer whose Generating Facility is a Variable Energy Resource also shall submit data to the CAISO regarding all forced outages to the extent necessary for the CAISO's development and deployment of power production forecasts for that class of Variable Energy Resources. The exact specifications of the meteorological and

forced outage data to be provided by the Interconnection Customer to the CAISO, including the frequency and timing of data submittals, shall be made taking into account the size and configuration of the Variable Energy Resource, its characteristics, location, and its importance in maintaining generation resource adequacy and transmission system reliability in its area. All requirements for meteorological and forced outage data must be commensurate with the power production forecasting employed by the CAISO. Such requirements for meteorological and forced outage data are set forth in Appendix C, Interconnection Details, of this LGIA, as they may change from time to time.

ARTICLE 9. OPERATIONS

9.1 General. Each Party shall comply with Applicable Reliability Standards and the Applicable Reliability Council requirements. Each Party shall provide to the other Party all information that may reasonably be required by the other Party to comply with Applicable Laws and Regulations and Applicable Reliability Standards.

9.2 Balancing Authority Area Notification. At least three months before Initial Synchronization Date, the Interconnection Customer shall notify the CAISO and Participating TO in writing of the Balancing Authority Area in which the Large Generating Facility intends to be located. If the Interconnection Customer intends to locate the Large Generating Facility in a Balancing Authority Area other than the Balancing Authority Area within whose electrically metered boundaries the Large Generating Facility is located, and if permitted to do so by the relevant transmission tariffs, all necessary arrangements, including but not limited to those set forth in Article 7 and Article 8 of this LGIA, and remote Balancing Authority Area generator interchange agreements, if applicable, and the appropriate measures under such agreements, shall be executed and implemented prior to the placement of the Large Generating Facility in the other Balancing Authority Area.

9.3 CAISO and Participating TO Obligations. The CAISO and Participating TO shall cause the Participating TO's Transmission System to be operated and controlled in a safe and reliable manner and in accordance with this LGIA. The Participating TO at the Interconnection Customer's expense shall cause the Participating TO's Interconnection Facilities to be operated, maintained and controlled in a safe and reliable manner and in accordance with this LGIA. The CAISO and Participating TO may provide operating instructions to the Interconnection Customer consistent with this LGIA and Participating TO and CAISO operating protocols and procedures as they may change from time to time. The Participating TO and CAISO will consider changes to their operating protocols and procedures proposed by the Interconnection Customer.

9.4 Interconnection Customer Obligations. The Interconnection Customer shall at its own expense operate, maintain and control the Large Generating Facility and the Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA. The Interconnection Customer shall operate the Large Generating Facility and the Interconnection Customer's Interconnection Facilities in accordance with all applicable requirements of the Balancing Authority Area of which it is part, including such requirements as set forth in Appendix C, Interconnection Details, of this LGIA. Appendix C, Interconnection Details, will be modified to reflect changes to the requirements as they may change from time to time. A Party may request that another Party provide copies of the requirements set forth in Appendix C, Interconnection Details, of this LGIA. The Interconnection Customer shall not commence Commercial Operation of an Electric Generating Unit with the Participating TO's Transmission System until the Participating TO provides prior written approval, which approval shall not be unreasonably withheld, for operation of such Electric Generating Unit.

9.5 Start-Up and Synchronization. Consistent with the Parties' mutually acceptable procedures, the Interconnection Customer is responsible for the proper synchronization of each Electric Generating Unit to the CAISO Controlled Grid.

9.6 Reactive Power and Primary Frequency Response.

9.6.1 Power Factor Design Criteria. For all Generating Facilities other than Asynchronous Generating Facilities, the Interconnection Customer shall design the Large Generating Facility to maintain a composite power delivery at continuous rated power output at the terminals of the Electric Generating Unit at a power factor within the range of 0.95 leading to 0.90 lagging, unless the CAISO has established different requirements that apply to all generators in the Balancing Authority Area on a comparable basis. For Asynchronous Generating Facilities, the Interconnection Customer shall design the Large Generating Facility to maintain power factor criteria in accordance with Appendix H of this LGIA except in the following cases: (a) an Interconnection Customer posts Interconnection Financial Security for an Asynchronous Generating Facility pursuant to Appendix DD of the CAISO Tariff Section 11.2.2 on or after September 21, 2016; or (b) an Interconnection Customer that submits an Interconnection Request for an Asynchronous Generating Facility under the Fast Track Process pursuant to Appendix DD of the CAISO Tariff on or after September 21, 2016.

When an Interconnection Customer posts Interconnection Financial Security for an Asynchronous Generating Facility pursuant to Appendix DD of the CAISO Tariff on or after September 21, 2016, the Interconnection Customer will design the Large Generator Facility to

maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 0.95 leading to 0.95 lagging, unless the CAISO has established a different power factor range that applies to all Asynchronous Generating Facilities on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors and reactors, or a combination of the two.

When an Interconnection Customer submits an Interconnection Request for an Asynchronous Generating Facility under the Fast Track Process pursuant to Appendix DD of the CAISO Tariff on or after September 21, 2016, the Interconnection Customer will design the Large Generating Facility to maintain a composite power delivery at continuous rated power output at the high-side of the generator substation at a power factor within the range of 0.95 leading to 0.95 lagging, unless the CAISO has established a different power factor range that applies to all Asynchronous Generating Facilities on a comparable basis. This power factor range standard shall be dynamic and can be met using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors and reactors, or a combination of the two.

9.6.2 Voltage Schedules. Once the Interconnection Customer has synchronized an Electric Generating Unit with the CAISO Controlled Grid, the CAISO or Participating TO shall require the Interconnection Customer to maintain a voltage schedule by operating the Electric Generating Unit to produce or absorb reactive power within the design limitations of the Electric Generating Unit set forth in Article 9.6.1 (Power Factor Design Criteria). CAISO's voltage schedules shall treat all sources of reactive power in the Balancing Authority Area in an equitable and not unduly discriminatory manner. The Participating TO shall exercise Reasonable Efforts to provide the Interconnection Customer with such schedules at least one (1) day in advance, and the CAISO or Participating TO may make changes to such schedules as necessary to maintain the reliability of the CAISO Controlled Grid or the Participating TO's electric system. The Interconnection Customer shall operate the Electric Generating Unit to maintain the specified output voltage or power factor within the design limitations of the Electric Generating Unit set forth in Article 9.6.1 (Power Factor Design Criteria), and as may be required by the CAISO to operate the Electric Generating Unit at a specific voltage schedule within the design limitations set forth in Article 9.6.1. If the Interconnection Customer is unable to maintain the specified voltage or power factor, it shall promptly notify the CAISO and the Participating TO.

9.6.2.1 Voltage Regulators. Whenever an Electric Generating Unit is operated in parallel with the CAISO Controlled Grid and voltage regulators are capable of operation, the Interconnection Customer shall operate the Electric Generating Unit with its voltage regulators in automatic operation. If the Electric Generating Unit's voltage regulators are not capable of such automatic operation, the Interconnection Customer shall immediately notify the CAISO and the Participating TO and ensure that the Electric Generating Unit operates as specified in Article 9.6.2 through manual operation and that such Electric Generating Unit's reactive power production or absorption (measured in MVARs) are within the design capability of the Electric Generating Unit(s) and steady state stability limits. The Interconnection Customer shall restore the speed governors and voltage regulators to automatic operation as soon as possible. If the Large Generating Facility's speed governors and voltage regulators are improperly tuned or malfunctioning, the CAISO shall have the right to order the reduction in output or disconnection of the Large Generating Facility if the reliability of the CAISO Controlled Grid would be adversely affected. The Interconnection Customer shall not cause its Large Generating Facility to disconnect automatically or instantaneously from the CAISO Controlled Grid or trip any Electric Generating Unit comprising the Large Generating Facility for an under or over frequency condition unless the abnormal frequency condition persists for a time period beyond the limits set forth in ANSI/IEEE Standard C37.106, or such other standard as applied to other generators in the Balancing Authority Area on a comparable basis.

9.6.3 Payment for Reactive Power. CAISO is required to pay the Interconnection Customer for reactive power that Interconnection Customer provides or absorbs from an Electric Generating Unit when the CAISO requests the Interconnection Customer to operate its Electric Generating Unit outside the range specified in Article 9.6.1, provided that if the CAISO pays other generators for reactive power service within the specified range, it must also pay the Interconnection Customer. Payments shall be pursuant to Article 11.6 or such other agreement to which the CAISO and Interconnection Customer have otherwise agreed.

9.6.4 Primary Frequency Response. Interconnection Customer shall ensure the primary frequency response capability of its Electric Generating Unit(s) by installing, maintaining, and operating a functioning governor or equivalent controls. The term "functioning governor or equivalent controls" as used herein shall mean the required hardware and/or software that provides frequency responsive real power control with the ability to sense changes in system frequency and autonomously adjust the Electric Generating Unit's real power output in accordance with the droop and

deadband parameters and in the direction needed to correct frequency deviations. Interconnection Customer is required to install a governor or equivalent controls with the capability of operating: (1) with a maximum 5 percent droop and ±0.036 Hz deadband; or (2) in accordance with the relevant droop, deadband, and timely and sustained response settings from Applicable Reliability Standards providing for equivalent or more stringent parameters. The droop characteristic shall be: (1) based on the nameplate capacity of the Electric Generating Unit(s), and shall be linear in the range of frequencies between 59 to 61 Hz that are outside of the deadband parameter; or (2) based on Applicable Reliability Standards providing for an equivalent or more stringent parameter. The deadband parameter shall be: the range of frequencies above and below nominal (60 Hz) in which the governor or equivalent controls is not expected to adjust the Electric Generating Units' real power output in response to frequency deviations. The deadband shall be implemented: (1) without a step to the droop curve, that is, once the frequency deviation exceeds the deadband parameter, the expected change in the Electric Generating Units' real power output in response to frequency deviations shall start from zero and then increase (for under-frequency deviations) or decrease (for over-frequency deviations) linearly in proportion to the magnitude of the frequency deviation; or (2) in accordance with Applicable Reliability Standards providing for an equivalent or more stringent parameter. Interconnection Customer shall notify the CAISO that the primary frequency response capability of the Electric Generating Unit(s) has been tested and confirmed during commissioning. Once Interconnection Customer has synchronized the Electric Generating Unit(s) with the CAISO Controlled Grid, Interconnection Customer shall operate the Electric Generating Unit(s) consistent with the provisions specified in Sections 9.6.4.1 and 9.6.4.2 of this LGIA. The primary frequency response requirements contained herein shall apply to both synchronous and non-synchronous Large Generating Facilities.

9.6.4.1 Governor or Equivalent Controls. Whenever the Electric Generating Unit(s) is operated in parallel with the CAISO Controlled Grid, Interconnection Customer shall operate the Electric Generating Unit(s) with its governor or equivalent controls in service and responsive to frequency. Interconnection Customer shall, in coordination with the CAISO, set the deadband parameter to: (1) a maximum of ±0.036 Hz and set the droop parameter to a maximum of 5 percent; or (2) implement the relevant droop and deadband settings from Applicable Reliability Standards that provides for equivalent or more stringent parameters. Interconnection Customer shall be required to provide the status and settings of the governor or equivalent controls to the CAISO upon request. If Interconnection Customer needs to operate the Electric Generating Unit(s) with its governor or equivalent controls

not in service, Interconnection Customer shall immediately notify the CAISO, and provide the following information: (1) the operating status of the governor or equivalent controls (i.e., whether it is currently out of service or when it will be taken out of service); (2) the reasons for removing the governor or equivalent controls from service; and (3) a reasonable estimate of when the governor or equivalent controls will be returned to service. Interconnection Customer shall make Reasonable Efforts to return its governor or equivalent controls into service as soon as practicable. Interconnection Customer shall make Reasonable Efforts to keep outages of the Electric Generating Units' governor or equivalent controls to a minimum whenever the Electric Generating Unit(s) is operated in parallel with the CAISO Controlled Grid.

9.6.4.2 Timely and Sustained Response. Interconnection Customer shall ensure that the Electric Generating Units' real power response to sustained frequency deviations outside of the deadband setting is automatically provided and shall begin immediately after frequency deviates outside of the deadband, and to the extent the Electric Generating Unit(s) has operating capability in the direction needed to correct the frequency deviation. Interconnection Customer shall not block or otherwise inhibit the ability of the governor or equivalent controls to respond and shall ensure that the response is not inhibited, except under certain operational constraints including, but not limited to, ambient temperature limitations, physical energy limitations, outages of mechanical equipment, or regulatory requirements. The Electric Generating Unit(s) shall sustain the real power response at least until system frequency returns to a value within the deadband setting of the governor or equivalent controls. A FERC-approved Applicable Reliability Standard with equivalent or more stringent requirements shall supersede the above requirements.

9.6.4.3 Exemptions. Large Generating Facilities that are regulated by the Nuclear Regulatory Commission shall be exempt from Sections 9.6.4, 9.6.4.1, and 9.6.4.2 of this LGIA. Large Generating Facilities that are behind-the-meter generation that is sized-to-load (i.e., the thermal load and the generation are near-balanced in real-time operation and the generation is primarily controlled to maintain the unique thermal, chemical, or mechanical output necessary for the operating requirements of its host facility) shall be required to install primary frequency response capability in accordance with the droop and deadband capability requirements specified in Section 9.6.4, but shall be otherwise exempt from the operating requirements in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.4 of this LGIA.

9.6.4.4 Electric Storage Resources. Interconnection Customer interconnecting an electric storage resource shall establish an operating range in Appendix C of this LGIA that specifies a minimum state of charge and a maximum state of charge between which the electric storage resource will be required to provide primary frequency response consistent with the conditions set forth in Sections 9.6.4, 9.6.4.1, 9.6.4.2, and 9.6.4.3 of this LGIA. Appendix C shall specify whether the operating range is static or dynamic, and shall consider (1) the expected magnitude of frequency deviations in the interconnection; (2) the expected duration that system frequency will remain outside of the deadband parameter in the interconnection; (3) the expected incidence of frequency deviations outside of the deadband parameter in the interconnection; (4) the physical capabilities of the electric storage resource; (5) operational limitations of the electric storage resource due to manufacturer specifications; and (6) any other relevant factors agreed to by the CAISO and Interconnection Customer, and in consultation with the relevant transmission owner or balancing authority as appropriate. If the operating range is dynamic, then Appendix C must establish how frequently the operating range will be reevaluated and the factors that may be considered during its reevaluation.

Interconnection Customer's electric storage resource is required to provide timely and sustained primary frequency response consistent with Section 9.6.4.2 of this LGIA when it is online and dispatched to inject electricity to the CAISO Controlled Grid and/or receive electricity from the Participating TO's Transmission System or the CAISO Controlled Grid. This excludes circumstances when the electric storage resource is not dispatched to inject electricity to the CAISO Controlled Grid and/or dispatched to receive electricity from the Participating TO's Transmission system or the CAISO Controlled Grid. If Interconnection Customer's electric storage resource is charging at the time of a frequency deviation outside of its deadband parameter, it is to increase (for over-frequency deviations) or decrease (for under-frequency deviations) the rate at which it is charging in accordance with its droop parameter. Interconnection Customer's electric storage resource is not required to change from charging to discharging, or vice versa, unless the response necessitated by the droop and deadband settings requires it to do so and it is technically capable of making such a transition.

9.7 Outages and Interruptions.

9.7.1 Outages.

9.7.1.1 Outage Authority and Coordination. Each Party may in accordance with Good Utility Practice in coordination with the other Parties remove from service any of its respective Interconnection Facilities or Network Upgrades that may impact another Party's facilities as necessary to perform maintenance or testing or to install or replace equipment. Absent an Emergency Condition, the Party scheduling a removal of such facility(ies) from service will use Reasonable Efforts to schedule such removal on a date and time mutually acceptable to all Parties. In all circumstances any Party planning to remove such facility(ies) from service shall use Reasonable Efforts to minimize the effect on the other Parties of such removal.

9.7.1.2 Outage Schedules. The CAISO shall post scheduled outages of CAISO Controlled Grid facilities in accordance with the provisions of the CAISO Tariff. The Interconnection Customer shall submit its planned maintenance schedules for the Large Generating Facility to the CAISO in accordance with the CAISO Tariff. The Interconnection Customer shall update its planned maintenance schedules in accordance with the CAISO Tariff. The CAISO may request the Interconnection Customer to reschedule its maintenance as necessary to maintain the reliability of the CAISO Controlled Grid in accordance with the CAISO Tariff. Such planned maintenance schedules and updates and changes to such schedules shall be provided by the Interconnection Customer to the Participating TO concurrently with their submittal to the CAISO. The CAISO shall compensate the Interconnection Customer for any additional direct costs that the Interconnection Customer incurs as a result of having to reschedule maintenance in accordance with the CAISO Tariff. The Interconnection Customer will not be eligible to receive compensation, if during the twelve (12) months prior to the date of the scheduled maintenance, the Interconnection Customer had modified its schedule of maintenance activities.

9.7.1.3 Outage Restoration. If an outage on a Party's Interconnection Facilities or Network Upgrades adversely affects another Party's operations or facilities, the Party that owns or controls the facility that is out of service shall use Reasonable Efforts to promptly restore such facility(ies) to a normal operating condition consistent with the nature of the outage. The Party that owns or controls the facility that is out of service shall provide the other Parties, to the extent such information is known, information

on the nature of the Emergency Condition, if the outage is caused by an Emergency Condition, an estimated time of restoration, and any corrective actions required. Initial verbal notice shall be followed up as soon as practicable with written notice explaining the nature of the outage, if requested by a Party, which may be provided by e-mail or facsimile.

9.7.2 Interruption of Service. If required by Good Utility Practice to do so, the CAISO or the Participating TO may require the Interconnection Customer to interrupt or reduce deliveries of electricity if such delivery of electricity could adversely affect the CAISO's or the Participating TO's ability to perform such activities as are necessary to safely and reliably operate and maintain the Participating TO's electric system or the CAISO Controlled Grid. The following provisions shall apply to any interruption or reduction permitted under this Article 9.7.2:

9.7.2.1 The interruption or reduction shall continue only for so long as reasonably necessary under Good Utility Practice;

9.7.2.2 Any such interruption or reduction shall be made on an equitable, non-discriminatory basis with respect to all generating facilities directly connected to the CAISO Controlled Grid, subject to any conditions specified in this LGIA;

9.7.2.3 When the interruption or reduction must be made under circumstances which do not allow for advance notice, the CAISO or Participating TO, as applicable, shall notify the Interconnection Customer by telephone as soon as practicable of the reasons for the curtailment, interruption, or reduction, and, if known, its expected duration. Telephone notification shall be followed by written notification, if requested by the Interconnection Customer, as soon as practicable;

9.7.2.4 Except during the existence of an Emergency Condition, the CAISO or Participating TO shall notify the Interconnection Customer in advance regarding the timing of such interruption or reduction and further notify the Interconnection Customer of the expected duration. The CAISO or Participating TO shall coordinate with the Interconnection Customer using Good Utility Practice to schedule the interruption or reduction during periods of least impact to the Interconnection Customer, the CAISO, and the Participating TO;

9.7.2.5 The Parties shall cooperate and coordinate with each other to the extent necessary in order to restore the Large Generating Facility, Interconnection Facilities, the Participating TO's

Transmission System, and the CAISO Controlled Grid to their normal operating state, consistent with system conditions and Good Utility Practice.

9.7.3 Under-Frequency and Over Frequency Conditions. The CAISO Controlled Grid is designed to automatically activate a load-shed program as required by Applicable Reliability Standards and the Applicable Reliability Council in the event of an under-frequency system disturbance. The Interconnection Customer shall implement under-frequency and over-frequency protection set points for the Large Generating Facility as required by Applicable Reliability Standards and the Applicable Reliability Council to ensure “ride through” capability. Large Generating Facility response to frequency deviations of pre-determined magnitudes, both under-frequency and over-frequency deviations, shall be studied and coordinated with the Participating TO and CAISO in accordance with Good Utility Practice. The term "ride through" as used herein shall mean the ability of a Generating Facility to stay connected to and synchronized with the CAISO Controlled Grid during system disturbances within a range of under-frequency and over-frequency conditions, in accordance with Good Utility Practice. Asynchronous Generating Facilities shall be subject to frequency ride through capability requirements in accordance with Appendix H to this LGIA.

9.7.4 System Protection and Other Control Requirements.

9.7.4.1 System Protection Facilities. The Interconnection Customer shall, at its expense, install, operate and maintain System Protection Facilities as a part of the Large Generating Facility or the Interconnection Customer’s Interconnection Facilities. The Participating TO shall install at the Interconnection Customer's expense any System Protection Facilities that may be required on the Participating TO’s Interconnection Facilities or the Participating TO’s Transmission System as a result of the interconnection of the Large Generating Facility and the Interconnection Customer’s Interconnection Facilities.

9.7.4.2 The Participating TO’s and Interconnection Customer’s protection facilities shall be designed and coordinated with other systems in accordance with Applicable Reliability Standards, Applicable Reliability Council criteria, and Good Utility Practice.

9.7.4.3 The Participating TO and Interconnection Customer shall each be responsible for protection of its facilities consistent with Good Utility Practice.

9.7.4.4 The Participating TO's and Interconnection Customer's protective relay design shall incorporate the necessary test switches to perform the tests required in Article 6. The required test switches will be placed such that they allow operation of lockout relays while preventing breaker failure schemes from operating and causing unnecessary breaker operations and/or the tripping of the Interconnection Customer's Electric Generating Units.

9.7.4.5 The Participating TO and Interconnection Customer will test, operate and maintain System Protection Facilities in accordance with Good Utility Practice and, if applicable, the requirements of the Participating TO's Interconnection Handbook.

9.7.4.6 Prior to the in-service date, and again prior to the Commercial Operation Date, the Participating TO and Interconnection Customer or their agents shall perform a complete calibration test and functional trip test of the System Protection Facilities. At intervals suggested by Good Utility Practice, the standards and procedures of the Participating TO, including, if applicable, the requirements of the Participating TO's Interconnection Handbook, and following any apparent malfunction of the System Protection Facilities, each Party shall perform both calibration and functional trip tests of its System Protection Facilities. These tests do not require the tripping of any in-service generation unit. These tests do, however, require that all protective relays and lockout contacts be activated.

9.7.5 Requirements for Protection. In compliance with Good Utility Practice and, if applicable, the requirements of the Participating TO's Interconnection Handbook, the Interconnection Customer shall provide, install, own, and maintain relays, circuit breakers and all other devices necessary to remove any fault contribution of the Large Generating Facility to any short circuit occurring on the Participating TO's Transmission System not otherwise isolated by the Participating TO's equipment, such that the removal of the fault contribution shall be coordinated with the protective requirements of the Participating TO's Transmission System. Such protective equipment shall include, without limitation, a disconnecting device with fault current-interrupting capability located between the Large Generating Facility and the Participating TO's Transmission System at a site selected upon mutual agreement (not to be unreasonably withheld, conditioned or delayed) of the Parties. The Interconnection Customer shall be responsible for protection of the Large Generating Facility and the Interconnection Customer's other equipment from such conditions as negative sequence currents, over- or under-frequency, sudden load rejection, over- or under-voltage, and generator

loss-of-field. The Interconnection Customer shall be solely responsible to disconnect the Large Generating Facility and the Interconnection Customer's other equipment if conditions on the CAISO Controlled Grid could adversely affect the Large Generating Facility.

9.7.6 Power Quality. Neither the Participating TO's nor the Interconnection Customer's facilities shall cause excessive voltage flicker nor introduce excessive distortion to the sinusoidal voltage or current waves as defined by ANSI Standard C84.1-1989, in accordance with IEEE Standard 519, any applicable superseding electric industry standard, or any alternative Applicable Reliability Standard or Applicable Reliability Council standard. In the event of a conflict among ANSI Standard C84.1-1989, any applicable superseding electric industry standard, or any alternative Applicable Reliability Standard or Applicable Reliability Council standard, the alternative Applicable Reliability Standard or Applicable Reliability Council standard shall control.

9.8 Switching and Tagging Rules. Each Party shall provide the other Parties a copy of its switching and tagging rules that are applicable to the other Parties' activities. Such switching and tagging rules shall be developed on a non-discriminatory basis. The Parties shall comply with applicable switching and tagging rules, as amended from time to time, in obtaining clearances for work or for switching operations on equipment.

9.9 Use of Interconnection Facilities by Third Parties.

9.9.1 Purpose of Interconnection Facilities. Except as may be required by Applicable Laws and Regulations, or as otherwise agreed to among the Parties, the Interconnection Facilities shall be constructed for the sole purpose of interconnecting the Large Generating Facility to the Participating TO's Transmission System and shall be used for no other purpose.

9.9.2 Third Party Users. If required by Applicable Laws and Regulations or if the Parties mutually agree, such agreement not to be unreasonably withheld, to allow one or more third parties to use the Participating TO's Interconnection Facilities, or any part thereof, the Interconnection Customer will be entitled to compensation for the capital expenses it incurred in connection with the Interconnection Facilities based upon the pro rata use of the Interconnection Facilities by the Participating TO, all third party users, and the Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually-agreed upon methodology. In addition, cost responsibility for ongoing costs, including operation and maintenance costs associated with the Interconnection Facilities, will be allocated between the Interconnection Customer and any third party users based upon the pro rata use of the

Interconnection Facilities by the Participating TO, all third party users, and the Interconnection Customer, in accordance with Applicable Laws and Regulations or upon some other mutually agreed upon methodology. If the issue of such compensation or allocation cannot be resolved through such negotiations, it shall be submitted to FERC for resolution.

9.10 Disturbance Analysis Data Exchange. The Parties will cooperate with one another in the analysis of disturbances to either the Large Generating Facility or the CAISO Controlled Grid by gathering and providing access to any information relating to any disturbance, including information from oscillography, protective relay targets, breaker operations and sequence of events records, and any disturbance information required by Good Utility Practice.

ARTICLE 10. MAINTENANCE

10.1 Participating TO Obligations. The Participating TO shall maintain the Participating TO's Transmission System and the Participating TO's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.2 Interconnection Customer Obligations. The Interconnection Customer shall maintain the Large Generating Facility and the Interconnection Customer's Interconnection Facilities in a safe and reliable manner and in accordance with this LGIA.

10.3 Coordination. The Parties shall confer regularly to coordinate the planning, scheduling and performance of preventive and corrective maintenance on the Large Generating Facility and the Interconnection Facilities.

10.4 Secondary Systems. The Participating TO and Interconnection Customer shall cooperate with the other Parties in the inspection, maintenance, and testing of control or power circuits that operate below 600 volts, AC or DC, including, but not limited to, any hardware, control or protective devices, cables, conductors, electric raceways, secondary equipment panels, transducers, batteries, chargers, and voltage and current transformers that directly affect the operation of a Party's facilities and equipment which may reasonably be expected to impact the other Parties. Each Party shall provide advance notice to the other Parties before undertaking any work on such circuits, especially on electrical circuits involving circuit breaker trip and close contacts, current transformers, or potential transformers.

10.5 Operating and Maintenance Expenses. Subject to the provisions herein addressing the use of facilities by others, and except for operations and maintenance expenses associated with modifications made for providing interconnection or transmission service to a third party and such third party pays for such expenses, the Interconnection Customer shall be responsible for all

reasonable expenses including overheads, associated with: (1) owning, operating, maintaining, repairing, and replacing the Interconnection Customer's Interconnection Facilities; and (2) operation, maintenance, repair and replacement of the Participating TO's Interconnection Facilities.

ARTICLE 11. PERFORMANCE OBLIGATION

11.1 Interconnection Customer's Interconnection Facilities. The Interconnection Customer shall design, procure, construct, install, own and/or control the Interconnection Customer's Interconnection Facilities described in Appendix A at its sole expense.

11.2 Participating TO's Interconnection Facilities. The Participating TO shall design, procure, construct, install, own and/or control the Participating TO's Interconnection Facilities described in Appendix A at the sole expense of the Interconnection Customer. Unless the Participating TO elects to fund the capital for the Participating TO's Interconnection Facilities, they shall be solely funded by the Interconnection Customer.

11.3 Network Upgrades and Distribution Upgrades. The Participating TO shall design, procure, construct, install, and own the Network Upgrades and Distribution Upgrades described in Appendix A, except for Stand Alone Network Upgrades, which will be constructed, and if agreed to by the Parties owned by the Interconnection Customer, and Merchant Network Upgrades. The Interconnection Customer shall be responsible for all costs related to Distribution Upgrades. Network Upgrades shall be funded by the Interconnection Customer, which for Interconnection Customers processed under Section 6 of the GIDAP (in Queue Clusters) shall be in an amount determined pursuant to the methodology set forth in Section 6.3 of the GIDAP. This specific amount is set forth in Appendix G to this LGIA. For costs associated with Area Delivery Network Upgrades, any amounts set forth in Appendix G will be advisory estimates only, and will not operate to establishing any cap or Maximum Cost Exposure on the cost responsibility of the Interconnection Customer for Area Delivery Network Upgrades.

11.4 Transmission Credits. No later than thirty (30) Calendar Days prior to the Commercial Operation Date, the Interconnection Customer may make a one-time election by written notice to the CAISO and the Participating TO to (a) receive Congestion Revenue Rights as defined in and as available under the CAISO Tariff at the time of the election in accordance with the CAISO Tariff, in lieu of a repayment of the cost of Network Upgrades in accordance with Article 11.4.1, and/or (b) decline all or part of a refund of the cost of Network Upgrades entitled to the Interconnection Customer in accordance with Article 11.4.1.

11.4.1 Repayment of Amounts Advanced for Network Upgrades.

11.4.1.1 Repayment of Amounts Advanced Regarding Non-Phased Generating Facilities

An Interconnection Customer with a non-Phased Generating Facility in Queue Cluster 5 or earlier, or an Interconnection Customer in the Independent Study Process or the Fast Track Process that has been tendered a Generator Interconnection Agreement before December 19, 2014, shall be entitled to a repayment for the Interconnection Customer's contribution to the cost of Network Upgrades commencing upon the Commercial Operation Date of its Generating Facility.

An Interconnection Customer with a non-Phased Generating Facility in Queue Cluster 6 or later, or an Interconnection Customer in the Independent Study Process or the Fast Track Process that has not been tendered an Interconnection Agreement before December 19, 2014, shall be entitled to repayment for the Interconnection Customer's contribution to the cost of Network Upgrades placed in service on or before the Commercial Operation Date of its Generating Facility, commencing upon the Commercial Operation Date of the Generating Facility. Repayment for the Interconnection Customer's contribution to the cost of Network Upgrades placed into service after the Commercial Operation Date of its Generating Facility shall, for each of these Network Upgrades, commence no later than the later of: (i) the first month of the calendar year following the year in which the Network Upgrade is placed into service or (ii) 90 days after the Network Upgrade is placed into service.

An Interconnection Customer subject to this Article 11.4.1.1 shall be entitled to repayment for its contribution to the cost of Network Upgrades as follows:

(a) For Reliability Network Upgrades, the Interconnection Customer shall be entitled to a repayment of the amount paid by the Interconnection Customer for Reliability Network Upgrades as set forth in Appendix G, up to a maximum amount established in Section 14.3.2.1 of the GIDAP. For purposes of this determination, generating capacity will be based on the capacity of the Interconnection Customer's Generating Facility at the time it achieves Commercial Operation. To the extent that such repayment does not cover all of the costs of Interconnection Customer's Reliability Network Upgrades, the Interconnection Customer shall receive Merchant Transmission CRRs for that portion of its Reliability Network Upgrades that are not covered by cash repayment.

(b) For Local Delivery Network Upgrades:

i. If the Interconnection Customer is an Option (B) Interconnection Customer and has been allocated and continues to be eligible to receive TP Deliverability pursuant to the GIDAP, the Interconnection Customer shall be entitled to repayment of a portion of the total amount paid to the Participating TO for the costs of Local Delivery Network Upgrades for which it is responsible, as set forth in Appendix G. The repayment amount shall be determined by dividing the amount of TP Deliverability received by the amount of deliverability requested by the Interconnection Customer, and multiplying that percentage by the total amount paid to the Participating TO by the Interconnection Customer for Local Delivery Network Upgrades.

ii. If the Generating Facility is an Option (B) Generating Facility and has not been allocated any TP Deliverability, the Interconnection Customer shall not be entitled to repayment for the costs of Local Delivery Network Upgrades.

iii. If the Generating Facility is an Option (A) Generating Facility, the Interconnection Customer shall be entitled to a repayment equal to the total amount paid to the Participating TO for the costs of Local Delivery Network Upgrades for which it is responsible, as set forth in Appendix G.

(c) For Area Delivery Network Upgrades, the Interconnection Customer shall not be entitled to repayment for the costs of Area Delivery Network Upgrades.

(d) If an Interconnection Customer having a Option (B) Generating Facility, and is eligible, to construct and own Network Upgrades pursuant to the Merchant Option set forth in Article 5.15 of this LGIA, then the Interconnection Customer shall not be entitled to any repayment pursuant to this LGIA.

(e) For Local Off-Peak Network Upgrades, the Interconnection Customer will be entitled to a repayment equal to the total amount paid to the Participating TO for the costs of Local Delivery Network Upgrades for which it is responsible, as set forth in Appendix G.

Unless an Interconnection Customer has provided written notice to the CAISO that it is declining all or part of such repayment, such amounts shall include any tax gross-up or other tax-related payments associated with Network Upgrades not refunded to the

Interconnection Customer pursuant to Article 5.17.8 or otherwise, and shall be paid to the Interconnection Customer by the Participating TO on a dollar-for-dollar basis either through (1) direct payments made on a levelized basis over the five-year period commencing on the applicable date as provided for in this Article 11.4.1.1; or (2) any alternative payment schedule that is mutually agreeable to the Interconnection Customer and Participating TO, provided that such amount is paid within five (5) years of the applicable commencement date. Notwithstanding the foregoing, if this LGIA terminates within five (5) years of the applicable commencement date, the Participating TO's obligation to pay refunds to the Interconnection Customer shall cease as of the date of termination.

(f) Where the Interconnection Customer finances the construction of Network Upgrades for more than one Participating TO, the cost allocation, Interconnection Financial Security, and repayment will be conducted pursuant to Section 14.4.1 of the GIDAP, and set forth in Appendix G.

11.4.1.2 Repayment of Amounts Advanced Regarding Phased Generating Facilities

Upon the Commercial Operation Date of each phase of a Phased Generating Facility, the Interconnection Customer shall be entitled to a repayment equal to the Interconnection Customer's contribution to the cost of Network Upgrades for that completed phase for which the Interconnection Customer is responsible, as set forth in Appendix G, subject to the limitations specified in Article 11.4.1.1, if the following conditions are satisfied as described below:

(a) The Generating Facility is capable of being constructed in phases;

(b) The Generating Facility is specified in the LGIA as being constructed in phases;

(c) The completed phase corresponds to one of the phases specified in the LGIA;

(d) The phase has achieved Commercial Operation and the Interconnection Customer has tendered notice of the same pursuant to this LGIA;

(e) All Parties to the LGIA have confirmed that the completed phase meets the requirements set forth in this LGIA and any other

operating, metering, and interconnection requirements to permit generation output of the entire capacity of the completed phase as specified in this LGIA;

(f) The Network Upgrades necessary for the completed phase to meet the desired level of deliverability are in service; and

(g) The Interconnection Customer has posted one hundred (100) percent of the Interconnection Financial Security required for the Network Upgrades for all the phases of the Generating Facility (or if less than one hundred (100) percent has been posted, then all required Financial Security Instruments to the date of commencement of repayment).

Following satisfaction of these conditions (a) through (g), an Interconnection Customer in a Queue Cluster earlier than Queue Cluster 5, or an Interconnection Customer in the Independent Study Process or the Fast Track Process that has been tendered a Generator Interconnection Agreement before December 19, 2014, shall be entitled to receive a partial repayment of its financed cost responsibility, to the extent that it is otherwise eligible for such repayment per Article 11.4.1.1, in an amount equal to the percentage of the Generating Facility declared to be in Commercial Operation multiplied by the cost of the Network Upgrades associated with the completed phase. The Interconnection Customer shall be entitled to repayment in this manner for each completed phase until the entire Generating Facility is completed.

Following satisfaction of these conditions (a) through (e) and (g), an Interconnection Customer in Queue Cluster 6 or a later Queue Cluster, or an Interconnection Customer in the Independent Study Process or the Fast Track Process that has not been tendered a Generator Interconnection Agreement before December 19, 2014, shall be entitled to receive a repayment of its financed cost responsibility for the Network Upgrades associated with the completed phase that have been placed in service. The Interconnection Customer shall be entitled to repayment in this manner for each completed phase until the entire Generating Facility is completed. With respect to any Network Upgrades necessary for a completed phase to meet its desired level of deliverability that are not in service by the time the phase achieves Commercial Operation, repayment for each such Network Upgrade will commence no later than the later of: (i) the first month of the calendar year following the year in which the Network Upgrade is placed into service or (ii) 90 days after the Network Upgrade is placed into service.

A reduction in the electrical output (MW capacity) of the Generating Facility pursuant to the CAISO Tariff shall not diminish the Interconnection

Customer's right to repayment pursuant to this LGIA Article 11.4.1.2. If the LGIA includes a partial termination provision and the partial termination right has been exercised with regard to a phase that has not been built, then the Interconnection Customer's eligibility for repayment under this Article 11.4.1.2 as to the remaining phases shall not be diminished. If the Interconnection Customer completes one or more phases and then breaches the LGIA, the Participating TO and the CAISO shall be entitled to offset any losses or damages resulting from the Breach against any repayments made for Network Upgrades related to the completed phases.

Any repayment amount provided pursuant to this Article 11.4.1.2 shall include any tax gross-up or other tax-related payments associated with Network Upgrades not refunded to the Interconnection Customer pursuant to Article 5.17.8 or otherwise, and shall be paid to the Interconnection Customer by the Participating TO on a dollar-for-dollar basis either through (1) direct payments made on a levelized basis over the five-year period commencing on the applicable as provided for in this Article 11.4.1.2; or (2) any alternative payment schedule that is mutually agreeable to the Interconnection Customer and Participating TO, provided that such amount is paid within five (5) years of the applicable commencement date. Notwithstanding the foregoing, if this LGIA terminates within five (5) years of the applicable commencement date, the Participating TO's obligation to pay refunds to the Interconnection Customer shall cease as of the date of termination.

11.4.1.3 Interest Payments and Assignment Rights

Any phased or non-phased repayment shall include interest calculated in accordance with the methodology set forth in FERC's regulations at 18 C.F.R. §35.19a(a)(2)(iii) from the date of any payment for Network Upgrades through the date on which the Interconnection Customer receives a repayment of such payment. Interest shall continue to accrue on the repayment obligation so long as this LGIA is in effect. The Interconnection Customer may assign such repayment rights to any entity.

11.4.1.4 Failure to Achieve Commercial Operation

If the Large Generating Facility fails to achieve Commercial Operation, but it or another generating facility is later constructed and makes use of the Network Upgrades, the Participating TO shall at that time reimburse Interconnection Customer for the amounts advanced for the Network Upgrades. Before any such reimbursement can occur, the Interconnection Customer, or the entity that ultimately constructs the

generating facility, if different, is responsible for identifying and demonstrating to the Participating TO the appropriate entity to which reimbursement must be made in order to implement the intent of this reimbursement obligation.

11.4.2 Special Provisions for Affected Systems. The Interconnection Customer shall enter into an agreement with the owner of the Affected System and/or other affected owners of portions of the CAISO Controlled Grid, as applicable, in accordance with the GIDAP. Such agreement shall specify the terms governing payments to be made by the Interconnection Customer to the owner of the Affected System and/or other affected owners of portions of the CAISO Controlled Grid as well as the repayment by the owner of the Affected System and/or other affected owners of portions of the CAISO Controlled Grid. In no event shall the Participating TO be responsible for the repayment for any facilities that are not part of the Participating TO's Transmission System. In the event the Participating TO is a joint owner with an Affected System or with any other co-owner of a facility affected by the Large Generating Facility, the Participating TO's obligation to reimburse the Interconnection Customer for payments made to address the impacts of the Large Generating Facility on the system shall not exceed the proportionate amount of the cost of any upgrades attributable to the proportion of the jointly-owned facility owned by the Participating TO.

11.4.3 Notwithstanding any other provision of this LGIA, nothing herein shall be construed as relinquishing or foreclosing any rights, including but not limited to firm transmission rights, capacity rights, Congestion Revenue Rights, or transmission credits, that the Interconnection Customer shall be entitled to, now or in the future under any other agreement or tariff as a result of, or otherwise associated with, the transmission capacity, if any, created by the Network Upgrades, including the right to obtain cash reimbursements, merchant transmission Congestion Revenue Rights in accordance with Section 36.11 of the CAISO Tariff, or transmission credits for transmission service that is not associated with the Large Generating Facility.

11.5 Provision of Interconnection Financial Security. The Interconnection Customer is obligated to provide all necessary Interconnection Financial Security required under Section 11 of the GIDAP in a manner acceptable under Section 11 of the GIDAP. Failure by the Interconnection Customer to timely satisfy the GIDAP's requirements for the provision of Interconnection Financial Security shall be deemed a breach of this Agreement and a condition of Default of this Agreement.

11.5.1 Notwithstanding any other provision of this Agreement for notice of Default and opportunity to cure such Default, the CAISO or the Participating TO

shall provide the Interconnection Customer with written notice of any Default due to timely failure to post Interconnection Financial Security, and the Interconnection Customer shall have five (5) Business Days from the date of such notice to cure such Default by posting the required Interconnection Financial Security. If the Interconnection Customer fails to cure the Default, then this Agreement shall be deemed terminated.

11.6 Interconnection Customer Compensation. If the CAISO requests or directs the Interconnection Customer to provide a service pursuant to Articles 9.6.3 (Payment for Reactive Power) or 13.5.1 of this LGIA, the CAISO shall compensate the Interconnection Customer in accordance with the CAISO Tariff.

11.6.1 Interconnection Customer Compensation for Actions During Emergency Condition. The CAISO shall compensate the Interconnection Customer in accordance with the CAISO Tariff for its provision of real and reactive power and other Emergency Condition services that the Interconnection Customer provides to support the CAISO Controlled Grid during an Emergency Condition in accordance with Article 11.6.

ARTICLE 12. INVOICE

12.1 General. The Participating TO shall submit to the Interconnection Customer, on a monthly basis, invoices of amounts due pursuant to this LGIA for the preceding month. Each invoice shall state the month to which the invoice applies and fully describe the services and equipment provided. The Parties may discharge mutual debts and payment obligations due and owing to each other on the same date through netting, in which case all amounts a Party owes to the other Party under this LGIA, including interest payments or credits, shall be netted so that only the net amount remaining due shall be paid by the owing Party. Notwithstanding the foregoing, any invoices between the CAISO and another Party shall be submitted and paid in accordance with the CAISO Tariff.

12.2 Final Invoice. As soon as reasonably practicable, but within twelve months after completion of the construction of the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades, the Participating TO shall provide an invoice of the final cost of the construction of the Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades, and shall set forth such costs in sufficient detail to enable the Interconnection Customer to compare the actual costs with the estimates and to ascertain deviations, if any, from the cost estimates. With respect to costs associated with the Participating TO's Interconnection Facilities and Distribution Upgrades, the Participating TO shall refund to the Interconnection Customer any amount by which the actual payment by the Interconnection Customer for estimated costs exceeds the actual costs of construction within thirty (30) Calendar Days of the issuance of such final construction invoice; or, in the event the actual costs of

construction exceed the Interconnection Customer's actual payment for estimated costs, then the Interconnection Customer shall pay to the Participating TO any amount by which the actual costs of construction exceed the actual payment by the Interconnection Customer for estimated costs within thirty (30) Calendar Days of the issuance of such final construction invoice. With respect to costs associated with Network Upgrades, the Participating TO shall refund to the Interconnection Customer any amount by which the actual payment by the Interconnection Customer for estimated costs exceeds the actual costs of construction multiplied by the Interconnection Customer's percentage share of those costs, as set forth in Appendix G to this LGIA within thirty (30) Calendar Days of the issuance of such final construction invoice. In the event the actual costs of construction multiplied by the Interconnection Customer's percentage share of those costs exceed the Interconnection Customer's actual payment for estimated costs, then the Participating TO shall recover such difference through its transmission service rates.

12.3 Payment. Invoices shall be rendered to the Interconnection Customer at the address specified in Appendix F. The Interconnection Customer shall pay, or Participating TO shall refund, the amounts due within thirty (30) Calendar Days of the Interconnection Customer's receipt of the invoice. All payments shall be made in immediately available funds payable to the Interconnection Customer or Participating TO, or by wire transfer to a bank named and account designated by the invoicing Interconnection Customer or Participating TO. Payment of invoices by any Party will not constitute a waiver of any rights or claims any Party may have under this LGIA.

12.4 Disputes. In the event of a billing dispute between the Interconnection Customer and the Participating TO, the Participating TO and the CAISO shall continue to provide Interconnection Service under this LGIA as long as the Interconnection Customer: (i) continues to make all payments not in dispute; and (ii) pays to the Participating TO or into an independent escrow account the portion of the invoice in dispute, pending resolution of such dispute. If the Interconnection Customer fails to meet these two requirements for continuation of service, then the Participating TO may provide notice to the Interconnection Customer of a Default pursuant to Article 17. Within thirty (30) Calendar Days after the resolution of the dispute, the Party that owes money to the other Party shall pay the amount due with interest calculated in accordance with the methodology set forth in FERC's Regulations at 18 C.F.R. § 35.19a(a)(2)(iii). Notwithstanding the foregoing, any billing dispute between the CAISO and another Party shall be resolved in accordance with the provisions of Article 27 of this LGIA.

ARTICLE 13. EMERGENCIES

13.1 [Reserved]

13.2 Obligations. Each Party shall comply with the Emergency Condition procedures of the CAISO, NERC, the Applicable Reliability Council, Applicable Reliability Standards, Applicable Laws and Regulations, and any emergency procedures set forth in this LGIA.

13.3 Notice. The Participating TO or the CAISO shall notify the Interconnection Customer promptly when it becomes aware of an Emergency Condition that affects the Participating TO's Interconnection Facilities or Distribution System or the CAISO Controlled Grid, respectively, that may reasonably be expected to affect the Interconnection Customer's operation of the Large Generating Facility or the Interconnection Customer's Interconnection Facilities. The Interconnection Customer shall notify the Participating TO and the CAISO promptly when it becomes aware of an Emergency Condition that affects the Large Generating Facility or the Interconnection Customer's Interconnection Facilities that may reasonably be expected to affect the CAISO Controlled Grid or the Participating TO's Interconnection Facilities. To the extent information is known, the notification shall describe the Emergency Condition, the extent of the damage or deficiency, the expected effect on the operation of the Interconnection Customer's or Participating TO's facilities and operations, its anticipated duration and the corrective action taken and/or to be taken. The initial notice shall be followed as soon as practicable with written notice, if requested by a Party, which may be provided by electronic mail or facsimile, or in the case of the CAISO may be publicly posted on the CAISO's internet web site.

13.4 Immediate Action. Unless, in the Interconnection Customer's reasonable judgment, immediate action is required, the Interconnection Customer shall obtain the consent of the CAISO and the Participating TO, such consent to not be unreasonably withheld, prior to performing any manual switching operations at the Large Generating Facility or the Interconnection Customer's Interconnection Facilities in response to an Emergency Condition declared by the Participating TO or CAISO or in response to any other emergency condition.

13.5 CAISO and Participating TO Authority.

13.5.1 General. The CAISO and Participating TO may take whatever actions or inactions, including issuance of dispatch instructions, with regard to the CAISO Controlled Grid or the Participating TO's Interconnection Facilities or Distribution System they deem necessary during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the CAISO Controlled Grid or the Participating TO's Interconnection Facilities or Distribution System, (iii) limit or prevent damage, and (iv) expedite restoration of service.

The Participating TO and the CAISO shall use Reasonable Efforts to minimize the effect of such actions or inactions on the Large Generating Facility or the Interconnection Customer's Interconnection Facilities. The Participating TO or the CAISO may, on the basis of technical considerations, require the Large Generating Facility to mitigate an Emergency Condition by taking actions necessary and limited in scope to remedy the Emergency Condition, including, but not limited to, directing the Interconnection Customer to shut-down, start-up, increase or decrease the real or reactive power output of the Large Generating Facility; implementing a reduction or disconnection pursuant to Article 13.5.2; directing the Interconnection Customer to assist with black start (if available) or restoration efforts; or altering the outage schedules of the Large Generating Facility and the Interconnection Customer's Interconnection Facilities. Interconnection Customer shall comply with all of the CAISO's Dispatch Instructions and Operating Instructions and Participating TO's dispatch instructions or Operating Instructions concerning Large Generating Facility real power and reactive power output within the manufacturer's design limitations of the Large Generating Facility's equipment that is in service and physically available for operation at the time, in compliance with Applicable Laws and Regulations.

13.5.2 Reduction and Disconnection. The Participating TO or the CAISO may reduce Interconnection Service or disconnect the Large Generating Facility or the Interconnection Customer's Interconnection Facilities when such reduction or disconnection is necessary under Good Utility Practice due to Emergency Conditions. These rights are separate and distinct from any right of curtailment of the CAISO pursuant to the CAISO Tariff. When the CAISO or Participating TO can schedule the reduction or disconnection in advance, the CAISO or Participating TO shall notify the Interconnection Customer of the reasons, timing and expected duration of the reduction or disconnection. The CAISO or Participating TO shall coordinate with the Interconnection Customer using Good Utility Practice to schedule the reduction or disconnection during periods of least impact to the Interconnection Customer and the CAISO and Participating TO. Any reduction or disconnection shall continue only for so long as reasonably necessary under Good Utility Practice. The Parties shall cooperate with each other to restore the Large Generating Facility, the Interconnection Facilities, and the CAISO Controlled Grid to their normal operating state as soon as practicable consistent with Good Utility Practice.

13.6 Interconnection Customer Authority. Consistent with Good Utility Practice, this LGIA, and the CAISO Tariff, the Interconnection Customer may take actions or inactions with regard to the Large Generating Facility or the Interconnection Customer's Interconnection Facilities during an Emergency Condition in order to (i) preserve public health and safety, (ii) preserve the reliability of the Large

Generating Facility or the Interconnection Customer's Interconnection Facilities, (iii) limit or prevent damage, and (iv) expedite restoration of service. Interconnection Customer shall use Reasonable Efforts to minimize the effect of such actions or inactions on the CAISO Controlled Grid and the Participating TO's Interconnection Facilities. The CAISO and Participating TO shall use Reasonable Efforts to assist Interconnection Customer in such actions.

13.7 Limited Liability. Except as otherwise provided in Article 11.6.1 of this LGIA, no Party shall be liable to any other Party for any action it takes in responding to an Emergency Condition so long as such action is made in good faith and is consistent with Good Utility Practice.

ARTICLE 14. REGULATORY REQUIREMENTS AND GOVERNING LAWS

14.1 Regulatory Requirements. Each Party's obligations under this LGIA shall be subject to its receipt of any required approval or certificate from one or more Governmental Authorities in the form and substance satisfactory to the applying Party, or the Party making any required filings with, or providing notice to, such Governmental Authorities, and the expiration of any time period associated therewith. Each Party shall in good faith seek and use its Reasonable Efforts to obtain such other approvals. Nothing in this LGIA shall require the Interconnection Customer to take any action that could result in its inability to obtain, or its loss of, status or exemption under the Federal Power Act or the Public Utility Holding Company Act of 1935, as amended, or the Public Utility Regulatory Policies Act of 1978, or the Energy Policy Act of 2005.

14.2 Governing Law.

14.2.1 The validity, interpretation and performance of this LGIA and each of its provisions shall be governed by the laws of the state where the Point of Interconnection is located, without regard to its conflicts of law principles.

14.2.2 This LGIA is subject to all Applicable Laws and Regulations.

14.2.3 Each Party expressly reserves the right to seek changes in, appeal, or otherwise contest any laws, orders, rules, or regulations of a Governmental Authority.

ARTICLE 15. NOTICES

15.1 General. Unless otherwise provided in this LGIA, any notice, demand or request required or permitted to be given by a Party to another and any instrument required or permitted to be tendered or delivered by a Party in writing to another shall be effective when delivered and may be so given, tendered or delivered, by recognized national courier, or by depositing the same with the United States Postal Service with postage prepaid, for delivery by certified or registered mail,

addressed to the Party, or personally delivered to the Party, at the address set out in Appendix F, Addresses for Delivery of Notices and Billings.
A Party must update the information in Appendix F as information changes. A Party may change the notice information in this LGIA by giving five (5) Business Days written notice prior to the effective date of the change. Such changes shall not constitute an amendment to this LGIA.

15.2 Billings and Payments. Billings and payments shall be sent to the addresses set out in Appendix F.

15.3 Alternative Forms of Notice. Any notice or request required or permitted to be given by a Party to another and not required by this LGIA to be given in writing may be so given by telephone, facsimile or e-mail to the telephone numbers and e-mail addresses set out in Appendix F.

15.4 Operations and Maintenance Notice. Each Party shall notify the other Parties in writing of the identity of the person(s) that it designates as the point(s) of contact with respect to the implementation of Articles 9 and 10.

ARTICLE 16. FORCE MAJEURE

16.1 Force Majeure.

16.1.1 Economic hardship is not considered a Force Majeure event.

16.1.2 No Party shall be considered to be in Default with respect to any obligation hereunder, (including obligations under Article 4), other than the obligation to pay money when due, if prevented from fulfilling such obligation by Force Majeure. A Party unable to fulfill any obligation hereunder (other than an obligation to pay money when due) by reason of Force Majeure shall give notice and the full particulars of such Force Majeure to the other Party in writing or by telephone as soon as reasonably possible after the occurrence of the cause relied upon. Telephone notices given pursuant to this Article shall be confirmed in writing as soon as reasonably possible and shall specifically state full particulars of the Force Majeure, the time and date when the Force Majeure occurred and when the Force Majeure is reasonably expected to cease. The Party affected shall exercise due diligence to remove such disability with reasonable dispatch, but shall not be required to accede or agree to any provision not satisfactory to it in order to settle and terminate a strike or other labor disturbance.

ARTICLE 17. DEFAULT

17.1 Default.

17.1.1 General. No Default shall exist where such failure to discharge an obligation (other than the payment of money) is the result of Force

Majeure as defined in this LGIA or the result of an act or omission of the other Party. Upon a Breach, the affected non-Breaching Party(ies) shall give written notice of such Breach to the Breaching Party. Except as provided in Articles 11.5.1 and 17.1.2, the Breaching Party shall have thirty (30) Calendar Days from receipt of the Default notice within which to cure such Breach; provided however, if such Breach is not capable of cure within thirty (30) Calendar Days, the Breaching Party shall commence such cure within thirty (30) Calendar Days after notice and continuously and diligently complete such cure within ninety (90) Calendar Days from receipt of the Default notice; and, if cured within such time, the Breach specified in such notice shall cease to exist.

17.1.2 Right to Terminate. If a Breach is not cured as provided in this Article, or if a Breach is not capable of being cured within the period provided for herein, the affected non-Breaching Party(ies) shall have the right to declare a Default and terminate this LGIA by written notice at any time until cure occurs, and be relieved of any further obligation hereunder and, whether or not such Party(ies) terminates this LGIA, to recover from the Breaching Party all amounts due hereunder, plus all other damages and remedies to which it is entitled at law or in equity. The provisions of this Article will survive termination of this LGIA.

ARTICLE 18. INDEMNITY, CONSEQUENTIAL DAMAGES, AND INSURANCE

18.1 Indemnity. Each Party shall at all times indemnify, defend, and hold the other Parties harmless from, any and all Losses arising out of or resulting from another Party's action or inactions of its obligations under this LGIA on behalf of the indemnifying Party, except in cases of gross negligence or intentional wrongdoing by the Indemnified Party.

18.1.1 Indemnified Party. If an Indemnified Party is entitled to indemnification under this Article 18 as a result of a claim by a third party, and the Indemnifying Party fails, after notice and reasonable opportunity to proceed under Article 18.1, to assume the defense of such claim, such Indemnified Party may at the expense of the Indemnifying Party contest, settle or consent to the entry of any judgment with respect to, or pay in full, such claim.

18.1.2 Indemnifying Party. If an Indemnifying Party is obligated to indemnify and hold any Indemnified Party harmless under this Article 18, the amount owing to the Indemnified Party shall be the amount of such Indemnified Party’s actual Loss, net of any insurance or other recovery.

18.1.3 Indemnity Procedures. Promptly after receipt by an Indemnified Party of any claim or notice of the commencement of any action or administrative or legal proceeding or investigation as to which the indemnity provided for

in Article 18.1 may apply, the Indemnified Party shall notify the Indemnifying Party of such fact. Any failure of or delay in such notification shall not affect a Party's indemnification obligation unless such failure or delay is materially prejudicial to the indemnifying Party.
The Indemnifying Party shall have the right to assume the defense thereof with counsel designated by such Indemnifying Party and reasonably satisfactory to the Indemnified Party. If the defendants in any such action include one or more Indemnified Parties and the Indemnifying Party and if the Indemnified Party reasonably concludes that there may be legal defenses available to it and/or other Indemnified Parties which are different from or additional to those available to the Indemnifying Party, the Indemnified Party shall have the right to select separate counsel to assert such legal defenses and to otherwise participate in the defense of such action on its own behalf. In such instances, the Indemnifying Party shall only be required to pay the fees and expenses of one additional attorney to represent an Indemnified Party or Indemnified Parties having such differing or additional legal defenses.

The Indemnified Party shall be entitled, at its expense, to participate in any such action, suit or proceeding, the defense of which has been assumed by the Indemnifying Party. Notwithstanding the foregoing, the Indemnifying Party (i) shall not be entitled to assume and control the defense of any such action, suit or proceedings if and to the extent that, in the opinion of the Indemnified Party and its counsel, such action, suit or proceeding involves the potential imposition of criminal liability on the Indemnified Party, or there exists a conflict or adversity of interest between the Indemnified Party and the Indemnifying Party, in such event the Indemnifying Party shall pay the reasonable expenses of the Indemnified Party, and (ii) shall not settle or consent to the entry of any judgment in any action, suit or proceeding without the consent of the Indemnified Party, which shall not be unreasonably withheld, conditioned or delayed.

18.2 Consequential Damages. Other than the liquidated damages heretofore described in Article 5.3, in no event shall any Party be liable under any provision of this LGIA for any losses, damages, costs or expenses for any special, indirect, incidental, consequential, or punitive damages, including but not limited to loss of profit or revenue, loss of the use of equipment, cost of capital, cost of temporary equipment or services, whether based in whole or in part in contract, in tort, including negligence, strict liability, or any other theory of liability; provided, however, that damages for which a Party may be liable to another Party under another agreement will not be considered to be special, indirect, incidental, or consequential damages hereunder.

18.3 Insurance. As indicated below, the designated Party shall, at its own expense, maintain in force throughout the periods noted in this LGIA, and until released by

the other Parties, the following minimum insurance coverages, with insurers rated no less than A- (with a minimum size rating of VII) by Bests' Insurance Guide and Key Ratings and authorized to do business in the state where the Point of Interconnection is located, except in the case of any insurance required to be carried by the CAISO, the State of California:

18.3.1 Workers' Compensation Insurance and Employers' Liability. The Participating TO and the Interconnection Customer shall maintain such coverage from the commencement of any Construction Activities providing statutory benefits for Workers Compensation coverage and coverage amounts of no less than One Million Dollars ($1,000,000) for employer's liability for each employee for bodily injury by accident and One Million Dollars ($1,000,000) for each employee for bodily injury by disease in accordance with the laws and regulations of the state in which the Point of Interconnection is located. The Participating TO shall provide the Interconnection Customer with evidence of such insurance coverage within thirty (30) Calendar Days of any request by the Interconnection Customer. The Interconnection Customer shall provide evidence of such insurance thirty (30) Calendar Days prior to entry by any employee or contractor or other person acting on the Interconnection Customer's behalf onto any construction site to perform any work related to the Interconnection Facilities or Generating Facility.

18.3.2 Commercial General Liability Insurance. The Participating TO and the Interconnection Customer shall maintain commercial general liability insurance coverage commencing within thirty (30) Calendar Days of the Effective Date of this LGIA, including coverage for premises and operations, bodily injury (including death), personal injury, property damage, products and completed operations coverage, coverage for explosion, collapse and underground hazards, independent contractors coverage, and (i) liability of Participating TO and the Interconnection Customer that would be imposed without the LGIA, or (ii) liability assumed by the Participating TO and the Interconnection Customer in a contract or agreement that is an "insured contract" under commercial general liability insurance policy. Such insurance shall include no cross liability exclusions or separation of insured clause endorsement exclusions, with minimum limits of One Million Dollars ($1,000,000) per occurrence/One Million Dollars ($1,000,000) aggregate. If the activities of the Interconnection Customer are being conducted through the actions of an Affiliate, then the Interconnection Customer may satisfy the insurance requirements of this Section 18.3.2 by providing evidence of insurance coverage carried by such Affiliate and showing the Participating TO and the CAISO as an additional insured only with respect to the LGIA, together with the Interconnection Customer's written representation to the Participating TO and the CAISO that the insured Affiliate is conducting all of the necessary pre-construction work. Within

thirty (30) Calendar Days prior to the entry of any person on behalf of the Interconnection Customer onto any construction site to perform work related to the Interconnection Facilities or Generating Facility, the Interconnection Customer shall replace any evidence of Affiliate Insurance with evidence of such insurance carried by the Interconnection Customer, naming the Participating TO and CAISO as additional insured only with respect to the LGIA.

18.3.3 Business Automobile Liability Insurance. Prior to the entry of any such vehicles on any construction site in connection with work done by or on behalf of the Interconnection Customer, the Interconnection Customer shall provide evidence of coverage of owned and non-owned and hired vehicles, trailers or semi-trailers designed for travel on public roads, with a minimum, combined single limit of One Million Dollars ($1,000,000) per occurrence for bodily injury, including death, and property damage. The Interconnection Customer shall include the Participating TO and the CAISO as additional insured with respect to the LGIA on any such policies.

18.3.4 Excess Liability Insurance. Commencing at the time of entry of any person on its behalf upon any construction site for the Network Upgrades, Interconnection Facilities, or Generating Facility, the Participating TO and the Interconnection Customer shall maintain Excess Liability insurance over and above the Employer's Liability Commercial General Liability and Business Automobile Liability Insurance coverage, with a minimum limit of Twenty Million Dollars ($20,000,000) per occurrence/Twenty Million Dollars ($20,000,000) aggregate. Such insurance carried by the Participating TO shall include the Interconnection Customer and CAISO as additional insured with respect to the LGIA, and such insurance carried by the Interconnection Customer shall include the Participating TO and CAISO as an additional insured with respect to the LGIA. The requirements of Section 18.3.2 and 18.3.4 may be met by any combination of general and excess liability insurance.

18.3.5 The Commercial General Liability Insurance, Business Automobile Insurance and Excess Liability Insurance policies shall include the other Parties identified in the sections above, their parents, their subsidiaries, respective directors, officers, agents, servants and employees ("Other Party Group") and the CAISO as additional insured. All policies shall contain provisions whereby the insurers waive all rights of subrogation in accordance with the provisions of this LGIA against the Other Party Group. If any Party can reasonably demonstrate that coverage policies containing provisions for insurer waiver of subrogation rights, or advance notice are not commercially available, then the Parties shall meet and confer and mutually determine to (i) establish replacement or equivalent

terms in lieu of subrogation or notice or (ii) waive the requirements that coverage(s) include such subrogation provision or require advance written notice from such insurers.

18.3.6 The Commercial General Liability Insurance, Business Automobile Liability Insurance and Excess Liability Insurance policies shall contain provisions that specify that the policies are primary and non-contributory. Each Party shall be responsible for its respective deductibles or self-insured retentions.

18.3.7 The Commercial General Liability Insurance, Business Automobile Liability Insurance and Excess Liability Insurance policies, if written on a Claims First Made Basis, shall be maintained in full force and effect for two (2) years after termination of this LGIA, which coverage may be in the form of extended reporting period coverage if agreed by the Parties.

18.3.8 [Not Used.]

18.3.9 Thirty (30) Calendar Days prior to the start of any work at the construction site related to Interconnection Facilities or Generating Facility under this LGIA, and as soon as practicable after the end of each fiscal year or at the renewal of the insurance policy and in any event within ninety (90) Calendar Days thereafter, the Participating TO and the Interconnection Customer shall provide a certificate of insurance for all insurance required in this LGIA, executed by each insurer or by an authorized representative of each insurer.

18.3.10 Notwithstanding the foregoing, each Party may self-insure

a) to meet the minimum insurance requirements of Article 18.3.1, to the extent that it maintains a self-insurance program that is a qualified self-insurer within the state in which the Point of Interconnection is located, under the laws and regulations of such state; and

b) to meet the minimum insurance requirements of Articles 18.3.2 through 18.3.8 to the extent it maintains a self-insurance program; provided that, such Party's senior unsecured debt or issuer rating is BBB-, or better, as rated by Standard & Poor's and that its self-insurance program meets the minimum insurance requirements of Articles 18.3.2 through 18.3.8. For any period of time that a Party's senior unsecured debt rating and issuer rating are both unrated by Standard & Poor's or are both rated at less than BBB- by Standard & Poor's, such Party shall comply with the insurance requirements applicable to it under Articles 18.3.2 through 18.3.9.

c) in the event that a Party is permitted to self-insure pursuant to this Article 18.3.10, it shall notify the other Parties that it meets the requirements to self-insure and that its self-insurance program meets the minimum insurance requirements in a manner consistent with that specified in Article 18.3.9.

18.3.11 The Parties agree to report to each other in writing as soon as practical all accidents or occurrences resulting in injuries to any person, including death, and any property damage greater than $25,000, including within the scope of coverage of such insurance whether or not such coverage is sought.

ARTICLE 19. ASSIGNMENT

19.1 Assignment. This LGIA may be assigned by a Party only with the written consent of the other Parties; provided that a Party may assign this LGIA without the consent of the other Parties to any Affiliate of the assigning Party with an equal or greater credit rating and with the legal authority and operational ability to satisfy the obligations of the assigning Party under this LGIA; and provided further that the Interconnection Customer shall have the right to assign this LGIA, without the consent of the CAISO or Participating TO, for collateral security purposes to aid in providing financing for the Large Generating Facility, provided that the Interconnection Customer will promptly notify the CAISO and Participating TO of any such assignment. Any financing arrangement entered into by the Interconnection Customer pursuant to this Article will provide that prior to or upon the exercise of the secured party's, trustee's or mortgagee's assignment rights pursuant to said arrangement, the secured creditor, the trustee or mortgagee will notify the CAISO and Participating TO of the date and particulars of any such exercise of assignment right(s), including providing the CAISO and Participating TO with proof that it meets the requirements of Articles 11.5 and 18.3. Any attempted assignment that violates this Article is void and ineffective. Any assignment under this LGIA shall not relieve a Party of its obligations, nor shall a Party's obligations be enlarged, in whole or in part, by reason thereof. Where required, consent to assignment will not be unreasonably withheld, conditioned or delayed.

The Interconnection Customer may assign Surplus Interconnection Service pursuant to Section 3.4 of the GIDAP. The CAISO, Participating TO, and original Interconnection Customer will work in good faith to amend this GIA to reflect the transfer of Surplus Interconnection Service before the execution of the assignee's GIA. The assignee must execute a separate GIA with the CAISO and Participating TO to memorialize its Interconnection Service.

ARTICLE 20. SEVERABILITY

20.1 Severability. If any provision in this LGIA is finally determined to be invalid, void or unenforceable by any court or other Governmental Authority having

jurisdiction, such determination shall not invalidate, void or make unenforceable any other provision, agreement or covenant of this LGIA; provided that if the Interconnection Customer (or any third party, but only if such third party is not acting at the direction of the Participating TO or CAISO) seeks and obtains such a final determination with respect to any provision of the Alternate Option (Article 5.1.2), or the Negotiated Option (Article 5.1.4), then none of the provisions of Article 5.1.2 or 5.1.4 shall thereafter have any force or effect and the Parties' rights and obligations shall be governed solely by the Standard Option (Article 5.1.1).

ARTICLE 21. COMPARABILITY

21.1 Comparability. The Parties will comply with all applicable comparability and code of conduct laws, rules and regulations, as amended from time to time.

ARTICLE 22. CONFIDENTIALITY

22.1 Confidentiality. Confidential Information shall include, without limitation, all information relating to a Party's technology, research and development, business affairs, and pricing, and any information supplied by any of the Parties to the other Parties prior to the execution of this LGIA.

Information is Confidential Information only if it is clearly designated or marked in writing as confidential on the face of the document, or, if the information is conveyed orally or by inspection, if the Party providing the information orally informs the Parties receiving the information that the information is confidential.

If requested by any Party, the other Parties shall provide in writing, the basis for asserting that the information referred to in this Article 22 warrants confidential treatment, and the requesting Party may disclose such writing to the appropriate Governmental Authority. Each Party shall be responsible for the costs associated with affording confidential treatment to its information.

22.1.1 Term. During the term of this LGIA, and for a period of three (3) years after the expiration or termination of this LGIA, except as otherwise provided in this Article 22, each Party shall hold in confidence and shall not disclose to any person Confidential Information.

22.1.2 Scope. Confidential Information shall not include information that the receiving Party can demonstrate: (1) is generally available to the public other than as a result of a disclosure by the receiving Party; (2) was in the lawful possession of the receiving Party on a non-confidential basis before receiving it from the disclosing Party; (3) was supplied to the receiving Party without restriction by a third party, who, to the knowledge of the receiving Party after due inquiry, was under no obligation to the disclosing Party to keep such information confidential; (4) was independently developed by the receiving Party without reference to Confidential

Information of the disclosing Party; (5) is, or becomes, publicly known, through no wrongful act or omission of the receiving Party or Breach of this LGIA; or (6) is required, in accordance with Article 22.1.7 of this LGIA, Order of Disclosure, to be disclosed by any Governmental Authority or is otherwise required to be disclosed by law or subpoena, or is necessary in any legal proceeding establishing rights and obligations under this LGIA. Information designated as Confidential Information will no longer be deemed confidential if the Party that designated the information as confidential notifies the other Parties that it no longer is confidential.

22.1.3 Release of Confidential Information. No Party shall release or disclose Confidential Information to any other person, except to its employees, consultants, Affiliates (limited by the Standards of Conduct requirements set forth in Part 358 of FERC's Regulations, 18 C.F.R. 358), subcontractors, or to parties who may be or considering providing financing to or equity participation with the Interconnection Customer, or to potential purchasers or assignees of the Interconnection Customer, on a need-to-know basis in connection with this LGIA, unless such person has first been advised of the confidentiality provisions of this Article 22 and has agreed to comply with such provisions. Notwithstanding the foregoing, a Party providing Confidential Information to any person shall remain primarily responsible for any release of Confidential Information in contravention of this Article 22.

22.1.4 Rights. Each Party retains all rights, title, and interest in the Confidential Information that each Party discloses to the other Parties. The disclosure by each Party to the other Parties of Confidential Information shall not be deemed a waiver by a Party or any other person or entity of the right to protect the Confidential Information from public disclosure.

22.1.5 No Warranties. The mere fact that a Party has provided Confidential Information does not constitute a warranty or representation as to its accuracy or completeness. In addition, by supplying Confidential Information, no Party obligates itself to provide any particular information or Confidential Information to the other Parties nor to enter into any further agreements or proceed with any other relationship or joint venture.

22.1.6 Standard of Care. Each Party shall use at least the same standard of care to protect Confidential Information it receives as it uses to protect its own Confidential Information from unauthorized disclosure, publication or dissemination. Each Party may use Confidential Information solely to fulfill its obligations to the other Parties under this LGIA or its regulatory requirements.

22.1.7 Order of Disclosure. If a court or a Government Authority or entity with the right, power, and apparent authority to do so requests or requires any Party, by subpoena, oral deposition, interrogatories, requests for production of documents, administrative order, or otherwise, to disclose Confidential Information, that Party shall provide the other Parties with prompt notice of such request(s) or requirement(s) so that the other Parties may seek an appropriate protective order or waive compliance with the terms of this LGIA. Notwithstanding the absence of a protective order or waiver, the Party may disclose such Confidential Information which, in the opinion of its counsel, the Party is legally compelled to disclose. Each Party will use Reasonable Efforts to obtain reliable assurance that confidential treatment will be accorded any Confidential Information so furnished.

22.1.8 Termination of Agreement. Upon termination of this LGIA for any reason, each Party shall, within ten (10) Calendar Days of receipt of a written request from another Party, use Reasonable Efforts to destroy, erase, or delete (with such destruction, erasure, and deletion certified in writing to the other Party) or return to the other Party, without retaining copies thereof, any and all written or electronic Confidential Information received from the other Party.

22.1.9 Remedies. The Parties agree that monetary damages would be inadequate to compensate a Party for another Party's Breach of its obligations under this Article 22. Each Party accordingly agrees that the other Parties shall be entitled to equitable relief, by way of injunction or otherwise, if the first Party Breaches or threatens to Breach its obligations under this Article 22, which equitable relief shall be granted without bond or proof of damages, and the receiving Party shall not plead in defense that there would be an adequate remedy at law. Such remedy shall not be deemed an exclusive remedy for the Breach of this Article 22, but shall be in addition to all other remedies available at law or in equity. The Parties further acknowledge and agree that the covenants contained herein are necessary for the protection of legitimate business interests and are reasonable in scope. No Party, however, shall be liable for indirect, incidental, or consequential or punitive damages of any nature or kind resulting from or arising in connection with this Article 22.

22.1.10 Disclosure to FERC, its Staff, or a State. Notwithstanding anything in this Article 22 to the contrary, and pursuant to 18 C.F.R. section 1b.20, if FERC or its staff, during the course of an investigation or otherwise, requests information from one of the Parties that is otherwise required to be maintained in confidence pursuant to this LGIA, the Party shall provide the requested information to FERC or its staff, within the time provided for in the request for information. In providing the information to FERC or its staff, the Party must, consistent with 18 C.F.R. section 388.112, request

that the information be treated as confidential and non-public by FERC and its staff and that the information be withheld from public disclosure. Parties are prohibited from notifying the other Parties to this LGIA prior to the release of the Confidential Information to FERC or its staff. The Party shall notify the other Parties to the LGIA when it is notified by FERC or its staff that a request to release Confidential Information has been received by FERC, at which time any of the Parties may respond before such information would be made public, pursuant to 18 C.F.R. section 388.112. Requests from a state regulatory body conducting a confidential investigation shall be treated in a similar manner if consistent with the applicable state rules and regulations.

22.1.11 Subject to the exception in Article 22.1.10, Confidential Information shall not be disclosed by the other Parties to any person not employed or retained by the other Parties, except to the extent disclosure is (i) required by law; (ii) reasonably deemed by the disclosing Party to be required to be disclosed in connection with a dispute between or among the Parties, or the defense of litigation or dispute; (iii) otherwise permitted by consent of the other Parties, such consent not to be unreasonably withheld; or (iv) necessary to fulfill its obligations under this LGIA or as a transmission service provider or a Balancing Authority including disclosing the Confidential Information to an RTO or ISO or to a regional or national reliability organization. The Party asserting confidentiality shall notify the other Parties in writing of the information it claims is confidential. Prior to any disclosures of another Party's Confidential Information under this subparagraph, or if any third party or Governmental Authority makes any request or demand for any of the information described in this subparagraph, the disclosing Party agrees to promptly notify the other Party in writing and agrees to assert confidentiality and cooperate with the other Party in seeking to protect the Confidential Information from public disclosure by confidentiality agreement, protective order or other reasonable measures.

ARTICLE 23. ENVIRONMENTAL RELEASES

23.1 Each Party shall notify the other Parties, first orally and then in writing, of the release of any Hazardous Substances, any asbestos or lead abatement activities, or any type of remediation activities related to the Large Generating Facility or the Interconnection Facilities, each of which may reasonably be expected to affect the other Parties. The notifying Party shall: (i) provide the notice as soon as practicable, provided such Party makes a good faith effort to provide the notice no later than twenty-four hours after such Party becomes aware of the occurrence; and (ii) promptly furnish to the other Parties copies of any publicly available reports filed with any Governmental Authorities addressing such events.

ARTICLE 24. INFORMATION REQUIREMENTS

24.1 Information Acquisition. The Participating TO and the Interconnection Customer shall submit specific information regarding the electrical characteristics of their respective facilities to each other as described below and in accordance with Applicable Reliability Standards.

24.2 Information Submission by Participating TO. The initial information submission by the Participating TO shall occur no later than one hundred eighty (180) Calendar Days prior to Trial Operation and shall include the Participating TO's Transmission System information necessary to allow the Interconnection Customer to select equipment and meet any system protection and stability requirements, unless otherwise agreed to by the Participating TO and the Interconnection Customer. On a monthly basis the Participating TO shall provide the Interconnection Customer and the CAISO a status report on the construction and installation of the Participating TO's Interconnection Facilities and Network Upgrades, including, but not limited to, the following information: (1) progress to date; (2) a description of the activities since the last report; (3) a description of the action items for the next period; and (4) the delivery status of equipment ordered.

24.3 Updated Information Submission by Interconnection Customer. The updated information submission by the Interconnection Customer, including manufacturer information, shall occur no later than one hundred eighty (180) Calendar Days prior to the Trial Operation. The Interconnection Customer shall submit a completed copy of the Electric Generating Unit data requirements contained in Appendix 1 to the GIDAP. It shall also include any additional information provided to the Participating TO and the CAISO for the Interconnection Studies. Information in this submission shall be the most current Electric Generating Unit design or expected performance data. Information submitted for stability models shall be compatible with the Participating TO and CAISO standard models. If there is no compatible model, the Interconnection Customer will work with a consultant mutually agreed to by the Parties to develop and supply a standard model and associated information.

If the Interconnection Customer's data is materially different from what was originally provided to the Participating TO and the CAISO for the Interconnection Studies, then the Participating TO and the CAISO will conduct appropriate studies pursuant to the GIDAP to determine the impact on the Participating TO's Transmission System and affected portions of the CAISO Controlled Grid based on the actual data submitted pursuant to this Article 24.3. The Interconnection Customer shall not begin Trial Operation until such studies are completed and all other requirements of this LGIA are satisfied.

24.4 Information Supplementation. Prior to the Trial Operation date, the Parties shall supplement their information submissions described above in this Article 24 with any and all "as-built" Electric Generating Unit information or "as-tested" performance information that differs from the initial submissions or, alternatively, written confirmation that no such differences exist. The Interconnection Customer shall conduct tests on the Electric Generating Unit as required by Good Utility Practice such as an open circuit "step voltage" test on the Electric Generating Unit to verify proper operation of the Electric Generating Unit's automatic voltage regulator.

Unless otherwise agreed, the test conditions shall include: (1) Electric Generating Unit at synchronous speed; (2) automatic voltage regulator on and in voltage control mode; and (3) a five percent (5 percent) change in Electric Generating Unit terminal voltage initiated by a change in the voltage regulators reference voltage. The Interconnection Customer shall provide validated test recordings showing the responses of Electric Generating Unit terminal and field voltages. In the event that direct recordings of these voltages is impractical, recordings of other voltages or currents that mirror the response of the Electric Generating Unit's terminal or field voltage are acceptable if information necessary to translate these alternate quantities to actual Electric Generating Unit terminal or field voltages is provided. Electric Generating Unit testing shall be conducted and results provided to the Participating TO and the CAISO for each individual Electric Generating Unit in a station.

Subsequent to the Commercial Operation Date, the Interconnection Customer shall provide the Participating TO and the CAISO any information changes due to equipment replacement, repair, or adjustment. The Participating TO shall provide the Interconnection Customer any information changes due to equipment replacement, repair or adjustment in the directly connected substation or any adjacent Participating TO-owned substation that may affect the Interconnection Customer's Interconnection Facilities equipment ratings, protection or operating requirements. The Parties shall provide such information pursuant to Article 5.19.

ARTICLE 25. INFORMATION ACCESS AND AUDIT RIGHTS

25.1 Information Access. Each Party (the "disclosing Party") shall make available to the other Party information that is in the possession of the disclosing Party and is necessary in order for the other Party to: (i) verify the costs incurred by the disclosing Party for which the other Party is responsible under this LGIA; and (ii) carry out its obligations and responsibilities under this LGIA. The Parties shall not use such information for purposes other than those set forth in this Article 25.1 and to enforce their rights under this LGIA. Nothing in this Article 25 shall obligate the CAISO to make available to a Party any third party information in its possession or control if making such third party information available would

violate a CAISO Tariff restriction on the use or disclosure of such third party information.

25.2 Reporting of Non-Force Majeure Events. Each Party (the "notifying Party") shall notify the other Parties when the notifying Party becomes aware of its inability to comply with the provisions of this LGIA for a reason other than a Force Majeure event. The Parties agree to cooperate with each other and provide necessary information regarding such inability to comply, including the date, duration, reason for the inability to comply, and corrective actions taken or planned to be taken with respect to such inability to comply. Notwithstanding the foregoing, notification, cooperation or information provided under this Article shall not entitle the Party receiving such notification to allege a cause for anticipatory breach of this LGIA.

25.3 Audit Rights. Subject to the requirements of confidentiality under Article 22 of this LGIA, the Parties' audit rights shall include audits of a Party's costs pertaining to such Party's performance or satisfaction of obligations owed to the other Party under this LGIA, calculation of invoiced amounts, the CAISO's efforts to allocate responsibility for the provision of reactive support to the CAISO Controlled Grid, the CAISO's efforts to allocate responsibility for interruption or reduction of generation on the CAISO Controlled Grid, and each such Party's actions in an Emergency Condition.

25.3.1 The Interconnection Customer and the Participating TO shall each have the right, during normal business hours, and upon prior reasonable notice to the other Party, to audit at its own expense the other Party's accounts and records pertaining to either such Party's performance or either such Party's satisfaction of obligations owed to the other Party under this LGIA. Subject to Article 25.3.2, any audit authorized by this Article shall be performed at the offices where such accounts and records are maintained and shall be limited to those portions of such accounts and records that relate to each such Party's performance and satisfaction of obligations under this LGIA. Each such Party shall keep such accounts and records for a period equivalent to the audit rights periods described in Article 25.4.

25.3.2 Notwithstanding anything to the contrary in Article 25.3, each Party's rights to audit the CAISO's accounts and records shall be as set forth in Section 22.1 of the CAISO Tariff.

25.4 Audit Rights Periods.

25.4.1 Audit Rights Period for Construction-Related Accounts and Records. Accounts and records related to the design, engineering, procurement, and construction of Participating TO's Interconnection Facilities, Network Upgrades, and Distribution Upgrades constructed by the Participating TO shall be subject to audit for a period of twenty-four months following the

Participating TO's issuance of a final invoice in accordance with Article 12.2. Accounts and records related to the design, engineering, procurement, and construction of Participating TO's Interconnection Facilities and/or Stand Alone Network Upgrades constructed by the Interconnection Customer shall be subject to audit and verification by the Participating TO and the CAISO for a period of twenty-four months following the Interconnection Customer's issuance of a final invoice in accordance with Article 5.2(8).

25.4.2 Audit Rights Period for All Other Accounts and Records. Accounts and records related to a Party's performance or satisfaction of all obligations under this LGIA other than those described in Article 25.4.1 shall be subject to audit as follows: (i) for an audit relating to cost obligations, the applicable audit rights period shall be twenty-four months after the auditing Party's receipt of an invoice giving rise to such cost obligations; and (ii) for an audit relating to all other obligations, the applicable audit rights period shall be twenty-four months after the event for which the audit is sought; provided that each Party's rights to audit the CAISO's accounts and records shall be as set forth in Section 22.1 of the CAISO Tariff.

25.5 Audit Results. If an audit by the Interconnection Customer or the Participating TO determines that an overpayment or an underpayment has occurred with respect to the other Party, a notice of such overpayment or underpayment shall be given to the other Party together with those records from the audit which supports such determination. The Party that is owed payment shall render an invoice to the other Party and such invoice shall be paid pursuant to Article 12 hereof.

25.5.1 Notwithstanding anything to the contrary in Article 25.5, the Interconnection Customer's and Participating TO's rights to audit the CAISO's accounts and records shall be as set forth in Section 22.1 of the CAISO Tariff, and the CAISO's process for remedying an overpayment or underpayment shall be as set forth in the CAISO Tariff.

ARTICLE 26. SUBCONTRACTORS

26.1 General. Nothing in this LGIA shall prevent a Party from utilizing the services of any subcontractor as it deems appropriate to perform its obligations under this LGIA; provided, however, that each Party shall require its subcontractors to comply with all applicable terms and conditions of this LGIA in providing such services and each Party shall remain primarily liable to the other Party for the performance of such subcontractor.

26.2 Responsibility of Principal. The creation of any subcontract relationship shall not relieve the hiring Party of any of its obligations under this LGIA. The hiring Party shall be fully responsible to the other Parties for the acts or omissions of any subcontractor the hiring Party hires as if no subcontract had been made; provided, however, that in no event shall the CAISO or Participating TO be liable for the actions or inactions of the Interconnection Customer or its subcontractors with respect to obligations of the Interconnection Customer under Article 5 of this LGIA. Any applicable obligation imposed by this LGIA upon the hiring Party shall be equally binding upon, and shall be construed as having application to, any subcontractor of such Party.

26.3 No Limitation by Insurance. The obligations under this Article 26 will not be limited in any way by any limitation of subcontractor's insurance.

ARTICLE 27. DISPUTES

All disputes arising out of or in connection with this LGIA whereby relief is sought by or from the CAISO shall be settled in accordance with the provisions of Article 13 of the CAISO Tariff, except that references to the CAISO Tariff in such Article 13 of the CAISO Tariff shall be read as references to this LGIA. Disputes arising out of or in connection with this LGIA not subject to provisions of Article 13 of the CAISO Tariff shall be resolved as follows:

27.1 Submission. In the event either Party has a dispute, or asserts a claim, that arises out of or in connection with this LGIA or its performance, such Party (the "disputing Party") shall provide the other Party with written notice of the dispute or claim ("Notice of Dispute"). Such dispute or claim shall be referred to a designated senior representative of each Party for resolution on an informal basis as promptly as practicable after receipt of the Notice of Dispute by the other Party. In the event the designated representatives are unable to resolve the claim or dispute through unassisted or assisted negotiations within thirty (30) Calendar Days of the other Party's receipt of the Notice of Dispute, such claim or dispute may, upon mutual agreement of the Parties, be submitted to arbitration and resolved in accordance with the arbitration procedures set forth below. In the event the Parties do not agree to submit such claim or dispute to arbitration, each Party may exercise whatever rights and remedies it may have in equity or at law consistent with the terms of this LGIA.

27.2 External Arbitration Procedures. Any arbitration initiated under this LGIA shall be conducted before a single neutral arbitrator appointed by the Parties. If the Parties fail to agree upon a single arbitrator within ten (10) Calendar Days of the submission of the dispute to arbitration, each Party shall choose one arbitrator who shall sit on a three-member arbitration panel. The two arbitrators so chosen shall within twenty (20) Calendar Days select a third arbitrator to chair the arbitration panel. In either case, the arbitrators shall be knowledgeable in electric utility matters, including electric transmission and bulk power issues, and shall

not have any current or past substantial business or financial relationships with any party to the arbitration (except prior arbitration). The arbitrator(s) shall provide each of the Parties an opportunity to be heard and, except as otherwise provided herein, shall conduct the arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association ("Arbitration Rules") and any applicable FERC regulations; provided, however, in the event of a conflict between the Arbitration Rules and the terms of this Article 27, the terms of this Article 27 shall prevail.

27.3 Arbitration Decisions. Unless otherwise agreed by the Parties, the arbitrator(s) shall render a decision within ninety (90) Calendar Days of appointment and shall notify the Parties in writing of such decision and the reasons therefor. The arbitrator(s) shall be authorized only to interpret and apply the provisions of this LGIA and shall have no power to modify or change any provision of this Agreement in any manner. The decision of the arbitrator(s) shall be final and binding upon the Parties, and judgment on the award may be entered in any court having jurisdiction. The decision of the arbitrator(s) may be appealed solely on the grounds that the conduct of the arbitrator(s), or the decision itself, violated the standards set forth in the Federal Arbitration Act or the Administrative Dispute Resolution Act. The final decision of the arbitrator(s) must also be filed with FERC if it affects jurisdictional rates, terms and conditions of service, Interconnection Facilities, or Network Upgrades.

27.4 Costs. Each Party shall be responsible for its own costs incurred during the arbitration process and for the following costs, if applicable: (1) the cost of the arbitrator chosen by the Party to sit on the three member panel and one half of the cost of the third arbitrator chosen; or (2) one half the cost of the single arbitrator jointly chosen by the Parties.

ARTICLE 28. REPRESENTATIONS, WARRANTIES AND COVENANTS

28.1 General. Each Party makes the following representations, warranties and covenants:

28.1.1 Good Standing. Such Party is duly organized, validly existing and in good standing under the laws of the state in which it is organized, formed, or incorporated, as applicable; that it is qualified to do business in the state or states in which the Large Generating Facility, Interconnection Facilities and Network Upgrades owned by such Party, as applicable, are located; and that it has the corporate power and authority to own its properties, to carry on its business as now being conducted and to enter into this LGIA and carry out the transactions contemplated hereby and perform and carry out all covenants and obligations on its part to be performed under and pursuant to this LGIA.

28.1.2 Authority. Such Party has the right, power and authority to enter into this LGIA, to become a Party hereto and to perform its obligations hereunder. This LGIA is a legal, valid and binding obligation of such Party, enforceable against such Party in accordance with its terms, except as the enforceability thereof may be limited by applicable bankruptcy, insolvency, reorganization or other similar laws affecting creditors' rights generally and by general equitable principles (regardless of whether enforceability is sought in a proceeding in equity or at law).

28.1.3 No Conflict. The execution, delivery and performance of this LGIA does not violate or conflict with the organizational or formation documents, or bylaws or operating agreement, of such Party, or any judgment, license, permit, order, material agreement or instrument applicable to or binding upon such Party or any of its assets.

28.1.4 Consent and Approval. Such Party has sought or obtained, or, in accordance with this LGIA will seek or obtain, each consent, approval, authorization, order, or acceptance by any Governmental Authority in connection with the execution, delivery and performance of this LGIA, and it will provide to any Governmental Authority notice of any actions under this LGIA that are required by Applicable Laws and Regulations.

ARTICLE 29. [RESERVED]

ARTICLE 30. MISCELLANEOUS

30.1 Binding Effect. This LGIA and the rights and obligations hereof, shall be binding upon and shall inure to the benefit of the successors and assigns of the Parties hereto.

30.2 Conflicts. In the event of a conflict between the body of this LGIA and any attachment, appendices or exhibits hereto, the terms and provisions of the body of this LGIA shall prevail and be deemed the final intent of the Parties.

30.3 Rules of Interpretation. This LGIA, unless a clear contrary intention appears, shall be construed and interpreted as follows: (1) the singular number includes the plural number and vice versa; (2) reference to any person includes such person's successors and assigns but, in the case of a Party, only if such successors and assigns are permitted by this LGIA, and reference to a person in a particular capacity excludes such person in any other capacity or individually; (3) reference to any agreement (including this LGIA), document, instrument or tariff means such agreement, document, instrument, or tariff as amended or modified and in effect from time to time in accordance with the terms thereof and, if applicable, the terms hereof; (4) reference to any Applicable Laws and Regulations means such Applicable Laws and Regulations as amended, modified, codified, or reenacted, in whole or in part, and in effect from time to

time, including, if applicable, rules and regulations promulgated thereunder; (5) unless expressly stated otherwise, reference to any Article, Section or Appendix means such Article of this LGIA or such Appendix to this LGIA, or such Section to the GIDAP or such Appendix to the GIDAP, as the case may be; (6) "hereunder", "hereof", "herein", "hereto" and words of similar import shall be deemed references to this LGIA as a whole and not to any particular Article or other provision hereof or thereof; (7) "including" (and with correlative meaning "include") means including without limiting the generality of any description preceding such term; and (8) relative to the determination of any period of time, "from" means "from and including", "to" means "to but excluding" and "through" means "through and including".

30.4 Entire Agreement. This LGIA, including all Appendices and Schedules attached hereto, constitutes the entire agreement among the Parties with reference to the subject matter hereof, and supersedes all prior and contemporaneous understandings or agreements, oral or written, between or among the Parties with respect to the subject matter of this LGIA. There are no other agreements, representations, warranties, or covenants which constitute any part of the consideration for, or any condition to, any Party's compliance with its obligations under this LGIA.

30.5 No Third Party Beneficiaries. This LGIA is not intended to and does not create rights, remedies, or benefits of any character whatsoever in favor of any persons, corporations, associations, or entities other than the Parties, and the obligations herein assumed are solely for the use and benefit of the Parties, their successors in interest and, where permitted, their assigns.

30.6 Waiver. The failure of a Party to this LGIA to insist, on any occasion, upon strict performance of any provision of this LGIA will not be considered a waiver of any obligation, right, or duty of, or imposed upon, such Party.

Any waiver at any time by either Party of its rights with respect to this LGIA shall not be deemed a continuing waiver or a waiver with respect to any other failure to comply with any other obligation, right, duty of this LGIA. Termination or Default of this LGIA for any reason by the Interconnection Customer shall not constitute a waiver of the Interconnection Customer's legal rights to obtain an interconnection from the Participating TO. Any waiver of this LGIA shall, if requested, be provided in writing.

30.7 Headings. The descriptive headings of the various Articles of this LGIA have been inserted for convenience of reference only and are of no significance in the interpretation or construction of this LGIA.

30.8 Multiple Counterparts. This LGIA may be executed in two or more counterparts, each of which is deemed an original but all constitute one and the same instrument.

30.9 Amendment. The Parties may by mutual agreement amend this LGIA by a written instrument duly executed by all of the Parties. Such amendment shall become effective and a part of this LGIA upon satisfaction of all Applicable Laws and Regulations.

30.10 Modification by the Parties. The Parties may by mutual agreement amend the Appendices to this LGIA by a written instrument duly executed by all of the Parties. Such amendment shall become effective and a part of this LGIA upon satisfaction of all Applicable Laws and Regulations.

30.11 Reservation of Rights. The CAISO and Participating TO shall each have the right to make a unilateral filing with FERC to modify this LGIA pursuant to section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder with respect to the following Articles and Appendices of this LGIA and with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation covered by these Articles and Appendices:

> Recitals, 1, 2.1, 2.2, 2.3, 2.4, 2.6, 3.1, 3.3, 4.1, 4.2, 4.3, 4.4, 5 preamble, 5.4, 5.7, 5.8, 5.9, 5.12, 5.13, 5.18, 5.19.1, 7.1, 7.2, 8, 9.1, 9.2, 9.3, 9.5, 9.6, 9.7, 9.8, 9.10, 10.3, 11.4, 12.1, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24.3, 24.4, 25.1, 25.2, 25.3 (excluding subparts), 25.4.2, 26, 28, 29, 30, Appendix D, Appendix F, Appendix G, and any other Article not reserved exclusively to the Participating TO or the CAISO below.

The Participating TO shall have the exclusive right to make a unilateral filing with FERC to modify this LGIA pursuant to section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder with respect to the following Articles and Appendices of this LGIA and with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation covered by these Articles and Appendices:

> 2.5, 5.1, 5.2, 5.3, 5.5, 5.6, 5.10, 5.11, 5.14, 5.15, 5.16, 5.17, 5.19 (excluding 5.19.1), 6, 7.3, 9.4, 9.9, 10.1, 10.2, 10.4, 10.5, 11.1, 11.2, 11.3, 11.5, 12.2, 12.3, 12.4, 24.1, 24.2, 25.3.1, 25.4.1, 25.5 (excluding 25.5.1), 27 (excluding preamble), Appendix A, Appendix B, Appendix C, and Appendix E.

The CAISO shall have the exclusive right to make a unilateral filing with FERC to modify this LGIA pursuant to section 205 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder with respect to

the following Articles of this LGIA and with respect to any rates, terms and conditions, charges, classifications of service, rule or regulation covered by these Articles:

3.2, 4.5, 11.6, 25.3.2, 25.5.1, and 27 preamble.

The Interconnection Customer, the CAISO, and the Participating TO shall have the right to make a unilateral filing with FERC to modify this LGIA pursuant to section 206 or any other applicable provision of the Federal Power Act and FERC's rules and regulations thereunder; provided that each Party shall have the right to protest any such filing by another Party and to participate fully in any proceeding before FERC in which such modifications may be considered. Nothing in this LGIA shall limit the rights of the Parties or of FERC under sections 205 or 206 of the Federal Power Act and FERC's rules and regulations thereunder, except to the extent that the Parties otherwise mutually agree as provided herein.

30.12 No Partnership. This LGIA shall not be interpreted or construed to create an association, joint venture, agency relationship, or partnership among the Parties or to impose any partnership obligation or partnership liability upon any Party. No Party shall have any right, power or authority to enter into any agreement or undertaking for, or act on behalf of, or to act as or be an agent or representative of, or to otherwise bind, another Party.

30.13 Joint and Several Obligations. Except as otherwise provided in this LGIA, the obligations of the CAISO, the Participating TO, and the Interconnection Customer are several, and are neither joint nor joint and several.

IN WITNESS WHEREOF, the Parties have executed this LGIA in multiple originals, each of which shall constitute and be an original effective agreement among the Parties.

16DO 8me LLC

By: DocuSigned by: Thomas Buttgenbach 45638ED963BE4D9...

Name: Thomas Buttgenbach

Title: President

Date: 1/28/2022

Southern California Edison Company

By: DocuSigned by: 6E1E83BD01DF44A...

Name: Greg Ferree

Title: VP, Vegetation, Inspections & Ops Services

Date: 1/21/2022

California Independent System Operator Corporation

By: DocuSigned by: Neil Millar 9236FA183EA64FB...

Name: Neil Millar

Title: Vice President Infrastructure and Ops Planning

Date: 1/20/2022

APPENDICES TO LGIA

Appendix A Interconnection Facilities, Network Upgrades and Distribution Upgrades

Appendix B Milestones

Appendix C Interconnection Details

Appendix D Security Arrangements Details

Appendix E Commercial Operation Date

Appendix F Addresses for Delivery of Notices and Billings

Appendix G Interconnection Customer's Share of Costs of Network Upgrades for Applicable Project Group

Appendix H Interconnection Requirements for an Asynchronous Generating Facility

Appendix A

Interconnection Facilities, Network Upgrades and Distribution Upgrades

Additional Definitions: For the purposes of the Appendices to the LGIA, the following terms, when used with initial capitalization, whether in the singular or the plural, shall have the meanings specified below:

(a) Annual Tax Security Reassessment: The annual reassessment of the current tax liability in accordance with the directives of FERC Orders 2003-A and 2003-B associated with Article 5.17.4 of the LGIA which will commence the first year after Interconnection Customer's in-service date.

(b) Area Delivery Network Upgrades Cost: The Interconnection Customer's allocated share of all costs, excluding One-Time Cost, determined by the Participating TO to be associated with the design, engineering, procurement, construction and installation of the Area Delivery Network Upgrades constructed and owned by the Participating TO. The Area Delivery Network Upgrades Cost is provided in Section 5 of this Appendix A.

(c) BES Cyber Asset: A programmable electronic device, including the hardware, software, and data in that device, that if rendered unavailable, degraded, or misused would, within 15 minutes of its required operation, misoperation, or non-operation, adversely impact one or more facilities, systems, or equipment, which, if destroyed, degraded, or otherwise rendered unavailable when needed, would affect the reliable operation of the Bulk Electric System, as that term is defined in NERC's Glossary of Terms.

(d) Charging Capacity: The capacity provided under this LGIA for the Storage Energy of a Large Generating Facility that includes storage, subject to available capacity on the CAISO Controlled Grid and the applicable congestion management procedures in the CAISO Tariff.

(e) Construction Activities: Actions by the Participating TO that result in irrevocable financial commitments for the purchase of major electrical equipment or land for Participating TO's Interconnection Facilities or Network Upgrades assigned to the Interconnection Customer that occur after receipt of all appropriate governmental approvals needed for the Participating TO's Interconnection Facilities or Network Upgrades.

(f) Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities: As defined in Appendix X of the Transmission Owner Tariff. The currently effective Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities is as

provided in Appendix X of the Transmission Owner Tariff.

(g) Distribution Upgrades Charge: The monthly charge to the Interconnection Customer to recover the revenue requirements for the Participating TO's Distribution Upgrades, calculated as the product of the Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities and the Distribution Upgrades Cost. The Distribution Upgrades Charge is provided in Section 5 of this Appendix A.

(h) Distribution Upgrades Completion Date: The date upon which the construction of the Distribution Upgrades is complete and such facilities are successfully tested and ready for service.

(i) Distribution Upgrades Cost: The Interconnection Customer's allocated share of all costs, excluding One-Time Cost, determined by the Participating TO to be associated with the design, engineering, procurement, construction and installation of the Distribution Upgrades. The Distribution Upgrades Cost is provided in Section 5 of this Appendix A.

(j) Generation Tie-Line: The generation tie-line described in Section 1(a)(ii) of this Appendix A which is designated as the Vincent – Marcott 500 kV Transmission Line.

(k) Identified Affected System: As defined in Appendix A of the CAISO Tariff.

(l) Interconnection Facilities Charge: The monthly charge to the Interconnection Customer to recover the revenue requirements for the Participating TO's Interconnection Facilities, calculated as the product of the Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities and the Interconnection Facilities Cost. The Interconnection Facilities Charge is provided in Section 5 of this Appendix A.

(m) Interconnection Facilities Completion Date: The date upon which the construction of the Participating TO's Interconnection Facilities is complete and such facilities are successfully tested and ready for service.

(n) Interconnection Facilities Cost: All costs, excluding One-Time Cost, determined by the Participating TO to be associated with the design, engineering, procurement, construction and installation of the Participating TO's Interconnection Facilities. The Interconnection Facilities Cost is provided in Section 5 of this Appendix A.

(o) ITCC (Income Tax Component of Contribution): As defined in Appendix X of the Transmission Owner Tariff.

(p) Local Delivery Network Upgrades Cost: The Interconnection Customer's allocated share of all costs, excluding One-Time Cost, determined by the Participating TO to be associated with the design, engineering, procurement, construction and installation of the Local Delivery Network Upgrades constructed and owned by the Participating TO. The Local Delivery Network Upgrades Cost is provided in Section 5 of this Appendix A.

(q) One-Time Cost: All costs determined by the Participating TO to be associated with the installation of the Participating TO's Interconnection Facilities, Distribution Upgrades, Participating TO's Reliability Network Upgrades, or Participating TO's Delivery Network Upgrades which are not capitalized. The One-Time Cost is provided in Section 5 of this Appendix A.

(r) Reliability Network Upgrades Cost: The Interconnection Customer's allocated share of all costs, excluding One-Time Cost, determined by the Participating TO to be associated with the design, engineering, procurement, construction and installation of the Participating TO's Reliability Network Upgrades. The Reliability Network Upgrades Cost is provided in Section 5 of this Appendix A.

(s) Remedial Action Scheme (RAS): As defined in Appendix A of the CAISO Tariff.

(t) Shared BES Cyber Asset Facility: A location containing BES Cyber Asset(s) for which both the Interconnection Customer and the Participating TO claim ownership of either the physical building, parcel of land, or devices inside the property line of the location.

(u) Storage Energy: The flow of wholesale electric energy from the CAISO Controlled Grid solely to charge the storage component of the Large Generating Facility from the CAISO Controlled Grid for later redelivery of such energy, net of Large Generating Facility losses, to the CAISO Controlled Grid. Storage Energy does not include the delivery of energy for purposes that are subject to the Participating TO's retail tariff.

(v) Tax Security: The Interconnection Customer's provision of security with respect to the Interconnection Customer's tax indemnification obligations, provided in accordance with Article 5.17.3. The Tax Security is provided in Section 5 of this Appendix A.

(w) Transmission Owner Tariff: The Participating TO's Tariff designated as FERC Electric Tariff, Volume No. 6, as such tariff may be amended or superseded.

The following definitions from Article 1 – Definitions of the LGIA, Appendix EE of the CAISO Tariff, that were approved as per FERC Docket No. ER19-2679 to be applicable for projects in CAISO Queue Cluster 11 and forward, do not apply to this LGIA as this project belongs to a prior CAISO Queue Cluster:

Assigned Network Upgrade (ANU), Conditionally Assigned Network Upgrade (CANU), Current Cost Responsibility (CCR), General Reliability Network Upgrade (GRNU), Interconnection Reliability Network Upgrades (IRNU), Maximum Cost Exposure (MCE), Maximum Cost Responsibility (MCR), Precursor Network Upgrades (PNU).

1. Interconnection Facilities:

(a) **Interconnection Customer's Interconnection Facilities:** The Interconnection Customer shall:

(i) Install a substation with six (6) 500 / 34.5 / 13.8 kV wye grounded-delta-wye grounded main step-up transformer with a 10.5 percent impedance on a 133 MVA base.

(ii) Install the Generation Tie-Line consisting of a new 24.4 mile, 1,272 kcmil aluminum conductor steel reinforced 500kV transmission line with normal (continuous) rating of 2368 A and an emergency (four hour) rating of 2,563 A, from the Large Generating Facility to a position designated by the Participating TO, outside of the Participating TO's Vincent Substation, where Interconnection Customer shall install a structure designed and engineered in accordance with the Participating TO's specifications ("Last Structure"). The right-of-way for the Generation Tie-Line shall extend up to the edge of the Vincent Substation property line.

(iii) Install optical ground wire ("OPGW") on the Generation Tie-Line to provide one of three telecommunication paths required for the line protection scheme, the remote terminal units ("RTUs"). A minimum of eight (8) strands within the OPGW shall be provided for the Participating TO's exclusive use into Vincent Substation, which includes a minimum of six (6) digital channels to support the line protection scheme.

(iv) Install appropriate single-mode fiber optic cable from the Large Generating Facility to a point designated by the Participating TO near the Participating TO's Vincent Substation to provide the second telecommunication path required for the line protection scheme and the RAS. A minimum of eight (8) strands within the single-mode fiber optic cable shall be provided for the Participating TO's exclusive use. The telecommunication path shall meet the Applicable Reliability Standards criteria for diversity.

(v) Install appropriate single mode fiber optic cables from the Large Generating Facility to a point designated by the Participating TO near the Participating TO's Vincent Substation to provide a third telecommunication path required for the Generation Tie-Line protection scheme. A minimum of eight (8) strands within the single mode fiber optic cable shall be provided for the Participating TO's exclusive use, which includes a minimum of six (6) digital channels to support Generation Tie-Line protection. The telecommunication path shall meet the Applicable Reliability Standards criteria for diversity.

(vi) Own, operate and maintain all three telecommunication paths (including OPGW, any fiber-optic cables, and appurtenant facilities), with the exception of the terminal equipment at both Vincent Substation and at the

Large Generating Facility, which terminal equipment will be installed, owned, operated and maintained by the Participating TO.

(vii) Allow the Participating TO to review the Interconnection Customer's telecommunication equipment design and perform inspections to ensure compatibility with the Participating TO's terminal equipment and protection engineering requirements; allow the Participating TO to perform acceptance testing of the telecommunication equipment and the right to request and/or to perform correction of installation deficiencies.

(viii) Provide required data signals, make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of the Participating TO's RTU in accordance with the Interconnection Handbook. The Participating TO's RTU is a BES Cyber Asset and the Interconnection Customer shall cooperate with the Participating TO in implementing and adhering to required security protections in accordance with Applicable Reliability Standards. In accordance with Article 5.12 of this LGIA, the Interconnection Customer acknowledges that the access required under such section will include Participating TO's personnel ability to access twenty-four hours a day the space provided for the Participating TO's RTU.

(ix) Make available adequate space, facilities, and associated dedicated electrical circuits within a secure building having suitable environmental controls for the installation of the Participating TO's telecommunications terminal equipment in accordance with the Interconnection Handbook. In accordance with Article 5.12 of this LGIA, the Interconnection Customer acknowledges that the access required under such section will include Participating TO's personnel ability to access twenty-four hours a day the space provided for the Participating TO's telecommunications terminal equipment.

(x) Extend the main and diverse fiber-optic cables for the three telecommunication paths to Interconnection Customer provided and installed patch panels located adjacent to the Participating TO's telecommunications terminal equipment specified above.

(xi) Install all required CAISO-approved compliant metering equipment at the Large Generating Facility, in accordance with Section 10 of the CAISO Tariff.

(xii) Pursuant to Article 7.3 of this LGIA, install a metering cabinet and metering equipment (typically, potential and current transformers) at the Large Generating Facility to meter the Large Generating Facility retail load, as specified by the Participating TO. In accordance with Article 5.12 of this LGIA, the Interconnection Customer acknowledges that the access required under such section will include Participating TO's personnel ability to access twenty-four hours a day the metering cabinet provided for the Participating TO's metering equipment.

(xiii) Pursuant to Article 7 of this LGIA, install a metering cabinet(s) and metering equipment (typically, potential and current transformers) at the

Large Generating Facility to meter the Charging Demand, as specified by the Participating TO. In accordance with Article 5.12 of this LGIA, the Interconnection Customer acknowledges that the access required under such section will include Participating TO's personnel ability to access twenty-four hours a day the metering cabinet(s) provided for the Participating TO's metering equipment.

(xiv) Pursuant to Article 7.3 of this LGIA, allow the Participating TO to install, in the metering cabinet provided by the Interconnection Customer, meters required to meter the retail load at the Large Generating Facility.

(xv) Pursuant to Article 7 of this LGIA, allow the Participating TO to install, in the metering cabinet(s) provided by the Interconnection Customer, meters required to meter the Charging Demand at the Large Generating Facility.

(xvi) Install relay protection to be specified by the Participating TO to match the relay protection used by the Participating TO at Vincent Substation, in order to protect the Generation Tie-Line, as follows:

1. Three (3) line current differential relays, which will include transfer trip capabilities. The make and type of current differential relays will be specified by the Participating TO during final engineering of the Participating TO's Interconnection Facilities.

(xvii) Install all equipment necessary to comply with the power factor requirements of Article 9.6.1 of the LGIA, including the ability to regulate the power factor to maintain a voltage schedule (VAR schedule) in accordance with Article 9.6.2 of the LGIA. [The power factor requirements specified in Article 9.6.1 shall be as measured at the high-side of the Interconnection Customer's 500/34.5.13.8 kV Substation.

(xviii) Install disconnect facilities in accordance with the Participating TO's Interconnection Handbook to comply with the Participating TO's switching and tagging procedures.

(xix) Acquire the necessary rights-of-way for the Interconnection Customer's Interconnection Facilities.

(xx) Perform the necessary environmental studies and obtain permits for the Interconnection Customer's Interconnection Facilities and perform the environmental activities related to the Participating TO's Interconnection Facilities as described in the Section 1(b) and the Interconnection Reliability Network Upgrades as described in Section 2(b)(i) of Appendix A of the LGIA.

(xxi) Submit to the Participating TO and the CAISO, the final PSCAD model of the Large Generating Facility as part of the "as-built" drawings, information and documents required pursuant to Article 5.10.3 of the LGIA by the date specified in Appendix B.

(b) **Participating TO's Interconnection Facilities:** The Participating TO shall**:**

(i) **Vincent Substation.**

1. Install facilities for a new 500kV switchrack position to terminate the Generation Tie-Line. This work includes the following:
   a. One (1) 500kV dead-end substation structure.

b. Three (3) 500kV coupling capacitor voltage transformers ("CCVTs") with steel pedestal support structures.
c. Three (3) 500kV line drops.

2. Install the following relays to protect the Generation Tie-Line:
Three (3) line current differential relays which include transfer trip capabilities, via diversely routed dedicated digital communications channels to the Large Generating Facility. The make and type of current differential relays will be specified by the Participating TO during final engineering of the Participating TO's Interconnection Facilities.

(ii) **Generation Tie-Line.**
Install an appropriate number of 500kV transmission tower structures including insulator/hardware assemblies, and appropriate number of spans of conductor and OPGW between the Last Structure and the dead-end substation structure at Vincent Substation. The actual number and location of the transmission tower structures and spans of conductor and OPGW will be determined by the Participating TO following completion of final engineering of the Participating TO's Interconnection Facilities. The Phase II Interconnection Study assumed four (4) transmission tower structures and five (5) spans of conductor.

(iii) **Telecommunications.**

1. Install all required lightwave, channel, and associated equipment (including terminal equipment), supporting protection and the RTU requirements at the Large Generating Facility and Vincent Substation for the interconnection of the Large Generating Facility. Notwithstanding that certain telecommunication equipment, including the telecommunications terminal equipment, will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Participating TO shall own, operate and maintain such telecommunication equipment as part of the Participating TO's Interconnection Facilities.
2. Install appropriate length of fiber optic cable, including conduit and vaults, from the Vincent Substation 500kV switchrack to extend the fiber optic cable and conduit into the communication room at Vincent Substation. The actual location and length of fiber optic cable and conduit, and location and number of vaults, will be determined during final engineering of the Participating TO's Interconnection Facilities. The 2021 Reassessment Study assumed the installation of approximately 250 feet of underground fiber optic cable and associated conduit, and one (1) 4' X 4' X 6'vault to extend the fiber optic cable into the communication room at Vincent Substation.
3. Install appropriate length of fiber optic cable, including conduit and vaults, to extend the Interconnection Customer's second diverse telecommunications from the point designated by the Participating TO near the Participating TO's Vincent Substation into the communication room at Vincent Substation. The actual location and length of fiber

optic cable and conduit, and location and number of vaults, will be determined during final engineering of the Participating TO's Interconnection Facilities. The 2021 Reassessment Study assumed the installation of approximately 250 feet of underground fiber optic cable and associated conduit, and one (1) vault to extend the Interconnection Customer's diverse telecommunications into the communication room at Vincent Substation.

4. Install appropriate length of fiber optic cable, including conduit and vaults, from the point designated by the Participating TO to extend the Interconnection Customer's third diverse fiber optic cable to into the communication room at Vincent Substation. The actual location and length of fiber optic cable and conduit, and location and number of vaults, will be determined during final engineering of the Participating TO's Interconnection Facilities. The 2021 Reassessment Study assumed the installation of approximately 950 feet of underground fiber optic cable and associated conduit, and one (1) 4' x 4' x 6' vault to extend the fiber optic cable into the communication room at Vincent Substation.

(iv) **Metering.**

1. Pursuant to Article 7.3 of this LGIA, install meters required to meter the retail load at the Large Generating Facility. Notwithstanding that the meters will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Participating TO shall own, operate and maintain such facilities as part of the Participating TO's Interconnection Facilities.
2. Pursuant to Article 7 of this LGIA, install meters required to meter the Charging Demand at the Large Generating Facility. Notwithstanding that the meters will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Participating TO shall own, operate and maintain such facilities as part of the Participating TO's Interconnection Facilities.

(v) **Power System Control.**

1. Install one (1) RTU at the Large Generating Facility to monitor typical generation elements such as MW, MVAR, terminal voltage and circuit breaker status for the Large Generating Facility and plant auxiliary load, and transmit the information received thereby to the Participating TO's grid control center. Notwithstanding that the RTU will be located on the Interconnection Customer's side of the Point of Change of Ownership, the Participating TO shall own, operate and maintain the RTU as part of the Participating TO's Interconnection Facilities.
2. Add points to the existing RTU at Vincent Substation to inlcude points for the new protection relay / status / alarm / control.

(vi) Review the "as-built" drawings, information and documents, as applicable, for Interconnection Customer's Interconnection Facilities and Large Generating Facility submitted by the Interconnection Customer in

accordance with Article 5.10.3 of the LGIA, and the final PSCAD model of the Generating Facility, to ensure the consistency of such documentation with that provided by the Interconnection Customer during the interconnection process and relied upon in the Interconnection Studies.

(vii) **Real Properties.**
Obtain easements and/or acquire land for the installation of the Participating TO's Interconnection Facilities, including any associated telecommunication equipment.

(viii) **Environmental Activities, Permits, and Licensing.**
Perform and or coordinate all required environmental activities, and obtain required licensing and permits for the installation of the Participating TO's Interconnection Facilities, including any associated telecommunication equipment.

The Interconnection Customer shall:
Perform the environmental activities related to the Participating TO's Interconnection Facilities
The Interconnection Customer shall provide the Participating TO an accounting of the actual costs incurred by the Interconnection Customer for the environmental services work described above for the Participating TO's Interconnection Facilities in a form acceptable to the Participating TO (the "Environmental Services Costs Declaration"). The Environmental Services Costs Declaration will be provided to the Interconnection Customer prior to the commencement of Construction Activities and shall be completed, signed by an authorized representative, and returned by the Interconnection Customer by the date set forth in Appendix B of the LGIA. The actual cost information provided by the Interconnection Customer will be used by the Participating TO in determining the Interconnection Facilities Charge and applicable ITCC as part of the final accounting of costs pursuant to Article 12.2 of the LGIA, and is subject to audit by the Participating TO in accordance with Article 25 of the LGIA.

The Interconnection Customer understands and acknowledges that should the environmental services work performed by the Interconnection Customer not meet the industry standards utilized in the State of California or by the Participating TO in accordance with Applicable Laws and Regulations, as determined by Participating TO, the Interconnection Customer shall be required to remedy all deficiencies under the Participating TO's direction.

2. Network Upgrades:

(a) **Stand Alone Network Upgrades:** None.

(b) **Other Network Upgrades:**

(i) **Participating TO's Reliability Network Upgrades.**

1. **Interconnection Reliability Network Upgrades.** The Participating TO shall:
   a. Vincent Substation.

Install one (1) 500 kV line position which includes the following equipment:

i. Two (2) 500 kV circuit breakers comprised of three (3) single phase units.
ii. Three (3) 500 kV single phase group operated disconnect switches with grounding attachment.
iii. Nine (9) 500 kV single phase group operated disconnect switches.
iv. Forty-five (45) post insulators.
v. Two (2) local breaker failure backup relays.

b. Environmental Activities, Permits, and Licensing.
Perform and/or coordinate the required environmental activities and obtain required licensing and permits for the installation of the Interconnection Reliability Network Upgrades, if applicable. Refer to Appendix A, section D.4 for assumptions related to environmental activities, permits, and licensing.

2. **General Reliability Network Upgrades.** None identified in the Phase II Interconnection Study

(i) **Participating TO's Delivery Network Upgrades.**

1. **Area Delivery Network Upgrades.** None identified in the Phase II Interconnection Study.
2. **Local Delivery Network Upgrades.** None identified in the Phase II Interconnection Study.

3. Distribution Upgrades: None identified in the Phase II Interconnection Study.

4. Point of Change of Ownership, Point of Interconnection and One-Line Diagram of Interconnection:

(a) **Point of Change of Ownership.**

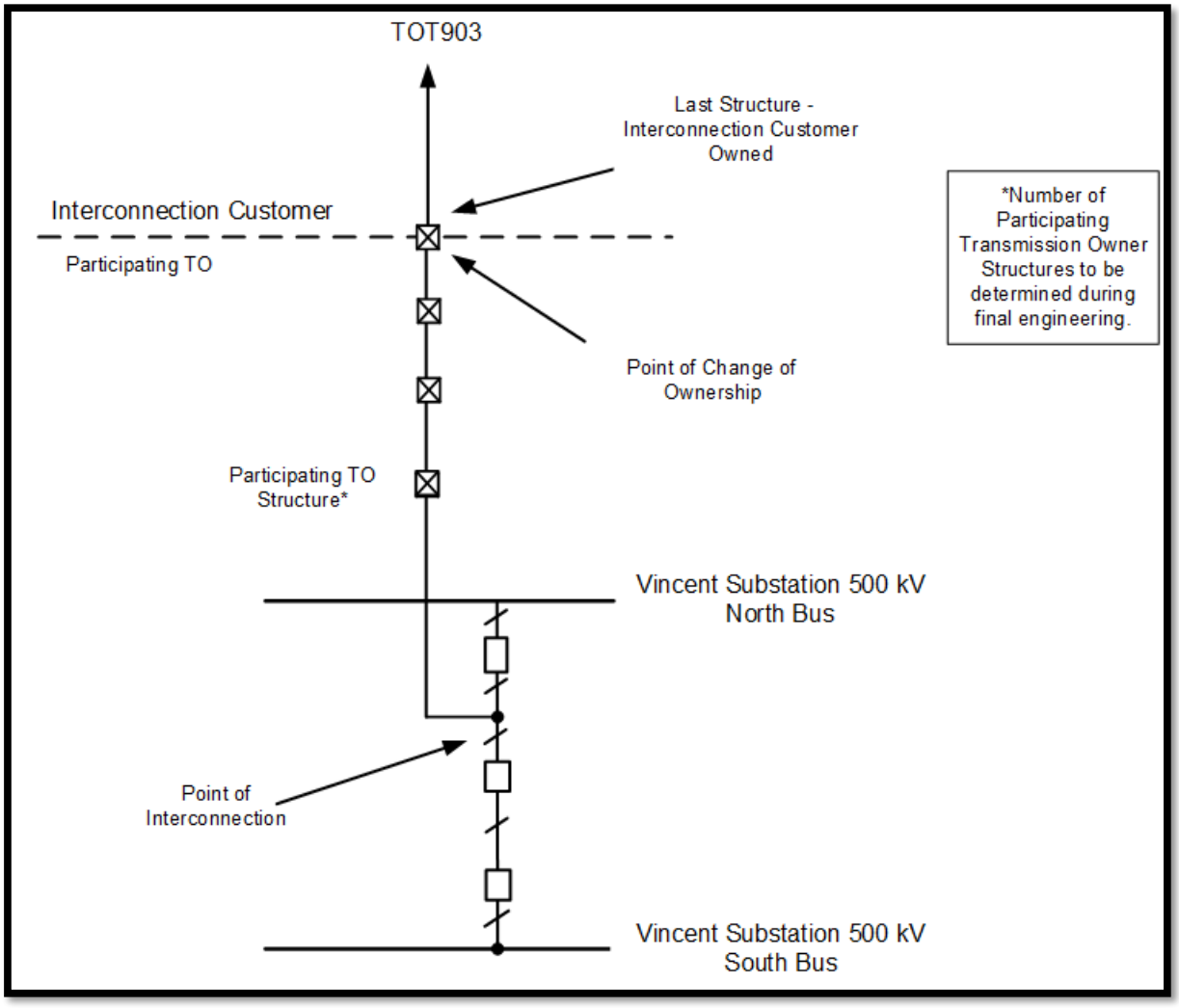
(i) Generation Tie-Line: The Point of Change of Ownership shall be the point where the conductors of the Generation Tie-Line are attached to the Last Structure, which will be connected on the side of the Last Structure facing Vincent Substation. The Interconnection Customer shall own and maintain the Last Structure, the conductors, insulators and jumper loops from such Last Structure to the Interconnection Customer's Large Generating Facility. The Participating TO will own and maintain the Vincent Substation, as well as all circuit breakers, disconnects, relay facilities and metering within the Vincent Substation, together with the line drop, in their entirety, from the Last Structure to Vincent Substation. The Participating TO will own the insulators that are used to attach the Participating TO-owned conductors to the Last Structure.

(ii) Telecommunication main fiber optic cable: The Point of Change of Ownership shall be the point where the fiber optic cable for the Generation Tie-Line is attached to the Participating TO owned fiber optic cable.

(iii) Telecommunication diverse fiber-optic cable: The Point of Change of Ownership shall be the point at an Interconnection Customer installed and owned pole located at a position designated by the Participating TO outside the Participating TO's substation, or a Participating TO owned vault, where the Interconnection Customer's fiber-optic cable is connected to the Participating TO's fiber optic cable.

(b) **Point of Interconnection.** The Participating TO's Vincent Substation at the 500kV bus.

(c) **One-Line Diagram of Interconnection.**



5. Cost of Interconnection Facilities, Distribution Upgrades and Network Upgrades, Payment Schedule, On-Going Monthly Charges and Financial Security:

(a) **Estimated Cost.**

Element	Interconnection Facilities Cost	Distribution Upgrades Cost	Reliability Network Upgrades Cost	Area Delivery Network Upgrades Cost	Local Delivery Network Upgrades Cost	One-Time Cost	Total
Participating TO's Interconnection Facilities							
Substation	$3,691,788						$3,691,788
Transmission	$7,957,919						$7,957,919
Telecommunications	$1,559,300						$1,559,300
Metering Services	$201,980						$201,980
Power System Controls	$84,909					$31,053	$115,962
Real Properties	$111,970						$111,970
Environmental Services	$99,602						$99,602
PSCAD model and as-build validation	$0.00					$9,530	$9,530
Subtotal	**$13,707,468**					**$40,583**	**$13,748,051**
Distribution Upgrades - None							
Subtotal		**$0.00**				**$0.00**	**$0.00**
Participating TO's Reliability Network Upgrades							
IRNUs							
Substation			$7,493,467				$7,493,467
Environmental Services			$18,145				$18,145
Subtotal			**$7,511,612**			**$0.00**	**$7,511,612**
Area Delivery Network Upgrades - None							
Subtotal				**$0.00**		**$0.00**	**$0.00**
Local Delivery Network Upgrades - None							
Subtotal					**$0.00**	**$0.00**	**$0.00**
Total	**$13,707,468**	**$0.00**	**$7,511,612**	**$0.00**	**$$0.00**	**$40,583**	**$21,259,663**

All amounts shown above are in nominal dollars and reflect the Interconnection Customer's Current Cost Responsibility for the Participating TO's Reliability Network Upgrades and Local Delivery Network Upgrades as of the date of the final Phase II Interconnection Study report dated November 20, 2020, and the 2021 Reassessment Study Report dated August 31, 2021. The Current Cost Responsibility is subject to change pursuant to the GIDAP.

As of the date of the final Phase II Interconnection Study report dated November 20, 2020 and the 2021 Reassessment Study Report dated August 31, 2021 the Interconnection Customer's Maximum Cost Responsibility and Maximum Cost Exposure for the Participating TO's Reliability Network Upgrades and Local Delivery Network Upgrades are $7,622,300 and $9,082,000 expressed in 2025 constant dollars, respectively. The Maximum Cost Responsibility and Maximum Cost Exposure are each subject to change pursuant to the GIDAP.

The costs associated with any mitigation measures required to third party transmission systems, which result from interconnection of the Large Generating Facility to the Participating TO's electrical system, are not reflected in this LGIA.

(b) **Payment Schedule.**

The payment amounts shown below are based on an estimate of the monthly incurred costs for the Participating TO's Interconnection Facilities, Distribution Upgrades, and Network Upgrades

Payment No.	Payment Due Date	Interconnection Facilities Cost	Distribution Upgrades Cost	Reliability Network Upgrades Cost	Area Delivery Network Upgrades Cost	Local Delivery Network Upgrades Cost	One-Time Cost	Project Payment
1	4/1/2022	$61,627	$0.00	$33,771	$0.00	$0.00	$183	**$95,581**
2	5/1/2022	$73,335	$0.00	$40,187	$0.00	$0.00	$217	**$113,739**
3	6/1/2022	$87,096	$0.00	$47,728	$0.00	$0.00	$258	**$135,082**
4	7/1/2022	$103,202	$0.00	$56,555	$0.00	$0.00	$306	**$160,063**
5	8/1/2022	$121,952	$0.00	$66,829	$0.00	$0.00	$361	**$189,142**
6	9/1/2022	$143,645	$0.00	$78,716	$0.00	$0.00	$425	**$222,786**
7	10/1/2022	$168,551	$0.00	$92,365	$0.00	$0.00	$499	**$261,415**
8	11/1/2022	$196,895	$0.00	$107,897	$0.00	$0.00	$583	**$305,375**
9	12/1/2022	$228,806	$0.00	$125,385	$0.00	$0.00	$677	**$354,868**
10	1/1/2023	$264,284	$0.00	$144,827	$0.00	$0.00	$783	**$409,894**
11	2/1/2023	$303,136	$0.00	$166,116	$0.00	$0.00	$898	**$470,150**
12	3/1/2023	$344,919	$0.00	$189,014	$0.00	$0.00	$1,021	**$534,954**
13	4/1/2023	$397,481	$0.00	$217,817	$0.00	$0.00	$1,176	**$616,474**
14	5/1/2023	$443,580	$0.00	$243,079	$0.00	$0.00	$1,313	**$687,972**
15	6/1/2023	$489,381	$0.00	$268,178	$0.00	$0.00	$1,449	**$759,008**
16	7/1/2023	$533,129	$0.00	$292,152	$0.00	$0.00	$1,579	**$826,860**
17	8/1/2023	$572,848	$0.00	$313,918	$0.00	$0.00	$1,696	**$888,462**
18	9/1/2023	$606,498	$0.00	$332,358	$0.00	$0.00	$1,796	**$940,652**
19	10/1/2023	$632,157	$0.00	$346,419	$0.00	$0.00	$1,871	**$980,447**
20	11/1/2023	$648,248	$0.00	$355,236	$0.00	$0.00	$1,920	**$1,005,404**
21	12/1/2023	$653,733	$0.00	$358,242	$0.00	$0.00	$1,935	**$1,013,910**
22	1/1/2024	$648,248	$0.00	$355,236	$0.00	$0.00	$1,920	**$1,005,404**
23	2/1/2024	$632,157	$0.00	$346,419	$0.00	$0.00	$1,871	**$980,447**
24	3/1/2024	$606,498	$0.00	$332,358	$0.00	$0.00	$1,796	**$940,652**
25	4/1/2024	$585,399	$0.00	$320,795	$0.00	$0.00	$1,733	**$907,927**
26	5/1/2024	$544,808	$0.00	$298,551	$0.00	$0.00	$1,613	**$844,972**
27	6/1/2024	$500,101	$0.00	$274,052	$0.00	$0.00	$1,481	**$775,634**
28	7/1/2024	$453,296	$0.00	$248,403	$0.00	$0.00	$1,342	**$703,041**
29	8/1/2024	$406,187	$0.00	$222,589	$0.00	$0.00	$1,202	**$629,978**
30	9/1/2024	$360,254	$0.00	$197,417	$0.00	$0.00	$1,066	**$558,737**
31	10/1/2024	$316,612	$0.00	$173,501	$0.00	$0.00	$937	**$491,050**
32	11/1/2024	$276,034	$0.00	$151,264	$0.00	$0.00	$817	**$428,115**
33	12/1/2024	$238,977	$0.00	$130,958	$0.00	$0.00	$707	**$370,642**
34	1/2/2025	$205,647	$0.00	$112,693	$0.00	$0.00	$609	**$318,949**
35	2/1/2025	$176,043	$0.00	$96,471	$0.00	$0.00	$521	**$273,035**
36	3/1/2025	$150,031	$0.00	$82,216	$0.00	$0.00	$444	**$232,691**
37	4/1/2025	$130,205	$0.00	$71,350	$0.00	$0.00	$386	**$201,941**
38	5/1/2025	$110,186	$0.00	$60,381	$0.00	$0.00	$327	**$170,894**
39	6/1/2025	$92,989	$0.00	$50,957	$0.00	$0.00	$276	**$144,222**
40	7/1/2025	$78,297	$0.00	$42,906	$0.00	$0.00	$231	**$121,434**
41	8/1/2025	$65,796	$0.00	$36,056	$0.00	$0.00	$195	**$102,047**
42	9/1/2025	$55,200	$0.00	$30,250	$0.00	$0.00	$163	**$85,613**
Total		$13,707,468		$7,511,612			$40,583	**$21,259,663**

All amounts shown above are in nominal dollars.

In accordance with Article 11.4 of the LGIA, transmission credits are available as follows :

a) Transmission credits for Participating TO's Reliability Network Upgrades = the lesser of the sum of the payments made for Reliability Network Upgrades or $60,000 per MW, as

adjusted pursuant to Section 14.3.2.1 of the GIDAP, of the Large Generating Facility capacity at the time it achieves Commercial Operation.

b) Transmission credits for Local Deliverability Network Upgrades = sum of the payments made for the Local Deliverability Network Upgrades = $0.00

(c) **On-Going Monthly Charges.**

Commencing on or following the Interconnection Facilities Completion Date or Distribution Upgrades Completion Date, if applicable, each month the Participating TO will render bills to the Interconnection Customer for the Interconnection Facilities Charge and/or Distribution Upgrades Charge as set forth below. The Interconnection Facilities Charge and Distribution Upgrades Charge shall initially be based on the estimated Interconnection Facilities Cost and Distribution Upgrades Cost, and payments made for such Interconnection Facilities Charge and Distribution Upgrades Charge shall be subject to later adjustment to reflect actual costs.

In the event that any portion of the Participating TO's Interconnection Facilities or Distribution Upgrades is not complete but, at the request of the Interconnection Customer, the Participating TO commences interconnection service under this LGIA notwithstanding the incomplete facilities, the Participating TO shall commence billing, and the Interconnection Customer shall pay, the Interconnection Facilities Charge and the Distribution Upgrades Charge, as applicable, commencing on the date that such service commences.

(i) Interconnection Facilities Charge.

		Estimated	
Effective	Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities	Interconnection Facilities Cost	Interconnection Facilities Charge
As of the Interconnection Facilities Completion Date	See Section 4.1 of Appendix X to the Transmission Owner Tariff*	$13,707,468	Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities x Interconnection Facilities Cost

* Appendix X to the Transmission Owner Tariff is available at the following link: https://www.sce.com/openaccess

(ii) Distribution Upgrades Charge.

		Estimated	
Effective	Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities	Distribution Upgrades Cost	Distribution Upgrades Charge
As of the Distribution Upgrades Completion Date	See Section 4.1 of Appendix X to the Transmission Owner Tariff*	$0.00	Customer-Financed Monthly Rate for Non-ISO-Controlled Facilities x Distribution Upgrades Cost

* Appendix X to the Transmission Owner Tariff is available at the following link: https://www.sce.com/openaccess

(d) **Financial Security.**

(i) Interconnection Financial Security.

1. The Participating TO's Interconnection Facilities: Pursuant to Article 11.5 and Appendix B of the LGIA, the Interconnection Customer shall provide Interconnection Financial Security in the total amount of $4,183,000 for the second posting and shall increase such amount to $13,748,051 for the third posting to cover the costs for constructing, procuring and installing the Participating TO's Interconnection Facilities.
2. Distribution Upgrades: Pursuant to Appendix B of the LGIA, the Interconnection Customer shall provide Interconnection Financial Security in the total amount of $0.00 to cover the costs for constructing, procuring and installing the Distribution Upgrades.
3. Network Upgrades: Pursuant to Article 11.5 and Appendix B of the LGIA, the Interconnection Customer shall provide Interconnection Financial Security in the total amount of $2,287,00 for the second posting and shall increase such amount to $7,511,612 for the third posting to cover the costs for constructing, procuring and installing the Network Upgrades.
4. To the extent that any Interconnection Financial Security is not utilized by the Participating TO, the release of such Interconnection Financial Security shall be made in accordance with the Interconnection Customer's instructions.

(ii) Security Amount for Estimated Tax Liability.

Pursuant to Article 5.17.4 of the LGIA, the Interconnection Customer's estimated tax liability is as follows:

1. Estimated tax liability for Participating TO's Interconnection Facilities = The sum of the product of (i) the applicable ITCC rate for the year payments are to be received, and (ii) the total of the payments to be received for the Interconnection Facilities Cost for that year.

Year(s) payments to be received	Applicable ITCC rate	Total payments to be received for Interconnection Facilities Cost	ITCC for Participating TO's Interconnection Facilities	Tax Security Due Date
2022	See Section 4.4 of Appendix X to the Transmission Owner Tariff*	$1,185,109	Applicable ITCC rate x Total payments to be received for Interconnection Facilities Cost	April 1, 2022
2023	"	$5,889,394	"	December 1, 2022
2024	"	$5,568,571	"	December 1, 2023

2025	"	$1,064,394	"	December 1, 2024
Total		**$13,707,468**	Sum of the amount calculated for each year above	

* The estimated tax liability is based on the applicable ITCC rate in Appendix X to the Transmission Owner Tariff and is available at the following link: https://www.sce.com/openaccess

2. Estimated tax liability for Distribution Upgrades = $0.00

Based upon the total estimated tax liability, the Interconnection Customer shall provide the Participating TO Tax Security in the total amount as calculated above in this Section 5(d)(ii) of Appendix A of the LGIA in the form of a cash deposit in an escrow account, a letter of credit, a parent guaranty or other form reasonably acceptable to the Participating TO, pursuant to Article 5.17.3 and Appendix B of the LGIA. The amount of Tax Security provided each year will be cumulative following the first year to equal the total estimated tax liability due to the Participating TO. The letter of credit, cash deposit in an escrow account, or parent guaranty shall meet the requirements of Section 11.1 of the GIDAP.

Upon notification of the Annual Tax Security Reassessment, the Interconnection Customer shall modify its Tax Security accordingly. If the Annual Tax Security Reassessment results in a deficiency in the Tax Security amount, the Interconnection Customer will be required to increase its Tax Security amount within thirty (30) Calendar Days after receipt of the deficiency notification. If the Annual Tax Security Reassessment results in a reduction of the Tax Security amount, the Interconnection Customer may choose to reduce its Tax Security amount or maintain the Tax Security in the current amount for the following year.

The Interconnection Customer's obligation to provide Tax Security shall terminate in accordance with Article 5.17.3 of this LGIA. Upon termination of the Interconnection Customer's obligation to provide Tax Security, and Participating TO's receipt of the Interconnection Customer's written instructions regarding the release of any unused Tax Security, any unused amount of the Tax Security shall be released to the Interconnection Customer.

Appendix B

Milestones

1. The Interconnection Customer's Selected Option: Pursuant to Article 5.1 of the LGIA, the Interconnection Customer has selected the Standard Option.

2. Milestone Dates:

Item	Milestone	Responsible Party	Due Date
(a)	Submit proof of insurance coverage in accordance with Article 18.3 of the LGIA	Interconnection Customer	Within thirty (30) Calendar Days after the Effective Date
(b)	Submittal of written authorization to proceed with design of the Participating TO's Interconnection Facilities, Distribution Upgrades and Network Upgrades to the Participating TO and the CAISO, in accordance with Article 5.5.2 of the LGIA	Interconnection Customer	April 1, 2022
(c)	Submittal of second posting of Interconnection Financial Security for the Participating TO's Interconnection Facilities and Network Upgrades to the Participating TO, pursuant to Article 11.5 and Section 5(d)(i) of Appendix A of the LGIA	Interconnection Customer	Within one hundred eighty (180) Calendar Days after publication of the final Phase II Interconnection Study Report May 19, 2021
(d)	Submittal of third posting of Interconnection Financial Security for the Participating TO's Interconnection Facilities and Network Upgrades to the Participating TO, pursuant to Article 11.5 and Section 5(d)(i) of Appendix A of the LGIA	Interconnection Customer	On or before the start of Construction Activities estimated to be May 1, 2023.
(e)	Submittal of security for the Distribution Upgrades to the Participating TO pursuant to	Interconnection Customer	Not Applicable

Item	Milestone	Responsible Party	Due Date
	Section 5(d)(i) of Appendix A of the LGIA		
(f)	Submittal of written authorization to proceed with procurement and construction to the Participating TO and the CAISO, pursuant to Article 5.6.3 of the LGIA	Interconnection Customer	May 1, 2023
(g)	Submittal of Tax Security for the estimated tax liability to the Participating TO, pursuant to Article 5.17.3 and Section 5(d)(ii) of Appendix A of the LGIA	Interconnection Customer	On the dates specified in Section 5.d.ii of Appendix A of the LGIA
(h)	Submittal of initial specifications for the Interconnection Customer's Interconnection Facilities and Large Generating Facility, including System Protection Facilities, to the Participating TO and the CAISO, pursuant to Article 5.10.1 of the LGIA	Interconnection Customer	April 1, 2022
(i)	Review of and comment on the Interconnection Customer's initial specifications, pursuant to Article 5.10.1 of the LGIA	Participating TO and CAISO	Within thirty (30) Calendar Days after the Interconnection Customer's submission of initial specifications
(j)	Submittal of initial information including the Participating TO's Transmission System information necessary to allow the Interconnection Customer to select equipment, in accordance with Article 24.2 of the LGIA	Participating TO	April 1, 2022
(k)	Provide a copy of the Environmental Services Costs Declaration to the Interconnection Customer in accordance with Section 1.b of Appendix A of the LGIA	Participating TO	April 1, 2023
(l)	Submittal of final specifications for the	Interconnection Customer	At least twelve (12) months prior to

Item	Milestone	Responsible Party	Due Date
	Interconnection Customer's Interconnection Facilities and Large Generating Facility, including System Protection Facilities, to the Participating TO and the CAISO, as specified in Article 5.10.1 of the LGIA		completion of the Participating TO's Interconnection Facilities, Distribution Upgrades and Network Upgrades
(m)	Review of and comment on the Interconnection Customer's final specifications, pursuant to Article 5.10.1 of the LGIA	Participating TO and CAISO	Within thirty (30) Calendar Days after the Interconnection Customer's submission of final specifications
(n)	Submittal of updated information by the Interconnection Customer, including manufacturer information, in accordance with Article 24.3 of the LGIA	Interconnection Customer	No later than one hundred eighty (180) Calendar Days prior to Trial Operation
(o)	Notification of Balancing Authority Area to the Participating TO and the CAISO, pursuant to Article 9.2	Interconnection Customer	At least three (3) months prior to the Initial Synchronization Date
(p)	Completion of the Participating TO's Interconnection Facilities, Distribution Upgrades, and Network Upgrades	Participating TO	Within forty-two (42) months following Interconnection Customer's submittal of written authorization to proceed with design and within thirty (30) months following Interconnection Customer's submittal of written authorization to proceed with procurement and construction of the Participating TO's Interconnection Facilities, Distribution Upgrades and Network Upgrades, in accordance with

Item	Milestone	Responsible Party	Due Date
			Article 5.5.2 of the LGIA*
(q)	Performance of a complete calibration test and functional trip test of the System Protection Facilities, pursuant to Article 9.7.4.6 of the LGIA	Interconnection Customer and Participating TO	Prior to the In-Service Date
(r)	In-Service Date	Interconnection Customer	October 1, 2025
(s)	Testing of the Participating TO's Interconnection Facilities, Distribution Upgrades, Network Upgrades, and testing of the Interconnection Customer's Interconnection Facilities and Large Generating Facility, all in accordance with Article 6.1 of the LGIA	Interconnection Customer and Participating TO	At least thirty (30) Calendar Days prior to the Initial Synchronization Date
(t)	Provide the Participating TO written notice of the Interconnection Customer's expected date of initial synchronization of the Electric Generating Unit(s) at the Large Generating Facility to the CAISO Controlled Grid	Interconnection Customer	At least fifteen (15) Calendar Days prior to the Initial Synchronization Date
(u)	Provide the Interconnection Customer written notice that the required Participating TO facilities have been installed and tested, and have been approved to allow initial synchronization of the Electric Generating Unit(s) at the Large Generating Facility to the CAISO Controlled Grid and the commencement of Trial Operation in accordance with Article 6.1 of the LGIA	Participating TO	At least ten (10) Calendar Days prior to the Initial Synchronization Date
(v)	Provide the CAISO written notice of the expected Initial Synchronization Date and of the Participating TO's notice approving the readiness of the	Interconnection Customer	At least ten (10) Calendar Days prior to the Initial Synchronization Date

Item	Milestone	Responsible Party	Due Date
	required Participating TO facilities for initial synchronization of the Electric Generating Unit(s) at the Large Generating Facility to the CAISO Controlled Grid and the commencement of Trial Operation		
(w)	Initial Synchronization Date/Trial Operation	Interconnection Customer	October 15, 2025
(x)	Provide the CAISO and Interconnection Customer written notice that the required Participating TO facilities have been installed and tested, and have been approved to allow the Large Generating Facility to operate in parallel with the CAISO Controlled Grid	Participating TO	Within five (5) Calendar Days after the Initial Synchronization Date and satisfaction of the testing requirements of Articles 6.1 and 9.7.4.6 of the LGIA
(y)	Commercial Operation Date	Interconnection Customer	April 1, 2026
(z)	Provide the completed and signed Environmental Services Costs Declaration to the Participating TO in accordance with Section 1.b of Appendix A of the LGIA	Interconnection Customer	Within thirty (30) Calendar Days after the completion of the Participating TO's Interconnection Facilities, Distribution Upgrades, and Network Upgrades as reflected in milestone (p)
(aa)	Submittal to the Participating TO and the CAISO of "as-built" drawings, information and documents for the Interconnection Customer's Interconnection Facilities and the Electric Generating Units, including the final detailed PSCAD model of the Large Generating Facility, in accordance with Article 5.10.3 of the LGIA	Interconnection Customer	Within one hundred twenty (120) Calendar Days after the Commercial Operation Date, unless otherwise agreed

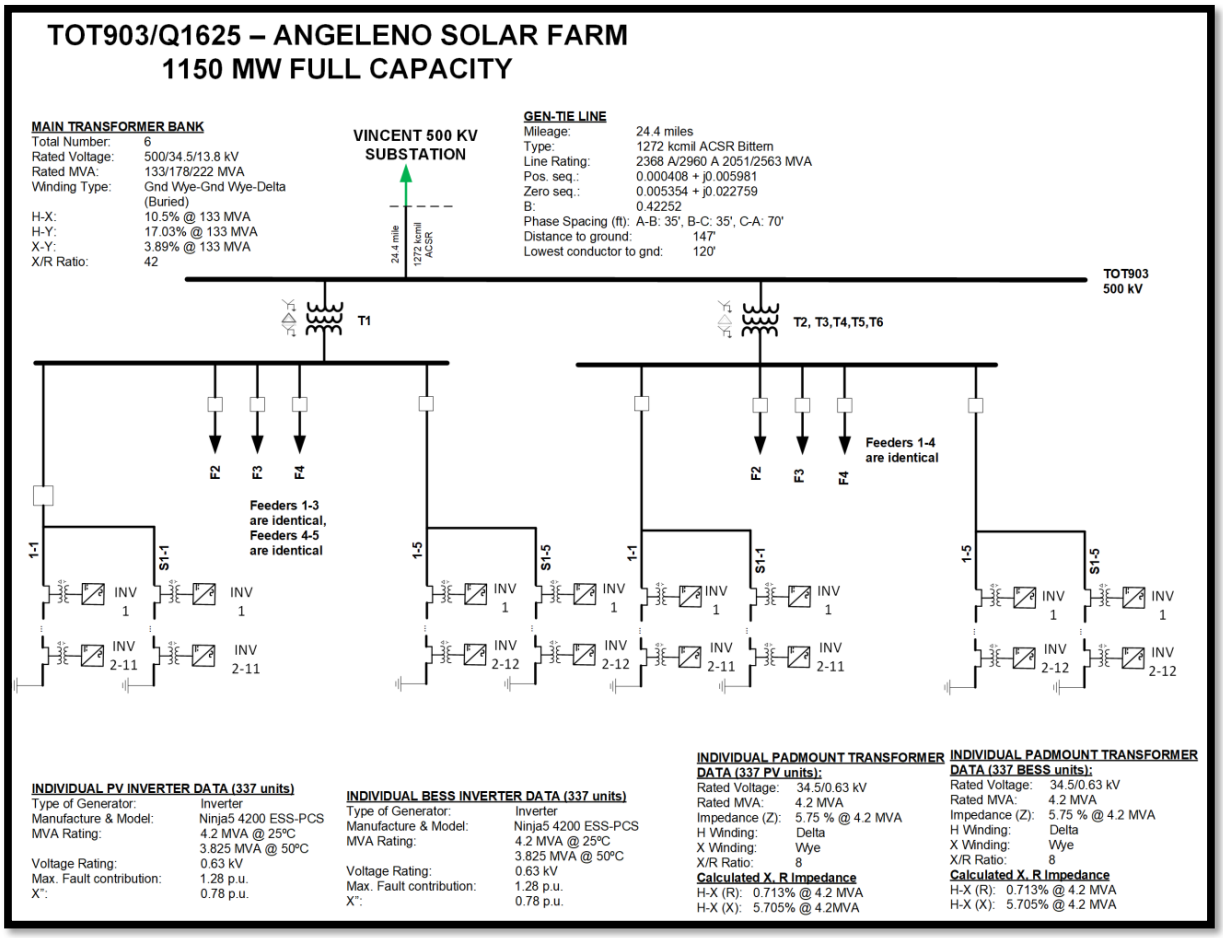
* Note: Pursuant to Article 5.1.1, Participating TO shall use Reasonable Efforts to complete Participating TO's Interconnection Facilities, Distribution Upgrades, and Network Upgrades by the dates set forth above. In the event Participating TO reasonably expects that it will not be able to complete Participating TO's Interconnection Facilities, Distribution Upgrades, and Network Upgrades by the specified dates, Participating TO shall promptly provide written notice to Interconnection Customer and shall undertake Reasonable Efforts to meet the earliest dates thereafter.

Appendix C

Interconnection Details

1. **Large Generating Facility:** All equipment and facilities comprising the Interconnection Customer's hybrid solar photovoltaic and battery energy storage system Angeleno Solar Farm generating facility in Los Angeles County, California, as disclosed by the Interconnection Customer in its Interconnection Request, as may have been amended during the Interconnection Study process, as summarized below:

CAISO Resource ID:	[insert Resource ID(s)]	
Description: (i) Three-hundred thirty-seven (337) Ninja5 4200 BESS inverters with a rated output of 4.2 MW @ ≤25°C for the battery portion of the project, and three-hundred thirty-seven (337) Ninja 5 4200 PV inverters with a rated output of 4.2 MW @ ≤25°C for the PV portion of the project, (ii) the associated infrastructure and step-up transformers, (iii) meters and metering equipment, and (iv) appurtenant equipment, (v) appropriate amount of static and dynamic reactive resources to provide for the 0.95 power factor (PF) requirements as outlined in FERC Order 827; these PF requirements must be satisfied under all ambient temperature conditions at the Generating Facility.		
Generating Facility Output		
Total rated (gross) capacity at inverter terminals:	1,415.4 MW at 25°C	1,415.4 MW at 25°C
Total net capability at high-side of main step-up transformer(s):	2,763.27 MW at 25°C	
Total net capacity provided under the LGIA at high-side of main step-up transformer(s):	1,155.25 MW	
Total net capacity provided under the LGIA at Point of Interconnection:	1,150 MW	
Generating Facility Charging		
Total rated charging capacity at inverter/converter terminals:	1,415.4 MW	
Total charging capability at high-side of main step-up transformer(s):	1,438.58 MW	
Total Charging Capacity provided under the LGIA at high-side of main step-up transformer(s):	1,164.81 MW	
Total Charging Capacity provided under the LGIA at Point of Interconnection:	1,169.87 MW	



The Interconnection Customer has requested, and this LGIA provides for, a total net output capacity of 1,155.25 **MW** as measured at the high-side of the main step-up transformer(s) and 1,150.00 **MW** at the Point of Interconnection. The Parties acknowledge that the Large Generating Facility has a total net capability that exceeds these values. Accordingly, the Interconnection Customer agrees to install, own, operate and maintain a control limiting device or, alternatively, by means of configuring the Large Generating Facility's control system to ensure the Large Generating Facility does not exceed the total net output capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection, subject to the following:

(a) The Interconnection Customer shall provide documentation to the Participating TO and CAISO prior to the Initial Synchronization Date which demonstrates the ability of the control limiting device or configuration of the control system to ensure the Large Generating Facility does not exceed the total net output capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection.

(b) The Interconnection Customer's control limiting device or configuration of the control system for the Large Generating Facility shall be installed prior to the Initial Synchronization Date.
(c) The control limiting device or configuration of the control system must be tested and remain in-service and operable at all times during which the Large Generating Facility is producing electricity.
(d) The Interconnection Customer understands and acknowledges that if at any time the Participating TO or CAISO identifies that the Large Generating Facility has exceeded the total net output capacity provided under the LGIA at the high-side of the main step-up transformer(s) or Point of Interconnection, this shall be considered a Breach of the LGIA and the Participating TO shall issue a notice of such Breach pursuant to Article 17.1 of this LGIA. Such Breach shall not be considered cured until such time as the Interconnection Customer can demonstrate, to the satisfaction of the Participating TO and the CAISO, that the Large Generating Facility will be restricted to within the total net output capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection by the Interconnection Customer's control limiting device or control system.

The Interconnection Customer has requested, and this LGIA provides for a total Charging Capacity of **1,164.81 MW** as measured at the high-side of the main step-up transformer(s) and **1,169.97 MW** at the Point of Interconnection. The Parties acknowledge that the Large Generating Facility has a total charging capability that exceeds these values. Accordingly, the Interconnection Customer agrees to install, own, operate and maintain a control limiting device or, alternatively, by means of configuring the Large Generating Facility's control system to ensure the Large Generating Facility does not exceed the total Charging Capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection, subject to the following:

(a) The Interconnection Customer shall provide documentation to the Participating TO and CAISO prior to the Initial Synchronization Date which demonstrates the ability of the control limiting device or configuration of the control system to ensure the Large Generating Facility does not exceed the total Charging Capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection.
(b) The Interconnection Customer's control limiting device or configuration of the control system for the Large Generating Facility shall be installed prior to the Initial Synchronization Date.
(c) The control limiting device or configuration of the control system must be tested and remain in-service and operable at all times during which the Large Generating Facility is producing electricity.
(d) The Interconnection Customer understands and acknowledges that if at any time the Participating TO or CAISO identifies that the Large Generating Facility has exceeded the total Charging Capacity provided under the LGIA at the high-

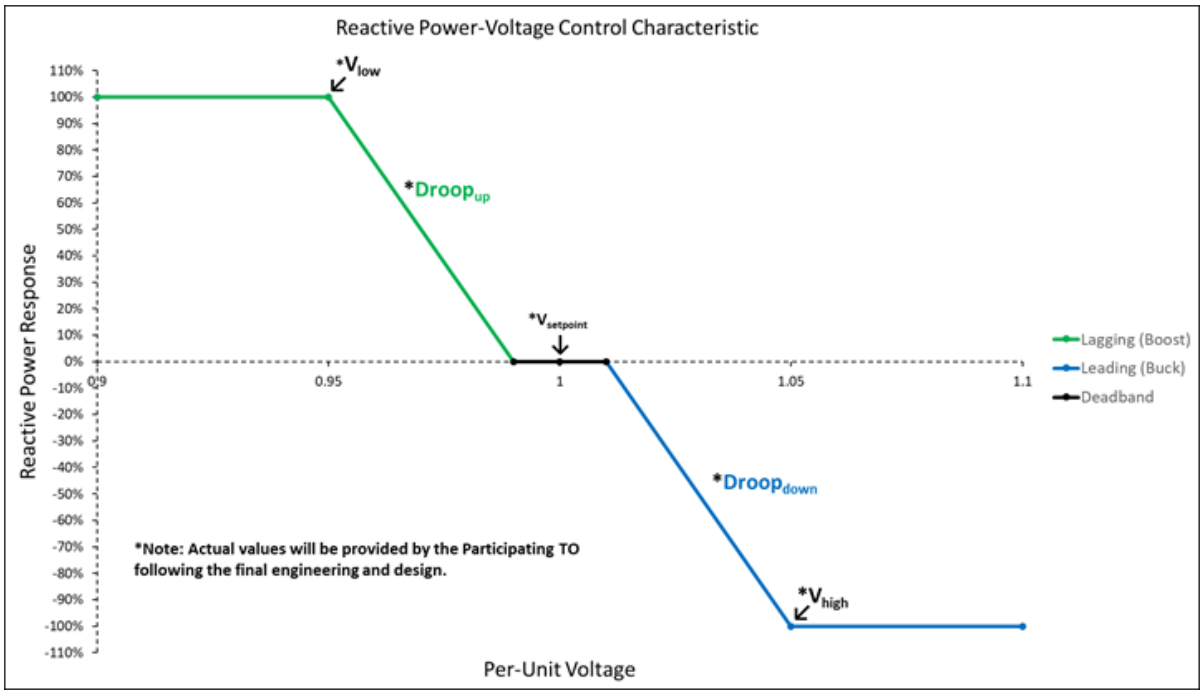
side of the main step-up transformer(s) or Point of Interconnection, this shall be considered a Breach of the LGIA and the Participating TO shall issue a notice of such Breach pursuant to Article 17.1 of this LGIA. Such Breach shall not be considered cured until such time as the Interconnection Customer can demonstrate, to the satisfaction of the Participating TO and the CAISO, that the Large Generating Facility will be restricted to within the total Charging Capacity provided under the LGIA at the high-side of the main step-up transformer(s) and Point of Interconnection by the Interconnection Customer's control limiting device or control system.

The Interconnection Customer acknowledges that if the Interconnection Customer wishes to increase the amount of interconnection capacity provided pursuant to this LGIA, the Interconnection Customer shall be required to submit a new Interconnection Request in accordance with the terms and conditions of the CAISO Tariff.

2. Interconnection Customer Operational Requirements:

(a) The Large Generating Facility shall be operated so as to prevent or protect against the following adverse conditions on the Participating TO's electric system: inadvertent and unwanted re-energizing of a utility dead line or bus; interconnection while out of synchronization; overcurrent; voltage imbalance; ground faults; generated alternating current frequency outside permitted safe limits; power factor or reactive power outside permitted limits; and abnormal waveforms.

(b) The Large Generating Facility will be required to operate within a 0.95 leading (buck) to 0.95 lagging (boost) power factor in accordance with Article 9.6.1 of the LGIA. Under real-time operations, it is anticipated the Large Generating Facility will be required to operate in automatic voltage control mode actively controlling voltage as shown in the figure below. The actual values of the reactive power droop, deadband, scheduled voltage setpoint, V_{low} and V_{high} will be provided by the Participating TO once final engineering and design is completed.



(c) The Interconnection Customer shall cause the Large Generating Facility to participate in any RAS required to prevent thermal overloads and unstable conditions resulting from outages. Such participation shall be in accordance with applicable FERC regulations, and CAISO Tariff provisions and protocols. In accordance with Good Utility Practice, the Participating TO will provide the Interconnection Customer advance notice of any required RAS beyond that which has already been identified in the Phase II Interconnection Study and this LGIA.

(d) Following outages of the Interconnection Facilities or the Large Generating Facility, the Interconnection Customer shall not energize the Large Generating Facility or Interconnection Customer's Interconnection Facilities for any reason without specific permission from the Participating TO's and the CAISO's operations personnel. Such permission shall not be unreasonably withheld.

(e) The Interconnection Customer shall maintain operating communications with the Participating TO's designated switching center. The operating communications shall include, but not be limited to, system parallel operation or separation, scheduled and unscheduled outages, equipment clearances, protective relay operations, and levels of operating voltage and reactive power.

(f) In accordance with Appendix D of the LGIA, the Interconnection Customer shall immediately notify the Participating TO and the CAISO of an occurrence of a physical or cyber breach, or any attempted breach, of the Participating TO's BES Cyber Asset(s) located at the Large Generating Facility or within a Shared

BES Cyber Asset Facility. Such notification to the Participating TO and the CAISO by the Interconnection Customer shall be made to the Participating TO's and the CAISO's respective operations representative as identified in Section (b) of Appendix F of the LGIA.

The Interconnection Request for the Large Generating Facility was evaluated as part of CAISO's Queue Cluster 12 and the Interconnection Customer selected Option A as the deliverability option under GIDAP Section 7.2. In accordance with the TP Deliverability allocation procedures of GIDAP Section 8.9, following the CAISO's allocation of TP Deliverability, the Interconnection Customer has elected for the Large Generating Facility to have Full Capacity Deliverability Status, as such term is defined in the CAISO Tariff. The Interconnection Customer acknowledges and understands that until (i) all required Network Upgrades as stated in this LGIA and (ii) all required network upgrades identified for the Large Generating Facility as stated in the governing interconnection study report (i.e., Phase ll Interconnection Study report as that report may have been amended or modified in subsequent studies or reassessments), including all required transmission upgrades triggered by earlier queued generation that were assumed in-service in the governing interconnection study, are constructed and placed in service, the Large Generating Facility will not achieve Full Capacity Deliverability Status or Partial Capacity Deliverability Status.

(g) In accordance with Section 6.3.2.3 of the GIDAP, the Large Generating Facility will have Off-Peak Deliverability Status, as such term is defined in the CAISO Tariff. The Interconnection Customer acknowledges and understands that until (i) all required Network Upgrades as stated in this LGIA and (ii) all required network upgrades identified for the Large Generating Facility as stated in the governing interconnection study report, including all required transmission upgrades triggered by earlier queued generation that were assumed in-service in the governing interconnection study, are constructed and placed in service, the Large Generating Facility will not achieve Off-Peak Deliverability Status.

(h) The Interconnection Customer whose Large Generating Facility is a Variable Energy Resource shall provide meteorological and forced outage data to the CAISO pursuant to Article 8.4 of the LGIA. Requirements for meteorological data shall be in accordance with Appendix Q of the CAISO Tariff, and for forced outage data in accordance with Sections 9.3.10.3(b) and 9.3.10.3.1(b) of the CAISO Tariff.

(i) Compliance with Applicable Reliability Standards: The Interconnection Customer shall comply with all Applicable Reliability Standards for the Interconnection Customer's Interconnection Facilities and the Large Generating Facility, which for purposes of clarity includes the Interconnection Customer's BES Cyber Asset(s). The Participating TO will not assume any responsibility for complying with mandatory reliability standards for such facilities and offers

no opinion as to whether the Interconnection Customer must register with NERC. If required to register with NERC, the Interconnection Customer shall be responsible for complying with all Applicable Reliability Standards for the Interconnection Customer's Interconnection Facilities and the Large Generating Facility up to the Point of Change of Ownership, as described in Section 4 of Appendix A of this LGIA. Consistent with Article 5.12, the Interconnection Customer shall provide access to the Participating TO to enable the Participating TO to comply with all Applicable Reliability Standards for the Participating TO's BES Cyber Asset(s), including for BES Cyber Asset(s) located at a Shared BES Cyber Asset Facility. The Interconnection Customer acknowledges that the access required under this section may include both physical and electronic access, and may require the installation of physical access controls by the Participating TO.

(j) Primary Frequency Response Operating Range for Electric Storage Resources: In accordance with Article 9.6.4.4 of the LGIA, the storage component(s) of the Large Generating Facility as described in Section 1 of this Appendix C shall comply with the primary frequency response requirements of Articles 9.6.4, 9.6.4.1 and 9.6.4.2 of the LGIA whenever such storage component(s) is operating in parallel (in generation or charging mode) with the CAISO Controlled Grid and is at a state of charge within the range set forth below as provided by the Interconnection Customer:

Minimum state of charge: 0.0 % of the upper charging limit of each storage component

Maximum state of charge: 100 % of the upper charging limit of each storage component

Upper charging limit: 9,200 MWh for each storage component of the Large Generating Facility

The state of charge range specified above for the purpose of complying with the primary frequency response requirements of the LGIA shall be dynamic and is subject to initial evaluation as part of final engineering after the execution of the LGIA and periodic reevaluation once every three years (unless requested otherwise by the CAISO), and modification by the CAISO in consultation with the Interconnection Customer and Participating TO. Factors to be considered, but not limited to, in such reevaluation and potential modification may include the following: 1) the expected magnitude of frequency deviations in the interconnection, 2) the expected duration that system frequency will remain outside of the deadband parameter in the interconnection, 3) the expected incidence of frequency deviations outside of the deadband parameter in the interconnection, 4) the physical capabilities of the electric storage resource, 5) operational limitations of the electric storage resource due to manufacturer specifications, and 6) any other relevant factors agreed to by CAISO and Interconnection Customer, and in consultation with the Participating TO. Any

change in the state of charge range specified above, or as previously determined pursuant to this Section 2(k) of Appendix C of the LGIA, as the result of such reevaluation shall be provided in writing by the CAISO to the Interconnection Customer and Participating TO in accordance with Article 15 of the LGIA.

3. Affected Systems Coordination:

The CAISO cannot study comprehensively the impacts of the Large Generating Facility on the transmission systems of Affected System operators. The CAISO does not have detailed information about Affected Systems on a transmission-element level, nor does the CAISO know the details of the various reliability and operating criteria applicable to the Affected Systems. In addition, because the operation of transmission systems and NERC reliability standards change over time, the CAISO cannot presume to know all of the impacts of these changes on Affected Systems. As such, the CAISO contacted all potential Affected Systems to inquire whether they are impacted by the Large Generating Facility's interconnection to the CAISO Controlled Grid. The CAISO provided notice to the Interconnection Customer of the Identified Affected Systems for the Large Generating Facility. To ensure a safe and reliable interconnection to the CAISO Controlled Grid, six (6) months before the Initial Synchronization Date of the Large Generating Facility, the Interconnection Customer shall provide documentation to the CAISO, in accordance with Article 11.4.2 of the LGIA and Section 3.7 of the GIDAP, confirming that the Identified Affected Systems have been contacted by the Interconnection Customer, and (i) that any system reliability impacts have been addressed (or that there are no system impacts), or (ii) that the Interconnection Customer has taken all reasonable steps to address potential reliability system impacts with the Identified Affected Systems but has been unsuccessful.

Appendix D

Security Arrangements Details

Infrastructure security of CAISO Controlled Grid equipment and operations and control hardware and software is essential to ensure day-to-day CAISO Controlled Grid reliability and operational security. FERC will expect the CAISO, all Participating TOs, market participants, and Interconnection Customers interconnected to the CAISO Controlled Grid to comply with Applicable Reliability Criteria. All public utilities will be expected to meet basic standards for system infrastructure and operational security, including physical, operational, and cyber-security practices.

The Interconnection Customer shall meet the requirements for security implemented pursuant to the CAISO Tariff, including the CAISO's standards for information security posted on the CAISO's internet web site at the following internet address: http://www.caiso.com/pubinfo/info-security/index.html.

Appendix E

Commercial Operation Date

[This Appendix E sets forth a form of letter to be provided by the Interconnection Customer to the CAISO and Participating TO to provide formal notice of the Commercial Operation of an Electric Generating Unit.]

[Date]

Mike Turner
Manager, Model and Contract Implementation
California Independent System Operator Corporation
250 Outcropping Way
Folsom CA 95630

Manager, Grid Contract Management
Southern California Edison Company
P. O. Box 800
2244 Walnut Grove Avenue
Rosemead, California 91770

Re: _____ Electric Generating Unit

Dear Mr. Turner, Manager, Grid Contract Manager:

On **[Date]** **16DO 8me LLC** has completed Trial Operation of Unit No. ___. This letter confirms that 16DO 8me LLC commenced Commercial Operation of Unit No. ___ at the Electric Generating Unit, effective as of **[Date plus one day]** and that 16DO 8me LLC provided the CAISO's operations personnel advance notice of its intended Commercial Operation Date no less than five Business Days prior to that date.

Thank you.

[Signature]

[Interconnection Customer Representative]
CC: CAISO Queue Management

Appendi F

Addresses for Delivery of Notices and Billings

Notices

(a) **General Notices**

CAISO	Participating TO	Interconnection Customer
California Independent System Operator Corporation Attn: Regulatory Contracts	Southern California Edison Company Attn: Manager, Grid Contract Management	16DO 8me LLC Attn: Transmission & Interconnection
250 Outcropping Way Folsom, CA 95630	P. O. Box 800 Rosemead, CA 91770	4370 Town Center Blvd., Suite 110 El Dorado Hills, CA 95762
E-mail: regulatorycontracts@caiso.com	E-mail: GridContractManagement@sce.com	ti@avantus.com

(b) **Operating Communications and Notifications**

The CAISO, Participating TO and the Interconnection Customer shall provide for operating communications through their respective designated representatives as follows:

The Parties agree to exchange the following information prior to the Initial Synchronization Date:

CAISO	Participating TO	Interconnection Customer
CAISO Real Time Desk	Grid Control Center	Operator Name and/or Title:
24 Hour Telephone:	24 Hour Telephone:	Control Room Operator 24 Hour Telephone:
Alternate Phone:		Operation Center Fax. No.:
		E-mail:

Operational Matters, Force Majeure, Outage Notices, Requests for Physical Access to the Large Generating Facility and/or Shared BES Cyber Asset Facility, and Reports of Cyber or Physical Breaches or Attempted Breaches:

The Parties agree to exchange the following information prior to the Initial Synchronization Date:

CAISO	Participating TO	Interconnection Customer
Name:	Name/Title:	Name/Title:
Phone:	Phone:	Phone:

For Emergencies:

The Parties agree to exchange the following information prior to the Initial Synchronization Date:

CAISO	Participating TO	Interconnection Customer
Name:	Name/Title:	Name/Title:
Phone:	Phone:	Phone:

Billings and Payments

CAISO	Participating TO	Interconnection Customer
California Independent System Operator Corporation Attn: Finance Dept. Mr. Dennis Estrada	Southern California Edison Company Attn: Accounts Receivable (GCM)	16DO 8me LLC Attn: Accounts Payable
250 Outcropping Way Folsom, CA 95630	P. O. Box 800 Rosemead, CA 91771-0001	4370 Town Center Blvd., Suite 110 El Dorado Hills, CA 95762 Email: ap@avantus.com

Alternative Forms of Delivery of Notices telephone, facsimile or e-mail

CAISO	Participating TO	Interconnection Customer
California Independent System Operator Corporation Attn: Queue Management	Southern California Edison Company Attn: Manager, Grid Contract Management.	16DO 8me LLC Attn: Ali Chowdhury, Vice President – Transmission & Interconnection

Phone: (916) 351-4400	Phone: (626) 302-9640	Phone (916) 990-8027
E-mail: queuemanagement@caiso.com	E-mail: GridContractManagement@sce.com	achowdhury@avantus.com

Appendix G

Interconnection Customer's Share of Costs of Network Upgrades for Applicable Project Group

Type	Upgrades	Needed For	Cost factor	Cost Share ($1000)
Reliability	Substation and Envoronmental Services	Interconnection Plan of Service	100.00%	$7,511,612
			Total:	$7,511,612

Note: The amounts shown above are in nominal dollars.

Appendix H

Interconnection Requirements For An Asynchronous Generating Facility

Appendix H sets forth interconnection requirements specific to all Asynchronous Generating Facilities. Except as provided in Section 25.4.2 of the CAISO tariff, existing individual generating units of an Asynchronous Generating Facility that are, or have been, interconnected to the CAISO Controlled Grid at the same location are exempt from the requirements of this Appendix H for the remaining life of the existing generating unit.

A. Technical Requirements Applicable to Asynchronous Generating Facilities

i. Voltage Ride-Through Capability

An Asynchronous Generating Facility shall be able to remain online during voltage disturbances up to the time periods and associated voltage levels set forth in the requirements below.

1. An Asynchronous Generating Facility shall remain online for the voltage disturbance caused by any fault on the transmission grid, or within the Asynchronous Generating Facility between the Point of Interconnection and the high voltage terminals of the Asynchronous Generating Facility's step up transformer, having a duration equal to the lesser of the normal three-phase fault clearing time (4-9 cycles) or one-hundred fifty (150) milliseconds, plus any subsequent post-fault voltage recovery to the final steady-state post-fault voltage unless clearing the fault effectively disconnects the generator from the system. Clearing time shall be based on the maximum normal clearing time associated with any three-phase fault location that reduces the voltage at the Asynchronous Generating Facility's Point of Interconnection to 0.2 per-unit of nominal voltage or less, independent of any fault current contribution from the Asynchronous Generating Facility.

2. An Asynchronous Generating Facility shall remain online for any voltage disturbance caused by a single-phase fault on the transmission grid, or within the Asynchronous Generating Facility between the Point of Interconnection and the high voltage terminals of the Asynchronous Generating Facility's step up transformer, with delayed clearing, plus any subsequent post-fault voltage recovery to the final steady-state post-fault voltage unless clearing the fault effectively disconnects the generator from the system. Clearing time shall be based on the maximum backup clearing time associated with a single point of failure (protection or breaker failure) for any single-phase fault location that reduces any phase-to-ground or phase-to-phase voltage at the Asynchronous Generating Facility's Point of Interconnection to 0.2 per-unit of nominal voltage or less, independent of any fault current contribution from the Asynchronous Generating Facility.

3. Remaining on-line shall be defined as continuous connection between the Point of Interconnection and the Asynchronous Generating Facility's units, without any mechanical isolation. Momentary cessation (namely, ceasing to inject current during a fault without mechanical isolation) is prohibited unless transient high voltage conditions rise to 1.20 per unit or more. For transient low voltage conditions, the Asynchronous Generating Facility's inverters will inject reactive current. The level of this reactive current must be directionally proportional to the decrease in per unit voltage at the inverter AC terminals. The inverter must produce full reactive current capability when the AC voltage at the inverter terminals drops to a level of 0.50 per unit or below. The Asynchronous Generating Facility must continue to operate and absorb reactive current for transient voltage conditions between 1.10 and 1.20 per unit.

   Upon the cessation of transient voltage conditions and the return of the grid to normal operating voltage ($0.90 < V < 1.10$ per unit), the Asynchronous Generating Facility's inverters automatically must transition to normal active (real power) current injection. The Asynchronous Generating Facility's inverters must ramp up to inject active (real power) current with a minimum ramping rate of at least 100% per second (from no output to full available output). The total time to complete the transition from reactive current injection or absorption to normal active (real power) current injection must be one second or less. The total time to return from momentary cessation, if used, during transient high voltage conditions over 1.20 per unit or more must be one second or less.

4. The Asynchronous Generating Facility's inverter will be considered to have tripped where its AC circuit breaker is open or otherwise has electrically isolated the inverter from the grid. Following an inverter trip, the inverter must make at least one attempt to resynchronize and connect back to the grid unless the trip resulted from a fatal fault code, as defined by the inverter manufacturer. This attempt must take place within 2.5 minutes from the inverter trip. An attempt to resynchronize and connect back to the grid is not required if the trip was initiated due to a fatal fault code, as determined by the original equipment manufacturer.

5. The Asynchronous Generating Facility is not required to remain on line during multi-phased faults exceeding the duration described in Section A.i.1 of this Appendix H or single-phase faults exceeding the duration described in Section A.i.2 of this Appendix H.

6. The requirements of this Section A.i. of this Appendix H do not apply to faults that occur between the Asynchronous Generating Facility's terminals and the high side of the step-up transformer to the high-voltage transmission system.

7. Asynchronous Generating Facilities may be tripped after the fault period if this action is intended as part of a special protection system.

8. Asynchronous Generating Facilities may meet the requirements of this Section A.i of this Appendix H through the performance of the generating units or by installing additional equipment within the Asynchronous Generating Facility, or by a combination of generating unit performance and additional equipment.

9. The provisions of this Section A.i of this Appendix H apply only if the voltage at the Point of Interconnection has remained within the range of 0.9 and 1.10 per-unit of nominal voltage for the preceding two seconds, excluding any sub-cycle transient deviations.

10. Asynchronous Generating Facility inverters may not trip or cease to inject current for momentary loss of synchronism. As a minimum, the Asynchronous Generating Facility's inverter controls may lock the phase lock loop to the last synchronized point and continue to inject current into the grid at that last calculated phase prior to the loss of synchronism until the phase lock loop can regain synchronism. The current injection may be limited to protect the inverter. Any inverter may trip if the phase lock loop is unable to regain synchronism 150 milliseconds after loss of synchronism.

11. Inverter restoration following transient voltage conditions must not be impeded by plant level controllers. If the Asynchronous Generating Facility uses a plant level controller, it must be programmed to allow the inverters to automatically re-synchronize rapidly and ramp up to active current injection (without delayed ramping) following transient voltage recovery, before resuming overall control of the individual plant inverters.

ii. Frequency Disturbance Ride-Through Capability

An Asynchronous Generating Facility shall comply with the off nominal frequency requirements set forth in the NERC Reliability Standard for Generator Frequency and Voltage Protective Relay Settings, or successor requirements as they may be amended from time to time.

iii. Power Factor Design Criteria (Reactive Power)

An Asynchronous Generating Facility not studied under the Independent Study Process, as set forth in Section 4 of Appendix DD, shall operate within a power factor within the range of 0.95 leading to 0.95 lagging, measured at the high voltage side of the substation transformer, as defined in this LGIA in order to maintain a specified voltage schedule, if the Phase II Interconnection Study shows that such a requirement is necessary to ensure safety or reliability. An Asynchronous Generating Facility studied under the Independent Study Process, as set forth in Section 4 of Appendix DD, shall

operate within a power factor within the range of 0.95 leading to 0.95 lagging, measured at the high voltage side of the substation transformer, as defined in this LGIA in order to maintain a specified voltage schedule. The power factor range standards set forth in this section can be met by using, for example, power electronics designed to supply this level of reactive capability (taking into account any limitations due to voltage level, real power output, etc.) or fixed and switched capacitors, or a combination of the two, if agreed to by the Participating TO and CAISO. The Interconnection Customer shall not disable power factor equipment while the Asynchronous Generating Facility is in operation. Asynchronous Generating Facilities shall also be able to provide sufficient dynamic voltage support in lieu of the power system stabilizer and automatic voltage regulation at the generator excitation system if the Phase II Interconnection Study shows this to be required for system safety or reliability.

iv. Supervisory Control and Data Acquisition (SCADA) Capability

An Asynchronous Generating Facility shall provide SCADA capability to transmit data and receive instructions from the Participating TO and CAISO to protect system reliability. The Participating TO and CAISO and the Asynchronous Generating Facility Interconnection Customer shall determine what SCADA information is essential for the proposed Asynchronous Generating Facility, taking into account the size of the plant and its characteristics, location, and importance in maintaining generation resource adequacy and transmission system reliability.

v. Power System Stabilizers (PSS)

Power system stabilizers are not required for Asynchronous Generating Facilities.

vi. Transient Data Recording Equipment for Facilities above 20 MW

Asynchronous Generating Facilities with generating capacities of more than 20 MW must monitor and record data for all frequency ride-through events, transient low voltage disturbances that initiated reactive current injection, reactive current injection or momentary cessation for transient high voltage disturbances, and inverter trips. The data may be recorded and stored in a central plant control system. The following data must be recorded:

Plant Level:

(1) Plant three phase voltage and current
(2) Status of ancillary reactive devices
(3) Status of all plant circuit breakers
(4) Status of plant controller
(5) Plant control set points
(6) Position of main plant transformer no-load taps
(7) Position of main plant transformer tap changer (if extant)
(8) Protective relay trips or relay target data

Inverter Level:

(1) Frequency, current, and voltage during frequency ride-through events
(2) Voltage and current during momentary cessation for transient high voltage events (when used)
(3) Voltage and current during reactive current injection for transient low or high voltage events
(4) Inverter alarm and fault codes
(5) DC current
(6) DC voltage

The data must be time synchronized, using a GPS clock or similar device, to a one millisecond level of resolution. All data except phase angle measuring unit data must be sampled at least every 10 milliseconds. Data recording must be triggered upon detecting a frequency ride-through event, a transient low voltage disturbance that initiated reactive current injection, momentary cessation or reactive current injection for a transient high voltage disturbance, or an inverter trip. Each recording will include as a minimum 150 milliseconds of data prior to the triggering event, and 1000 milliseconds of data after the event trigger. The Asynchronous Generating Facility must store this data for a minimum of 30 days. The Asynchronous Generating Facility will provide all data within 10 calendar days of a request from the CAISO or the Participating TO.

The Asynchronous Generating Facility must install and maintain a phase angle measuring unit or functional equivalent at the entrance to the facility or at the Generating Facility's main substation transformer. The phase angle measuring unit must have a resolution of at least 30 samples per second. The Asynchronous Generating Facility will store this data for a minimum of 30 days. The Asynchronous Generating Facility will provide all phase angle measuring unit data within 10 calendar days of a request from the CAISO or the Participating TO.

ATTACHMENT 13

DOCUMENTS DEMONSTRATING HECATE INTEREST IN PROPERTY ACQUIRED FOR THE MAATHAI BESS PROJECT.

This page is part of your document - DO NOT DISCARD

20230705676

Pages:
0006

Recorded/Filed in Official Records
Recorder's Office, Los Angeles County,
California

10/17/23 AT 08:00AM

FEES:	34.00
TAXES:	660.00
OTHER:	0.00
PAID:	694.00

LEADSHEET

202310170140002

00023871059

014338334

SEQ:
01

SECURE - 8:00AM

THIS FORM IS NOT TO BE DUPLICATED

E535543

E13-202310166

RECORDING REQUESTED BY AND WHEN RECORDED MAIL TO:

33440 Angeles Forest Highway LLC
621 W. Randolph St., Suite 200
Chicago, Illinois 60661
Attn: Manager

MAIL TAX STATEMENTS TO:

33440 Angeles Forest Highway LLC
621 W. Randolph St., Suite 200
Chicago, Illinois 60661
Attn: Manager

(Above space for Recorder's use only)

APN: 3056-012-008

THE UNDERSIGNED GRANTOR(s) DECLARE(s):
DOCUMENTARY TRANSFER TAX is $660.00. CITY TAX $0.00.
☒ Computed on full value of property conveyed, or
☐ Computed on full value less value of liens or encumbrances remaining at time of sale,
☒ Unincorporated area ☐ City of Palmdale.

GRANT DEED

THIS GRANT DEED (this "**Deed**") is executed as of the 11th day of October, 2023, from Tina Marie Brzeczek, a widow ("**Grantor**"), to 33440 Angeles Forest Highway LLC, a Delaware limited liability company ("**Grantee**").

WITNESSETH:

NOW, THEREFORE, for valuable consideration, the receipt and sufficiency of which are hereby acknowledged by Grantor, Grantor does hereby grant unto Grantee the real property more particularly described on **Exhibit A** attached hereto and made a part hereof (the "**Property**"), subject to the matters set forth on **Exhibit B** attached hereto.

This Grant Deed and the conveyance hereinabove set forth is executed by Grantor and accepted by Grantee subject to the encumbrances described in Exhibit B, to the which the parties acknowledge are in existence at the time of this conveyance (collectively, the "**Permitted Encumbrances**").

[signature page to follow]

IN WITNESS WHEREOF, Grantor does hereby execute this Deed as of the date and year first above written.

GRANTOR:

Tina Marie Brzecek,
a widow

By: Tina Marie Brzecek
Name: Tina Marie Brzecek

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF California)
)
COUNTY OF Los Angeles)

On October 11, 2023, before me, Nazih M. Abuershaid. Notary Public, a Notary Public, personally appeared Tina Marie Brzecek who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument, and acknowledged to me that she executed the same in her authorized capacity, and that by her signature on the instrument the person, or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature N. Abuershaid (Seal)

NAZIH M. ABUERSHAID
Notary Public - California
Los Angeles County
Commission # 2333287
My Comm. Expires Oct 8, 2024

EXHIBIT A

LEGAL DESCRIPTION

That certain real property in Los Angeles County: APN 3056-012-008 with address 33440 Angeles Forest Hwy, Palmdale, CA 93550, described as follows:

The Northwest quarter of the Southwest quarter of Section 26, Township 5 North, Range 12 West, San Bernardino Meridian, in the County of Los Angeles, State of California, according to the Official Records Plat of said land filed in District Land Office April 22, 1880, as per Map recorded in the office of the County Recorder of said County.

Containing 39.68 acres.

EXHIBIT B

PERMITTED ENCUMBRANCES

1. Property taxes, any assessments collected with taxes, levied for the fiscal year 2023-2024, which are not yet due and payable.

2. The lien of supplemental taxes, if any, assessed pursuant to the provisions of Chapter 3.5 (commencing with Section 75) of the revenue and taxation code of the State of California.

3. Taxes and/or assessments affecting the Land, if any, for community facility districts, including Mello Roos, which may exist by virtue of assessment maps or filed notices.

4. Water rights, claims or title to water in, on or under the Land, whether or not shown by the public records.

5. Ownership of, or rights to, minerals or other substances, subsurface and surface, of whatsoever kind, including, but not limited to coal, ores, metals, lignite, oil, gas, geothermal resources, brine, uranium, clay, rock, sand and gravel in, on, under and that may be produced from the Land, together with all rights, privileges, and immunities relating thereto, whether the ownership or rights arise by lease, grant, exception, conveyance, reservation or otherwise, and whether or not appearing in the Public Records or listed in Schedule B.

6. Easement and rights incidental thereto for public utilities to the Pacific Telephone and Telegraph company, as set forth in a document recorded April 22, 1970 as Instrument No. 1751 of Official Records.

7. Any claim to (a) ownership of or rights to minerals and similar substances, including but not limited to ores, metals, coal, lignite, oil, gas, uranium, clay, rock, sand, and gravel located in, on, or under the Land or produced from the Land, whether such ownership or rights arise by lease, grant, exception, conveyance, reservation, or otherwise; and (b) any rights, privileges, immunities, rights of way, and easements associated therewith or appurtenant thereto, whether or not the interests or rights excepted in (a) or (b) appear in the Public Records or are shown in Schedule B.

8. Facts, rights, interests or claims disclosed on the ALTA/NSPS survey prepared by Minh A. Le of Stantec, dated October 12, 2023 as Job No. 1858-05391 as follows:

   a. Dirt roads and dirt trails located on the subject property.
   b. Tanks located on the subject property.
   c. Containers located on the property.
   d. Access across the northerly property line.
   e Access across the westerly property line.
   f. Access across the easterly property line.
   g. E. Soledas Pass Road located on the subject property.

h. Hillside Drive located on the subject property.
i. Power poles located on the westerly property line.
j. Overhead electric lines located on subject property.
k. Power poles located in the subject property.
l. CMRI, GW
m. Fence encroaches over the easterly property line.
n. Wall located on southerly property line.
o. Barbwire fence encroaches over the southerly property line.

Office of the Secretary of State
ilsos.gov

Business Entity Search

Entity Information

Entity Name	HECATE GRID LLC		
Principal Address	621 W. RANDOLPH ST. CHICAGO,IL 606610000		
File Number	12819919	**Status**	ACTIVE on 01-22-2024
Entity Type	LLC	**Type of LLC**	Foreign
Org. Date/Admission Date	03-09-2023	**Jurisdiction**	DE
Duration	PERPETUAL		
Annual Report Filing Date	01-22-2024	**Annual Report Year**	2024
Agent Information	ILLINOIS CORPORATION SERVICE COMPANY 801 ADLAI STEVENSON DRIVE SPRINGFIELD, IL 62703-4261	**Agent Change Date**	03-09-2023

Services and More Information

Choose a tab below to view services available to this business and more information about this business.

Purchase Master Entity Certificate of Good Standing

Adopting Assumed Name

Change of Registered Agent and/or Registered Office

Department of State: Division of Corporations

Allowable Characters

HOME

Entity Details

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	**7507919**	Incorporation Date / Formation Date:	**6/12/2023** (mm/dd/yyyy)
Entity Name:	**33440 ANGELES FOREST HIGHWAY LLC**		
Entity Kind:	**Limited Liability Company**	Entity Type:	**General**
Residency:	**Domestic**	State:	**DELAWARE**

REGISTERED AGENT INFORMATION

Name:	**CORPORATION SERVICE COMPANY**		
Address:	**251 LITTLE FALLS DRIVE**		
City:	**WILMINGTON**	County:	**New Castle**
State:	**DE**	Postal Code:	**19808**
Phone:	**302-636-5401**		

Additional Information is available for a fee. You can retrieve Status for a fee of $10.00 or more detailed information including current franchise tax assessment, current filing history and more for a fee of $20.00.

Would you like ○ Status ○ Status,Tax & History Information

Submit

View Search Results New Entity Search

For help on a particular field click on the Field Tag to take you to the help area.

Department of State: Division of Corporations

Allowable Characters

HOME

Entity Details

THIS IS NOT A STATEMENT OF GOOD STANDING

File Number:	**5790375**	Incorporation Date / Formation Date:	**4/5/2021** (mm/dd/yyyy)
Entity Name:	**HECATE GRID MAATHAI STORAGE 1 LLC**		
Entity Kind:	**Limited Liability Company**	Entity Type:	**General**
Residency:	**Domestic**	State:	**DELAWARE**

REGISTERED AGENT INFORMATION

Name:	**CORPORATION SERVICE COMPANY**		
Address:	**251 LITTLE FALLS DRIVE**		
City:	**WILMINGTON**	County:	**New Castle**
State:	**DE**	Postal Code:	**19808**
Phone:	**302-636-5401**		

Additional Information is available for a fee. You can retrieve Status for a fee of $10.00 or more detailed information including current franchise tax assessment, current filing history and more for a fee of $20.00.

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ATTACHMENT 14

SCE RECOMMENDATION TO CPUC FOR MINIMAL OVERSIGHT AND REVIEW OF UTILITY BESS DEVELOPMENTS.

BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

FILED
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R2305018

Order Instituting Rulemaking to Update and Amend Commission General Order 131-D.	R.23-05-018

SOUTHERN CALIFORNIA EDISON COMPANY'S (U 338-E) COMMENTS ON PHASE 2 STAFF PROPOSAL PURSUANT TO THE MAY 17, 2024 ADMINISTRATIVE LAW JUDGE'S RULING INVITING COMMENTS

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Dated: **July 1, 2024**

While any streamlining effort is appreciated, SCE is concerned that this particular pilot program is predisposed to tell an unrepresentative story about any streamlining effort. In general, SCE believes that most of the types of projects that would qualify for the pilot program likely would also qualify for existing permitting exemptions or otherwise have so few complexities that licensing would be accomplished relatively quickly. Therefore, SCE expects that while the program might demonstrate that *those types* of projects could be processed according to CEQA Guidelines timelines, it will provide little value in reducing siting and permitting timeframes for projects that are more likely to require deeper consideration. In fact, of all of SCE's projects currently in licensing review with the CPUC, SCE has identified only one project that might fit into the proposed parameters for the pilot program (and even that project may not be eligible as some federal agency approvals are likely to be required).[55] Rather than expending limited staff resources on projects that might already experience comparatively short administrative process timelines today, SCE recommends any Energy Division pilot program consider opportunities to expedite a broad range of projects that are more complex and accurately reflect a range of permitting challenges.

J. The Staff Proposal Should Firmly State That The CPUC Has Preempted The Field Of BESS Project Permitting, And No Permitting Should Be Required For Small BESS Projects Or Projects At Existing Substations.

Recognizing that this proceeding affords a unique opportunity to streamline permitting for all types of projects and not just less impactful ones or even just new transmission lines, SCE appreciates Staff's proposed provisions governing the permitting of BESS facilities, which to date have not been addressed in a formal CPUC General Order. BESS facilities are an increasingly important component of the development of the electrical grid that support preservation of renewable energy after its production, and to facilitate that broad Statewide

[55] Namely, SCE's Kern River Transmission Line Rating Remediation (TLRR) Project (A.22-02-014).

concern, the CPUC should firmly establish its role in BESS facility permitting and should encourage development of BESS facilities at locations where other infrastructure already exists. The Staff Proposal supports these objectives in some respects, but further revisions are still warranted.

Proposals 1 and 2 in Section 3.5.2. of the Staff Proposal (and accompanying revisions to Sections I and III of GO 131-D) generally provide that PTC approval is required for: 1) BESS projects at or within existing substations; and 2) transmission lines connecting BESS projects to the broader grid. SCE appreciates the CPUC's acknowledgement that BESS facilities should be regulated by the Commission, and generally does not disagree with Proposals 1 and 2 (subject to specific exceptions discussed further below). However, taken together, the language of the Staff Proposal, the textual amendments proposed in Staff's GO 131-D redline, and the discussion at the June 3, 2024 workshop leave uncertainty regarding how new BESS facilities at non-substation locations would be permitted, whether all BESS projects (no matter how small) must undergo a permitting process and whether local agencies would have any discretionary decision-making jurisdiction over BESS projects.

First, although the Staff Proposal states that Section 3.5.2. was included to "clarify" permitting of BESS facilities, it remains *unclear* exactly what type of permitting is required. The Staff Proposal implies that the CPUC intends to preempt the field of discretionary permitting for BESS projects, stating that BESS technology:

> "clearly falls under the definition of 'electric facilities.' Section XIV of GO 131-D clarifies that local authorities are preempted from regulating electric facilities constructed by public utilities subject to the CPUC's jurisdiction."[56]

That statement *implies* that BESS projects would be treated as electrical facilities – much like transmission lines, power lines and substations – and, as such, utilities would not be required to obtain discretionary permits from local agencies for BESS projects.[57] However, at the June 3,

[56] Staff Proposal, at 59.

[57] *See* existing GO 131-D § XIV.B.

2024 workshop, in response to questions from interested stakeholders regarding the role of local agencies in BESS permitting, Staff responded by saying that BESS projects would continue to be permitted the way they have been to date. To date some local agencies have asserted that battery storage remains within their discretionary permitting authority because the CPUC has not directly spoken on the subject. Therefore, to alleviate any confusion regarding the role of local agencies with respect to BESS projects that do not fall within Proposals 1 and 2 (*i.e.,* a new BESS facility to be constructed neither at nor adjacent to an existing substation), the CPUC should make clear that it intends to preempt local agencies from discretionary permitting in those instances as well. It could do so by adding: 1) a statement clearly defining BESS projects as within the types of facilities over which local permitting is preempted; 2) indicating that a PTC would be required for BESS facilities (in the absence of any PTC exemption pursuant to Section III.B.1.); and 3) identifying situations where no PTC would be required.[58]

SCE recommends that no PTC should be required for certain small BESS facilities or for facilities located entirely within existing substations. As stated in SCE's previous comments, SCE supports Staff's original suggestion that facilities designed to produce 50 MW or less could be exempt from any discretionary permitting, including any PTC requirement.[59] In addition, in many ways, battery storage facilities resemble substations in terms of size, shape and ground disturbance footprint. Therefore, SCE believes that BESS projects located *entirely within* existing substation footprints should be treated like substation modification projects, where no PTC or any other discretionary approval is required.[60]

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[58] *See* Attachment A and Attachment B, at §§ III.B.1.d, III.C.1.d, XII.A. for proposed edits on this issue.

[59] SCE Phase 1 Reply, at 16-18; SCE Phase 2 Opening Comments at 16.

[60] *See* Attachment A and Attachment B, at § III.C.1.d for proposed edits on this issue. In addition, even where a BESS project would typically require a PTC pursuant to these recommendations, the project would still be eligible for an exemption from the PTC requirement if it qualified for any of the exemptions in Section III.B.1.

ATTACHMENT 15

THE LOS ANGELES COUNTY GENERAL PLAN

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Cover: *Topographical Map*, Joseph Young, 1962, Hall of Records, Los Angeles, CA.

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Part I: Introduction

Executive Summary

The unincorporated areas of Los Angeles County are comprised of approximately 2,650 square miles, and over one million people. The Los Angeles County General Plan provides the policy framework and establishes the long range vision for how and where the unincorporated areas will grow, and establishes goals, policies, and programs to foster healthy, livable, and sustainable communities. This document represents a comprehensive effort to update the County's 1980 General Plan.

I. Guiding Principles

The following five guiding principles work to emphasize the concept of sustainability throughout the General Plan.

1. Employ Smart Growth: Shape new communities to align housing with jobs and services; and protect and conserve the County's natural and cultural resources, including the character of rural communities.

2. Ensure community services and infrastructure are sufficient to accommodate growth: Coordinate an equitable sharing of public and private costs associated with providing appropriate community services and infrastructure to meet growth needs.

3. Provide the foundation for a strong and diverse economy: Protect areas that generate employment and promote programs that support a stable and well educated workforce. This will provide a foundation for a jobs-housing balance and a vital and competitive economy in the unincorporated areas.

4. Promote excellence in environmental resource management: Carefully manage the County's natural resources, such as air, water, wildlife habitats, mineral resources, agricultural land, forests, and open space in an integrated way that is both feasible and sustainable.

5. Provide healthy, livable and equitable communities: Design communities that incorporate their cultural and historic surroundings, are not overburdened by nuisance and negative environmental factors, and provide reasonable access to food systems. These factors have a measureable effect on public well-being.

II. Planning Areas Framework

The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. The General Plan identifies 11 Area Plans. The purpose of the Planning Areas Framework is to provide a mechanism for local communities to work with the County to develop plans that respond to their unique and diverse character. The 11 Planning Areas are:

- Antelope Valley Planning Area
- Coastal Islands Planning Area
- East San Gabriel Valley Planning Area
- Gateway Planning Area

- Metro Planning Area
- San Fernando Valley Planning Area
- Santa Clarita Valley Planning Area
- Santa Monica Mountains Planning Area
- South Bay Planning Area
- West San Gabriel Valley Planning Area
- Westside Planning Area

III. General Plan Elements

The General Plan is comprised of the following elements:

Land Use Element

The Land Use Element designates land uses, and provides strategies and planning tools to facilitate and guide future development and revitalization efforts.

Mobility Element

The Mobility Element provides an overview of the transportation infrastructure and strategies for developing an efficient and multimodal transportation network. The Highway Plan and the Bicycle Master Plan are sub-components of the Mobility Element.

Air Quality Element

The Air Quality Element summarizes air quality issues and outlines the goals and policies that will improve air quality and reduce greenhouse gas emissions. The Community Climate Action Plan is a sub-component of the Air Quality Element.

Conservation and Natural Resources Element

The Conservation and Natural Resources Element guides the long-term conservation of natural resources and preservation of available open space areas.

Parks and Recreation Element

The Parks and Recreation Element plans and provides for an integrated parks and recreation system that meets the needs of residents.

Noise Element

The Noise Element reduces and limits the exposure of the general public to excessive noise levels. The Noise Element sets the goals and policy direction for the management of noise.

Safety Element

The purpose of the Safety Element is to reduce the potential risk of death, injuries, property damage, economic loss, and social dislocation resulting from natural and human-made hazards.

Public Services and Facilities Element

The Public Services and Facilities Element promotes the orderly and efficient planning of public services and facilities and infrastructure in conjunction with development and growth.

Economic Development Element

The Economic Development Element outlines economic development goals, and provides strategies that contribute to economic well-being.

Housing Element

The Housing Element analyzes and plans for existing and future housing needs. The Housing Element addresses the housing needs of all income levels and accommodates a diversity of housing types and special needs.

IV. General Plan Implementation

The General Plan Implementation section describes the ordinances, programs and tasks that will implement the General Plan. The section describes which County departments and agencies are responsible for implementation programs and sets a timeframe for completion of those programs.

Chapter 1: Introduction

I. Purpose

The California Government Code requires that each city and county adopt a general plan "for the physical development of the county or city, and any land outside its boundaries which bears relation to its planning." The Los Angeles County General Plan is the guide for long-term physical development and conservation through a framework of goals, policies, and implementation programs.

The unincorporated areas of Los Angeles County are comprised of approximately 2,650 square miles, and over one million people. The Los Angeles County General Plan provides the policy framework for how and where the unincorporated areas will grow through the year 2035, and establishes goals, policies, and programs to foster healthy, livable, and sustainable communities. This document represents a comprehensive effort to update the County's 1980 General Plan.

The General Plan guides growth countywide through goals, policies, and programs that discourage sprawling development patterns; protect areas with hazard, environment and resource constraints; encourage infill development in areas near transit, services and existing infrastructure; and make a strong commitment to ensuring sufficient services and infrastructure. It also lays the foundation for future community-based planning initiatives that will identify additional opportunities for accommodating growth.

II. Document Organization

Part I: Introduction: This section is a user's guide to the General Plan, with information on document organization, applicability, and the guiding principles of the General Plan. This section also provides background information and the growth forecast for the unincorporated areas.

Part II: Planning Areas Framework: This section provides an overview of the Planning Areas Framework, which facilitates the planning of all unincorporated areas through 11 identified planning areas.

Part III: General Plan Elements: This section contains the elements of the General Plan. These elements identify unincorporated countywide planning issues, as well as the goals and policies to address them. Policies are organized by topic for ease of use.

Part IV: General Plan Implementation Program: This section provides information on updating and maintaining the General Plan, including data and maps. This section also contains the implementation programs of the General Plan. The implementation programs create actions for policies, and also identify lead/partner agencies, and a timeline for program completion. The implementation programs are organized by General Plan element. This section includes a summary of all goals and policies.

Appendices: The appendices contain many of the data, methodologies and assumptions, background studies, and documentation that informed the development of the General Plan. The appendices are organized by General Plan element.

III. How to Use the General Plan

The General Plan provides a general policy framework for community-based plans, such as area plans, community plans and coastal land use plans, and works in conjunction with several planning documents, including strategic plans and master plans. The General Plan is implemented by the Los Angeles County Code, in particular, Titles 21 (Subdivisions) and 22 (Planning and Zoning). The California Government Code requires that all zoning ordinances, zone changes, subdivisions, capital improvement plans, and public works projects be consistent with the General Plan.

The General Plan also serves as an advisory countywide document to coordinate land use planning, public service and facilities planning, circulation, environmental management and regional land use and transportation initiatives with the 88 cities within Los Angeles County and with special districts and regional agencies, such as the Southern California Association of Governments (SCAG), the Los Angeles County Metropolitan Transportation Authority (Metro), Los Angeles County Sanitation Districts, air quality districts, water districts and suppliers, and school districts.

There are many regulatory and policy components to this General Plan. Below are instructions for using and interpreting the General Plan:

- **Guiding Principles:** Guiding principles serve as the base metric for interpreting the General Plan goals, policies, and implementation programs.

- **Goals:** A goal is a general direction-setter that expresses the community's values. It may be abstract in nature and is generally not quantifiable or time dependent.

- **Policies:** A policy is a specific statement or diagram that guides decision-making. It indicates a commitment of the County to a particular course of action. A policy may be carried out through implementation programs and/or by direct application of the policy. No policy, whether in written or diagram form, shall be given greater weight than any other policy.

- **Topics:** Topics are used to categorize policies throughout the General Plan elements. Topics are meant to facilitate ease of use, and are not to be used to interpret policies.

- **Implementation Programs:** Implementation programs identify actions for carrying out the policies of the General Plan. Each program identifies lead/partner agencies; however, they are not exclusive and new partners can be added as needed. The programs also include general timeframes that assume the availability of adequate funding. The programs and timeframes may need to be modified accordingly if adequate funding is not available.

- **Maps and Tables:** Maps and tables provide background information, technical justification for policies, and/or other policy information. They should be updated regularly and interpreted in the context of General Plan goals and policies.

Chapter 2: Applicability

The following provisions shall apply to complete applications filed prior to the effective date of this General Plan.

The applicant may choose whether the application will be reviewed for consistency with the previously adopted General Plan or with this General Plan. In either case, approval of the application is not guaranteed.

If the applicant chooses to have the application be reviewed for consistency with the previously adopted General Plan, the application may be modified prior to consideration by the Los Angeles County Board of Supervisors, the Regional Planning Commission, the Hearing Officer or the Director, and still be reviewed for consistency with the previously adopted General Plan as long as the requested modification does not:

- Change the project's housing type (e.g., from single-family to two-family or multi-family);
- Increase the project's residential density;
- Increase the project's floor area or lot coverage for non-residential space;
- Increase the amount of grading for the project; or
- Increase the area of ground disturbance resulting from the project.

Such a modification may necessitate submittal by the applicant of revised, updated, or additional materials, including, but not limited to, site plans, elevations, and oak tree reports. If the requested modification does not meet all of the criteria listed above, the modified project shall be reviewed for consistency with this General Plan.

An application for a modification to an approved but not used permit, that is valid on the effective date of this General Plan, where the modification will result in a project that substantially conforms with the previously approved project, as determined by the Director, may, at the election of the applicant, be reviewed for consistency with the previously adopted General Plan. In all other cases, an application for a modification to such permit shall be considered a new application and shall be reviewed for consistency with this General Plan.

If an approved permit has been used prior to the effective date of this General Plan and the permit contains a grant term, the approved use may continue until the end of the grant term, and, at the end of the grant term, shall be subject to the General Plan policies in effect at that time. If, during the grant term, a request for a modification to the previously approved permit is made, and the modification will result in a use that substantially conforms with the previously approved permit, as determined by the Director, the modified permit shall be reviewed for consistency with the previously adopted General Plan. In all other cases, a request for a modification to the previously approved permit shall be subject to the General Plan policies in effect at the time of filing the application for the modification.

If an approved permit has been used prior to the effective date of this General Plan and the permit does not have a grant term, the approved use may continue indefinitely without regard to the policies in this General Plan. Notwithstanding the preceding sentence, all applicable non-conforming use provisions of the Zoning Code shall apply to the previously approved permit. If a request for a modification to the previously approved permit is made, and the modification will result in a use that substantially conforms with the previously approved permit, as determined by the Director, the modified permit shall be reviewed for consistency with the previously adopted General Plan. In all

other cases, a request for a modification to the previously approved permit shall be subject to the General Plan policies in effect at the time of filing the application for the modification.

Chapter 3: Guiding Principles

Guiding Principles

Sustainability requires that planning practices meet the needs of Los Angeles County without compromising the ability of its future generations to realize their economic, social, and environmental goals. The following five guiding principles work to emphasize the concept of sustainability throughout the General Plan.

1. Employ Smart Growth: Shape new communities to align housing with jobs and services; and protect and conserve the County's natural and cultural resources, including the character of rural communities.

The General Plan implements smart growth by using strategies that are tailored to each community. In urban areas, transit-oriented development will create vibrant neighborhood centers around transit stations where people can live, work, and shop without the need to drive to each destination. Also in urban areas, active corridor development will connect major centers and neighborhoods. In rural areas, land uses and developments that are compatible with the natural environment and landscape will maintain existing community character. These work in conjunction with other smart growth strategies to "green" streets and buildings, and protect and conserve natural resources.

2. Ensure community services and infrastructure are sufficient to accommodate growth: Coordinate an equitable sharing of public and private costs associated with providing appropriate community services and infrastructure to meet growth needs.

Community-based services, such as schools, parks, libraries, police and fire services, and waste management are essential elements of all communities. In urban areas, quality of life is further dependent on infrastructure such as water and sewer systems, flood protection, utilities, and circulation systems and traffic signalization. Successful land use planning and growth management relies upon orderly and efficient planning and placement of community services where appropriate. It also relies upon the coordination of public and private partners to provide and maintain appropriate and sufficient services to all communities, and develop urban infrastructure where it is commensurate with urban growth. Planning for community services and infrastructure must be context-sensitive. The General Plan establishes policies and programs to ensure appropriate service levels for all communities, and provide urban infrastructure for new urban developments.

3. Provide the foundation for a strong and diverse economy: Protect areas that generate employment and promote programs that support a stable and well educated workforce. This will provide a foundation for a jobs-housing balance and a vital and competitive economy in the unincorporated areas.

Ensuring the economic vitality and long-term competitiveness of the unincorporated areas requires policies that will promote a stable and well-educated job base, generate tax revenues to support quality services, provide for a jobs-housing balance, and accommodate the businesses and industries that represent the jobs of the future. As planning for future growth and the appropriate land use mix has major impacts on the local and regional economy, the General Plan addresses the protection of industrial land in the unincorporated areas. The General Plan also provides policies and programs to foster economic development.

4. Promote excellence in environmental resource management: Carefully manage the County's natural resources, such as air, water, wildlife habitats, mineral resources, agricultural land, forests, and open space in an integrated way that is both feasible and sustainable.

Stewardship of the natural resources in Los Angeles County, such as clean air, clean water, wildlife habitats, mineral resources, agricultural land, forests, and open space, is essential to a successful sustainability strategy. The majority of the natural resources in Los Angeles County are located in the unincorporated areas. Natural resources are vital for the recreational, scenic and wilderness opportunities they provide, as well as for their role in sustaining the function of natural environments. The General Plan provides policy guidance to protect and conserve natural resources and to improve the quality of its air, water and biological resources. The General Plan also includes goals, policies and programs to minimize risks and discourage development in areas that are prone to safety hazards, such as earthquakes, floods and wildfires.

5. Provide healthy, livable and equitable communities: Design communities that incorporate their cultural and historic surroundings, are not overburdened by nuisance and negative environmental factors, and provide reasonable access to food systems. These factors have a measureable effect on public well-being.

The General Plan promotes the creation of communities that foster physical activity, safety, and health. Land use that promotes physical activity and access to healthy food is a strategy to address the obesity epidemic and corresponding high rates of chronic diseases. In addition, policies to address environmental conditions, such as poor air quality, polluted urban runoff, deteriorated housing conditions, and ground and surface contamination have a direct impact on public health. Furthermore, promoting safety through improvements in the County's bikeway network, the creation of pedestrian-friendly environments and complete streets that are accessible to all users produce positive outcomes from a land use and public health perspective.

The General Plan addresses environmental justice by providing information and raising awareness of a number of issues that impact the unincorporated areas, including but not limited to excessive noise, traffic, water pollution, air pollution, and heavy industrial uses. The General Plan also addresses environmental justice by emphasizing the importance of meaningful coordination and actions. The General Plan emphasizes the importance of sufficient community-based services and infrastructure; protecting and conserving open space, natural and resource areas; preventing and minimizing pollution impacts; and stakeholder participation in planning efforts.

Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.

An environmentally just Los Angeles County is a place where:

- Environmental risks, hazards, and public service related environmental services, such as trash hauling and landfills, are distributed equitably without discrimination;
- Existing and proposed negative environmental impacts are mitigated to the fullest extent to protect the public health, safety, and well-being;
- Access to environmental investments, benefits, and natural resources are equally distributed; and
- Information, participation in decision-making, and access to justice in environment-related matters are accessible to all.

SB 1000 requires that local jurisdictions include an environmental Justice element to their General Plan or related goals, policies, and objectives as they relate to disadvantaged communities in other elements of the General Plan. The Green Zones Program supports the goals of SB 1000 and the implementation of environmental justice throughout the unincorporated areas by identifying communities that disproportionately bear a burden from stationary sources of pollution due to incompatible land uses and better regulating incompatible land uses in close proximity to each other through new Zoning Code definitions, new permitting requirements and development standards.

Chapter 4: Background

I. Location and Description

With approximately 4,083 square miles, Los Angeles County is geographically one of the largest counties in the country. Los Angeles County stretches along 75 miles of the Pacific Coast of Southern California, and is bordered to the east by Orange County and San Bernardino County, to the north by Kern County, and to the west by Ventura County. Los Angeles County also includes two offshore islands, Santa Catalina Island and San Clemente Island. Figure 4.1 shows the regional location of Los Angeles County.

Figure 4.1: Regional Location of Los Angeles County Map

Unincorporated Areas

The unincorporated areas account for approximately 65 percent of the total land area of Los Angeles County, as shown in Table 4.1.

Table 4.1: Los Angeles County Distribution of Land Area

County Land Components	Cities (sq. miles)	Unincorporated (sq. miles)	Total (sq. miles)
Mainland	1,456.0	2,497.7	3,953.7
San Clemente Island	0	56.4	56.4
Santa Catalina Island	2.9	71.9	74.8
Total	1,458.9	2,626.0	4,084.9

Source: Los Angeles County Department of Regional Planning

The unincorporated areas in the northern portion of Los Angeles County are covered by large amounts of sparsely populated land, and include the Angeles National Forest, part of the Los Padres National Forest, and the Mojave Desert. The unincorporated areas in the southern portion of Los Angeles County consist of many non-contiguous land areas, which are often referred to as the County's unincorporated urban islands.

The County's governmental structure is comprised of five Supervisorial Districts. The Board of Supervisors is the governing body of the County, and makes legislative land use decisions for the unincorporated areas. Figure 4.2 shows the unincorporated areas, and Figure 4.3 shows the County's Supervisorial Districts.

Figure 4.2: Los Angeles County Unincorporated Areas Map

Figure 4.3: Los Angeles County Supervisorial Districts Map

Climate and Topography

Los Angeles County is a land of beaches, valleys, mountains, and deserts. Overall, the climate can be characterized as "Mediterranean," with hot, dry summers and mild, wet winters. The diversity of the topography results in localized climate zones that are roughly divided by the Transverse Ranges (Santa Monica Mountains and San Gabriel Mountains). The climate zones are closely tied to geologic landforms and vary based on elevation changes and distance from the ocean. These climate zones can be grouped into three broad categories:

Coastal Plain

The coastal plain includes the beaches, valleys, and canyons that occupy the Los Angeles Basin and terminate at the Transverse Ranges. During the dry season, the determining factor in coastal plain weather is the proximity to the Pacific Ocean and the resultant marine layer. The marine layer acts as a buffer, which is evidenced by relatively cool and constant temperatures, low clouds, fog, and haze. The marine layer settles over the Basin during the evening and early morning before being burned off by sunshine midday. Due to the dominance and stability of the high pressure area in the Basin, precipitation is rare between May and November.

Mountain

Climates in the mountains are characterized by lower average temperatures and heavier rainfall than in the coastal plain. The Transverse Ranges are further removed from the climatic influences of marine wind patterns and experience the additional influence of altitude.

High Desert

The high desert includes the Antelope Valley, which is the westernmost portion of the Mojave Desert. The high desert is located more than 50 miles inland, and is removed from marine influences and experiences a more extreme type of climate. The Transverse Ranges act as a barrier to rain-bearing clouds moving inland. In addition, the Antelope Valley is home to several wildlife and wildflower sanctuaries that thrive in the often inhospitable climate found in the high desert.

Regional Context

The Southern California Association of Governments (SCAG) is the Metropolitan Planning Organization that represents the counties of Los Angeles, Orange, Ventura, Imperial, San Bernardino, and Riverside, and 190 cities. Los Angeles County is further divided into nine SCAG subregions: North Los Angeles County; San Fernando Valley Council of Governments; Las Virgenes Malibu Conejo Council of Governments; Arroyo Verdugo; Westside Cities Council of Governments; South Bay Cities Council of Governments; City of Los Angeles; San Gabriel Valley Council of Governments; and Gateway Cities Council of Governments. Table 4.2 shows population growth in the SCAG region, by county, between 2000 and 2010.

Table 4.2 Population for the SCAG Region, County, 2000 and 2010

County	2000 Population	Percent of Region	2010 Population	Percent of Region
Los Angeles	9,519,000	57.6%	9,819,000	54.4%
Orange	2,846,000	17.2%	3,010,000	16.7%
Riverside	1,545,000	9.4%	2,190,000	12.1%
San Bernardino	1,709,000	10.4%	2,035,000	11.3%

Ventura	753,000	4.6%	823,000	4.6%
Imperial	142,000	0.9%	175,000	1.0%
Total	16,514,000	100.0%	18,052,000	100.0%

Source: SCAG 2012-2035 RTP/SCS

Existing Population

There are approximately 10 million people in Los Angeles County as a whole, with approximately one million living in the unincorporated areas. Table 4.3 shows the percent change in population from the year 2000 to 2010.

Table 4.3: Los Angeles County Population, 2000 and 2010

Area	Population 2000	Population 2010	Increase (%)
Los Angeles County	9,519,338	9,818,605	3%
Unincorporated Areas	986,050	1,057,088	7%

Source: 2000 and 2010 U.S. Census

Race and Ethnicity

The cultural diversity of residents plays a significant role in defining the character of the unincorporated areas. Influenced by migratory patterns, the approximately 10 million residents comprise one of the most diverse communities in the country. The California Department of Finance estimates that by the year 2050, the Hispanic and Asian populations will account for more than 80 percent of the residents. Planning efforts must acknowledge and account for the diversity and social values that accompany these demographic shifts. Table 4.4 shows the racial and ethnic composition of the unincorporated areas.

Table 4.4: Unincorporated Los Angeles County, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	512,219	48%
Black or African-American	96,384	9%
American Indian or Alaska Native	8,851	1%
Asian	124,109	12%
Native Hawaiian and Other Pacific Islander	2,037	0.2%
Some Other Race	271,531	26%
Two or More Races	41,957	4%
Total	1,057,088	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	602,045	57%
Not Hispanic or Latino	455,043	43%

Total	1,057,088	100%

Source: 2010 U.S. Census

II. Growth Forecast

Population, housing, and employment projections play a critical role in the planning process and can help identify and guide future development patterns. The growth forecast includes population projections, household projections, and employment projections. It is important to note that the General Plan uses a regional strategy to guide growth in a way that plans for more efficient and sustainable land use patterns to address climate change, mobility, and community development. The General Plan plans for total growth by encouraging development in areas with infrastructure and access to transit, and discouraging growth in undeveloped areas and environmentally-sensitive and hazardous areas.

The General Plan's growth forecast is from the SCAG 2012 Regional Transportation Plan (RTP). The growth projections in Tables 4.5, 4.6 and 4.7 provide a picture of probable occurrences rather than assured outcomes. Furthermore, the projections do not account for unforeseen future events, as well as changes in General Plan policies.

Table 4.5: Los Angeles County Population Projections

	Population2008	Population 2035	Increase (%)
Los Angeles County	9,778,000	11,353,000	16%
Unincorporated Areas	1,052,800	1,399,500	33%

Source: SCAG 2012-2035 RTP/SCS

Table 4.6: Los Angeles County Household Projections

	Households2008	Households 2035	Increase (%)
Los Angeles County	3,228,000	3,852,000	19%
Unincorporated Areas	298,100	405,500	36%

Source: SCAG 2012-2035 RTP/SCS

Table 4.7: Los Angeles County Employment Projections

	Employment 2008	Employment 2035	Increase (%)
Los Angeles County	4,340,000	4,827,000	11%
Unincorporated Areas	237,000	318,100	34%

Source: SCAG 2012-2035 RTP/SCS

III. Community Participation

The General Plan reflects a comprehensive effort to facilitate stakeholder participation and garner local input in the development of its goals, policies and programs. Appendix B provides an overview and timeline of the recent outreach activities and drafts of the General Plan that have been released to the public, and a summary of community and stakeholder identified issues that informed the development of the General Plan Guiding Principles.

Part II: Planning Areas Framework

Chapter 5: Planning Areas Framework

I. Planning Areas Framework

The Los Angeles County General Plan is the foundational document for all community-based plans that serve the unincorporated areas. The purpose of the Planning Areas Framework is to provide a mechanism for local communities to work with the County to develop plans that respond to their unique and diverse character. As shown in Figure 5.1, the General Plan identifies 11 Planning Areas, which make up the Planning Areas Framework. The 11 Planning Areas are:

- Antelope Valley Planning Area
- Coastal Islands Planning Area
- East San Gabriel Valley Planning Area
- Gateway Planning Area
- Metro Planning Area
- San Fernando Valley Planning Area
- Santa Clarita Valley Planning Area
- Santa Monica Mountains Planning Area
- South Bay Planning Area
- West San Gabriel Valley Planning Area
- Westside Planning Area

Figure 5.1 Planning Areas Framework Map

The General Plan provides goals and policies to achieve countywide planning objectives for the unincorporated areas, and serves as the foundation for all community-based plans, such as area plans, community plans, and coastal land use plans. Area plans focus on land use and policy issues that are specific to the Planning Area. Community plans cover smaller geographic areas within the Planning Area, and address neighborhood and/or community-level policy issues. Coastal land use plans are components of local coastal programs, and regulate land use and establish policies to guide development in the coastal zone.

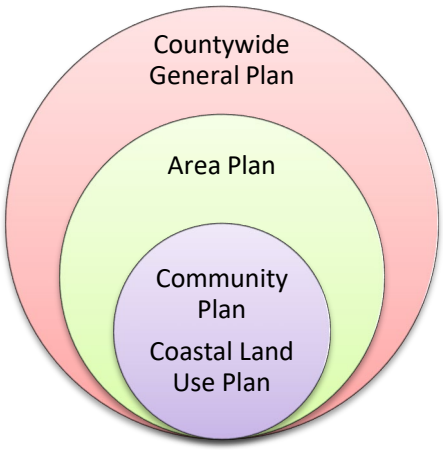
Figure 5.2 shows the relationship of the General Plan to community-based plans. All community-based plans are components of the General Plan and must be consistent with General Plan goals and policies.

The following is a list of community-based plans:

- Altadena Community Plan
- Antelope Valley Area Plan

- East Los Angeles Community Plan
- Hacienda Heights Community Plan
- Marina del Rey Local Coastal Land Use Plan
- Malibu Local Coastal Land Use Plan
- Rowland Heights Community Plan
- Santa Monica Mountains North Area Plan
- Santa Catalina Island Local Coastal Land Use Plan
- Santa Clarita Valley Area Plan
- Twin Lakes Community Plan
- Walnut Park Neighborhood Plan
- West Athens-Westmont Community Plan

Figure 5.2: Relationship of General Plan to Community-Based Plans



Planning Areas Framework Implementation

An area plan will be prepared or updated for each of the 11 Planning Areas. The unique characteristics and needs of each of the Planning Areas will guide the development of each area plan. Area plans provide opportunities to update community-based plans, as well as implementation tools of the General Plan, such as specific plans and community standards districts. For more information, see Program LU-1: Planning Areas Framework Program in Chapter 16: General Plan Implementation Programs.

II. Planning Areas Descriptions

The following are profiles of the 11 Planning Areas. They include the identification of opportunity areas, which should be considered for further study when preparing community-based plans. The opportunity areas are described in Table 5.1.

Table 5.1: Opportunity Area Types

Transit Centers	Areas that are supported by major public transit infrastructure. Transit centers are identified based on opportunities for a mix of higher intensity development, including multifamily housing, employment and commercial uses; infrastructure improvements; access to public services and infrastructure; playing a central role within a community; or the potential for increased design, and improvements that promote living streets and active transportation, such as trees, lighting, and bicycle lanes.
Neighborhood Centers	Areas with opportunities suitable for community-serving uses, including commercial only and mixed-use development that combine housing with retail, service, office and other uses. Neighborhood centers are identified based on opportunities for a mix of uses, including housing and commercial; access to public services and infrastructure; playing a central role within a community; or the potential for increased design, and improvements that promote living streets and active transportation, such as street trees, lighting, and bicycle lanes.
Corridors	Areas along boulevards or major streets that provide connections between neighborhoods, employment and community centers. Corridors are identified based on opportunities for a mix of uses, including housing and commercial; access to public services and infrastructure; playing a central role within a community; or the potential for increased design, and improvements that promote living streets and active transportation, such as trees, lighting, and bicycle lanes.
Industrial Flex Districts	Industrial areas that provide opportunities for non-industrial uses and mixed uses, where appropriate, and also light industrial or office/professional uses that are compatible with residential uses.
Industrial Opportunity Areas	Economically viable industrial and employment-rich lands located in an unincorporated community that has an adopted community-based plan, or is in the process of creating one. Future considerations should be given to these areas to be mapped as Employment Protection Districts, where industrial zoning and industrial land use designations should remain, and where policies to protect industrial land from other uses (residential and commercial) should be enforced.
Rural Town Centers	Focal points of rural communities, serving the daily needs of residents and providing local employment opportunities. Rural town centers are identified based on the opportunities for new public facilities and new commercial uses.

1. Antelope Valley Planning Area

Figure 5.3: Antelope Valley Planning Area Map

Planning Area Profile

Location

The Antelope Valley is located approximately 60 miles north of Downtown Los Angeles. The unincorporated portion of the Antelope Valley Planning Area covers 1,800 square miles, or 44 percent of the 4,083 square miles in the County. The unincorporated Antelope Valley surrounds the City of Palmdale and City of Lancaster, and borders San Bernardino County to the east, Ventura County to the west, and Kern County to the north. The Planning Area is shown in Figure 5.3.

Population and Housing

Table 5.2: Antelope Valley Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	382,868	73,488	19%
Housing Units	125,317	26,939	21%
Household Size (Average)	3.28	3.05	n/a

Source: 2010 U.S. Census

Table 5.3: Antelope Valley Planning Area, Race and Ethnicity,2010

Race	Unincorporated Area Population	Percentage
White	51,555	70%
Black or African American	4,505	6%
American Indian and Alaska Native	887	1%
Asian	1,475	2%
Native Hawaiian and Other Pacific Islander	132	0%
Some Other Race	11,692	16%
Two or More Races	3,242	4%

Total	73,488	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	27,069	37%
Not Hispanic or Latino	46,419	63%
Total	73,488	100%

Source: 2010 U.S. Census

Geography

The Planning Area contains many diverse vegetative communities, geologic forms and climatic conditions. The Angeles National Forest, and the Liebre and Sierra Pelona mountain ranges, are located in the Planning Area. The main land feature is the high desert, with elevations between 2,300 and 2,400 feet above sea level. The Planning Area contains the majority of active agricultural land uses in Los Angeles County. The Antelope Valley Significant Ecological Area (SEA), San Andreas SEA, Joshua Tree Woodlands SEA, and Santa Clara River SEA also cover large portions of the Planning Area. The San Andreas Seismic Fault Zone, which cuts across the Planning Area, poses significant hazards. In addition, a significant portion of the Planning Area faces threats of wildfires and floods.

Transportation Infrastructure

Two major freeways provide access to the Planning Area: Interstate-5, which is located in the western portion of the Planning Area, and links Northern and Southern California; and State Route-14, which connects the adjacent Santa Clarita Valley just north of metropolitan Los Angeles, to the eastern portion of the Antelope Valley.

In addition, Metrolink's Antelope Valley Line has three station stops in the Antelope Valley, which are located in unincorporated Acton, the City of Palmdale, and the City of Lancaster. Palmdale Regional Airport, General William J. Fox Airfield and Edwards Air Force Base are also located in the unincorporated Antelope Valley. Antelope Valley Transit Authority includes four local routes, two special routes, and three commuter routes that connect the Antelope Valley to other areas.

There are a number of major transportation infrastructure projects that are planned for the Planning Area. On the eastern side of the Antelope Valley, the High Desert Corridor Project will connect State Route-14 with State Route-18 in San Bernardino County, and promote connectivity, traffic safety and goods movement. On the western side of the Antelope Valley, the Northwest-138 Corridor Improvement Project will connect Interstate-5 with State Route-14. Both the High Desert Corridor and the Northwest-138 Corridor Improvement projects are joint initiatives of the Los Angeles County Metropolitan Transportation Authority (Metro) and the California Department of Transportation (Caltrans). Together, the two projects will result in significant improvements to the east-west connection of the Antelope Valley by linking Interstate-5 on the western side, and Interstate-15 on the eastern side of the Antelope Valley. Both projects also include considerations for the incorporation of rail components, which has the added potential of linking the proposed California High Speed Rail system on the western side and the Xpress West line on the eastern side. These separate, stand-alone rail projects propose to connect Southern California to the City of San Francisco and the City of Las Vegas, respectively. With the potential for interconnected transportation systems, the Planning Area is expected to have strong linkages to the major population and employment centers, which create future opportunities for economic growth and development.

Planning Area Issues

The Planning Area is predominately rural and has major constraints, including natural hazards, environmental issues, lack of infrastructure, and limited water supply. It is critical that existing rural communities, agriculture, natural resources, and biological diversity remain protected. In addition, incorporating water conservation strategies and encouraging the recycling of water is important.

As thousands of acres of desert lands have been subdivided over the past decade, the population of the Planning Area has increased significantly. While much of the growth has been at urban densities in and adjacent to the City of Palmdale and the City of Lancaster, the desirability of rural living and the availability of affordable housing have led to significant growth in the many unincorporated communities. In turn, many residents have had to commute further distances to access employment opportunities.

Figure 5.4: Opportunity Areas Map—Acton

Figure 5.5: Opportunity Areas Map—Antelope Acres

Figure 5.6: Opportunity Areas Map—Lake Hughes

Figure 5.7: Opportunity Areas Map—Lake Los Angeles

Figure 5.8: Opportunity Areas Map—Leona Valley

Figure 5.9: Opportunity Areas Map—Littlerock

Figure 5.10: Opportunity Areas Map—Pearblossom

Figure 5.11: Opportunity Areas Map—Quartz Hill

Figure 5.12: Opportunity Areas Map—Roosevelt

Figure 5.13: Opportunity Areas Map—Sun Village

The opportunity areas in the Planning Area include Rural Town Centers as shown in Figures 5.4-5.13. The Planning Area also includes three Economic Opportunity Areas (EOA), which are areas where major infrastructure projects are ongoing or are being planned, which create various opportunities for economic growth and development at a regional scale. Further planning studies and activities should be conducted in these areas to ensure that any growth and development resulting from these infrastructure projects progress in a sustainable and environmentally-sensitive way, while preserving the unique character and identity of the area. The three EOA are established due to ongoing plans by Metro and Caltrans to build the High Desert Corridor Project in the eastern side of the Antelope Valley and the Northwest 138 Corridor Improvement Project in the western side of the Antelope Valley: East EOA, encompassing the communities of Lake Los Angeles, Sun Village and Littlerock; Central EOA, located along Avenue D, north of Fox Field Airport and west of the State Route-14; and West EOA, located along Highway 138 and including portions of Neenach.

2. Coastal Islands Planning Area

Figure 5.14: Coastal Islands Planning Area Map

Planning Area Profile

Location

San Clemente Island lies approximately 63 miles south of the City of Long Beach and 78miles west of the City of San Diego. San Clemente Island is approximately 24 miles long and 5miles across at its widest point. It has a land area of approximately 57 square miles. Since 1934, San Clemente Island has been owned and operated by the U.S. Navy. More than a dozen range and operational areas are clustered within a 60 mile radius of San Clemente Island. The Commander-in-Chief U.S. Pacific Fleet (CINCPACFLT) is the major claimant for San Clemente Island, and Naval Air Station North Island (NASNI) is responsible for its administration.

Santa Catalina Island is the only significantly inhabited island near the California coast. It is located approximately 22 miles south of the Palos Verdes Peninsula and 27 miles southwest of the Orange County shoreline. Santa Catalina Island is approximately 21 miles long and 8 miles wide. It has a land area of approximately 74 square miles.

The Coastal Islands Planning Area is shown in Figure 5.14.

Population and Housing

Table 5.4: Coastal Islands Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	4,096	368	9%
Housing Units	2,483	217	9%
Household Size (Average)	2.50	2.27	n/a

Source: 2010 U.S. Census

Table 5.5: Coastal Islands Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	300	82%
Black or African American	4	1%
American Indian and Alaska Native	4	1%

Asian	9	2%
Native Hawaiian and Other Pacific Islander	0	0%
Some Other Race	37	10%
Two or More Races	14	4%
Total	368	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	72	20%
Not Hispanic or Latino	296	80%
Total	368	100%

Source: 2010 U.S. Census

Geography

Santa Catalina Island is characterized by its rugged landscape and a cliffed shoreline. Level terrain is limited to the floors of a few large coastal canyons, such as Avalon, Pebbly Beach, White's Landing, Middle Ranch, Two Harbors, and Emerald Bay. Mt. Orizaba, which is located in the central part of Santa Catalina Island, is the highest peak with an elevation of 2,069 feet.

Transportation Infrastructure

The City of Avalon and the unincorporated community of Two Harbors are the major ports of entry to Santa Catalina Island, and are the primary communities on Santa Catalina Island in terms of population and services. The actual roadway distance is 26 miles through rugged terrain, with an average driving time of 1 hour and 15 minutes. In addition, Santa Catalina Island is accessed via ferry or plane. Santa Catalina Island includes the Santa Catalina Island Airport. Roads in the unincorporated areas of Santa Catalina Island are privately-owned, and access is restricted.

Planning Area Issues

San Clemente Island supports a number of endemic species as well as other species of special interest, which have experienced a resurgence with the Navy's restoration efforts. Land use activities on the Island are regulated by the U.S. Navy.

For Santa Catalina Island, the County and the Santa Catalina Island Company signed a 50-year Open Space Easement Agreement in 1974, which calls for the preservation of Santa Catalina Island's natural character, and improvements to access and recreational opportunities. The Santa Catalina Island Local Coastal Program (LCP), which was adopted in 1983, implements the goals and requirements of this agreement and ensures that the vast majority of Santa Catalina Island remains in its natural state for future generations to enjoy. The LCP provides multiple policies to improve access to and increase the range of recreational and open space activities, as well as to preserve, protect and conserve Santa Catalina Island's open space and natural resources.

3. East San Gabriel Valley Planning Area

Figure 5.15: East San Gabriel Valley Planning Area Map

Planning Area Profile

Location

The East San Gabriel Valley Planning Area contains the easternmost areas of Los Angeles County, and is located south of the Angeles National Forest, north of the Orange County border, and east of Interstate-605. The Planning Area's eastern border is the San Bernardino County line. The East San Gabriel Valley Planning Area is shown in Figure 5.15.

Population and Housing

Table 5.6: East San Gabriel Valley Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	933,116	234,251	25%
Housing Units	275,604	63,357	23%
Household Size (Average)	3.45	3.78	n/a

Source: 2010 U.S. Census

Table 5.7: East San Gabriel Valley Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	102,440	44%
Black or African American	4,362	2%
American Indian and Alaska Native	1,791	1%
Asian	61,297	26%
Native Hawaiian and Other Pacific Islander	342	0%
Some Other Race	55,603	24%
Two or More Races	8,416	4%
Total	234,251	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	136,104	58%

Not Hispanic or Latino	98,147	42%
Total	234,251	100%

Source: 2010 U.S. Census

Geography

The Planning Area's geography is characterized by valleys and rolling, dry hills. The San Gabriel River runs along the Interstate-605 and the western boundary of the Planning Area. The Puente Hills form the southern border for the Planning Area, and include natural areas and recreational opportunities for the region. The northern portion of the Planning Area is characterized by the steep upgrade and urban-wildland interface with the Angeles National Forest and San Gabriel Mountains.

Transportation Infrastructure

The Planning Area is served by Interstate-10, Interstate/State Route-210 and State Route-60, which provide east-west access and the Interstate-605 and State Route-57, which provide north-south access. The Planning Area is also served by the Metrolink commuter rail Riverside and San Bernardino lines, and Foothill Transit local and regional bus services.

Planning Area Issues

The primary constraints in the Planning Area are a growing shortage of large blocks of developable land and worsening traffic congestion. Many of the traditional suburbs within the Planning Area are maturing and facing infrastructure capacity issues and limited mobility options. Specifically, solid waste and sewerage disposal are concerns. In addition, portions of the City of Diamond Bar, City of Pomona, City of San Dimas, City of Walnut, and the unincorporated areas are on septic systems, which are subject to failure and potential groundwater contamination if not properly maintained. Transportation improvements will be critical for the long-term economic health of the Planning Area. Traffic on the major east-west freeways, including the Interstate-10, Interstate-210 and State Route-60, is heavily congested during peak hours, with commuters generally traveling west in the morning for work and east in the evening to return home.

The Planning Area also includes environmental and hazard constraints. The Puente Hills, which include portions of Rowland Heights and Hacienda Heights, contain fault traces and wildfire threats. Wildfires and landslides also pose safety hazards in the foothill communities. In addition, the Planning Area contains SEAs.

Opportunity Areas

Figure 5.16: Opportunity Area Map—Avocado Heights

A portion of Valley Boulevard in Avocado Heights, which is located between Temple Avenue and Vineland Avenue, is identified as an Industrial Flex District. This area is shown in Figure 5.16. Although these parcels are currently used for industrial purposes, the shallow parcel sizes will make it difficult for any future high-use industrial redevelopment. There is an opportunity to encourage the development of this area as a supportive commercial use district to adjacent, high-employment work sites.

Figure 5.17: Opportunity Area Map—Charter Oak

Figure 5.17 identifies a corridor opportunity area along Arrow Highway in Charter Oak. Arrow Highway is a major thoroughfare that extends across many local jurisdictions in the San Gabriel Valley, including unincorporated areas. In the community of Charter Oak, Arrow Highway includes mostly residential and a few commercial land uses, and has the potential for improved street and pedestrian improvements. In 2008, SCAG conducted a study on multi-jurisdictional corridor planning that analyzed Arrow Highway. The purpose of the study was to develop strategies to improve multi-jurisdictional coordination, transportation linkages, economic development, and overall street design and amenities.

Figure 5.18: Opportunity Areas Map – Hacienda Heights

The industrial parcels in Hacienda Heights, as shown in Figure 5.18, lie adjacent to heavily industrial districts in the City of Industry to the north. These parcels are being fully utilized for industrial purposes and should remain industrially zoned.

Figure 5.19: Opportunity Areas Map – Rowland Heights

The industrial parcels in Rowland Heights, as shown in Figure 5.19, are fully utilized for industrial purposes and are surrounded by parcels with similarly heavy industrial uses in the City of Industry. This is viable industrial land that should be protected.

Figure 5.20: Opportunity Area Map—South San Jose Hills

Figure 5.20 identifies an Industrial Flex District stretching along Valley Boulevard and bordered to the north by low to medium density residential neighborhoods, and to the south by heavily industrialized parcels in the City of Industry. Much of this area is zoned C-M (Commercial Manufacturing), which allows for less intensive industrial uses as well as other non-industrial uses. Auto repair, auto sales, churches, a mobilehome park, and a large self-service storage facility are some of the non-industrial uses in the area. While there are also some industrial uses, due to the mix of other non-industrial uses as well as the close proximity to the residential neighborhoods, this area should be further studied during the area planning process as there is an opportunity to encourage the development of this area as a supportive commercial use district to the nearby high-employment work sites south of Valley Boulevard in the City of Industry.

4. Gateway Planning Area

Figure 5.21: Gateway Planning Area Map

Planning Area Profile

Location

The Gateway Planning Area is located in the southeastern portion of Los Angeles County. The eastern border of the Planning Area is the Orange County line. The Planning Area contains a number of cities, including the City of Long Beach, as well as a large corridor of industrial areas that lead out of the ports of Los Angeles and Long Beach into Downtown Los Angeles. Unincorporated Rancho Dominguez consists primarily of industrially-designated land. The Gateway Planning Area is shown in Figure 5.21.

Population and Housing

Table 5.8: Gateway Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	1,666,588	103,094	6%
Housing Units	523,365	29,586	6%
Household Size (Average)	3.30	3.58	n/a

Source: 2010 U.S. Census

Table 5.9: Gateway Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	61,748	60%
Black or African American	2,477	2%
American Indian and Alaska Native	1,265	1%
Asian	4,049	4%
Native Hawaiian and Other Pacific Islander	241	0%
Some Other Race	29,029	28%
Two or More Races	4,285	4%
Total	103,094	100%

Ethnicity	Unincorporated Area Population	Percentage

Hispanic or Latino	76,782	74%
Not Hispanic or Latino	26,312	26%
Total	103,094	100%

Source: 2010 U.S. Census

Geography

The Planning Area is built out, and has a large percentage of industrial land. The Los Angeles River and San Gabriel River flow through the Planning Area.

Transportation Infrastructure

Interstate-710, which is the primary trucking route for cargo moving to and from the ports of Los Angeles and Long Beach, has increasingly become congested. Projects, such as the Alameda Corridor, demonstrate the importance of inter-jurisdictional efforts to aid in the region's economic development. The Planning Area is also bisected by the Interstate-405, State Route-91, Interstate-5, and Interstate-105. The Port of Long Beach, which combined with the Port of Los Angeles in the South Bay Planning Area, is the busiest container port in the country, creates high volumes of truck and cargo traffic in the Planning Area along Interstate-710. The region is served by Metro and Metrolink rail service.

Planning Area Issues

Industrial uses and trade and logistics from the ports are an important part of the economy of Planning Area; however, the concentration of industrial uses and high truck traffic raises concerns over air and water pollution. As a large economic center with high-wage jobs, it is important to balance environmental and economic concerns in the Planning Area.

The Planning Area also suffers from a lack of parks and recreational opportunities. In certain communities, there is also a lack of multifamily housing opportunities and the need for revitalization.

Opportunity Areas

Figure 5.22: Opportunity Areas Map—Rancho Dominguez

In the industrial community of Rancho Dominguez, the area around the Del Amo Station for the Metro Blue Line can be used to encourage a transit-oriented jobs district, where employees can commute to work on Metro. This transit center opportunity area is depicted in Figure 5.22.

Figure 5.23: Opportunity Areas Map—West Whittier-Los Nietos

Whittier Boulevard in West Whittier-Los Nietos, which is shown in Figure 5.23, is a major commercial corridor in which recent streetscape improvements have reactivated the street and can spur future redevelopment opportunities.

5. Metro Planning Area

Figure 5.24: Metro Planning Area Map

Planning Area Profile

Location

The Metro Planning Area is located in the geographic center of Los Angeles County. The Planning Area is home to and heavily defined by its proximity to Downtown Los Angeles, which includes major corporations and professional firms, tourist and convention hotels, restaurants, retail, and the largest concentration of government offices outside of Washington D.C. The Planning Area is shown in Figure 5.24.

Population and Housing

Table 5.10: Metro Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	1,819,084	306,768	17%
Housing Units	586,832	79,236	14%
Household Size (Average)	3.25	4.09	n/a

Source: 2010 U.S. Census

Table 5.11: Metro Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	118,358	39%
Black or African American	46,725	15%
American Indian and Alaska Native	3,000	1%
Asian	1,829	1%
Native Hawaiian and Other Pacific Islander	332	0%
Some Other Race	126,439	41%
Two or More Races	10,085	3%
Total	306,768	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	254,135	83%

Not Hispanic or Latino	52,633	17%
Total	306,768	100%

Source: 2010 U.S. Census

Geography

The majority of the Planning Area is urbanized, with little variation in elevation. There are no large areas of natural open space. All open space areas are contained with parks and recreational areas. The Los Angeles River and the Compton Creek tributary flow through the Planning Area. These waterways provide an opportunity for enhancement and serve as community assets.

Transportation Infrastructure

The Planning Area is rich in bus services and rail transit. The Metro Blue Line traverses South Los Angeles on a north-south route, with stops in Willowbrook and three stops in Florence-Firestone. The Metro Green Line travels east-west along the Interstate-105, with stops in Willowbrook, Westmont-West Athens, and Lennox. The Metro Gold Line Eastside Extension runs through unincorporated East Los Angeles and the City of Los Angeles. Furthermore, the Metro Expo Line, which connects Culver City and Downtown Los Angeles, and runs along Exposition Boulevard.

Planning Area Issues

The presence of industrial districts in the Planning Area provides a strong foundation for job recovery and job growth, and opportunities for transit-oriented development. The Planning Area also includes a heavily transit-dependent population. However, the Planning Area also faces a number of challenges for mobility, including traffic congestion and the need for improved pedestrian safety and more bicycle facilities. Communities in the Planning Area are urbanized and are generally characterized by challenging physical and economic conditions. In terms of land use, several residential communities abut industrial uses, which create land use compatibility conflicts. The Planning Area, in particular, faces issues of overcrowding. In addition, the Planning Area contains very few natural areas and open spaces. Although infill opportunities exist, many sites have a combination of environmental issues that affect their redevelopment potential. Much of the South Los Angeles is characterized by economically disadvantaged conditions that further hamper private investment and redevelopment. Public investment in redevelopment activities will be an important factor in the economic turnaround of South Los Angeles. For example, many opportunities exist for public-private partnerships to revitalize many of the older, commercial corridors with pedestrian amenities and mixed uses. There are also opportunities along the Metro Gold Line through East Los Angeles.

Opportunity Areas

Figure 5.25: Opportunity Areas Map—East Los Angeles

East Los Angeles is an older, urban community that is rich in history and culture. The community's transit center opportunity area, depicted in Figure 5.25, covers an area along 3rd Street and includes four transit stations along the Metro Gold Line. This area is ripe for complete street improvements, as well as pedestrian-scale and mixed use development that incorporate local commercial-serving uses and multifamily housing. In addition, Figure 5.25 also depicts the Industrial Opportunity Areas and Industrial Flex Districts in the East Los Angeles.

Figure 5.26: Opportunity Areas Map—East Rancho Dominguez

The Planning Area has opportunities for future planning efforts to improve its economic health. As shown in Figure 5.26, Atlantic Avenue and East Compton Boulevard are major commercial corridors with local-serving uses in the community of East Rancho Dominguez.

Figure 5.27: Opportunity Areas Map—Florence-Firestone

Florence-Firestone is home to many opportunity areas, which are depicted in Figure 5.27. Central Avenue, which was once a hub of jazz culture, is in need of investment and redevelopment. The three-mile corridor is along the western border of Florence-Firestone, and abuts the City of Los Angeles. The northern portion of the corridor is comprised of industrial and auto-related uses, and the southern portion of the corridor is predominantly commercial and residential. An abundant amount of vacant and underutilized land, coupled with the City of Los Angeles' efforts in the corridor, and the location of the Slauson, Florence and Firestone stations for the Metro Blue Line, make the area prime for transit-oriented development and economic revitalization.

Figure 5.28: Opportunity Areas Map—Walnut Park

Figure 5.28 identifies the opportunity areas in the community of Walnut Park. Florence Avenue and Pacific Boulevard are active local commercial corridors that border the City of Huntington Park and the City of South Gate. The area supplies much of the retail, restaurants and services to the residents who live nearby. These corridors are considered opportunity areas because of their proximity to the Florence Station for the Metro Blue Line and the opportunity for increased design, pedestrian and bicyclist improvements, such as street trees, lighting and bicycle lanes.

Figure 5.29: Opportunity Areas Map—West Athens-Westmont

The transit center around the Vermont Station for the Metro Green Line in West Athens-Westmont, as identified in Figure 5.29, presents an opportunity to capitalize on infrastructure investments in a community with high ridership. Vermont Avenue has the potential for increased economic vitality through the creation of employment-rich activities along the commercial corridors that are adjacent to the Metro station. In addition, the residential areas within the transit center would benefit from increased pedestrian amenities and design improvements. The width of Vermont Avenue, in particular, provides major opportunities for pedestrian and bicyclist improvements. Imperial Highway also connects the transit center opportunity area to the areas around the intersection of Western Avenue and Imperial Highway, which provide additional opportunities for design improvements.

Figure 5.30: Opportunity Areas Map—West Rancho Dominguez-Victoria

The intersection of El Segundo Boulevard and Avalon Boulevard in West Rancho Dominguez-Victoria, as shown in Figure 5.30, has the potential to become an active local neighborhood center. The surrounding community is rich with public amenities, such as the Earvin Magic Johnson Park and the A.C. Bilbrew Library. In addition, the area has many multifamily sites, as well as vacant and underutilized commercial sites along El Segundo Boulevard.

Figure 5.31: Opportunity Areas Map—Willowbrook

Significant opportunities exist in Willowbrook, particularly in the area surrounding the Martin Luther King, Jr. Multi-Service Ambulatory Care Center (MLK-MACC), as identified in Figure 5.31. The

rehabilitation and reuse of the site could be a catalyst for further redevelopment. Neighborhood amenities that support healthcare services and office uses, as well as connectivity with the nearby Rosa Parks Metro Blue/Green Line Station will be important factors in future planning activities in the area.

6. San Fernando Valley Planning Area

Figure 5.32: San Fernando Valley Planning Area Map

Planning Area Profile

Location

The San Fernando Valley Planning Area is bordered by the Santa Clarita Valley and the Angeles National Forest to the north, and the Santa Monica Mountains Planning Area and Westside Planning Area to the south. The Ventura County line is the western border of the Planning Area, and the San Gabriel Valley and Downtown Los Angeles make up the eastern border. The San Fernando Valley Planning Area is shown in Figure 5.32.

Population and Housing

Table 5.12: San Fernando Valley Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	1,749,325	5,137	0%
Housing Units	630,556	2,195	0%
Household Size (Average)	2.91	2.72	n/a

Source: 2010 U.S. Census

Table 5.13: San Fernando Valley Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	3,855	75%
Black or African American	148	3%
American Indian and Alaska Native	35	1%
Asian	498	10%
Native Hawaiian and Other Pacific Islander	8	0%
Some Other Race	321	6%
Two or More Races	272	5%
Total	5,137	100%

Ethnicity	Unincorporated Area Population	Percentage

Hispanic or Latino	1,118	22%
Not Hispanic or Latino	4,019	78%
Total	5,137	100%

Source: 2010 U.S. Census

Geography

The San Fernando Valley Planning Area has several distinguishing geographic characteristics. Almost the entire Planning Area is ringed with distinct hillsides and mountain ranges, including the Santa Susana Mountains to the northwest, the Simi Hills to the west, the Santa Monica Mountains and Chalk Hills to the south, the Verdugo Mountains to the east, and the San Gabriel Mountains to the northeast. Looking southeast, highrises from Downtown Los Angeles can be seen from some neighborhoods, passes, and parks in the San Fernando Valley.

The Los Angeles River begins at the confluence of Calabasas Creek and Bell Creek and flows eastward along the southern regions of the Planning Area. One of the Los Angeles River's two unpaved sections can be found at the Sepulveda Basin. The seasonal river, the Tujunga Wash, drains much of the western facing San Gabriel Mountains, and passes through the Hansen Dam Recreation Center in Tujunga, south along the Verdugo Mountains, through the eastern communities of the Planning Area to join the Los Angeles River in Studio City. Mulholland Drive, which runs along the ridgeline of the Santa Monica Mountains, marks the boundary between the Planning Area and Hollywood and the westside of the City of Los Angeles.

Transportation Infrastructure

The development pattern in the Planning Area is almost exclusively suburban, and driving is the dominant mode of transportation. Several freeways cross the Planning Area, most notably, Interstate-405, U.S. Route-101, State Route-118, and Interstate-5. The Planning Area includes the Universal City Station and North Hollywood Station along the Metro Red Line. The Metro Orange Line, which is an east-west rapid transit busway, connects the North Hollywood Station to points west of the Planning Area. Two Metrolink commuter rail lines connect the Planning Area to Downtown Los Angeles. Amtrak's Pacific Surfliner has stations at Burbank Airport, Van Nuys and Chatsworth. Several Metro Rapid bus lines also serve the area.

Planning Area Issues

Only a small portion of the Planning Area is unincorporated. These communities are primarily low-density, suburban communities, with the exception of the Universal Studios Specific Plan area, and Oat Mountain, which is primarily vacant land except for utility facilities. Many of these communities are near environmentally-sensitive and hazardous areas. One of the main hazards facing these communities is wildfires. Sylmar Island, Lopez Canyon, Kagel Canyon, and large portions of Oat Mountain, Westhills, and the Universal Studios Specific Plan area are located within Very High Fire Hazard Severity Zones. In addition, portions of the Planning Area include SEAs. Economic challenges facing the Planning Area include an ongoing decline in manufacturing jobs, a shortage of new or improved industrial and office space, and worsening traffic congestion.

7. Santa Clarita Valley Planning Area

Figure 5.33: Santa Clarita Valley Planning Area Map

Planning Area Profile

Location

The Santa Clarita Planning Area is bordered to the west by the Ventura County line, to the north by the Los Padres National Forest and Angeles National Forest, to the east by the Angeles National Forest, and to the south by a major ridgeline that separates the Santa Clarita Valley from the San Fernando Valley. The Planning Area includes over 480 square miles, of which about 195 square miles are unincorporated. The Planning Area is located approximately 30 to 40 miles northwest of Downtown Los Angeles. The Santa Clarita Valley Planning Area is shown in Figure 5.33.

Population and Housing

Table 5.14: Santa Clarita Valley Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	271,227	94,907	35%
Housing Units	91,094	29,039	32%
Household Size (Average)	3.02	3.14	n/a

Source: 2010 U.S. Census

Table 5.15: Santa Clarita Valley Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	58,135	61%
Black or African American	6,283	7%
American Indian and Alaska Native	464	0%
Asian	13,230	14%
Native Hawaiian and Other Pacific Islander	135	0%
Some Other Race	12,001	13%
Two or More Races	4,659	5%
Total	94,907	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	26,041	27%
Not Hispanic or Latino	68,866	73%
Total	94,907	100%

Source: 2010 U.S. Census

Geography

The Planning Area is framed by the San Gabriel, Santa Susana, and Sierra Pelona mountain ranges, and the Angeles National Forest. The Santa Clara River flows from east to west from its headwaters near Acton to the Pacific Ocean. The Planning Area contains multiple geographic constraints to development, including large swaths of land that are covered by steep hillsides, SEAs, and Very High Fire Hazard Severity Zones.

Transportation Infrastructure

The Planning Area is located at the convergence of several major transportation and utility facilities. The Southern Pacific Railroad, Interstate-5 and State Route-14, and two major aqueducts traverse the Planning Area. In addition, the Metrolink Antelope Valley Line has three station stops, which are located in the City of Santa Clarita. The Agua Dulce Airport is also located in the unincorporated community of Agua Dulce. Additionally, major oil, natural gas, and power lines transect the Planning Area.

Planning Area Issues

Despite the sensitive and hazardous environment, the Planning Area is one of the fastest growing areas in Los Angeles County. In the last 10 years, approximately 33,500 housing units have been approved in the unincorporated portions of the Planning Area. Due to this rapid growth, the Planning Area faces multiple challenges related to infrastructure planning, preservation of open space and biological diversity, jobs-housing balance, reducing vehicle miles traveled, and coordination of public services and facilities.

8. Santa Monica Mountains Planning Area

Figure 5.34: Santa Monica Mountains Planning Area Map

Planning Area Profile

Location

The Santa Monica Mountains Planning Area covers the scenic Santa Monica Mountains and the shoreline along the Pacific Coast to the Ventura County line to the north and west, and up to the San Fernando Valley to the north. The eastern border is the Westside Planning Area and the City of Los Angeles. Some of the unincorporated communities within the Planning Area include: Malibou Lake, Monte Nido, Malibu Vista, Old Topanga, and Topanga. The Santa Monica Mountains Planning Area is shown in Figure 5.34.

Population and Housing

Table 5.16: Santa Monica Mountains Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	85,785	19,222	22%
Housing Units	34,529	7,081	21%
Household Size (Average)	2.62	2.64	n/a

Source: 2010 U.S. Census

Table 5.17: Santa Monica Mountains Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	16,524	86%
Black or African American	440	2%
American Indian and Alaska Native	72	0%
Asian	1,015	5%
Native Hawaiian and Other Pacific Islander	11	0%
Some Other Race	418	2%
Two or More Races	742	4%
Total	19,222	100%

Ethnicity	Unincorporated Area Population	Percentage

Hispanic or Latino	1,551	8%
Not Hispanic or Latino	17,671	92%
Total	19,222	100%

Source: 2010 U.S. Census

Geography

The Planning Area provides recreational opportunities, such as hiking, bicycling, birding, horseback riding, swimming and camping, on county, federal, and state parks and beaches, as well as privately-held conservancy land. The Santa Monica Mountains contain many environmentally sensitive areas.

Transportation Infrastructure

U.S. Route-101 and the Pacific Coast Highway (Highway 1) are the two major roads that serve the Planning Area. There are many scenic roads throughout the Planning Area, two of which are state-designated scenic corridors: two portions of Mulholland Highway and the Malibu Canyon-Las Virgenes Highway.

Planning Area Issues

The Planning Area's natural beauty comes with multiple environmental issues and numerous natural hazards. The Planning Area contains an SEA and SERAs. Development pressures, particularly in the Santa Monica Mountains, sometimes result in a conflict between habitat protection and development. Maintaining recreational areas, protecting environmentally-sensitive lands, expanding public access to the coast, and protecting residents from natural hazards are priorities in the Santa Monica Mountains Planning Area. In addition, a majority of the Planning Area is designated a Very High Fire Hazard Severity Zone. The Santa Monica Mountains are frequently struck by wildfires, which threaten the safety of people living along the Mountains' winding, narrow roads, which are often in very isolated locations. The Santa Monica Mountains are also subject to slope failure due to their geology and steep topography, particularly during rainstorms. Wildfire threats combined with limited road access pose dangers for area residents.

9. South Bay Planning Area

Figure 5.35: South Bay Planning Area Map

Planning Area Profile

Location

The South Bay Planning Area is located in the southwest corner of Los Angeles County. The Pacific Ocean provides the western border and the Gateway Planning Area and Metro Planning Area provide the eastern and northern borders. The Westside Planning Area lies directly north of the Planning Area. The South Bay Planning Area is shown in Figure 5.35.

Population and Housing

Table 5.18: South Bay Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	1,016,674	69,612	7%
Housing Units	373,187	21,348	6%
Household Size (Average)	2.83	3.31	n/a

Source: 2010 U.S. Census

Table 5.19: South Bay Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	29,592	43%
Black or African American	4,711	7%
American Indian and Alaska Native	539	1%
Asian	10,133	15%
Native Hawaiian and Other Pacific Islander	697	1%
Some Other Race	20,508	29%
Two or More Races	3,432	5%
Total	69,612	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	40,504	58%

Not Hispanic or Latino	29,108	42%
Total	69,612	100%

Source: 2010 U.S. Census

Geography

The majority of the Planning Area is comprised of low-level areas of the Los Angeles basin. The Palos Verde Peninsula is covered with hills, open spaces and communities that abut cliffs and rocky shorelines along the Pacific Coast.

Transportation Infrastructure

The Planning Area is served mainly by four major freeways: Interstate-105, Interstate-405, Interstate-110, and State Route-91. The Metro Green Line also serves the Planning Area. Other transportation facilities in the region include Torrance Municipal Airport-Zamperini Field and Hawthorne Municipal Airport. The Los Angeles International Airport (LAX) is located in the northern portion of the Planning Area. The Port of Los Angeles is also located in the Planning Area.

Planning Area Issues

Issues facing the Planning Area include traffic congestion, limited public transportation options, air quality concerns, and a lack of developable land. Also, due to the region's proximity and inclusion of major transportation hubs—LAX and the ports of Long Beach and Los Angeles—goods movement has become an important part of the Planning Area's economy. However, goods movement also creates planning and environmental challenges. While physical infrastructure improvements are needed to ensure that freeways and streets are adequate to serve increased truck volumes, the massive increase in cargo volume has created significant air pollution impacts to neighboring communities. In addition, petroleum refining is a significant source of air pollution in the region.

Although manufacturing still plays an important role in the region's economy, certain communities have witnessed a decline in manufacturing/industrial uses in recent years. This creates both brownfield redevelopment potential and land use planning challenges. For instance, in unincorporated West Carson, abandoned industrial sites have been redeveloped into multifamily residential uses, which creates land use incompatibility between the new high-density residential developments and the adjacent active industrial uses. The Planning Area's proximity to LAX, one of the busiest airports in the world, also creates a unique land use planning challenge to the region. Neighboring communities, including unincorporated Lennox and Del Aire, will need to continue their efforts to mitigate the noise impacts generated by aircraft on predominately lower density residential areas.

Opportunity Areas

Figure 5.36: Opportunity Area Map—Alondra Park

The Crenshaw Boulevard corridor, depicted in Figure 5.36, only covers a small portion of Alondra Park, but includes a range of commercial uses and has potential for pedestrian-scale and mixed use development. In addition, Alondra Park is home to El Camino Community College, which makes this corridor an important connector for commuting students, faculty and staff. Future planning efforts must be closely coordinated with the City of Gardena, which has jurisdiction over the eastern portion of Crenshaw Boulevard.

Figure 5.37: Opportunity Area Map—Del Aire

The Del Aire opportunity area includes the Aviation/LAX Station on the Metro Green Line and a corridor along Inglewood Avenue. As shown in Figure 5.37, the transit center around the Metro station provides opportunities to activate the land uses adjacent to the station and provide design improvements, including pedestrian and bicycle amenities. Inglewood Avenue, as an existing commercial corridor with a mix of uses, including neighborhood-serving businesses, also provides opportunities for mixed use development, as well as design improvements for pedestrians and bicyclists.

Figure 5.38: Opportunity Area Map—Lennox

The Metro Green Line also includes the Hawthorne Station in Lennox. As shown in Figure 5.38, the corridor along Hawthorne Boulevard and the area at the intersection of Hawthorne Boulevard and Lennox Boulevard, within the transit center, provide opportunities for mixed uses, as well as design improvements.

Figure 5.39: Opportunity Area Map—West Carson

West Carson is home to many opportunity areas in the South Bay Planning Area, which are identified in Figure 5.39. Portions of West Carson have undergone transition from a warehousing and distribution center servicing the Port of Los Angeles, to a higher density residential community impacted by the rapid growth of the nearby City of Torrance and City of Carson. An Industrial Flex District identifies an area with an opportunity for industrial uses to transition to non-industrial uses through future planning efforts. Harbor-UCLA Medical Center, also located in West Carson, is a major employer and activity center in the area. Planned future expansions of the medical facility, as well as its proximity to the Metro Silver Line, provide redevelopment and infill opportunities in the surrounding neighborhoods.

10. West San Gabriel Valley Planning Area

Figure 5.40: West San Gabriel Valley Planning Area Map

Planning Area Profile

Location

The Angeles National Forest is the northern border of the West San Gabriel Valley Planning Area, while Downtown Los Angeles and the Gateway Planning Area make up the southern border. The eastern border of the Planning Area is roughly Interstate-605. The West San Gabriel Valley Planning Area is shown in Figure 5.40.

Population and Housing

Table 5.20: West San Gabriel Valley Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	915,196	122,834	13%
Housing Units	319,288	43,239	14%
Household Size (Average	2.99	2.98	n/a

Source: 2010 U.S. Census

Table 5.21:West San Gabriel Valley Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	60,555	49%
Black or African American	11,748	10%
American Indian and Alaska Native	689	1%
Asian	29,338	24%
Native Hawaiian and Other Pacific Islander	121	0%
Some Other Race	14,911	12%
Two or More Races	5,472	4%
Total	122,834	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	36,762	30%

Not Hispanic or Latino	86,072	70%
Total	122,834	100%

Source: 2010 U.S. Census

Geography

The Planning Area includes the San Gabriel Mountains and Angeles National Forest, and provides a large range of open space and recreational opportunities for area residents. The San Gabriel River flows north-south along the Planning Area's eastern border and Interstate-605. The Planning Area is almost entirely developed with historically suburban developments.

Transportation Infrastructure

Two major east-west freeways, Interstate-10 and Interstate/State Route-210, run through the Planning Area. In addition, the Metro Gold Line traverses the City of Pasadena and terminates adjacent to unincorporated East Pasadena-East San Gabriel. Metro has also approved the expansion of the Gold Line light rail to several communities in the Planning Area. Other available transit options include Foothill Transit, which operates multiple bus lines throughout the Planning Area. The El Monte Airport is also located in the Planning Area.

Planning Area Issues

The Planning Area is comprised of mature, suburban communities, including some in the foothills of the San Gabriel Mountains. Some of these communities contain environmental resources and others face hazardous constraints. Portions of the Altadena Foothills and Arroyos SEA, San Gabriel Canyon SEA, and Puente Hills SEA cover the Planning Area. In addition, many of the foothill communities are designated Very High Fire Hazard Severity Zones, which reflects the increased threat of wildfires and subsequent mudslides within those areas.

Many of the unincorporated areas are isolated islands of almost entirely residential development. It is important to integrate these islands into the fabric of their surrounding communities, where many of the services and daily needs of the unincorporated residents are met.

Opportunity Areas

Figure 5.41: Opportunity Area Map—Altadena

Located in the heart of Altadena, Lake Avenue, between Altadena Drive and New York Drive, as shown in Figure 5.41, is a commercial corridor with various community-serving businesses, such as retail commercial, restaurants, services, and small professional offices.

Figure 5.42: Opportunity Area Map—East Pasadena-East San Gabriel

The intersection of Colorado Boulevard and Rosemead Boulevard in East Pasadena–East San Gabriel is an active local commercial center. Due to its proximity to the Sierra Madre Villa Station on the Metro Gold Line, this area has the opportunity for increased pedestrian and bicyclist improvements, as well as more transit-oriented developments. In addition, along Rosemead Boulevard, there is also a variety of retail commercial, restaurants, services and apartment complexes. This corridor is considered an opportunity area because it can serve as an extension of the transit center opportunity area, both of which are identified in Figure 5.42.

Figure 5.43: Opportunity Area—La Crescenta-Montrose Map

Foothill Boulevard in La Crescenta-Montrose, as shown in Figure 5.43, is an active local commercial corridor. The corridor supplies much of the retail, restaurants and services to nearby residents. This corridor is considered an opportunity area for increased design, pedestrian and bicyclist improvements, such as street trees, lighting and bicycle lanes.

Figure 5.44: Opportunity Area Map—South Monrovia Islands

Although Live Oak Boulevard in unincorporated South Monrovia Islands only covers a few blocks, it is part of a major corridor that runs from the City of Arcadia to the west and the City of Irwindale to the east, as shown in Figure 5.44. The corridor provides much of the retail, restaurants and services to nearby residents. This corridor is considered an opportunity area for its potential for increased design, pedestrian and bicyclist improvements, such as street trees, lighting, and bicycle lanes.

11. Westside Planning Area

Figure 5.45: Westside Planning Area Map

Planning Area Profile

Location

The Westside Planning Area covers the coastal communities, including Marina del Rey, the westside of the City of Los Angeles, and other small cities, such as the City of Santa Monica, City of Beverly Hills, and City of West Hollywood. The Westside Planning Area is shown in Figure 5.45.

Population and Housing

Table 5.22: Westside Planning Area, Population and Housing, 2010

	Planning Area	Unincorporated Area	Percentage Unincorporated
Population	974,646	27,407	3%
Housing Units	482,821	14,564	3%
Household Size (Average)	2.13	2.05	n/a

Source: 2010 U.S. Census

Table 5.23: Westside Planning Area, Race and Ethnicity, 2010

Race	Unincorporated Area Population	Percentage
White	9,157	33%
Black or African American	14,981	55%
American Indian and Alaska Native	105	0%
Asian	1,236	5%

Native Hawaiian and Other Pacific Islander	18	0%
Some Other Race	572	2%
Two or More Races	1,338	5%
Total	27,407	100%

Ethnicity	Unincorporated Area Population	Percentage
Hispanic or Latino	1,907	7%
Not Hispanic or Latino	25,500	93%
Total	27,407	100%

Source: 2010 U.S. Census

Geography

The western portion of the Planning Area is comprised of a string of beaches and Marina del Rey. The Planning Area contains one of the few remaining wetlands in Ballona Creek. The eastern portion of the Planning Area includes the Baldwin Hills and Kenneth Hahn State Park, which provide natural areas and recreational opportunities for area residents. Marina del Rey is the largest, man-made small boat harbors in the country and is bounded by the City of Los Angeles.

Transportation Infrastructure

Opportunities for new development are being explored along planned Metro line expansions that will bring rail transit to the Planning Area. Although the Planning Area is served by multiple bus routes, it is not served by rail service and is impacted by traffic congestion. The Metro Expo Line serves the Planning Area, including stations at the University of Southern California, Exposition Park, Culver City, the Crenshaw District, and connection to Downtown Los Angeles. In addition, there are two airports in the Planning Area: LAX and the Santa Monica Municipal Airport. Marina del Rey is a popular and highly active small boat harbor with 19 marinas with room for roughly 5,300 boats.

Planning Area Issues

Significant environmental resources exist in the Planning Area, most notably the Ballona Wetlands, which are threatened by potential sea level rise due to climate change. Marina del Rey faces traffic congestion and housing affordability issues; however, protection of the coastline and fish and wildlife

resources is unique to this coastal community. Large portions of the area, including Marina del Rey, are located in a liquefaction zone. Marina del Rey is also in a tsunami hazard zone and is particularly susceptible to the negative impacts of climate change. In addition, most of Ladera Heights / View Park–Windsor Hills is in a Very High Fire Hazard Severity Zone. There is also a fault trace running through this community. The Planning Area also includes a large urban oil field in Baldwin Hills.

Traffic congestion is one of the biggest issues facing the Planning Area. The Metro Expo Line runs through Culver City to the westside of the City of Los Angeles, but the popular and populous northern routes are not served by rail transit. Another issue is the relatively high cost of land and housing. The Planning Area is seen as a desirable place to live and do business, but there is little land for new development and costs are high.

Opportunity Areas

Figure 5.46: Opportunity Area Map—Ladera Heights/View Park—Windsor Hills

The Slauson Boulevard opportunity area in Ladera Heights/View Park–Windsor Hills, shown in Figure 5.46 is a commercial corridor with a major commercial center at the intersection of Overhill Drive. The area is characterized by a mix of large parcels with regional commercial activities and local-serving retail services and offices. Significant pedestrian improvements and commercial corridor revitalization are needed to create an attractive, walkable center with linkages to nearby residential neighborhoods.

Figure 5.47: Opportunity Area Map—Sawtelle - VA

The Sawtelle – VA opportunity area, shown in Figure 5.47, is a transit center in anticipation for the extension of the Purple Line.

[Text Box]

Impacts of Social and Economic Factors on Health

The report on "How Social and Economic Factors Affect Health," published by the County Department of Public Health, demonstrates the impact of social determinants on the overall health of Los Angeles County, as well as disparities in health, and the importance of active multi-sectoral partnerships. The report is available at http://www.publichealth.lacounty.gov/epi/reports.htm.

Part III: General Plan Elements

Chapter 6: Land Use Element

I. Introduction

The Land Use Element provides strategies and planning tools to facilitate and guide future development and revitalization efforts. In accordance with the California Government Code, the Land Use Element designates the proposed general distribution and general location and extent of uses. The General Plan Land Use Policy Map and Land Use Legend serve as the “blueprint” for how land will be used to accommodate growth and change in the unincorporated areas.

II. Background

Land Uses

As shown in Table 6.1, more than half of the unincorporated area is designated for natural resources. The next largest is rural, which accounts for approximately 39 percent of the unincorporated areas, followed by residential, which accounts for approximately three percent of the unincorporated areas.

Table 6.1: General Land Use Categories, by Acreage

General Land Use Categories	Acres
Residential	51,480
Rural	641,321
Commercial	5,268
Industrial	7,304
Natural Resources*	844,224
Public and Semi-Public	79,920
Mixed Use	291
Specific Plan**	13,556
Other***	1,080
Total:	1,644,444

*Natural Resources includes all natural resource and categories (including natural areas, developed parks, waterways, golf courses, etc.), and military areas (San Clemente Island and Edwards AFB).

** Specific Plans include a combination of land uses.

** Some area and community plans have special categories that do not fit into the scheme of the Land Use Legend categories (such as "special use sites," parking areas, senior citizen density bonus areas, etc.)

General Plan Amendments and Implementation Tools

As the constitution for local development, the General Plan guides all activities that affect the physical environment.

General Plan Amendments

The General Plan will be amended periodically and through a comprehensive, community-based effort to address changes to community priorities, demographics or economic trends. Project-specific amendments must be consistent with the General Plan's overall intent, goals and policies.

Subdivision and Zoning Codes (Title 21 and 22)

The County's Zoning Code, Subdivision Code, and zoning map are implementation tools of the General Plan that provide details on specific allowable uses, design and development standards, and procedures. Zoning and subdivision regulations govern the division, design and use of individual parcels of land, including minimum lot size, lot configuration, access, height restrictions, and yard setbacks standards for structures.

For more information on the Los Angeles County Subdivision and Zoning codes (Titles 21 and 22), please visit the Los Angeles County Department of Regional Planning's web site at http://planning.lacounty.gov.

Specific Plans

A specific plan is a tool to systematically implement the General Plan within an identified project area. Specific plans are used to ensure that multiple property owners and developers adhere to a common plan or coordinate multiple phases of a long-term development. Specific plans must further the goals and policies of the General Plan. Specific plans must be consistent with the General Plan. No local public works project may be approved, no tentative map or parcel map for which a tentative map was not required may be approved, and no zoning ordinance may be adopted or amended within an area covered by a specific plan unless it is consistent with the adopted specific plan.

California Government Code Sections 65450 et seq. require specific plans to include text and a diagram(s) to detail the following:

- Distribution, location, and extent of the uses of land, including open space, within the project area;

- Proposed distribution, location and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the project area and needed to support the land uses described in the specific plan;

- Standards and criteria by which development will proceed and, where applicable, standards for conservation, development, and utilization of natural resources; and

- Implementation measures, including regulations, programs, public works projects, and financing measures necessary to carry out the above.

Specific plans must include a statement of the relationship of the specific plan to the General Plan, and may also include provisions regarding affordable housing, resource management, development requirements or any other matter relevant to the project area. In addition, a specific plan must be prepared, adopted, and amended in the same manner as a general plan, except that a specific plan may be adopted by resolution or by ordinance and may be amended as often as deemed necessary by the Board of Supervisors. A specific plan may be repealed in the same manner as it is required to be amended. Furthermore, a specific plan may be initiated by the public or private sector; however, the responsibility for the adoption, amendment, and repeal lies with the Board of Supervisors.

The Specific Plan Overlay in the General Plan Land Use Legend identifies the boundaries and shows the relationship of specific plans to the General Plan Land Use Policy Map.

The following is a list of specific plans in the unincorporated areas:

- Canyon Park Specific Plan
- East Los Angeles Third Street Plan and Form-Based Code Specific Plan
- La Viña Specific Plan
- Marina del Rey Specific Plan (component of Local Coastal Program)
- Santa Catalina Island Specific Plan (component of Local Coastal Program)
- Northlake Specific Plan
- Newhall Ranch Specific Plan
- Universal Studios Specific Plan

Development Agreements

A development agreement is a negotiated contract between the County and a private developer that, among other things, secures land use and zoning regulations for the duration of the agreement. A development agreement provides assurance to an applicant that a development project may proceed in accordance with existing policies, rules and regulations, and conditions of approval in effect at the time the agreement is adopted. The agreement in turn allows the County to negotiate a wider range of public benefits, including but not limited to, affordable housing, civic art, open space, or other amenities not authorized or required by current ordinances.

A development agreement must specify the duration of the agreement, the permitted uses of the property, the density or intensity of use, the maximum height and size of proposed buildings, and provisions for reservation or dedication or land for public purposes. It may include fees, conditions, terms, restrictions, and requirements for subsequent discretionary actions. However, any future actions must not prevent the development of the land for the uses and the density or intensity of development set forth in the agreement. Furthermore, the agreement may also include timeframes for commencing or completing construction, and terms and conditions for financing necessary public facilities and subsequent reimbursement.

Government Code Sections 65865 et seq. authorize the Board of Supervisors to adopt development agreements. At the time of adoption, a development agreement must be consistent with the General Plan and any applicable specific plan.

Special Management Areas

The County's Special Management Areas require additional development regulations to prevent the loss of life and property, and to protect the natural environment and important resources. The County's Special Management Areas are shown in Figure 6.1.

The General Plan minimizes risks to hazards and discourages development in Special Management Areas through goals and policies. The Hazard, Environmental and Resource Constraints Model, which is a visual representation of some of the Special Management Areas, can be used to inform applicants

and property owners of potential site constraints, as well as to guide community-based planning efforts. For more information on the Hazard, Environmental and Resource Constraints Model, please refer to Appendix C.

Figure 6.1: Special Management Areas Policy Map

Special Management Areas are comprised of the following:

Agricultural Resource Areas

Agricultural Resource Areas (ARAs) consist of farmland identified by the California Department of Conservation and farms that have received permits from the County Agricultural Commissioner/Weights and Measures. The County encourages the preservation and sustainable utilization of agricultural land, agricultural activities, and compatible uses within these areas. ARAs are described in greater detail in the Conservation and Natural Resources Element.

Airport Influence Areas

Airport Influence Areas are comprised of airport property, runway protection zones, and noise contours. With certain exceptions, all developments located in an Airport Influence Area are subject to review by the Los Angeles County Airport Land Use Commission (ALUC) for compliance with noise and safety regulations, per Title 21 of the California Code of Regulations. The Airport Influence Areas are shown in Figure 6.2.

Figure 6.2: Airport Influence Areas Policy Map

Coastal Zone

The coastal zones comprised of land and water areas regulated by the California Coastal Commission. There are five unincorporated areas in the coastal zone: Santa Catalina Island, Marina del Rey, Santa Monica Mountains, Ballona Wetlands, and San Clemente Island. In accordance with the California Coastal Act, all development within the coastal zone must first obtain a Coastal Development Permit (CDP). Local Coastal Programs (LCPs) establish detailed land use policy and development standards within their respective coastal zone segments.

The County has certified LCPs for Santa Catalina Island and Marina del Rey. In areas where an LCP has not yet been certified, specific development proposals are reviewed by the County for consistency with the General Plan, but the final authority to issue CDPs lies with the California Coastal Commission.

In the coastal zone, the County has designated several types of coastal resources that are important to protect. These resources include: Environmentally Sensitive Habitat Areas; Significant Woodlands and Savannahs; Significant Watersheds; the Malibu Cold Creek Resource Management Area; and the Wildlife Migration Corridor. Coastal resources are described in greater detail in the Conservation and Natural Resources Element.

Historic, Cultural and Paleontological Resources

Historic, Cultural and Paleontological Resources include historic buildings, structures, Native American artifacts or sites, and districts of historical, architectural, archaeological, or paleontological significance that are officially recognized by the California Office of Historic Preservation or identified in authoritative surveys of archaeological societies, historical societies, or academic studies. Historic,

Cultural and Paleontological Resources are described in greater detail in the Conservation and Natural Resources Element.

Flood Hazard Zones

Flood Hazard Zones are areas subject to flooding. The Federal Emergency Management Agency (FEMA) delineates flood hazard zones as special hazard areas, or areas of moderate or minimal hazard on flood insurance rate maps. Flood Hazard Zones are described in greater detail in the Safety Element.

Mineral Resource Zones

Mineral Resource Zones are commercially viable mineral or aggregate deposits, such as sand, gravel, and other construction aggregate. The County's Mineral Resources consist of the California Geological Survey's identified deposits of regionally significant aggregate resources. Mineral Resource Zones are described in greater detail in the Conservation and Natural Resources Element.

Military Influence Areas

The U.S. Department of Defense is responsible for thousands of acres within Los Angeles County, including installations and facilities. Coordination between the County and the U.S. Department of Defense is important to ensure compatibility between military influence areas, and adjacent land uses. The management of natural resources within military installations and operation areas are described in greater detail in the Conservation and Natural Resources Element.

A Military Operation Area (MOA) is a three-dimensional airspace designated for military training and transport activities that have a defined floor (minimum altitude) and ceiling (maximum altitude). Within Los Angeles County, there are several MOAs used by military aircraft to practice high and low altitude training exercises and travel routes between military installations. Additionally, in and around MOAs, testing is conducted to maintain military readiness. A High Risk of Adverse Impact Zone (HRAIZ) depicts the Air Force area of interest for wind development within Los Angeles County. The 412th Test Wing Mission at Edwards Air Force Base provides full spectrum aircraft research, development, test, and evaluation capabilities. Wind turbines built within the radio frequency line of sight of related systems can create significant adverse impacts to test and evaluation activities depending on vertical height, electromagnetic sensitivity and distance from activities conducted on the range.

In guiding growth and development in the unincorporated areas, it is important to consider the critical role of MOAs and HRAIZs in support of national defense. The General Plan considers all future land uses that seriously impact or hinder the military's training and testing capabilities to be incompatible land uses.

Figure 6.3: Military Influence Areas Map

National Forests

The Los Padres National Forest and Angeles National Forest encompass nearly 650,000 acres of land within Los Angeles County. Nearly 40,000 acres are privately-owned. For these parcels, commonly referred to as in-holdings, the County retains responsibility for land use regulation. Privately-owned parcels in the national forests are regulated consistently with the overall mission and management plans of the national forests, which the U.S. Forest Service prepares and periodically updates. The national forests are described in greater detail in the Conservation and Natural Resources Element.

Open Space Resource Areas

Open Space Resource Areas refer to public and private lands, and waters that are preserved in perpetuity or for long-term open space and recreational uses. Existing open spaces in the unincorporated areas include County parks and beaches, conservancy lands, state parklands, and federal lands. Open spaces can also include deed-restricted open space parcels and easements. Open Space Resource Areas are described in greater detail in the Conservation and Natural Resources Element.

Scenic Resources

The County recognizes that scenic features in the region, such as the coastline and mountain vistas are significant natural resources for the County. One type of scenic resource is the Hillside Management Areas (HMAs), which are mountainous or foothill terrain with a natural slope of 25 percent or greater. The purpose of the Hillside Management Ordinance in Title 22 of the County Code is to regulate development within Hillside Management Areas to 1) protect the public from natural hazards associated with steep hillsides, and 2) to minimize the effects of development and grading on the scenic resources. In addition to HMAs, the General Plan protects ridgelines, scenic viewsheds, and areas along scenic highways. Scenic resources are described in greater detail in the Conservation and Natural Resources Element.

Seismic and Geotechnical Hazard Zones

Seismic and Geotechnical Hazard Zones include active and potentially active faults identified by the California Geological Survey (formerly the Division of Mines and Geology) under the provisions of the Alquist-Priolo Earthquake Fault Zones Act (California Public Resources Code, Division 2, Chapter 7.5), as well as faults that are considered active based on published and unpublished information. The Seismic and Geotechnical Hazard Zones also include seismically-induced liquefaction and landslide areas. Seismic and Geotechnical Hazard Zones are described in greater detail in the Safety Element.

Significant Ecological Areas and Coastal Resource Areas

A Significant Ecological Area (SEA) designation is given to land in the County that contains irreplaceable biological resources. Cumulatively, the 21 SEAs and nine Coastal Resource Areas (CRAs) represent the wide-ranging biodiversity of Los Angeles County, and contain its most important biological resources. Individual SEAs include undisturbed or lightly disturbed habitat that support valuable and threatened species, linkages and corridors that facilitate species movement, and are sized to support sustainable populations of its component species. SEAs and CRAs are described in greater detail in the Conservation and Natural Resources Element.

Very High Fire Hazard Severity Zones

Very High Fire Hazard Severity Zones (VHFHSZ) are woodland and brush areas with high fire potential. VHFHSZs are discussed in greater detail in the Safety Element.

Disadvantaged Unincorporated Legacy Communities (SB 244)

SB244, which became effective in 2011, requires cities and counties to identify and study the infrastructure needs of disadvantaged unincorporated communities. These communities were identified and studied only for the infrastructure needs based on the State criteria. The County used the following criteria to identify "disadvantaged unincorporated legacy communities" as required by state law:

- Parcels are at least 50 years old.
- Parcels are outside of a city's sphere of influence.
- Parcels are clustered with 10 or more units in close proximity.
- Households earn less than 80% of the state median income.

As shown in Figure 6.4, the majority of parcels identified for SB 244 are concentrated in the eastern portion of the Antelope Valley. The remaining parcels are located in the western portion of the Antelope Valley, Lopez Canyon, Kagel Canyon, Altadena, Hacienda Heights, and Rowland Heights.

Figure 6.4: Disadvantaged Unincorporated Communities (SB 244)

For a general assessment of structural fire protection for the unincorporated areas, please refer to the Fire Hazards section of the Safety Element. For information on water service and sanitary sewers, please refer to the Drinking Water and Sanitary Sewer sections of the Public Services and Facilities Element. For information on stormwater management, please refer to the Local Water Resources section of the Conservation and Natural Resources Element. The intent of the General Plan is to address the specific needs of the disadvantaged legacy communities through area planning efforts. Please refer to Program PS/F-1: Planning Area Capital Improvement Plans in Chapter 16: General Plan Implementation Programs.

III. Issues

1. Creating Opportunities for Infill Development

Infill development contributes to compact development, which consumes less land and resources. It can reduce the costs of providing public infrastructure and services. It is important to recognize the opportunities as well as challenges of infill development in the unincorporated areas.

Transit Oriented Development

Urban and suburban areas with access to major transit and commercial corridors have the most potential for infill development. Transit-oriented development is well-suited for higher density housing and mixed uses in urban and suburban areas, with nodes commercial, employment, and civic activities. Transit-oriented development in urban and suburban areas connects neighborhoods, and community and employment centers through a broad network of pedestrian, bicycle, transit, and roadway facilities.

Transit Oriented Districts (TODs)

Transit Oriented Districts (TODs) are areas within a 1/2 mile radius from a major transit stop that have development and design standards, and incentives to facilitate transit-oriented development. Figure 6.5 shows the location of the following 11 TODs:

- Aviation/LAX Station TOD (Metro Green Line)
- Hawthorne Station TOD (Metro Green Line)
- Vermont Station TOD (Metro Green Line)
- Rosa Parks Station TOD (Metro Green Line/Blue Line)
- Slauson Station TOD (Metro Blue Line)
- Florence Station TOD (Metro Blue Line)
- Firestone Station TOD (Metro Blue Line)
- Del Amo Station TOD (Metro Blue Line)
- Sierra Madre Villa Station TOD (Metro Gold Line)
- Third Street TOD Corridor (Metro Gold Line Eastside Extension)
- 110 Freeway/Carson Station TOD (connection to Metro Silver Line)

All TODs will be implemented by a TOD specific plan, or a similar mechanism, with standards, regulations, and infrastructure plans that tailor to the unique characteristics and needs of each community, and address access and connectivity, pedestrian improvements, and safety. For more information, please refer to Program LU-2 Transit Oriented District Program in Chapter 16 General Plan Implementation Programs.

The TOD plans will address existing challenges within many of the County's TODs. For example, many of the transit stations that serve the unincorporated areas are located in the middle of freeways, which limit access to the station, expose users to traffic and noise pollution, and create unsafe environments for pedestrians. Another challenge to implementing TODs is the existing development patterns around the transit stations. As many of the lots are small, developments will require lot consolidation and incentives to utilize higher densities.

Figure 6.5: Transit Oriented Districts Policy Map

Vacant and Underutilized Parcels

Infill potential in urbanized areas is measured by the availability of vacant and underutilized parcels. Many vacant or underutilized parcels in infill areas have site constraints and in some cases, do not meet current zoning regulations and development standards. For example, many infill parcels along major commercial corridors are shallow or narrow, and new parking, landscaping or drainage requirements may require more land area than physically or financially feasible. Regulatory incentives, such as lot consolidation provisions and parking reductions, are needed to encourage development on these sites.

Brownfields

Brownfield sites are former industrial or commercial sites that are abandoned or underutilized due to real or perceived environmental contamination from previous or current uses. Brownfield sites present infill development opportunities, as well as opportunities to clean up environmentally damaged sites.

The costs and liability associated with remediating brownfield sites, however, is a deterrent to redevelopment. The availability of technical assistance, financing and other programs is necessary to promote brownfields redevelopment.

Adaptive Reuse

Adaptive reuse can play a key role in revitalizing older, economically-distressed neighborhoods. Older and often historically significant buildings can be recycled and converted into other uses, such as multifamily residential developments, live and work units, mixed use developments, or commercial uses. However, preexisting conditions, such as building location, lack of onsite parking, footprint and size can add to the difficulty in meet current zoning regulations and development standards. Regulatory incentives, such as flexibility in zoning, are needed to encourage the adaptive reuse of older buildings.

2. The Impacts of Suburban Sprawl

Suburban sprawl is a land use pattern that extends urban infrastructure and residential development into undeveloped areas with limited or no infrastructure, such as roads, public utilities, and public transit. While well-designed development may occur in isolation, the impacts of suburban sprawl can be seen when there are no clear and defined growth boundaries and strong development restrictions, which results, over time, in the spread of the initial developed area into surrounding undeveloped areas. A suburban sprawl land use pattern puts the unincorporated areas at risk of losing resources, such as agricultural lands, and will contribute to the fragmentation and isolation of open space areas. Suburban sprawl also can potentially contribute to traffic congestion, air pollution, and greenhouse gas emissions.

3. Protecting Rural Communities

“Rural” is defined as a way of life characterized by living in a non-urban or agricultural environment at low densities without typical urban services. Urban services and facilities not normally found in rural areas, unless determined to be necessary for public safety, include curbs, gutters and sidewalks; street lighting, landscaping and traffic signalization; public solid waste disposal, integrated water and sewerage system; mass transit; and commercial facilities dependent upon large consumer volumes, such as regional shopping centers, sports stadiums and theaters.

4. Land Use Compatibility and Distribution

Land Use Compatibility

The placement, configuration, and distribution of land uses have a significant impact on a community’s quality of life. For example, in some cases, a residential use could be impacted by noise, traffic and odor from adjacent commercial or heavy industrial uses. The General Plan addresses land use compatibility by mapping and regulating uses and intensities, and including policies and programs that mitigate land use conflicts through design, such as the use of landscaping, walls, building orientation, and performance standards. The General Plan also encourages developments that are compatible with community identity and character and existing conditions, such as rural and natural environmental settings.

The General Plan encourages the protection of major facilities, such as landfills, solid waste disposal sites, energy facilities, natural gas storage facilities, oil and gas production and processing facilities, military installations, and airports from the encroachment of incompatible uses. For example, the County’s Airport Land Use Plan, which was adopted by the ALUC in 1991, addresses compatibility between airports and surrounding land uses by addressing noise, overflight, safety, and airspace

protection concerns to minimize the public's exposure to excessive noise and safety hazards within Airport Influence Areas.

Planning for Various Needs through Land Use Planning

Land use planning can contribute to addressing community needs. For example, complementary land uses, such as local-serving grocery stores, parks and schools in residential neighborhoods, or community-serving uses near employment centers, can promote a balanced distribution of jobs, housing and services. The Housing Element identifies the need to plan for denser and more compact housing types are necessary in the unincorporated areas to accommodate the changing housing needs for populations, such as a growing senior citizen population, younger individuals living alone, low-income households, and others who need and/or desire apartments, condominiums, and smaller, more affordable housing units. There is also a need to plan for areas that accommodate job growth and support increased demand for goods and services. Furthermore, there is a need to plan for community-serving commercial uses.

Land use planning can also provide access to amenities that can lead to important health outcomes, such as reducing the occurrence of obesity and chronic diseases. In particular, access to food systems is critical for healthy, livable, and equitable communities. Ensuring that opportunities exist to grow, sell, and consume healthy foods promotes public health and supports efforts to reduce obesity rates.

Among community-serving uses, early care and education falls short of meeting demand. There is a need to ensure that all households have access to a sufficient supply of quality early care and education and supervised school-age enrichment options for children from birth to age 13. In conjunction with the goals, strategies and objectives of the County's Child Care Policy Framework and Child Care Planning Committee, the General Plan encourages and facilitates the development of early care and education in the unincorporated areas. For more information, please visit the CEO Office of Child Care web site at http://childcare.lacounty.gov.

5. Community Wellness

Community design and sustainable developments are two concepts that contribute to land use patterns and community infrastructure that promote health and wellness in communities.

Community Design

Community design relates to the physical character of a community, and the relationship between people and their environment. What constitutes "good" design is entirely dependent on the context and perspective of each individual community. Community design in rural areas in the Antelope Valley is different from community design in urbanized communities, such as East Los Angeles and Florence-Firestone.

Successful community design standards build upon the characteristics of both the natural and man-made environments that are unique to each community. Community design is more than a focus on the architectural style of a specific building or site. It involves groups of related elements and uses that when taken together, define a community. In some areas, community design considers the scale of new buildings relative to neighboring structures, the relationship of the street to the sidewalk, neighborhood gateways and streetscape improvements. Examples of community design elements include consistent landscaping for streets or uniform signage that designates a special district within a community in an urbanized setting; or large minimum lot sizes, standards to minimize the visual impact of man-made structures on the rural landscape, and design standards for equestrian trails in a rural setting.

The General Plan provides general community design policies that help create a “sense of place” and uniqueness within the diverse communities of the unincorporated areas.

The Role of the Arts

Artistic and cultural resources are important components of community design. Civic art, which improves the quality of the environment and fosters a positive community identity, can be used in conjunction with community design efforts to sustain and enhance community character and a sense of place. The arts can play a central role in comprehensive community revitalization efforts that include public safety, health, education, affordable housing, transportation, planning, and design.

The General Plan protects existing artistic and cultural assets, and promotes the creation of new art to enhance communities. The General Plan also includes implementation programs that promote creative place-making to enhance the physical and social character of healthy, livable communities.

Sustainable Developments

Below are techniques that could help achieve a range of sustainable development.

Energy Efficient Developments

Sustainable practices, such as optimizing the solar orientation of buildings to maximize passive and active solar design techniques, result in healthier and energy efficient environments. In addition, providing substantial tree canopy cover, and utilizing light colored paving materials and energy-efficient roofing materials, can reduce the urban heat island effect.

Sustainable Subdivision Design

Energy Efficient Lot Design

The size, shape and orientation of a lot are important considerations in achieving energy-efficient building designs. Energy-efficient lot design maximizes solar access during the cooler months, while minimizing solar access during the warmer months. The slope of the land also has implications for lot design and energy-efficiency. Constructing roads to follow slope contours can reduce construction costs and minimize energy inputs to the development of the site.

Street Patterns, Public Transportation and Implications for Accessibility

An interconnected street pattern that minimizes cul-de-sacs and dead ends provides increased safety and a greater number of route options for pedestrians, bicyclists and motorists. Interconnected streets also provide direct access to schools and neighborhood shopping without cars. Interconnected streets disperse rather than concentrate vehicular traffic, decrease trip lengths for all road users, and improve local and regional accessibility.

IV. Land Use Legend

The General Plan Land Use Legend, Table 6.2, describes the designations that guide land use and development activities in the unincorporated areas. There are two exceptions to the applicability of the General Plan Land Use Legend. One exception is for land use legends in existing community-based plans, which differ from the General Plan Land Use Legend. As described in LU Policy 2.12,land use legends for existing community-based plans and existing specific plans will be updated using the General Plan Land Use Legend through a comprehensive area plan effort. Another exception is for coastal land use plans, which are subject to review by the California Coastal Commission, per the

California Coastal Act, and may result in different land use designations than those described in the General Plan Land Use Legend.

The General Plan Land Use Legend provides general intended uses and development intensities for each land use designation. Land uses are not limited to the general intended uses listed under each designation; other uses that are allowed through zoning may be deemed compatible with the general intended uses. For specific use types, permitting procedures and development standards, please refer to the Zoning Code or the applicable specific plan. For an estimate of population and employment density for each land use designation, please refer to Appendix C.

Intensity Calculations

Allowable Residential Units Calculation

Residential density shall be calculated using the net area of the project site, unless the property is on land that is designated Rural Land. The net area excludes dedicated streets and private easements (e.g., access) where the owner of the underlying parcel does not have the right to use the entire surface. All proposed residential densities must fit within the range specified by the land use designation in the General Plan Land Use Legend.

For any Rural Land designation, the residential density shall be calculated using the gross area of the parcel(s). The gross area of a parcel includes dedicated streets and private easements.

Floor Area Ratio (FAR) Calculation

Floor Area Ratio (FAR) is the ratio of the total above-ground gross floor area of all enclosed buildings to the area of the project site. As a formula, FAR = (total above-ground gross floor area of all enclosed buildings)/ (area of the project site).

When specified, and under limited circumstances, the General Plan permits deviations to the Land Use Legend and Land Use Policy Map, such as an increase in density above the maximum allowable density. These include the allowance of density bonuses for affordable and senior citizen housing, as well as other incentive-based local ordinances that implement the goals of the General Plan.

Table 6.2: Land Use Designations

Land Use	Code	Permitted Density or FAR	Purpose
RURAL			
Rural Land	RL1	Residential: Maximum 1 du/1 gross ac Non-Residential: Maximum FAR 0.5	Purpose: Single family residences; equestrian and limited animal uses; and limited agricultural and related activities.
	RL2	Residential: Maximum 1 du/2 gross ac Non-Residential: Maximum FAR 0.5	

	RL5	Residential: Maximum 1 du/5 gross ac Non-Residential: Maximum FAR 0.5	
	RL10	Residential: Maximum 1 du/10 gross ac Non-Residential: Maximum FAR 0.5	Purpose: Single family residences; equestrian and animal uses; and agricultural and related activities.
	RL20	Residential: Maximum 1 du/20 gross ac Non-Residential: Maximum FAR 0.5	
	RL40	Residential: Maximum 1 du/40 gross ac Non-Residential: Maximum FAR 0.5	

Land Use	Code	Permitted Density or FAR	Purpose
RESIDENTIAL			
Residential 2	H2	Residential: 0–2 du/net ac	Purpose: Single family residences.
Residential 5	H5	Residential: 0–5 du/net ac	
Residential 9	H9	Residential: 0–9 du/net ac	
Residential 18	H18	Residential: 0–18 du/net ac	Purpose: Single family residences, two family residences.
Residential 30	H30	Residential: 20–30 du/net ac	Purpose: Single family residences, two family residences, multifamily residences.
Residential 50	H50	Residential: 20–50 du/net ac	

Residential 100	H100	Residential: 50-100 du/net ac	Purpose: Multifamily residences.
Residential 150	H150	Residential: 100-150 du/net ac	

Land Use	Code	Permitted Density or FAR	Purpose
COMMERCIAL			
Rural Commercial	CR	Residential: 0-5 du/net ac Non-Residential: Maximum FAR 0.5	Purpose: Limited, low intensity commercial uses that are compatible with rural and agricultural activities, including retail, restaurants, and personal and professional services.
General Commercial	CG	Residential: 20-50 du/net ac** Non-Residential: Maximum FAR 1.0 Mixed Use: 20-50 du/net ac** and FAR 1.0	Purpose: Local-serving commercial uses, including retail, restaurants, and personal and professional services; single family and multifamily residences; and residential and commercial mixed uses. **Also applicable to residential developments or the residential component in mixed-use developments on lots with one of the following land use designations: - Altadena Community Plan: Business Park (BP) or General Commercial (GC); - East Los Angeles Community Plan: Community Commercial (CC), Major Commercial (MC), or Commercial Manufacturing (CM); - Rowland Heights Community Plan: Commercial (C); - Walnut Park Neighborhood Plan: General Commercial (GC), Mixed Commercial (MC), or Office Commercial (OC); or - West Athens-Westmont Community Plan: Regional Commercial (C.1), Community Commercial (C.2), Neighborhood Commercial (C.3), Commercial Manufacturing (C.4), or Commercial Recreation (CR).
Major Commercial	CM	Residential: 30-150 du/net ac Non-Residential: Maximum FAR 3.0 Mixed Use: 30-150 du/net ac and FAR 3.0	Purpose: Large and intense commercial uses, such as regional and destination shopping centers, tourist and recreation related commercial services; multifamily residences; and residential and commercial mixed uses.

Land Use	Code	Permitted Density or FAR	Purpose
MIXED USE			
Mixed Use	MU	Residential: 50-150 du/net ac Non-Residential: Maximum FAR 3.0 Mixed Use: 50-150 du/net ac and FAR 3.0	Purpose: Pedestrian-friendly and community-serving commercial uses that encourage walking, bicycling, and transit use; residential and commercial mixed uses; and multifamily residences.
Mixed Use – Rural	MU-R	Residential: 0-5 du/net ac Non-Residential: Maximum FAR 0.5 Mixed Use: 0-5 du/net ac and FAR 0.5	Purpose: Limited, low intensity commercial uses that are compatible with rural and agricultural activities, including retail, restaurants, and personal and professional services; residential and commercial mixed uses.

Land Use	Code	Permitted Density or FAR	Purpose
INDUSTRIAL			
Light Industrial	IL	Non-Residential: Maximum FAR 1.0	Purpose: Light industrial uses, including light manufacturing, assembly, warehousing and distribution.
Heavy Industrial	IH	Non-Residential: Maximum FAR 1.0	Purpose: Heavy industrial uses, including heavy manufacturing, refineries, and other labor and capital intensive industrial activities.
Industrial Office	IO	Non-Residential: Maximum FAR 2.0	Purpose: Employment centers with major office and business uses, such as technology and research centers, corporate headquarters, clean tech, and clean industry hubs.

Land Use	Code	Permitted Density or FAR	Purpose
PUBLIC AND SEMI-PUBLIC			
Public and Semi-Public	P	Residential: Density Varies* Non-Residential: Maximum FAR 3.0	Purpose: Public and semi-public facilities and community-serving uses, including public buildings and campuses, schools, hospitals, cemeteries, and fairgrounds; airports and other major transportation facilities. Other major public facilities, including planned facilities that may be public-serving but may not be publicly accessible, such as landfills, solid and liquid waste disposal sites, multiple use storm water treatment facilities, and major utilities. *In the event that the public or semi-public use of mapped facilities is terminated, alternative uses that are compatible with the surrounding development, in keeping with community character, are permitted.
NATURAL RESOURCES			
Conservation	OS-C	N/A	Purpose: The preservation of open space areas and scenic resource preservation in perpetuity. Applies to land that is legally dedicated for open space and conservation efforts.
Parks and Recreation	OS-PR	N/A	Purpose: Open space recreational uses, such as regional and local parks, trails, athletic fields, community gardens, and golf courses.
National Forest	OS-NF	N/A	Purpose: Areas within the national forest and managed by the National Forest Service.
Bureau of Land Management	OS-BLM	N/A	Purpose: Areas that are managed by the Federal Bureau of Land Management.
Water	W	N/A	Purpose: Bodies of water, such as lakes, reservoirs, natural waterways, and man-made infrastructure, such as drainage channels, floodways, and spillways. Includes active trail networks within or along drainage channels.
Mineral Resources	MR	N/A	Purpose: Areas appropriate for mineral extraction and processing as well as activities related to the drilling for and production of oil and gas.
Military Land	ML	N/A	Purpose: Military installations and land controlled by U.S. Department of Defense.

Land Use	Code	Permitted Density or FAR	Purpose
OVERLAYS			
Transit Oriented District	TOD	Determined by the station area plan for each TOD	Purpose: Pedestrian-friendly and community-serving uses near transit stops that encourage walking, bicycling, and transit use.
Special Management Areas	SMA	N/A	Purpose: Special Management Areas require additional development regulations due to the presence of natural resources, scenic resources, or identified hazards. Development regulations are necessary to prevent loss of life and property, and to protect the natural environment. Special Management Areas include: Significant Ecological Areas; National Forests; Coastal Zone; Agricultural Resource Areas; Mineral Resource Zones; Scenic Resources; Historic, Cultural and Paleontological Resources; Seismic Hazard Zones; Flood Hazard Zones; Very High Fire Hazard Severity Zones; and Airport Influence Areas.
Specific Plan	SP	N/A	Purpose: Specific plans contain precise guidance for land development, infrastructure, amenities and resource conservation. Specific plans must be consistent with the General Plan. Detailed policy and/or regulatory requirements are contained within each specific plan document.
Employment Protection District	EPD	N/A	Purpose: Economically viable industrial and employment-rich lands with policies to protect these areas from conversion to non-industrial uses.

V. Goals and Policies

Goal LU 1: A General Plan that serves as the constitution for development, and a Land Use Policy Map that implements the General Plan's Goals, Policies and Guiding Principles.	
Topic	**Policy**
General Plan Amendments	Policy LU 1.1: Support comprehensive updates to the General Plan, area plans, community plans, coastal land use plans and specific plans.
	Policy LU 1.2: Discourage project-specific amendments to the text of the General Plan, including but not limited to the Guiding Principles, Goals, and Policies.
	Policy LU 1.3: In the review of project-specific amendments to the General Plan, ensure that they support the Guiding Principles.
	Policy LU 1.4: In the review of a project-specific amendment(s) to the General Plan, ensure that the project-specific amendment(s): • Is consistent with the goals and policies of the General Plan; • Shall benefit the public interest and is necessary to realize an unmet local or regional need.
	Policy LU 1.5: In the review of a project-specific amendment(s) to convert OS-C designated lands to other land use designations, ensure that the project-specific amendment(s) does not contribute to the overall loss of open space that protects water quality, provides natural habitats, and contributes to improved air quality.
	Policy LU 1.6: In the review of a project-specific amendment(s) to convert lands within the EPD Overlay to non-industrial land use designations, ensure that the project-specific amendment(s): • Is located on a parcel that adjoins a parcel with a comparable use, at a comparable scale and intensity; • Will not negatively impact the productivity of neighboring industrial activities; • Is necessary to promote the economic value and the long-term viability of the site; and • Will not subject future residents to potential noxious impacts, such as noise, odors or dust or pose significant health and safety risks.
	Policy LU 1.7: In the review of a project-specific amendment(s) to convert lands within the ARAs, ensure that the project-specific amendment(s): • Is located on a parcel that adjoins another parcel with a comparable use, at a comparable scale and intensity; and • Will not negatively impact the productivity of neighboring agricultural activities.
	Policy LU 1.8: Limit the amendment of each mandatory element of the General Plan to four times per calendar year, unless otherwise specified in Section 65358 of the California Government Code.
	Policy LU 1.9: Allow adjustments to the General Plan Land Use Policy Map to follow an adjusted Highway Plan alignment without a General Plan amendment, when the following findings can be met: • The adjustment is necessitated by an adjusted Highway Plan alignment that was approved by the Los Angeles County Interdepartmental Engineering Committee (IEC) in a duly noticed public meeting; • The adjustment maintains the basic relationship between land use types; and • The adjustment is consistent with the General Plan.

	Policy LU 1.10: Prohibit plan amendments that increase density of residential land uses within mapped fire and flood hazard areas unless generally surrounded by existing built development and the County determines the adjoining major highways and street networks can accommodate evacuation as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County.
Specific Plans	Policy LU 1.11: Require the intensity, density, and uses allowed in a new specific plan to be determined using the General Plan, including the Land Use Policy Map and Land Use Legend.
	Policy LU 1.12: Require a General Plan amendment for any deviation from the intensities, densities, and uses allowed by the General Plan (to apply the appropriate designation from the General Plan Land Use Legend), unless allowances for flexibility are specified in the specific plan.
	Policy LU 1.13: Require development regulations and zoning for new specific plans to be consistent with their corresponding General Plan land use designation.
	Policy LU 1.14: Allow specific plans to include implementation procedures for flexibility, such as development phasing, and redistribution of intensities and uses, as appropriate.
	Policy LU 1.15: Require a specific plan amendment for any deviation from the procedures and policies established by a specific plan.
	Policy LU 1.16: For existing specific plans, which are depicted with an "SP" land use designation, the General Plan Land Use Policy Map shall be amended as part of a comprehensive area planning effort, to identify existing specific plans using the Specific Plan Overlay.
Goal LU 2: Community-based planning efforts that implement the General Plan and incorporate public input, and regional and community level collaboration.	
Topic	**Policy**
Regional and Community-Based Planning Initiatives	Policy LU 2.1: Ensure that all community-based plans are consistent with the General Plan.
	Policy LU 2.2: Ensure broad outreach, public participation, and opportunities for community input in community-based planning efforts.
	Policy LU 2.3: Consult with and ensure that applicable County departments, adjacent cities and other stakeholders are involved in community-based planning efforts.
	Policy LU 2.4: Coordinate with other local jurisdictions to develop compatible land uses.
	Policy LU 2.5: Support and actively participate in inter-jurisdictional and regional planning efforts to help inform community-based planning efforts.
	Policy LU 2.6: Consider the role of arts and culture in community-based planning efforts to celebrate and enhance community character.
	Policy LU 2.7: Set priorities for Planning Area-specific issues, including transportation, housing, open space, and public safety as part of community-based planning efforts.
	Policy LU 2.8: Coordinate with the Los Angeles County Department of Public Works and other infrastructure providers to analyze and assess infrastructure improvements that are necessary for plan implementation.
	Policy LU 2.9: Utilize the General Plan Land Use Legend and the Hazard, Environmental and Resource Constraints Model to inform the development of land use policy maps.
	Policy LU 2.10: Ensure consistency between land use policy and zoning by undergoing a comprehensive zoning consistency analysis that includes zoning map changes and Zoning Code amendments, as needed.
	Policy LU 2.11: Update community-based plans on a regular basis.

	Policy LU 2.12: Community-based plans and existing specific plans shall be updated, as needed, to reflect the General Plan Land Use Legend as part of a comprehensive area planning effort. An exception to this is for coastal land use plans, which are subject to the California Coastal Act and to review by the California Coastal Commission.
Goal LU 3: A development pattern that discourages sprawl, and protects and conserves areas with natural resources and SEAs.	
Topic	**Policy**
Growth Management	Policy LU 3.1: Encourage the protection and conservation of areas with natural resources, and SEAs.
	Policy LU 3.2: Discourage development in areas with high environmental resources and/or severe safety hazards.
	Policy LU 3.3: Discourage development in undeveloped areas where infrastructure and public services do not exist, or where no major infrastructure projects are planned, such as state and/or federal highways.
Goal LU 4: Infill development and redevelopment that strengthens and enhances communities.	
Topic	**Policy**
Infill Development	Policy LU 4.1: Encourage infill development in urban and suburban areas on vacant, underutilized, and/or brownfield sites.
	Policy LU 4.2: Encourage the adaptive reuse of underutilized structures and the revitalization of older, economically distressed neighborhoods.
	Policy LU 4.3: Encourage transit-oriented development in urban and suburban areas with the appropriate residential density along transit corridors and within station areas.
	Policy LU 4.4: Encourage mixed use development along major commercial corridors in urban and suburban areas.
Goal LU 5: Vibrant, livable and healthy communities with a mix of land uses, services and amenities.	
Topic	**Policy**
Community-Serving Uses	Policy LU 5.1: Encourage a mix of residential land use designations and development regulations that accommodate various densities, building types and styles.
	Policy LU 5.2: Encourage a diversity of commercial and retail services, and public facilities at various scales to meet regional and local needs.
	Policy LU 5.3: Support a mix of land uses that promote bicycling and walking, and reduce VMTs.
	Policy LU 5.4: Encourage community-serving uses, such as early care and education facilities, grocery stores, farmers markets, restaurants, and banks to locate near employment centers.
	Policy LU 5.5: Ensure that all households have access to a sufficient supply of quality early care and education and supervised school-age enrichment options for children from birth to age 13.
	Policy LU 5.6: Reduce regulatory and other barriers to early care and education facilities.
	Policy LU 5.7: Direct resources to areas that lack amenities, such as transit, clean air, grocery stores, bikeways, parks, and other components of a healthy community.
	Policy LU 5.8: Encourage farmers markets, community gardens, and proximity toother local food sources that provide access to healthful and nutritious foods.
	Policy LU 5.9: Preserve key industrially designated land for intensive, employment-based uses.

Employment Generating Uses	Policy LU 5.10: Encourage employment opportunities and housing to be developed in proximity to one another.
Goal LU 6: Protected rural communities characterized by living in a non-urban or agricultural environment at low densities without typical urban services.	
Topic	**Policy**
Rural Character	Policy LU 6.1: Protect rural communities from the encroachment of incompatible development that conflict with existing land use patterns and service standards.
	Policy LU 6.2: Encourage land uses and developments that are compatible with the natural environment and landscape.
	Policy LU 6.3: Encourage low density and low intensity development in rural areas that is compatible with rural community character, preserves open space, and conserves agricultural land.
Goal LU 7: Compatible land uses that complement neighborhood character and the natural environment.	
Topic	**Policy**
Land Use Compatibility	Policy LU 7.1: Reduce and mitigate the impacts of incompatible land uses, where feasible, using buffers, appropriate technology, building enclosure, and other design techniques.
	Policy LU 7.2: Protect industrial parks and districts from incompatible uses.
	Policy LU 7.3: Protect public and semi-public facilities, including but not limited to major landfills, natural gas storage facilities, and solid waste disposal sites from incompatible uses.
	Policy LU 7.4: Ensure land use compatibility in areas adjacent to military installations and where military operations, testing, and training activities occur.
	Policy LU 7.5: Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.
	Policy LU 7.6: Ensure that proposed land uses located within Airport Influence Areas are compatible with airport operations through compliance with airport land use compatibility plans.
	Policy LU 7.7: Review all proposed projects located within Airport Influence Areas for consistency with policies of the applicable airport land use compatibility plan.
	Policy LU 7.8: Promote environmental justice in the areas bearing disproportionate impacts from stationary pollution sources.
Goal LU 8: Land uses that are compatible with military operations and military readiness, and enhance safety for military personnel and persons on the ground.	
Topic	**Policy**
Military Compatible Uses	Policy LU 8.1: Facilitate the early exchange of project-related information that is pertinent to military operations with the military for proposed actions within MOAs, HRAIZs, and within 1,000 ft. of a military installation.

	Policy LU 8.2: Evaluate the potential impact of new structures within MOAs and HRAIZs to ensure the safety of the residents on the ground and continued viability of military operations. In the review of development within MOAs and HRAIZs, consider the following: • Uses that produce electromagnetic and frequency spectrum interference, which could impact military operations; • Uses that release into the air any substance such as steam, dust and smoke, which impair pilot visibility; • Uses that produce light emissions, glare or distracting lights, which could interfere with pilot vision or be mistaken for airfield lighting; and • Uses that physically obstruct any portion of the MOA and/or HRAIZ due to relative height above ground level.
Goal LU 9: Land use patterns and community infrastructure that promote health and wellness.	
Topic	**Policy**
Community Wellness	Policy LU 9.1: Promote community health for all neighborhoods.
	Policy LU 9.2: Encourage patterns of development that promote physical activity.
	Policy LU 9.3: Encourage patterns of development that increase convenient, safe access to healthy foods, especially fresh produce, in all neighborhoods.
	Policy LU 9.4: Encourage patterns of development that protect the health of sensitive receptors.
Goal LU 10: Well-designed and healthy places that support a diversity of built environments.	
Topic	**Policy**
Community Design	Policy LU 10.1: Encourage community outreach and stakeholder agency input early and often in the design of projects.
	Policy LU 10.2: Design development adjacent to natural features in a sensitive manner to complement the natural environment.
	Policy LU 10.3: Consider the built environment of the surrounding area and location in the design and scale of new or remodeled buildings, architectural styles, and reflect appropriate features such as massing, materials, color, detailing or ornament.
	Policy LU 10.4: Promote environmentally-sensitive and sustainable design.
	Policy LU 10.5: Encourage the use of distinctive landscaping, signage and other features to define the unique character of districts, neighborhoods or communities, and engender community identity, pride and community interaction.
	Policy LU 10.6: Encourage pedestrian activity through the following: • Designing the main entrance of buildings to front the street; • Incorporating landscaping features; • Limiting masonry walls and parking lots along commercial corridors and other public spaces; • Incorporating street furniture, signage, and public events and activities; and • Using wayfinding strategies to highlight community points of interest.

	Policy LU 10.7: Promote public spaces, such as plazas that enhance the pedestrian environment, and, where appropriate, continuity along commercial corridors with active transportation activities.
	Policy LU 10.8: Promote public art and cultural amenities that support community values and enhance community context.
	Policy LU 10.9: Encourage land uses and design that stimulate positive and productive human relations and foster the achievement of community goals.
	Policy LU 10.10: Promote architecturally distinctive buildings and focal points at prominent locations, such as major commercial intersections and near transit stations or open spaces.
	Policy LU 10.11: Facilitate the use of streets as public space for activities that promote civic engagement, such as farmers markets, parades, etc.
	Policy LU 10.12: Discourage gated entry subdivisions ("gated communities") to improve neighborhood access and circulation, improve emergency access, and encourage social cohesion.
	Policy LU 10.13: Discourage flag lot subdivisions unless designed to be compatible with the existing neighborhood character.
Goal LU 11: Development that utilize sustainable design techniques.	
Topic	**Policy**
Energy Efficient Development	Policy LU 11.1: Encourage new development to employ sustainable energy practices, such as utilizing passive solar techniques and/or active solar technologies.
	Policy LU 11.2: Support the design of developments that provide substantial tree canopy cover, and utilize light-colored paving materials and energy-efficient roofing materials to reduce the urban heat island effect.
	Policy LU 11.3: Encourage development to optimize the solar orientation of buildings to maximize passive and active solar design techniques.
Sustainable Subdivisions	Policy LU 11.4: Encourage subdivisions to utilize sustainable design practices, such as maximizing energy efficiency through lot configuration; preventing habitat fragmentation; promoting stormwater retention; promoting the localized production of energy; promoting water conservation and reuse; maximizing interconnectivity; and utilizing public transit.
	Policy LU 11.5: Prohibit the use of private yards as required open space within subdivisions, unless such area includes active recreation or outdoor activity areas dedicated for common and/or public use.
	Policy LU 11.6: Ensure that subdivisions in VHFHSZs site open space to minimize fire risks, as feasible.
	Policy LU 11.7: Encourage the use of design techniques to conserve natural resource areas.
	Policy LU 11.8: Encourage sustainable subdivisions that meet green neighborhood standards, such as Leadership in Energy and Environmental Design–Neighborhood Development (LEED-ND).

VI. Land Use Element Implementation Programs

- Planning Areas Framework Program
- TOD Program
- Airport Land Use Compatibility Plans
- Growth Management Program

- Civic Art Program
- Transfer of Development Rights Program
- Adaptive Reuse Ordinance
- Art and Cultural Resources Program
- Community Design Guidelines
- Early Care and Education Program
- Military Operation Areas Overlay Ordinance

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Jobs-Housing Balance

Jobs-housing balance is reached by working toward increasing opportunities for people to work and live in close proximity, and reduce long commutes that are costly both economically and environmentally. This can be quantified by taking the number of jobs divided by the number of housing units. A community with fewer jobs than residences would have a low jobs-housing ratio. Communities with a high jobs-housing ratio are usually considered major employment centers for a region. If the ratio is high or low, there is a jobs-housing imbalance.

Brownfields

Data on the number of brownfield sites in unincorporated areas of the County is provided by the California Department of Toxic Substances Control (DTSC) EnviroStor public web site, which provides access to detailed information on hazardous waste permitted and corrective action facilities, as well as existing site cleanup information. For further information on particular brownfield sites, please visit the DTSC web site at http://www.dtsc.ca.gov/.

Soul of the Community 2010

What makes a community a desirable place to live? What makes people stay and build a future in a community?

In 2008, Gallup and the John S. and James L. Knight Foundation set out to answer these questions through the Soul of the Community project. After interviewing around 43,000 people in 26 communities, the study concluded that the main factors that attached people to place include: an area's physical beauty, opportunities for socializing, and a community's openness to all people.

Source: Knight Soul of the Community 2010, Why People Love Where They Live and Why It Matters: A National Perspective. http://www.soulofthecommunity.org/

Airport Land Use Commission (ALUC)

The State law requires each county with public use airports to establish an Airport Land Use Commission (ALUC). The ALUC is mandated to fulfill two specific duties:

- To prepare airport land use plans for promoting and ensuring compatibility between each airport in a county and its surrounding and adjacent land uses; and
- To review local agency land use actions and airport plans for consistency with the airport land use plan and policies.

SCAG's Compass Blueprint Growth Vision

The Land Use Element goals and policies are consistent with the SCAG's Compass Blueprint Growth Vision, which contains a set of land use strategies that SCAG encourages local governments to implement:

- Focusing growth in existing and emerging centers and along major transportation corridors.
- Creating significant areas of mixed-use development and walkable, "people-scaled" communities.
- Providing new housing opportunities that respond to the region's changing demographics.
- Targeting growth in housing, employment, and commercial development within walking distance of existing and planned transit stations.
- Injecting new life into under-used areas by creating vibrant new business districts, redeveloping old buildings, and building new businesses and housing on vacant lots.
- Preserving existing, stable, single family neighborhoods.
- Protecting important open space, environmentally sensitive areas and agricultural lands from development.

Chapter 7: Mobility Element

I. Introduction

The California Complete Streets Act of 2008 requires the General Plan to demonstrate how the County will provide for the routine accommodation of all users of a road or street, including pedestrians, bicyclists, users of public transit, motorists, children, seniors, and the disabled. The Mobility Element addresses this requirement with policies and programs that consider all modes of travel, with the goal of making streets safer, accessible and more convenient to walk, ride a bicycle, or take transit.

The Mobility Element provides an overview of the transportation infrastructure and strategies for developing an efficient and multimodal transportation network. The Element assesses the challenges and constraints of the Los Angeles County transportation system, and offers policy guidance to reach the County's long-term mobility goals. Two sub-elements—the Highway Plan and Bicycle Master Plan—supplement the Mobility Element. These plans establish policies for the roadway and bikeway systems in the unincorporated areas, which are coordinated with the networks in the 88 cities in Los Angeles County. The General Plan also establishes a program to prepare community pedestrian plans, with guidelines and standards to promote walkability and connectivity throughout the unincorporated areas.

II. Background

Los Angeles County has one of the largest transportation systems in the world. Despite continuing efforts to increase transportation services and build transportation infrastructure, transportation systems are heavily burdened by the demands of a growing population and a diversity of activities. Transportation is also one of the biggest contributors of noise, and greenhouse gases and other air pollutants.

Regulatory Framework

Local agencies responsible for transportation services in Los Angeles County coordinate their activities to comply with the goals and policies of Southern California Association of Governments (SCAG) and Los Angeles County Metropolitan Transportation Authority (Metro). SCAG is the federally designated regional transportation planning agency responsible for preparing the Regional Transportation Plan (RTP) and the Sustainable Communities Strategy (SCS). Metro is the county-level transportation planning agency responsible for the preparation of the Long Range Transportation Plan (LRTP). The County, the 88 cities in Los Angeles County, and other transportation agencies engage in transportation planning activities by participating in the development and implementation of the RTP and LRTP.

The County participates in establishing policies, promoting specific projects, and funding the strategies in the RTP and the LRTP. Each Los Angeles County Supervisor is a member of the Metro Board of Directors, and two members of the Board of Supervisors serve on SCAG's Regional Council, and on the Southern California Regional Rail Authority (Metrolink) Board of Directors.

Metro is also the Congestion Management Agency for Los Angeles County and is responsible for implementing the Congestion Management Program (CMP). Metro is currently exploring the development of a countywide congestion mitigation fee program to improve transportation roadways including state facilities. This program, adopted locally by individual jurisdictions, would impose a fee on new development that would be collected and spent locally on transportation projects that would

help to ease regional congestion. For more information, please visit Metro's web site at http://www.metro.net/projects/congestion_mgmt_pgm/.

Transportation Systems in Los Angeles County

Public Transit

Los Angeles County is served by a large public transit system that includes rail systems and various bus service options, such as transitways and bus rapid transit systems. Figure 7.1 depicts the major public transit systems in Los Angeles County.

Figure 7.1: Major Public Transit Systems Map

Rail

Metro operates the Metro rail system, which is exclusively within Los Angeles County. The Metro rail system consists of the following lines: Red, Purple, Blue, Green, Gold and Expo. The hub of the system is in Downtown Los Angeles at Union Station. The Metro lines that primarily serve the unincorporated areas include the Metro Blue, Green and Gold Lines. The Metro Blue Line stations that serve the unincorporated areas include: Slauson, Florence, Firestone, Willowbrook and Del Amo. The Aviation/LAX, Vermont, Hawthorne, and Rosa Parks stations along the Metro Green Line also serve the unincorporated areas. The Gold Line has five stations that serve the unincorporated areas: Indiana, Maravilla, East LA Civic Center, Atlantic and Sierra Madre Villa.

Two additional rail service operators that provide services in Los Angeles County are Metrolink and Amtrak. The Southern California Regional Rail Authority (SCRRA) operates the 416-mile Metrolink commuter rail system, which has its hub in Downtown Los Angeles at Union Station and extends to Ventura, San Bernardino, Riverside, Orange, and San Diego counties, and serves some of the unincorporated areas. There is one Metrolink station located in the unincorporated community of Acton, on the Antelope Valley Line. Amtrak provides interstate service from points around the country to Union Station, as well as regional service between major cities throughout California.

Bus

With many regional and municipal operators providing bus services, buses provide the majority of public transit service in Los Angeles County. Examples of these operators include Torrance Transit, Foothill Transit, Santa Clarita Transit, and the Antelope Valley Transit Authority. According to Metro's 2009 Long Range Transportation Plan, the transit providers in Los Angeles County collectively operate 4,000 buses and serve 1.6 million bus riders daily.

The Metro bus system is the largest in Los Angeles County. Metro operates the Metro Rapid Bus service, which runs on select surface street corridors with fewer stops and electronic signal switching devices to expedite traffic flow, and the Metro Express Bus service, which are express bus routes for a portion of the route and then local or limited routes in other areas. Metro also operates two bus rapid transitways: the Orange Line and Silver Line. The Metro Orange Line operates on a dedicated bus lane in the San Fernando Valley and also includes a separated bike path that runs along part of the route. The Metro Silver Line operates between Downtown Los Angeles and the Artesia Transit Center.

Furthermore, the Los Angeles County Department of Public Works (DPW) operates fixed route shuttle services in the following unincorporated areas: Willowbrook and King Medical Center Shuttle services in Willowbrook; Athens Shuttle service in West Athens-Westmont; Lennox Shuttle service in Lennox; Florence-Firestone/Walnut Park Shuttle service in Florence-Firestone and Walnut Park; El Sol Shuttle

service in East Los Angeles; Sunshine Shuttle service in South Whittier; Avocado Heights/Bassett/West Valinda Shuttle service in Avocado Heights, Bassett and West Valinda; East Valinda Shuttle service in East Valinda; Edmund D. Edelman's Children's Court Shuttle service in East Los Angeles; Los Nietos Shuttle service in Los Nietos; and Acton/Agua Dulce Shuttle service in Acton and Agua Dulce. For detailed information on these shuttle services, please visit http://www.lagobus.info. For data on monthly average boardings for the County shuttles, please refer to Appendix D.

Paratransit

Paratransit is an alternative mode of flexible transportation that does not follow fixed routes or schedules. Demand-responsive paratransit contractors are used to meet the needs of seniors and mobility-impaired individuals living in the unincorporated areas.

The Whittier paratransit service operating in the unincorporated communities of North Whittier, West Whittier–Los Nietos and South Whittier–Sunshine Acres has, on average, the highest number of monthly boardings at 3,207. Unincorporated East Los Angeles has the second highest demand with 2,049 boardings on average per month. For detailed information on the County's paratransit services, please visit http://www.lagobus.info. For additional data on average monthly boardings, please refer to Appendix D.

Bikeways

The State Vehicle Code allows roadways to be used by bicyclists. Therefore, the entirety of surfaced roadways, excluding freeways, may be used by the bicycling public even though they are not all identified as bikeways. However, the lack of public awareness and the safety concerns associated with road sharing create a need for bikeways with a grade separation, lane delineation, or designated trail/path construction for bicycle users.

Bicycle Master Plan

The Los Angeles County Bicycle Master Plan, adopted in March 2012, provides policy guidance for building a comprehensive bicycle network throughout the unincorporated areas. The Bicycle Master Plan identifies bikeways and transportation systems that are available for use by bicyclists, such as roadways with bike lanes or designated bike routes, and dedicated off-road bike paths, such as bike paths along the flood protection channels. The purpose of the Bicycle Master Plan is to: 1) guide the development of infrastructure, policies and programs that improve the bicycling environment; 2) depict the general location of planned bikeway routes; and 3) provide for a system of bikeways that is consistent with the General Plan.

The Bicycle Master Plan maps depict bikeways along roadways in the unincorporated areas and along rivers, creeks, and flood protection facilities countywide. These bikeways may be used for both recreational use and commuter travel.

The Bicycle Master Plan also includes data on collisions involving bicyclists and motor vehicles in the unincorporated areas between the years 2004 and 2009. In total, there were 1,369 collisions, including 25 fatalities. One of the goals of the Bicycle Master Plan is to reduce the number of collisions by making bicycling more safe through the implementation of education programs and network improvements. For more detailed data on collisions in the unincorporated areas, please refer to Appendix D. To view the Bicycle Master Plan, including policies, programs, and the mapped bicycle network, please visit DPW's Bicycle Master Plan web site at http://dpw.lacounty.gov/go/bikeplan.

Pedestrian Networks

The diversity of communities in Los Angeles County creates distinct conditions, opportunities and challenges for pedestrians. There are a number of trails and paths that are available for use by pedestrians, such as sidewalks, hiking trails, over and under passes, and skywalks. Together, these systems constitute a network for accommodating pedestrian travel.

Community Pedestrian Plans

The County is committed to improving the environment to allow for increased alternative transportation uses. The General Plan includes a program to prepare community pedestrian plans for the unincorporated areas that will set standards for sidewalks, street crossings, sidewalk continuity, street connectivity, and topography. The community pedestrian plans will emphasize the connectivity of pedestrian paths to and from public transportation, major employment centers, shopping centers, and government buildings.

For more information on community pedestrian plans, please refer to Program M-2, Community Pedestrian Plans in Chapter 16: General Plan Implementation Programs.

Freeway, Highway, and Local Road Networks

The highway network is comprised of the State Highway System, which consists of 915 freeway and highway miles, and includes U.S. Interstate freeways and state-maintained freeways and highways, High Occupancy Vehicle (HOV) lanes, and county and city highways. The California Department of Transportation (Caltrans) is the state agency responsible for the maintenance of freeways and highways. Caltrans estimates that on average there are more than 100 million vehicle miles traveled per day in Los Angeles County via the State Highway System. Figure 7.2 is a map of State Highways and Freeways System that serves Los Angeles County.

Figure 7.2: Highways and Freeways Map

The County is responsible for the design, construction, operation, maintenance, and repair of roads in the unincorporated areas, as well as in a number of local jurisdictions that contract with the County for these services. DPW maintains over 3,100 miles of major roads and local streets in the unincorporated areas and over 1,700 miles in 22 cities.

Highway Plan

The Los Angeles County Highway Plan provides policy guidance for building a comprehensive highway network throughout the unincorporated areas. The Highway Plan provides a highway system that is consistent with and supportive of the goals and policies outlined in the Land Use Element. More specifically, the Highway Plan maintains right-of-way corridors to ensure space for future facility improvements to accommodate alternative modes. This is important in urbanized areas, which often have limited room for expansion, but are in need of additional facilities and improvements, such as bike lanes, sidewalks, and bus service. This is also important in rural areas to accommodate trails and landscaping, which encourage active transportation, provide shade, and reduce runoff from pollutants.

The purpose of the Highway Plan is to: 1) depict the general location of planned highway routes; 2) provide a means for protecting highway rights-of-way within the unincorporated areas; 3) establish a plan and process for coordinating highway policies with neighboring cities and counties; and 4) provide for a system of highways that is consistent with the General Plan.

The Los Angeles County Interdepartmental Engineering Committee (IEC), which is comprised of the Director of Planning, the Road Commissioner, and the County Engineer, is charged with maintaining the Highway Plan.

Figure 7.3 shows the Highway Plan, which includes locations of existing and proposed major arterial highways. Although the County has no jurisdiction over roads in the 88 cities, or the freeways and other state routes maintained by Caltrans, these roadways are included in the map for reference and visual continuity. The Highway Plan roadway classifications and descriptions are provided in Table 7.1.

Figure 7.3: Highway Plan Policy Map

Table 7.1: Highway Plan Roadway Classifications

Classification	Description
Major Highway	This classification includes urban and rural highways that are of countywide significance and are, or are projected to be, the most highly traveled routes. These roads generally require four or more lanes of moving traffic, channelized medians and, to the extent possible, access control and limits on intersecting streets. In urban areas, the typical right-of-way width for these highways is 100 feet. Alternative major highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, major highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way width of a rural major highway is 108 feet. Additional right-of-way may be required to accommodate other transportation uses. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Secondary Highway	This classification includes urban and rural routes that serve or are planned to serve an areawide or countywide function, but are less heavily traveled than major highways. Secondary highways also frequently act as oversized collector roads that feed the countywide system. In this capacity, the routes serve to remove heavy traffic from local streets, especially in residential areas. Access control, especially to residential property and minor streets, is desirable along these roads. In urban areas, secondary highways generally have four lanes of vehicular traffic on 80 feet of right-of-way. However, configuration and width may vary with traffic demand and existing conditions. In a few cases, routes that carry major highway levels of traffic are classified as secondary highways because it is impractical to widen them to major highway standards. Alternative secondary highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, certain connector highways to and between rural communities are also classified as secondary highways. These highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way width of rural secondary highways is 86 feet. Additional right-of-way may be required to accommodate other transportation uses. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Limited Secondary Highway	This classification includes urban and rural routes that provide access to low-density areas.

	In urban areas, limited secondary highways generally feature lower traffic volumes and multimodal transportation facilities. The typical right-of-way width of these highways generally ranges between 64-80 feet. Alternative secondary highway sections may be established by the County to accommodate features such as raised medians, bicycle facilities, and wider parkways with varying right-of-way widths. In rural areas, limited secondary highways are generally located in rural communities and remote foothill, mountain and canyon areas. These highways are intended to maintain a rural appearance (without curb, gutter, and/or sidewalk) to reflect the rural character of various communities throughout Los Angeles County. The typical right-of-way width of rural limited secondary highways is 64 feet. Additional right-of-way width may be required to accommodate left-turn pockets and passing lanes may be provided when required for traffic safety. The right-of-way may be increased for additional improvements where traffic or drainage conditions warrant. In addition, beyond the ultimate road right-of-way, there may be a need for additional dedications for trail purposes, to accommodate equestrian and other non-vehicular uses.
Parkway	This classification includes urban and rural routes that have park-like features either within or adjacent to the roadway. The right-of-way width required varies as necessary to incorporate these features, typically with a minimum of 80 feet. Roadway improvements vary depending on the composition and volume of traffic carried.
Expressway	This classification includes urban and rural controlled-access highways connecting communities. Expressways can generally accommodate six to ten traffic lanes and are intended for thru-traffic, featuring full or partial control of access. The right-of-way required varies as necessary to incorporate these features, but is typically 180 feet in width. Roadway improvements vary depending upon the composition and volume of traffic carried.

Level of Service

DPW uses level of service (LOS) to assess the congestion of roadways in the transportation system. Based on a roadway's volume-to-capacity ratio (the number of vehicles currently using the roadway compared to the ideal maximum number of vehicles that can efficiently use the roadway), a letter designation is assigned that represents the traffic flow conditions, or LOS. Letter designations "A" through "F" represent progressively declining traffic flow conditions. LOS designations indicate whether the roadways are operating in excess of their intended capacity. Acceptable LOS is determined on a case by case basis, but generally, Level D is the desired minimum LOS. In some instances, LOS below D will be deemed acceptable in order to further other General Plan goals and policies, such as those that protect environmentally sensitive areas, promote active transportation, and encourage infill development, particularly within the Transit Oriented Districts. For the freeway system, DPW will work closely with Caltrans to identify potential significant traffic impacts and traffic mitigations to alleviate traffic congestion within the unincorporated areas.

Table 7.2 provides the definitions for LOS A-F, which are based on the definitions in the Transportation Research Board's Highway Capacity Manual.

Table 7.2: Level of Service Definitions

LOS	Type of Flow	Description
A	Free flow	Vehicles are completely unimpeded in their ability to maneuver within the traffic stream. Control delay at intersections is minimal. The travel speed exceeds 85% of the base free-flow speed.

B	Stable flow	The ability to maneuver within the traffic stream is only slightly restricted and control delay at intersections is no significant. The travel speed is between 67% and 85% of the base free-flow speed.
C	Stable flow	The ability to maneuver and change lanes at midsegment locations may be more restricted than at LOS B. Longer queues at intersections may contribute to lower travel speeds. The travel speed is between 50% and 67% of the base free-flow speed.
D	Approaching unstable flow	Small increases in flow may cause substantial increases in delay and decreases in travel speed. The travel speed is between 40% and 50% of the base free-flow speed.
E	Unstable flow	Significant delay is commonly experienced. The travel speed is between 30% and 40% of the base free-flow speed.
F	Forced flow	Congestion is likely occurring at intersections, as indicated by high delay and extensive queuing. The travel speed is 30% or less of the base free-flow speed.

Although DPW utilizes the above described LOS criteria for assessing the performance of, and determining impacts to, roadways, DPW is currently working on the development of a multimodal transportation planning function. This effort will ensure that transportation facilities are planned, designed, and maintained to provide safe and efficient mobility for all users. Please refer to Program M-4, Multimodal Transportation Planning Function in Chapter 16: General Plan Implementation Program, for more details.

Aviation Network

There are 15 public-use airports located in Los Angeles County and one military airport located on San Clemente Island, as shown in Figure 7.4. The majority of passenger air transportation is serviced through Los Angeles International Airport (LAX), Burbank Airport, and the Long Beach Airport. Table 7.3 is a list of the airports and owners.

Figure 7.4: Airports/Airfields Map

Table 7.3: Los Angeles County Airports/Airfields

Airport/Airfield	Location	Owner
Agua Dulce Airport	Agua Dulce	Private
Burbank (Bob Hope) Airport	City of Burbank	Airport Authority
Brackett Field Airport	City of La Verne	Los Angeles County
Catalina Island Airport	Santa Catalina Island	Private
Compton/Woodley Airport	City of Compton	Los Angeles County
El Monte Airport	City of El Monte	Los Angeles County
Frederick Sherman Field	San Clemente Island	U.S. Navy
General William J. Fox Airfield	City of Lancaster	Los Angeles County
Jack Northrop Field Airport (Hawthorne Municipal Airport)	City of Hawthorne	City of Hawthorne
Long Beach Municipal Airport (Daugherty Field Airport)	City of Long Beach	City of Long Beach

Los Angeles International Airport (LAX)	City of Los Angeles	City of Los Angeles (LAWA)
Santa Monica Municipal Airport	City of Santa Monica	City of Santa Monica
Palmdale Regional Airport	City of Palmdale	City of Los Angeles (LAWA)
Van Nuys Airport	City of Los Angeles, Van Nuys	City of Los Angeles (LAWA)
Whiteman Airport	City of Los Angeles, Pacoima	Los Angeles County
Torrance Municipal Airport-Zamperini Field	City of Torrance	City of Torrance

Freight Rail Network

Los Angeles County has an extensive rail network that is focused on the efficient and safe movement of goods throughout the region. An effective goods movement system requires the elimination of at-grade crossings, and the creation and operation of rail networks, such as the Alameda Corridor.

The Alameda Corridor is a 20-mile rail cargo corridor, with a 10-mile below-grade trench between the ports of Los Angeles and Long Beach and the central Los Angeles freight yard transfer stations. The Alameda Corridor has been instrumental in efficiently transporting goods from the ports to inland transfer stations. The Alameda Corridor East Project, which is an extension of the Alameda Corridor Project, covers the area from central Los Angeles eastward 35 miles through the San Gabriel Valley, past Pomona and onward to the transcontinental rail network. The $910 million endeavor of mobility and safety improvements includes signalization upgrades, roadway widening, and 20 grade separations.

Figure 7.5 shows the freight and passenger rail lines that run throughout Los Angeles County.

Figure 7.5: Freight and Passenger Rail Lines Map

Interstate, Highways, and Local Roads

The six-county SCAG region has about 53,400 road miles traversing incorporated and unincorporated areas, 1,630 miles of which are interstate and freeway type. Sections of Interstate-710, Interstate-605, State Route-60, and State Route-91 carry the highest volumes of truck traffic in the region, averaging over 25,000 trucks per day in 2008. Other major components of the regional highway network also serve significant numbers of trucks, including Interstate-5, Interstate-10, Interstate-15, and Interstate-210, with some sections carrying over 20,000 trucks per day. These roads carry a mix of local, domestic trade, and international cargoes. The arterial roadway system also plays a critical role, providing “last mile” connections to the ports, manufacturing facilities, intermodal terminals, warehouses, and distribution centers.

Supportive Facilities

Harbors

The ports of Los Angeles and Long Beach are key links in the global economy and can handle a variety of cargo, including containers, bulk products, and automobiles. Combined, they are one of the largest and most efficient international shipping ports in the country, and the fifth busiest container port in the world. According to SCAG, the ports handled just under 120 million metric tons of cargo imports and exports, valued at $336 billion in 2010. The ports also serve as a significant tourism driver, as the largest cruise ship terminal on the West Coast, serving over a million passengers per year.

Parking

A limited number of public parking lots are maintained in the unincorporated areas by a variety of agencies, including Caltrans, Metro, the Los Angeles County Departments of Beaches and Harbors, and DPW. Metrolink and Caltrans maintain park-and-ride lots adjacent to commuter rail stops. The County owns and operates the following four park-and-ride lots: Studio City (Ventura Boulevard); Pomona (Fairplex); San Dimas (Via Verde); and Acton (Acton/Vincent Grade Metrolink Station).

The County regulates on-street parking in certain high-traffic areas through restricted parking zones enforced by the Sheriff's Department and California Highway Patrol. In addition, the Los Angeles County Department of Regional Planning regulates parking for new developments by requiring an adequate number of spaces to meet anticipated demand.

Terminals

Terminal facilities provide multiple uses, from park-and-ride lots for daily commuter vehicles to the heavily used freight terminals that serve the ports. Fierce competition among West Coast cities for international trade business has led to the planning and construction of an efficient terminal network. The most notable terminal facilities are the intermodal terminal networks located in and around the ports of Los Angeles and Long Beach, the goods transfer stations located near Downtown Los Angeles, and several freight and trucking facilities in the City of Industry.

III. Issues

1. Providing Streets That Accommodate All Users

Historically, transportation planning and street design have focused on the efficient movement of automobiles and not on the travel needs of pedestrians, equestrians, and bicyclists. In order to create more welcoming places to walk, ride and bicycle, as well as to take transit, more emphasis needs to be placed on these other viable modes of transportation. Furthermore, transportation corridor designs should accommodate all users, including children, seniors, and the disabled.

Aesthetics and function are also important considerations when creating comfortable places to walk, bicycle, and take transit. This can include landscaping, street furniture, and amenities, such as benches and shelters at transit stops.

In a jurisdiction as diverse as the unincorporated areas, the approach to complete streets must be flexible and street designs must be context-sensitive. For example, complete streets in rural areas, such as the Antelope Valley, could look and feel very different from complete streets in urban communities, such as Willowbrook and Florence-Firestone.

2. Creating a Multimodal Transportation System

Single occupant vehicle use is associated with the highest level of land consumption among all transportation modes, and generates the highest level of environmental impacts. Estimates from the American Community Survey suggest that 74 percent of residents in the unincorporated areas drive alone to work, compared with 13 percent that carpool and 6 percent that use public transportation. The percentages for walking and bicycling are even lower, at less than 2 percent each. To encourage alternative modes and discourage single occupant vehicle use, the County can facilitate an interconnected, multimodal network of streets, equestrian trails, alleys, paths, greenways, and waterways where people can choose to walk, bicycle, ride, take transit or drive. The key to achieving a functional and sustainable multimodal transportation system is to provide efficient connections

between different modes. For example, bicyclists can conveniently travel to farther destinations if they have the option to board the transit system with their bicycles. Multimodal options, such as bicycling and walking are cost-effective, energy efficient and healthy alternatives to driving. Additionally, creating bike-friendly and walkable communities is a critical component in meeting the County's greenhouse gas emission and energy reduction goals, while enhancing vibrant, livable communities.

Mobility management is an important component of a multimodal transportation system. Highway congestion results in major social costs, and long travel times and congestion increase energy and oil usage, exacerbate automobile emissions, and diminish the region's quality of life. In addition, long delays and congestion negatively impact the region's economy. According to SCAG, by failing to address congestion in the region, jobs have been lost–-every 10 percent decrease in congestion can bring an employment increase of about 132,000 jobs.

Mobility management is an important strategy for improving congestion and reducing VMTs. Mobility management strategies are designed to be used alone, or in concert with other policies to have a cumulative effect on the efficiency of the transportation system. Such strategies include the use of technologies in the development of transportation facilities and infrastructure, such as liquid and compressed natural gas, and hydrogen gas stations, Intelligent Transportation Systems (ITS), and electric car plug-in ports. Mobility management also refers to transportation demand management (TDM), which includes strategies that change travel behavior and discourage the single occupant driver, such as offering employer-based transit passes or increasing transit availability; regional carpooling programs; and parking management. One of the most effective TDM strategies is arguably congestion pricing.

Achieving a multimodal transportation system will require a greater investment in transit, pedestrian, and bicycle infrastructure. New proposals, such as tolling major freeways, double-decking highways, and/or raising the gas tax, all have varying levels of political and popular support. However, paying for transportation infrastructure will remain a critical planning issue. To plan efficient, functional and cost-effective transportation networks, including public transit, roadways, and alternative transportation, the County should leverage investment with the planning, financing and management of other jurisdictions' transportation efforts. The County must work with transportation planning agencies on infrastructure, capital improvements and programming in areas where the General Plan focuses growth.

3. Connecting Transportation and Land Use Planning

For any transportation system to be effective, healthy and sustainable, all aspects–streets, freeways, public transit, highways, sidewalks, bicycle facilities, and freight movement–must be coordinated with land use planning. Land use and mobility are inherently linked. For example, sprawling single use development encourages driving. In another example, denser, communities with a mix of land uses that encourage transit use, walking, and bicycling are healthier and sustainable.

Land use planning and urban design are important factors in developing transit use and multimodal transportation options. Historically, streets have been designed to move the maximum amount of automobile traffic. Congested roadways and high on-street parking demand create insufficient space to accommodate bike lanes. In addition, a frequent complaint of bicyclists is the absence of adequate facilities to secure bicycles at public and private buildings or facilities. Many of the commercial corridors in mature urbanized areas are underutilized and in need of redevelopment. Strengthening mixed land uses and promoting compact development in these areas, in concert with design standards for rights-of-way, can help encourage walking and bicycling for shorter trips, as well as make transit more accessible. This is certainly true in the first-last mile connection to transit, which is the portion of a transit trip between a transit stop and one's final destination. At its April 2014 meeting, the Metro Board

approved the First Last Mile Strategic Plan and Planning Guidelines, which aims to "better coordinate infrastructure investments in station areas to extend the reach of transit, with the ultimate goal of increasing ridership." The First Last Mile Strategic Plan details an extensive toolbox of pedestrian and cycling facilities that would make it safer and more convenient for riders to walk and bike to and from a transit stop. The strategies and tools identified in this Strategic Plan should be considered and utilized by the County, when feasible, during future planning efforts within the Transit Oriented Districts. The First Last Mile Strategic Plan is available online at: http://media.metro.net/docs/sustainability_path_design_guidelines.pdf. Finally, an important consideration in rural areas is to ensure that land uses account for equestrian uses, including the development of feeder trails and regional trails, to address equestrian mobility issues.

Because of the nature and financing of regional transportation networks, transportation planning is fragmented among many jurisdictions, agencies and County departments. Effective inter-jurisdictional collaboration, and public-private partnerships are essential to creating an efficient and multimodal transportation network.

4.Safe and Efficient Movement of Goods

The safe and efficient movement of goods is an important mobility issue that significantly impacts the economy. Goods movement has been negatively impacted by inefficient transportation networks. The ports, airports, rail lines and intermodal transit terminals have existing capacity constraints that undermine the efficiency and productivity of the goods movement system. In addition, the existing roadway and rail networks are reaching capacity. As a result, the system is susceptible to disruptions, which causes delays that reduce the quality of services and increase costs to consumers. Furthermore, the roadways and rail networks that accommodate the movement of goods are shared by motorists and passengers, which raises additional concerns over efficiency and safety.

The ports of Long Beach and Los Angeles are heavily investing in infrastructure to handle a projected doubling of container volumes. However, the ports have also been identified as one of the largest sources of air pollution in the region. In addition, terminal operations and supporting infrastructure are consumptive land uses, and are often characterized as having heavily polluting activities. The ports have created a Clean Air Action Plan in conjunction with the U.S. Environmental Protection Agency, the California Air Resources Board, and the South Coast Air Quality Management District to reduce emissions related to port operations.

The 2012–2035 RTP/SCS describes a goods movement system with initiatives and projects totaling nearly $50 billion through 2035 for SCAG's six-county region, including Los Angeles County. Key regional initiatives include a comprehensive system of zero- and/or near-zero-emission freight corridors, alleviation of major bottlenecks, a rail package totaling approximately $12 billion, and an environmental strategy to address emissions through both near term initiatives and a long term action plan for technology advancement. The comprehensive system of zero- and/or near-zero-emission freight corridors includes Interstate-710. The rail package includes main line capacity enhancements, on-dock and near-dock rail facility improvements, and 71 grade separations. In addition, critical projects to facilitate access to the ports (e.g., improvements to the Gerald Desmond Bridge), and to alleviate congestion at critical border crossings, are underway.

Regional Clean Freight Corridor System

In past RTPs, SCAG has envisioned a system of truck-only lanes extending from the ports to Downtown Los Angeles along Interstate-710, connecting to an east-west segment, and finally reaching Interstate-15 in San Bernardino County. Such a system would address the growing truck traffic on core highways throughout the region and serve key goods movement industries in a manner that mitigates impacts on communities and the environment.

East-West Freight Corridor

The 2012–2035 RTP/SCS identifies a corridor concept that connects to the north end of the I-710 freight corridor and roughly parallel the Union Pacific Railroad Los Angeles Subdivision before finally following a route adjacent to SR-60 just east of SR-57. The potential use of two non-roadway routes provides an opportunity to move the facility away from neighborhoods and closer to the industrial activities that it would serve. Utilizing a right-of-way of approximately 100 feet, the bi-directional corridor would be restricted to truck traffic and have limited ingress/egress points. The East-West Freight Corridor would be a catalyst for the use of zero-and/or near-emission truck technologies, improving air quality for communities near the corridor and throughout the region.

Bottleneck Relief

The 2012 RTP/SCS allocates an estimated $5 billion toward goods movement bottleneck relief strategies. Examples of bottleneck relief strategies include ramp metering, extension of merging lanes, ramp and interchange improvements, capacity improvements, and auxiliary lane additions. Additional project concepts will continue to be refined through SCAG's Comprehensive Regional Goods Movement Plan and Implementation Strategy.

Truck Corridors and Localized Arterials

While SCAG's effort is regional in scope, Metro is working to identify a County-Wide Strategic Truck Arterial Network (CSTAN) for Los Angeles County. The CSTAN will be informed by collection of data including truck counts on arterials, existing truck routes, connectivity to goods movement facilities, the location of bottlenecks, identification of land uses along truck routes and where they overlap with active transportation areas. The information is expected to guide funding priorities for projects such as roadway widening, road repair and intersection improvements while minimizing potential conflicts between trucks and active transportation facilities.

While truck route studies have been performed at the council of government level, Metro is coordinating a countywide effort in recognition that truck routes frequently traverse subregions. As a key stakeholder and steward of public rights-of-way in the unincorporated areas, DPW serves as a technical advisor to the CSTAN program.

Air Travel and Cargo

SCAG expects air travel in the region to continue to grow. LAX, for instance, is the sixth busiest airport in the world and third busiest in the United States, offering more than 565 daily flights to 81 domestic cities and more than 1,000 weekly nonstop flights to 66 international destinations on more than 75 air carriers. It ranks 13th in the world in the amount of air cargo tonnage handled. In 2010, LAX served more than 59 million passengers, processed more than 1.9 million tons of air cargo valued at nearly $84 billion, and handled 575,835 aircraft operations (landings and takeoffs).

A $4.11 billion capital improvement program is underway at LAX, generating nearly 40,000 local jobs. The program's centerpiece is the $1.5-billion Bradley West Project with new gates for the latest-generation aircraft; new concourses and seating areas; new retail and food and beverage offerings; and expanded areas for more efficient security screening, immigration and customs processing. There also are several major airfield and facility projects, including a new Central Utility Plant, new taxiways and taxi lanes, and multi-million-dollar renovations--undertaken by both Los Angeles World Airports (LAWA) and the airlines--to other terminals.

5. Impacts of Transportation on Natural and Community Resources

Transportation systems, goods movement activities, and automobile use directly affect quality of life. This includes traffic congestion, truck intrusion into neighborhoods, safety, land use incompatibility, poor air quality and related health impacts, restricted mobility and delay at rail crossings, noise and vibration impacts, and visual impacts. Significant short- and long-term air quality impacts directly result from goods movement activities, such as emissions from ocean ships, diesel trucks, as well as increased auto-emissions, which in turn contributes to climate change.

The expansion and operation of transportation systems, which invariably affect biological resources and water quality, can be mitigated to lessen the negative impacts on resources. One key ecological issue is the effect of increased runoff from paved surfaces, which increases sediment movement, destroys aquatic habitat, and redistributes road-source pollutants. A second crucial ecological issue is potential negative impacts of human transportation systems on biological resources. Human transit is often responsible for transporting non-native species to ecosystems that do not have any natural defenses against the new threats. At the same time, transit infrastructure creates physical barriers across wildlife habitats and corridors that can reduce the mobility of local species, contribute toward mortality, and threaten genetic diversity. As discussed in the Public Services and Facilities Element, the majority of stormwater runoff is discharged directly into the Pacific Ocean. The General Plan provides policies that support transportation systems that treat and infiltrate stormwater runoff to mitigate the environmental impacts of the runoff.

IV. Goals and Policies

Goal M 1: Street designs that incorporate the needs of all users.	
Topic	**Policy**
Complete Streets	Policy M 1.1: Provide for the accommodation of all users, including pedestrians, motorists, bicyclists, equestrians, users of public transit, seniors, children, and persons with disabilities when requiring or planning for new, or retrofitting existing, transportation corridors/networks whenever appropriate and feasible.
	Policy M 1.2: Ensure that streets are safe for sensitive users, such as seniors and children.
	Policy M 1.3: Utilize industry standard rating systems to assess sustainability and effectiveness of street systems for all users.
Goal M 2: Interconnected and safe bicycle- and pedestrian-friendly streets, sidewalks, paths and trails that promote active transportation and transit use.	
Topic	**Policy**
Active Transportation Design	Policy M 2.1: Provide transportation corridors/networks that accommodate pedestrians, equestrians and bicyclists, and reduce motor vehicle accidents through a context-sensitive process that addresses the unique characteristics of urban, suburban, and rural communities whenever appropriate and feasible.
	Policy M 2.2: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following street designs, whenever appropriate and feasible: • Lane width reductions to 10 or 11 feet in low speed environments with a low volume of heavy vehicles. • Wider lanes may still be required for lanes adjacent to the curb, and where buses and trucks are expected. • Low-speed designs. • Access management practices developed through a community-driven process. • Back in angle parking at locations that have available roadway width and bike lanes, where appropriate.

	Policy M 2.3: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following intersection designs, whenever appropriate and feasible: • Right angle intersections that reduce intersection skew. • Smaller corner radii to reduce crossing distances and slow turning vehicles. • Traffic calming measures, such as bulb-outs, sharrows, medians, roundabouts, and narrowing or reducing the number of lanes (road diets) on streets. • Crossings at all legs of an intersection. • Shorter crossing distances for pedestrians. • Right-turn channelization islands. Sharper angles of slip lanes may also be utilized. • Signal progression at speeds that support the target speed of the corridor. • Pedestrian push buttons when pedestrian signals are not automatically recalled. • Walk interval on recall for short crossings. • Left-turn phasing. • Prohibit right turn on red. • Signs to remind drivers to yield to pedestrians.

	Policy M 2.4: Ensure a comfortable walking environment for pedestrians by implementing the following, whenever appropriate and feasible: • Designs that limit dead-end streets and dead-end sidewalks. • Adequate lighting on pedestrian paths, particularly around building entrances and exits, and transit stops. • Designs for curb ramps, which are pedestrian friendly and compliant with the American Disability Act (ADA). • Perpendicular curb ramps at locations where it is feasible. • Pedestrian walking speed based on the latest standard for signal timing. Slower speeds should be used when appropriate (i.e., near senior housing, rehabilitation centers, etc.) • Approved devices to extend the pedestrian clearance times at signalized intersections. • Accessible Pedestrian Signals (APS) at signalized intersections. • Pedestrian crossings at signalized intersections without double or triple left or right turn lanes. • Pedestrian signal heads, countdown pedestrian heads, pedestrian phasing and leading pedestrian intervals at signalized intersections. • Exclusive pedestrian phases (pedestrian scrambles) where turning volume conflicts with very high pedestrian volumes. • Advance stop lines at signalized intersections. • Pedestrian Hybrid Beacons. • Medians or crossing islands to divide long crossings. • High visibility crosswalks. • Pedestrian signage. • Advanced yield lines for uncontrolled crosswalks. • Rectangular Rapid Flashing Beacon or other similar approved technology at locations of high pedestrian traffic. • Safe and convenient crossing locations at transit stations and transit stops located at safe intersections.
	Policy M 2.5: Ensure a comfortable bicycling environment by implementing the following, whenever appropriate and feasible: • Bicycle signal heads at intersections. • Bicycle signal detection at all signalized intersections. • Wayfinding signage. • Road diet techniques, such as lane narrowing, lane removal, and parking removal/restriction. • Appropriate lighting on all bikeways, including those in rural areas. • Designs, or other similar features, such as: shoulder bikeways, cycle tracks, contra flow bike lanes, shared use paths, buffered bike lanes, raised bike lanes, and bicycle boulevards.
	Policy M 2.6: Encourage the implementation of future designs concepts that promote active transportation, whenever available and feasible.
	Policy M 2.7: Require sidewalks, trails and bikeways to accommodate the existing and projected volume of pedestrian, equestrian and bicycle activity, considering both the paved width and the unobstructed width available for walking.

	Policy M 2.8: Connect trails and pedestrian and bicycle paths to schools, public transportation, major employment centers, shopping centers, government buildings, residential neighborhoods, and other destinations.
	Policy M 2.9: Encourage the planting of trees along streets and other forms of landscaping to enliven streetscapes by blending natural features with built features.
	Policy M 2.10: Encourage the provision of amenities, such as benches, shelters, secure bicycle storage, and street furniture, and comfortable, safe waiting areas near transit stops.
	Policy M 2.11: In urban and suburban areas, promote the continuity of streets and sidewalks through design features, such as limiting mid-block curb cuts, encouraging access through side streets or alleys, and promoting shorter block lengths.
Goal M 3: Streets that incorporate innovative designs.	
Topic	**Policy**
Innovative Street Design	Policy M 3.1: Facilitate safe roadway designs that protect users, preserve state and federal funding, and provide reasonable protection from liability.
	Policy M 3.2: Consider innovative designs when part of an accepted standard, or when properly vetted through an appropriate engineering/design review, in compliance with all state and federal laws.
	Policy M 3.3: Complete the following studies prior to the implementation of innovative design concepts: • An analysis of the current and future context of the community and neighborhood in which they are proposed; • A balanced assessment of the needs of all users and travel modes (i.e., pedestrian, bicycle, transit, vehicular, and equestrian, where appropriate); • A technical assessment of the operational and safety characteristics for each mode; and • A consistency check with transportation network plans, including the Highway Plan, Bicycle Master Plan, and Community Pedestrian Plans.
	Policy M 3.4: Support legislation that minimizes or eliminates liability associated with the implementation of innovative street designs that accommodate all users.
Goal M 4: An efficient multimodal transportation system that serves the needs of all residents.	
Topic	**Policy**
Transit Efficiency, Multimodal Transportation	Policy M 4.1: Expand transportation options that reduce automobile dependence.
	Policy M 4.2: Expand shuttle services to connect major transit centers to community points of interest.
	Policy M 4.3: Maintain transit services within the unincorporated areas that are affordable, timely, cost-effective, and responsive to growth patterns and community input.
	Policy M 4.4: Ensure expanded mobility and increase transit access for underserved transit users, such as seniors, students, low income households, and persons with disabilities.
	Policy M 4.5: Encourage continuous, direct routes through a connected system of streets, with small blocks and minimal dead ends (cul-de-sacs), as feasible.
	Policy M 4.6: Support alternatives to LOS standards that account for a multimodal transportation system.
	Policy M 4.7: Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.

	Policy M 4.8: Provide and maintain appropriate signage for streets, roads and transit.
	Policy M 4.9: Ensure the participation of all potentially affected communities in the transportation planning and decision-making process.
	Policy M 4.10: Support the linkage of regional and community-level transportation systems, including multimodal networks.
	Policy M 4.11: Improve the efficiency of the public transportation system with bus lanes, signal prioritization, and connections to the larger regional transportation network.
	Policy M 4.12: Work with adjacent jurisdictions to ensure connectivity and the creation of an integrated regional network.
	Policy M 4.13: Coordinate with adjacent jurisdictions in the review of land development projects near jurisdictional borders to ensure appropriate roadway transitions and multimodal connectivity.
	Policy M 4.14: Coordinate with Caltrans on mobility and land use decisions that may affect state transportation facilities.
Travel Demand Management	Policy M 4.15: Reduce vehicle trips through the use of mobility management practices, such as the reduction of parking requirements, employer/institution based transit passes, regional carpooling programs, and telecommuting.
	Policy M 4.16: Promote mobility management practices, including incentives to change transit behavior and using technologies, to reduce VMTs.
Goal M 5: Land use planning and transportation management that facilitates the use of transit.	
Topic	**Policy**
Land Use and Transportation	Policy M 5.1: Facilitate transit-oriented land uses and pedestrian-oriented design, particularly in the first-last mile connections to transit, to encourage transit ridership.
	Policy M 5.2: Implement parking strategies that facilitate transit use and reduce automobile dependence.
	Policy M 5.3: Maintain transportation right-of-way corridors for future transportation uses, including bikeways, or new passenger rail or bus services.
Transportation Funding	Policy M 5.4: Support and pursue funding for the construction, maintenance and improvement of roadway, public transit, and equestrian, pedestrian and bicycle transportation systems.
	Policy M 5.5: Encourage financing programs, such as congestion pricing, bonding, increasing parking costs, fair share programs for each community, to implement local and state transportation systems and facilities.
Goal M 6: The safe and efficient movement of goods.	
Topic	**Policy**
Goods Movement	Policy M 6.1: Maximize aviation and port system efficiencies for the movement of people, goods and services.
	Policy M 6.2: Support the modernization of aviation systems, including LAX.
	Policy M 6.3: Designate official truck routes to minimize the impacts of truck traffic on residential neighborhoods and other sensitive land uses.
	Policy M 6.4: Minimize noise and other impacts of goods movement, truck traffic, deliveries, and staging in residential and mixed-use neighborhoods.
	Policy M 6.5: Support infrastructure improvements and the use of emerging technologies that facilitate the clearance, timely movement, and security of trade.

	Policy M 6.6: Preserve property for planned roadway and railroad rights-of-way, marine and air terminals, and other needed transportation facilities.
Goal M 7: Transportation networks that minimizes negative impacts to the environment and communities.	
Topic	**Policy**
Environmentally Sensitive Transportation Design	Policy M 7.1: Minimize roadway runoff through the use of permeable surface materials, and other low impact designs, wherever feasible.
	Policy M 7.2: Encourage the creation of wildlife underpasses and overpasses, fencing, signage, and other measures to minimize impacts to wildlife at junctures where transit infrastructure passes through or across sensitive habitats.
	Policy M 7.3: Encourage the use of sustainable transportation facilities and infrastructure technologies, such as liquid and compressed natural gas, and hydrogen gas stations, ITS, and electric car plug-in ports.
	Policy M 7.4: Where the creation of new or the retrofit of roadways or other transportation systems is necessary in areas with sensitive habitats, particularly SEAs, use best practice design to encourage species passage and minimize genetic diversity losses.
Rural Streets	Policy M 7.5: In rural areas, require rural highway and street standards that minimize the width of paving and the placement of curbs, gutters, sidewalks, street lighting, and traffic signals, except where necessary for public safety.

V. Mobility Element Implementation Programs

- Parking Ordinance
- Community Pedestrian Plans
- Safe Routes to School Program
- Multimodal Transportation Planning Function

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Model Design Manual for Living Streets

The Model Design Manual for Living Streets is a valuable resource for local jurisdictions looking to create streets that are safe and comfortable for all users and all modes. It outlines various design features that not only accommodate cars, but also pedestrians, bicyclists, and transit riders. Street design features that help to create vibrant and attractive streets are also outlined in the manual.

The manual was funded by the Department of Health and Human Services through the Los Angeles County Department of Public Health and the UCLA Luskin Center for Innovation.

For more information please visit: http://www.modelstreetdesignmanual.com/

Green Streets

Green streets is a sustainable stormwater management and landscaping strategy that utilizes a combination of increased permeable surfaces and planted areas, soil filtration, vegetative bio-retention and underground stormwater retention basins to maximize groundwater recharge. Green streets not only improve water quality and drainage, but also improve mobility and promote complete streets through traffic calming. They also enhance the pedestrian experience through sustainable landscaping, such as bio-swales, street trees, rain gardens, and planters.

Chapter 8: Air Quality Element

I. Introduction

The South Coast Air Basin, which includes the majority of Los Angeles County, continues to have among the worst air quality ratings in the country. Additionally, climate change, which is primarily caused by an increase in greenhouse gas (GHG) emissions, is one of the most pressing environmental issues faced by all levels of government. Air pollution and climate change pose serious threats to the environment, economy, and public health.

The Air Quality Element summarizes air quality issues and outlines the goals and policies in the General Plan that will improve air quality and reduce greenhouse gas emissions. One sub element—the Community Climate Action Plan—supplements the Air Quality Element. This plan establishes actions for reaching the County's goals to reduce greenhouse gas emissions in the unincorporated areas.

II. Background

Air Pollutants

The air quality in Southern California does not meet state and federal standards. The American Lung Association consistently gives Los Angeles County failing grades in the amount of ozone and particulate pollution in the air. Although smog levels are impacted by seasons and weather patterns, smog is visible in the air on most days.

Los Angeles County is a large basin with the Pacific Ocean to the west, and several mountain ranges with 11,000 foot peaks to the east and south. Frequent sunny days and low rainfall contribute to ozone formation, as well as high levels of fine particles and dust. In addition, Los Angeles County is home to many diverse industries and the largest goods movement hub on the West Coast. In spite of emission controls that are among the most stringent in the country, power generation and petroleum refining continue to be among the largest stationary sources of air pollution in Los Angeles County.

Poor air quality is a measurable environmental hazard that impacts public health, welfare and the economy. The California Air Resources Board (CARB) has identified diesel particulate matter (PM) as representing 70 percent of the known cancer risk from air toxics in California. Diesel PM is primarily emitted from trucks, trains and ships, which puts those who live near ports and distribution centers at greater risk. A 2008 report by the Institute of Economic and Environmental Studies at California State University Fullerton found that California loses about $28 billion annually due to premature deaths and illnesses linked to ozone and particulates from sources in the South Coast and San Joaquin air basins. Most of those costs, about $25 billion, are connected to roughly 3,000 smog-related deaths in the State each year. Additional impacts include work and school absences, emergency room visits, asthma attacks and other respiratory illnesses.

Poor air quality in the region is attributed to emissions from human activities and natural sources, as well as geography, local weather and climate. Specific contributors to poor air quality include: natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun; natural processes within the climate system (e.g., changes in ocean circulation); human activities that change the atmosphere's composition (e.g., through the burning of fossil fuels); and human activities that change the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Federal, state and regional agencies regulate air pollutants and contaminants that harm human health. Regulations can include standard-setting, ambient monitoring, developing permitting programs, enforcement activities, and establishing economic incentives to reduce air pollution. As shown in Figure 8.1, Los Angeles County is divided into air basins, which are areas with similar meteorological and geographic conditions. The majority of Los Angeles County is in the South Coast Air Basin, with the area north of the San Gabriel Mountains located in the Mojave Desert Air Basin.

Figure 8.1: Air Basins Map

Criteria Air Pollutants

The Clean Air Act requires the U.S. Environmental Protection Agency (EPA) to set national ambient air quality standards for six common air pollutants. These pollutants are called criteria air pollutants because the U.S. EPA has developed human health-based and/or environmentally-based criteria (science-based guidelines) for setting permissible levels:

- Ozone (O_3)
- Particulate matter (PM)
- Carbon monoxide (CO)
- Nitrogen dioxide (NO_2)
- Sulfur dioxide (SO_2)
- Lead (Pb)

Of the six identified criteria air pollutants, particle pollution and ground-level ozone have the most widespread health impacts. The levels of ozone, particulate matter, and carbon monoxide in Los Angeles County continually exceed federal and state ambient air quality standards. Table 8.1 is a summary of the primary sources and effects of the federally-identified criteria air pollutants.

Table 8.1: Primary Sources and Effects of Criteria Pollutants

Pollutants	Source	Los Angeles County Classification	Primary Health Effects
Ozone (O_3)	Atmospheric reaction of organic gases with nitrogen oxides in sunlight (“smog”)	Extreme Non-Attainment Area	Aggravation of respiratory and cardiovascular diseases; reduced lung function; increased cough and chest discomfort
Fine Particulate Matter (PM10 and PM 2.5)	Stationary combustion of fuels; construction activities; industrial processes; atmospheric chemical reactions	Serious Non-Attainment Area	Reduced lung function; aggravation of respiratory and cardio-respiratory diseases; increased mortality rate; reduced lung function growth in children.
Carbon Monoxide (CO)	Incomplete combustion of fuels, such as motor vehicle exhaust	Serious Non-Attainment Area	Aggravation of some heart diseases.

Nitrogen Dioxide (NO_2)	Motor vehicle exhaust; high temperature stationary combustion; atmospheric reactions	*Concentrations have not exceeded federal standards since 1991, but emissions remain a concern because of their contribution to O_3 and PM	Aggravation of respiratory diseases.
Sulfur Dioxide (SO_2)	Combustion of sulfur containing fossil fuels; smelting of sulfur bearing metal ores; industrial processes	Attainment Area	Aggravation of respiratory diseases (eg., asthma, emphysema); reduced lung function.
Lead (Pb)	Contaminated soil	Attainment Area	Behavioral and hearing disabilities in children; nervous system impairment.

Source: South Coast Air Quality Management District, 2005.

Air Quality Management Plans

The long-term trend of air quality in Southern California shows continuous improvement since the 1970s, as a direct result of a comprehensive, multi-year strategy of reducing air pollution from all sources as outlined in air quality management plans (AQMPs). To ensure continued progress toward clean air, the SCAQMD in conjunction with the CARB, SCAG, and the U.S. EPA, prepared the 2012 AQMP that employs the latest science and analytical tools, and incorporates a comprehensive strategy to meet all federal criteria pollutant standards within the timeframes allowed under the federal Clean Air Act. The AQMP is updated every three years. For more information, please visit http://aqmd.gov/aqmp.

Toxic Air Contaminants

Many toxic air contaminants (TACs), such as formaldehyde and methanol, do not have federal or state ambient air quality standards. However, exposure to TACs is associated with elevated risk of cancer, birth defects, genetic damage, and other adverse health effects.

TACs are regulated by technology-based requirements that are enforced at the state and local level. In California, the Air Toxics Program and the Air Toxics “Hot Spots” Information and Assessment Act regulate TACs. In Los Angeles County, operators of certain types of facilities must submit emissions inventories. The Air Toxics Program categorizes each facility as being high, intermediate, and low-priority based on the potency, toxicity, quantity, and volume of its emissions. If the risks are above established levels, facilities are required to notify surrounding populations and to develop and implement a risk reduction plan.

Greenhouse Gases

GHGs in the atmosphere affect the Earth’s heat balance by absorbing infrared radiation. This layer of gases prevents the escape of heat, similar to the function of a greenhouse. According to the U.S. EPA, the principal GHGs that enter the atmosphere because of human activities are carbon dioxide, methane, nitrous oxide, and fluorinated gases.

GHGs contribute to the destruction of the Earth’s naturally-occurring ozone, which provides protection from the damaging effects of solar ultraviolet radiation. The biggest contributors to ozone depletion are chlorofluorocarbons (CFCs), halons, carbon tetrachloride, methyl chloroform, and other halogenated compounds.

Climate Change

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). While climate change is not solely the result of poor air quality, the two have many common causes and effects.

Scientists believe that the Earth is warming faster than at any time in the previous 1,000 years. According to the California Energy Commission, the average global surface temperature has increased by 1.1 degrees Fahrenheit since the 19th century, and the 10 warmest years of the last century have occurred within the last 15 years.

A large GHG contributor is carbon dioxide, and in California, more than 35 percent of the fossil fuel emissions of carbon dioxide are related to transportation uses. As Los Angeles County has some of the highest rates of single occupant vehicle use, traffic congestion, and VMTs in the country, it is a significant contributor to climate change in the region.

The impacts of climate change are exacerbated by increased emissions during warm weather. Warmer temperatures cause increased energy consumption through the use of air conditioners, which increases emissions from power plants and vehicles. Climate change causes warming, drying, and increased winds that result in hotter wildfires that are harder to control. These wildfires result in increased levels of fine particulate matter that could also exceed state and federal standards and harm the public.

Legislation

The Global Warming Solutions Act of 2006 (AB 32) manages and reduces GHG emissions in California. AB 32 requires that CARB establish a comprehensive program of regulatory and market mechanisms to reduce GHG emissions to 1990 levels by the year 2020.

The Sustainable Communities and Climate Protection Act of 2008 (SB 375), is one of many bills that implement AB 32, and requires CARB to develop regional GHG emission reduction targets for automobile and light trucks. It requires the 18 metropolitan planning organizations in California, such as the Southern California Association of Governments (SCAG), to coordinate land use, transportation and housing strategies, and prepare a Sustainable Communities Strategy (SCS) to reduce the amount of VMTs in their respective regions and demonstrate their ability to meet CARB's targets. SCAG adopted its SCS as part of its 2012 RTP. For more information on the 2012 RTP/SCS, please visit SCAG's web site at http://www.scag.ca.gov.

Los Angeles County Energy and Environmental Program

In 2006, the Board of Supervisors adopted an Energy and Environmental Program (EEP) for the development and enhancement of energy conservation and environmental programs for County departments. These programs contribute to the County's efforts to reduce communitywide GHGs and GHGs from County operations. The EEP consists of the following programs:

Energy and Water Efficiency

The EEP establishes a reduction target of 20 percent by 2015, and implements conservation monitoring practices and water and energy shortage awareness programs for County buildings and departments.

Green Building Construction and Operations

The County's Green Building Program consists of the Green Building, Low-Impact Development, and Drought Tolerant Ordinances. For more information on the County's environmental and sustainability programs, please visit http://green.lacounty.gov.

Environmental Stewardship

The Environmental Stewardship Program measures and reduces the County's environmental footprint, including the amount of greenhouse gases produced through direct and indirect County operations, and develops climate change-related policies.

Public Outreach and Education

The Public Outreach and Education Program utilizes the County's communication and outreach channels to share utility industry information, facilitate implementation of subsidy and assistance programs, and spread energy conservation practices throughout the region.

Los Angeles County Community Climate Action Plan

The Los Angeles County Community Climate Action Plan (CCAP) provides policy guidance for reducing GHG emissions generated within the unincorporated areas. The CCAP ensures that the County will be able to reduce its emissions to 1990 levels by 2020. The CCAP includes an emissions inventory for the unincorporated areas and an analysis of the reduction needed to achieve County goals. It analyzes specific actions that result in reduced emissions and lays out a plan for their use and implementation. It also provides a mechanism for tracking and evaluating the County's progress in achieving its climate change goals. The CCAP supports sustainable design and energy efficiency, as well as active and multi-modal transportation strategies to reduce VMT.

The purpose of the CCAP is to: 1) establish a baseline emissions inventory and reduction needed to meet County goals; 2) identify specific actions that will measurably reduce GHG emissions; 3) implement state and local level measures; and 4) provide a mechanism for ongoing tracking and updates to the CCAP. For more information, please visit http://planning.lacounty.gov/ccap.

III. Issues

1. Coordinating Land Use, Transportation and Air Quality Planning

Where and how land is developed can impact air quality, which impacts public health. People who live near major sources of air pollution are at a greater health risk. Sensitive receptors, or users of residences, schools, daycare centers, parks and playgrounds, or medical facilities, are particularly susceptible to the impacts of air pollution. Furthermore, CARB advises distancing requirements for sources of air pollution, including freeways, distribution centers, ports, rail yards, refineries, chrome platers, dry cleaners that use perchloroethylene, and gasoline dispensing facilities.

Studies indicate that residing near sources of traffic pollution is associated with adverse health effects, such as the exacerbation of asthma, onset of childhood asthma, non-asthma respiratory symptoms, impaired lung function, reduced lung development during childhood, and cardiovascular morbidity and mortality. These associations are diminished with distance from the pollution source. Given the association between traffic pollution and health, many recommend that residences, schools and other sensitive uses be sited at least 500 feet from freeways, in particular. The Health Effects Institute (HEI) indicates that exposure to traffic pollution may occur up to 300 to 500 meters (approximately 984 to

1640 feet). The range reported by HEI reflects the variable influence of background pollution concentrations, meteorological conditions, and seasons. In addition, siting parks and active recreational facilities near freeways may increase public exposure to harmful pollutants, particularly while exercising. Studies show that heavy exercise near sources of traffic pollution may have adverse health effects.

In addition, there is a direct link between transportation activities and air pollution. According to the SCAQMD, mobile sources of pollution, such as cars, trucks, buses, construction equipment, trains, ships and airplanes, account for 60 percent of all smog producing emissions in the region. Additionally, highly congested freeways and highways further contribute to the conditions that produce air pollution. The continued population growth that is projected for Los Angeles County could overwhelm these air quality gains unless careful attention is paid to voluntary and regulatory measures that reduce transportation-related emissions.

Developing land and transportation systems to reduce the need for vehicle trips and provide alternative modes of transportation can improve air quality. In addition, integrating land use plans, transportation plans, and air quality management plans can help minimize exposure to toxic air pollutant emissions from industrial and other stationary sources. The Mobility Element and Land Use Element provide transportation-based policies to reduce VMTs, such as improving the efficiency of the County roadway network; mobility management, such as increased ridesharing and vanpools; and improving the jobs-housing balance. In addition, the preservation of existing natural habitats and vegetation, as discussed in the Conservation and Natural Resources Element, can also reduce and mitigate air pollution impacts. Natural plant communities, especially woodlands and forests, contribute significant ecosystem service benefits that are extremely costly to replicate once they are gone.

2. Responding to Climate Change

Climate change will have a number of adverse impacts on ecosystems and the economy. Various scenarios predict intense flooding or prolonged droughts, higher temperatures that can lead to frequent wildfires, and rising sea levels that will affect low-lying coastal areas. Therefore, it is critical to develop strategies to reduce greenhouse gas emissions, and also to address the impacts related to agriculture, public health, ecosystems and natural resources, energy, infrastructure, and emergency management. Development of climate change adaptation strategies in particular may be conducted sequentially, starting with the evaluation of threats, vulnerability and risk assessments, identification of mitigation actions, and implementation. The strategies may also investigate short and long-term funding mechanisms.

IV. Goals and Policies

Goal AQ 1: Protection from exposure to harmful air pollutants.	
Topic	**Policy**
Air Pollutants	Policy AQ 1.1: Minimize health risks to people from industrial toxic or hazardous air pollutant emissions, with an emphasis on local hot spots, such as existing point sources affecting immediate sensitive receptors.
	Policy AQ 1.2: Encourage the use of low or no volatile organic compound (VOC) emitting materials.
	Policy AQ 1.3: Reduce particulate inorganic and biological emissions from construction, grading, excavation, and demolition to the maximum extent feasible.
	Policy AQ 1.4: Work with local air quality management districts to publicize air quality warnings, and to track potential sources of airborne toxics from identified mobile and stationary sources.
Goal AQ 2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation and air quality planning.	
Topics	**Policy**
Air Quality, Land Use, and Transportation	Policy AQ 2.1: Encourage the application of design and other appropriate measures when siting sensitive uses, such as residences, schools, senior centers, daycare centers, medical facilities, or parks with active recreational facilities within proximity to major sources of air pollution, such as freeways.
	Policy AQ 2.2: Participate in, and effectively coordinate the development and implementation of community and regional air quality programs.
	Policy AQ 2.3: Support the conservation of natural resources and vegetation to reduce and mitigate air pollution impacts.
	Policy AQ 2.4: Coordinate with different agencies to minimize fugitive dust from different sources, activities, and uses.
Goal AQ 3: Implementation of plans and programs to address the impacts of climate change.	
Topic	**Policy**
Climate Change	Policy AQ 3.1: Facilitate the implementation and maintenance of the Community Climate Action Plan to ensure that the County reaches its climate change and greenhouse gas emission reduction goals.
	Policy AQ 3.2: Reduce energy consumption in County operations by 20 percent by 2015.
	Policy AQ 3.3: Reduce water consumption in County operations.
	Policy AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions.
	Policy AQ 3.5: Encourage energy conservation in new development and municipal operations.
	Policy AQ 3.6: Support rooftop solar facilities on new and existing buildings.
	Policy AQ 3.7: Support and expand urban forest programs within the unincorporated areas.
	Policy AQ 3.8: Develop, implement, and maintain countywide climate change adaptation strategies to ensure that the community and public services are resilient to climate change impacts.

V. Air Quality Element Implementation Program

- PACE Financing Program
- Climate Change Adaptation Program

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Air Quality Regulating Agencies

The following are federal, state and local agencies that regulate air quality in Los Angeles County:

U.S. Environmental Protection Agency

The U.S. EPA enforces the Clean Air Act through multiple programs, policies and regulations. The U.S. EPA focuses on pollution prevention and energy efficiency, indoor and outdoor air quality, industrial air pollution, pollution from vehicles and engines, radon, acid rain, stratospheric ozone depletion, climate change, and radiation protection. The U.S. EPA sets emissions standards for mobile sources, such as automobiles, aircraft, certain ships, and locomotives. Information on the programs and activities in U.S. EPA Region IX, which includes California, can be found on the U.S. EPA web site at http://www.epa.gov/region9.

California Air Resources Board

The California Air Resources Board is responsible for the implementation of the Clean Air Act, which establishes state ambient air quality standards, and several programs related to emission reduction activities. Per AB 32, CARB is also responsible for establishing a program to track and report GHG emissions, and to regulate, measure, and enforce the required GHG emission reductions. Information on CARB's programs and activities can be found on their web site at http://www.arb.ca.gov.

South Coast Air Quality Management District and the Antelope Valley Air Quality Management District

The SCAQMD and AVAQMD are responsible for monitoring air quality as well as planning, implementing, and enforcing programs designed to attain and maintain state and federal ambient air quality standards in Los Angeles County. The SCAQMD jurisdiction is approximately 10,743 square miles and includes Los Angeles County except for the Antelope Valley, which is covered by the AVAQMD. Information on air quality management districts can be found on the AQMD web site, located at http://www.aqmd.gov.

Los Angeles Regional Collaborative for Climate Action and Sustainability (LARC)

LARC is a network of leaders from government, the business community, academia, labor, and environmental and community groups dedicated to encouraging greater coordination and cooperation in addressing climate change at the local and regional levels. The purpose of this collaboration is to share information, foster partnerships, and develop systemwide strategies to address climate change and promote a green economy through sustainable communities.

Chapter 9: Conservation and Natural Resources Element

I. Introduction

The County's role in the protection, conservation and preservation of natural resources and open space areas is vital as most of the natural resources and open space areas in Los Angeles County are located within the unincorporated areas. The County must act as the steward for Los Angeles County's natural resources and available open space areas, and conserve and protect these lands and resources from inappropriate development patterns.

The Conservation and Natural Resources Element guides the long-term conservation of natural resources and preservation of available open space areas. The Conservation and Natural Resources Element addresses the following conservation areas: Open Space Resources; Biological Resources; Local Water Resources; Agricultural Resources; Mineral and Energy Resources; Scenic Resources; and Historic, Cultural and Paleontological Resources.

II. Open Space Resources

This section addresses open space and natural area resources, and provides policies for preserving and managing dedicated open space areas through preservation, acquisition, and easements.

Background

Open space resources consist of public and private lands and waters that are preserved in perpetuity or for long-term open space and recreational uses. Existing open spaces in the unincorporated areas include County parks and beaches, conservancy lands, state parklands, and federal lands, such as national forests. Open space resources include private lands, such as deed-restricted open space parcels and easements. Various stakeholders share a responsibility to manage and preserve the available open space resources in the unincorporated areas.

Open Space Resources

Table 9.1 shows a summary of open space resources areas, by acreage and category.

Table 9.1: Unincorporated Los Angeles County Open Space Resources, in Acres

Open Space Resource Category	Acres
Conservancy Lands	48,271.79
County Lands	16,834.24
Federal Lands	679,629.58
Private Open Space Lands	9,181.03
State Lands	50,893.72
Total Open Space	804,810.36

Source: Los Angeles County Department of Regional Planning GIS Section

County Lands

The County Lands category includes open space areas owned and maintained by the Los Angeles County Department of Parks and Recreation (DPR): natural areas, wildlife and wildflower sanctuaries, and regional parks with significant natural resources. Examples include: Devil's Punchbowl Natural Area, High Desert Wildlife Sanctuaries, Whittier Narrows Recreation Area, Santa Fe Dam Recreation Area, and Schabarum Regional Park. Please refer to the Parks and Recreation Element, Appendix E and Appendix F for a full discussion on parkland resources.

Conservancy Lands

The unincorporated areas house scenic areas and diverse topographic, geologic and vegetative features that provide important habitat for wildlife, but also hold recreational value. State-created and non-profit conservancies play a critical role in preserving many of these areas through the acquisition and preservation of available open space areas. A list and descriptions of partnering conservancies and non-state public agencies can be found in Appendix E.

State Lands

The State Lands category includes open space and recreation areas owned and operated by the State. The California Department of Parks and Recreation has been instrumental in providing open space and recreation areas in the unincorporated areas. State parklands preserve important natural habitat areas, while providing both passive and active recreational opportunities that attract users throughout the region. The County is committed to preserving the quality of these areas by planning for compatible uses on adjacent lands. Examples of State Lands include Malibu Creek and Topanga State Park.

Federal Lands

The Federal Lands category refers to public lands managed by the federal government including:

National Forest

The Angeles National Forest and a small portion of the Los Padres National Forest encompass nearly 650,000 acres of land within the unincorporated areas. The Angeles National Forest stretches across Los Angeles County in two sections encompassing the San Gabriel Mountain Range, and is 1,018 square miles, or 25 percent of the land area of Los Angeles County. The U.S. Forest Service is responsible for managing public forest lands. Its mission is the stewardship of forest lands and resources through programs that provide recreation and multiple uses of natural resources, wilderness areas, and significant habitat areas. The U.S. Forest Service prepares and periodically updates the Land and Resource Management Plan as a policy guide for the use of lands in the national forests.

Within the boundaries of the national forests, nearly 40,000 acres are privately-owned. For these parcels, commonly referred to as in-holdings, the County retains responsibility for land use regulation.

National Recreation Area

The Santa Monica Mountains National Recreation Area is a part of the National Park System and is managed by the National Park Service. The Recreation Area preserves natural habitats, historical and cultural sites, offers recreational opportunities, and improves the air quality for the Los Angeles basin. It is covered by chaparral, oak woodlands, and coastal sage scrub, and home to many species that are listed as rare, threatened, or endangered.

Bureau of Land Management Land

The U.S. Bureau of Land Management (BLM) owns thousands of acres of open space land in the northern portion of Los Angeles County. These primarily desert lands serve to preserve federally-listed endangered and threatened species, and where compatible, provide recreational, agricultural, energy, and mining activities.

Private Open Space

Open space dedications are defined as privately-owned lands that have been set aside for permanent open space as part of a larger land development proposal.

The California Open Space Easement Act of 1969 sets forth general conditions governing the creation of recognized open space easements. Agreements or contracts establishing such easements specify the standards and conditions for uses and activities permitted within the area covered. Commitment of such lands to open space use in perpetuity is typically assured through deed-restrictions or dedication of construction rights secured at the time of development permit approval. Within dedicated open space areas, standards and conditions for use are specifically set forth as conditions of the zoning permit or subdivision tract map.

Open Space Resources Policy Map

Figure 9.1: Open Space Resources Policy Map

The Open Space Resources Policy Map, Figure 9.1, aids decision-makers in identifying and maintaining open space in an undisturbed state for public recreation, scenic enjoyment, and for the protection and study of natural ecosystems. Open Space Resources are part of the County's Special Management Areas. For more information on the Special Management Areas, please refer to the Land Use Element.

Issues

1. Open Space Preservation

Increased population growth and ongoing development activities continue to impact open space areas. Dedicated open space areas are vital for the recreational, scenic and wilderness opportunities they provide. Leapfrog development and sprawl affect the ability to preserve biotic diversity and to provide appropriate recreational amenities. Because of sprawling development, open space areas are becoming increasingly fragmented or isolated, which decreases connectivity.

2. Open Space Acquisition and Planning

The acquisition and preservation of open space areas is a challenging and expensive endeavor. Additionally, there is no coordinated master plan to acquire, manage and preserve available open space areas. Working in partnership with conservancies and other stakeholders that can purchase and acquire available open space lands is an important part of the County's open space acquisition strategy. A coordinated and collaborative effort to manage and fund a countywide open space master plan is needed to adequately protect available open space areas.

Goals and Policies for Open Space Resources

Goal C/NR 1: Open space areas that meet the diverse needs of Los Angeles County.	
Topic	**Policy**
Open Space Preservation and Conservation of Natural Areas	Policy C/NR 1.1: Implement programs and policies that enforce the responsible stewardship and preservation of dedicated open space areas.
	Policy C/NR 1.2: Protect and conserve natural resources, natural areas, and available open spaces.
Open Space Acquisition	Policy C/NR 1.3: Support the acquisition of new available open space areas. Augment this strategy by leveraging County resources in concert with the compatible open space stewardship actions of other agencies, as feasible and appropriate.
	Policy C/NR 1.4: Create, support and protect an established network of dedicated open space areas that provide regional connectivity, between the southwestern extent of the Tehachapi Mountains to the Santa Monica Mountains, and from the southwestern extent of the Mojave Desert to Puente Hills and Chino Hills.
	Policy C/NR 1.5: Provide and improve access to dedicated open space and natural areas for all users that considers sensitive biological resources.
	Policy C/NR 1.6: Prioritize open space acquisitions for available lands that contain unique ecological features, streams, watersheds, habitat types and/or offer linkages that enhance wildlife movements and genetic diversity.
Goal C/NR 2: Effective collaboration in open space resource preservation.	
Topic	**Policy**
Open Space Collaboration and Financing	Policy C/NR 2.1: Establish new revenue generating mechanisms to leverage County resources to enhance and acquire available open space and natural areas.
	Policy C/NR 2.2: Encourage the development of multi-benefit dedicated open spaces.
	Policy C/NR 2.3: Improve understanding and appreciation for natural areas through preservation programs, stewardship, and educational facilities.
	Policy C/NR 2.4: Collaborate with public, non-profit, and private organizations to acquire and preserve available land for open space.

III. Biological Resources

The physical environment of the unincorporated areas is extremely diverse: elevations range from sea level to 10,000 feet; soils vary due to prehistoric volcanic activity, marine sedimentation and river deposition; and climates that are mild and moist near the coast change to severe temperature extremes in the high mountains and desert. The unincorporated areas boast a treasury of natural features, including coastlines, islands, dunes, marshes, tidal flats, sea cliffs, hills, mountain ranges, freshwater ponds, rivers, streams, wetlands, woodlands, deserts, chaparral, grasslands, valleys, and plains. As a result, the unincorporated areas contain a unique and varied collection of biological resources, including habitats and species—some of which may not be found anywhere else in the world. For example, Los Angeles County is part of the California Floristic Province, which has been designated by Conservation International as one of the world's top 25 hotspots of biodiversity loss—the only one in the United States.

The main types of biological resources in the unincorporated areas are: regional habitat linkages; forests; coastal zone; riparian habitats, streambeds and wetlands; woodlands; chaparral; desert shrubland; alpine habitats; Significant Ecological Areas (SEAs); and Coastal Resource Areas (CRAs). The General Plan works to protect and enhance these resources, and ensure that the legacy of the unique biotic diversity is passed on to future generations.

In addition, there are two sites in the unincorporated areas that are controlled by the U.S. Department of Defense and that contain important biological resources. The resources and protections on Edwards Air Force Base in the Antelope Valley are described in detail in the Antelope Valley SEA description in Appendix E. The resources and protections on San Clemente Island are described in detail in the Coastal Zone Resources section in Appendix E.

Background

Regional Habitat Linkages

Biological resources and important habitat areas in the unincorporated areas are part of a greater habitat linkage that extends beyond Los Angeles County boundaries. Figure 9.2 maps the regional habitat linkages that connect biological resource areas in Los Angeles County with resource areas in adjacent local jurisdictions. The areas depicted are based on national forest boundaries, the County's SEAs, and a series of missing linkage design studies conducted by the South Coast Wildlands Project. For a detailed description of these linkages, please refer to Appendix E. The following linkages are important to ensure greater regional biodiversity, and species and habitat connectivity:

- The Puente Hills SEA is a linkage connecting the Puente Hills with the Chino Hills in Orange County.

- Linkages in the Santa Monica Mountains, Santa Susana and Simi Hills, Santa Clara River and Santa Felicia Creek SEAs connect to habitats in Ventura County and to the Tehachapi and San Gabriel Mountains.

- The San Andreas SEA is a linkage to the Santa Clara River Watershed, San Gabriel Mountains, Antelope Valley, and Tehachapi Mountains.

- The Antelope Valley SEA serves as a linkage between the San Gabriel Mountains and the Mojave Desert, and provides wildlife movement opportunities into open areas in Kern County and San Bernardino County.

Figure 9.2: Regional Habitat Linkages Map

National Forests

The two National Forests, Los Padres National Forest and Angeles National Forest, contain extensive biological resources. The Angeles National Forest contains the largest area of dedicated open space in Los Angeles County. A vast number of wildlife species depend on the Angeles National Forest for protection, foraging, and breeding. Two thirds of the Angeles National Forest has slopes steeper than 60 percent, with elevations ranging from 1,200 to 10,000 feet above sea level. General habitat types within the National Forests include riparian habitats, streambeds, wetlands, chaparral, coastal sage scrub, and woodlands, each of which is described below. In addition to these, Angeles National Forest also supports alpine habitats which are typified by low-growing herbaceous and scrubby vegetation above the tree line.

Activities that occur in the National Forests have a potential impact on biotic resources, as well as on the quality of local water supplies and the health of major watersheds. There are 240 miles of perennial rivers and streams, as well as 19 lakes and reservoirs. The floor of the National Forests allows rainfall and snowmelt to replenish groundwater basins, which provides the unincorporated areas with approximately 13 percent of its annual water supply. Surface water runoff fills streams and rivers, which support riparian habitats and which, in the case of the Angeles National Forest, flow downstream into the channelized waterways of the Los Angeles River and its tributaries before reaching the Pacific Ocean. To protect these forest functions, the U.S. Forest Service has identified two thirds of the National Forests in Los Angeles County as sensitive watershed areas.

The County is responsible for the land use regulation of the nearly 40,000acres of privately-owned in-holdings within the National Forest boundaries. Much of this land is in remote locations, subject to a high degree of natural hazards, and lacks adequate access to paved roads and water supply. The County does not encourage development in the national forests, and regulation is coordinated closely with the U.S. Forest Service.

Coastal Zone

The biological resource value in the coastal zone, which includes San Clemente Island, Santa Catalina Island, Marina del Rey, Ballona Wetlands and the Santa Monica Mountains, is significant. The study and management of these resource areas is more rigorous than any other area in Los Angeles County, and any land disturbance is regulated through coastal land use plans and local coastal programs, in conjunction with the California Coastal Commission.

Biological resources in the coastal zone are identified through Sensitive Environmental Resource Areas (SERAs), which contain terrestrial or marine resources that, because of their characteristics and/or vulnerability, require special protection. SERAs are comprised of the following sub-categories: Environmentally Sensitive Habitat Areas (ESHAs); Significant Woodlands and Savannahs; Significant Watersheds; Malibu Cold Creek Resource Management Area; and Wildlife Migration Corridor. SERAs are not intended to function as isolated preservation areas, but as areas subject to strictly-enforced environmental resource protections and land use regulations.

Biological resource management and regulation on Santa Catalina Island is implemented through the Santa Catalina Island Local Coastal Program (LCP). Island resources, such as Significant Ecological Areas (SEA), are identified in the LCP and are subject to restrictive development regulations. Any changes to the SEA boundaries or associated regulations require an amendment to the LCP and certification by the California Coastal Commission. Biological resource management and regulation on Marina del Rey is also implemented through an LCP.

Land use regulation and jurisdictional authority in the Santa Monica Mountains Coastal Zone involves many public entities. In the unincorporated areas, biological resource protection is implemented through the Malibu Land Use Plan and the Malibu Coastal Program District, and by both the County and the California Coastal Commission.

Finally, resources within San Clemente Island and the Ballona Wetlands are managed by the U.S. Navy and California Department of Parks and Recreation, respectively.

For more information on the biological resources in the coastal zone, please refer to Appendix E.

Riparian Habitats, Streambeds and Wetlands

Riparian habitats are comprised of vegetation and other physical features that are typically found on stream banks and flood plains associated with streams, lakes, or other bodies of perennial or nearly-perennial surface water. Streambeds are the physical confines that water typically flows through, either perennially or after rain events. Riparian habitats and streambeds are of inherent value to local and regional ecosystems. They serve as important connectors to up- and downstream ecosystems or adjacent habitats; provide critical value to migratory birds; contribute to the quality of habitat linkages and wildlife corridors; and play a crucial role in maintaining surface and subsurface water quality.

Wetlands are areas that are inundated or saturated by surface water or groundwater at a frequency and duration that are sufficient to support vegetation, which is typically adapted for life in saturated soil conditions. Examples of wetlands include swamps, marshes, bogs, vernal pools, and playa lake areas. However, wetlands can also remain dry for long periods of time (e.g., arroyos or ephemeral streams, characteristic of the American Southwest), which makes their identification and management potentially difficult. Wetlands contribute to water quality and the overall health of watersheds in several ways. They slow water flow, decrease erosion, filter water runoff, and provide habitat for many endangered plant and animal species.

The Emergency Wetlands Resources Act establishes a national wetlands conservation program, which requires states to include wetlands in their Comprehensive Outdoor Recreation Plans for management and preservation. California has lost over 90 percent of its original wetland areas, and Los Angeles County has lost 95 percent. The County is dedicated to preserving its remaining wetlands and supports the wetland reclamation and conservation efforts of other public agencies and numerous non-profit organizations. In addition to County policy and regulation, projects that are subject to CEQA and located in a wetland are forwarded to applicable state and federal agencies for further review and permitting requirements.

Woodlands

The County's oak woodlands are an important resource that provides an abundance of aesthetic, ecological, and economic benefits to residents. Oak woodland habitats are the most diverse terrestrial ecosystems in California. Similarly, riparian woodlands, California walnut, juniper, and Joshua tree woodlands provide habitat for multiple species within a concentrated area. Various types of woodlands are found in the unincorporated areas, including riparian woodlands; California walnut woodlands in the San Gabriel Valley and Puente Hills; juniper and Joshua tree woodlands in the Antelope Valley; and oak woodlands countywide.

Chaparral

Chaparral consists of broad-leaved or needle-leaved, sclerophyllous (hard-leaved), medium height to tall shrubs that form a dense cover on steep slopes, usually below 5,000 feet in Southern California. It is a common shrub community composed of robust, mostly evergreen species. Chaparral types are

identified according to their dominant plant species. These may include chamise, buck brush, California lilac, scrub oak, interior live oak, or birch-leaf mountain-mahogany on north-facing exposures. Coastal occurrences of chaparral may include laurel sumac, toyon, lemonade berry, big-pod ceanothus and manzanita as dominant species. Additional species that often occur include scrub oaks (several species), California buckwheat, chaparral yucca, sugar bush, holly-leaved cherry, holly leaf redberry, hoary leaved ceanothus, black sage, and sawtooth goldenbush on south-facing slopes. Thick leaved yerba santa may be abundant along dirt roads and other disturbed areas. In the canyons bottoms, where groundwater levels are higher, giant rye grass, blue elderberry, sacapellote, redberry, toyon, and holly-leaved cherry may occur.

Coastal Sage Scrub

Coastal sage scrub is shorter in stature than chaparral and is dominated by drought-deciduous species, including California sagebrush, bush sunflower, white sage, black sage, and California buckwheat. Other common species within this community may include woolly blue-curls, chaparral yucca, black sage, Acton encelia (in more inland locations), white sage, and chamise. A variety of less common associated species are also present including lance-leaved live-forever, common tarplant, beavertail cactus, Turkish rugging, and southern California morning-glory. Disked or cleared areas that have regrown may have a dense cover of oats and bromes, California poppy, fiddleneck, several species of lupines, popcorn flower, comb-bur and other disturbance-favored native annuals.

Desert Scrub

Desert scrub is a comprehensive plant assemblage term applied for a number of relatively low-stature, widely-spaced desert formations of shrubs and subshrubs, commonly occurring on open, sandy soils where groundwater is inaccessible to all but a few deep-rooted species. Dominants include Great Basin sagebrush, antelope bush, brittlebush, creosote bush, several species of saltbush, rubber rabbitbrush, cheesebush, sages, winterfat, and burrobrush, often with one or more perennial grass species.

Significant Ecological Areas (SEAs) and Coastal Resources Areas (CRAs)

A Significant Ecological Area (SEA) designation is given to land that contains irreplaceable biological resources, as detailed in Appendix E. Cumulatively, the 21 SEAs and nine Coastal Resource Areas (CRAs) represent the wide-ranging biodiversity of Los Angeles County, and contain its most important biological resources. Each individual SEA is sized to support sustainable populations of its component species, and includes undisturbed or lightly disturbed habitat along with linkages and corridors that promote species movement. Table 9.2 details the 21 SEAs and nine Coastal Resources Areas of the County. Note that two Coastal Resource Areas, the Santa Monica Mountains Coastal Zone and Palos Verde Coastline, are linked to SEAs that are not entirely within Coastal Resource Areas.

Table 9.2: Significant Ecological Areas and Coastal Resource Areas

Significant Ecological Areas	Coastal Resource Areas
• Cruzan Mesa Vernal Pools • East San Gabriel Valley • Griffith Park • Harbor Lake Regional Park • Joshua Tree Woodlands • Madrona Marsh Preserve • Palos Verdes Peninsula and Coastline • Puente Hills • Rio Hondo College Wildlife Sanctuary • San Andreas • San Dimas Canyon and San Antonio Wash • San Gabriel Canyon • Santa Clara River • Santa Felicia • Santa Monica Mountains • Santa Susana Mountains and Simi Hills • Tujunga Valley and Hansen Dam • Valley Oaks Savannah • Verdugo Mountains	• El Segundo Dunes • Malibu Coastline • Palos Verdes Coastline (ocean and shoreline portions) • Point Dume • Santa Catalina Island • Coastal Zone of the Santa Monica Mountains • Terminal Island (Pier 400)

Figure 9.3 Significant Ecological Areas and Coastal Resource Areas Policy Map

SEAs are part of the County's Special Management Areas Policy Map (Figure 6.1) in the Land Use Element. The County's SEA Program has a long history going back to the 1970s. The SEA Program, for those SEAs located in unincorporated areas, is administered through the General Plan goals, policies and implementation program and the SEA Ordinance. Some SEAs are located entirely or partially outside of the County's jurisdiction in cities, along the coastline, or within national forest land. The SEAs within the jurisdiction of cities are shown on the map for reference and visual continuity, and are intended to be used for informational purposes only. Appendix E provides more information on the history of the SEA Program, guiding principles, criteria for designation, and detailed summaries of the biological resources contained within each SEA. The nine CRAs are included in the Significant Ecological Areas map. CRAs are located within the coastal zone and include biological resources equal in significance to SEAs. Protection of these areas must defer ultimately to the authority of the California Coastal Commission. Of particular note for the CRAs, the coastal zone of the Santa Monica Mountains and the entirety of Santa Catalina Island are regulated through their individual local coastal programs.

The objective of the SEA Program is to conserve genetic and physical diversity by designating biological resource areas that are capable of sustaining themselves into the future. However, SEAs are not wilderness preserves. Much of the land in SEAs is privately-held, used for public recreation, or abuts developed areas. The SEA Program must therefore balance the overall objective of resource preservation against other critical public needs. The General Plan goals and policies are intended to

ensure that privately-held lands within the SEAs retain the right of reasonable use, while avoiding activities and developments that are incompatible with the long-term survival of the SEAs.

Certain uses of the SEAs are compatible by definition with the long-term sustainability of biological resources. Some examples of uses that do not conflict with the goals of the SEA Program include: regulated scientific study; passive recreation, including wildlife observation and photography; and limited picnicking, riding, hiking and overnight camping. Many other uses may also be compatible with the SEA Program, or may partially or fully mitigate against potential impacts through careful site design and stewardship. In particular, the following uses may be determined compatible by scientific review or biotic surveys, or through the addition of conditions that are intended to protect against site specific and cumulative impacts to biotic resources in the SEA:

- Low-density or clustered residential uses that are compatible with identified biotic resources present in or affected by the site.
- Low-intensity local or visitor-serving commercial uses.
- Essential public and semi-public uses that are necessary for health, safety and welfare, and that cannot be relocated to alternative sites.
- Agricultural uses that are compatible with identified biotic resources that are present on or near the site.
- Extractive uses, including oil and gas recovery, and rock, sand and gravel quarrying, which are compatible with identified biotic resources.

More complex or intensive types of developments within SEAs are not precluded from development, but may require additional technical review to ensure that projects properly identify existing resources and potential impacts. The Los Angeles County Department of Regional Planning (DRP) assumes a responsibility to assist these types of projects with site design in the early stages of the project to ensure that projects are sensitive to and compatible with the resources of the area. The process of analyzing impacts to existing biological resources and determining SEA compatibility is designed to provide careful evaluation of projects within SEAs, in order to ensure that the ecological function of the SEA is maintained.

Generally, complex or intensive types of developments in the SEAs require an SEA Conditional Use Permit (SEA CUP). The SEA Technical Advisory Committee (SEATAC) is an expert advisory committee that assists the DRP and the Los Angeles County Regional Planning Commission in assessing applications for SEA CUPs by providing recommendations on the biological analyses conducted for SEA CUPs, and on the project's compatibility with SEA resources.

Sensitive Local Native Resources

The County considers authoritatively defined sensitive local native resources, including species on watch lists, as important resources to identify and conserve. Examples of authoritatively compiled databases include lists on the Audubon Society's "Los Angeles County Sensitive Bird List," and those in the inventory of the California Native Plant Society. For more information, please visit the Los Angeles Audubon Society web site at: http://losangelesaudubon.org/, and the California Native Plant Society web site at http://www.cnps.org/cnps/rareplants/inventory/.

Issues

1. Preservation of Biotic Diversity

Development continues to be the main cause of species decline in the Southern California region, where approximately 20 percent of the species on the federally-endangered species list are found. Although both federal and state agencies are tasked with protecting their listed species, the County has a role to play in species survival when it decides whether or not to approve development within habitats that contain endangered and threatened species. The SEA Program balances future development and human activities against the preservation of irreplaceable biotic resources. The SEA designation does not protect or identify every individual biotic resource, and SEAs are not preserves or conservation areas; rather, SEAs are areas in which planning decisions are made with extra sensitivity toward biological resources and ecosystem functions. In order to accommodate potential development pressures, the SEAs were designed as large-scale areas connected to regional resources, creating a sufficient habitat and mobility areas for species. However, the resiliency and long-term sustainability of the SEAs is dependent upon careful land use decisions by the County to maintain core habitats and linkages.

2. SEA Monitoring and Status Reporting

SEAs are large and changing areas containing evolving resources, and new science, species, or development practices may create a need for changes to the SEA Program over time. In order to meet the changing needs of the SEA Program, and assess progress in implementation, the County should periodically review the SEA Program. This periodic review may include undertaking new studies, monitoring approved uses, disclosing impacts of development and human activities on biological resources and, when necessary, amending the SEA Ordinance, SEA boundaries and technical descriptions to address any changes required to meet the overall objective of the SEA Program.

3. Coordination of Property Rights and Environmental Protection

The SEA Program is a method of balancing private property rights against impacts to irreplaceable biological resources. Preservation of these resources must not compromise the right of privately-held lands to be fairly used by their owners, nor burden them with excessive development costs or regulatory procedures. The SEA Program is tasked with serving the needs of property owners in SEA areas by simplifying the development process when possible, providing clear guidelines and expectations about the requirements for development in SEAs, coordinating with other regulatory agencies, and seeking out financing mechanisms that incentivize the preservation of biological resources and the acquisition of conservation areas.

Goals and Policies for Biological Resources

Goal C/NR 3: Permanent, sustainable preservation of genetically and physically diverse biological resources and ecological systems including: habitat linkages, forests, coastal zone, riparian habitats, streambeds, wetlands, woodlands, alpine habitat, chaparral, shrublands, and SEAs.	
Topic	**Policy**
Protection of Biological Resources	Policy C/NR 3.1: Conserve and enhance the ecological function of diverse natural habitats and biological resources.
	Policy C/NR 3.2: Create and administer innovative County programs incentivizing the permanent dedication of SEAs and other important biological resources as open space areas.
	Policy C/NR 3.3: Restore upland communities and significant riparian resources, such as degraded streams, rivers, and wetlands to maintain ecological function—acknowledging the importance of incrementally restoring ecosystem values when complete restoration is not feasible.
	Policy C/NR 3.4: Conserve and sustainably manage forests and woodlands.
	Policy C/NR 3.5: Ensure compatibility of development in the National Forests in conjunction with the U.S. Forest Service Land and Resource Management Plan.
	Policy C/NR 3.6: Assist state and federal agencies and other agencies, as appropriate, with the preservation of special status species and their associated habitat and wildlife movement corridors through the administration of the SEAs and other programs.
	Policy C/NR 3.7: Participate in inter-jurisdictional collaborative strategies that protect biological resources.
Site Sensitive Design	Policy C/NR 3.8: Discourage development in areas with identified significant biological resources, such as SEAs.
	Policy C/NR 3.9: Consider the following in the design of a project that is located within an SEA, to the greatest extent feasible: • Preservation of biologically valuable habitats, species, wildlife corridors and linkages; • Protection of sensitive resources on the site within open space; • Protection of water sources from hydromodification in order to maintain the ecological function of riparian habitats; • Placement of the development in the least biologically sensitive areas on the site (prioritize the preservation or avoidance of the most sensitive biological resources onsite); • Design required open spaces to retain contiguous undisturbed open space that preserves the most sensitive biological resources onsite and/or serves to maintain regional connectivity; • Maintenance of watershed connectivity by capturing, treating, retaining, and/or infiltrating storm water flows on site; and • Consideration of the continuity of onsite open space with adjacent open space in project design.
	Policy C/NR 3.10: Require environmentally superior mitigation for unavoidable impacts on biologically sensitive areas, and permanently preserve mitigation sites.
	Policy C/NR 3.11: Discourage development in riparian habitats, streambeds, wetlands, and other native woodlands in order to maintain and support their preservation in a natural state, unaltered by grading, fill, or diversion activities.
Goal C/NR 4: Conserved and sustainably managed woodlands.	

Topic	Policy
Woodland Preservation	Policy C/NR 4.1: Preserve and restore oak woodlands and other native woodlands that are conserved in perpetuity with a goal of no net loss of existing woodlands.

IV. Local Water Resources

The arid and semi-arid climate and landscape of Los Angeles County require that water be managed as an invaluable resource. The County recognizes that the effective management and preservation of its local water resources are vital to preserving a high quality of life for residents and businesses, as well as for sustaining the functioning of watersheds and the natural environment.

Background

Local Water

The occurrence and movement of water above, on, and below the ground can be explained in general terms by the hydrologic cycle. Precipitation falls to earth, is intercepted by vegetation before it reaches the ground, then soaks into the soil where it infiltrates into shallow and deeper groundwater zones. Water drawn up by vegetation transpires into the atmosphere in the form of water vapor. Similarly, water collected on surfaces and in the soil evaporates into the atmosphere. Collectively, this process of water vapor passing into the atmosphere is called evapotranspiration. During a storm, as the soil approaches saturation and rainfall continues, runoff begins to occur. Rainfall falling on paved surfaces does not soak into the ground. At first, the runoff gathers in small pools and minor depressions on the ground surface. Once these small depressions are filled and rainfall continues, runoff increases, forming rivulets and filling streams, rivers, and lakes. Precipitation, interception, infiltration, evapotranspiration, and runoff occur in the context of a system called a watershed.

Precipitation

During the wet season, storms approach from the west or northwest, with southerly winds that continue until the weather front passes. Nearly all precipitation occurs during the months of December through March, while precipitation during summer months is infrequent, and rainless periods of several months are common. The average annual rainfall across Los Angeles County is 15.65 inches, but the annual average varies from 7.8 inches in the high desert, to 12.1 inches at Los Angeles International Airport (LAX) near the coast, to 27.5 inches at Mt. Wilson. Another examination of characteristic rainfall patterns shows that 85% of all storms within Los Angeles County deposit between 3/4 inch and 1 1/4 inches or less of rain, depending on location.

Snowfall at elevations above 5,000 feet is frequently experienced during winter storms but, except on higher peaks and the northern slopes, melts rapidly. In the coastal plain and mountainous areas, the distribution of rainfall from individual storms generally follows patterns related to elevation and terrain. This distribution is called the orographic effect.

Runoff and Surface Waters

The Pacific Ocean eventually receives the excess runoff that is generated on the coastal plain of Los Angeles. Excess runoff generated in the Antelope Valley of the high desert will eventually arrive at the dry lake bed near the border with Kern County. The high desert can also experience summer thunderstorms, which cause the most serious flooding in that area. Surface flows reach the dry lake bed when the storms in the high desert are large enough for runoff to exceed local infiltration and transpiration.

Runoff can even occur at times of no rain. In urban areas, dry weather runoff can occur as the result of the discharge of process flows and other human endeavors. Examples of process flows include treated wastewater and industrial flows. Excessive irrigation can also contribute to dry weather runoff. Dry weather discharge from natural springs and seeps can occur in mountainous areas and where

high groundwater levels otherwise reach the ground surface. The amount and continuity of springs and seep flows can vary year to year, depending significantly on previous rainfall.

Surface waters occur in the form of streams, rivers, ponds, lakes, and reservoirs. In Los Angeles County, there are over 900 miles of major river systems, 3,600 miles of smaller streams, and 25 square miles of pond, lake, and reservoir surface. Streams and rivers convey surface runoff and can be instrumental in groundwater recharge. They can also serve as corridors for fish and wildlife movement. Streams and rivers support their own habitats as well as link other habitats together.

A number of the ponds, lakes and reservoirs in Los Angeles County are human-made impoundments that serve as water storage facilities. These storage facilities receive and store rainfall and runoff, as well as imported water supplies from outside of Los Angeles County, and hold them until needed at a later time. Examples within Los Angeles County boundaries are Hollywood Reservoir, which is operated by the City of Los Angeles Department of Water and Power, and Pyramid Lake, operated by the Metropolitan Water District of Southern California. Smaller impoundments are operated by other public and private water wholesalers and retailers. Some of these facilities support fish and wildlife, and provide recreation areas for residents that are compatible with flood management and water storage operations.

Some impoundments, which are primarily operated by the Los Angeles County Flood Control District, serve the dual functions of flood protection and storage. Stored runoff collected during the storm season is later released at controlled rates throughout the year for downstream groundwater recharge. For example, an array of Los Angeles County Flood Control District dams in the San Gabriel Mountains provides flood protection, while storing runoff for later release to the San Gabriel River and downstream groundwater recharge areas. These downstream facilities capture close to 80 percent of the runoff that flows from the mountains. Water sources that originate in Los Angeles County provide approximately one third of the area's water supply.

The rate and quantity, as well as the quality, of runoff are significantly influenced by the land use within the tributary area. For example, the amount of impervious surface that accompanies development, in particular, connected impervious surfaces, dictates the volume of runoff produced from most storms. Furthermore, the degree to which flow paths are straightened, channelized, piped, and connected influence how soon runoff appears during a storm and the rate at which it flows. The types of land uses, ranging from open space, single family, and heavy industrial, affect the type and concentration of pollutants that may be carried in the runoff.

For flood protection and erosion control purposes, many of the larger rivers within Los Angeles County are armored with concrete lining. Some rivers, such as the Ballona Creek and Los Angeles River, are mostly lined on the bottoms as well as along the banks. Others, such as the San Gabriel River and Santa Clara River, are armored primarily along their banks.

Also located within Los Angeles County are a number of regional groundwater recharge areas called spreading grounds. Most spreading grounds are owned by the Los Angeles County Flood Control District and are located in areas where the underlying soils are composed of permeable formations and are hydraulically connected to the underlying groundwater basin. Some spreading grounds are owned by the City of Los Angeles and by a few other cities. The total area of regional spreading grounds countywide is 3,361 acres.

Soils, Infiltration, and Groundwater

Soil type and geography will influence the location and amount of rainwater and surface water infiltration. Igneous, metamorphic, and sedimentary rock groups are present within Los Angeles County. The San Gabriel Mountains and Verdugo Hills are composed primarily of highly fractured

igneous rock, with large areas of granitic rock formation being exposed. Faulting and deep weathering have produced porous zones in the rock formation; however, rock masses have produced a comparatively shallow soil mantle due to the steepness of slopes, which is a condition that accelerates erosion of the finer material.

Surface soils that are deposited by the movement of water are termed alluvial soils. Valley and desert soils are alluvial and vary from coarse sand and gravel near canyon mouths to silty clay, clay, and sand, and gravel in the lower valleys and coastal plain. The alluvial fill has accumulated by repeated deposition of sediments to depths as great as several thousand feet. This fill is quite porous in areas of relatively low clay content. Geologic structures and irregularities in the underlying bedrock divide the alluvium into several groundwater basins. Valley soils are generally well drained, but there are a few areas containing perched water where groundwater sits above the main aquifer separated by a relatively impermeable layer. Soils are further described in the Agricultural Resources section.

When precipitation and surface water infiltrate naturally into the ground, they first typically travel through an unsaturated soil zone until they reach the water table, which is the layer where the soil is saturated. This layer of soil saturation is called a groundwater basin, or aquifer. Aquifers can hold millions of acre-feet of water and extend for miles. There are numerous major groundwater basins, located geographically as shown in Table 9.3.

Table 9.3: Major Groundwater Basins

	Major Groundwater Basin
Coastal Plain	• Central Basin • West Coast Basin • Santa Monica Basin • Hollywood Basin
San Gabriel Valley	• Main San Gabriel Basin • Upper San Gabriel Canyon Basin • Lower San Gabriel Canyon Basin • Wayhill Basin • Foothill Basin • Glendora Basin • Claremont Heights Basin • Live Oak Basin • Chino Basin • San Dimas Basin • Pomona Basin • Puente and Spadra Basins • Raymond Basin
San Fernando Valley (also known as the Upper Los Angeles River Area)	• San Fernando Main Basin • Sylmar Basin • Verdugo Basin • Eagle Rock Basin
Santa Clarita Valley	N/A
Antelope Valley	N/A

Except during times of drought, groundwater extraction accounts for nearly 1/3 of the water usage in the unincorporated areas. In rural areas, households depend largely on private wells.

Watersheds

A watershed is a geographic area that, due to its terrain and topography, contributes to the flow of surface water, sediments, and transported materials from the land into a common river, lake, groundwater basin, ocean, or other water body. A watershed, also known as a drainage area or catchment, can be large or small, pristine or urbanized. All land is located in a watershed of some sort. Furthermore, just as larger river systems can have smaller tributary streams, a major watershed can also have smaller sub-watersheds within it that define the tributary drainage areas. An action that occurs within an upstream watershed, therefore, can have an impact on downstream conditions.

A healthy watershed is a place where the interrelated functions of the water cycle—water movement, soil movement, and vegetative cover—unite to simultaneously provide the benefits of water supply, clean runoff, healthy microclimate, flood protection, recreation, and habitat.

The following are major watersheds in Los Angeles County, as shown in Table 9.4 and Figure 9.4. For descriptions of these major watersheds, please refer to Appendix E.

Table 9.4: Major Watersheds

Watershed	Sub-Watershed
Antelope Valley Watershed	• Amargosa Creek • Big Rock Creek • Little Rock Creek
Los Angeles Harbor Watershed	• Dominguez Channel
Los Angeles River Watershed	• Tujunga Wash • Verdugo Wash • Arroyo Seco • Rio Hondo • Compton Creek
San Gabriel River Watershed	• Walnut Creek • Puente Creek • Coyote Creek
Santa Clara River Watershed	• Soledad Canyon • Mint Canyon • Bouquet Creek • South Fork Santa Clara River
Santa Monica Bay Watershed	• Malibu Creek • Topanga Canyon • Santa Monica Canyon • Ballona Creek

Watershed Management

Watershed management is an effective and comprehensive method to address water resource challenges. Watershed management integrates habitat enrichment and recreation availability with water supply, flood protection, and clean runoff.

Because a watershed encompasses many jurisdictions, water supply, water quality, flood protection and natural resource issues are best managed at a regional or multiple-agency level. The County works within its jurisdiction to improve the health of rivers, streams and lesser tributaries to enhance overall water resources, runoff quality and wildlife habitat. However, watershed integration must be a

multi-jurisdictional process. The County has to participate with other stakeholders in various ways to manage the function and health of watersheds.

The collaborative process is the most effective way to engage local stakeholders and local jurisdictions, generate partnerships, collaborate with educational and professional institutions, and develop and implement watershed plans. Such plans should incorporate measures to protect and augment local water supplies, maintain flood protection standards, provide assistance in the event of flooding, encourage recreational opportunities, conserve habitats of native species, and improve the quality of water that flows to rivers, lakes, and the ocean.

Figure 9.4: Major Watersheds Map

Surface Water Quality Regulations

The federal government established the Clean Water Act (CWA) in 1972 to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" with the goal that "wherever attainable water quality should provide for the protection and propagation of fish, shellfish, and wildlife, and provide for recreation in and on the water." Under delegated authority from the United States Environmental Protection Agency (EPA), the California Water Resources Control Board (State Water Board) and the nine Regional Water Quality Control Board (Regional Boards) are responsible for implementing portions of the CWA in California, including the development of water quality standards and the implementation of regulatory programs such as the National Discharge Elimination System (NPDES). In 1949, nine California Regional Boards were established to protect the quality of receiving waters from adverse impacts of wastewater discharges. In 1969, the enactment of the Porter-Cologne Water Quality Act (California Water Code) authorized the State Water Board to adopt, review, and revise policies for all water bodies in California. The Act also directed Regional Boards to develop regional Water Quality Control Plans (Basin Plans) that would help protect or restore the beneficial uses of inland waterbodies.

In 1972, the State Water Board adopted the California Ocean Plan for ocean waters of California. Over the years, the Ocean Plan has been amended numerous times, with the most recent amendment in 2012. The Ocean Plan helps to protect the water quality of California's coastal ocean through the control of the discharge of waste into the ocean. The Ocean Plan identifies beneficial uses of ocean waters and establishes water quality objectives and implementation programs to protect those beneficial uses. The beneficial uses to be protected under the Ocean Plan include "industrial water supply; water contact and non-contact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance (ASBS); rare and endangered species; marine habitat; fish migration; fish spawning and shellfish harvesting."

In 1975, the Los Angeles Regional Board adopted two basin plans: one for the Santa Clara Basin and another for the Los Angeles Basin. In 1994, the Los Angeles Regional Board adopted a comprehensive Basin Plan applicable to the Los Angeles Region (encompassing Ventura and Los Angeles counties, excluding the Antelope Valley). A majority of the Antelope Valley area of Los Angeles County is under the jurisdiction of the Lahontan Regional Board, while a small portion in the northwest corner of the Antelope Valley is under the jurisdiction of the Central Valley Regional Board, Region 5. The Lahontan Basin Plan took effect in 1995, replacing three earlier plans. Since the 1990's, the Basin Plans have been amended numerous times. The Basin Plan designates beneficial uses for inland and coastal surface waters, establishes water quality objectives and implementation programs and policies to protect those uses. There are up to 24 beneficial uses identified and defined in the Basin. Examples of beneficial uses in the Basin Plan include: municipal and domestic supply; water

contact recreation; and preservation of biological habitats. A complete list of the beneficial uses can be found in the basin plans of the Los Angeles, Lahontan and Central Valley regions.

National Pollutant Discharge Elimination System (NPDES)

In 1987, an amendment to the Clean Water Act effectively prohibited the discharge of pollutants to waters of the U.S. from stormwater, unless such discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. The NPDES is a permitting program that establishes a framework for regulating municipal, industrial, and construction stormwater discharges into surface water bodies, including stormwater channels. **Error! Hyperlink reference not valid.**The Los Angeles Regional Water Quality Control Board (Los Angeles Regional Board), Lahontan Regional Water Quality Control Board and Central Valley Regional Water Quality Board are responsible for implementing the federally-mandated NPDES program in Los Angeles County through the adoption of Orders, which are effectively the NPDES Permits for that region. An NPDES Permit defines the responsibilities of each permittee to control pollutants, including the adoption and enforcement of local ordinances and monitoring programs. Consequently, the County has a Stormwater Ordinance that requires that the discharge, deposit, or disposal of any stormwater and/or runoff to storm drains must be covered by an NPDES Stormwater Permit. For more information on the regional boards' NPDES programs, please visit the State of California Environmental Protection Agency web site at http://www.swrcb.ca.gov/rwqcb4, http://www.swrcb.ca.gov/rwqcb5, and http://www.swrcb.ca.gov/rwqcb6.

As part of its NPDES Program, the Los Angeles Regional Board adopted a new Municipal Separate Storm Sewer Permit (MS4 Permit) in 2012 (MS4 Permits are also sometimes referred to as Stormwater Permits). The remainder of this section discusses the MS4 permit and some of the County's associated efforts.

The Los Angeles Regional Board's 2012 MS4 Permit named 84 incorporated cities, the County, and the Los Angeles County Flood Control District as permittees. The MS4 Permit imposes a number of basic programs, called Minimum Control Measures, on all permittees in order to maintain a level of acceptable runoff conditions through the implementation of practices, devices, or designs generally referred to as Best Management Practices (BMPs), that mitigate stormwater quality problems. The programs required by the MS4 Permit are: public information and participation; industrial/commercial inspection; planning and land development; development construction; public agency activities; and illicit connection/discharge abatement. For example, the planning and land development program requires the inclusion of post-construction stormwater BMPs into the design of most new public and private development at the project site level to address pollutants generated by specific activities and types of development. The development construction program requires the implementation of temporary BMPs during a project's construction phase. These construction phase BMPs protect water resources by preventing erosion, controlling runoff, protecting natural slopes and channels, storing fluids safely, managing spills quickly, and conserving natural areas. In the public agency activities program, the County and other permittees are directed to implement "good housekeeping" BMPs to eliminate runoff problems that might be associated with an agency's routine activities. These BMPs include material storage management, vehicle washing management, spill containment, and public parking lot sweeping.

The Los Angeles Regional Board's 2012 MS4 Permit offers an integrated-planning approach, called a Watershed Management Program (WMP), in which permittees can collaborate to address water quality priorities on a watershed scale. The WMP allows permittees to customize BMPs and develop multi-benefit projects that contain water quality improvement, flood protection, water conservation, and/or beautification components.

As a result of the Los Angeles Regional Board's 2012 MS4 Permit, in November 2013, the County's Low Impact Development (LID) and Hydromodification Ordinance was amended. More information on the County's LID requirements can be found at http://dpw.lacounty.gov/wmd/LA_County_LID_Manual.pdf.

Areas of Special Biological Significance (ASBSs)

Ocean areas requiring the protection of marine species or biological communities from an undesirable alteration in natural water quality are designated by the California Water Resources Control Board as Areas of Special Biological Significance (ASBSs). There are 34 areas designated as ASBS. Of those, six are located within the jurisdiction of the County. Five ASBSs are located off the coasts of the Channel Islands (one along the coastline of the San Clemente Island and four along the coastlines of Santa Catalina Island). The sixth ASBS (designated as "ASBS-24") is located along the coast of Ventura County and Los Angeles County, extending from Laguna Point to Latigo Point. About two-thirds of ASBS-24 lies along the coastline of Los Angeles County.

Federal and state policies prohibit the discharge of pollutants into areas identified as ASBS. Specifically, the Ocean Plan requires that "waste shall not be discharged to areas designated as being of special biological significance. Discharges shall be located a sufficient distance from such designated areas to assure maintenance of natural water quality conditions in these areas." The County, the Los Angeles County Flood Control District, cities and other public jurisdictions, and private property owners own and maintain dozens of storm drains that discharge into ASBS-24.

Marine Protected Areas

Marine Protected Areas(MPAs) are areas of the ocean where certain activities are limited or restricted to protect or conserve marine life and habitats. There are two MPAs in Los Angeles County—Point Dume and Point Vicente-Abalone Cove. For more information, please visit: https://www.dfg.ca.gov/marine/mpa/scmpas_list.asp.

Issues

1. Watershed Impacts

All development and urban activities occur in a watershed. Rivers, streams, and people can be adversely affected by poorly designed land uses within a watershed. With urbanization comes impervious surfaces, the straightening and channelizing of water courses, the filling of wetlands, intrusion into flood plains, the loss of vegetation, heat island effects, compacted soils, increased and polluted runoff, eroded streams, and the impairment of surface and groundwaters. The General Plan recognizes the importance of utilizing a watershed-based planning approach as a method to protect, conserve and restore resources by utilizing or mimicking natural hydrologic processes. The path to improving local water resources is through improving watershed functions.

2. Surface Water Impairments

The U.S. EPA has found that close to 218 million Americans live within 10 miles of a polluted lake, stream, river, or coastline, and most of Los Angeles County falls within this category. The cost of cleaning polluted water bodies is significant and requires additional funding for local agencies to implement. Water quality regulation and implementation programs are beginning to make a difference, but without major public awareness, behavioral changes, and operational changes, the clean-up process will remain an ongoing challenge.

Federal and state agencies, such as U.S. EPA and Regional Boards, are working to improve the quality of surface and groundwater by identifying contaminants, imposing clean-up efforts, and bringing enforcement actions against polluters. In order to comply with surface water quality regulations to protect existing clean water bodies and restore impaired water bodies, the County and all cities are implementing water pollution prevention programs appropriate for their jurisdiction.

Section 303(d) of the CWA requires states to identify and establish a list of water bodies that do not meet applicable water quality standards. Those water bodies are considered “impaired” and are placed on the CWA Section 303(d) list. A significant number of the water bodies in Los Angeles County, including rivers, lakes, coastal estuaries, bays, and beaches, are included on the 303(d) list. More than a dozen different stormwater and wastewater pollutants including metals, nutrients, indicator bacteria, organics, pesticides, trash, and other contaminants are found in water bodies in Los Angeles County in amounts significantly above established water quality standards.

For each impaired water body, states are required to develop a total maximum daily load (TMDL). A TMDL is a tool by which water quality standards are implemented to restore impaired water bodies. It establishes the allowable pollutant loading that a water body can receive and still attain water quality standards. Any pollution above the TMDL has to be “budgeted,” meaning that the residual pollution is allocated for reduction among the various sources of the pollutant in order to regain the beneficial uses of the water body. As of 2013, there are 34 TMDLs developed for water bodies in Los Angeles County. All of these TMDLs are being implemented through the NPDES Permit. More TMDLs are expected in the future for the remaining pollutants in the 303(d) list.

3. Groundwater Impairment and Depletion

In the more urbanized coastal basin of Los Angeles County, the natural recharge process is hampered by compacted soils and impervious surfaces associated with urbanization and development. In the open space areas of the northern portion of Los Angeles County, where substantial percolation can occur, water demand is so great that annual precipitation and groundwater recharge operations are not sufficient enough to recharge the basins.

Because approximately one-third of the local water supply is drawn from groundwater basins, the quantity and quality of this water source is critical. Contamination from past industrial and agricultural practices, saltwater intrusion, and underground storage tank leakage has decreased usable groundwater supplies.

In an effort to mitigate groundwater depletion, water agencies have developed strategies to recharge groundwater artificially. One strategy involves purchasing water imported from outside Los Angeles County or utilizing recycled water (highly treated wastewater or reclaimed water) and recharging it back into the groundwater basins. Another strategy diverts imported water to certain regional spreading grounds, where it can percolate back into the water basins. The Los Angeles County Flood Control District also diverts a certain amount of stormwater into regional spreading grounds to replenish the groundwater supply.

Highly-treated, recycled waste water is also used for recharging groundwater aquifers through Los Angeles County Flood Control District spreading operations and injection at seawater barriers to resist saltwater intrusion. This recycled water is provided to a large degree by the Los Angeles County Sanitation Districts and to lesser degrees by the Water Replenishment District of Southern California, the City of Los Angeles, and the West Basin Municipal Water District.

In February 2009, the State Water Board adopted Resolution No. 2009-0011, which established a statewide Recycled Water Policy. This policy encourages increased use of recycled water and local stormwater and requires local water, stormwater, and wastewater agencies and other stakeholders to

develop a Salt and Nutrient Management Plan (SNMP) for each groundwater basin in California. The objectives are to facilitate basin-wide management of salts and nutrients from all sources in a manner that optimizes recycled water use while ensuring protection of groundwater supply. The SNMP will eventually be adopted by the Regional Board as a Basin Plan Amendment.

Goals and Policies for Local Water Resources

Goal C/NR 5: Protected and useable local surface water resources.	
Topic	**Policy**
Surface Water Protection	Policy C/NR 5.1: Support the LID philosophy, which seeks to plan and design public and private development with hydrologic sensitivity, including limits to straightening and channelizing natural flow paths, removal of vegetative cover, compaction of soils, and distribution of naturalistic BMPs at regional, neighborhood, and parcel-level scales.
	Policy C/NR 5.2: Require compliance by all County departments with adopted Municipal Separate Storm Sewer System (MS4), General Construction, and point source NPDES permits.
	Policy C/NR 5.3: Actively engage with stakeholders in the formulation and implementation of surface water preservation and restoration plans, including plans to improve impaired surface water bodies by retrofitting tributary watersheds with LID types of BMPs.
	Policy C/NR 5.4: Actively engage in implementing all approved Enhanced Watershed Management Programs/Watershed Management Programs and Coordinated Integrated Monitoring Programs/Integrated Monitoring Programs or other County-involved TMDL implementation and monitoring plans.
	Policy C/NR 5.5: Manage the placement and use of septic systems in order to protect nearby surface water bodies.
	Policy C/NR 5.6: Minimize point and non-point source water pollution.
	Policy C/NR 5.7: Actively support the design of new and retrofit of existing infrastructure to accommodate watershed protection goals, such as roadway, railway, bridge, and other—particularly—tributary street and greenway interface points with channelized waterways.
Goal C/NR 6: Protected and usable local groundwater resources.	
Topic	**Policy**
Groundwater Protection	Policy C/NR 6.1: Support the LID philosophy, which incorporates distributed, post-construction parcel-level stormwater infiltration as part of new development.
	Policy C/NR 6.2: Protect natural groundwater recharge areas and regional spreading grounds.
	Policy C/NR 6.3: Actively engage in stakeholder efforts to disperse rainwater and stormwater infiltration BMPs at regional, neighborhood, infrastructure, and parcel-level scales.
	Policy C/NR 6.4: Manage the placement and use of septic systems in order to protect high groundwater.
	Policy C/NR 6.5: Prevent stormwater infiltration where inappropriate and unsafe, such as in areas with high seasonal groundwater, on hazardous slopes, within 100 feet of drinking water wells, and in contaminated soils.
Goal C/NR 7: Protected and healthy watersheds.	
Topic	**Policy**
Watershed Protection	Policy C/NR 7.1: Support the LID philosophy, which mimics the natural hydrologic cycle using undeveloped conditions as a base, in public and private land use planning and development design.
	Policy C/NR 7.2: Support the preservation, restoration and strategic acquisition of available land for open space to preserve watershed uplands, natural streams, drainage paths, wetlands, and rivers, which are necessary for the healthy function of watersheds.

	Policy C/NR 7.3: Actively engage with stakeholders to incorporate the LID philosophy in the preparation and implementation of watershed and river master plans, ecosystem restoration projects, and other related natural resource conservation aims, and support the implementation of existing efforts, including Watershed Management Programs and Enhanced Watershed Management Programs.
	Policy C/NR 7.4: Promote the development of multi-use regional facilities for stormwater quality improvement, groundwater recharge, detention/attenuation, flood management, retaining non-stormwater runoff, and other compatible uses.

V. Agricultural Resources

Agricultural land is an important resource in California and in Los Angeles County. Much of the agricultural land in Los Angeles County has been developed. Therefore, agricultural land is viewed as a non-renewable resource that needs to be protected from conversion and encroachment of incompatible uses.

Background

According to the Los Angeles County Crop Report, Los Angeles County produced over $173 million in agriculture products in 2011. Table 9.5 summarizes the dollar value of the crops and farm products produced, where nursery products remain number one commodity.

Table 9.5: Value of Los Angeles County Agricultural Crops and Commodities, 2011

Commodity	2011 Value
Nursery Products	$96,635,150
Flowers and Foliage	$7,774,900
Fruits and Nuts Crops	$2,999,260
Vegetable Crops	$31,956,680
Field Crops	$22,575,260
Livestock Production	$8,978,030
Apiary	$2,167,600
Forest Products	$19,170
Total	**$173,106,050**

Source: 2011 Los Angeles County Crop and Livestock Report

The trend for agriculture in Los Angeles County is more farms on fewer acres of land. As shown in Table E.1 of Appendix E, according to data from the U.S. Census of Agriculture, since 1997 the number of farms in Los Angeles County has increased; however, the total acreage of land used for farming activities has continually declined. The 2007 U.S. Census of Agriculture identified a total of 1,734 farms in Los Angeles County, which represents a 41 percent increase from the 1997 Census. Despite this increase, the Census shows a decrease in the total number of acres used for farming. In 2007, the total number of acres in Los Angeles County used for farming was 108,463, which is a 17 percent decrease from the 1997 Census. Similarly, data from the 2011 Los Angeles County Crop Report shows that between 2010 and 2011, Los Angeles County saw decreases in the acreage of fruit and nut crops, vegetable crops, and field crops by 32 percent, 12 percent, and 7 percent, respectively.

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service classifies soils into eight categories based on agricultural potential. This classification depends on factors, such as slope, organic matter, flooding potential, and erosion hazards. From this classification, prime soils (Class I and II soils) are identified for agricultural production. Based on this system, the California Department of Conservation Farmland Mapping and Monitoring Program identifies farmland that is ideally suited for agricultural use. The program does not affect local land use decisions, but is an identification tool that can be used for policy purposes by local governments.

Agricultural Resources Areas

Agricultural Resource Areas (ARAs) consist of farmland identified by the California Department of Conservation, including Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. In addition, the ARAs include lands that received permits from the Los Angeles County Agricultural Commissioner/Weights and Measures.

The ARAs exclude the following: Significant Ecological Areas; approved specific plans; approved large-scale renewable energy facilities; lands outside of the Santa Clarita Valley and Antelope Valley, where farming is concentrated; and lands that are designated Public and Semi-Public (P).

Figure 9.5, Agricultural Resource Areas Policy Map, identifies areas where the County promotes the preservation of agricultural land.

Figure 9.5: Agricultural Resource Areas Policy Map

Issues

1. Agricultural Land Use Compatibility

Increased population growth and accompanying development will result in the conversion of agricultural lands to non-agricultural uses. This is problematic in the northern portion of Los Angeles County, which contains most of the agricultural land and is also experiencing the most rapid population growth. As development in the unincorporated areas expands from urban centers into agricultural areas, conflicts between land uses may occur. Residents of new housing developments often voice concern over odors, dust, and pesticides from neighboring farms. It is important to regulate development adjacent to agricultural land to minimize these impacts.

2. Sustainable Agriculture

Certain agricultural practices have been identified as being major contributors to pollutants that impact air and water quality. It is important that agricultural production address air quality, water quality, water supply and other issues related to sustainability. Sustainable agricultural practices, such as organic farming, can help mitigate the potential impacts of agricultural production.

Goals and Policies for Agricultural Resources

Goal C/NR 8: Productive farmland that is protected for local food production, open space, public health, and the local economy.	
Topic	**Policy**
Agricultural Resources	Policy C/NR 8.1: Protect ARAs, and other land identified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance by the California Department of Conservation, from encroaching development and discourage incompatible adjacent land uses.
	Policy C/NR 8.2: Discourage land uses in ARAs, and other land identified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance by the California Department of Conservation, that are incompatible with agricultural activities.
	Policy C/NR 8.3: Encourage agricultural activities within ARAs.
Goal C/NR 9: Sustainable agricultural practices.	
Topic	**Policy**
Sustainable Agricultural Practices	Policy C/NR 9.1: Support agricultural practices that minimize and reduce soil loss, minimize pesticide use, and prevent water runoff from leaching pesticide and fertilizer into groundwater and affecting water, soil, and air quality.
	Policy C/NR 9.2: Support innovative agricultural practices that conserve resources and promote sustainability, such as drip irrigation, hydroponics, organic farming, and the use of compost.
	Policy C/NR 9.3: Support farmers markets, farm stands, and community-supported agriculture.
	Policy C/NR 9.4: Support countywide community garden and urban farming programs.
	Policy C/NR 9.5: Discourage the conversion of native vegetation to agricultural uses.

VI. Mineral and Energy Resources

The Mineral and Energy Resources section of the Conservation and Natural Resources Element addresses the use and management of valuable energy and mineral resources in the unincorporated areas, and the importance of sustaining and maintaining these resources for future users. The demand for resources is high, and projected growth in the region will continue to strain the mineral supply.

Background

Mineral Resources

Mineral Resource Zones (MRZ-2s)

Mineral resources are commercially-viable aggregate or mineral deposits, such as sand, gravel, and other construction aggregate. California is the largest consumer of sand and gravel in the country, but is also a major producer, generating approximately one billion dollars-worth of these mineral resources annually. The Los Angeles metropolitan area produces and consumes more construction aggregate than any other metropolitan area in the country. A continuous supply of aggregate materials for urban infrastructure is essential to the Southern California economy.

The County depends on the California Geological Survey to identify deposits of regionally-significant aggregate resources. These clusters or belts of mineral deposits are designated as Mineral Resource Zones (MRZ-2s). Four major MRZ-2s are identified in, or partially within the unincorporated areas and are shown in Table 9.7: Little Rock Creek Fan, Soledad Production Area, Sun Valley Production Area, and Irwindale Production Area. The Soledad and Little Rock Creek MRZ-2s contain significant deposits that are estimated to provide for future needs through the year 2046. However, the Sun Valley MRZ-2 is near depletion, and the Irwindale MRZ-2 is expected to approach depletion in 2017. The County's MRZ-2s are shown in Figure 9.6, the Mineral Resources Map.

Table 9.6: Geologic Inventory of Mineral Resources in Los Angeles County

Production Region	Aggregate Reserves as of 1999	Per Capita Consumption Rates	Estimated Depletion Year
Irwindale Production Area	250 Million Tons	4.0 Tons	2017
Little Rock Creek Fan	250 Million Tons	12.7 Tons	2046
Soledad Production Area	160 Million Tons	9.9 Tons	2046
Sun Valley Production Area	20 Million Tons	2.4 Tons	near depletion

Source: California State Mining and Geology Board, Aggregate Resources in the Los Angeles Metropolitan Area, 1999

Figure 9.6: Mineral Resources Map

Mineral Resource Zone Regulation and Conservation

The California Department of Conservation protects mineral resources to ensure adequate supplies for future production. The California Surface Mining and Reclamation Act of 1975 (SMARA) was adopted to encourage the production and conservation of mineral resources, prevent or minimize adverse effects to the environment, and protect public health and safety. An important component of SMARA requires that all surface mines be reclaimed to a productive second use upon the completion of mining (Public Resources Code, sub-sections 2712 (a), (b), and (c)).

In a joint regulatory effort, SMARA authorizes local governments to assist the State in issuing mining permits and monitoring site reclamation efforts. To manage mining resources, the County has incorporated mineral resource policies into the Conservation and Natural Resources Element. In addition to these policies, Title 22 of the County Code (Part 9 of Chapter 22.56) requires that applicants of surface mining projects submit a reclamation plan prior to receiving a permit to mine, which must describe how the excavated site will ultimately be reclaimed and transformed into another use.

Oil and Natural Gas

Mineral Resources include areas that are appropriate for the drilling for and production of oil and natural gas. Oil production still occurs in many parts of the unincorporated areas, including the Baldwin Hills and the Santa Clarita Valley and is regulated by the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR). DOGGR retains exclusive jurisdiction over all subsurface oil and gas activities in California including well stimulation techniques such as hydraulic fracturing ("fracking"). The County may regulate zoning and land use to mitigate impacts from surface operations on surrounding communities. Jurisdiction for offshore oil and gas production falls to the State Lands Commission and the DOGGR for near-shore facilities on state leases and to the federal government for facilities farther offshore on federal leases. Adherence to the standards for the installation, operation, and abandonment of oil and gas production and storage facilities is important to protect public health and safety.

Energy Resources

Energy in California is produced from a variety of non-renewable and renewable natural resources, including oil, natural gas, and hydrologic, wind, and solar power. Although non-renewable energy resources (oil and natural gas) generate a majority of its energy, California has one of the most diverse portfolios of renewable energy resources in the country. Renewable energy is derived from resources that are regenerative and cannot be depleted, such as wind and solar power. For this reason, renewable energy sources are fundamentally different from fossil fuels, such as coal, oil, and natural gas, which are finite and also produce greenhouse gases and other pollutants. Aside from existing oil and natural gas deposits, California's topography and climate lend themselves to the production of energy from wind, solar, and tidal power. There are significant opportunities for the County to produce energy from renewable sources. Information about solar energy can be found on the County's web site at http://lacounty.solarmap.org.

Issues

1. Development of Mineral Resources

Mineral Resources include existing surface mining activities and known deposits of commercially-viable minerals and aggregate resources, as well as areas suitable for the drilling for and production of energy resources, including crude oil and natural gas. Many issues arise from the incompatible development of land near Mineral Resources. Mineral resource extraction and production, and activities related to the drilling for and production of oil and gas, can often garner community complaints due to perceived environmental threats and surface operations. The General Plan protects Mineral Resources, as well as the conservation and production of these resources, by encouraging compatible land uses in surrounding and adjacent areas.

It is also important to work with the State Mining and Geology Board and State Geologist in the permitting process, as well as to coordinate with different agencies to address mineral resources within regional efforts. This includes the prioritization of Mineral Land Classifications efforts of MRZ-3 and MRZ-4 lands adjacent to planned new or existing freight routes, or addressing mineral resources in the Sustainable Communities Strategy, per SB 375.

2. Energy Conservation

Energy demand for transportation and non-transportation uses, including gasoline, electricity, heating, and cooling will continue to increase as Los Angeles County grows. Energy consumption patterns demonstrate that residents consume proportionally more energy for transportation than the rest of California. Low-density, automobile-dependent communities place high demands on declining energy resources. The Mobility Element promotes rail, bus, carpool, bicycle, and pedestrian modes of transportation as alternatives to the single-occupant automobile, and the Land Use Element promotes the efficient development and use of land to reduce consumptive land use patterns.

In addition, state and county building codes determine energy efficiency requirements for building construction. Changes to building codes over the years have resulted in substantial improvements in energy efficiency. This has translated into less energy required to light, cool, and heat buildings. In addition, green building techniques, such as the use of passive solar orientation, recycled building materials, improved insulation, energy star appliances, and onsite small-scale renewable energy generation have contributed to energy conservation. The Air Quality Element includes policies on energy conservation and promoting renewable energy to help the County meet its climate change goals.

Goals and Policies for Mineral and Energy Resources

Goal C/NR 10: Locally available mineral resources to meet the needs of construction, transportation, and industry.	
Topic	**Policy**
Mineral Resource Zone Protection	Policy C/NR 10.1: Protect MRZ-2s and access to MRZ-2s from development and discourage incompatible adjacent land uses.
	Policy C/NR 10.2: Prior to permitting a use that threatens the potential to extract minerals in an identified Mineral Resource Zone, the County shall prepare a statement specifying its reasons for permitting the proposed use, and shall forward a copy to the State Geologist and the State Mining and Geology Board for review, in accordance with the Public Resources Code, as applicable.
	Policy C/NR 10.3: Recognize newly identified MRZ-2s within 12 months of transmittal of information by the State Mining and Geology Board.
	Policy C/NR 10.4: Work collaboratively with agencies to identify Mineral Resource Zones and to prioritize mineral land use classifications in regional efforts.
	Policy C/NR 10.5: Manage mineral resources in a manner that effectively plans for access to, development and conservation of, mineral resources for existing and future generations.
	Policy C/NR 10.6: Require that new non-mining land uses adjacent to existing mining operations be designed to provide a buffer between the new development and the mining operations. The buffer distance shall be based on an evaluation of noise, aesthetics, drainage, operating conditions, biological resources, topography, lighting, traffic, operating hours, and air quality.
Goal C/NR 11: Mineral extraction and production activities that are conducted in a manner that minimizes impacts to the environment.	
Topic	**Policy**
Mineral Extraction	Policy C/NR 11.1: Require mineral resource extraction and production activities and drilling for and production of oil and natural gas to comply with County regulations and state requirements, such as SMARA, and DOGGR regulations.
	Policy C/NR 11.2: Require the reclamation of abandoned surface mines to productive second uses.
	Policy C/NR 11.3: Require appropriate levels of remediation for all publicly-owned oil and natural gas production sites based on possible future uses.
	Policy C/NR 11.4: Require that mineral resource extraction and production operations, as well as activities related to the drilling for and production of oil and natural gas, be conducted to protect other natural resources and prevent excessive grading in hillside areas.
	Policy C/NR 11.5: Encourage and support efforts to increase the safety of oil and gas production and processing activities, including state regulations related to well stimulation techniques such as hydraulic fracturing or “fracking.”
Goal C/NR 12: Sustainable management of renewable and non-renewable energy resources.	
Topic	**Policy**
Energy Resources	Policy C/NR 12.1: Encourage the production and use of renewable energy resources.
	Policy C/NR 12.2: Encourage the effective management of energy resources, such as ensuring adequate reserves to meet peak demands.

	Policy C/NR12.3: Encourage distributed systems that use existing infrastructure and reduce environmental impacts.

VII. Scenic Resources

The County recognizes that the coastline, mountain vistas, and other scenic features of the region are a significant resource. This section of the Conservation and Natural Resources Element addresses the preservation of valuable designated scenic areas, vistas, and roadways.

Background

Scenic resources consist of designated scenic highways and corridors (or routes), and hillsides and ridgelines.

State Scenic Highways and Corridors

The State Scenic Highway Program was created in 1963 to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. The Los Angeles County Scenic Highway Plan was created to conform to the State Scenic Highway Program. According to state guidelines, a highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view.

To be designated as an official state scenic highway, the County must create a corridor protection program, which must be adopted by the Board of Supervisors. Each corridor protection program must contain the following five elements related to preserving the nominated scenic highway:

- Regulation of land use and density of development;
- Detailed land and site planning;
- Control of outdoor advertising;
- Careful attention to and control of earthmoving and landscaping; and
- Attention to design and appearance of structures and equipment.

For more information on nominations for official state scenic highway designations, please visit the California Department of Transportation Scenic Highway Program web site at http://www.dot.ca.gov/hq/LandArch/scenic_highways/scenic_hwy.htm.

The County contains three state scenic highways, as seen in Table 9.7 and Figure 9.7. There may be additional scenic highways that have not been identified and that have importance to local communities. In such cases, a community-based plan may designate these areas.

Table 9.7: State Scenic Highways

Highway	Location
Angeles Crest HighwayRoute-2	From 2.7 miles north of I-210 to the San Bernardino County line.
Mulholland Highway (two sections)	From CA-1 to Kanan Dume Road. From West of Cornell Rd. to East of Las Virgenes Road.
Malibu Canyon–Las Virgenes Highway	From CA-1 to Lost Hills Road

Figure 9.7: Scenic Highways Map

Hillsides, Scenic Viewsheds, and Ridgelines

Other scenic resources in the County include hillsides, scenic viewsheds, and ridgelines.

Hillsides

The San Gabriel Mountains, Verdugo Hills, Santa Susana Mountains, Simi Hills, Santa Monica Mountains and Puente Hills play a major role in physically defining the diverse communities in the unincorporated areas. They not only create dramatic backdrops against densely developed suburbs and communities, but also provide extensive environmental and public benefits to residents.

The vast majority of the native plant and animal species reside within the hilly and mountainous terrain. Mountain lions, bobcats, black bears and deer are among the larger animals that inhabit these areas, and serve as indicators that smaller mammals and vegetation within the food chain are stable. A high number of heritage oak trees that are 100 to 600 years old occur in many of the oak woodlands in the unincorporated areas, which further indicate the biological significance of these areas.

In addition to their scenic beauty, undeveloped mountains and hills serve to protect the overall health of watersheds. They provide natural drainage systems, which play a role in water quality, slope stability, stormwater runoff, erosion control and groundwater replenishment.

Scenic Viewsheds

A scenic viewshed provides a scenic vista from a given location, such as a highway, a park, a hiking trail, river/waterway, or even from a particular neighborhood. The boundaries of a viewshed are defined by the field of view to the nearest ridgeline. Scenic viewsheds vary by location and community and can include ridgelines, unique rock outcroppings, waterfalls, ocean views or various other unusual or scenic landforms.

Ridgelines

There are numerous ridgelines that provide dramatic views for the unincorporated areas. The General Plan supports the protection and preservation of ridgelines, and allows individual communities to identify and regulate their ridgeline resources. As indicated in C/NR Policy 13.10, the following criteria must be considered to identify significant ridgelines:

- Topographic complexity;
- Uniqueness of character and location;
- Presence of cultural or historical landmarks;
- Visual dominance on the skyline or viewshed, such as the height and elevation of a ridgeline; and
- Environmental significance to natural ecosystems, parks, and trail systems.

Figure 9.8 identifies the County's Hillside Management and designated Ridgeline Management Areas.

Figure 9.8: Hillside Management Areas and Ridgeline Management Map

Issues

1. Protection of Scenic Resources

Southern California has lost many of its scenic resources due to a variety of human activities. In the absence of adequate land use controls, many scenic resources have been adversely affected by unsightly development and sprawl. The visual pollution associated with the proliferation of billboards, signs, utility lines, and unsightly uses detracts from and often obscures many of the County's scenic resources. Another factor that significantly affects visual quality is air pollution. Man-made sources of air pollution, particularly tailpipe emissions from cars and trucks, contribute to the reduction of visibility and to the deterioration of some vegetation and wildlife.

2. Hillside Regulation

The geologic instability of mountain ranges is apparent in the numerous earthquake-induced landslide and liquefaction areas in the unincorporated areas. A majority of the mountains and hilly terrain have natural slope gradients of 25 percent or steeper, with a significant portion having natural slope gradients of 50 percent or steeper. Development of steep terrain can be costly and the need to provide public services and safety to these areas are costly to developers and public agencies. The best use for some mountainous terrain may be to let it remain as an airshed, watershed and natural habitat.

In addition, hillside development has the potential to change natural drainage systems and remove the native vegetation that once slowed water runoff. The removal of vegetation eliminates the natural containment of runoff. Water cannot then percolate into the soil, and instead gathers velocity as it flows down the hillside, causing accelerated erosion. Erosion that is accelerated beyond its normal rate can transport silt to streams and lakes, which may adversely affect water quality.

To conserve the natural beauty and public benefit of hillsides, hillside development land use activities that may result in environmental degradation are subject to regulations and design guidelines for impacts affecting, but not limited to, slope, soil erosion, natural drainage channels, and seismic and fire hazards. The Hillside Management Areas Ordinance is a regulatory vehicle to consider potential environmental degradation and hillside alteration in Hillside Management Areas (HMAs), which are areas with a natural slope gradient of 25 percent or steeper.

The HMA Ordinance allows clustering development at the base of the slope, limits grading, and ensures that the drainage configuration remains as natural as possible and will not adversely impact offsite property. Hillside design guidelines are referenced during the pre-development and permit processing phases to minimize hillside alteration, conserve ridgeline silhouettes, determine traffic circulation and building placement by topography, and incorporate trails where appropriate. By imposing these design conditions, a more sensitive development will occur in hillsides in a manner that respects the natural topography and biological resources of the area.

Goals and Policies for Scenic Resources

Goal C/NR 13: Protected visual and scenic resources.	
Topic	**Policy**
Scenic Resource Protection	Policy C/NR 13.1: Protect scenic resources through land use regulations that mitigate development impacts.
	Policy C/NR 13.2: Protect ridgelines from incompatible development that diminishes their scenic value.
	Policy C/NR 13.3: Reduce light trespass, light pollution and other threats to scenic resources.
	Policy C/NR 13.4: Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.
	Policy C/NR 13.5: Encourage required grading to be compatible with the existing terrain.
	Policy C/NR 13.6: Prohibit outdoor advertising and billboards along scenic routes, corridors, waterways, and other scenic areas.
	Policy C/NR 13.7: Encourage the incorporation of roadside rest stops, vista points, and interpretive displays into projects in scenic areas.
Hillside Management	Policy C/NR 13.8: Manage development in HMAs to protect their natural and scenic character and minimize risks from natural hazards, such as fire, flood, erosion, and landslides.
	Policy C/NR 13.9: Consider the following in the design of a project that is located within an HMA, to the greatest extent feasible: • Public safety and the protection of hillside resources through the application of safety and conservation design standards; • Maintenance of large contiguous open areas that limit exposure to landslide, liquefaction and fire hazards and protect natural features, such as significant ridgelines, watercourses and SEAs.
	Policy C/NR 13.10: To identify significant ridgelines, the following criteria must be considered: • Topographic complexity; • Uniqueness of character and location; • Presence of cultural or historical landmarks; • Visual dominance on the skyline or viewshed, such as the height and elevation of a ridgeline; and • Environmental significance to natural ecosystems, parks, and trail systems.

VIII. Historic, Cultural, and Paleontological Resources

Historic, cultural, and paleontological resources are an important part of Los Angeles County's identity. This section sets forth goals and policies for the management and preservation of historic, cultural, and paleontological resources in the unincorporated areas.

Background

The resources described in this section include historic buildings, structures, artifacts, sites, and districts of historic, architectural, archaeological, or paleontological significance. They may be

locations of important events that were turning points in the history, or be unique structures or groups of structures possessing distinct architectural features that depict a historic period.

Historic, cultural, and paleontological resources are non-renewable and irreplaceable. The County aims to promote public awareness of their value, and their public enjoyment should be fostered whenever possible. To this end, the County promotes cooperative efforts between public and private organizations to identify, restore, and conserve these resources.

Legislative Tools

The County embraces the importance of protecting historic, cultural, and paleontological resources and is guided in development decisions by federal, state, and local programs that officially recognize these resources. The following legislative tools improve the protection and enhancement of historic and cultural structures:

Local

- Los Angeles County Historical Landmarks and Records Commission reviews and recommends cultural heritage resources in the unincorporated areas for inclusion in the State Historic Resources Inventory. The County's Historic Preservation Ordinance seeks to preserve, conserve and protect buildings, objects, landscapes and other artifacts of historical and cultural significance.

State

- The California State Parks Department's Office of Historic Preservation maintains the State Historic Resources Inventory, which is a compilation of all resources formally determined eligible for or listed in the National Register of Historic Places, the California Register of Historical Resources or designated as State Historical Landmarks or Points of Historical Interest.

- CEQA provides guidelines for the identification and protection of archaeological sites, artifacts, and paleontological resources. If a project threatens an archaeological or paleontological resource, the project is required to provide mitigation measures to protect the site or enable study and documentation of the site. Assessment of these resources requires a survey prepared by a qualified archaeologist or paleontologist. For discretionary projects on sites containing Native American resources, CEQA also requires a monitor if warranted.

- The State Historical Building Code (SHBC) is a set of regulations adopted in 1979 that was created to improve the protection and enhancement of historic structures. The intent of SHBC is to protect California's architectural heritage by recognizing the unique construction problems inherent in historic buildings and offering an alternative code to deal with these problems. The SHBC provides alternative building regulations for the rehabilitation, preservation, restoration, or relocation of structures designated as historic buildings. SHBC regulations are intended to facilitate restoration or accommodate change of occupancy to conserve a historic structure's original or restored architectural elements and features.

Federal

- The Archaeological Resources Protection Act of 1979 protects archaeological resources and provides requirements for permit issuance to excavate or remove archaeological resources.

- The Native American Heritage Act of 1992 provides guidelines for the protection of Native American remains and artifacts.

- The National Register of Historic Places is the official list of the country's historic places worthy of preservation. Authorized by the National Historic Preservation Act of 1966, the National Park Service's National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect the country's historic and archeological resources.

- National Historic Landmarks are nationally significant historic places designated by the Secretary of the Interior because they possess exceptional value or quality in illustrating or interpreting the heritage of the U.S. Today, fewer than 2,500 historic places bear this national distinction.

Historic Resource Sites

The State designates historic resources as Historical Landmarks or Points of Historical Interest and lists them in the California Register of Historical Resources. Historical Landmarks are resources of statewide significance, and Points of Historical Interest are resources of local significance. Many of the resources listed in the California Register are also of national significance and are listed in the National Register of Historic Places.

The County has many Historical Landmarks and Points of Historical Interest in its jurisdiction, including the remnants of vast ranchos, routes of early explorers, historic railroad lines, and the homes of prominent people who shaped local history. The State Historical Resources Commission administers the California Register, which lists over 500 historic resources throughout Los Angeles County. While the great majority of these resources are located in cities, 31 are located in the unincorporated areas. Table 9.8 and Figure 9.9 display the location and designation of the 31 historic resources in the unincorporated areas.

Figure 9.9: Historic Resource Sites Policy Map

Table 9.8: Historic Resource Sites in the Unincorporated Areas

Altadena Town & Country Club	Lang Southern Pacific Station	Scripps Hall
Andrew McNally House	Maravilla Handball Court and El Centro Grocery Store	Site of Llano Del Rio Cooperative Colony
Antelope Valley Indian Museum	Mentryville	Soledad-Acton Schoolhouse
Bassett Elementary School	Mount Lowe Railway	St. Francis Dam Disaster Site
Christmas Tree Lane	Oak of the Golden Dream	Sylvia Park Country Club Clubhouse
Clear Creek Vista Point	Old Ridge Route	Topanga Christian Fellowship Church
Crank House	Old Short Cut	Vasquez Rocks
Dominguez Adobe Ranch House	Pacific Electric Railway Company Substation No. 8	Woodbury Story House
General Charles S. Farnsworth County Park	Pico Canyon Oil Field Well No. 4	Zane Grey Estate
Golden Gate Theater	Pomona Water Powerplant	

Keyes Bungalow	Rancho San Francisco	

Archaeological Resources

Archaeological resources refer to any material remains of past human life or activities that are of archaeological interest, including, but not be limited to: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, intaglios, graves, and human skeletal materials.

The indigenous Chumash and Gabrieliño/Tongva peoples, two of the most populous and sophisticated native cultures, have occupied land within Los Angeles County since prehistoric times. Unfortunately, many of the known archaeological, paleontological and historic cultural sites in the region have been disturbed to some extent by both human activity, such as development, occupation, and use, and natural occurrences, such as erosion that results from earthquakes, fire, and flood. In some instances, historic and prehistoric artifacts such as stone tools, antique nails, and equipment parts have been picked up or even destroyed by visitors or residents.

Significant General Fossil Localities

Paleontological resources, or fossils, are the remains of ancient animals and plants, as well as trace fossils such as burrows, which can provide scientifically-significant information on the history of life on Earth.

Over 1,000 fossil localities have been recorded and in excess of a million specimens have been collected in Los Angeles County. Numerous places countywide have yielded fossils, especially in the Santa Monica Mountains and in the vicinity of Rancho La Brea.

Eleven significant general fossil localities have been identified in the County, as shown in Table 9.9. Fossils continue to be discovered in Los Angeles County in association with ground-disturbing activities in fossil-rich areas.

Table 9.9: Significant General Fossil Localities in Los Angeles County

Location	Fossil Type	Formations
La Brea Tar Pits	N/A	N/A
Palos Verdes Peninsula	Mastadon, mammoth, horse, camel, sloth	Palos Verdes Sand
Palos Verdes Peninsula	Grey whale	San Pedro
Palos Verdes Peninsula	Fish, birds, sea lion, plants, baleen whale, horse, sloth, sea otter, mammoth, mastodon, bison, camel, tapir	Monterey Shale
Palos Verdes Peninsula	Dolphin	Monterey Shale
Santa Monica Mountains(Topanga Canyon)	Cypraeid gastropod	Topanga
Santa Monica Mountains (Old Topanga Canyon Road, Piuma Road)	Multiple	Topanga
Mint Canyon	Oldest hawk in California	Tick Canyon

Mint Canyon	Horse, elephant, camel	Mint Canyon
Puente Hills (Hacienda Heights)	Fish	Puente
Puente Hills (Diamond Bar)	Fish and leaves	Puente

Issues

Land Use Compatibility and the Importance of a Local Process

The primary threats historic, cultural, and paleontological resources are incompatible land uses and development on or adjacent to resources, a lack of a local registry, and the limitations of state and federal programs to protect resources.

Incompatible land uses and development can adversely affect resources by degrading the historic nature of the site through incompatible and inappropriate design features, allowing development that blocks views or hinders the public's enjoyment of a particular cultural site, or development that removes or demolishes significant historical features on existing buildings.

Officially-recognized resources are integral parts of the built and natural environments, as well as landscape configuration, and are important considerations in County land use actions. There may be other sites and structures that have not been identified and that have importance to local communities. A community-based plan may serve as an opportunity to comprehensively identify locally significant sites or structures.

Goals and Policies for Historic, Cultural, and Paleontological Resources

Goal C/NR 14: Protected historic, cultural, and paleontological resources.	
Topic	**Policy**
Historic, Cultural, and Paleontological Resource Protection	Policy C/NR 14.1: Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
	Policy C/NR 14.2: Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural, and paleontological resources.
	Policy C/NR 14.3: Support the preservation and rehabilitation of historic buildings.
	Policy C/NR 14.4: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004).
	Policy C/NR 14.5: Promote public awareness of historic, cultural, and paleontological resources.
	Policy C/NR 14.6: Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.

IX. Conservation and Natural Resources Element Implementation Programs

- SEA Preservation Program
- SEA Ordinance
- Mitigation Land Banking Program/Open Space Master Plan
- Oak Woodlands Conservation Management Plan Implementation
- Native Woodlands Conservation Management Plan
- Scenic Resources Ordinance
- Agricultural Resource Areas Ordinance
- Mineral Resource Areas Ordinance
- Habitat Conservation Plan
- Water Quality Initiatives
- Watershed and Rivers Master Plans
- Urban Greening Program
- Open Space Land Acquisition Strategy
- Healthy and Sustainable Food Systems Ordinance
- Solar Energy Orientation Study

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Dark Skies

Regulation of night lighting and providing places where residents can see the stars is a key element in resource conservation. The Rural Outdoor Lighting Districts in the Zoning Code establish regulations that conserve energy and resources and promote dark skies for the enjoyment and health of humans and wildlife, while permitting reasonable uses of outdoor lighting for nighttime safety and security. The Districts include limitations on allowable light trespass, fully shielding outdoor lighting, and imposes maximum heights of fixtures.

Oak Woodlands

As defined by the California Department of Fish and Wildlife, an oak woodland is an oak stand with a greater than 10 percent canopy cover or that may have historically supported greater than 10 percent canopy cover. Associated with that canopy cover and connectivity are over 300 vertebrate species and more than 5,000 invertebrates, as well as hundreds of native understory plant species. In August 2011, the County adopted Part 1 of the Oak Woodlands Conservation Management Plan through the provision of technical advice from the Fire Department and DRP. As an implementation tool for the Oak Woodlands Conservation Management Plan, the Department of Regional

Planning completed and published a Plan Guide on its website in April 2014. The Plan Guide is available at http://planning.lacounty.gov/assets/upl/project/oakwoodlands_conservation-management-plan-guide.pdf.

Low Impact Development (LID)

LID is a stormwater quality management strategy that seeks to mitigate the increase in pollution that enters into storm drains due to the development of urban hardscapes. Urban and storm runoff conveyed through municipal storm drain systems is one of the causes of poor water quality at discharge locations of urban areas. LID seeks to mimic the hydrologic cycle of pre-development conditions by implementing various site designs, materials, and design structures that can slow, infiltrate, filter, store, or detain stormwater runoff close to its source and reduce the amount of runoff. These design techniques may include maintaining recharge areas, buffer zones, open spaces, and drainage courses. LID may also utilize infiltration swales, grading strategies, and open drainage systems to promote the percolation of stormwater at the source location. Although LID practices can reduce the amount of storm runoff, they are not intended as flood protection measures and do not replace traditional flood management practices.

Integrated Regional Water Management Plans (IRWMP's)

Integrated Regional Water Management Plans (IRWMP's) define a clear vision and strategy for the sustainable management of water resources within a specific region delineated by one or more watersheds. IRWMP's generally contain an assessment of current and future water demand, water supply, water quality, and environmental needs. They address the challenges for delivering a stable and clean supply of water for the public, addressing stormwater and urban runoff water quality, providing flood protection, meeting water infrastructure needs, maximizing the use of reclaimed water, enhancing water conservation, and promoting environmental stewardship.

During the planning process, all stakeholders, including water distributors and purveyors, regional waterworks and sanitation districts, local public works departments, environmental organizations, non-profits, and other vested interests work together to develop common goals, objectives, and strategies. Since water related issues are addressed on a regional, watershed basis, these plans are instrumental in building consensus amongst the various stakeholders in the development and prioritization of an action plan that is complementary and leverages inter-jurisdictional cooperation, resources, and available funding. There are four IRWMP regions in Los Angeles County:

- Antelope Valley IRWMP;
- Upper Santa Clara River IRWMP;
- Greater Los Angeles County IRWMP; and
- Los Angeles Gateway Region.

For more information on the IRWMP's, please go to http://www.avwaterplan.org, http://www.scrwaterplan.org, or http://www.lawaterplan.org, respectively.

Sustainable Groundwater Management Act of 2014 (SGMA)

On September 16, 2014, the Governor signed three bills – AB 1739 and Senate Bills 1168 and 1319, collectively referred to as the Sustainable Groundwater Management Act of 2014 (SGMA)– to create a framework for sustainable, local groundwater management. The legislation allows local agencies to tailor sustainable groundwater plans to their regional economic and environmental needs. The bills establish a definition of sustainable groundwater management and require local agencies to adopt management plans for the state's most important groundwater basins. The legislation prioritizes groundwater basins that are currently overdrafted and sets a timeline for implementation:

- By 2017, local groundwater management agencies must be identified;
- By 2020, overdrafted groundwater basins must have sustainability plans;
- By 2022, other high and medium priority basins not currently in overdraft must have sustainability plans; and
- By 2040, all high and medium priority groundwater basins must achieve sustainability.

Additionally, the legislation provides measurable objectives and milestones to reach sustainability and a state role of limited intervention when local agencies fail to adopt sustainable management plans. Local water agencies and the County will work together to ensure compliance with this legislation.

Hydromodification

Hydromodification is one of the leading sources of impairment in streams, lakes, estuaries, aquifers, and other water bodies in the country. Three major types of hydromodification activities—channelization and channel modification, dams, and stream bank and shoreline erosion—change a water body's physical structure as well as its natural function. These changes can cause problems, such as changes in flow, increased sedimentation, higher water temperature, lower dissolved oxygen, degradation of aquatic habitat structure, loss of fish and other aquatic populations, and decreased water quality. It is important to properly manage hydromodification activities to reduce non-point source pollution in surface and groundwater.

Sustainable Food Systems: Organic Farming, Urban Farming, and Community Gardens

Sustainable agriculture refers to the production of food without the depletion of the Earth's resources or polluting of the environment. Sustainable agriculture addresses the social, economic, and environmental effects of farming. For more information on organic farming practices, please visit the National Sustainable Agriculture Information Service web site at http://www.attra.org.

Organic farming is a form of agricultural production that avoids or largely excludes the use of synthetic fertilizers, pesticides, herbicides, plant growth regulators and livestock feed additives. Organic farmers use crop rotation, crop residues, animal manures, other beneficial organisms, and mechanical cultivation to maintain soil productivity and control pests. Organic farming is considered environmentally responsible in that the exclusion of chemicals prevents the spread of these toxins into the air, water, soil, and food stuffs. There are an estimated 75 million acres of organic farmland in the world. In the U.S., "organic" foods must be certified by the U.S. Department of Agriculture. Any food that claims it is organic or organically produced must attain this certification. In Los Angeles County, there is a limited amount of organic farming, reaching only 111 acres in 2006.

Urban farming refers to the practice of cultivating, processing and distributing food in, or around a village, town or city. Urban farming can be practiced as a food producing activity, for income, and in some cases simply for recreation. However, urban farming contributes to food security and food safety in two ways: it increases the amount of food available to people living in cities; and, it allows fresh vegetables and fruits and meat products to be made available to urban consumers. Because urban farming promotes local food production and distribution, urban farming activities are generally seen as sustainable practices. For more information on urban farming, please visit http://www.urbanfarming.org.

The American Community Garden Association allows a broad definition of what a community garden entails. Community gardens have been shown to provide a catalyst for neighborhood and community development, beautify neighborhoods, preserve or create urban green space, and create income opportunities and economic development. For more information on community gardens, please visit http://www.communitygarden.org/.

Senate Bill (SB) 18

Senate Bill 18 (2004) requires California cities and counties to contact and consult with California Native American tribes prior to amending or adopting a general plan or specific plan, or designating land as open space. SB 18 requires city and county governments to consult with California Native American tribes to aid in the protection of traditional tribal cultural places through local land use planning. SB 18 provides California Native American tribes an opportunity to participate in local land use decisions at an early stage in the planning process for the purpose of protecting, or mitigating, impacts to sites of cultural significance. Involving tribes early allows for ample consideration of cultural places in the context of broad local land use policy, before individual site specific, project level land use decisions are made by a local government.

Chapter 10: Parks and Recreation Element

I. Introduction

The parks and recreational facilities of Los Angeles County play a vital role in maintaining a high quality of life for residents. The County owns and operates parks and recreational facilities in both unincorporated areas and cities in Los Angeles County. These facilities serve the local needs of communities in the unincorporated areas, as well as regional needs countywide.

The Parks and Recreation Element provides policy direction for the maintenance and expansion of the County's parks and recreation system. The purpose of the Parks and Recreation Element is to plan and provide for an integrated parks and recreation system that meets the needs of residents. The goals and policies set forth in this Element address the growing and diverse recreation needs of the communities served by the County.

II. Parkland Classifications

For planning purposes, parks are classified based on the size, use, and physical characteristics of the land. In addition, the traditional template of local and regional parks has been expanded to capture diverse opportunities for acquisition and development of parkland. The County's park system, including facilities that are owned, operated, and maintained by the County, totals approximately 70,000 acres. Table 10.1 summarizes the acreage of local and regional parkland, by Planning Area. A complete inventory of the parks operated by DPR can be found in Appendix F.

Table 10.1: Existing County Parkland, by Planning Area

	Parkland, in Acres		
Planning Area	**Local**	**Regional**	**Total**
Antelope Valley	50	3,870	3,920
Coastal Islands	0	41,000	41,000
East San Gabriel Valley	220	3,440	3,660
Gateway	51	816	867
Metro	111	398	509
Santa Clarita Valley	71	14,425	14,497
San Fernando Valley	1	565	566
Santa Monica Mountains	0	0	0
South Bay	26	593	618
West San Gabriel Valley	56	3,465	3,521
Westside	22	414	436
Total	608	68,986	69,594

Source: Los Angeles County Department of Parks and Recreation, July2013.

The County offers a wide variety of parks and recreation resources, which generally fall under two systems: local park system and regional park system.

Local Park System

The local park system consists of parks of varying sizes that meet local needs and offer opportunities for daily recreation. This system includes community parks, neighborhood parks, pocket parks, and park nodes, and is summarized in Table 10.2.

Community Parks

Community parks are typically 10 to 20 acres, and serve several neighborhoods within a 1 to 2 mile radius of the park. Community parks that are located in residential neighborhoods serve both the needs of the community park service radius and neighborhood park service radius. Community parks provide opportunities for a wide variety of active and passive recreation activities. The amenities programmed into a community park are focused on meeting the needs of several neighborhoods or large sections of the community. They allow for group activities and recreational opportunities that may not be feasible in neighborhood parks. Amenities for community parks can include informal open play areas, children's play apparatus, group picnic areas with overhead shelters, barbecues, lighted sports fields, basketball courts and tennis courts, public restrooms, concession buildings, maintenance buildings, onsite parking and information kiosks.

Neighborhood Parks

Neighborhood parks are typically 3 to 10 acres, and serve residents living within a half mile radius of the park. Neighborhood parks provide space, programs and recreation activities to create healthy social networks within residential communities. The common objective of all neighborhood parks is to bring people together to recreate and socialize close to home. Ease of access and walking distance uninterrupted by major roads and other physical barriers are important factors in locating neighborhood parks. Neighborhood parks should be well-connected to other public facilities, such as schools and libraries. Amenities for neighborhood parks can include informal open play areas, children's play apparatus, picnic tables, picnic shelters, barbecues, practice sports fields, basketball, tennis and volleyball courts, public restrooms, information kiosks, recreation offices, and onsite parking.

Pocket Parks

Pocket parks are less than three acres in size, and serve residential or business areas within a quarter mile radius or within walking distance. They are best used to meet limited or specialized recreational needs. Pocket parks can provide landscaped public use areas in industrial and commercial areas, scenic overlooks, linkage to a community pathway system, and urban infill sites in park poor communities. Pocket parks generally do not have onsite parking. Amenities for pocket parks can include both active and passive features, depending on the community's setting and needs, such as children's play apparatus, picnic areas, fountains and seating areas. Due to the limited amenities included in pocket parks, they are typically not included in the service radius analysis.

Park Nodes

Park nodes are small pieces of open space that serve as public destinations, connections, and community defining spaces. Nodes provide physical and visual breaks to the urban landscape and connect various spaces, such as waterways, streets, trails, and greenways. Park nodes are used as gathering and rest areas, and serve as opportunities for social and cultural exchange. Examples of park nodes include equestrian and hiking trail heads, bike rest stops and stations with lockers and

repair areas, neighborhood focal points, and passive amenities, such as plazas, rest areas, playgrounds, landmarks, and public art installations.

Table 10.2: Local Park System Summary

Facility	Typical Park Features and Amenities
Community Park Acres Per Thousand Population: 4/1,000 Suggested Acreage: 10 to 20 acres Service Area: 1 to 2 miles	Passive park amenities including but not limited to: informal open play areas, children's play apparatus, family and group picnic areas with overhead shelters, barbecues. Active sports activities including but not limited to: lighted sports fields, basketball courts and tennis courts. Additional amenities may include aquatics complex, skate park, arena soccer, roller hockey, community gardens, and dog parks. Park facilities including but not limited to: public restrooms, concession building, community buildings, maintenance building and onsite parking and information kiosks.
Neighborhood Park Acres Per Thousand Population: 4/1,000 Suggested Acreage: 3 to 10 acres Service Area: 1/2 mile	Passive park amenities including but not limited to: informal open play areas, children's play apparatus, group picnic areas with overhead shelters, barbecues. Active park amenities including but not limited to: practice sports fields, basketball, tennis, and volleyball courts. Park facilities including but not limited to: public restroom, onsite parking and information kiosks.
Pocket Park Acres Per Thousand Population: 4/1,000 Suggested Acreage: less than 3 acres Service Area: 1/4 mile	Passive park amenities including but not limited to: picnic areas and seating areas. Active park amenities including but not limited to: children's play apparatus.
Park Node Acres Per Thousand Population: 4/1,000 Suggested Acreage: 1/4 acre or less No service radius area	Varies; can include: plazas, rest areas, playgrounds, landmarks and public art installations

Regional Park System

The regional park system is intended to meet the park and recreation needs of residents and visitors throughout Los Angeles County. This system consists of community regional parks, regional parks, and special use facilities, and is summarized in Table 10.3.

Community Regional Parks

Community regional parks are typically 20 to 100 acres, and have a service radius of 20 miles. Community regional parks protect and conserve natural resources, preserve open spaces, and provide recreational facilities that are not available in neighborhood or community parks. Amenities for community regional parks can include a jogging exercise course, informal open play areas, children's play apparatus, group picnic areas with overhead shelters, barbecues, lighted sports fields, basketball

courts and tennis courts, information kiosks, public restrooms, concession building, recreation offices, maintenance buildings, and onsite parking. Community regional parks may also have one or more of the following features: multiple sports facilities, aquatics center, fishing lake, community building and gymnasium, and scenic views and vistas.

Regional Parks

Regional parks are typically greater than 100 acres in size, and have a service radius of 25 miles or more. They include unique areas such as lakes, wetlands, auditoriums, water bodies, and campgrounds, in addition to the active recreational facilities offered in community and community regional parks. Many of the recreation activities are associated with experiencing the natural environment. A regional park may also perform important ecological and environmental functions, including serving as wildlife habitats. The connection of these parks to natural areas is often vital to ensuring a healthy ecological system. Amenities for regional parks can include picnic areas, nature centers, trail systems, scenic drives, campgrounds, water areas for swimming, fishing and boating, and in some cases, sport fields.

Special Use Facilities

Special use facilities are generally single purpose facilities that serve greater regional recreational or cultural needs. One notable example is the Hollywood Bowl. Special use facilities require adequate public access and sufficient buffers to protect adjacent residential users and to insulate the park from commercial or industrial development. Special use facilities can meet both passive (e.g., historic and cultural facilities, natural areas, habitat preservation areas, arboreta and botanical gardens, and nature centers) and active (e.g., golf courses and driving ranges, equestrian centers, off-highway vehicle parks, water parks) needs within the region. There are no size criteria or service radius areas associated with special use facilities.

Table 10.3: Regional Park System Summary

Facility	Typical Park Features and Amenities
Community Regional Park Acres Per Thousand Population: 6/1,000 Suggested Acreage: 20 to100 acres Service Area: up to 20 miles	Passive park amenities including but not limited to: informal open play areas, children's play apparatus, group picnic areas with overhead shelters, barbecues. Active sports activities including but not limited to: lighted sports fields, basketball courts and tennis courts. Additional amenities may include one or more of the following features: multiple sports facilities, aquatics center, fishing lake, community building and gymnasium, and scenic views and vistas. Park facilities including but not limited to: public restrooms, concession building, community buildings, maintenance building and onsite parking and information kiosks.
Regional Park Acres Per Thousand Population: 6/1,000 Suggested Acreage: greater than 100 acres Service Area: 25+ miles	Passive park amenities including but not limited to: group picnic areas with overhead shelters, barbecues. Additional amenities may include one or more of the following features: lakes, wetlands, auditoriums,

	water bodies for swimming, fishing and boating, and sports fields.
Special Use Facility Acres Per Thousand Population: 6/1,000 No size criteria No assigned service radius area	Generally, single purpose facilities. Can include passive features such as: wilderness parks, nature preserves, botanical gardens and nature centers. Active uses can include: performing arts, water parks, golf driving ranges and golf courses.

Trails

The County offers unique trail user opportunities that showcase its diverse scenery and provide connectivity to parks, open spaces, cultural resources, and wilderness areas. Los Angeles County has an ideal climate for trail user activities on most days of the year.

Typical trail uses range from hiking and walking, to mountain biking and horseback riding, with many users participating in more than one activity. The quality of the trail experience is directly proportional to the state of the visual, natural, and educational environment through which the trail passes. The wide variety of experiences, include but are not limited to: exercise, solitude, spiritual practices, physical and mental well-being, building social networks, testing athletic skills, and experiencing nature. The County strives to make all trails multi-use and accessible to all non-motorized users including pedestrians, equestrians, and mountain bicyclists, where appropriate.

In May 2011, the Board of Supervisors adopted the County of Los Angeles Trails Manual, which provides County staff and developers with guidelines and standards for trail planning, design, development, and maintenance of County trails. The purpose of the Trails Manual is to provide guidance to County departments that interface with trail planning, design, development and maintenance of hiking, equestrian, and mountain biking recreational trails, while addressing physical and social constraints and opportunities associated with the diverse topographic and social conditions that occur in the unincorporated areas.

Figure 10.1 depicts the County's regional trail system.

Figure 10.1: Regional Trail System Map

Other Recreation Facilities

In addition to local and regional parks and trails, residents are served by the following types of recreation facilities: multi-benefit parks, school sites, city parks and facilities, private recreational facilities, and greenways.

Multi-Benefit Parks

Multi-benefit parks and open spaces are created through collaborative efforts among city, county, state, and federal agencies; private organizations; schools; private landowners; and industries. These parks are characterized as having more than one function and contributing to multiple program goals. There are a number of applications of multi-benefit parks including: utility corridors and flood protection basins that can serve as areas for active or passive recreation; school sites located adjacent to parks that can share facilities, such as parking and park amenities; watershed areas that can protect critical wildlife habitats, preserve open space, provide trails for recreation, and contribute to water conservation objectives; and water districts, where trails can be located adjacent to flood protection channels and trailhead parks.

School Sites

The County works with school districts to organize, promote, and conduct joint recreational and educational programs. These community recreation agreements are a form of joint-use agreement, where either a school or park facility may be put to some recreational use by the other party in exchange for some facility improvement and/or maintenance. A park does not have to be adjacent to a school (i.e., share a common boundary) for an agreement to be viable.

City Parks and Facilities

City parks and facilities that are located close to the borders of the unincorporated areas are enjoyed by city and County residents alike. Similarly, local County parks that are located within or close to the borders of cities provide recreational amenities for both populations. This overlap in local park service radius is an important factor to consider in the placement of new local County parks.

Private Recreational Facilities

Private recreational facilities play an important role in meeting recreational needs. The network of private recreational facilities consists of churches, health and fitness clubs, and other organizations that offer a variety of programs and facilities. This Element does not include an inventory of private recreational facilities, and as the County does not control, maintain, or program private recreational facilities, these resources are not credited toward the County's acreage goals for public parks.

Greenways

Greenways provide a linear area along natural corridors, and often follow features such as rivers, man-made waterways, drainage channels, and utility easements. Greenways can accommodate various modes of uninterrupted pedestrian travel on pathways, including walking, jogging, and bicycling, and can include recreation areas and natural landscape features.

Recreation Programs

Along with access to parks and recreation facilities, the availability of a wide range of recreation programs is critical to the quality of life in any community. A comprehensive offering of effective recreation programs benefit individuals, neighborhoods, and households of all ages, income levels, cultures and abilities by:

- Offering opportunities to play, grow, and learn;
- Providing a sense of place and of belonging;
- Promoting health and wellness, including obesity prevention;
- Improving neighborhood and community connections, and problem-solving;
- Enhancing community cohesiveness while honoring diversity;
- Helping protect natural environments; and
- Providing positive youth development opportunities.

Recreation programs can range from organized sports, tournaments, scheduled classes, and special events, to more individualized, casual leisure activities such as picnics and walking. Effective

recreation programs promote the constructive use of leisure time and a lifelong commitment to a healthy lifestyle.

DPR offers a wide variety of recreation programs to meet the diverse needs of residents. These programs serve a diverse group of stakeholders including, but not limited to: preschool-aged children, elementary school-aged youth, middle school-aged youth, high school-aged youth, adults, seniors and households.

Parkland Dedication and Funding

As specified in P/R Policy 3.1, the County standard for the provision of parkland is 4 acres of local parkland per 1,000 residents of the population in the unincorporated areas, and 6 acres of regional parkland per 1,000 residents of the total population of Los Angeles County. This section describes the County's parkland dedication requirements, as well as funding mechanisms for the planning and development of parks and recreation facilities.

Quimby Act

The California Quimby Act, which is part of the Subdivision Map Act, applies to residential subdivisions and permits the County, by ordinance, to require the dedication of land or payment of fees for park and recreational purposes. As part of its approval of a subdivision, the County may require the subdivider to provide land to serve the park and recreational needs of future residents of the subdivision.

The Quimby Act establishes a standard of dedicating 3 acres of parkland per 1,000 residents for subdivisions. Quimby fees may be used to acquire land for local park purposes, improve local parkland (including existing local parks), or both acquire and develop local parkland. To convert a Quimby obligation inland (acres) into the Quimby fee, the land obligation is multiplied by the Representative Land Value (RLV) per acre for the Park Planning Area (PPA) in which the subdivision is located. RLVs are adjusted annually based upon changes in the Consumer Price Index.

Because of the need for usable public parkland for active recreation purposes, DPR rarely gives any Quimby credit for parkland exceeding a slope of three percent and instead gives credit for the "net" park acreage (maximum slope of three percent) the County receives. As specified in P/R Policy 3.10, DPR does not accept undeveloped park sites from developers. This means that the developer is required to provide a developed park to the County on a "turn-key" basis and receives credit for the costs of developing the public park up to and against any remaining Quimby obligation, after accounting for the net acreage dedicated to the County.

For the purposes of the County's Quimby Act Ordinance, the unincorporated areas are divided into 47 PPAs, based on location and neighborhood characteristics. The Quimby fees generated in one PPA may not be spent in another area.

Proposition A Funds

Proposition A Funds may be used to fund the development, acquisition, improvement, restoration and maintenance of parks; recreational, cultural and community facilities; and open space lands. These funds are administered by the Los Angeles County Regional Park and Open Space District. The Open Space District was created when voters approved Proposition A in 1992. Proposition A authorized an annual assessment on nearly all of the 2.25 million parcels of real property. Proposition A funded $540 million for the acquisition, restoration or rehabilitation of real property for parks and park safety, senior recreation facilities, gang prevention, beaches, recreation, community or cultural facilities, trails, wildlife habitats, or natural lands, and maintenance and servicing of those projects. In 1996, voters

approved another Proposition A to fund an additional $319 million for parks and recreation projects and additional funds for maintenance and to service those projects.

Landscaping and Lighting Districts

The California Landscaping and Lighting Act of 1972 authorizes local legislative bodies to establish benefit related assessment districts, or Landscaping and Lighting Districts (LLADs), and to levy assessments for the construction, installation, and maintenance of certain public landscaping and lighting improvements. LLADs may be established to maintain local public parks.

Mello-Roos District

A developer may apply to the County to form a Mello-Roos District pursuant to the California Mello-Roos Community Facilities Act of 1982 to develop and maintain park improvements. Pursuant to County guidelines, the parks should be regional in nature, and have an impact or benefit beyond the associated subdivision.

III. Issues

1. Park Planning For a Diversity of Needs

Parks and recreation facilities are used for various purposes by a wide range of users. Because the needs of park users are diverse, no individual park or recreational facility can meet the needs of all users. Therefore, a diverse and comprehensive system of facilities is needed to provide a wide range of recreational opportunities.

A mistaken assumption is that parks and recreation planning only involves looking at population projections and then providing more of what already exists. Numerous studies have shown that parks and recreation needs and preferences vary by age, race and ethnicity, and other factors. In addition, the physical distribution of parkland and park accessibility by underrepresented groups and underserved populations, including low-income and transit-dependent communities, are important considerations. The County must understand and plan for these diverse park and recreation needs.

Based on data from a wide variety of sources, outdoor recreation activities with learning components, trail related experiences, and water recreation will increase. Motorized recreation, augmented with navigational equipment, will also continue to grow. As the population evolves and changes, there will be many new supporters and advocates for outdoor recreation and opportunities for partners to contribute to a better quality of life. Cooperation and partnerships between public, private, and nongovernmental service providers can ensure a seamless and comprehensive system of outdoor recreation opportunities and experiences.

Enhanced collaboration refers to the idea of providing more and improved park and recreation services through multiple use facilities and partnerships with other public, non-profit, and private organizations. The County must work with other agencies to leverage financial, land, and other resources to meet the growing and diverse recreation needs of residents.

2. Acquisition and Development of Additional Parkland

There are large areas that are underserved by parks and recreational facilities. Nearly two out of three children do not live within walking distance (one quarter mile) of a park, playground, or open space.

DPR conducted a preliminary gap analysis to determine the need for additional parks and to identify park poor areas. Using the County's goals for 4 acres of local parkland per 1,000 residents in the unincorporated areas, and 6 acres of regional parkland per 1,000 residents, the Gap Analysis Study shows that the unincorporated areas face a significant deficit in local parkland: 3,719 acres, as shown in Table 10.4.. Also noteworthy is the fact that 9 of the 11 Planning Areas have deficits in regional parkland. Based on population projections, the unincorporated areas would have deficits of 5,987 acres in local parkland and 5,046 acres in regional parkland by the year 2035 if no new parks are created.

The Gap Analysis Study represents a first step toward identifying park-deficient neighborhoods in the unincorporated areas. Figures 10.2 and 10.3 show the service radius for local and regional parks. Areas that do not lie within the service radius are considered underserved by parks and recreation facilities.

Figure 10.2: Community Regional and Regional Park Service Radius Map

Figure 10.3: Community, Neighborhood and Pocket Park Service Radius Map

Table 10.4: Existing County Parkland by Planning Area, Year 2010

	Local Parkland Goal 4 Acres / 1,000 Population			**Regional Parkland Goal 6 Acres / 1,000 Population**		
Planning Areas	**Unincorporated Population 2010**	**Parkland Acreage**	**Surplus / Deficit Acreage**	**Countywide Population 2010**	**Parkland Acreage**	**Surplus / Deficit Acreage**
Antelope Valley	73,488	50	-244	382,868	3,870	1,573
Coastal Islands	368	0	-1	4,096	41,000	40,975
East San Gabriel Valley	234,251	220	-717	933,116	3,440	-2,159
Gateway	103,094	51	-361	1,666,588	816	-9,183
Metro	306,768	111	-1,116	1,819,084	398	-10,517
Santa Clarita Valley	94,907	71	-308	271,227	14,425	12,798
San Fernando Valley	5,137	1	-20	1,749,325	565	-9,931
Santa Monica Mountains	19,222	0	-77	85,785	0	-515
South Bay	69,612	26	-253	1,016,674	593	-5,507
West San Gabriel Valley	122,834	56	-435	915,196	3,465	-2,026
Westside	27,407	22	-87	974,646	414	-5,434
Total	**1,057,088**	**608**	**-3,719**	**9,818,605**	**68,986**	**-6,522**

Sources: 2010 U.S. Census and Los Angeles County Department of Parks and Recreation, July 2013.

Table 10.5: Projected Future County Parkland Need, Year 2035

	Local Parkland Goal 4 Acres / 1,000 Population	**Regional Parkland Goal 6 Acres / 1,000 Population**

	Unincorporated Population Projection 2035	Current Local Parkland Acreage	Surplus / Deficit Acreage	Countywide Population Projection 2035	Current Regional Parkland Acreage	Surplus / Deficit Acreage
Total	1,648,695	608	-5,987	12,338,623	68,986	-5,046

Source: 2008 SCAG RTP and Los Angeles County Department of Parks and Recreation, July 2013.

A good community parks and recreation system is based on the quality of facilities and services provided, as well as the ability to anticipate and respond to changing trends. According to the report, *Park and Recreation Trends in California 2005*, changes in the size and composition of State's population will drive the impacts on the delivery of parks and recreation services in the future.

A more in-depth gap analysis will be conducted as part of the County's future Parks and Recreation Master Plan. This analysis will involve a detailed review of topics such as demographic, geographic, land use, and transportation data for each Planning Area to determine its park deficiencies in terms of acreage, accessibility, and suitability. For more information on the Parks and Recreation Master Plan, please refer to Chapter 16: General Plan Implementation Programs.

3. Improved Trail Systems

Trails offer opportunities for people to hike, walk, run or ride, and encourage people to connect with nature. As linear parks, trails help make the region more livable and provide communities with access to increased health and fitness activities. Trails can also promote increased activity with smaller amounts of land than large parks, and can often use leftover or unwanted land.

As the population continues to grow and the region becomes increasingly urbanized, the demand for outdoor recreation opportunities and trails will increase. One way to meet this demand is to create and maintain an adequate multi-use trail system that is accessible to all residents and to provide continuous enjoyment though increased and expanded connectivity. Additional trails are also needed closer to population centers in the central and southwestern portions of Los Angeles County, where more residents could conveniently access and reap the recreation, health, and mobility benefits of trails.

Multi-use trails are used by equestrians, cyclists, hikers, and runners. As the amount of public land continues to decrease, the need for multi-use trails will continue to grow, as well as the need to find solutions to possible user conflicts. An expanded multi-use trial system can alleviate user conflicts, while also providing increased access to this important health and fitness system.

4. Protection of Historical and Natural Resources on County Park Properties

Many County parks contain important historical and natural resources that must be protected. Historic resources on County park properties include buildings, collections, landscapes, bridges, and other physical features. The maintenance, repair, rehabilitation, restoration, or reconstruction of historical resources are carried out in a manner that is consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.

Natural resources include natural areas, sanctuaries, and open space preserves. There is a need to establish linkages that will promote connectivity to enhance the movement of wildlife and promote genetic health among native species of plants and animals. Continuous efforts to expand the regional

park system are necessary to protect and conserve natural resources regardless of the required park acreage based upon park standards. Open space areas that are established for conservation purposes, such as wildlife sanctuaries, provide a greater benefit than the relative location of the site to populated areas. In the regional park system, a key consideration is the ecological health of natural environments. Accessibility to regional facilities is also important. Access may be enhanced by providing improved public transportation to connect population centers with regional parks.

Threats to these resources include both intentional and unintentional acts, such as deferred maintenance, renovation or improvements that significantly alter or damage the resource, acts of vandalism and theft, or overuse by park users.

5. Sustainable Parks

It is important for County park properties to contribute to the County's goals of sustainability, carbon footprint reduction, water conservation, and energy conservation. Sustainable design and management are necessary to promote responsible environmental practices, enhance social benefits, and reduce the cost of ownership and management.

All park projects must be considered within their surrounding context. Landscapes need to be treated as interdependent and interconnected spaces that share systems of soil, topography, vegetation, and water. By understanding these larger patterns and employing a comprehensive approach, parks can be designed in a way that helps repair and restore ecosystems rather than detract from them. For example, designing a park to take advantage of natural processes is one way to achieve sustainability through site design.

Funding is the main challenge facing the design and implementation of sustainable strategies. However, sustainable design and management practices will help reduce operation and maintenance costs in the long run. In addition, regular maintenance and preventative measures can prolong the life of existing buildings and facilities on County park properties, and reduce the need for new or expanded facilities.

IV. Goals and Policies

Goal P/R 1: Enhanced active and passive park and recreation opportunities for all users.	
Topic	**Policy**
Park Programming	Policy P/R 1.1: Provide opportunities for public participation in designing and planning parks and recreation programs.
	Policy P/R 1.2: Provide additional active and passive recreation opportunities based on a community's setting, and recreational needs and preferences.
	Policy P/R 1.3: Consider emerging trends in parks and recreation when planning for new parks and recreation programs.
	Policy P/R 1.4: Promote efficiency by building on existing recreation programs.
Park Management	Policy P/R 1.5: Ensure that County parks and recreational facilities are clean, safe, inviting, usable and accessible.
	Policy P/R 1.6: Improve existing parks with needed amenities and address deficiencies identified through the park facility inventories.
	Policy P/R 1.7: Ensure adequate staffing, funding, and other resources to maintain satisfactory service levels at all County parks and recreational facilities.

	Policy P/R 1.8: Enhance existing parks to offer balanced passive and active recreation opportunities through more efficient use of space and the addition of new amenities.
	Policy P/R 1.9: Offer more lighted playing fields using energy efficient light fixtures to extend playing time, where appropriate (eg., not in areas adjacent to open space or natural areas that can be impacted by spillover lighting).
	Policy P/R 1.10: Ensure a balance of passive and recreational activities in the development of new park facilities.
	Policy P/R 1.11: Provide access to parks by creating pedestrian and bicycle-friendly paths and signage regarding park locations and distances.
Goal P/R 2: Enhanced multi-agency collaboration to leverage resources.	
Topic	**Policy**
Collaboration and Financing	Policy P/R 2.1: Develop joint-use agreements with other public agencies to expand recreation services.
	Policy P/R 2.2: Establish new revenue generating mechanisms to leverage County resources to enhance existing recreational facilities and programs.
	Policy P/R 2.3: Build multi-agency collaborations with schools, libraries, non-profit, private, and other public organizations to leverage capital and operational resources.
	Policy P/R 2.4: Utilize school and library facilities for County sponsored and community sponsored recreational programs and activities.
	Policy P/R 2.5: Support the development of multi-benefit parks and open spaces through collaborative efforts among entities such as cities, the County, state, and federal agencies, private groups, schools, private landowners, and other organizations.
	Policy P/R 2.6: Participate in joint powers authorities (JPAs) to develop multi-benefit parks as well as regional recreational facilities.
	Policy P/R 2.7: Increase communication and partnerships with local law enforcement, neighborhood watch groups, and public agencies to improve safety in parks.
Mass Care and Shelters	Policy P/R 2.8: Evaluate and enhance facilities and amenities with respect to alternative use of parks to carry out Mass Care and Shelter operations in the wake of a disaster.
Goal P/R 3: Acquisition and development of additional parkland.	
Topic	**Policy**
Parkland Acquisition and Dedication	Policy P/R 3.1: Acquire and develop local and regional parkland to meet the following County goals: 4 acres of local parkland per 1,000 residents in the unincorporated areas and 6 acres of regional parkland per 1,000 residents of the total population of Los Angeles County.
	Policy P/R 3.2: For projects that require zone change approvals, general plan amendments, specific plans, or development agreements, work with developers to provide for local and regional parkland above and beyond their Quimby obligations.
	Policy P/R 3.3: Provide additional parks in communities with insufficient local parkland as identified through the gap analysis.
	Policy P/R 3.4: Expand the supply of regional parks by acquiring land that would: 1) provide a buffer from potential threats that would diminish the quality of the recreational experience; 2) protect watersheds; and 3) offer linkages that enhance wildlife movements and biodiversity.
	Policy P/R 3.5: Collaborate with other public, non-profit, and private organizations to acquire land for parks.

	Policy P/R 3.6: Pursue a variety of opportunities to secure property for parks and recreational facilities, including purchase, grant funding, private donation, easements, surplus public lands for park use, and dedication of private land as part of the development review process.
Parkland Development	Policy P/R 3.7: Mitigate impacts from freeways to new parks to the extent feasible.
	Policy P/R 3.8: Site new parks near schools, libraries, senior centers and other community facilities where possible.
	Policy P/R 3.9: The Department of Parks and Recreation does not accept undeveloped park sites from developers. Developers are required to provide a developed park to the County on a "turn-key" basis and receive credit for the costs of developing the public park up to and against any remaining Quimby obligation, after accounting for the net acreage dedicated to the County.
Goal P/R 4: Improved accessibility and connectivity to a comprehensive trail system including rivers, greenways, and community linkages.	
Topic	**Policy**
Trail System	Policy P/R 4.1: Create multi-use trails to accommodate all users.
	Policy P/R 4.2: Develop staging areas and trail heads at strategic locations to accommodate multi-use trail users.
	Policy P/R 4.3: Develop a network of feeder trails into regional trails.
	Policy P/R 4.4: Maintain and design multi-purpose trails in ways that minimize circulation conflicts among trail users.
	Policy P/R 4.5: Collaborate with other public, non-profit, and private organizations in the development of a comprehensive trail system.
	Policy P/R 4.6: Create new multi-use trails that link community destinations including parks, schools and libraries.
Goal P/R 5: Protection of historical and natural resources on County park properties.	
Topic	**Policy**
Park Resource Preservation	Policy P/R 5.1: Preserve historic resources on County park properties, including buildings, collections, landscapes, bridges, and other physical features.
	Policy P/R 5.2: Expand the collection of historical resources under the jurisdiction of the County, where appropriate.
	Policy P/R 5.3: Protect and conserve natural resources on County park properties, including natural areas, sanctuaries, and open space preserves.
	Policy P/R 5.4: Ensure maintenance, repair, rehabilitation, restoration, or reconstruction of historical resources in County parks and recreational facilities are carried out in a manner consistent with the most current Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
Education and Programming	Policy P/R 5.5: Preserve and develop facilities that serve as educational resources that improve community understanding of and appreciation for natural areas, including watersheds.
	Policy P/R 5.6: Promote the use of County parks and recreational facilities for educational purposes, including a variety of classes and after school programs.
	Policy P/R 5.7: Integrate a range of cultural arts programs into existing activities, and partner with multicultural vendors and organizations.
Goal P/R 6: A sustainable parks and recreation system.	

Topic	Policy
Sustainable Parks System	Policy P/R 6.1: Support the use of recycled water for landscape irrigation in County parks.
	Policy P/R 6.2: Support the use of alternative sources of energy, such as wind and solar sources to reduce the use of energy at existing parks.
	Policy P/R 6.3: Prolong the life of existing buildings and facilities on County park properties through preventative maintenance programs and procedures.
	Policy P/R 6.4: Ensure that new buildings on County park properties are environmentally sustainable by reducing carbon footprints, and conserving water and energy.
	Policy P/R 6.5: Ensure the routine maintenance and operations of County parks and recreational facilities to optimize water and energy conservation.

V. Park and Recreation Element Implementation Program

- County Parks and Recreation Master Plan
- Trails Program
- Parks Sustainability Program

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Parks, Playgrounds, and Beaches in the Los Angeles Region (1930)

The Olmsted Brothers and Bartholomew report entitled *Parks, Playgrounds, and Beaches in the Los Angeles Region* was the first comprehensive parks and open space plan for the greater Los Angeles area. The report proposed a system of parks, parkways, children's playgrounds, and public beaches. It was a model of ambitious, intelligent, and sensitive planning commissioned at a time when land was available. However, only segments of the report have been implemented to date. Through its planning efforts and collaboration with other agencies and jurisdictions, the DPR hopes to revive and fulfill the Olmsted and Bartholomew vision to the maximum extent possible.

Green Visions Plan (2007)

Green Visions is a joint venture between the University of Southern California and the region's land conservancies, including the Rivers and Mountains Conservancy, Santa Monica Mountains Conservancy, Coastal Conservancy, and the Baldwin Hills Conservancy. The Green Visions Plan offers a guide to habitat conservation, watershed health and recreational open space for the Los Angeles metropolitan region. The electronic tools and data developed as part of Green Visions are intended to expand the analytic and planning capabilities of local agencies and organizations to, among other things, reduce the fragmented, piecemeal approach to regional resource planning.

Greater Los Angeles County Integrated Regional Water Management Plan (2013)

The 2013 Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP) addresses water resource issues of the Los Angeles region in an integrated and collaborative manner. Recreation and open space are important components of the IRWMP, with priority projects providing open space, habitat, and recreational benefits. The IRWMP also recommends that new parkland be acquired to keep pace with population growth.

SCAG Regional Comprehensive Plan (2008)

In 2008, the Southern California Association of Governments (SCAG) completed the Regional Comprehensive Plan (RCP) as a vision of how Southern California can balance resource conservation, economic vitality, and quality of life. The RCP presents a visionary, regionwide approach to coordinate and facilitate the preservation of open space in Southern California. Specifically, the Plan includes an “Open Space and Habitat” chapter, which focuses on community open space, natural lands, and farmlands. Community open space includes areas that enhance the quality of life and completes interconnected networks of parks, trails, greenbelts, community gardens, and urban forests serving the region’s communities.

Chapter 11: Noise Element

I. Introduction

Noise levels can have a significant impact on quality of life. Excessive levels of noise result in increased neighborhood annoyance, dissatisfaction, and in some cases, health and safety hazards. Due to Los Angeles County's geographic, environmental, and cultural diversity, the levels and types of noise issues vary significantly. The purpose of the Noise Element is to reduce and limit the exposure of the general public to excessive noise levels. The Noise Element sets the goals and policy direction for the management of noise in the unincorporated areas.

II. Background

Sound is the result of a sound source inducing vibration in the air. The vibration produces alternating bands of relatively dense and sparse particles in the air, spreading outward from the source. The result of the movement of the particles is a fluctuation in the normal atmosphere pressure, or sound waves. These waves radiate in all directions from the source and may be reflected and scattered or, like other wave actions, may turn corners. When the source stops vibrating, the sound waves disappear, almost instantaneously, and the sound ceases. The ear is extremely sensitive to sound pressure fluctuations, which are converted into auditory sensations.

Sound may be described by three variables: amplitude, frequency, and time pattern. For more information on sound descriptors, please refer to Appendix G.

Noise Measurement

Noise is often described in qualitative terms, and individuals differ greatly on what noises are considered pleasant or annoying. The community noise metrics used in the Noise Element are either Community Noise Equivalent Level (CNEL) or Day-Night Average Level (Ldn). CNEL and Ldn are the metrics used to describe annoyance due to noise and to establish land use planning criteria regarding noise.

Community Noise Equivalent Level (CNEL)

CNEL is the average equivalent A-weighted sound level during a 24-hour day that is obtained after the addition of five decibels to sound levels in the evening, from 7 p.m. to 10 p.m., and after the addition of 10 decibels to sound levels in the evening, from 10 p.m. to 7 a.m. The CNEL metric is currently used by the California Aeronautics Code for the evaluation of noise impacts at airports. Local compliance with the state airport standard requires that community noise levels be expressed in CNEL.

Day-Night Average Level (Ldn)

Ldn is the average equivalent A-weighted sound level during a 24-hour day that is obtained after the addition of 10 decibels to sound levels in the evening, after 10 p.m. and before 7 a.m. The Ldn represents a simplification of CNEL.

For more information on basic levels of noise measurement, please refer to Appendix G.

Noise Environment

The typical community noise environment is made up of background or “ambient noise,” and higher, “intrusive” levels of noise. In the unincorporated areas, the major sources of noise come from transportation systems, such as commercial and private airports, rail and bus networks, and the regional freeway and highway system. Other major sources of noise have historically been identified with industrial uses, such as manufacturing plants.

Effects of Noise

Noise by definition is unwanted sound. It is an intrusion on one’s sense of privacy. Noise can be an emotional strain and a source of great frustration when the noise is beyond a person’s control. Noise may interfere with a broad range of human activities, the overall effect of which is to cause annoyance.

The potential effects of noise on humans include the following:

- Hearing loss;
- Non-auditory physiological response;
- Communication interference;
- Performance interference;
- Sleep disturbance;
- Subjective response; and
- Community response.

Hearing Loss

Exposure to sufficient levels of noise for long periods of time can produce temporary or permanent loss of hearing. Noise levels have been identified as protective of the hearing of the general population from significant damage due to environmental noise. Environmental noise differs from workplace noise in that it is generally intermittent, covers 365 days per year rather than 250 work days, and covers 24 hours per day rather than 8 hours. Taking these factors into account, the U.S. Environmental Protection Agency (EPA) has identified an environmental noise level of Leq (24) = 70 dB to protect 96 percent of the general population from a hearing loss of greater than 5 dB at 4000 Hz.

Non-Auditory Physiological Response

Excessive exposure to noise may contribute to the development and aggravation of stress-related conditions, such as high blood pressure, coronary diseases, ulcers, colitis, and migraine headaches. U.S.EPA studies suggest the possibility of adverse health outcomes associated with environmental noise and underscore the need for additional research. Although it is reasonable to view annoyance as a symptom or sign of noise-induced stress, no direct test of this relationship has been made.

Communication Interference

The indirect effects of speech interference are:

- Disturbance of normal domestic or educational activities;
- Creation of an undesirable living environment;

- Safety hazards; and
- A source of extreme annoyance.

The appropriate noise levels to prevent outdoor speech interference (oral communication) for the outdoors, depends on the voice level and communication distance. For example, at a distance of two meters from the speaker with a normal voice (70 dB) the sound level that would allow communication with 95 percent intelligibility is 60 dB. Indoors, an Ldn of 50 dB permits virtually100 percent intelligibility. For older populations and people with hearing problems, the background noise would be lower.

High levels of noise reduce the number of conversations and their content, quality, and fidelity. Children have a relative lack of knowledge of language that makes them less able to "hear" speech when some of the cues are lost. Repeated exposure to high levels of noise in "critical periods of development" might affect conceptual development and the acquisition of speech, language, and language-related skills, such as reading and listening.

Performance Interference

In general, noise is more likely to reduce the accuracy than the total quantity of work, and it affects complex tasks more than simpler ones. As noise levels increase, both reaction times and numbers of errors increase. For some simple tasks, noise may enhance performance (when distracting cues are dropped out). Factors to consider on how noise affects work performance include: the characteristics of noise; characteristics of the task; aspects of performance considered important; and individual differences.

Noise levels most likely to be detrimental to performance are:

- Continuous noise levels above 90 dB; and
- Levels less than 90 dB, if they have predominantly high frequency components, are intermittent, unexpected, or uncontrollable.

According to the U.S. EPA, field studies demonstrate that high noise levels have been corroborated with poor performance on reading tests and auditory discrimination problems.

Sleep Disturbance

Sleep disturbance is one of the major causes of annoyance due to noise. Long-term or chronic sleep disturbance may lead to health disorders. In general, the higher the noise level, the greater the probability of a response. For example, a study found that there was a 5 percent probability of subjects being awakened by peak levels of 40 dB and a 30 percent probability at 70 dB. If the number of sound peaks increases, an individual will take longer to fall asleep, even if the average sound level decreases. However, continuous or very frequent noise throughout the night, even as high as 95 dB, appears to cause little change in the average duration of the sleep stages, since such stages are disturbed more by peaks than by high continuous levels alone.

Subjective Response

Excessive noise exposure can result in a variety of psychological responses or symptoms in an individual. The physical attributes of noise that can affect an individual's subjective response include apparent loudness or intensity, spectral shape, presence of discrete frequency components, abruptness or impulsiveness, intermittency, duration, and temporal variations. Other factors include the time of day, the activity interfered with, the ability to control the source and the information content, and personal factors.

Sounds of two KHz or higher are generally the most annoying and disruptive, although noises that are abrupt, intermittent, or fluctuate with time can be very annoying as well. In general, the louder the noise, the more annoying it is likely to be.

Community Response

Community response to noise is usually studied through social surveys. These studies attempt to predict, on an aggregate basis, the degree of annoyance or other effects that can be expected by the community at varying noise levels. Community response to noise is based on statistical averages, since it is known that response to noise varies greatly among individuals.

The most stable indicator of annoyance is the percentage of exposed persons who rate themselves as being highly annoyed. According to the U.S. EPA, there is a relationship between annoyance, complaints, and community reaction as a function of day-night sound levels. Approximately 17 percent of the population will be highly annoyed at an Ldn of 55 dB, and over 40 percent of the population will be highly annoyed if the Ldn exceeds 70 dB, which is the maximum safe level that the U.S. EPA has identified to protect against the risk of hearing loss. The relationship between noise and annoyance is based largely on the results of surveys around airports. These estimates have been criticized because aircraft noise is not present in many urban areas. In addition, complaints occur at a much lower rate than annoyance, and generally do not become evident until the noise levels are very high. For example, at an Ldn of 70 dB, approximately 10 percent of the population can be expected to complain, while 25 to 40 percent of the population will be annoyed.

Table 11.1 lists disturbances from excessive noise that range from minor sleep annoyance to potential hearing loss. Schools and hospitals, and other land uses that house sensitive receptors, or those at high risk of being affected by high noise levels, are considered noise-sensitive uses. In addition to the effects on human physiology and behavior, excessive noise impacts other species. For example, birds living in noisier environments tend to sing louder at night.

Table 11.1: Sources and Effects of Common Noise

dB	Effects	Observation	Source
130	Hearing loss	Pain threshold	Hard rock band Thunder
120		Deafening	
110			Jet take-off
100			Loud auto horn at 10 ft.
90		Very loud	Noisy city street
85			
80			School cafeteria
75			
70	Physiological effects	Loud	Vacuum cleaner at 10 ft.
65			
60	Interference with speech		Normal speech at 3 ft.
55			
50	Sleep interruption	Moderately loud	Average office Dishwasher in next room
45			
40	Sleep disturbance		

35			Soft radio music Quiet residential area
30		Faint	Interior of average residence
20			Average whisper at 6 ft.
10			Rustle of leaves in wind
5		Very faint	Human breathing
0	Audibility threshold		

Source: Compilation of scientific and academic literature, generated by FHWA and U.S. EPA.

Community Attitudes Toward Noise Impacts

Countywide outreach efforts for the General Plan reveal that both urban and rural communities experience neighborhood disturbances, such as barking dogs, leaf blowers, garbage trucks, buses, back-up alarms, permanent amplified noise (i.e., PA systems),and motorcycles. Urban residential areas seemed to be affected by commercial and industrial spillover noise, such as trucks making late night deliveries at neighborhood shopping centers. Virtually all communities objected to noise generated by freeways and major arterials. All communities reacted to aircraft noise to some extent, with the strongest reaction from those whose homes and businesses lie beneath the flight path of major airports.

In compliance with the County Noise Ordinance, the Los Angeles County Department of Public Health (DPH) has performed noise complaint assessments and surveys from 1996 through 1999. During this period, DPH responded to a total of 111 noise complaints under its statutory authority. It should be noted, however, that the quantification of complaints should not be used solely as a definitive expression of community response.

Regulatory Framework

The following section outlines federal, state and county noise-level standards.

Federal Regulations

The adverse impact of noise was officially recognized by the federal government in the Noise Control Act of 1972, which serves three purposes:

- Promulgating noise emission standards for interstate commerce;
- Assisting state and local abatement efforts; and
- Promoting noise education and research.

The Office of Noise Abatement and Control (ONAC) was initially tasked with implementing the Noise Control Act. However, the ONAC has since been eliminated, leaving the development of federal noise policies and programs to other federal agencies and inter-agency committees. For example, the Occupational Safety and Health Administration (OSHA) agency prohibits exposure of workers to excessive sound levels. The U.S. Department of Transportation (DOT) assumed a significant role in noise control through its various operating agencies, such as with the Federal Aviation Administration (FAA), which regulates noise generated by aircraft and airports. Surface transportation system noise is regulated by a host of agencies, including the Federal Transit Administration (FTA), which requires that all rail systems receiving federal funding be constructed and operated in accordance with its regulations and specifications. The Federal Railroad Administration (FRA) sets forth and enforces

safety standards, including noise emissions within railroad locomotive cabs. Transit noise is regulated by the FTA, while freeways that are part of the interstate highway system are regulated by the Federal Highway Administration (FHWA). The FHWA has adopted and promulgated noise abatement criteria for highway construction projects. The federal government encourages local jurisdictions to use their land use regulatory authority to site new development to minimize potential noise impacts. For information on federal guidelines for acceptable environmental noise levels, please refer to Appendix G.

State Regulations

A major source of excessive noise is airports. Title 21 of the California Code of Regulations establishes the maximum acceptable level of aircraft noise in proximity to residences, schools, hospitals, and places of assembly at 65 dB CNEL. The County's Airport Land Use Plan was adopted by the Airport Land Use Commission (ALUC) in 1991 and contains noise contours based on the state standards for all public use airports within Los Angeles County. Figure 11.1 shows these noise contours, and includes updated noise contour data where available. The County's Airport Land Use Plan can be found on the Los Angeles County Department of Regional Planning's web site, located at http://planning.lacounty.gov/ALUC.

Figure 11.1: Airport Noise Contours Map

Additional state regulatory codes that relate to noise abatement include:

- Uniform Building Code: Title 24 of the California Code of Regulations requires certain noise insulation measures to be used in the design of all new residential construction other than detached, single family dwellings;

- Vehicle Code: Establishes maximum noise levels for motor vehicles; and

- California Code of Regulations: Establishes maximum acceptable levels of aircraft noise.

The California Department of Health Service's Office of Noise Control (ONC), established in 1973, was instrumental in developing regulatory tools to control and abate noise for use by local agencies. One significant model is the Land Use Compatibility for Community Noise Environments Matrix, which allows a local jurisdiction to clearly delineate the compatibility of sensitive uses with various incremental levels of noise. The County has adapted this matrix to develop the County's exterior noise standards, as seen in Table 11.2.

County Regulations

The County maintains the health and welfare of its residents with respect to noise through nuisance abatement ordinances and land use planning. The County Noise Control Ordinance, Title 12 of the County Code, was adopted by the Los Angeles County Board of Supervisors in 1977 "…to control unnecessary, excessive, and annoying noise and vibration.…" It declares that the purpose of the County policy is to "…maintain quiet in those areas which exhibit low noise levels and to implement programs aimed at reducing noise in those areas within the county where noise levels are above acceptable values." (Section 12.08.010 of the County Code).

On August 14, 2001, the Board of Supervisors approved an ordinance amending Title 12 of the County Code to prohibit loud, unnecessary, and unusual noise that disturbs the peace and/or quiet of any neighborhood or which causes discomfort or annoyance to any reasonable person of normal sensitivity residing in the area. Regulations can include requirements for sound barriers, mitigation measures to reduce excessive noise, or the placement and orientation of buildings, and can specify the

compatibility of different uses with varying noise levels, as shown in Table 11.2. For more information on noise barrier strategies, please see Appendix G.

Table 11.2: Los Angeles County Community Noise Criteria

			Level (dBA)				
Noise Zone	**Land Use of Receptor Property**	**Time**	**Std 1L5030 min/hr**	**Std 2L2515 min/hr**	**Std 3L8.35 min/hr**	**Std 4L1.71 min/hr**	**Std5L0 at no time**
I	Noise Sensitive	Anytime	45	50	55	60	65
II	Residential	10PM to 7AM	45	50	55	60	65
		7AM to 10PM	50	55	60	65	70
III	Commercial	10PM to 7AM	55	60	65	70	75
		7AM to 10PM	60	65	70	75	80
IV	Industrial	Anytime	70	75	80	85	90

Source: Section 12.08.390 of the Los Angeles County Code (a portion of the Noise Control Ordinance)

Noise Levels

Figure 11.2 shows the noise contours for major sources of noise. A discussion of current and projected levels for major sources of noise in the unincorporated areas can be found in Section 5.12 Noise and Vibration, and Appendix K of the General Plan Environmental Impact Report.

Figure 11.2: Noise Contours Map

III. Issues

Reducing Noise Impacts Through Planning

Since excessive noise affects quality of life, existing and future noise levels must be considered when making land use planning decisions to minimize exposure to excessive noise. Noise-sensitive uses, such as residences, hospitals, schools, childcare facilities, and places of assembly are especially vulnerable to excessive noises generated by airports, rail, freeways and primary arterials, heavy industry and warehousing facilities. As stated in the noise policies, planning for these noise-sensitive uses must include sufficient spatial separation or site design and construction to ensure compatibility with noise-generating uses.

Coordinated transportation and land use planning plays a critical role in the prevention and mitigation of excessive noise impacts. Federal and state laws, in many instances, preempt local laws from controlling certain sources by setting noise levels and operational procedures for aircraft, motor vehicles, and interstate carriers. Local governments can, whenever they have jurisdictional authority, address these noise problems through a combination of land use planning, building code and zoning regulations, and other policies where a noise abatement program is required.

As specified in Policy N 1.12, decisions on land adjacent to transportation facilities, such as the airports, freeways and other major highways, must consider both existing and future noise levels of these transportation facilities to assure the compatibility of proposed uses.

In addition, the condition of road surfaces and traffic congestion can contribute to vehicle noise. Local roadway design features, traffic management, and traffic calming techniques can minimize noise from traffic speed and frequent vehicle acceleration and deceleration, while innovative roadway paving material can further reduce traffic noise.

IV. Goals and Policies

Goal N 1: The reduction of excessive noise impacts.	
Topic	**Policy**
Reducing Noise Impacts	Policy N 1.1: Utilize land uses to buffer noise-sensitive uses from sources of adverse noise impacts.
	Policy N 1.2: Reduce exposure to noise impacts by promoting land use compatibility.
	Policy N 1.3: Minimize impacts to noise-sensitive land uses by ensuring adequate site design, acoustical construction, and use of barriers, berms, or additional engineering controls through Best Available Technologies (BAT).
	Policy N 1.4: Enhance and promote noise abatement programs in an effort to maintain acceptable levels of noise as defined by the Los Angeles County Exterior Noise Standards and other applicable noise standards.
	Policy N 1.5: Ensure compliance with the jurisdictions of State Noise Insulation Standards (Title 24, California Code of Regulations and Chapter 35 of the Uniform Building Code), such as noise insulation of new multifamily dwellings constructed within the 60 dB (CNEL or Ldn) noise exposure contours.
	Policy N 1.6: Ensure cumulative impacts related to noise do not exceed health-based safety margins.
	Policy N 1.7: Utilize traffic management and noise suppression techniques to minimize noise from traffic and transportation systems.
	Policy N 1.8: Minimize noise impacts to pedestrians and transit-riders in the design of transportation facilities and mobility networks.
	Policy N 1.9: Require construction of suitable noise attenuation barriers on noise sensitive uses that would be exposed to exterior noise levels of 65 dBA CNEL and above, when unavoidable impacts are identified.
	Policy N 1.10: Orient residential units away from major noise sources (in conjunction with applicable building codes).
	Policy N 1.11: Maximize buffer distances and design and orient sensitive receptor structures (hospitals, residential, etc.) to prevent noise and vibration transfer from commercial/light industrial uses.
	Policy N 1.12: Decisions on land adjacent to transportation facilities, such as the airports, freeways and other major highways, must consider both existing and future noise levels of these transportation facilities to assure the compatibility of proposed uses.

V. Noise Element Implementation Program

- Countywide Noise Assessment Survey/County Noise Ordinance Update
- Countywide Noise Mapping
- Noise Abatement Program

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

Chapter 12: Safety Element

I. Introduction

Development in Los Angeles County has extended into areas with environmental hazards, such as hillsides, floodplains, and seismic areas. If this pattern of growth continues, it will further increase the vulnerability of Los Angeles County residents to seismic, geotechnical, flood, and fire hazards. In addition, studies suggest that climate change will increase the risk of natural hazards, particularly related to wildland fires, extreme heat, inland flooding and extreme precipitation, coastal flooding, and drought.

The purpose of the Safety Element is to reduce the potential risk of death, injuries, property damage, economic loss, and social dislocation resulting from natural and human-made hazards. The California Government Code requires the General Plan to address "the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards...; flooding; and wildland and urban fires." The Safety Element addresses only limited aspects of human-made disasters, such as hazardous waste and materials management. In general, hazardous materials management is addressed in the Los Angeles County Integrated Waste Management Plan (California Code of Regulations (CCR) Section 18755.5).

The Safety Element works in conjunction with the Operational Area Emergency Response Plan (OAERP), which is prepared by County's Chief Executive Office - Office of Emergency Management (CEO OEM). The OAERP strengthens short and long-term emergency response and recovery capability, and identifies emergency procedures and emergency management routes in Los Angeles County.

CEO OEM also prepares the All-Hazards Mitigation Plan, which provides policy guidance for minimizing threats from natural and human-made hazards in Los Angeles County. The All-Hazards Mitigation Plan, which has been approved by the Federal Emergency Management Agency (FEMA) and the California Emergency Management Agency (CalEMA), includes a compilation of known and projected hazards in Los Angeles County. The All-Hazards Mitigation Plan also includes information on historical disasters in Los Angeles County. To access the latest OAERP and the County All-Hazards Mitigation Plan, please visit the CEO's web site at https://lacounty.gov/emergency/county-of-los-angeles-all-hazards-mitigation-plan/.

II. Seismic and Geotechnical Hazards

Background

Since 1700, over 78 significant earthquakes with a magnitude of 6.5 or greater have occurred in California. In the Los Angeles region, there are over 50 active and potentially active fault segments, an undetermined number of buried faults, and at least four blind thrust faults capable of producing damaging earthquakes in Los Angeles County.

The California Alquist-Priolo Earthquake Fault Zoning Act of 1972 and Section 113 of the County Building Code prohibits the location of most structures for human occupancy across the traces of active faults, and lessens the impacts of fault rupture. In addition, the California Seismic Hazards Mapping Act of 1990 regulates developments as defined by the Act. Seismic Hazard Zone maps depict areas where earthquake induced liquefaction or landslides have historically occurred, or where there

is a high potential for such occurrences. Liquefaction is a process by which water saturated granular soils transform from a solid to a liquid state during strong ground shaking. A landslide is a general term for a falling, sliding, or flowing mass of soil, rocks, water and debris.

The main provisions of the Alquist-Priolo Earthquake Fault Zoning and Seismic Hazard Mapping Acts are to:

- Require the California Geological Survey to prepare maps depicting earthquake fault zones, liquefaction hazard zones and earthquake-induced landslide zones.
- Require property owners (or their real estate agents) to disclose that their property lies within identified hazard zones; and
- Prohibit new construction of projects within identified hazard zones until a comprehensive geotechnical study has been completed.

Figure 12.1 identifies the County's Seismic Hazard Zones. In addition to depicting faults within Alquist-Priolo Earthquake Fault Zones, Figure 12.1 also depicts faults that are considered active based on published information. For more details on active faults in Los Angeles County, please refer to Appendix H.

Figure . Seismic and Geotechnical Hazard Zones Policy Map

Issues

1. Seismic Hazards

Earthquakes can cause ground rupture, liquefaction and landslides. In addition, flooding in low-lying coastal areas can result from a tsunami that is generated by a large offshore earthquake or sub-marine landslides. Widespread and localized earthquake induced effects place structures or utility corridors at-risk, and if damaged, can result in fires, failure of large dams, or the release of toxic, flammable, or explosive materials. The General Plan prohibits new projects, as defined by the Alquist-Priolo Act and Seismic Hazards Mapping Acts, until a comprehensive geotechnical study has been approved.

2. Geotechnical Hazards

More than 50 percent of the unincorporated areas are comprised of hilly or mountainous terrain. Most hillside hazards include mud and debris flows, active deep-seated landslides, hillside erosion, and man-induced slope instability. These geotechnical hazards include artificially or rainfall-saturated slopes, the erosion and undercutting of slopes, earthquake induced rock falls and shallow failures, and natural or artificial compaction of unstable ground. The County's Hillside Management Area Ordinance regulates development in hillsides that have natural slope gradients of 25 percent or steeper, and these potential hazards are analyzed as part of the permitting process.

Goals and Policies for Seismic and Geotechnical Hazards

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life and property damage due to seismic and geotechnical hazards.	
Topic	**Policy**
Geotechnical Hazards	Policy S 1.1: Discourage development in Seismic Hazard and Alquist-Priolo Earthquake Fault Zones.
	Policy S 1.2: Prohibit construction of structures for human occupancy adjacent to active faults unless a comprehensive fault study that addresses seismic hazard risks and proposes appropriate actions to minimize the risk is approved.
	Policy S 1.3: Require developments to mitigate geotechnical hazards, such as soil instability and landslides, in Hillside Management Areas through siting and development standards.
	Policy S 1.4: Support the retrofitting of unreinforced masonry structures and soft-story buildings to help reduce the risk of structural and human loss due to seismic hazards.

III. Climate Adaptation and Resilience

Background

Climate change has exacerbated existing hazards and introduced new hazards, such as extreme heat, extreme precipitation, and drought in Los Angeles County. Adaptation and resilience strategies are adjustments in natural or human systems in response to existing or expected climate impacts to reduce harm. This section includes adaptation and resilience strategies applicable to all hazards in compliance with Senate Bill 379. Hazard-specific adaptation and resilience strategies can be found in the individual hazard sections of this Element.

The 2021 Los Angeles County Climate Vulnerability Assessment (CVA) assesses how people and infrastructure in Los Angeles County may be vulnerable to climate change. Vulnerability in this context is generally defined as a combination of increased exposure to climate hazards; high sensitivity, or susceptibility, to negative impacts of exposure; and adaptive capacity, or ability to manage and recover from exposure. The CVA analyzes five climate hazards: extreme heat, wildfire, extreme precipitation and inland flooding, coastal flooding, and drought. The CVA assesses the severity that climate hazards will impact in two points in time: today and at mid-century under Representative Concentration Pathway (RCP) 8.5. RCP 8.5 is one of the scenarios adopted by the Intergovernmental Panel on Climate Change to project the concentration of greenhouse gas emissions based on differing volumes of emissions in the future. RCP 8.5 is considered the “business as usual” projection, which assumes that global greenhouse gas emissions will continue to increase in the absence of climate change policies until at least the end of the 21st century. The CVA evaluated the RCP 8.5 scenario for a worst-case evaluation of how climate hazards may worsen over time. The key takeaways from the CVA are:

- Extreme heat will increase in frequency, severity, and duration.
- Wildfires will become larger, more frequent, and more destructive.
- Rainfall patterns will change, with drier springs and summers and wetter winters. The concentration of rainfall over short periods will increase the likelihood of inland flooding.
- A rise in sea level of up to 2.5 feet by mid-century will lead to more frequent and severe coastal flooding.
- Drought and mega-drought will become more likely because of rising temperatures and shifting precipitation patterns.

Additional details from the CVA can be found at https://ceo.lacounty.gov/cso-actions/.

Frontline communities - populations that often experience the earliest and most acute consequences of climate change, face historic and current inequities, and have limited resources and/or capacity to adapt - are at immediate risk from climate-induced hazards. When disadvantaged communities are also in the frontlines of such hazards, it makes it harder for these communities to recover from the damages. A hazard event may require residents to vacate homes due to unsafe conditions, and the costly and lengthy rebuilding process may prevent communities that were already at a disadvantage ~~to~~ from recovering completely. The lack of a social safety net can also make it difficult for disadvantaged communities to navigate reducing the harms of hazards. A strong social structure is imperative for communities to build resiliency and adapt to climate change, and a physical space like a resilience hub can serve as an anchor for a community. This Element contains policies that provide additional support to frontline communities through supportive planning, education, and services.

Resilience hubs

Resilience hubs are community-serving facilities that support residents and coordinate resource distribution and services before, during, or after a natural hazard event. They provide the physical space and social safety net for a community in the event of a hazard and its secondary impacts, such as heat waves, wildfire smoke, floods, and earthquakes. Resilience hubs can be designed to operate independent of the electrical grid by relying on solar power and battery storage as a backup source of electricity. These alternative sources of power allow the hubs to provide support to residents who are impacted by the hazards. Resilience hubs can also be used as a space to promote meaningful engagement and programming that empower communities to build resilience to climate hazards, especially for frontline communities that are directly impacted by climate hazards and/or their secondary impacts.

Microgrids

Microgrids are smaller distributed energy sources that have localized grids that can disconnect from the traditional grid to operate autonomously. Microgrids can become a more flexible and efficient electric grid by integrating renewable energy resources, such as solar. Microgrids can strengthen grid resilience and help mitigate grid disturbances during Public Safety Power Shutoffs (PSPS) due to dangerous wind conditions that may exacerbate wildland fire ignition potential. A microgrid can provide life-saving reprieve in the event of a hazard, especially for sensitive populations that are dependent on electricity for survival.

Issues

1. Climate Change and Social Vulnerabilities

Social vulnerability encompasses the conditions that affect people's sensitivity and exposure to the impacts of climate change that may put people at greater risk of harm. Although climate hazards pose a risk to all Los Angeles County residents, various factors can make certain populations more susceptible to harm than others. These factors include inequities in infrastructure and access to the benefits of education, living wages and income, economic opportunity, social capital, healthcare, and/or other services; institutionalized bias or exclusion from political and decision-making power; inequities in environmental and living conditions and health status; and differences in individual health, age, and ability. The CVA includes a Social Vulnerability Assessment to identify the conditions that contribute to a community's social vulnerability for individual climate hazards. To access the CVA, please visit: https://ceo.lacounty.gov/cso-actions/.

2. Climate Change and Physical Vulnerabilities

Physical vulnerability is the susceptibility and limitations of physical infrastructure in the context of climate hazards and extreme events. Climate change has the potential to damage physical infrastructure and disrupt services or limit accessibility. The CVA explores the vulnerability of key infrastructure systems to understand how climate change will affect them by mid-century. In the CVA, climate hazard exposure and infrastructure sensitivities to climate hazards are combined to determine physical vulnerability to climate change. The Physical Vulnerability Assessment in the CVA aims to highlight infrastructure systems that are most vulnerable to different climate hazards and prioritize and bring attention to those that should be the focus of investment and policy advancements.

Disruption to infrastructure can create cascading impacts that can heighten the severity of a climate event and impact other interconnected sectors that serve critical needs. The Cascading Impacts Assessment in the CVA examines potential cascading impacts in Los Angeles County caused by climate-related disruption affecting linked systems and socially vulnerable populations. To access the CVA, please visit: https://ceo.lacounty.gov/cso-actions/.

3. Secondary Impacts of Climate Hazards

Secondary impacts are the effects that occur directly as a result of the primary impacts of climate-induced hazards. Secondary impacts may be felt during and after the hazard event and outside of the immediate area of impact. Examples of secondary impacts are smoke and hazardous air quality from a wildland fire, increased mosquito activity after a flood event, mudslides after extreme precipitation falling on a recent burn area, or poor air quality due to extreme heat events increasing production of smog. Effective emergency response planning will need to consider how secondary impacts may affect the impacted and adjacent communities.

Goals and Policies for Climate Adaptation and Resilience

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life, and property damage due to climate hazards and climate-induced secondary impacts.	
Topic	**Policy**
Climate Adaptation and Resiliency	Policy S 2.1: Explore the feasibility of community microgrids that are driven by renewable energy sources to increase local energy resilience during grid power outages, reduce reliance on long-distance transmission lines, and reduce strain on the grid when demand for electricity is high.
	Policy S 2.2: Plan for future climate impacts on critical infrastructure and essential public facilities.
	Policy S 2.3: Require new residential subdivisions and new accessory dwelling units within hazard areas to meet required evacuation standards.
	Policy S 2.4: Promote the creation of resilience hubs in frontline communities that are ~~at~~ highly vulnerable to climate hazards and ensure that they have adequate resources to adapt to climate-induced emergencies.
	Policy S 2.5: Promote the development of community-based and workplace groups such as Community Emergency Response Teams to improve community resilience to climate emergencies.
	Policy S 2.6: Promote climate change and resilience awareness education about the effects of climate change-induced hazards and ways to adapt and build resiliency to climate change.
	Policy S 2.7: Increase the capacity of frontline communities to adapt to climate impacts by focusing planning efforts and interventions on communities facing the greatest vulnerabilities and ensuring representatives of these communities have a role in the decision-making process for directing climate change response.

IV. Flood and Inundation Hazards

Background

Federal, state, and local agencies share and coordinate responsibilities for flood protection in Los Angeles County. The two main federal agencies include the U.S. Army Corps of Engineers, which implements federal flood protection policies, and the Federal Emergency Management Agency (FEMA). The California Department of Water Resources (DWR) is responsible for managing the state's waterways. Locally, the Los Angeles County Public Works (PW) and the Los Angeles County Flood Control District work to reduce flood risk in Los Angeles County. There are numerous ways in which PW and the Flood Control District manage flood risk. PW maintains a vast system of dams, reservoirs, debris basins/inlets, flood basins, channels and storm drains, and coordinates operations of this system with the U.S. Army Corps of Engineers' operations of its flood management facilities. PW also regulates development in flood hazard areas in accordance with ordinances and standards that meet or exceed those of the National Flood Insurance Program (NFIP). Development and implementation of documents like the Los Angeles County Comprehensive Floodplain Management Plan and Sediment Management Strategic Plan aim to reduce adverse impacts of flood hazards for unincorporated Los Angeles County.

For more information on the Los Angeles County Comprehensive Floodplain Management Plan, please visit https://dpw.lacounty.gov/wmd/NFIP/FMP/. For more information on the Sediment Management Strategic Plan, please visit https://dpw.lacounty.gov/lacfcd/sediment/stplan.aspx.

For a comprehensive list of agencies responsible for flood management, protection, as well as financial assistance, please refer to Appendix H.

Flood Hazard Zones

Flood Hazard Zones are areas subject to moderate or minimal flood hazards that are identified on an official Flood Insurance Rate Map issued by FEMA. Flooding in Los Angeles County can be earthquake induced or can result from intense rainfall. Figure 12.2a shows the County's Flood Hazard Zones, which are 1% Annual Chance of Flood (100-Year) and 0.2% Annual Chance of Flood (500-Year) floodplains designated by FEMA.

In addition to the Flood Hazard Zones, DWR's Awareness Floodplain Mapping Program identifies potential flood hazard areas that are not part of the regulated floodplain. For the available awareness floodplain maps for the unincorporated areas, please refer to Appendix H.

Figure . a FEMA Flood Hazard Zones Policy Map

Since 1980, the County has been a voluntary participant in the FEMA National Flood Insurance Program (NFIP). As a participant, the County is responsible for regulating development in Flood Hazard Zones in unincorporated Los Angeles County and planning for floodplain management activities that promote and encourage the preservation and restoration of the natural state of the floodplain. As a compliance requirement of the NFIP, the County enforces regulations to ensure that buildings are erected at a safe elevation and to prevent potential damage to properties.

In 1980, the County also identified flood hazard areas associated with the County Capital Flood, which are shown on County Floodway Maps that were adopted into the County Code (Title 11, Chapter 11.60). The County Floodway Maps are used in conjunction with the FEMA Flood Insurance Rate Maps to regulate development in flood hazard areas to meet or exceed NFIP standards. Figure 12.2b shows the mapped floodways and floodplains associated with the County Capital Flood floodplains,

which are undeveloped areas that may flood based on a 50-year (2% annual chance) rainfall frequency falling on a watershed that have undergone a burn and four years of post-fire recovery.

Figure . b County Floodways and Floodplains Policy Map

The County provides information on Flood Hazard Zones from FEMA's Flood Insurance Rate Maps to property owners for use in resolving flood insurance matters with insurance companies and lending institutions. The County conducts educational outreach to communities in the unincorporated areas on how to mitigate flooding impacts on properties. Through these and other efforts, the County reduces flood insurance costs for residents who are required to purchase flood insurance by lowering a community's overall rating system number.

To view FEMA and County flood zone information on PW's Flood Zone Determination web site, please visit https://pw.lacounty.gov/floodzone. For more information on flood hazards, please visit the ~~D~~PW web site at http://dpw.lacounty.gov/wmd/nfip. Please also visit the U.S. Army Corps of Engineers National Levee Database at http://nld.usace.army.mil.

Regulations

Table . . Flood-Related Land se and Building Regulations in the Los Angeles County Code

Reference	Summary
Title 11, Health and Safety, Chapter 11.60	County Floodway Maps – basis of all County regulation of activities within County floodways
Title 20, Utilities, Section 20.32	Sewer permits
Title 20, Utilities, Section 20.94	Natural watercourses, swales, and man-made drainage channels, prohibition of activities in waterways

Issues

1. Climate Change and Flood Hazards Impacts

Climate change is expected to produce longer and more severe droughts due to higher average temperatures, as well as greater and more frequent floods. The water systems in Los Angeles County are designed to balance flood protection during the winter and spring months with water storage during the dry months. While the average amount of annual precipitation in California is not projected to significantly change due to climate change, there is a greater chance for wet and dry extremes to occur more frequently. However, it is too early to quantify the frequency of extreme storm events. More studies to determine the impact of climate change on extreme storm events will be needed before evaluating the adequacy of flood control systems in Los Angeles County. With increased rainfall, facilities that handle stormwater can become overburdened and lose the capacity to protect communities from inland flooding. This can result in greater and more frequent floods in areas within river floodplains or adjacent to drainage systems, low-lying areas, where heavy rainfall can collect, and areas with inadequate storm drain infrastructure. Infrastructure at risk include bridges, tunnels, and coastal highways. In particular, the ports of Los Angeles and Long Beach are vulnerable to coastal flooding, and if impacted, could result in economic repercussions across the region.

2. Dam or Aqueduct Failure

Catastrophic dam or aqueduct failure can devastate large areas and threaten residences and businesses. There are 85 dams in Los Angeles County that hold billions of gallons of water in reservoirs, and seismic activity can compromise dam structures and result in catastrophic flooding (https://fmds.water.ca.gov/webgis/?appid=dam_prototype_v2). The Division of Safety of Dams of the California Department of Water Resources has jurisdiction over large dams throughout the State and enforces strict safety requirements and annual inspections. Additionally, dam inundation areas have been mapped by dam owners and submitted to the California Office of Emergency Services (Cal/OES) to ensure effective emergency planning and adequate preparations in the event of a catastrophic event (https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams/Inundation-Maps). The California State Water Project provides information on aqueducts located in Los Angeles County (https://water.ca.gov/swp/).

3. Tsunami Hazard Areas

Coastal areas are vulnerable to tsunamis. Tsunamis are a series of powerful waves that originate from geologic disturbances in the ocean. Generated by large earthquakes below the ocean floor, underwater landslides, volcanic activity, and meteor strikes, tsunamis grow significantly in mass and height as they approach land and have the potential to cause injury and damage along adjacent coastal areas in Southern California. The travel time for a locally generated tsunami, from initiation at the source to arrival at coastal communities, can be 5 to 30 minutes. Tsunamis can last for hours and resemble a flood or surge. Figure 12.3 identifies Tsunami Hazard Areas in Los Angeles County, which include Marina del Rey, Santa Catalina Island, and portions of the Santa Monica Mountains Coastal Zone.

Figure . Tsunami Hazard Areas Map

The likelihood for the catastrophic inundation of low-lying coastal areas from tsunamis in Los Angeles County is low. However, the risk of losing vital commerce associated with the ports of Los Angeles and Long Beach warrants adequate risk reduction measures from tsunamis. The ports of Los Angeles and Long Beach have completed a Tsunami Hazard Assessment to guide disaster planning and mitigate damage from a potential tsunami at their facilities. In addition, the County All-Hazards Mitigation Plan includes risk reduction measures for the coastal areas. To learn more about tsunamis, please visit the California Geological Survey Tsunami Program: www.tsunami.ca.gov.

4. Coastal Flooding

Sea level rise can affect and alter the impacts of flood inundation of low-lying coastal areas. While these impacts are likely to occur over a long period of time, impacts related to sea level rise include the flooding of septic systems and the intrusion of salt water into the fresh water supply. Coastal habitats can adapt to gradual changes in sea level, however, an accelerated rise in sea level will negatively impact coastal habitats. Wetlands are at risk of being inundated. Figure 12.4 shows the areas along the coastline that can potentially be impacted due to coastal flooding.

Figure . Sea Level Rise Impact Areas Map

Goals and Policies for Flood and Inundation Hazards

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life, and property damage due to flood and inundation hazards.	
Topic	**Policy**
Flood Hazards	Policy S 3.1: Strongly discourage development in the County's Flood Hazard Zones, unless it solely provides a public benefit.
	Policy S 3.2: Strongly discourage development from locating downslope from aqueducts, unless it solely provides a public benefit.
	Policy S 3.3: Promote the use of natural, or nature-based flood protection measures to prevent or minimize flood hazards, where feasible.
	Policy S 3.4: Ensure that developments located within the County's Flood Hazard Zones are sited and designed to avoid isolation from essential services and facilities in the event of flooding.
	Policy S 3.5: Ensure that biological and natural resources are protected during rebuilding after a flood event.
	Policy S 3.6: Infiltrate development runoff on-site, where feasible, to preserve or restore the natural hydrologic cycle and minimize increases in stormwater or dry weather flows.

V. Fire Hazards

Background

Fire Hazard Severity Zones

While all of California is subject to some degree of fire hazard, there are specific features that make some areas more hazardous. The California Department of Forestry and Fire Protection (CAL FIRE) is required by law to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), influence how people construct buildings and protect property to reduce risk associated with wildland fires.

Los Angeles County faces wildland fire threats due to its topography, rainfall patterns, and fire-adapted vegetation. The at-risk areas are designated as FHSZs per Government Code Sections 51175–51189. FHSZs in the unincorporated areas are classified as Very High, High, and Moderate in State Responsibility Areas (SRA) and Very High in Local and Federal Responsibility Areas (LRA and FRA). SRA are areas where the State has financial responsibility for wildland fire protection and prevention. Cities and federal ownerships are not included. LRA are areas where the local government is responsible for wildfire protection. FRA are lands that are administered by federal agencies that are responsible for wildfire protection. The County of Los Angeles Fire Department (Fire Department) provides the wildfire protection in LRAs in District and Fee-for Service cities and all unincorporated areas of Los Angeles County. A map of SRA, LRA, and FRA boundaries can be viewed here: https://osfm.fire.ca.gov/divisions/community-wildfire-preparedness-and-mitigation/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/.

To reduce the threats to lives and property, the Fire Department has instituted a variety of regulatory programs and standards. These include vegetation management, pre-fire management and planning, the fuel modification plan review program, and brush clearance inspection program. In addition to these programs, the Fire Department and PW enforce fire and building codes related to development in FHSZs. The Fire Department implements Title 32 (Fire Code) requirements in FHSZs.

Figure 12.5 identifies the FHSZs in Los Angeles County. For more information on the County's fire prevention and safety programs, please visit the Fire Department's web site at http://www.fire.lacounty.gov.

Figure . Fire Hazard Severity Zones Policy Map

California Strategic Fire Plan

The State Board of Forestry and CAL FIRE have completed a comprehensive document for wildland fire protection in California, the California Strategic Fire Plan (Fire Plan). The Fire Plan acknowledges the persistence of wildfires in California and addresses how local, state, federal, and private entities can work together to increase resilience to adapt to this risk. The Fire Department Forestry Division's Fire Plan Unit annually prepares and implements the Los Angeles County Strategic Fire Plan, a parallel document to the State Fire Plan. The planning process defines a level of service measurement, considers assets at risk, incorporates the cooperative inter-dependent relationships of wildland fire protection providers, provides for public stakeholder involvement, and creates a fiscal framework for policy analysis. The Fire Plan assessment process utilizes weather, assets at risk, fuels, and input from the various regions, bureaus, divisions, and battalions to help target critical areas and prioritize projects.

The Fire Department is one of six contract counties that maintain a contractual relationship with CAL FIRE and implements the Fire Plan within unincorporated Los Angeles County through the Strategic

Fire Plan. The Strategic Fire Plan identifies and prioritizes pre- and post-fire management strategies and tactics to reduce loss of life, property, and natural resources. It also includes a map of existing Fire Department helispots fuel reduction projects, water resources, motorway maintenance maps, and a description of the road and fuel maintenance functions of the Fire Department. This Safety Element incorporates the Strategic Fire Plan by reference. For more information, please visit the following web site: http://www.fire.lacounty.gov.

Regulations

Fuel Modification Plan Review Program

Fuel modification plans are required for development projects within areas designated as a Fire Hazard Severity Zone within the State Responsibility Areas or Very High Fire Hazard Severity Zone within the Local Responsibility Areas, as described in Title 32, Fire Code. The fuel modification plan identifies specific zones within a property that are subject to fuel modification. A fuel modification zone is an area of land where combustible native or ornamental vegetation has been modified and/or partially or totally replaced with drought-tolerant, low-fuel-volume plants. The County of Los Angeles Fuel Modification Guidelines can be found at http://www.fire.lacounty.gov.

Fire prevention items addressed in Title 32 include provision of fire apparatus access roads, adequate road widths, requirements for all-weather access and fire flow, fire hydrant spacing, and clearance of brush around structures located on hillside areas that are considered primary wildland fire risk areas. Table 12.2 references fire-related land use and building regulations, including fuel modification, in the Los Angeles County Code.

Table . . Fire-Related Land se and Building Regulations in the Los Angeles County Code

Reference	Summary
Title 20, Utilities, Section 20.16.060	Fire flow and fire hydrant requirements, including in Very High Fire Hazard Severity Zones
Title 21, Subdivisions, Chapter 21.24, Part 1	Streets and access routes requirements, including fire apparatus access, and public evacuation
Title 21, Subdivisions, Section 21.24.220	Fire-protection access easements
Title 26, Building, Chapter 7A	Materials and Construction Methods for Exterior Wildfire Exposure
Title 30, Residential, Section R337	Materials and Construction Methods for Exterior Wildfire Exposure
Title 32, Fire, Section 325	Clearance of brush and vegetative growth
Title 32, Fire, Section 503	Specifications for fire access roads in developed areas, including dimensions and markings.
Title 32, Fire, Section 4907.1	Defensible space around structures in State Responsibility Areas, per Title 14, Section 1270 of the California Code of Regulations

Title 32, Fire, Sections 4908, 1117.2.1	Fuel modification
Title 32, Fire, Appendix B and Appendix C	Fire flow requirements and fire hydrant locations

Conservation and Wildland Areas

Significant Ecological Areas and Oak Woodlands

Overlapping with fire hazard zones are areas that contain biological resources, including oak woodlands, Significant Ecological Areas (SEAs) and Coastal Resource Areas (CRAs). The General Plan's Conservation and Natural Resources Element includes a map and goals and policies related to SEAs and CRAs.

Oak woodlands play an important role in reducing wildfire risk. The native oak woodland understory typically contains less flammable vegetation compared to other types of trees. Oak trees are also harder to ignite and not as prone to rapid combustion. Well-maintained oak stands prevent slope failure, reduce erosion, and can slow down a wildfire. As described in the Conservation and Natural Resources Element, the Department of Regional Planning will work to expand documentation of oak woodlands as part of the implementation of the Oak Woodlands Conservation Management Plan.

The SEA Program also includes the SEA Ordinance, an implementing ordinance, that is part of Title 22 (Planning and Zoning). The SEA Program Guide contains additional detail about the biological resources present in each SEA, along with additional information to assist the County in managing resources within the SEAs. General descriptions of the biological resources and designation criteria for each SEA and CRA are contained in Appendix E.

As part of the project planning review process, the Fire Department complies with the California Environmental Quality Act (CEQA), the CAL FIRE Programmatic Environmental Impact Report for chaparral vegetation management programs, and the County's Oak Tree and SEA ordinances to consider project impacts to wildlife habitats, endangered species and cultural resources.

Integrated Vegetation Management Program

Vegetation management, as it relates to wildland fire, refers to the total or partial removal of high fire hazard grasses, shrubs, or trees. This includes thinning to reduce the fuel loads and modification of vegetation arrangement and distribution to disrupt fire progress. In addition to fire hazard reduction, vegetation management has other benefits. These include increased water yields, habitat restoration and improvement, reduction of invasive exotic plant species, and open access for recreational purposes.

The Vegetation Management Program (VMP) is a cost-sharing program that focuses on the use of prescribed fire, hand crews, mechanical, biological, and chemical means, for addressing wildland fire fuel hazards, habitat restoration and other resource management issues on State Responsibility Area and Local Responsibility Area lands.

A VMP allows private landowners, and state and conservancy entities to enter into a contract with CAL FIRE to accomplish a combination of fire protection and resource management goals, including in

open space areas. The Fire Department Forestry Division's Vegetation Management Unit and the Air and Wildland Division's Prescribed Fire Office implement VMP projects.

Pest, Disease, and Other Forest Health Issues

The County of Los Angeles Department of Agricultural Commissioner / Weights and Measures (ACWM) maintains a vast network of insect traps throughout much of Los Angeles County. The network is designed to serve as an early warning system for some of California's most feared insect pests, including species such as the gypsy moth, gold-spotted oak borer (GSOB), and invasive shot-hole borer (ISHB), which have the potential to damage fragile wildland and watershed areas. The County of Los Angeles Fire Department Forestry Division assists the ACWM with detection and mitigation of insect and plant diseases, pests, and invasive species.

The County also collaborates with state, local, and educational agencies on the detection, management, and mitigation of insect and plant diseases, pests, and invasive species.

Issues

1. Climate Change and Wildfire Impacts

Climate change has resulted in wildland fires that last longer and occur more frequently due to higher temperatures and extended drought. In 2007 and 2008, wildland fires burned over 147,000 acres, destroyed 570 residences, and damaged an additional 42 residences in the unincorporated areas. In 2009, the Station Fire broke out in the Angeles National Forest, which burned nearly 160,000 acres and destroyed approximately 76 residences. This fire, the largest in recorded history for Los Angeles County, occurred months before low-moisture and strong Santa Ana winds, which often exacerbate wildland fires in the fall and spring months. In more recent years, fire season has become longer, affecting all jurisdictions in the State. Wildfires from neighboring jurisdictions pose new challenges for Los Angeles County. In 2018, the Woolsey Fire began in Ventura County and crossed into Los Angeles County, burning nearly 97,000 acres of the Santa Monica Mountains, and destroying 1,643 structures. In 2020, California endured the 2020 Fire Siege that saw multiple fires burning up and down the State at the same time. During this unprecedented year, the Bobcat Fire, which started in the San Gabriel Mountains, burned over 115,000 acres, destroying over 170 structures, and becoming the second largest in recorded history for Los Angeles County. Appendix H contains descriptions of these and other recent wildfires.

As wildfires have become intense, all-year phenomena due to climate change, the risk of injury to residents and damage to property and infrastructure have increased. Secondary impacts, such as smoke from wildfires, have also significantly impacted the health of Los Angeles County residents. As these risks are projected to increase, there is a need to develop adaptation strategies, such as emergency and evacuation planning for communities located in high fire risk areas, retrofitting older homes to current fire code standards, and updating communications and energy infrastructure.

2. The Increasing Costs of Wildland Fires

Although fires are a natural part of the wildland ecosystem, development in wildland areas put more residents and their homes/businesses at risk of adverse impacts from wildfires, increases adverse fire-related environmental impacts, and increases the burden on public services to protect residents, homes/businesses, and the environment. Increased fire frequency is the primary threat to wildland ecosystems, which are adapted to an infrequent fire return interval. Frequent fires cause habitat type conversion and the presence of invasive species.

Wildland fire threats are increasing, in part due to climate change causing heavier (dead) fuel loads but also due to further encroachment of development into wildland areas. Increased development and land uses at the urban periphery introduces structures, roads, vehicle traffic, and people into areas that were previously undeveloped, and increases the probability of ignitions within wildland areas. Nearly all wildfire ignitions in Los Angeles County in recent times were human-caused, often by electrical equipment, vehicles, fireworks, debris burning, smoking, campfires, or arson. According to the National Interagency Fire Center, Southern California experienced 5,295 human-caused wildfires resulting in 927,722 acres burned in the year 2020 alone. The rise in temperatures and prolonged periods of drought increase the fire ignition potential and may increase the frequency and duration of wildfires. Wildfires also have negative impacts on air quality. As exposure to smoke and particulate matter has immediate and long-term public health impacts, populations may suffer from eye irritations, respiratory problems, and complications to existing lung and heart conditions. Wildfires also have major economic impacts and have the potential to cost the County millions of dollars every year.

Although multiple regulations are in place to ensure that adequate infrastructure is incorporated into new developments, older communities with aging and substandard infrastructure may face greater risks from wildland fires. Future regulations will need to consider the increased risk for existing developments located in FHSZs from larger and more frequent wildland fire threats.

For a timeline of recent fires and their countywide impacts, as well as their impacts on the unincorporated areas, please refer to Appendix H.

3. The Wildland Urban Interface

Recent fires throughout the State have established that communities and homes located in and near wildlands with vegetative 'fuels' are at much higher risk of loss due to wildfire. These areas, known as the wildland urban interface (WUI), are characterized by the geographical intersection of two land types: human development and undeveloped wildlands. WUIs are common throughout ~~the~~ Los Angeles County, particularly in rural and mountainous areas, and can also include urban communities that are located near open space, conservation areas, and national forests. Development in the WUI is broken down into two classes: interface and intermix. Interface represents relatively dense development adjacent to wildlands, with a clear boundary between them. Intermix represents less dense, or sparse, development interspersed within wildland areas.

Development within the WUI, particularly for residential homes, represents a significant proportion of growth across the State. Development within the WUI has increased over the last several decades due to a variety of factors, including peoples' interest in living near open space amenities. According to a 2018 study authored by the Department of Forest Ecology & Management, University of Wisconsin-Madison and the U.S. Forest Service, titled "Rapid Growth of The U.S. Wildland Urban Interface Raises Wildfire Risk," Los Angeles County had over 561,000 housing units and 1.5 million residents within the WUI countywide in 2010. According to the report's County Summary Statistics data, published in 2019, this represents 16% of Los Angeles County's total housing and population. Based on this data, it is estimated that every 10 years an additional 50,000 homes are built in the WUI in Los Angeles County. A large portion of the homes built within the WUI are within the Very High Fire Hazard Severity Zone (VHFHSZ). Thus, increasing climate-related wildfire conditions combined with the scale of existing and potential development within the WUI and VHFHSZ represent an enormous risk to a significant proportion of Los Angeles County residents.

Development within the WUI and VHFHSZ increases the likelihood of fire spreading between developed and undeveloped areas. Particularly within a densely populated area such as Los Angeles County, wildfire ignitions often start near development and can rapidly spread into nearby wildlands. Conflagrations can then spread through vegetated areas and threaten multiple communities over a wide geographical area. As communities grow further out into undeveloped areas, the ability for fire protection agencies to protect homes is diminished and the resources to maintain adequate

infrastructure required for evacuation and emergency response is stretched thin. This results in greater risk to communities and increased costs for residents and agencies for fire protection.

As wildfire risks mount due to climate change, communities that have developed within the WUI and VHFHSZ face significant challenges related to natural resource management and hazard mitigation. Expanding development boundaries exacerbate wildfire risk by degrading natural resources through impacts to biological communities and watersheds. Other conditions such as topography, hydrology, vegetation types, and climate contribute to the risk factors associated with development in the WUI. As climate-related impacts to precipitation and vegetation occur and development persists, the boundaries of the WUI will continue to change into the future.

4. Urban Fire Considerations

Due to the intensity of development, population density, and the difficulties of containment, the County must also devote major resources to controlling potential fire hazards in its urbanized areas. Fire safety and suppression are especially critical in industrial areas and high-rise buildings. The County must also consider performance standards and use exemptions that minimize urban fire risks, such as regulating certain commercial uses that have high fire risks in mixed use developments.

5. Fire Prevention, Response and Recovery

The Fire Department serves unincorporated areas of Los Angeles County as well as 60 cities. The Fire Department has a contractual agreement with CAL FIRE to provide wildland fire protection on SRAs. The Gray Book staffing agreement identifies resource allocations that CAL FIRE considers necessary for the protection of SRA and provides funding accordingly. In Los Angeles County, the Gray Book provides funding for 23 stations and fire prevention activities.

In emergency services, mutual aid is an agreement among emergency responders to lend assistance across jurisdictional boundaries. This may occur due to an emergency response exceeding capabilities of local resources, such as a disaster or a multiple alarm fire. Mutual aid may be ad hoc, requested only when such an emergency occurs, or may be a formal standing agreement for cooperative emergency management on a continuing basis, such as ensuring resources are dispatched from the nearest fire station, regardless of the incident's jurisdictional boundary. Agreements sending the closest resources are regularly referred to as "automatic aid agreements."

Los Angeles County currently has five new operational fire stations in the Santa Clarita Valley as of 2021. Nineteen new stations are planned for development within the next five years in the Antelope Valley, Santa Clarita Valley, and Santa Monica Mountains.

Appendix H references the relevant County codes, as well as programs and functions of the Fire Department and other agencies in fire prevention, fire/emergency response, and recovery as required by CAL FIRE. Additional information can be found in the Strategic Fire Plan.

6. Community Resilience and Fire-Resistant Planning

As wildfires increase in frequency and intensity due to climate change, the capacity of fire agencies to respond to heightened fire risks within their own jurisdictions and to provide mutual aid to other areas is becoming increasingly strained. As such, communities in FHSZs can reduce the potential risk of death, injuries, and economic loss by increasing their resilience to wildfire. Adaptive measures include hardening homes, installing fire-retardant landscapes, maintaining defensible space, increasing fuel breaks, maintaining clear emergency access routes, evacuation planning, and adopting community wildfire protection plans. Residents living in existing development with inadequate access/evacuation routes are strongly encouraged to implement such adaptive measures, as it could increase their safety

during a wildfire event. The Fire Department provides resources through the Ready! Set! Go! brochure to provide residents with critical information on creating defensible space around homes, retrofitting homes with fire-resistant materials, and preparing residents to safely evacuate well ahead of a wildfire. Additional information can be found at the Fire Department's web site: http://fire.lacounty.gov/rsg/.

Goals and Policies for Fire Hazards

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life, and property damage due to fire hazards.	
Topic	**Policy**
Fire Hazards	Policy S 4.1: Prohibit new subdivisions in VHFHSZs unless: (1) the new subdivision is generally surrounded by existing or entitled development or is located in an existing approved specific plan or is within the boundaries of a communities facility district adopted by the County prior to January 1, 2022, including any improvement areas and future annexation areas identified in the County resolution approving such district; (2) the County determines there is sufficient secondary egress; and (3) the County determines the adjoining major highways and street networks are sufficient for evacuation as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County. Discourage new subdivisions in all other FHSZs.
	Policy S 4.2: New subdivisions shall provide adequate evacuation and emergency vehicle access to and from the subdivision on streets or street systems that are evaluated for their traffic access or flow limitations, including but not limited to weight or vertical clearance limitations, dead-end, one-way, or single lane conditions.
	Policy S 4.3: Ensure that biological and natural resources are protected during rebuilding after a wildfire event.
	Policy S 4.4: Reduce the risk of wildland fire hazards through meeting minimum State and local regulations for fire-resistant building materials, vegetation management, fuel modification, and other fire hazard reduction programs.
	Policy S 4.5: Encourage the use of climate-adapted plants that are compatible with the area's natural vegetative habitats.
	Policy S 4.6: Ensure that infrastructure requirements for new development meet minimum State and local regulations for ingress, egress, peak load water supply availability, anticipated water supply, and other standards within FHSZs.
	Policy S 4.7: Discourage building mid-slope, on ridgelines and on hilltops, and employ adequate setbacks on and below slopes to reduce risk from wildfires and post-fire, rainfall-induced landslides and debris flows.
	Policy S 4.8: Support the retrofitting of existing structures in FHSZs to meet current safety regulations, such as the building and fire code, to help reduce the risk of structural and human loss due to wildfire.
	Policy S 4.9: Adopt by reference the County of Los Angeles Fire Department Strategic Fire Plan, as amended.
	Policy S 4.10: Encourage the planting of native oaks in strategic locations and near existing oak woodlands, including those to be mapped in the Oak Woodlands Conservation Management Plan, to protect developments from wildfires, as well as to lessen fire risk associated with developments.
	Policy S 4.11: Support efforts to address unique pest, disease, exotic species and other forest health issues in open space areas to reduce fire hazards and support ecological integrity.
	Policy S 4.12: Support efforts to incorporate systematic fire protection improvements for open space, including the facilitation of safe fire suppression tactics, standards for adequate access for firefighting, fire mitigation planning with landowners and other stakeholders, and water sources for fire suppression.

	Policy S 4.13: Encourage the siting of major landscape features, including but not limited to large water bodies, productive orchards, and community open space at the periphery of new subdivisions to provide strategic firefighting advantage and function as lasting firebreaks and buffers against wildfires, and the maintenance of such features by respective property owners.
	Policy S 4.14: Encourage the strategic placement of structures in FHSZs that conserves fire suppression resources, increases safety for emergency fire access and evacuation, and provides a point of attack or defense from a wildfire.
	Policy S 4.15: Encourage rebuilds and additions to comply with fire mitigation guidelines.
	Policy S 4.16: Require local development standards to meet or exceed SRA Fire Safe Regulations, which include visible home and street addressing and signage and vegetation clearance maintenance on public and private roads; all requirements in the California Building Code and Fire Code; and Board of Forestry Fire Safe Regulations.
	Policy S 4.17: Coordinate with agencies, including the Fire Department and ACWM, to ensure that effective fire buffers are maintained through brush clearance and fuel modification around developments.
	Policy S 4.18: Require Fire Protection Plans for new residential subdivisions in FHSZs that minimize and mitigate potential loss from wildfire exposure, and reduce impact on the community's fire protection delivery system.
	Policy S 4.19: Ensure all water distributors providing water in unincorporated Los Angeles County identify, maintain, and ensure the long-term integrity of future water supply for fire suppression needs, and ensure that water supply infrastructure adequately supports existing and future development and redevelopment, and provides adequate water flow to combat structural and wildland fires, including during peak domestic demand periods.
	Policy S 4.20: Prohibit new and intensification of existing general assembly uses in VHFHSZs unless: (1) the use is located in an existing approved specific plan or (2) the County determines there is sufficient secondary egress and the County determines the adjoining major highways and street networks are sufficient for evacuation, as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County. Discourage new general assembly uses in all other FHSZs.

VI. E treme Heat and Drought

Background

Extreme Heat

Extreme heat occurs when temperatures are much hotter and/or humid than average for a particular location and time of year for at least two to three days. Heat waves, which are prolonged periods of extreme heat, are becoming more common. Natural land cover provides cooling functions but in many areas of Los Angeles County development has replaced those areas serving as a contributor to the urban heat island effect. The urban heat island refers to areas that are artificially hotter due to surfaces that absorb heat (like roofs and pavements) and a lack of vegetation, particularly trees. Dense concentrations of impervious pavement and buildings cause the absorption and retention of heat throughout the day and fails to cool by night.

The County of Los Angeles Department of Public Health provides information and resources on how individuals can prepare for and tackle the effects of extreme heat: http://publichealth.lacounty.gov/eh/climatechange/ExtremeHeat.htm.

Drought

A drought is an extended period of time, typically a season or more, when an area experiences below average precipitation resulting in a water shortage. Droughts can cause altered weather patterns, damaged natural ecosystems, reduced soil moisture, diminished water courses, crop damage, and general water shortage. It is difficult to monitor since it has a creeping effect through its slow absence of precipitation rather than the occurrence of a hazard event. When drought conditions persist and/or intensify, a drought emergency can occur where conditions of disaster or extreme peril pose a threat to the safety of people and property.

Water in Los Angeles County is already a precious resource, and climate change poses significant challenges to maintaining supplies both for humans and the environment. Los Angeles County gets its water from different sources, such as the Colorado River, groundwater basins, captured stormwater, and recycled water. Heavy reliance on imported water means that the regional effects on water sources can directly affect Los Angeles County. More frequent and intense periods of drought throughout the State of California and neighboring states could reduce the availability of imported water and drive an increasing use of groundwater. Local aquifers must be maintained sustainably to avoid over drafting of water and permanently decreasing the groundwater table.

Regulations

Los Angeles County Cooling Centers

The County operates cooling centers for residents to find respite during extreme heat days. Libraries, community and senior centers, and County parks all serve as cooling centers. At times, excessive heat results in the need for extended hours and additional centers. When this occurs, the County extends hours or open additional centers in select locations. To view locations and hours of cooling centers, please visit: https://ready.lacounty.gov/heat/.

Low-Impact Development Ordinance

The Low-Impact Development (LID) Ordinance requires development occurring in unincorporated Los Angeles County to incorporate LID strategies in the project design to enhance pollutant removal and groundwater recharge benefits beyond conventional stormwater quality control measures as of January 1, 2009. LID strategies work to mimic the natural hydrology of the site by retaining precipitation on-site to the maximum extent possible. LID strategies are designed to protect surface and

groundwater quality, maintain the integrity of ecosystems, and preserve the physical integrity of receiving waters by managing stormwater runoff at or close to the source. The benefits of reduced stormwater runoff volume include reduced pollutant loadings and increased groundwater recharge and evapotranspiration rates.

Water Conservation Ordinance

The Water Conservation Ordinance mandates water conservation requirements for unincorporated Los Angeles County. Such requirements include watering of lawns and landscapes, indoor plumbing and fixtures, washing of vehicles, serving drinking water at public eating places, and maintaining decorative fountains. This ordinance was last amended on March 19, 2015, in response to the ongoing drought at that time. Amendments to the Water Conservation Ordinance included an increase in fines for violating this ordinance.

Issues

1. Climate Change and Extreme Heat Impacts

Climate change exacerbates conditions to produce extreme heat days. Extreme heat is projected to increase in frequency and severity and have widespread effects on people and infrastructure. Extreme heat can result when heat collects in urban areas without the cooling qualities of parks, overhead tree canopies, and other vegetated areas. Heat collects in inland valleys, and in the arid valleys on the eastern side of the San Gabriel Mountains. The areas that already experience heat will continue to see rising temperatures. Populations, such as seniors, people living in poverty, those with chronic conditions, and outdoor workers are more susceptible to heat-related illnesses. In addition, energy infrastructure, and parks and open space, which are also critical for helping people cope with heat, are vulnerable to extreme heat. Temperatures are projected to rise 95th-percentile daily maximum temperatures—or the temperature threshold at which 95 percent of all days in a year have cooler maximum temperatures.

Extreme heat is projected to increase in frequency, severity, and duration, with the largest increases occurring in the Santa Clarita and San Fernando Valleys. Seasonal temperatures can be most extreme in the northern areas of Los Angeles County, where 95th-percentile daily maximum temperatures of over 100 ℉ are common during the summer months.

Extreme heat is a public health concern as it negatively affects sensitive populations. Extreme heat days also place a strain on the electrical grid and may lead to rolling blackouts and brownouts. Interruptions in the electrical system may prevent people to run cooling mechanisms and life-sustaining equipment.

2. Climate Change and Drought Impacts

Drier springs and summers are projected for Los Angeles County as low precipitation years are expected to coincide with warm years. Together with lower snowpack in California, the risk and severity of drought is expected to increase. Drought reduces the availability of water from wells, increases water prices, decreases water quality, and reduces power generation from hydropower. Although the groundwater basins of Los Angeles County are regulated to prevent the permanent lowering of groundwater tables, a state or region-wide drought can make it difficult to replenish the local groundwater basins to maintain or increase groundwater levels during and after a drought. Prolonged periods of drought coupled with rising temperatures can also weaken the health of forests, rendering them susceptible to insect outbreaks and increasing their likelihood to ignite, while reductions in the irrigation of landscapes can produce harmful dust.

Goals and Policies for E treme Heat and Drought Hazards

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life, and property damage due to e treme heat and drought impacts.	
Topic	**Policy**
Extreme Heat	Policy S 5.1: Encourage building designs and retrofits that moderate indoor temperatures during extreme heat events.
	Policy S 5.2: Encourage the addition of shade structures in the public realm through appropriate means, and in frontline communities.
	Policy S 5.3: Encourage the use of cooling methods to reduce the heat retention of pavement and surfaces.
	Policy S 5.4: Ensure all park facilities, including recreational sports complexes, include a tree canopy, shade structures, and materials with low solar gain to improve usability on high heat days and reduce heat retention.
	Policy S 5.5: Encourage alternatives to air conditioning such as ceiling fans, air exchangers, increased insulation, and low-solar-gain exterior materials to reduce peak electrical demands during extreme heat events to ensure reliability of the electrical grid.
	Policy S 5.6: Coordinate with demand-response/paratransit transit services prior to expected extreme heat days to ensure adequate capacity for customer demand for transporting to cooling centers.
	Policy S 5.7: Coordinate with local transit agencies to retrofit existing bus stops, where feasible, with shade structures to safeguard the health and comfort of transit users.
	Policy S 5.8: Enhance and sustainably manage urban forests that provide shade and cooling functions.
	Policy S 5.9: Promote greater awareness of the impacts of extreme heat exposure on the most vulnerable populations, such as seniors, people living in poverty, those with chronic conditions, and outdoor workers.
Drought	Policy S 5.10: Protect and improve local groundwater quality and supply to increase opportunities for use as a potable water source during drought periods.
	Policy S 5.11: Encourage the conservation of water by employing soil moisture sensors, automated irrigation systems, subsurface drip irrigation, and weather-based irrigation controllers.
	Policy S 5.12: Encourage water efficiency in buildings through upgrading appliances and building infrastructure retrofits.
	Policy S 5.13: Encourage the use of drought tolerant landscaping in ~~for~~ new developments to reduce reliance on potable and recycled water resources.
	Policy S 5.14: Encourage the installation of grey water reuse systems in new developments.

VII. Human-made Hazards

Background

This Element also addresses limited aspects of human-made hazards, such as oil and gas well management and mitigation. Tens of thousands of Los Angeles County residents live in close proximity to an oil well; nearly 73 percent of whom are people of color. There are approximately 1,600 active and idle oil wells located within unincorporated Los Angeles County. Over half of those wells are within the Inglewood Oil Field, the largest urban oil field in the nation, located in the Baldwin Hills community.

The County's Oil and Gas Strike Team identified a total of 637 idle wells (i.e., wells that have not operated for two years or more) and 2,173 wells that were plugged and abandoned according to the standards at the time of abandonment. Of the 2,173 abandoned wells, the Strike Team identified 128 "higher priority" abandoned oil wells based on proximity to frontline communities and based on the risk of well leakage. The lead regulatory agency, California Geologic Energy Management Division (CalGEM), publishes annual reports regarding the status of idle wells and may have additional information on idle wells that should be considered priorities.

To find information about well stimulation treatment permits, well stimulation disclosures, well maintenance data, well records, and underground injection control projects, please visit: https://www.conservation.ca.gov/calgem/for_operators/Pages/WellSTAR.aspx.

Regulations

Baldwin Hills Community Standards District

The Baldwin Hills Community Standards District (CSD) was adopted in 2008 to better regulate oil drilling operations and prioritize the public health and safety of its residents living near oil wells. The Baldwin Hills CSD established stricter regulations, safeguards, and controls for oil and gas production activities at the Inglewood Oil Field. The CSD requires that the County conduct a comprehensive review of the CSD at least every five years to determine if the provisions of the CSD are adequately protecting the health, safety, and general welfare of adjacent communities. The review shall consider whether additional provisions should be added, appended, or removed and to evaluate if proven technological advances that would further reduce impacts of oil operations on neighboring land uses should be incorporated into the provisions of the CSD.

Issues

1. Abandoned and unsealed oil and gas wells

Abandoned and unsealed wells can leak pollutants into the groundwater, soil, and air, which can expose residents to harmful emissions. According to CalGEM, 800 oil companies have dissolved over the years without scheduling wells for proper plugging and abandonment, or paying sufficient State fees to cover the costs. Inadequate monitoring of drilling operations failed to ensure that all idle wells are properly abandoned after two years of inactivity. These circumstances can lead to unfettered oil and gas pollution, with significant public health and safety consequences.

2. Public health risks for adjacent communities

Living in close proximity to oil drilling operations can result in negative public health risks that includes asthma, cardiovascular disease, low birth weight, and reproductive health impacts. A 2018 Los Angeles County Department of Public Health Report found that even at a distance of 1,500 feet, oil wells still pose a safety risk to nearby communities. Health impacts can result from the particulate matter and toxic pollutants from oil and gas operations, such as volatile organic compounds, released

from oil and gas extraction. Health protections and mitigation measures at oil production sites are not standardized across the County, which often results in low-income and marginalized communities disproportionately suffering from poor health due to the lack of strictly-enforced regulatory controls.

3. "Just transition" of oil and gas extraction workforce

The County is currently working on a Just Transition Strategy for the oil and gas extraction workforce. Developing a framework for capping and plugging oil wells, remediating sites and returning lands to beneficial uses ensures that the physical infrastructure of the fossil fuel industry is remediated as the just transition of its workforce is implemented. As the County continues to support clean energy goals, it is anticipated that the number of idle and abandoned wells will grow. The Just Transition Strategy needs to align policy efforts with the training and readiness of a workforce to support the proper abandonment of wells. Collaboration amongst environmental, labor, and business stakeholders is imperative to closely examine this issue and identify opportunities to incorporate incentives, enforcement protocols, funding strategies and legislative advocacy to ensure that inactive wells are properly plugged and abandoned in a timely manner to eliminate potentially dangerous emissions and climate pollution.

Goals and Policies for Human-made Hazards

Goal S An effective regulatory system that prevents or minimizes personal in ury, loss of life, and property damage due to human-made hazards.	
Topic	**Policy**
Human-made Hazards	Policy S 6.1: Assess public health and safety risks associated with existing oil and gas facilities in the unincorporated Los Angeles County.
	Policy S 6.2: Coordinate with State and regional air quality agencies to ensure funding and implementation of annual inspections, ongoing air monitoring, and health impact assessment data continue to be collected and used to prioritize and facilitate the timely phase out of existing wells.
	Policy S 6.3: Support State and federal policies and proposals that increase funding sources to help plug, abandon, remediate and revitalize idle and orphaned well sites, and advocate for increased funding that will provide critical relief to the County and its residents.

VIII. Emergency Response

Background

Emergency Responders

Office of Emergency Management (OEM)

The Office of Emergency Management is responsible for organizing and directing the preparedness efforts of the Emergency Management Organization of Los Angeles County. OEM is the day-to-day Los Angeles County Operational Area coordinator for the County. The emergency response plan for the unincorporated areas is the Operational Area Emergency Response Plan (OAERP), which is prepared by OEM. The OAERP strengthens short and long-term emergency response and recovery capability, and identifies emergency procedures and emergency management routes in Los Angeles County. To access the OAERP, and to find more information on the OEM, please visit the CEO's web site at https://ceo.lacounty.gov/emergencydisaster-plans-and-annexes/.

Disaster Response

Figure 12.6 shows the County's disaster routes. For more information on disaster response, please refer to the County OAERP.

Figure . Disaster Routes Map

Identifying Possible Evacuation Routes

Assembly Bill 747 (Levine, 2019) requires the Safety Element to identify evacuation routes and their capacity, safety, and viability under a range of emergency scenarios. Evacuation routes are determined by emergency responders who decide at the time of the emergency the routes that should be used for evacuation after assessing the conditions and location of the emergency to avoid endangering the lives of others, personal injury, or death. Evaluating a route for safety and viability is situational, context-specific, and subject to change. Figure 12.9 identifies roads that are public, paved, and through-ways, which may be used for evacuation if they are viable routes during an actual emergency. These evacuation routes are not all inclusive and may not be the most suitable routes since actual emergency events necessitate day-of-event conditions and risks assessments.

More information on the methodology to identify possible evacuation routes can be found in Appendix H.

Figure . Possible Evacuation Routes Map

Identifying Communities with Residential Developments with Limited Egress

Evacuation planning is also addressed in Senate Bill 99 (Nielsen, 2019), which focuses on identifying residential developments in hazard areas that have fewer than two emergency evacuation routes. Table 12.3 lists the communities in unincorporated Los Angeles County that are both subject to a hazard and have at least one residential development within the community that has a single possible evacuation route. These residential communities can be viewed in the Residential Developments with Limited Egress map application, which can be accessed at the following link: http://bit.ly/SE-SB99.

More information on the methodology to identify and communities with residential developments with fewer than two evacuation routes can be found in Appendix H.

Table . nincorporated Communities with Residential Developments with Limited Egress

Antelope Valley Planning Area			
Acton	Angeles National Forest	Crystalaire/(Little Rock/Juniper Hills)	Del Sur
Elizabeth Lake	Fairmont/W. Antelope Valley	Green Valley/Bouquet Canyon	Hi Vista
Lake Hughes	Lake Los Angeles	Lakeview/Anaverde	Leona Valley
Littlerock/Juniper Hills	Llano	Longview/(Pearblossom/Llano)	Neenach
North Lancaster	Paradise	Pearblossom/Llano	
East San Gabriel Valley Planning Area			
Avocado Heights	Bassett	Charter Oak	Covina Islands
East Azusa (CSA: Azusa)	Glendora Islands	Hacienda Heights	La Verne
North Claremont (also see Padua Hills)	North Pomona	Northeast La Verne	Padua Hills
Pellissier Village			
Gateway Planning Area			
East Whittier	La Habra Heights Islands	Long Beach Island	North Whittier
Northwest Whittier	Cerritos Islands		
Metro Planning Area			
Florence-Firestone	East LA: Belvedere Gardens	East LA: City Terrace	East LA: Eastmont
East Rancho Dominguez			
San Fernando Valley Planning Area			
Kagel / Lopez Canyon			
Santa Clarita Valley Planning Area			
Agua Dulce	Alpine	Castaic	Castaic Junction/Castaic
Forest Park/ Canyon Country	Hasley Canyon/ Castaic	Newhall	Placerita Canyon
Santa Monica Mountains Planning Area			
Agoura	Calabasas	Malibu Vista	Cornell
Las Virgenes/Malibu Canyon	Malibou Lake	Malibu Bowl	Malibu Highlands

Malibu/Sycamore Canyon	Monte Nido	Seminole Hot Springs	Sunset Mesa
Triunfo Canyon	Pepperdine University		
South Bay Planning Area			
Alondra Park	Del Aire	El Camino Village	Hawthorne Island
La Rambla	Lennox		
West San Gabriel Valley Planning Area			
East Pasadena	East Pasadena-Northeast San Gabriel	Kinneola Mesa/East Pasadena	La Crescenta-Montrose
Mayflower Village/Arcadia	North El Monte/Monrovia		
Westside Planning Area			
Baldwin Hills/ Ladera Heights	Franklin Canyon	Ladera Heights	Marina del Rey

Identifying Evacuation Locations

Assembly Bill 1409 (Levine, 2021) requires the Safety Element to identify evacuation locations. The County departments responsible for emergency response and logistics have identified facilities that can serve as potential evacuation centers, shelters, and temporary evacuation points. These facilities are surveyed and assessed by the Department of Public Social Services to ensure ADA accessibility and the facilities have the capacity to serve as a potential evacuation location. The potential evacuation locations are activated depending on the location, nature, and scale of the emergency and are announced on the Los Angeles County Emergency Response web site (https://lacounty.gov/emergency/), OEM's social media pages, and the County's 2-1-1 call line. The real-time information and mapping provided on the County Emergency Response web site ensures people are evacuating to the correct location activated by emergency responders based on the latest conditions of the emergency.

The Los Angeles County Operational Area Emergency Response Plan Tsunami Annex provides a list of potential tsunami evacuation sites (https://ceo.lacounty.gov/wp-content/uploads/OEM/Tsunami%20Annex.pdf).

County of Los Angeles Fire Department

The Fire Department provides fire, safety, and emergency medical services to the unincorporated areas. The Strategic Fire Plan includes the County of Los Angeles Fire Department Operations Bureau Map, which indicates that emergency services are available in all unincorporated areas of the County. Additionally, many cities within Los Angeles County utilize Fire Department services. There are three major geographic regions in the Fire Department service area, which are divided into nine divisions and 22 battalions, as seen in Figure 12.7.

Figure . Fire Department Battalions and Stations Map

The Fire Department operates multiple divisions including Air and Wildland, Fire Prevention, and Forestry. In addition, the Health Hazardous Materials Division's mission is to "protect the public health and the environment...from accidental releases and improper handling, storage, transportation, and disposal of hazardous materials and wastes through coordinated efforts of inspections, emergency response, enforcement, and site mitigation oversight."

The Fire Department is a special district and receives most of its revenue from the unincorporated areas from a portion of the ad valorem property tax paid by the owners of all taxable properties. This revenue source varies from one tax rate area to another, and is specifically earmarked for the Fire Department. The Fire Department's Special Tax, which was approved by voters in 1997, is a supplemental revenue source that pays for essential fire suppression and emergency medical services. In addition, in 1990, the Board of Supervisors adopted a Los Angeles County Developer Fee Program to fund the acquisition, construction, improvement, and equipping of fire station facilities in the high growth areas of the unincorporated areas.

The Fire Department has one of the premier firefighter training programs in the nation. For wildland firefighters, the Department follows the National Wildfire Coordination Group (NWCG) qualifications for operational, logistical, planning and financial positions. For more information, please visit http://www.nwcg.gov/.

For more information on the Fire Department's programs and divisions, please visit their web site at http://fire.lacounty.gov.

County of Los Angeles Sheriff's Department

The County of Los Angeles Sheriff's Department (LASD) is the largest sheriff's department in the country. In addition to specialized services, the LASD is divided into 10 divisions, including the Office of Homeland Security, which focuses on potential threats related to local homeland security issues, such as terrorism or bioterrorism. The LASD provides law enforcement services to more than one million people living within 90 unincorporated communities, as well as to more than four million residents living within 40 contract cities. In addition, LASD provides law enforcement services to nine community colleges, Metro, and 48 Superior Courts. In addition to proactive enforcement of criminal laws, the LASD also provides investigative, traffic enforcement, accident investigation, and community education functions.

The Training Bureau consists of seven different programs that are designed to provide academy recruits and in-service personnel with the most up-to-date, innovative, creative, and realistic learning experiences available to law enforcement. The featured programs are:

I. Recruit Training Unit
II. Advanced Officer Training Unit
III. Weapons of Mass Destruction Detail
IV. Field Operations Training Unit
V. Education-Based Discipline Unit
VI. Weapons Training
VII. Tactics and Survival Training Unit (Laser Village)
VIII. Emergency Vehicle Operations Center
IX. Professional Development Unit

The LASD budget is approved by the Board of Supervisors through the utilization of state and local tax dollars. These funds are augmented by revenue generating contracts and grant allowances.

The passage of tax limitation measures, decline in the popular support for bond measures, and reductions in state and federal assistance, have hampered the capability of local governments to fund public safety. The LASD partnered with the City of Santa Clarita and the Board of Supervisors to establish the Law Enforcement Facilities Fee. The Law Enforcement Facilities Fee is a fee program that applies to certain projects in the Santa Clarita Valley and aims to mitigate project impacts on law enforcement service and facilities.

Figure 12.8 identifies the location of LASD's service areas. The Field Operation Regions are centered on 25 patrol stations that are dispersed throughout Los Angeles County.

For the location and detailed information of each station, and further information on the LASD Office of Homeland Security, please visit the LASD web site at http://www.lasd.org.

Figure . : Sheriff's Department Service Areas Map

Emergency Response Across County Agencies

Emergency response is handled in the field through incident command posts, As described in the OAERP, the County's Emergency Operations Center provides centralized support to field responders to coordinate overall County response.

Cross-Jurisdictional Emergency Response

In emergency services, mutual aid is an agreement among emergency responders to lend assistance across jurisdictional boundaries. This may occur due to an emergency response that exceeds local resources, such as a disaster or a multiple-alarm fire. Mutual aid may be ad hoc, requested only when such an emergency occurs. It may also be a formal standing agreement for cooperative emergency management on a continuing basis, such as ensuring that resources are dispatched from the nearest fire station, regardless of which side of the jurisdictional boundary the incident is on. Agreements that send closest resources are regularly referred to as "automatic aid agreements." Current agreements are:

- Los Angeles County Operational Area Mutual Aid Plan;
- California Fire Master Mutual Aid Agreement;
- California Master Cooperative Wildland Fire Management (CFMA) and Stafford Act Response Agreement;
- California Fire Assistance Agreement; and
- Public Resources Code 4129

The expansion of communities, homes, and other improvements into wildland areas has created a significant challenge for the agencies responsible for providing fire protection in those areas.

Fires in the wildland-urban interface often overtax the local fire agency, resulting in the activation of mutual aid and automatic aid agreements to augment jurisdictional resources. Nearly every wildland-urban interface fire includes responses from a variety of wildland and municipal fire agencies. Los Angeles County's Operational Area Emergency Response Plan conforms to California's Standardized Emergency Management System (SEMS), which is intended to facilitate communication and coordination among all responding agencies. The system unifies all elements of California's emergency management community into a single integrated system and standardizes key elements.

SEMS incorporates the use of the Incident Command System (ICS), California Disaster and Civil Defense Master Mutual Aid Agreement, and other forms of multi-agency or inter-agency coordination.

Los Angeles Regional Interoperable Communication System (LA-RICS)

The Los Angeles region's first responders use a patchwork of often incompatible radio technologies and frequencies. This uncoordinated system means that neighboring agencies and systems cannot easily communicate with one another.

In April 2005, the Regional Interoperable Steering Committee was formed to explore the development of a single, shared communications system for all public safety agencies in the greater Los Angeles region. As a result, Los Angeles County, 82 municipalities, and three other public sector entities in the region drafted a Joint Powers Agreement that established the Los Angeles Regional Interoperable Communication System (LA-RICS) Joint Powers Authority to create a regional, area-wide, interoperable public safety communications network. LA-RICS is a modern, integrated wireless voice and data communication system designed and built to serve law enforcement, fire service, and health service professionals throughout Los Angeles County.

The Land Mobile Radio (LMR) system creates a unified web of communication, eliminates barriers to multi-jurisdictional responses and allows police, firefighters and paramedics to communicate directly with users outside of their agency. Construction of this network of approximately 60 LMR communication sites to provide narrowband data radio communications coverage for emergency responders throughout the County is underway.

The Public Safety Broadband Network (PSBN) provides police and firefighters with the capability to send and receive large amounts of data. The PSBN was completed on October 1, 2015, and is currently in use by various agencies throughout Los Angeles County. It consists of 63 fixed towers and 15 temporary sites that use Long-Term Evolution (LTE) technology. In July 2018 the network was transferred to AT&T for integration into the Nationwide Public Safety Broadband (NPSBN) under FirstNet.

LA-RICS will provide day-to-day communications within agencies and allow seamless interagency communications for responding to routine, emergency, and catastrophic events. LA-RICS will replace the patchwork system with a single countywide network, improve overall traffic capacity and coverage, and provide a dedicated broadband network for first responders. More information about LA-RICS is available at http://www.la-rics.org/.

Homeland Security

The Fire Department's Homeland Security/Hazardous Materials Section was created in 1995 in response to Presidential Decision Directive 39, outlining the need for the Fire Department to plan, organize, and direct its members in preparing and responding to any large-scale terrorist incident in the Los Angeles County Operational Area.

The Homeland Security Section was born out of necessity in response to the community's concerns that emergency responders need to be fully equipped and trained to deal with a chemical, biological, radiological, nuclear, or explosive event. All County firefighters and other emergency responders have the necessary personal protective equipment and the training to respond safely and effectively. The Fire Department is also represented on the Federal Bureau of Investigations' Los Angeles Joint Terrorism Task Force.

Issues

1. The Need for Adequate Emergency Response Services

A catastrophic natural or human-made disaster has the potential to severely strain the emergency response and recovery capabilities of federal, state, and local governments, and profoundly impact the regional and state economy. It is imperative that there are adequate resources available for emergency response. For example, to fulfill all its functions effectively and efficiently, the Fire Department requires a staff level of one deputy sheriff per each 1,000 population.

Effective emergency response requires that the County provide public alerts and warnings for disasters. In addition, there is a need for preparedness communications regarding threats to communities throughout Los Angeles County.

2. The Cost of Increased Hazard Events

A full accounting of long-term and complex costs from hazard events span areas of ecosystems, infrastructure, economy, and individuals. Resources required to address hazard events include direct, rehabilitation, indirect, and additional costs. Direct costs are the most immediate and typically include those to address the hazard event at the time it occurs such as fire suppression, loss of real property, and damage to utilities. Following a hazard event, rehabilitation costs to bring an area back may include debris removal, reconstruction, and ecosystem restoration. Many indirect costs relate to the economy where business and tax revenues are lost. Finally, health impacts and loss of life are additional costs that may be incurred during a hazard event. Emergency responders along with many other service providers pivot during hazard events to address the hazard and provide support to those affected by the event. Increased frequency and severity of hazard events can cause major disruptions where there may not be sufficient human-power or resources to quickly recover.

3. Creating Efficiencies Through Collaboration and Coordination

Continued growth and development in Los Angeles County will significantly affect the Fire Department and LASD operations. Coordination among various County departments is necessary to ensure adequate emergency response. Collaboration can also ensure that development occurs at a rate that keeps pace with service needs. To maintain an adequate emergency response system, it is important for the County to discourage development in hazardous areas, including Very High Fire Hazard Severity Zones, Flood Hazard Zones, and Seismic and Geotechnical Hazard Zones.

4. Support Community-Driven Planning and Adaptation Efforts

Community members play a huge role in prevention and planning measures. Grassroots and community-based organizations can effectively encourage partnerships within their communities to develop personal evacuation plans and Community Wildfire Protection Plans, establish resilience hubs, and conduct education to encourage community members to prepare for exposure to hazards. Community members can prepare for disasters through home retrofits, developing family emergency plans, subscribing to alert systems, and identifying neighbors that may need assistance during an emergency.

Goals and Policies for Emergency Response

Goal S	**Effective County emergency response management capabilities.**
Topic	**Policy**
Emergency Response	Policy S 7.1: Ensure that residents are protected from the public health consequences of natural or human-made disasters through increased readiness and response capabilities, risk communication, and the dissemination of public information.
	Policy S 7.2: Support County emergency providers in reaching their response time goals.
	Policy S 7.3: Coordinate with other County and public agencies, such as transportation agencies and health care providers, on emergency planning and response activities, and evacuation planning.
	Policy S 7.4: Encourage the improvement of hazard prediction and early warning capabilities.
	Policy S 7.5: Ensure that there are adequate resources, such as sheriff and fire services, for emergency response.
	Policy S 7.6: Ensure that essential public facilities are maintained during disasters, such as flooding, wildfires, extreme temperature and precipitation events, drought, and power outages.
	Policy S 7.7: Locate essential public facilities, such as hospitals, where feasible, outside of hazard zones identified in the Safety Element to ensure their reliability and accessibility during disasters.
	Policy S 7.8: Adopt by reference the County of Los Angeles All-Hazards Mitigation Plan, as amended.
	Policy S 7.9: Work cooperatively with public agencies with responsibility for flood and fire protection, and with stakeholders in planning for flood and fire hazards.

I . Safety Element Implementation Programs

1. Mass Debris Management Plan Implementation and Update
2. At-Risk Properties Hazard Fund and Strategies
3. Floodplain Management Plan Implementation
4. Climate-Adapted Landscape Program
5. Community Capacity and Resilience Program
6. Shaded Corridors Program
7. Oil and Gas Operation Strategy
8. OurCounty Sustainability Plan
9. Reduce Damage from Wildfire

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Boxes]

Wildland Fires and Climate Change

Recent studies indicate that climate change has resulted in wildland fires that last longer and occur more frequently. In 2007 and 2008 alone, wildland fires burned over 147,000 acres, destroyed 570 residences, and damaged an additional 42 residences in the unincorporated areas. In 2009, the Station Fire broke out in the Angeles National Forest, which burned nearly 160,000 acres and destroyed approximately 76 residences. This fire, the largest in recorded history for Los Angeles County, occurred months before the Santa Ana winds, which often exacerbate wildland fires in the fall and spring months. Appendix H contains descriptions of these and more recent wildfires in Los Angeles County.

Wildfire Preparedness Programs and Evacuation Guides

The following are guidelines for wildfire readiness for a variety of development and occupancy types:

County of Los Angeles Fire Department “Ready, Set, Go” Program

Santa Monica Mountains Fire Safe Alliance, “A Road Map to Fire Safety”

For more information, please visit the Fire Department web site at http://www.fire.lacounty.gov.

Community Wildfire Protection Plans

Community Wildfire Protection Plans are community-based collaborative plans developed by local stakeholders that identify and prioritize areas for hazardous fuel reduction treatments to protect natural resources, communities and infrastructure from wildfire. Applicable local governments, local fire departments, state forestry, and federal land management agencies agree to the plans, which are established under the umbrella of the County’s Strategic Fire Plan. The County of Los Angeles Fire Department’s Fire Plan Unit provides fire hazard reduction project design, development, planning and implementation for communities in Los Angeles County.

Community Emergency Response Team CERT Program

The Community Emergency Response Team (CERT) Program educates people about disaster preparedness for hazards that may impact their area, and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. Using the training learned in the

classroom and during exercises, CERT volunteers can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help. CERT members are also encouraged to support emergency response agencies by taking a more active role in emergency preparedness projects in their community.

For more information on the CERT Program, please visit the Fire Department web site at https://fire.lacounty.gov/community-emergency-response-team/.

Chapter 13: Public Services and Facilities Element

I. Introduction

As Los Angeles County continues to grow, the demand for public facilities and infrastructure will increase. This Element provides a summary of some of the major public services and facilities that serve the unincorporated areas, and establishes policies that guide the provision of public services and facilities.

The Public Services and Facilities Element promotes the orderly and efficient planning of public facilities and infrastructure in conjunction with land use development and growth. This Element focuses on services and facilities that are affected the most by growth and development: Drinking Water; Sanitary Sewers; Solid Waste; Utilities; Early Care and Education; and Libraries. The Element also discusses the key role of collaboration among County agencies in efficient and effective service provision and facilities planning.

This Element works in conjunction with the Los Angeles County Department of Public Works (DPW) Strategic Plan, which outlines service delivery goals for sanitary sewer, water supply, flood protection, water quality, garbage disposal, and traffic lighting; Integrated Waste Management Plan; Sewer System Management Plan; Library Strategic Plan; and other plans to address the provision of public services and facilities to the unincorporated areas.

II. Effective Service and Facilities Planning and Maintenance

Background

There are special development fees and legal requirements in place to address the provision of services or facilities and infrastructure, including school facilities fees, sewer connection mitigation fees, fire protection facilities fees, library facilities mitigation fees, and water supply assessments for large projects.

Issues

1. Development Fees

Many existing public facilities are operating at full capacity or are overburdened. In addition, many development fees and legal requirements that are intended to pay for infrastructure and services only apply to certain developments, such as subdivisions and projects that exceed a certain size threshold.

2. The Need to Effectively Track Development

In addition to fees, a comprehensive system is necessary to effectively track planned development and corresponding infrastructure and service needs. Furthermore, without adequate investment from the public sector to maintain and upgrade existing infrastructure, the costs of infrastructure improvements could make a project financially infeasible. Coordination among various County departments ensures that infrastructure is upgraded, as well as expanded in areas where the General Plan encourages development.

Goals and Policies for Effective Service and Facilities Planning and Maintenance

Goal PS/F 1: A coordinated, reliable, and equitable network of public facilities that preserves resources, ensures public health and safety, and keeps pace with planned development.	
Topic	**Policy**
Sufficient Infrastructure	Policy PS/F 1.1: Discourage development in areas without adequate public services and facilities.
	Policy PS/F 1.2: Ensure that adequate services and facilities are provided in conjunction with development through phasing or other mechanisms.
	Policy PS/F 1.3: Ensure coordinated service provision through collaboration between County departments and service providers.
	Policy PS/F 1.4: Ensure the adequate maintenance of infrastructure.
	Policy PS/F 1.5: Focus infrastructure investment, maintenance and expansion efforts where the General Plan encourages development.
	Policy PS/F 1.6: Support multi-faceted public facility expansion efforts, such as substations, mobile units, and satellite offices.
	Policy PS/F 1.7: Consider resource preservation in the planning of public facilities.

III. Drinking Water

Background

The County provides a continuous supply of clean water for everyday uses through a complex water management system, which consists of numerous water providers, water control boards and other agencies. A combination of local and imported water supplies is delivered through an intricate system of aqueducts, reservoirs, and groundwater basins.

Water Sources

Approximately 33 percent of the water supply comes from local sources, including surface water from mountain runoff, groundwater and recycled water. While local water supplies are the least costly, surface water and groundwater supplies fluctuate in response to variations in annual rainfall, contamination and effectiveness of conservation measures.

Water is imported into Los Angeles County from three sources: the Colorado River, the Bay Delta in Northern California via the State Water Project, and the Owens Valley via the Los Angeles Aqueduct. The Los Angeles Aqueduct primarily serves the residents and businesses of the City of Los Angeles.

For a description of local water sources and a discussion of water quality, please refer to the Conservation and Natural Resources Element. For description of the imported water sources, please refer to Appendix I.

Water Suppliers

Water services are provided by a complex network of water districts, water wholesalers and private companies that specialize in developing and improving water service for their customers. Most of the imported water utilized in the unincorporated areas is provided by the Metropolitan Water District, Castaic Lake Water Agency, Antelope Valley/East Kern Water Agency, Littlerock Creek Irrigation District and the Palmdale Water District. For a description of water suppliers, please refer to Appendix I.

Water Management Plans

In accordance with the California Urban Water Management Planning Act of 1983, every urban water supplier that annually serves 3,000 or more customers, or provides more than 3,000 acre-feet of water, must prepare and adopt an Urban Water Management Plan (UWMP). These plans contain a description and evaluation of water supplies, reclamation programs, and conservation activities. Based upon land use plans provided by local governments, population projections or other inputs, the UWMP calculates the projected water demand for the district and compares this demand against current and anticipated water supplies. These UWMPs, which are updated every five years, are provided to local governments to help inform decisions on development proposals.

UWMPs serve as building blocks for Integrated Regional Water Management Plans (IRWMPs), which define a clear vision and strategy for the sustainable management of water resources within a specific region delineated by one or more watersheds. Local and County UWMPs can be found ontheSouthernCaliforniaAssociationofGovernment'swebsiteathttp://www.scag.ca.gov/rcp/uwmp.htm.

Issues

Drought, pollution, population growth and land use affect the quantity and quality of local and regional water supplies. The climate in Los Angeles County is characterized by extended periods of dry weather and varying levels of rainfall, which range from an average of 27.5 inches per year in the San Gabriel Mountains to 7.8 inches in the Antelope Valley. The overall demand for water is projected to increase dramatically to 2035, and the cost, quality and availability of water will affect future development patterns.

1. Water Conservation

Los Angeles County needs to use its various sources of water wisely. Voluntary conservation measures by industries and residents have been successful in the past, particularly with regard to outdoor water use. Two thirds of residential water use is attributed to landscape maintenance, which makes conservation measures such as planting drought-tolerant, indigenous plants an important component of a water conservation policy.

The conservation of the water supply is a primary goal of the County. To reduce the County's dependence on imported water, County agencies are establishing various water conservation programs. One example from DPW is the creation of water reclamation projects and groundwater recharge facilities to capture stormwater runoff. Another effort by DPW is participation in a Water Augmentation Study, which is striving to make parcel-level groundwater recharge feasible. Additional actions include the Board of Supervisor's 2008 Countywide Water Supply and Conservation Alert. This resolution urges residents, businesses, and water purveyors to intensify water conservation efforts and directs all County departments to implement measures to achieve a 15 to 20 percent reduction in overall water demand.

The General Plan supports water conservation efforts that focus on curbing demand by reducing consumption through technological advances, such as aerators and motion sensors on low flush toilets and stalls, onsite gray water reclamation and dual plumbing; promoting xeriscaping; and organizing educational campaigns to discourage wasteful water consumption.

2. Increasing the Water Supply

Recycled water is used primarily for recharging groundwater aquifers through regional groundwater recharge operations and injection at seawater barriers. Other uses of recycled water include irrigating landscaping and supplying industrial processes. Recycled water provides a reliable and consistently high quality supply of water, but also requires additional infrastructure and modifications to regulations that govern the use of recycled water, before it can reach its full supply potential.

Several water agencies throughout Southern California, such as the Metropolitan Water District, Castaic Lake Water Agency and City of Los Angeles Department of Water and Power are taking steps to add desalinated water to their list of water supplies. Desalination, or removing salt from ocean water, has the potential to increase the local water supply, but is also energy-consumptive and costly.

Goals and Policies for Drinking Water

Goal PS/F 2: Increased water conservation efforts.	
Topic	**Policy**
Water Conservation	Policy PS/F 2.1: Support water conservation measures.
	Policy PS/F 2.2: Support educational outreach efforts that discourage wasteful water consumption.
Goal PS/F 3: Increased local water supplies through the use of new technologies.	
Topic	**Policy**
Water Supply	Policy PS/F 3.1: Increase the supply of water though the development of new sources, such as recycled water, gray water, and rainwater harvesting.
	Policy PS/F 3.2: Support the increased production, distribution and use of recycled water, gray water, and rainwater harvesting to provide for groundwater recharge, seawater intrusion barrier injection, irrigation, industrial processes and other beneficial uses.

IV. Sanitary Sewers

Background

Unlike combined sewer and stormwater drainage systems in many older cities throughout the country, the sanitary sewers and the stormwater/flood protection facilities in Los Angeles County are separate. The sanitary sewers convey sewage from lavatories and other plumbing fixtures in buildings and factories to a wastewater treatment facility where the effluent is treated before being discharged to the ocean or river. In the unincorporated areas, the Los Angeles County Sanitation Districts (LACSD), the Consolidated Sewer Maintenance District (CSMD), and municipal septic or wastewater systems all contribute to ensuring that the sanitary sewage system operates properly to protect public health.

Construction operations and the maintenance of facilities that collect, treat, recycle and dispose of sewage and industrial wastes is the responsibility of the LACSD. Local sewers connected to the LACSD's trunk sewer lines in the unincorporated areas are the responsibility of the CSMD. Sewer laterals connecting homes and businesses to local sewer lines are the responsibility of the homeowners for maintenance and repair.

The LACSD, which are a confederation of 24 independent districts, serve the wastewater and solid waste management needs of approximately 5.2 million people, cover over 800 square miles and service 78 cities and the unincorporated areas. As of 2005, the LACSD owned, operated and maintained 1,340 miles of sewers that conveyed 510 million gallons per day (gpd) of wastewater, 200 million gpd of which is recycled, to 11 wastewater treatment plants. The service areas for the County's sewer systems include the Joint Outfall System, which is a partnership of 17 of the 24 independent sanitation districts, the Santa Clarita Valley and the Antelope Valley.

DPW, on behalf of the CSMD, maintains 4,600 miles of main line sewers, 155 pumping stations, and four sewage treatment plants. The DPW Environmental Programs Division also permits and inspects industrial waste discharge into local sewers. The County Code requires that every business that disposes industrial wastewater obtain a permit. The Sewer System Management Plan (SSMP) controls and mitigates sewer sanitary overflows. For more information on the SSMP, please visit DPW's web site at http://dpw.lacounty.gov.

Issues

Sewer systems throughout the unincorporated areas are aging and require upgrades. The County does not plan for sewer infrastructure needs through long-range capital improvement planning, and instead addresses sewer infrastructure through their ongoing Condition Assessment Program utilizing their Accumulative Capital Outlay Program Funds.

In limited cases, primarily near the coast, the LACSD has accepted dry weather urban runoff into the sanitary sewer system to be treated along with sewage. To protect inland water bodies, the Los Angeles Flood Control District is evaluating the potential to construct more dry weather diversions, provided the sanitary sewers have the ability to accept the dry weather flows.

Goals and Policies for Sanitary Sewers

Goal PS/F 4: Reliable sewer and urban runoff conveyance treatment systems.	
Topic	**Policy**
Sanitary Sewers	Policy PS/F 4.1: Encourage the planning and continued development of efficient countywide sewer conveyance treatment systems.
	Policy PS/F 4.2: Support capital improvement plans to improve aging and deficient wastewater systems, particularly in areas where the General Plan encourages development, such as TODs.
	Policy PS/F 4.3: Ensure the proper design of sewage treatment and disposal facilities, especially in landslide, hillside, and other hazard areas.
	Policy PS/F 4.4: Evaluate the potential for treating stormwater runoff in wastewater management systems or through other similar systems and methods.

V. Solid Waste

Background

The County has the largest solid waste management system in the country. There are seven major solid waste landfills, four minor solid waste landfills and two waste-to-energy facilities, as shown in Figure 13.1. In 2012, the County's service area generated, on average, 58,987 tons per day (tbd) of solid waste. As available space for landfills becomes scarce and more distant, and as local landfills reach their holding capacity, cities and counties have been mandated to more effectively manage waste and reduce their solid waste volume.

Figure 13.1: Landfills Map

Annual Report for the Los Angeles County Integrated Waste Management Plan (IWMP)

Assembly Bill 939, also known as the California Integrated Waste Management Act of 1989, mandates local jurisdictions to meet a diversion goal of 50 percent by 2000, and thereafter. In addition, each county is required to prepare and administer a countywide IWMP. This plan is comprised of the County's and the cities' solid waste reduction planning documents, plus an Integrated Waste Management Summary Plan (Summary Plan) and a Countywide Siting Element (CSE). In order to assess a local jurisdiction's compliance with AB 939, the Disposal Reporting System was established to measure the amount of disposal from each local jurisdiction and determine if it has met the goals.

For Los Angeles County, the County's Department of Public Works is responsible for preparing and administering the Summary Plan and the CSE. These documents were approved by the County, a majority of the cities containing a majority of the cities' population, the Board of Supervisors, and the Department of Resources, Recycling, and Recovery (CalRecycle).

The existing Summary Plan, approved by CalRecycle on June 23, 1999, describes the steps to be taken by local agencies, acting independently and in concert, to achieve the mandated state diversion rate by integrating strategies aimed toward reducing, reusing, recycling, diverting, and marketing solid waste generated.

The existing CSE, approved by CalRecycle on June 24, 1998, identifies how, for a 15-year planning period, the County and the cities would meet their long-term disposal capacity needs to safely handle solid waste generated that cannot be reduced, recycled, or composted. As this 15-year planning cycle has come to an end, DPW, in consultation with the Integrated Waste Management Task Force, completed the preparation of the draft CSE update in November 2012.The draft revised CSE and its environmental document will undergo a review and approval process in compliance with numerous statutory and regulatory requirements. This includes CEQA review, and review and approval by jurisdictions in Los Angeles County, the Board of Supervisors, and CalRecycle. The goal is to complete the entire revision process, disseminate the document for public comments, and submit the final draft CSE and the environmental document to CalRecycle by 2016.

In addition, DPW prepares an annual report to summarize the changes that have taken place since the approval of the existing Summary Plan and the existing CSE by the jurisdictions and CalRecycle. The Annual Report consists of Section D: Summary Plan Assessment and Section E: Siting Element Assessment. The other sections pertaining to individual jurisdictions, namely, Sections A, B, C, and H, are included in a separate annual report from each jurisdiction.

The 2012 Annual Report includes in-depth assessments of the County's disposal capacity needs, detailed updates on the remaining permitted in-County disposal capacity, and the County's strategy for maintaining adequate disposal capacity through 2027.

Provided certain assumptions are met, the 2012 Annual Report demonstrates that the County would meet the disposal capacity requirements of AB 939 through a multi-pronged approach, which includes successfully permitting and developing proposed in-County landfill expansions, utilizing available or planned out-of-County disposal capacity, developing necessary infrastructure to facilitate exportation of waste to out-of-County landfills, and developing conversion and other alternative technologies. Additionally, by continuing to enhance diversion programs and increasing the countywide diversion rate, local jurisdictions in Los Angeles County may further ensure adequate disposal capacity is available to serve the needs of the residents and businesses through the planning period.

Solid Waste Information Management System (SWIMS)

SWIMS, a one-stop Internet portal for the public and solid waste industry, allows the County to collect and manage information regarding the collection, disposal, and recycling of approximately 58,987 tons of trash generated each day in one of the largest jurisdictions in the nation, the County of Los Angeles. Data collected through SWIMS allows the County to evaluate the waste stream, and thus design appropriate waste reduction programs and strategies. Even broader in scope, SWIMS is also a tool by which information about solid waste management activities is made readily available to the public, empowering people to make environmentally sustainable choices in managing waste. The SWIMS web site is located at http://www.LACountySWIMS.org.

Roadmap to a Sustainable Waste Management Future

The County unincorporated areas have already achieved and surpassed California's 50 percent waste diversion mandate. However, with available landfill space in Los Angeles County decreasing, the County must be proactive and develop innovative policies and procedures for waste management that further reduce the County's reliance on landfills.

On October 21, 2014, the Board approved the Roadmap to a Sustainable Waste Management Future Interdepartmental Sustainable Waste Management Future, which involves rethinking the approach to waste management, and rethinking the characterization of waste and which materials might be suitable for reuse and recycling. A traditional waste hierarchy seeks to implement waste reduction measures, reuse practices, recycling and composting techniques, and waste-to-energy processing to handle a large portion of the typical waste stream. Even when this is done effectively, a large volume of waste is still disposed at landfills. The Roadmap creates a new vision to significantly reduce, and someday eliminate, waste. As a result, an increasing amount of materials previously characterized as waste will be reduced, reused, or recycled, and a decreasing volume of material will remain for disposal.

The Roadmap focuses on the unincorporated areas, as well as regional/countywide and County operations (ie., County-owned and/or operated facilities and offices, and County-sponsored events), and the following four strategies: 1) Programs and Services; 2) Measuring Results; 3) Facilities and Infrastructure; and 4) Outreach and Education. These four strategies establish a framework for the implementation of specific initiatives.

Through the implementation of the Roadmap, the County's goal is to maximize the recovery of products, materials, and energy from waste that would otherwise be disposed of at landfills, and achieve the following:

- 80% diversion from landfills by 2025
- 90% diversion from landfills by 2035
- 95+% diversion from landfills by 2045

Issues

1. Waste Generation and Disposal Capacity

The major issues regarding waste management include the growing amounts of waste being generated and disposed of; a shortage of solid waste processing facilities; and strong public opposition for new solid waste management facilities. Table 13.1 lists the remaining permitted capacity for landfills as of December 31, 2012 in accordance with the County IWMP, 2012 Annual Report, which was released in August 2013.However, since the release of the 2012 Annual Report, the Puente Hills Landfill, which is the largest landfill in Los Angeles County, closed on October 31, 2013. As a result, a significant percentage of the County's solid waste may have to be exported to facilities out of Los Angeles County, which may result in increased costs and environmental impacts. This concern is exacerbated by the projected increase in waste generation to approximately 84,839 tpd by 2027.

Table 13.1: Remaining Permitted Disposal Capacity for Los Angeles County Existing Landfills (As of December 31, 2012)

Landfill	Maximum Daily Capacity (Tons)	Estimated Remaining Permitted Capacity (Million Tons)*	Remaining Life (Years)**
Antelope Valley	1,800	16.91	30
Burbank	240	2.95	41
Calabasas	3,500	5.51	16
Chiquita Canyon	6,000	3.97	2
Lancaster	3,000	12.27	13
Pebbly Beach	49	0.09	16
Puente Hills	13,200	6.10	1***
San Clemente	10	0.04	20
Scholl Canyon	3,400	3.41	16
Sunshine Canyon (City/County)	12,100	74.37	20
Whittier (Savage Canyon)	350	3.56	13
Total	**43,649**	**129.20**	**188**

Source: Los Angeles County Integrated Waste Management Plan, 2012 Annual Report, August 2013.

*Estimated remaining permitted capacity based on landfill owner/operator responses in a written survey conducted by the Los Angeles County Department of Public Works in May 2013, as well as a review of site specific permit criteria established by local land use agencies, local enforcement agencies, California Regional Water Quality Control Board, and the South Coast Air Quality Management District.

**Landfill remaining life is based on 1) the 2012 average daily disposal tonnage, 2) maximum permitted capacity as of December 31, 2012, or 3) the facility's permit restrictions as of December 31, 2012.

***The Puente Hills Landfill closed on October 31, 2013.

As detailed in the 2012 Annual Report for the County IWMP, a shortfall of permitted solid waste disposal capacity in Los Angeles County is anticipated under current conditions. The use of out-of-County facilities therefore plays a critical role in meeting the County's disposal needs. For instance, the LACSD acquired the Mesquite Regional Landfill in Imperial County in 2002 and completed construction of all infrastructures on December 24, 2008. The Mesquite Regional Landfill has a permitted capacity of 20,000 tpd and a 100-year lifespan. The Mesquite Regional Landfill, together with other existing out-of-County landfills, could potentially handle up to approximately 21,350 tpd of waste from Los Angeles County.

To facilitate the use of out-of-County facilities, it is also important to expand transfer and processing infrastructure and develop a waste-by-rail system. Specifically, nearly all solid waste is currently transported to disposal sites in the metropolitan area by truck. However, as public opposition to siting new or expanding existing disposal facilities near urban areas has grown, sites farther from the Los Angeles Basin have become more desirable, despite the costs associated with longer transport distances. For some sites, such as the Mesquite Regional Landfill, which is 210 miles from Downtown Los Angeles, rail transport is an efficient means to transport solid waste to remote disposal sites. Transitioning to remote disposal of solid waste that involves rail transport requires new infrastructure and is currently being developed by LACSD. The Waste-by-Rail system will provide long-term disposal capacity to replace local landfills as they reach capacity and close. The starting point of the Waste-by-Rail System is the Puente Hills Intermodal Facility (PHIMF), located near the Puente Hills Materials Recovery Facility. Residual waste from materials recovery facilities and transfer stations located throughout Los Angeles County will be loaded onto rail carts at the PHIMF, and transported via rail to the Mesquite Regional Landfill for disposal.

2. Promoting Alternative Technologies

Faced with a dwindling landfill capacity, as well as the impacts of climate change, the County must evaluate sustainable options for solid waste management, such as conversion technologies and landfill gas to energy facilities. LACSD currently has three landfill gas to energy facilities in Puente Hills, Scholl Canyon, and Calabasas that generate electrical power from landfill gas. Landfill gas is created through the natural decomposition of refuse and has about half the energy content of natural gas. Conversion technologies refer to a wide variety of biological, mechanical, chemical, and thermal (excluding incineration) processes that convert residual post recycled municipal solid waste and other organic feedstock into useful products, alternative fuels and clean and renewable energy. Additionally, utilizing conversion technologies locally could effectively enhance recycling, reduce pollution and greenhouse gas emissions, extend the life of existing landfills and reduce dependence on fossil fuels. Conversion technologies are currently being explored by the County in conjunction with the Alternative Technology Advisory Subcommittee, which is comprised of a diverse group of representatives from public agencies, industry, community, and other experts in the field of conversion technologies. As a part of the Southern California Conversion Technology Demonstration Project, on April 20, 2010, the Board of Supervisors approved agreements to develop three conversion technology demonstration projects, and instructed DPW to begin evaluating options for the development of commercial-scale projects. For more information, please visit the Southern California Conversion Technology Demonstration Project web site at http://www.socalconversion.org.

3. Trash Hauling

For many years, residential and commercial solid waste collection services within the unincorporated areas were provided through an open-market system, whereby each resident/business directly arranged for trash collection services with no County involvement. However, the open market system was unable to adapt to changes in federal and state laws regarding waste reduction, changing public attitudes toward protecting the environment and increasing consumer demands for better service. In

response, DPW gradually implemented the Garbage Disposal District and Residential Franchise System to replace the open-market system.

These systems provide many benefits such as quality customer services, enhanced recycling programs, environmental workshops, free bulky item pick-ups, and annual clean-up events. These systems are designed to provide uniform service standards by haulers operating in each area. The system provides each community with the flexibility needed to create services that will most benefit area residents. These features are modified to reflect feedback received through survey cards, community meetings, and telephone calls. This interactive process allows the County to tailor each contract or agreement to meet the needs voiced by each community. The system also benefits the community by limiting the wear and tear on County streets, assists the County in meeting the State's waste reduction mandate, and reduces the need for new landfills.

Garbage Disposal Districts

Garbage Disposal Districts (GDDs) are designated areas within the unincorporated portion of Los Angeles County where trash collection and recycling services are provided to both residents and businesses by a private waste hauler who contracts with DPW. Service fees are collected from each property owner through the property tax bill. To date, the County has established seven GDDs in the central Los Angeles and Malibu communities.

Residential Franchise System

In a residential franchise system, an agreement is awarded to an exclusive waste hauler to provide trash and recycling services through automated cart collection to all single family residences and duplexes within specific unincorporated communities. Currently, there are 21 residential franchise areas. DPW may replace the remaining residential open-market system areas, including the Antelope Valley in the near future.

Commercial Franchise System

As of July 2012, all unincorporated area residents, businesses and multifamily residents that utilize dumpster and/or roll-off trash collection service are served by a non-exclusive franchise system. In the non-exclusive franchise system, the County allows solid waste collection services to be provided by private waste haulers, but requires haulers to enter into a non-exclusive commercial franchise agreement with the County. Under this non-exclusive franchise system, waste haulers must provide a higher level of service standards and customers have a choice of more than one waste hauler because the system is open to competition to all haulers that enter into the agreement. The waste haulers deal directly with the public and businesses in competing for customers.

Goals and Policies for Solid Waste

Goal PS/F 5: Adequate disposal capacity and minimal waste and pollution.	
Topic	**Policy**
Waste Management	Policy PS/F 5.1: Maintain an efficient, safe and responsive waste management system that reduces waste while protecting the health and safety of the public.
	Policy PS/F 5.2: Ensure adequate disposal capacity by providing for environmentally sound and technically feasible development of solid waste management facilities, such as landfills and transfer/processing facilities.
	Policy PS/F 5.3: Discourage incompatible land uses near or adjacent to solid waste disposal facilities identified in the Countywide Integrated Waste Management Plan.
Waste Diversion	Policy PS/F 5.4: Encourage solid waste management facilities that utilize conversion and other alternative technologies and waste to energy facilities.
	Policy PS/F 5.5: Reduce the County's waste stream by minimizing waste generation and enhancing diversion.
	Policy PS/F 5.6: Encourage the use and procurement of recyclable and biodegradable materials.
	Policy PS/F 5.7: Encourage the recycling of construction and demolition debris generated by public and private projects.
	Policy PS/F 5.8: Ensure adequate and regular waste and recycling collection services.
	Policy PS/F 5.9: Encourage the availability of trash and recyclables containers in new developments, public streets, and large venues.

VI. Utilities

Background

The County's utility infrastructure, information and communication networks are layered with utility rights of way and properties that contain tower structures, substations, generating plants, pipelines, storage fields, valve stations, wells, radio and television studios and other equipment facilities. In the unincorporated areas, most electric, natural gas, or telecommunication services are delivered by private service providers. However, the County recognizes the need to define and ensure adequate levels of service in these areas as Los Angeles County continues to grow.

Issues

1. Energy Conservation

The unincorporated areas are faced with considerable strain on existing electricity and power delivery systems. As a result of increased electricity usage and prolonged hot weather conditions due to climate change, brown outs, or losses of power and forced reductions in electricity delivery, occur periodically throughout the State. There is a need to upgrade the County's power grid and service capabilities, and to educate the public on energy conservation. Upgrades and enhancements of local services and strong energy conservation programs can add to the reliability and efficiency of the overall utility network, and contribute to the long-term quality of life for residents and businesses.

Similarly, the region's substantial population growth is outpacing the development of new natural gas supplies, much of which is imported from out of state. In addition to heating and cooking, natural gas currently provides 73 percent to 90 percent of the energy used to generate electricity, especially during peak times. As the population continues to grow, the County must focus on the development of new natural gas supplies, including locally produced natural gas and liquefied natural gas (LNG); upgrading and enhancing the region's natural gas infrastructure system to improve reliability and efficiency; strong energy conservation programs; and renewable energy alternatives.

A major contributor to the long-term energy independence of Los Angeles County will be the increased production of energy from renewable sources. The production of energy from renewable sources onsite can also ensure the ongoing operations of primary health, safety and civic infrastructure during times of disruption. The County is a participant in the Statewide Renewable Energy Transmission Initiative (RETI), which identifies sites that are suitable for various types of renewable energy sources, including geothermal, solar, wind and biomass. This issue is discussed in greater detail in the Conservation and Natural Resources Element.

2. Siting Facilities

It is important for the County to address land use compatibility in siting infrastructure facilities that are necessary for the delivery of energy and information resources. Siting utility infrastructure and facilities is difficult, as many parts of the unincorporated areas are built out with little room for facility expansion. In certain areas, there is public opposition to the expansion or placement of utility infrastructure. In the case of new natural gas storage facilities, there is added difficulty in finding locations with specific geologic conditions to ensure efficiency and reliability.

Goals and Policies for Utilities

Goal PS/F 6: A County with adequate public utilities.	
Topic	**Policy**
Utility Infrastructure	Policy PS/F 6.1: Ensure efficient and cost-effective utilities that serve existing and future needs.
	Policy PS/F 6.2: Improve existing wired and wireless telecommunications infrastructure.
	Policy PS/F 6.3: Expand access to wireless technology networks, while minimizing visual impacts through co-location and design.
	Policy PS/F 6.4: Protect and enhance utility facilities to maintain the safety, reliability, integrity and security of utility services.
	Policy PS/F 6.5: Encourage the use of renewable energy sources in utility and telecommunications networks.
	Policy PS/F 6.6: Encourage the construction of utilities underground, where feasible.
	Policy PS/F 6.7: Discourage above-ground electrical distribution and transmission lines in hazard areas.
	Policy PS/F 6.8: Encourage projects that incorporate onsite renewable energy systems.
	Policy PS/F 6.9: Support the prohibition of public access within, and the limitation of access in areas adjacent to natural gas storage facilities and oil and gas production and processing facilities to minimize trespass and ensure security.
	Policy PS/F 6.10: Encourage utility siting to be localized and decentralized to reduce impacts; reduce transmission losses; promote local conservation by connecting users to their systems more directly; and reduce system malfunctions.

VII. Early Care and Education Facilities

Background

The County's role in developing and managing educational facilities and programs is limited. However, the Los Angeles County Office of Education (COE), which is the country's largest regional education agency, serves as an intermediary between the local school districts and the California Department of Education. The COE is guided by a seven member County Board of Education, which is appointed by the Board of Supervisors. The COE provides a vision statement and strategic opportunities for educational facility development to coordinate the assessment of facility needs and the construction of schools that fall to individual school districts. For more information, please visit the COE web site at http://www.lacoe.edu.

Another role that the County plays in coordinating in public school facilities is through the County subdivision approval process, in which developers are required to assess the need for, and in some cases provide, land for the construction of public schools within their development. Development impact fees, based on the size of a development, are distributed to the appropriate school district for the construction of school facilities before the County issues any building permits.

Issues

Land Use Coordination

At a minimum, the California Education Code requires public school districts to notify the local planning agency when siting new public schools to determine if the proposed site conforms to the General Plan. In addition, school districts consult with the County through the CEQA process.

As educational facilities are major components of, and significantly impact neighborhoods, it is essential for the County to work proactively with school districts and other educational providers to ensure the coordination between land use planning and school facilities planning. Joint-use school facilities, as opposed to stand-alone institutions, can benefit communities and create operational and economic efficiencies. School facilities should be accessible and open to multiple users, including students and the greater community.

As discussed in the Land Use Element and the Economic Development Element, there is a shortage of early care and education facilities in Los Angeles County. According to the 2011 Los Angeles County Child Care and Development Needs Assessment, the availability of licensed care facilities—both centers and family child care homes—varies by age. For infant/toddlers, there are sufficient facilities to accommodate only one out of every seven children in working families; for preschool-age children, there are three spaces for every four children; for school-age children requiring after school care while parents work, there is one licensed space for every three children. Half-day preschool options are available for seven out of every ten eligible children of three and four years who are able to use a half-day program. For more information on 2011 Child Care Needs Assessment, please visit the CEO Office of Child Care web site athttp://childcare.lacounty.gov.

Goals and Policies for Early Care and Education Facilities

Goal PS/F 7: A County with adequate educational facilities.	
Topic	**Policy**
Early Care and Educational Facilities	Policy PS/F 7.1: Encourage the joint-use of school sites for community activities and other appropriate uses.
	Policy PS/F 7.2: Proactively work with school facilities and education providers to coordinate land use and facilities planning.
	Policy PS/F 7.3: Encourage adequate facilities for early care and education.

VIII. Libraries

Background

The County of Los Angeles Public Library is one of the largest public library systems in the country. In fiscal year 2011-2012, the Library staff circulated 16.5 million items to 3.1 million cardholders; answered over 8 million reference questions; provided 18,000 programs to 500,000 children, teens, and adults; and assisted the public with three million internet sessions on the Library's public access computers. The Library system is a special fund County department operating under the direction of the Board of Supervisors. Figure 13.2 identifies the County libraries and service planning areas.

Figure 13.2: Libraries Map

Supplementing the 7.5 million volume book collection, the Library also offers magazines, newspapers, microfilm, government publications, specialized reference materials, magazines, audio-visual media, adult, teen and children programs, downloadable audio and e-books, and internet access, including WiFi.

For more information on the Library system, please refer to the County of Los Angeles Library Strategic Plan, which can be viewedathttp://www.colapublib.org/aboutus/strategic.html.

Library Facilities Mitigation Fees

The County applies a library facilities mitigation fee to new residential developments in the unincorporated areas. This fee is intended to mitigate the significant adverse impacts of increased residential development on the Library system. The library facilities mitigation fee is based on the estimated cost of providing the projected library facility needs in each library planning area. Please refer to Section 22.72.030 of the County's Zoning Code for the library facilities mitigation fee in each of the seven library planning areas.

The mitigation fee in each planning area is reviewed annually by the County Librarian, in consultation with the County Auditor Controller, and is adjusted every July 1. According to the Zoning Code, no adjustment shall increase or decrease the fee to an amount more or less than the amount necessary to recover the cost of providing applicable library facilities and services.

The provisions of the Library Facilities Mitigation Fee Ordinance are applicable to residential projects only. All library facilities mitigation fees received by the County are deposited into a special library capital facilities fund (one for each library planning area), and expended solely for the purposes for which the fees were collected.

Issues

Library Facility Needs

The majority of the County's 86 libraries are undersized and under-stocked to meet the service needs of current and projected populations served by the Library system. A study conducted by the Library in April 2001 determined that many of the County's libraries do not meet basic facility and service planning guidelines. The current guideline for library facility space is a minimum of 0.5 gross square foot per capita. The 2001 study determined that 89 percent of existing libraries will not meet that standard in the year 2020. In addition, the study determined that by 2020, 77 percent of existing libraries will not meet the Library's current service level planning guideline of 2.75 items (books and other library materials) per capita.

Many existing County libraries are located in areas with little or no new residential development, and therefore, there are no mitigation fees or other reliable sources of capital funding available to replace or expand them. A permanent source of funding to replace or expand existing facilities is needed to meet the projected population growth in the Library's service areas over the next two decades.

Goals and Policies for Libraries

Goal PS/F 8: A comprehensive public library system.	
Topic	**Policy**
Library System	Policy PS/F 8.1: Ensure a desired level of library service through coordinated land use and facilities planning.
	Policy PS/F 8.2: Support library mitigation fees that adequately address the impacts of new development.

IX. Public Services and Facilities Element Implementation Program

- Planning Area Capital Improvement Plans
- Water Conservation Ordinance
- Agricultural Water Conservation Program

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Box]

Constituent Service Centers and Environmental Service Centers

Due to geographic spread and demographic characteristics, there is a need to establish a number of local centers that can address specific constituent needs and requests, in close proximity to homes and places of work. Constituent Service Centers provide high quality, public services at conveniently located facilities. Specific County department presence will be tailored to each community's needs, including but not limited to community meeting rooms, libraries, senior community centers, and field offices for various County departments such as Consumer Affairs, Sheriff, Planning, and Building and Safety. Additional services could include Adult Protective Services, and space for community-based organizations. Constituent Service Centers include the East Los Angeles Civic Center, and two in Florence-Firestone and Lennox.

Environmental Service Centers are Constituent Service Centers that provide assistance to the community on environmental initiatives, such as the County's Green Building Program, AB 811 and the PACE program. County staff is available to answer questions about retrofits, water conservation, and the County's Green Building policies. An Environmental Service Center is located in West Athens-Westmont.

Chapter 14: Economic Development Element

II. Introduction

From its origins as a sparsely populated agricultural area, Los Angeles County has developed into a national and global economic center. Today, Los Angeles County's economy is diverse and fast-changing, and faces global competition for economic resources.

The Economic Development Element outlines the County's economic development goals, and provides strategies that contribute to the economic well-being of Los Angeles County. The overall performance of the economy and economic development efforts strongly impact land use and development patterns. Through the implementation of this Element, the County is planning for the economic health and prosperity of its physical and social environments, and planning strategically for the future economy.

The Element works in conjunction with the Los Angeles County Strategic Plan for Economic Development, which was adopted by the Los Angeles County Board of Supervisors in 2010. The Strategic Plan can be found at the following link: http://lacountystrategicplan.com/.

II. Background

Los Angeles County's historical growth pattern of sprawling single family development, with scattered commercial and industrial uses, has strongly influenced its economy.

The first major economic sectors to emerge in Los Angeles County were land development, real estate and the entertainment industry, which continue today to play a major role in the regional economy. In addition, the aerospace industry was responsible for some of the major growth spurts in Los Angeles County. By the 1960s, the aerospace industry employed hundreds of thousands of workers, which accounted for nearly half of the manufacturing jobs in Los Angeles County at that time.

During the 1990s, major economic, social, and environmental trends impacted Los Angeles County's economy, and in particular, its manufacturing sector. The end of the Cold War reduced defense spending, which significantly impacted the aerospace and related manufacturing industries. In addition, with free trade agreements and globalization, local, regional, state and national level economies merged with the global economy, and competition from overseas producers with cheaper labor and production costs prompted an exodus of manufacturing jobs from Los Angeles County.

The present economy of Los Angeles County is technology-driven, including biomedical, digital information technology, and environmental technology. Another key economic driver is the creative economy, which includes industries involved in the production of cultural, artistic, and design goods and services. Specifically, the fusion between technology and creativity, such as innovations in interactive media, plays an important role in the region's economic growth. International trade, aerospace, petroleum, and tourism continue to drive the economy, as well as media production, finance, telecommunications, law, healthcare, and transportation.

Employment Land

Appendix J identifies and analyzes employment land within the unincorporated areas. The study organizes the employment land into Employment Protection Districts, Industrial Flex Districts, and Industrial Opportunity Areas.

Employment Protection Districts

Employment Protection Districts are economically-viable industrial and employment-rich lands, with policies to prevent the conversion of industrial land to non-industrial uses. These areas, which are identified in Figure 14.1, are mapped as Employment Protection District Overlays in the General Plan Land Use Policy maps. For more information on the Employment Protection District Overlay, please refer to the Land Use Element.

Industrial Flex Districts

Industrial Flex Districts are industrial areas that provide opportunities for non-industrial uses and mixed uses, where appropriate, but also light industrial or office/professional uses that are compatible with residential uses. As opportunity areas, as discussed in Chapter 5: Planning Areas Framework of the General Plan, Industrial Flex Districts inform future industrial land use considerations in community-based planning efforts.

Industrial Opportunity Areas

Industrial Opportunity Areas are economically viable industrial and employment-rich lands located in an unincorporated community that has an adopted community-based plan, or is in the process of creating one. It is highly recommended that during the creation or update of the community-based plan, these areas be mapped as Employment Protection Districts.

Figure 14.1: Employment Protection Districts Policy Map

Economic Sectors and Jobs

Countywide

Los Angeles County has a diverse economic base, with multiple industry clusters spread across both incorporated and unincorporated areas. Although many of the largest employers are located in incorporated areas, the unincorporated areas support the regional economy with public sector jobs and services, manufacturing jobs, housing construction, and tourist destinations such as beaches and theme parks. Due to the difficulty in isolating economic drivers in the non-contiguous, geographically dispersed unincorporated areas, this section first presents key employment sectors for Los Angeles County, followed by an analysis by Planning Area.

Despite significant losses, Los Angeles County is still the largest manufacturing center in the country. It is also home to the ports of Los Angeles and Long Beach, which combined, is considered the sixth busiest port in the world.

Increased population growth has transformed the economic landscape, and growth in small and minority-owned businesses have contributed to offsetting the decline in manufacturing jobs. Although Los Angeles County has gained jobs in recent years, the total number of jobs has only recently rebounded to 1990 levels.

According to the Los Angeles County Economic Development Corporation (LAEDC), the largest growth sectors countywide in terms of jobs are professional, scientific and technical services, health services, and retail trade. Los Angeles County continues to have a net decrease in durable goods manufacturing and construction jobs. The LAEDC identifies the following key leading industry clusters:

- Entertainment
- Fashion
- Aerospace and Analytical Instruments
- Trade (transportation, logistics, and distribution)
- Education and Knowledge Creation
- Publishing and Printing
- Metal Manufacturing
- Biomedical
- Tourism

Planning Area

Antelope Valley Planning Area

The largest economic sectors in the Antelope Valley include government, retail services, and manufacturing, in large part due to the major concentration of aerospace research and development activity. Agriculture is also a major contributor to the economy in the Planning Area. Government employs nearly 20 percent of all employed persons in the Planning Area. The Planning Area has a number of comparative advantages that present unique opportunities for economic growth and development in the region. These include the availability of vast expanses of flat, affordable land; substantial plans for major transportation infrastructure projects; and the prospect of locating an "inland port" to handle trade near the Palmdale Regional Airport.

Coastal Islands Planning Area

Over 80 percent of Santa Catalina Island has been set aside by the Catalina Island Conservancy, which is dedicated to conservation, recreation, education, and research programs. The primary economic driver on Santa Catalina Island is tourism and recreational-related activities, such as boating and fishing. The majority of visitor activities in the unincorporated areas occur in the Two Harbors area.

East San Gabriel Valley Planning Area

Over the past decades, the San Gabriel Valley has lost jobs in manufacturing, while gaining jobs in the international trade sectors. The biggest economic sectors in the Planning Area are professional and business services, retail, educational and health services, and international trade. The major educational institutions in the Planning Area include California State Polytechnic University Pomona, University of La Verne, Azusa Pacific University and the Claremont McKenna Colleges, which are important economic generators in the area. The Planning Area includes Employment Protection Districts in South Walnut and Avocado Heights.

Gateway Planning Area

The Planning Area has evolved from an expanse of citrus orchards to one of the most important and busiest industrial and logistical hubs in the country. This region contains the largest concentration of manufacturing jobs in Los Angeles County, and is a hub for wholesale trade, warehousing and logistics. It is also home to three heavily-industrial cities: Commerce, Santa Fe Springs, and Vernon.

Although manufacturing is still a large part of the Planning Area's economy, over the years, the number of manufacturing jobs has declined. In addition, the Planning Area lacks high-tech industries and modern office and industrial space. Furthermore, because it is an older region, the Planning Area lacks large blocks of developable land, which constrains the growth of the region's industries. The Planning Area includes Employment Protection Districts in Rancho Dominguez, South Whittier-Sunshine Acres, West Whittier-Los Nietos, and North Whittier.

Metro Planning Area

The Planning Area has seen significant losses in the manufacturing sector over the last 20 years, and little to no overall economic or job growth. It is estimated that current unemployment rates in some unincorporated communities are very high. The California Employment Development Department estimates Florence-Firestone to have a 25 percent unemployment rate, and West Athens-Westmont to have a 15 percent unemployment rate. The East Los Angeles area has had very little recent economic growth, and experienced a significant loss of manufacturing, which historically had been a stable economic presence in the area, in addition to government employment and educational and health services. The Planning Area includes an Employment Protection District in West Rancho-Dominguez.

San Fernando Valley Planning Area

The Planning Area is a major center for entertainment, tourism, professional and business services, education, health services, and manufacturing. California State University Northridge and four community colleges work closely with the private sector to train the workforce of more than 750,000 people. The Universal Studios Specific Plan area is unincorporated land that houses the Universal Studios filming lot and is a large economic center within the Planning Area. The Planning Area includes an Employment Protection District in Lopez Canyon.

Santa Clarita Valley Planning Area

The Planning Area contains a wide variety of retail, office, industrial, medical, and entertainment centers that provide employment, goods, and services to both regional and local market areas. The Planning Area is experiencing an increase in jobs, but not enough economic growth to achieve a jobs-housing balance. Many people in the region still commute great distances for their employment. The largest economic sectors in the Planning Area are professional and business services, with several growing industries including biomedical, entertainment, technology, and aerospace manufacturing, due to the availability of land and facilities, as well as a qualified workforce. From 1992 to 2005, almost 40,000 new jobs were created in the Planning Area. Between 2000 and 2005, job growth averaged about 3,900 jobs per year. Most of this job growth occurred in the manufacturing, services, retail trade, and construction sectors.

Santa Monica Mountains Planning Area

Visitor-serving commercial and recreational uses are the primary economic activities in the Planning Area. The primary land uses in the Santa Monica Mountains are open space and low-density single family residential. Nodes of local-serving commercial activity are scattered among a few locations in the Santa Monica Mountains.

South Bay Planning Area

The Planning Area is home to numerous offices for company headquarters, research and development facilities, manufacturing, health care, telecommunications, financial services, and international trade businesses. Educational institutions, such as California State University-Dominguez Hills and several

community colleges provide training and degree programs to meet the needs of industry. The Planning Area includes Employment Protection Districts in West Carson and Lennox.

West San Gabriel Valley Planning Area

The West San Gabriel Valley Planning Area is employment-rich with several major employment centers, such as Jet Propulsion Laboratory and the California Institute of Technology. The Planning Area is also located near Downtown Los Angeles and is the gateway for goods movement infrastructure heading east. In addition, opportunities exist in some older commercial corridors to facilitate mixed use development and pedestrian amenities. The Planning Area includes Employment Protection Districts in Whittier Narrows and East Pasadena-East San Gabriel.

Westside Planning Area

The economy of the Planning Area is based on the entertainment industry, leisure and hospitality services, professional services, entrepreneurialism and design. The petroleum industry also supports many jobs, contributing significantly to the local economy. The Planning Area has very low office vacancy rates and high rents. Major education institutions and employers include the University of California Los Angeles and Loyola Marymount University.

Tools for Economic Development

In 1982, the Board of Supervisors consolidated three entities—the Housing Authority, Community Development Department, and the Redevelopment Agency—to form the Los Angeles County Community Development Commission (CDC). The CDC's Economic and Housing Development Division is responsible for implementing the County's economic development policies and programs in the unincorporated areas. In addition, the CDC is responsible for administering Board of Supervisors Policy No. 5.125, Economic Development Business Incentive Program, on a countywide basis. In addition, the County established the Los Angeles County Office of Small Business (OSB)to assist small businesses and connect them with government opportunities, and serve as a source of information on procurement opportunities, certification, financing, and technical assistance.

Below is a description of the economic development programs administered by the County. More information can be found on the CDC's web site at http://lacdc.org. More information on the Los Angeles County OSB can be found at http://doingbusiness.lacounty.gov/osb.htm.

Small Business Development Tools

In addition to assisting small businesses and connecting them with government opportunities, OSB serves as the County Procurement Technical Assistance Center, which is funded by the U.S. Department of Defense to help small businesses obtain contracts with prime defense contractors. In addition, OSB provides workshops and training for small businesses on how to sell goods and services to the County, the State, the federal government, and other public agencies in Southern California.

The Business Technology Center of Los Angeles County (BTC) is another example of the County's efforts to assist start-up, early stage small businesses to grow. The BTC, which is a project of the CDC, is dedicated to the development of high technology firms through business management assistance, technical assistance, and the coordination of available financial resources. The 40,000 square-foot facility, which is located in unincorporated Altadena, offers key business support services to emerging technology organizations, including access to capital and business professional mentorship from a large volunteer group of seasoned executives. The BTC houses companies with specialties such as software development, bio-informatics, cutting edge sensors and the commercialization of federal laboratory technologies. Tenants of the BTC have attracted over $200 million in capital and created over 1,800 jobs.

The CDC also operates business lending programs that have provided more than $125 million in business loans and created or retained over 3,000 jobs. The CDC offers loans for a variety of purposes—large and small businesses, commercial or industrial. These include the County Business Loan Program, County Expansion Loan Program, County Utility Loan Program, County Float Loan Program, Section 108 Loan Guarantee Program, and the County Technology Loan Program. These loan programs are designed to assist businesses that cannot obtain conventional bank financing.

Revitalization Tools

The CDC administers a comprehensive economic development program focused primarily on services to the unincorporated areas. The CDC also administers the Los Angeles Urban County CDBG Program for the unincorporated areas and 49 participating cities. CDBG funds have been used for many economic development activities, including land assembly and relocation to accommodate business expansion in low and moderate income areas.

The CDC also administers a Community Business Revitalization (CBR) Program, which provides grants and technical services to businesses and property owners to improve or rebuild storefront façades. Older commercial corridors in low and moderate income areas like those assisted through the CBR Program are vulnerable to vacancy and decay as retail trends have evolved over recent decades. Over 400 businesses have been assisted since the CBR Program's inception.

The CDC also assists in the creation of Business Improvement Districts (BIDs) to revitalize commercial corridors by working with local chambers of commerce and business associations to provide the technical assistance and capacity building necessary to pursue the BID process. Following the adoption by a vote of local property owners, BIDs can provide business-related improvements; image enhancement; promotions; physical amenities; maintenance (i.e., sidewalk cleaning, litter/bulky item pick-up, etc.); professional services (i.e., activities/services consultant); supplemental public services (i.e., security, other maintenance, etc.); and related management and operational services that directly benefit businesses and real property located in the BID, as determined by the property owners.

III. Issues

1. Economic Growth

Despite the continued population growth of Los Angeles County, total job numbers have only reached 1990 levels in recent years. Major growth areas include low-wage service and retail jobs. The rise in low-wage jobs is projected to continue.

Also, a significant portion of the economic growth in the last 15 years has been in the informal economy, as well as the growth of small and minority-owned businesses. However, these businesses often have limited growth potential due to limited access to capital and expansion opportunities.

2. Attracting Target Industries

The following industry clusters have the most potential to contribute to a broad-based, stable, and expanding economy for Los Angeles County:

Entertainment

Los Angeles County is home to an internationally-recognized entertainment industry and is the site of major television and movie production activities, video game and digital entertainment production, and an increasing number of fine arts establishments and venues. To prevent the relocation of entertainment production to other states and overseas, the County must continue to pursue state

incentives to keep entertainment production in California and in the Los Angeles region. In addition, the County must address the potential conflicts between communities, filming and production, and balance the needs of the entertainment industry with community concerns.

Fashion

The fashion industry workforce in Los Angeles County is more than twice the size of the fashion industry workforce in New York's fashion district. Big name designers operate alongside small, independent shops. Many fashion education programs support these activities, including the Fashion Institute of Design and Merchandising and the Otis College of Art and Design.

Aerospace and Analytical Instruments

With research universities, private think tanks, a NASA outpost, and research and development facilities, Los Angeles County lays claim to a sizeable share of the high-tech marketplace. Employment in the aerospace cluster is concentrated in the manufacturing of aerospace products and parts. The analytical instruments cluster supports the aerospace industry through the production of aerospace instrumentation. Both clusters demand a highly-skilled workforce and offer wages that are double the average of wage in Los Angeles County.

Trade

The ports of Los Angeles and Long Beach, along with the Los Angeles International Airport (LAX), handle more cargo than any other region in the country, and trade and logistics continues to be a growing economic sector in Los Angeles County. Infrastructure improvements related to trade and goods movement should be prioritized to maintain Los Angeles County's competitive hold on this sector. Additionally, expanding trade and goods movement can benefit Los Angeles County. For example, facilitating the creation of an "inland port" near the Palmdale Regional Airport would alleviate congested conditions in the ports and airports in the southern portion of Los Angeles County, while also strengthening the employment base in the northern portion of Los Angeles County. For an inland port to succeed, economical routes must be identified and supported by infrastructure improvements.

Education and Knowledge Creation

There are approximately 120 accredited institutions in Los Angeles County that confer associates, bachelors, and graduate degrees. Three universities—California Institute of Technology (Caltech), University of California Los Angeles, and University of Southern California—received more than $2.06 billion in research funding from federal agencies in 2010.

Publishing and Printing

Los Angeles County is a hub for publishing and printing activity, including book and directory publishing, music publishing, internet publishing and broadcasting, and web search portals.

Metal Manufacturing

Los Angeles County is the nation's number one manufacturing center in terms of employment. Los Angeles County is known for its expertise in advanced materials, such as composites, ceramics, polymers, and the latest innovations in nanomaterials. The presence of the aerospace industry has been a motivating factor in the research, development, and deployment of new materials and processes.

Biomedical

Health sciences and biomedical research represent a growing industry that provides high-paying jobs. Los Angeles County cannot capitalize on this sector without addressing the lack of high-tech industrial or office space. Land use policy can increase the amount of land available for this target industry.

Tourism

Los Angeles County must continue to promote its cultural icons, preserve its scenic and recreational opportunities, and expand its tourist destinations. A countywide umbrella organization is needed to focus initiatives into regional efforts that effectively promote a "Los Angeles" brand.

In addition to the above, Los Angeles County should focus efforts on growing the nascent, but fast-emerging innovation-based sectors, including digital media, clean technology (e.g., electric vehicles and renewable energy), and advanced materials.

3. Impact of Land Use Policy on the Economy

Land designated for industrial and employment-rich uses is needed to retain and attract businesses and jobs. Los Angeles County's historic growth patterns and land use policies have resulted in the conversion of much of the available industrial land for non-industrial uses. The remainder of industrial and office space is not sufficient to meet the needs of existing and emerging industries. The County's employment preservation strategy for the unincorporated areas, which is designed to discourage the conversion of areas with significant industrial uses to non-industrial uses, is described in the Land Use Element.

Incompatible land uses in and around industrial areas also hinder economic growth. For example, allowing residential uses in industrial areas increases tensions between the business community and new residents, as industrial activities often produce noise, odor, smells, traffic congestion, and other environmental impacts. Industrial land also needs to be buffered to avoid conflicts, and industrial uses must be thoughtfully incorporated into community-based planning efforts to address potential environmental justice impacts.

4. Impact of Mobility Infrastructure on the Economy

Mobility is a key component of economic development, as businesses and industry require efficient road, rail, shipping, and air networks to transport goods and services, and as employees and residents need access to employment centers. Much of the transportation infrastructure of Los Angeles County is strained, aging and overcapacity. Traffic congestion, compounded by aging infrastructure, is an economic obstacle for local businesses. Major transportation networks, such as the freeways leading out of the ports of Los Angeles and Long Beach, are congested. The aging and congested transportation infrastructure will continue to inhibit development efforts and business activities unless it is upgraded. The Mobility Element contains information about planning efforts underway to increase goods movement efficiency in the unincorporated areas and the region.

The County's approach to transportation infrastructure must advance economic success, but also be sustainable. The Alameda Corridor, which allows for the transport of freight on a dedicated rail line to inland transfer yards, is an example of a project that improves the transportation infrastructure, while mitigating the environmental impacts of trucking and trade activities. In addition to infrastructure for goods movement, an adequate public transit system is essential for moving and retaining a vital workforce in an environmentally sensitive manner. The Transit Oriented Districts, as described in the Land Use Element, provides opportunities for more housing and commercial uses next to existing Metro stations.

5. Revitalization

To achieve broad-based economic prosperity, local governments must stimulate business activity in neighborhoods that have limited economic opportunities. As revitalization activities can attract major new industries and businesses, the County can focus its resources on improving economically-distressed communities within the unincorporated areas.

In recent years, the State has eliminated redevelopment agencies and the local enterprise zone program to address budget issues. The elimination of these programs has reduced the resources and authority available to the County to conduct economic development activities. Several legislative proposals have emerged to return economic development tools to local governments, although none have been enacted as of 2013. Should the State act to create new economic development programs and incentives for local governments, the CDC will be prepared to make recommendations to the Board of Supervisors as to how to utilize any new resources or authority made available.

In addition, the CDC will actively pursue new financing strategies for real estate transactions that would promote job creation. Options may include creating a New Market Tax credit entity to provide investment capital for low-income communities throughout the Los Angeles County. Furthermore, the CDC will increase efforts to work collaboratively with philanthropic institutions to provide flexible financing for economic development.

6. The Role of Education in Economic Development

Los Angeles County is in need of more training and workforce development programs, as much of the blue collar workforce is not prepared to meet the job demands of the future. The continued globalization of the economy means that local workers with limited education have to compete with an increasingly educated global workforce. In addition, federal and state government cuts to education put Los Angeles County at greater risk of losing its competitive edge.

According to the LAEDC, over 50 percent of the working-age population in Los Angeles County has low levels of literacy, with a high percentage lacking a high school diploma or a GED. The industries that will provide the most economic returns require a workforce with a knowledge base and advance technical training. Furthermore, continuing demographic shifts over the next two decades will dramatically change the region's population, particularly the prime working age population. While the baby boom generation retires, a steady influx of low-skilled workers will comprise of an increasingly large portion of the labor pool.

A skilled and dedicated workforce is important for sustaining Los Angeles County's economic competitiveness, and invigorating economic activity through the reinvestment of wages. Fostering a diverse and cutting-edge industry base requires a synergistic relationship between companies and a well-developed workforce to advance technologies.

Multiple federal, state, county and local agencies aim to ensure that Los Angeles County's workforce is well-trained. The Workforce Investment Board (WIB) and the County's Community and Senior Services (CSS) are leading efforts to strengthen coordination of inter-governmental and inter-agency programs with America's Job Centers of California (AJCC). Coordinating with the AJCC system, a comprehensive career center network established by the federal Workforce Investment Act with locations in Los Angeles County, will better meet current and prospective needs of employers and jobseekers. The County's workforce development system will align and place greater emphasis on employment, training and business services in high-growth industry sectors and in-demand occupations.

Consistent with the state WIB and Governor's strategic priorities to achieve a more competitive workforce, sustain economic prosperity, and strengthen the workforce development pipeline between

education, training providers, job seekers and employers, the County's WIB and the Board of Supervisors adopted in 2013 a Five-Year Local Area Strategic Plan to better address the skills gap of the current and future workforce in the region. This forward-looking plan embraces strategic workforce development goals including: a partnership with the state Employment Development Department to deliver integrated services; unified AJCC branding that highlights the County's commitment and investment; a commitment to devoting 25% of resources to training in high-growth sectors; enhanced regional leadership and partnership with six other WIBs in Los Angeles County as well as with other stakeholders in education, and economic and workforce development; an emphasis on older and out-of-school disconnected youth; year-round subsidized work experience opportunities; and a greater investment in STEM (Science, Technology, Engineering and Math) initiatives.

Workforce development programs will be strategic and demand-driven in targeted industries, while preparing in and out-of-school youth for post-secondary education and career success.

Most importantly, the County's workforce development and training programs will increasingly focus on meeting the needs of emerging and growth industries, especially in high-growth sectors such as green/clean energy, transportation and logistics, health care, biotech, construction, and hospitality and tourism. Utilizing labor market intelligence information from the LAEDC, the WIB has approved funding for six Sector Intermediaries to convene and engage employers and business to identify the employment and training needs in these key sectors, and align training and case management resources to ensure job seekers are aware of, and competitive for sustainable employment and careers in the existing regional economy.

More information about the Los Angeles County Workforce Investment Board's Strategic Plan for 2013-2017 can be found on the Worksource California web site at:http://www.worksourcecalifornia.com/information/wib_LAcounty.htm.

7. The Need for Centralized Economic Development Planning

The LAEDC collects and distributes information on growth and market trends on a regional basis, encourages cooperation among jurisdictions to implement long-term goals for shaping the economy, and advocates for a more cohesive and unified economic development strategy. As a first crucial step to developing a unified countywide strategy, the LAEDC has worked with more than 1,080 stakeholders, including representatives from the public, private, business, government, labor, education, environmental, and community-based organizations, to develop the Strategic Plan for Economic Development in Los Angeles County. The Board of Supervisors adopted the Los Angeles County Strategic Plan for Economic Development in 2010.

Additionally, the County needs to proactively address business and economic development needs, including the provision of financial and regulatory incentives to attract jobs and target industries, and foster public-private partnerships.

8. Competitive Disadvantages

For Los Angeles County, increased global competition has resulted in tighter profit margins for economic sectors, and more cost-effective markets for labor and materials have made production methods more mobile and international. A study by the Los Angeles Economic Roundtable shows that in Los Angeles County, a business environment characterized by high production costs, high utility costs, strict environmental regulations, and a perceived indifference to the importance of industrial uses, are contributing to the relocation of industries to areas where incentives are attracting industries and businesses. One primary example of the effect of global and regional competition on Los Angeles County's economy is the regional trend of job losses in the manufacturing sector. Although local leaders have made significant efforts to retain manufacturing activities in the region, manufacturing jobs are relocating overseas, to inland areas and to other states due to lower production costs.

Another disadvantage for economic development is the high cost of doing business in Los Angeles County. For example, Los Angeles County has higher utility and energy costs compared to other regions, and the energy network may not be sufficient to meet the demands of both businesses and residential customers during peak energy periods. For the unincorporated areas in particular, many sites are not suitable for intense development, as they are dedicated open space or located within a fire hazard zone, flood zone, or other hazard area. For its part, the County is working to reduce the time and uncertainty associated with the permitting process by coordinating project reviews across departments in “one-stop” meetings with applicants.

Furthermore, industrial land and office space in the unincorporated areas are in need of retrofits and upgrades to accommodate target industries and attract high-paying jobs. More aggressive strategies and infrastructure improvements must be implemented to attract business and industry to limited, but key locations in the unincorporated areas.

Furthermore, the shortage of affordable housing and early care and education, have major impacts on the workforce as well as on the regional economy and economic development efforts. High housing costs are a deterrent to attracting an educated middle class labor force. Regional attention to building housing for all income levels is a primary factor in the success of the County’s economic future. Early care and education is not only extremely important to working families, it is important to the communities in which they live and work. A report in 2008entitled *The Economic Impact of Early Care and Education Industry in Los Angeles County* indicates that the early care and education industry generates $1.9 billion annually and provides over 65,000 full-time equivalent jobs in Los Angeles County. The report concludes that Los Angeles County’s future economic productivity depends upon investment in quality early care and education as a critical industry. The report also indicates: “The short-term economic benefits to working families and their employers are apparent. Equally important are the long-term benefits in human capital—children, their school readiness, and the productivity of the future workforce.” A copy of the report is available on the CEO Office of Child Care web site at http://childcare.lacounty.gov.

IV. Goals and Policies

Goal ED 1: An economic base and fiscal structures that attract and retain valuable industries and businesses.	
Topic	**Policy**
Target Industries	Policy ED 1.1: Encourage a diverse mix of industries and services in each Planning Area.
	Policy ED 1.2: Encourage and foster the development of the renewable energy economic sectors.
	Policy ED 1.3: Encourage public-private partnerships to support the growth of target industries.
	Policy ED 1.4: Encourage the expansion and retention of targeted industries and other growth economic sectors, such as the entertainment industry, aerospace industry, agriculture, transportation/logistics, healthcare, biomed/biotech, hospitality and tourism.
County Incentives for Business	Policy ED 1.5: Provide quality, responsible, and business-friendly municipal services to attract and retain businesses and employees.
	Policy ED 1.6: Develop, advance, and promote competitive advantages for economic development and growth.
	Policy ED 1.7: Identify opportunities to lower the costs of doing business in Los Angeles County.
	Policy ED 1.8: Promote Los Angeles County as a national and international center for business, global trade, and development.
Goal ED 2: Land use practices and regulations that foster economic development and growth.	
Topic	**Policy**
Industrial Land	Policy ED 2.1: Protect industrial lands, especially within Employment Protection Districts, from conversion to non-industrial uses.
	Policy ED 2.2: Utilize adequate buffering and other land use practices to facilitate the compatibility between industrial and non-industrial uses.
Business and Environmental Justice	Policy ED 2.3: Ensure environmental justice in economic development activities.
	Policy ED 2.4: Ensure high standards of development and encourage environmentally sustainable practices in economic development activities.
	Policy ED 2.5: Encourage employment opportunities to be located in proximity to housing.
	Policy ED 2.6: Encourage community-serving uses, such as child care centers and personal services, to be located in proximity to employment centers.
	Policy ED 2.7: Incentivize economic development and growth along existing transportation corridors and in urbanized areas.

	Policy ED 2.8: Incentivize as much as feasible, environmentally sustainable practices and high standards of development in the communities that bear disproportionate pollution and health impacts.
Streamlined Permit Processing	Policy ED 2.9: Streamline the permit review process and other entitlement processes for businesses and industries.
Agriculture	Policy ED 2.10: Support zoning incentives for the operation of farms in Agricultural Resource Areas (ARAs).
Goal ED 3: An expanded and improved infrastructure system to support economic growth and development.	
Topic	**Policy**
Infrastructure Improvements	Policy ED 3.1: Utilize capital improvement plans to prioritize infrastructure investments.
	Policy ED 3.2: Support the use of public-private partnerships to develop, fund, and deliver critical infrastructure.
	Policy ED 3.3: Work with state agencies dedicated to financing important critical infrastructure and economic development projects.
Goal ED 4: Enhanced revitalization activities.	
Topic	**Policy**
Economic Development Strategies	Policy ED 4.1: Develop a range of financial incentives and programs that encourage development and business growth.
	Policy ED 4.2: Support the development of community-level economic development strategies in line with the Los Angeles County Strategic Plan for Economic Development.
	Policy ED 4.3: Support the development of small business assistance and entrepreneurial programs that are focused on management, financial planning, and technology application.
Infill Development	Policy ED 4.4: Incentivize infill development in urban and suburban areas that revitalizes underutilized commercial and industrial areas.
	Policy ED 4.5: Direct resources to economically distressed areas to spur revitalization activities.
	Policy ED 4.6: Retrofit and reuse vacant and underutilized industrial and commercial sites in urban and suburban areas for emerging and targeted industries.
	Policy ED 4.7: Support expedited permitting for green building retrofits.
Goal ED 5: A skilled and educated workforce.	
Topic	**Policy**

Education	Policy ED 5.1: Attract and retain highly-skilled graduates, in particular, graduates of science and engineering programs.
	Policy ED 5.2: Support and create collaborative educational programs that address specific under-employed populations and workforce needs in targeted areas.
	Policy ED 5.3: Encourage outreach efforts to educational and community-learning institutions to expand workforce education programs.
	Policy ED 5.4: Expand functional literacy and English as a Second Language (ESL) programs.
	Policy ED 5.5: Support linked programs that align high schools with community colleges and four-year institutions.
	Policy ED 5.6: Engage employers earlier in the education and workforce development process to ensure work-readiness and a smooth transition from school or training to work placement.
Job Training	Policy ED 5.7: Ensure that businesses have enough skilled workers to meet their workforce needs.
	Policy ED 5.8: Prepare, train, and educate job seekers and incumbent workers to find and advance in high-value, high-wage jobs with built-in career ladders.
	Policy ED 5.9: Promote the attraction, retention and expansion of commercial and industrial firms that provide employment improvement opportunities for unskilled and semi-skilled workers.
	Policy ED 5.10: Initiate vocational training programs that provide the skills necessary for participation in the labor force.
	Policy ED 5.11: Collaborate with the private sector to identify growing workforce needs and link training initiatives to the needs of target industries.
	Policy ED 5.12: Establish employer assistance initiatives to expand skilled trades training and vocational education for high demand occupations.
	Policy ED 5.13: Play a leadership role in convening and coordinating the activities of key regional workforce development system stakeholders, including the six other WIBS that operate within Los Angeles County, as well as community colleges, businesses, K-12 institutions, philanthropic partners and others.
Goal ED 6: Collaborative efforts to implement coordinated economic development activities.	
Topic	**Policy**
Coordinated Economic Development	Policy ED 6.1: Encourage a collaborative inter-agency and inter-jurisdictional environment to align economic development activities and promote information sharing on economic trends, business cycles, best practices, and resources.
	Policy ED 6.2: Analyze emerging trends for policy modification, and maintain and update accurate labor force, market trends, and other important economic data.
	Policy ED 6.3: Strengthen cooperation with private sector organizations, economic development organizations, and community level business groups.

V. Economic Development Element Implementation Programs

- Economic Development Incentives Program
- Economic Development Outreach and Coordination Initiative
- Economic Development Land Use Strategy

For descriptions of these programs, please refer to Chapter 16: General Plan Implementation Programs.

[Text Box]

Economic Development Partners

The Los Angeles County Economic Development Corporation (LAEDC) was established in 1981 by the County as a public-private partnership with the mission to attract, retain, and expand businesses and jobs. LAEDC publishes semi-annual economic forecasts, and informs economic development by compiling data and research from a variety of sources, and providing analyses of key employment sectors and sub-regions of economic activity. More information on LAEDC can be found on their web site, located at http://www.laedc.org.

Part III: General Plan Implementation

Chapter 15: General Plan Maintenance

I. General Plan Annual Progress Report

Section 65400 of the Government Code requires that the County prepare a general plan annual progress report (annual report) on the status of General Plan implementation. The annual report is prepared by the Department of Regional Planning (DRP), presented to the Los Angeles County Regional Planning Commission and the Board of Supervisors, and submitted to the California Office of Planning and Research and the California Department of Housing and Community Development by April 1 of each year.

The annual report is the County's mechanism for comprehensively reporting on the following: 1) program implementation; 2) effectiveness of major policies; 3) updates to datasets; and 4) map maintenance.

1. Program Implementation

The annual report shall outline the County's progress toward implementing the General Plan implementation programs. A description of milestones, accomplishments, as well as any impediments will be included for each program.

2. Effectiveness of Major Policies

The annual report shall include information on the effectiveness of major policies. The table below outlines the monitoring strategy:

Policy Area	**Monitoring Method**
Transit Oriented Districts (TODs)	Report annually on the status of the TODs. Include: • A summary of new development within the TODs approved by DRP, including mixed-use projects; and • A summary of infrastructure improvements, including but not limited to pedestrian, bicycling, and streetscape improvements.
Significant Ecological Areas (SEAs)	Report biennially on the status of the County's SEAs. Include: • A summary of new development within SEAs approved by DRP; • A public comment process for accepting suggestions on improving the SEA Program, and its components. • The overall status of biological functions within each SEA, if known; • Identification of any new techniques or methods of conservation planning which are, or could, be utilized to enhance the SEA Program • Assessment of the necessity for new SEA studies and any resulting scientific studies undertaken on SEAs; • Recommendations for any modifications to the SEA Program, including General Plan goals and policies, SEA boundaries and the SEA Ordinance;

	• Identification of lands within individual SEAs as priority habitats or areas for protection; • A description of any ongoing partnerships with conservation agencies and other stakeholders; • A current map of SEA lands that are protected in perpetuity through deed-restrictions, conservation easements, etc.; and • The Director's conclusion as to the overall successes and challenges of the SEA Program in implementing General Plan goals and policies.
Employment Protection Districts (EPDs)	Report annually on the status of the EPDs. Include: • A summary of new development within the EPDs approved by DRP, including new industrial uses, as well as an analysis on the conversion of any industrial lands to non-industrial uses.
Agricultural Resource Areas (ARAs)	Report annually on the status of the ARAs. Include: • A summary of new development within the ARAs approved by DRP, including an analysis on the reduction or expansion of agricultural uses in the ARAs; • A comparison of the agricultural land uses countywide based on data from the California Department of Conservation and the Los Angeles County Agricultural Commissioner/Weights and Measures; and • Recommendations for any modifications to the ARA boundaries.
Oak Tree Preservation	Report annually on the status of the loss of oak trees.

3. Dataset Updates

The General Plan includes various maps and figures that rely on datasets that are continually updated. The annual report shall outline information on new data that impacts General Plan maps and figures. As new datasets become available, the following maps will be updated administratively:

- Mineral Resource Zones, as programs such as the State's mineral land use classification project are updated with new and expanded information over time. The County is required to recognize data transmitted by the State Mining and Geology Board in the General Plan within 12 months of receipt, per the Public Resources Code.
- Seismic and Geotechnical Hazard Zones
- Flood Hazard Zones
- Tsunami Hazard Areas
- Sea Level Rise Impact Areas
- Fire Hazard Severity Zones

The Special Management Areas Policy Map and the Hazard, Environmental, and Resource Constraints Map may also be updated administratively, if the changes are a result of new datasets that are applied to the aforementioned maps.

4. Map Maintenance

Lastly, certain policy maps may need to be amended annually to reflect new public lands and open space acquisitions. These changes will require a plan amendment. The annual report will outline plan amendment recommendations to be initiated by the DRP after the completion of the annual report.

The following policy maps will be reviewed annually and updated as needed:

- Land Use Policy Maps: Update based on changes to Public and Semi-Public (P) and Natural Resources (OS-C, OS-PR, OS-NF, OS-BLM, and W) land use categories.
- Open Space Resources Policy Map: Update to reflect new lands that have been dedicated permanently for open space conservation purposes, as well as land acquired for parks and recreation.

II. General Plan Updates

The County shall undergo a comprehensive General Plan Update every 10 years. The General Plan Update shall include a concurrent update to the zoning ordinance and zoning map, as needed, to ensure consistency with the General Plan. Individual elements shall be updated in accordance with the statutory deadlines specified in the Government Code. Updating a General Plan is a comprehensive process that ensures consistency with other countywide agency plans, and should include stakeholder input.

Chapter 16: General Plan Implementation Programs

I. Introduction

The Government Code requires that upon adoption of a general plan, a planning agency shall "investigate and make recommendations to the legislative body regarding reasonable and practical means for implementing the general plan."

II. Organization

The General Plan programs, outlined below, are organized by General Plan element and are designed to address the overall policy objectives identified in the General Plan. Each program identifies lead and partner agencies; however, they are not exclusive, and new partners can be added, as needed. The programs also include a timeframe and are categorized based on level of priority. The highest priority programs should be initiated within the first two years of the adoption of the General Plan. Programs that are designated as ongoing represent actions that must be addressed on a regular basis for General Plan implementation.

III. Funding

The General Plan programs guide the development of work programs for County departments. They also inform the budget process and will be used to set funding priorities. The schedules and tasks listed in the implementation program are based on adequate funding being secured through a joint effort undertaken by all departments and agencies. If funding is not secured, the implementation steps and/or timeframes may need to be modified. To supplement department budgets, County staff will also work to secure grants, as needed, for program implementation.

Program No.	Program Description	General Plan Goals and Policies	Lead and Partner Agencies	Timeframe
LU-1	**Planning Areas Framework Program** The General Plan serves as the foundation for all community-based plans, such as area plans, community plans, and coastal land use plans. Area plans focus on land use and other policy issues that are specific to the Planning Area. The Planning Areas Framework Program shall entail the completion of an area plan for each of the 11 Planning Areas. Area plans will be tailored toward the unique geographic, demographic, and social diversity of each Planning Area; however, at a minimum, area plans shall be developed using the following guidelines: • Involve major stakeholders, including but not limited to residents, businesses, property owners, County departments, regional agencies, and adjacent cities. • Explore the role of arts and culture, and consider beautification efforts. • Analyze the transportation network, and assess the transportation and community improvement needs. Utilize the street design considerations outlined in the Mobility Element as a tool for street improvements that meet the needs of all potential users, promote active transportation, and address the unique characteristics of the Planning Area. • Review and consider the identified opportunity areas, as applicable. • Develop a land use policy map that considers the local context, existing neighborhood character, and the General Plan Hazard, Environmental and Resource Constraints Map. • Consider the concurrent development of areawide zoning tools. • Update specific plans and zoning ordinances, as needed, to ensure consistency and plan implementation. At a minimum, each area plan shall consist of the following components: 1) a comprehensive policy document with area-specific elements, as needed, that incorporates community-based plans as chapters; 2) a land use policy map that utilizes the General Plan Land Use Legend; 3) a zoning map that is consistent with the area plan; 4) a capital improvement plan	Land Use Element: Goal LU 2	Lead: DRP Partners: DPW, CEO, DPH, CDC, DPR, Arts Commission, Fire	Years 1-2

	developed in partnership with the Department of Public Works (see Planning Area Capital Improvement Plans Program); and 5) an environmental review document that uses the General Plan Programmatic EIR as a starting point to assess the environmental impacts of the area plan. The creation of new community plans will be reserved for those communities in the unincorporated areas that are identified through the area plan process as having planning needs that go beyond the scope of the area plan. Community plans, as well as coastal land use plans, shall be incorporated as chapters of area plans.			
LU-2	**Transit Oriented District Program** Prepare a TOD specific plan, or similar mechanism, for each TOD. The goals of TOD specific plans are to: 1) increase walking, bicycling, and transit ridership and reduce vehicle miles traveled (VMTs); 2) facilitate compact, mixed use development; 3) increase economic activity;4) facilitate the public investment of infrastructure improvements; and 5) streamline the environmental review process for future infill development projects. The implementation of the TOD Program should, include the following: • Preliminary Research and Analysis: The TOD plans will be informed by the completion of preliminary research and analysis that will analyze existing conditions, parking supply and demand, and infrastructure supply and demand. • Stakeholder Outreach: In addition to the background research and analyses, the TOD plan will be informed by a comprehensive stakeholder outreach strategy. This strategy should consider input from residents and County staff and set priorities for transportation, housing, open space, and public safety. The TOD plan should also consider the local context and existing neighborhood character. • Informed by the preliminary research and stakeholder outreach, the TOD plan should, at a minimum, include the following: • General Plan Land Use Policy Map: Land uses within TODs should support active transportation, discourage automobile use, strategically focus compact development, and encourage a mix of housing types and commercial uses. • TOD plan, which will include: 1. Zoning Amendments: Prepare a zoning consistency analysis and consider both map and text amendments to ensure consistency with the land use policy map.	Land Use Element: Goals LU 4, LU 5; Policies 1.11, 1.12, 1.13, 1.14, 1.15. Mobility Element: Goal M 5 Public Services and Facilities Element: Policy 1.5 Economic Development Element: Policies: 2.5, 2.7, 3.1, 4.4	Lead: DRP Partners: DPW, Metro, Arts Commission, CDC	Years 1-2

	2. Design Guidelines: Incorporate guidelines applicable to the built environment that promote livability. 3. Mobility Strategy: Identify pedestrian, bicycle, and automobile routes and multimodal connections, particularly the first-last mile connections to the transit stop. Street infrastructure improvements should examine the street design considerations outlined in the Mobility Element. The strategy may also include new cross-sections to encourage active transportation and ensure the safety of all users. This strategy should also incorporate a strategy for parking management, such as the reduction or removal of minimum parking requirements for specific areas and the exploration of shared parking opportunities or parking benefit districts. Lastly, explore opportunities to better coordinate light rail, bus, and County shuttle transit services. 4. Economic Development Strategy: Develop a strategy to promote economic development and redevelopment. This should include working with the CDC to attract needed industries and services. 5. Capital Improvement Plan: Identify specific infrastructure improvements (i.e., sewer, transportation, waste management, stormwater, public water, and open space) and outline a financing plan. • California Environmental Quality Act (CEQA) Document: Complete the appropriate CEQA document that will substantially reduce the environmental review needed for subsequent projects, in particular future infill development and public infrastructure projects in the TOD.			
LU-3	**Airport Land Use Compatibility Plans** Develop the County's airport land use compatibility plans.	Land Use Element: Policy LU 7.6	Lead: DRP Partner: DPW	Years 1-2
LU-4	**Growth Management Program** Develop a growth management program for the unincorporated areas that does the following: • Explore the feasibility of implementing a program that uses infrastructure and service levels as a threshold for development and permitting; and • Explore the feasibility of establishing greenbelts or other growth management strategies in urbanized areas.	Land Use Element: Goal LU 3	Lead: DRP Partners: DPW	Years 1-2

LU-5	**Civic Art Program** The County Civic Art Policy requires certain capital development projects, either wholly or partially funded by the County, to dedicate one percent of the design and construction cost to public art projects on the site. Explore the expansion of this policy, including the cost implications to County capital projects, and support the management of the County's art collection.	Land Use Element: Goal LU 10	Lead: Arts Commission Partner: CEO	Year 1-2
LU-6	**Transfer of Development Rights Program** • Explore the feasibility of a Transfer of Development Rights (TDR) Program in order to direct growth and development away from valuable open space areas to identified infill areas. • Identify natural resource, rural and agricultural areas, including Agricultural Resource Areas (ARAs), and portions of the Significant Ecological Areas (SEAs) with high priority resources as sending areas. • Identify potential receiving areas, such as TODs and vacant and underutilized sites, in urban areas. • Consider partnering with other local jurisdictions to expand the scope of the TDR Program. Consider establishing a pilot program with the City of Santa Clarita. • Prepare an ordinance that outlines applicability and procedures for the TDR Program. • Establish or identify a County entity to coordinate the sales and transactions of TDR.	Land Use Element: Goals LU 3, LU 4	Lead: DRP Partners: CEO, DPR, Assessor, DPW	Years 1-2
LU-7	**Adaptive Reuse Ordinance** Prepare an Adaptive Reuse Ordinance within the context of, and in compliance with, existing building codes that considers the following: • The conversion of older, economically distressed or historically-significant buildings into multifamily residential developments, live-and-work units, mixed use developments, or commercial uses. • Incentives to expedite the rehabilitation and redevelopment of structures in older communities, and reduce vacant space in commercial areas.	Land Use Element: Policies LU 4.1, LU 4.2 Economic Development Element: Policies ED 4.4, 4.5	Lead: DRP Partner: DPW	Years 3-5

LU-8	**Art and Cultural Resources Program** Explore the feasibility of provisions for incorporating public art and other cultural amenities in new private development. Also examine the development of an in-lieu fee option.	Land Use Element: Goals LU 10	Lead: DRP Partner: Arts Commission	Year 3-5
LU-9	**Community Design Guidelines** Create design guidelines to preserve and enhance the character-defining features of all unincorporated communities.	Land Use Element: Goals LU 10	Lead: DRP Partners: DPW, Arts Commission	Years 6-10
LU-10	**Early Care and Education Program** In conjunction with the goals, strategies and objectives of the Strategic Plan for Child Care and Development for Los Angeles County, as adopted by the County Child Care Planning Committee, and the Child Care Policy Framework, as adopted by the Board of Supervisors: • Prepare an ordinance that considers the following within the unincorporated areas: 1. Barriers due to zoning regulations and costly permit fees. 2. Regulatory and other incentives, based on the conclusions and recommendations of the County's Child Care Planning Committee and other agencies in *The Economic Impact of the Early Care and Education Industry in Los Angeles County*, January 2008. These could include incentives to developers, such as fee reductions, waiver or modification to development standards, and streamlined permit review, to include child care within their projects, particularly within affordable housing developments, mixed use developments and projects that connect child care services to transit corridors. • Develop an education program that includes: 1. Engagement with the development community about the need/demand for child care services. 2. Technical assistance and training to child care providers on the development of child care facilities.	Land Use Element: Policies LU 5.4, 5.5, 5.6 Public Services and Facilities Element: Policies 7.1, 7.2, 7.3 Economic Development Element: Policy ED 2.6	Lead: CEO, Office of Child Care Partners; DRP, LACOE	Years 6-10
LU-11	**Military Influence Areas Overlay Ordinance** Prepare an ordinance to identify, coordinate and assist in resolving potential land use conflicts within Military Operation Areas (MOAs) and High Risk of Adverse Impact Zones (HRAIZs) to ensure that new development is compatible with military operations, safeguard mission training and testing requirements, support military readiness, and enhance safety for military personnel and persons on the ground. The ordinance should consider the following:	Land Use Element: Goal LU 8	Lead: DRP	Years 6-10

	• The establishment of an MOA and HRAIZ Overlay in which proposed developments are regulated; • Provisions to ensure that all uses are compatible with military operations within the MOA and/or HRAIZ Overlay; • Review procedures for all proposed development projects within the MOAs and/or HRAIZs that could impact military operations, such as uses that produce electromagnetic interference, frequency spectrum interference, height obstructions, glare, smoke, dust, and steam.			
M-1	**Parking Ordinance** • Prepare a study that assesses the applicability of parking requirements in all unincorporated areas, provides an overview of best practices, and identifies amendments, as needed. • Consider amendments to the Zoning Code to reflect the best new practices in land use and parking requirements.	Mobility Element: Policies M 5.2	Lead: DRP	Years 1-2
M-2	**Community Pedestrian Plans** Prepare Community Pedestrian Plans that consider the following: • The adequacy of pedestrian routes, accommodations, and the need for improvements or additional infrastructure, given the current or future context of particular neighborhoods. • Design guidelines for streets and walking paths in public and private developments. • Connectivity of pedestrian paths to and from schools, public transportation, major employment centers, shopping centers, and government buildings, in order to eliminate gaps in the transportation system. • Special needs populations, including seniors and people with disabilities. • A framework for the development and implementation of Community Pedestrian Plans in the unincorporated areas that considers safety, design, connectivity, and the needs of all users.	Mobility Element: Goal M 1, M 2, M 3	Lead: DPW Partner: DRP	Years 1-2

	• Coordination with the development of the Planning Areas Framework Program and the TOD Program to ensure planning consistency and to promote intermodal transportation connectivity and community livability. • The identification of unincorporated communities with a substantial absence of, and need for, sidewalks. • Construction of pedestrian improvements through the annual road construction program. • The securing of grant program funding to construct pedestrian plan improvements.			
M-3	**Safe Routes to School Program** • Develop Safe Routes to School programs that address pedestrian and bicycle safety for a two-mile radius around all elementary, middle and high school facilities. • Identify low income communities and/or communities with high rates of bike/pedestrian injury and prioritize these for Safe Routes to Schools grants. • Within high priority areas, identify schools in great need of bike/pedestrian improvements. • Submit grant proposals for high priority schools/areas.	Mobility Element: Goal M 1, M 2	Lead: DPW Partner: DPH	Years 3-5
M-4	**Multimodal Transportation Planning Function** Develop a multimodal transportation planning function for the County. This planning function will be based on traffic modeling activities, which integrate the Highway Plan, Bikeway Master Plan, and future Community Pedestrian Plans. The modeling effort will allow the County to plan, design, and maintain transportation facilities in the unincorporated areas, which provide safe and efficient mobility for all users, including bicyclists, pedestrians, transit vehicles, trucks, and motorists. It will also incorporate traffic analysis guidelines, per SB 743.	Mobility Element: Goal M 4	Lead: DPW Partner: DRP	Years 1-2
AQ-1	**PACE Financing Program** Pursuant to AB 811, establish a countywide property assessed clean energy (PACE) financing program to provide municipal financing for energy and water efficiency and renewable energy projects on private property.	Air Quality Element: Policies AQ 3.2, AQ 3.3 Public Services and Facilities Element: Policy 6.5	Lead: ISD	Years 1-2

		Economic Development Element: Policy ED 1.2		
AQ-2	**Climate Change Adaptation Program** • Develop strategies to address the impacts of climate change related but not limited to agriculture, public health, ecosystems and natural resources, energy, infrastructure, and emergency management. • Climate change adaptation strategies may be conducted sequentially, starting with the evaluation of threats, vulnerability and risk assessments, identification of mitigation actions, and implementation. • Investigate short and long-term funding mechanisms. • Amend the General Plan accordingly to incorporate proposed climate change adaptation actions.	Air Quality Element: Policy AQ 3.8	Lead: CEO	Years 1-2
C/NR-1	**SEA Preservation Program** Coordinate with programs for the preservation of natural resources, especially programs that identify financial incentives for the acquisition of SEA lands. Focus on targeting the following implementation actions to ensure that SEAs are specifically included: • Transfer of Development Rights Program • Habitat Conservation Plan • Mitigation Land Banking Program/Open Space Master Plan • Open Space Land Acquisition Strategy	Conservation and Natural Resources Element: Goal C/NR 3, Policy C/NR 3.2	Lead: DRP	Years 1-2
C/NR-2	**SEA Ordinance** Update the Significant Ecological Areas Ordinance to implement the SEA Program in the General Plan.	Conservation and Natural Resources Element: Goal C/NR 3, Policy C/NR 3.1-12	Lead: DRP	Years 1-2
C/NR-3	**Mitigation Land Banking Program/Open Space Master Plan**	Conservation and Natural Resources	Lead: DRP	Years 1-2

	Study the feasibility of creating a Mitigation Land Banking Program and an Open Space Master Plan with appropriate standards and criteria to allow eligible projects to purchase land within SEAs or other biologically sensitive areas as a mitigation measure for development in areas outside of SEAs. Encourage mitigation banking across watershed and jurisdictional boundaries to provide more opportunities for mitigation, and avoid the creation of "orphan mitigation banks."	Element: Goal C/NR 3, Policy C/NR 3.2	Partner: CEO, DPR, DPW, DPH, DBH, Agricultural Commissioner	
C/NR-4	**Oak Woodlands Conservation Management Plan Implementation** Implement the County's Oak Woodlands Conservation Management Plan through the following actions: • Develop a process for documenting oaks that are added by a property owner ("volunteer oaks") as part of the Zoning Ordinance Update Program; and • Work with the Los Angeles Region Imagery Acquisition Consortium to lobby for the inclusion of infrared imagery acquisition that will help document existing oak woodlands.	Conservation and Natural Resources Element: Goal C/NR 4, Policies C/NR 3.4, C/NR 4.1 Safety Element: Goal S 3, Policy S 3.10	Lead: DRP Partners: DPW, Fire	Years 1-2
C/NR-5	**Native Woodlands Conservation Management Plan** • Develop a conservation management plan, guidance document, and implementation ordinance for woodlands (other than oak) in Los Angeles County that are rare. Woodland types in need of conservation include but are not limited to: juniper woodlands; walnut woodlands; cherry woodlands; bay tree woodlands; willow woodlands; mixed riparian woodlands with willow, cottonwood, and sycamore components; California buckeye woodlands, and Joshua tree woodlands. • Work with the Los Angeles Region Imagery Acquisition Consortium for the inclusion of infrared imagery acquisition that will help document existing woodlands (other than oak).	Conservation and Natural Resources Element: Goal C/NR 4	Lead: DRP	Years 3-5
C/NR-6	**Scenic Resources Ordinance** • Prepare a Scenic Resources Ordinance that creates a scenic corridor, scenic viewshed, and significant ridgeline program and/or ordinance to protect remaining scenic resources. • Develop countywide ridgeline protection regulations and a countywide ridgeline map.	Conservation and Natural Resources Element: Goal C/NR 13	Lead: DRP	Years 1-2

C/NR-7	**Agricultural Resource Areas Ordinance** • Prepare an Agricultural Resource Areas Ordinance in order to encourage the retention and sustainable utilization of agricultural land for agricultural uses. • Analyze the feasibility of offering incentives, such as density bonuses and/or conservation subdivisions, that deed-restrict a certain percentage of the project site for open space and agricultural uses only. • Ensure compatibility between agricultural and non-agricultural land uses through buffering, development standards, and design requirements.	Conservation and Natural Resources Element: Goal C/NR 8 Economic Development Element: Policy ED 1.4 and Policy ED 2.9	Lead: DRP	Years 1-2
C/NR-8	**Mineral Resource Areas Ordinance** Prepare a Mineral Resource Areas Ordinance that considers the following: • Develop regulations for development in Mineral Resource Areas to ensure that development projects are compatible with existing or potential mineral resource areas, and are designed to maintain the future development of extractive, surface mining or energy production. Consider the role of design and the use of buffers between new development and the mining operations, based on an evaluation of noise, aesthetics, drainage, operating conditions biological resources, topography, lighting, traffic, operating hours and air quality. • Develop standards and conditions for extractive surface mining facilities.	Conservation and Natural Resources Element: Goals C/NR 10, C/NR 11	Lead: DRP	Years 1-2
C/NR-9	**Habitat Conservation Plan** Prepare a Habitat Conservation Plan to identify and preserve biologically sensitive land and natural resources, including SEAs. The Habitat Conservation Plan shall include the following: • A review of best practices in Habitat Conservation Plans in other local jurisdictions; and • A dedicated permanent source of funding for natural area conservation and preservation related efforts, including the routine study of biological resources.	Conservation and Natural Resources Element: Goal C/NR 3	Lead: DRP Partner: CEO, DPR, DPW, DPH, DBH, Agricultural Commissioner	Years 3-5
C/NR-10	**Water Quality Initiatives**	Conservation and Natural Resources Element: Goals C/NR 5, C/NR 6, C/NR 7	Lead: DPW Partners: DPH, DBH	Years 3-5

	• Support multi-benefit outcomes, such as water quality benefits arising from ecosystem restoration efforts, and identify, attract, and create funds and resources to implement this initiative. • Participate in Enhanced Watershed Management Programs and Watershed Management Programs in coordination with other agencies throughout Los Angeles County. • Participate in Coordinated Integrated Watershed Monitoring Plans in coordination with other agencies throughout Los Angeles County.			
C/NR-11	**Watershed and Rivers Master Plans** • Participate with stakeholders in the preparation of Watershed Management Plans in response to the NPDES Municipal Separate Storm Sewer Systems (MS4) Permit by promoting multi-benefit outcomes, including, but not limited to new public access to natural resources, new recreational opportunities, enhanced aquatic habitats, and restored natural features, where appropriate, while maintaining necessary levels of flood protection. • Identify, attract, and create funds and resources to implement these plans.	Conservation and Natural Resources Element: Goals C/NR 5, C/NR 6, C/NR 7	Lead: DPW Partner: DBH, DPR, CEO	Years 3-5
C/NR-12	**Urban Greening Program** • Work with the CDC and other stakeholders to expand community garden programs, and to identify County-owned parcels and other potential sites for community gardens. • Create and implement an urban farming program. • Conduct a tree inventory to identify tree deficient neighborhoods and target these areas for tree distribution and planting. • Adopt tree planting requirements for new developments, as described in the Community Climate Action Plan. • Explore joint-use agreements for green amenities for land under major utility corridor line easements. • Amend the County Code, as applicable, to require 30 percent tree canopy coverage, at maturity, on new development to shade parking lots and structures in a manner that will reduce the urban heat island effect.	Mobility Element: Policy M 2.9 Air Quality Element: Policy AQ 3.7 Conservation and Natural Resources Element: Policy C/NR 9.4	Lead: DRP Partners: DPW, DPR, CDC, Fire, CEO, Utilities, UC Cooperative Extension	Years 3-5

	• Work with other jurisdictions to leverage County resources in ways that facilitate environmental improvements consistent with natural landscape characteristics.			
C/NR-13	**Open Space Land Acquisition Strategy** Develop an open space land acquisition strategy that incorporates collaborative partners; identifies multi-use sites; explores all means of open space acquisition and preservation, such as inter-jurisdictional land swaps, mitigation banking, and other partnerships; and implements legal protections, such as deed-restrictions and easements. Develop programs to improve education, awareness, and stewardship of open spaces, natural areas and SEAs, recognizing and prioritizing opportunities to leverage County resources with those of other jurisdictions (such as when environmental improvements cross jurisdictions, but result in amplified improvements consistent with natural landscape boundaries/characteristics).	Conservation and Natural Resources Element: Goals C/NR 1,C/NR 2	Lead: DPR Partner: DRP, DPW	Years 6-10
C/NR-14	**Healthy and Sustainable Food Systems Ordinance** Perform an assessment of the food system in unincorporated areas to identify communities that lack access to healthy foods, barriers to the development of markets that support healthy food access, and opportunities to promote greater connectivity between local food sources and communities. Analyze the feasibility of urban agriculture incentive zones, which would provide a property tax incentive for dedication of vacant, unimproved or blighted urban infill properties to agriculture for a specified period. Prepare a Healthy and Sustainable Food Systems Ordinance that considers the following: • Incentives to promote healthy and sustainable farming practices, such as organic farming and hydroponics. • Identification and implementation of strategies and incentives to increase the availability of healthy and local foods in communities, especially those with limited access to fresh produce.	Conservation and Natural Resources Element: Goals C/NR 8, C/NR 9	Lead: DRP Partner: DPH, Agricultural Commissioner, UC Cooperative Extension	Years 6-10
C/NR-15	**Solar Energy Orientation Study** Prepare a Solar Energy Orientation Study that includes the following: • The feasibility of requiring the optimization of solar orientation in developments to maximize passive and active solar techniques,	Land Use Element: Goal LU 11 Air Quality Element: Policy AQ 3.1.	Lead: DRP	Years 6-10

	• Guidelines for reducing the urban heat island effect in new and existing development. • A solar energy subdivision design manual that depicts passive and active solar energy design guidelines.			
P/R-1	**County Parks and Recreation Master Plan** • Develop a comprehensive Los Angeles County Parks and Recreation Master Plan in collaboration with partner agencies, community groups and other stakeholders. The Master Plan will include a needs and demands analysis, in-depth gap analysis, evaluation of existing facilities and programs, asset management strategies, and implementation actions, including: • Park Inventories: Carry out repairs and improvements to existing parks based on the priority established in the park facility inventories. Access related improvements, including upgrades to comply with the Americans with Disabilities Act (ADA), are a priority. As County parks may be used to operate Mass Care Shelters in a major disaster, these shelters must be accessible to persons with disabilities. Compile an inventory of historical resources at all County parks and recreational facilities, including facilities that are listed or eligible to be included on the state and/or national Register of Historic Places. Improve and enhance educational, informational, and regulatory signage at County parks and recreational facilities, as appropriate. • New Park Opportunities: Identify properties that may be suitable for the development of new parks and expansion of existing parks. Study the possibility of developing multi-benefit parks and trails in areas, such as floodway channels, powerline alignments, major water and sewer easements, flood basins and impoundment areas, and transportation rights of way. In addition, evaluate opportunities to develop parks and recreation facilities on brownfields following appropriate cleanup and remediation. • Policy Development: Draft a countywide policy to require developers of large residential projects to develop new public parks. Survey and mark the boundaries of County-owned wildlife and wildflower sanctuaries to address encroachment by adjacent property owners. Pursue local, state, and/or federal historical registration and/or museum accreditation of additional County parks and recreational facilities, where appropriate. • Land Acquisition Strategy: Develop a land acquisition strategy as a component of the Master Plan that will establish a framework for evaluating land acquisition	Parks and Recreation Element: Goals P/R 1, P/R 2, P/R 3	Lead: DPR Partner: DRP	Years 1-2

	priorities, identify funding options for acquisitions, and provide a five-year implementation plan for land acquisition. • Program Development: Expand the park volunteer program and actively recruit more youth and seniors to conduct recreation programs and services, and identify additional facilities where historical and natural resource programs may be offered. • Parks Maintenance Master Plan: Develop a Parks Maintenance Master Plan and a computerized maintenance reporting and tracking system to ensure that routine maintenance and operations of County parks and recreational facilities are carried out in a timely, efficient, and sustainable manner. The Maintenance Master Plan will establish benchmarks for all routine park maintenance tasks and future goals based on national standards. • Revenue Enhancement: Pursue a variety of initiatives to generate additional revenues for parks and recreation including: expanding the Adopt-a-Park program, soliciting donations and sponsorships, applying for grants, and holding more fundraising activities and events.			
P/R-2	**Trails Program** • Develop a Trails Master Plan as a component of the Parks and Recreation Master Plan in collaboration with other public, non-profit, and private organizations. As part of the Master Plan, create a GIS layer of existing and proposed city, County, regional, state, and federal trails and trail segments to identify gaps and opportunities for linkages. • Collaborate with state and federal park agencies to develop uniform trail maintenance standards and trail use regulations. • Prepare and release an official map of County multi-use trails for all users. • Design and develop a new countywide uniform trail signage program that provides identification, by creating an overall branding to unify DPR's signs, along with directional and regulatory information.	Parks and Recreation Element: Goal P/R 4	Lead: DPR Partner: DRP	Years 1-2
P/R-3	**Parks Sustainability Program** Implement the County's Energy and Environmental Policy at County parks, including the following programs: • Leadership in Energy and Environmental Design (LEED) certification (or other equivalent energy certified ratings) for all new buildings of 10,000 square feet, which	Parks and Recreation Element: Goal P/R 6	Lead: DPR Partner: ISD	Years 3-5

	is the County's Board-approved policy. DPR will also pursue LEED-EB (Existing Buildings) certification for certain existing buildings on park properties by addressing whole building cleaning and maintenance issues (including chemical use), recycling programs, exterior maintenance programs, and systems upgrades. • Energy and Water Efficiency Program: This program seeks to further reduce energy and water consumption at County parks by establishing specific reduction targets and a formal reporting process to measure DPR's progress towards these targets. Recommended initiatives include the implementation of conservation monitoring practices, and energy and water efficiency projects in existing County parks. • Environmental Stewardship Program: Aims to reduce DPR's environmental footprint including, among other impacts, air pollutants that are produced through direct and indirect DPR operations, increase the use of environmentally-friendly products, and expand its recycling, composting, and mulching programs. • Sustainable Design Program: Provides for the integration of sustainable, green building technologies into the designs of park improvement and refurbishment projects, seeks to extend the life cycle or useful life of buildings on County parks, and maximize energy and water use efficiency. Establish and implement guidelines for the operation, design, and development of existing and new park facilities that will meet the needs of communities, while minimizing impacts to the natural environment. The guidelines will address a variety of issues, including but not limited to the following: • Systems design that promotes efficient use of water and energy; • Landscape design that uses drought-tolerant plants and native plants, where appropriate; • The use of construction material with recycled content; • The reduction of waste during construction and occupancy; • The use of construction materials with reduced or no release of harmful gases; • Building design and operation which promote indoor air quality and users' comfort level and productivity; • The installation of efficient plumbing fixtures to reduce potable water use and lower production of waste water; and • The purchase of sustainable cleaning materials and building maintenance products.			

N-1	**Countywide Noise Assessment Survey/County Noise Ordinance Update** • Identify major sources of noise and noise issues in the County (Countywide Assessment Survey) • Revise the County's Noise Ordinance, update the vibration standard.	Noise Element: Goal N 1	Lead: DPH Partner: DRP, DPW	Years 1-2
N-2	**Countywide Noise Mapping** If determined to be feasible, prepare a map of detailed noise contours and associated land uses within the County.	Noise Element: Goal N 1	Lead: DPH Partner: DRP	Years 6-10
N-3	**Noise Abatement Program** Create guidelines to mitigate noise issues in development projects and at a countywide level. Plan transportation/parking features to have minimal noise impacts to natural resources.	Noise Element: Goal N 1	Lead: DPH Partner: DRP	Years 6-10
S-1	**Mass Debris Management Plan Implementation and Update** Update the Mass Debris Management Plan based on organizational changes, new policies and guidance, and lessons learned from actual debris events to address the mass removal of debris that resulted from major disasters.	Safety Element: Goal S 7	Lead: PW and OEM Partner: CEO	Years 3-5 Ongoing
S-2	**At-Risk Properties Hazard Fund and Strategies** • Identify at-risk properties in hazard areas, such as those on FEMA's repetitive loss properties list. • Research available funding sources to retrofit existing structures that are located in hazard areas.	Safety Element: Goals S 1, S 3, S 4	Lead: PW Partner: CEO, DRP, DPH	Years 6-10
S-3	**Floodplain Management Plan Implementation and Update** • Distribute and advocate the County's Floodplain Management Plan, which focuses on flood hazard information and mitigation strategies for repetitive loss properties and properties in severe flood hazard areas in the County's unincorporated areas. • Update the Floodplain Management Plan and the Repetitive Loss Area Analysis on their five-year cycle to address any additional or reduction of repetitive loss properties and properties in severe flood hazard areas.	Safety Element: Goal S 3	Lead: PW	Ongoing

S-4	**Climate-Adapted Landscape Program** Develop model landscape design strategies for development projects that specify climate-adapted plants to appropriately address hazards while also supporting local biodiversity.	Safety Element: Goal S 2, S 4, S 5	Lead: DRP Partner: PW, Fire	Years 3-5
S-5	**Community Capacity and Resilience Program** • Develop an education campaign to engage communities on actions and resources for adapting and increasing resilience to climate impacts. • Collaborate with community-based organizations on strategies best suited for communities in areas with high vulnerability to climate impacts by supplying easily distributable information in a range of media platforms. • Develop a resource prioritization plan for funding allocation to frontline communities containing socially vulnerable populations as identified in the Los Angeles County Climate Vulnerability Assessment.	Safety Element: Goal S 2, S 3, S 4, S 5	Lead: DRP Partner: CEO, PW, DPH	Ongoing
S-6	**Shaded Corridors Program** • Identify corridors, particularly pedestrian pathways and bikeways that connect transit stations to nearby residential areas and public spaces, in extreme heat hazard overlay zones with the greatest need for shade. • Incorporate features, such as galleries, arcades, pergolas, awnings, and/or tree allées into development guidelines, where feasible and in compliance with fire regulations. • Coordinate with Public Works' Green Street Master Plan, which incorporates design strategies to mitigate climate change impacts. • Prioritize shading of pathways in disadvantaged communities in areas with high vulnerability to extreme heat.	Safety Element: Goal S 2, S 5	Lead: DRP Partner: PW	Ongoing
S-7	**Oil and Gas Operation Strategy** • Develop an ordinance that reflects best practices and current mitigation methods, minimize environmental impacts, and protect sensitive uses and populations. • Conduct an amortization study of oil and gas drill sites in unincorporated Los Angeles County to determine the most accelerated phase out period and	Safety Element: Goal S 6	Lead: DRP Partner: DPH, PW	Years 1-3

	recommendations to guide a phase-out process. • Develop a framework for an Oil Well Cleanup Pilot Program to plug and abandon idle oil wells, improve environmental conditions for affected communities and maximize local, high-road jobs.			
S-8	**OurCounty Sustainability Plan** Implement the hazard and climate-impact related actions identified in the OurCounty Sustainability Plan. Programs include an urban forest management plan, heat island reduction plan, and resilient integrated water system.	Safety Element: Goal S 2	Lead: CEO, DPH, DPR, DRP, Fire, ISD, OEM, PW	Ongoing
S-9	**Reduce Damage from Wildfire** • Amend Title 21 with development standards that could reduce the risk of personal injury or property damage in the Very High Fire Hazard Severity Zones (VHFHSZs). • Amend Title 22 to support the proposed changes in Title 21, and to further reduce the risks of personal injury and property damage in VHFHSZs.	Safety Element: Goal S 4	Lead: DRP Partner: Fire	Years 1-3
PS/F-1	**Planning Area Capital Improvement Plans** DRP and DPW to jointly secure sources of funding and set priorities for preparing studies to assess infrastructure needs for the 11Planning Areas. Once funding has been secured and priorities have been set, prepare a Capital Improvement Plan for each of the 11 Planning Areas (see also Planning Areas Framework Program). Each Capital Improvement Plan shall include the following as needed: Sewer Capacity Study; Transportation System Capacity Study; Waste Management Study; Stormwater System Study; Public Water System Study; list of necessary infrastructure improvements; Implementation Program; and Financing Plan. As applicable, studies related to water, sewer, traffic and stormwater management should specifically address the needs of the unincorporated legacy communities identified in the Land Use Element.	Mobility Element: Goal M 3 Public Services and Facilities Element: Goal PS/F 1 Economic Development Element: Policy ED 3.1	Leads: DPW and DRP	Years 1-2

PS/F-2	**Water Conservation Ordinance** • Continually review and update the County's water conservation ordinance with appropriate enforcement procedures, such as instituting a water conservation hotline and other measures.	Public Services and Facilities Element: Goals PS/F 2, PS/F 3	Lead: DPH	Years 1-2
PS/F-3	**Agricultural Water Conservation Program** Study the feasibility of creating an agricultural water conservation program, which will increase crop water use efficiency, and reduce water use through conservation and technological advancement in water management.	Public Services and Facilities Element: Goals PS/F 2, PS/F 3	Lead: DRP Partner: Agricultural Commissioner	Years 6-10
ED-1	**Economic Development Incentives Program** • Develop business incentives for infill development, brownfield remediation, and alternative energy production. • Identify federal, state, and local resources to create economic and regulatory incentives in order to attract targeted industries and to promote sustainable development policies. • Create incentives and programs, and seek and apply for grant funding to rehabilitate and upgrade commercial and industrial districts. • Expand and renew the County's incentive zones and districts to better address the need for economic development throughout the County's industrial and commercial areas. • Incentivize services and employment opportunities to revitalize economically distressed areas.	Economic Development Element: Policies ED 1.3, 1.4, 1.7, 3.4, 3.5, 4.1, 4.3, 4.8	Lead: CDC Partner: DRP, CEO, LAEDC	Years 1-2
ED-2	**Economic Development Outreach and Coordination Initiative** • Collect information and develop a benchmarking mechanism on economic and business trends and conditions, in conjunction with the Los Angeles County Economic Development Corporation (LAEDC), real estate professionals, site locator service providers, and economic development professionals. Determine needs and respond to changes using this information.	Economic Development Element: Policies ED 1.3, 1.4, 1.9, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 5.13, 6.1, 6.2, 6.3	Lead: CDC Partners: CEO, DRP, LAEDC	Years 6-10

	• Create a web site and related materials that guide developers and the business community through the County planning and permitting process, include information on policies that facilitate infill development and smart growth, and regularly update a site inventory of public land that is available for economic investment and redevelopment opportunities. • Develop sector strategies that emphasize the sustainability of sector-based training initiatives in targeted high growth industries, in conjunction with Los Angeles County Workforce Investment Boards, LAEDC, the state Employment Development Department, the Los Angeles Area Chamber of Commerce, Los Angeles Community College District, Los Angeles Unified School District, Los Angeles County Federation of Labor, and other partners. Inventory existing workforce development programs throughout the County and promote them via the County, Workforce Investment Board, LAEDC, local government, community-based organization and other web sites. • Lead the implementation of coordinated "one-stop" centers (America's Job Centers of California) that integrate state EDD programs and other county services, while leveraging varied partners to provide a seamless and diversified experience for job-seekers. • Utilize Sector Intermediaries to ensure the County's workforce services meet the needs of employers in high-growth industry sectors, thereby increasing the number of job-seekers placed into new and living wage occupations and careers. • Support in-school County youth by expanding the number who complete introductory STEM curricula (science, technology, engineering and math) and participate in the Summer Youth Employment Program, while ensuring out-of-school youth receive comprehensive services through AJCCs. • Participate in regional collaborative efforts around economic development between business and universities, colleges, and private training institutes and service providers. • Develop a promotional campaign that targets foreign-owned enterprises in specific industries in order to attract them to establish operations in Los Angeles County. Collaborate with entities, such as the World Trade Association.			

ED-3	**Economic Development Land Use Strategy** • Develop an economic development land use strategy that does the following: • Ensure that the unincorporated areas is competitive for business establishment and expansion, by identifying and addressing regulatory barriers. • Make the planning and entitlement process for economic development activities timely, accountable, customer-driven, and predictable. • Identify opportunities to relocate current residential uses, where feasible, that are surrounded by industrial uses in Employment Protection Districts. • Consider amendments to Title 22 to add development standards to buffer residential and industrial uses. • In key industrial areas, consider the allowance of flexibility in land uses and permitting requirements as a way to incentivize redevelopment of these areas, and establish clear guidelines for development to ensure compatibility. •	Land Use Element: Policy 5.9, 5.10, 6.2 Economic Development Element: Policy ED 1.5, 1.6, 2.1, 2.2, 2.3, 2.8	Lead: DRP Partner: CDC, CEO, LAEDC	Years 1-2

Chapter 17: Goals and Policies Summary

Land Use Element Goals and Policies

Goal LU 1: A General Plan that serves as the constitution for development, and a Land Use Policy Map that implements the General Plan's Goals, Policies and Guiding Principles.	
Topic	**Policy**
General Plan Amendments	Policy LU 1.1: Support comprehensive updates to the General Plan, area plans, community plans, coastal land use plans and specific plans.
	Policy LU 1.2: Discourage project-specific amendments to the text of the General Plan, including but not limited to the Guiding Principles, Goals, and Policies.
	Policy LU 1.3: In the review of project-specific amendments to the General Plan, ensure that they support the Guiding Principles.
	Policy LU 1.4: In the review of a project-specific amendment(s) to the General Plan, ensure that the project-specific amendment(s): • Is consistent with the goals and policies of the General Plan; • Shall benefit the public interest and is necessary to realize an unmet local or regional need.
	Policy LU 1.5: In the review of a project-specific amendment(s) to convert OS-C designated lands to other land use designations, ensure that the project-specific amendment(s) does not contribute to the overall loss of open space that protects water quality, provides natural habitats, and contributes to improved air quality.
	Policy LU 1.6: In the review of a project-specific amendment(s) to convert lands within the EPD Overlay to non-industrial land use designations, ensure that the project-specific amendment(s): • Is located on a parcel that adjoins a parcel with a comparable use, at a comparable scale and intensity; • Will not negatively impact the productivity of neighboring industrial activities; • Is necessary to promote the economic value and the long-term viability of the site; and • Will not subject future residents to potential noxious impacts, such as noise, odors or dust or pose significant health and safety risks.
	Policy LU 1.7: In the review of a project-specific amendment(s) to convert lands within the ARAs, ensure that the project-specific amendment(s): • Is located on a parcel that adjoins another parcel with a comparable use, at a comparable scale and intensity; and • Will not negatively impact the productivity of neighboring agricultural activities.
	Policy LU 1.8: Limit the amendment of each mandatory element of the General Plan to four times per calendar year, unless otherwise specified in Section 65358 of the California Government Code.

	Policy LU 1.9: Allow adjustments to the General Plan Land Use Policy Map to follow an adjusted Highway Plan alignment without a General Plan amendment, when the following findings can be met: • The adjustment is necessitated by an adjusted Highway Plan alignment that was approved by the Los Angeles County Interdepartmental Engineering Committee (IEC) in a duly noticed public meeting; • The adjustment maintains the basic relationship between land use types; and • The adjustment is consistent with the General Plan.
	Policy LU 1.10: Prohibit plan amendments that increase density of residential land uses within mapped fire and flood hazard areas unless generally surrounded by existing built development and the County determines the adjoining major highways and street networks can accommodate evacuation as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County.
Specific Plans	Policy LU 1.11: Require the intensity, density, and uses allowed in a new specific plan to be determined using the General Plan, including the Land Use Policy Map and Land Use Legend.
	Policy LU 1.12: Require a General Plan amendment for any deviation from the intensities, densities, and uses allowed by the General Plan (to apply the appropriate designation from the General Plan Land Use Legend), unless allowances for flexibility are specified in the specific plan.
	Policy LU 1.13: Require development regulations and zoning for new specific plans to be consistent with their corresponding General Plan land use designation.
	Policy LU 1.14: Allow specific plans to include implementation procedures for flexibility, such as development phasing, and redistribution of intensities and uses, as appropriate.
	Policy LU 1.15: Require a specific plan amendment for any deviation from the procedures and policies established by a specific plan.
	Policy LU 1.16: For existing specific plans, which are depicted with an “SP” land use designation, the General Plan Land Use Policy Map shall be amended as part of a comprehensive area planning effort, to identify existing specific plans using the Specific Plan Overlay.
Goal LU 2: Community-based planning efforts that implement the General Plan and incorporate public input, and regional and community level collaboration.	
Topic	**Policy**
Regional and Community-Based Planning Initiatives	Policy LU 2.1: Ensure that all community-based plans are consistent with the General Plan.
	Policy LU 2.2: Ensure broad outreach, public participation, and opportunities for community input in community-based planning efforts.
	Policy LU 2.3: Consult with and ensure that applicable County departments, adjacent cities and other stakeholders are involved in community-based planning efforts.
	Policy LU 2.4: Coordinate with other local jurisdictions to develop compatible land uses.

	Policy LU 2.5: Support and actively participate in inter-jurisdictional and regional planning efforts to help inform community-based planning efforts.
	Policy LU 2.6: Consider the role of arts and culture in community-based planning efforts to celebrate and enhance community character.
	Policy LU 2.7: Set priorities for Planning Area-specific issues, including transportation, housing, open space, and public safety as part of community-based planning efforts.
	Policy LU 2.8: Coordinate with the Los Angeles County Department of Public Works and other infrastructure providers to analyze and assess infrastructure improvements that are necessary for plan implementation.
	Policy LU 2.9: Utilize the General Plan Land Use Legend and the Hazard, Environmental and Resource Constraints Model to inform the development of land use policy maps.
	Policy LU 2.10: Ensure consistency between land use policy and zoning by undergoing a comprehensive zoning consistency analysis that includes zoning map changes and Zoning Code amendments, as needed.
	Policy LU 2.11: Update community-based plans on a regular basis.
	Policy LU 2.12: Community-based plans and existing specific plans shall be updated, as needed, to reflect the General Plan Land Use Legend as part of a comprehensive area planning effort. An exception to this is for coastal land use plans, which are subject to the California Coastal Act and to review by the California Coastal Commission.
Goal LU 3: A development pattern that discourages sprawl, and protects and conserves areas with natural resources and SEAs.	
Topic	**Policy**
Growth Management	Policy LU 3.1: Encourage the protection and conservation of areas with natural resources, and SEAs.
	Policy LU 3.2: Discourage development in areas with high environmental resources and/or severe safety hazards.
	Policy LU 3.3: Discourage development in undeveloped areas where infrastructure and public services do not exist, or where no major infrastructure projects are planned, such as state and/or federal highways.
Goal LU 4: Infill development and redevelopment that strengthens and enhances communities.	
Topic	**Policy**
Infill Development	Policy LU 4.1: Encourage infill development in urban and suburban areas on vacant, underutilized, and/or brownfield sites.
	Policy LU 4.2: Encourage the adaptive reuse of underutilized structures and the revitalization of older, economically distressed neighborhoods.
	Policy LU 4.3: Encourage transit-oriented development in urban and suburban areas with the appropriate residential density along transit corridors and within station areas.

	Policy LU 4.4: Encourage mixed use development along major commercial corridors in urban and suburban areas.
Goal LU 5: Vibrant, livable and healthy communities with a mix of land uses, services and amenities.	
Topic	**Policy**
Community-Serving Uses	Policy LU 5.1: Encourage a mix of residential land use designations and development regulations that accommodate various densities, building types and styles.
	Policy LU 5.2: Encourage a diversity of commercial and retail services, and public facilities at various scales to meet regional and local needs.
	Policy LU 5.3: Support a mix of land uses that promote bicycling and walking, and reduce VMTs.
	Policy LU 5.4: Encourage community-serving uses, such as early care and education facilities, grocery stores, farmers markets, restaurants, and banks to locate near employment centers.
	Policy LU 5.5: Ensure that all households have access to a sufficient supply of quality early care and education and supervised school-age enrichment options for children from birth to age 13.
	Policy LU 5.6: Reduce regulatory and other barriers to early care and education facilities.
	Policy LU 5.7: Direct resources to areas that lack amenities, such as transit, clean air, grocery stores, bikeways, parks, and other components of a healthy community.
	Policy LU 5.8: Encourage farmers markets, community gardens, and proximity toother local food sources that provide access to healthful and nutritious foods.
Employment Generating Uses	Policy LU 5.9: Preserve key industrially designated land for intensive, employment-based uses.
	Policy LU 5.10: Encourage employment opportunities and housing to be developed in proximity to one another.
Goal LU 6: Protected rural communities characterized by living in a non-urban or agricultural environment at low densities without typical urban services.	
Topic	**Policy**
Rural Character	Policy LU 6.1: Protect rural communities from the encroachment of incompatible development that conflict with existing land use patterns and service standards.
	Policy LU 6.2: Encourage land uses and developments that are compatible with the natural environment and landscape.
	Policy LU 6.3: Encourage low density and low intensity development in rural areas that is compatible with rural community character, preserves open space, and conserves agricultural land.
Goal LU 7: Compatible land uses that complement neighborhood character and the natural environment.	

Topic	Policy
Land Use Compatibility	Policy LU 7.1: Reduce and mitigate the impacts of incompatible land uses, where feasible, using buffers and other design techniques.
	Policy LU 7.2: Protect industrial parks and districts from incompatible uses.
	Policy LU 7.3: Protect public and semi-public facilities, including but not limited to major landfills, natural gas storage facilities, and solid waste disposal sites from incompatible uses.
	Policy LU 7.4: Ensure land use compatibility in areas adjacent to military installations and where military operations, testing, and training activities occur.
	Policy LU 7.5: Ensure land use compatibility in areas adjacent to mineral resources where mineral extraction and production, as well as activities related to the drilling for and production of oil and gas, may occur.
	Policy LU 7.6: Ensure that proposed land uses located within Airport Influence Areas are compatible with airport operations through compliance with airport land use compatibility plans.
	Policy LU 7.7: Review all proposed projects located within Airport Influence Areas for consistency with policies of the applicable airport land use compatibility plan.
Goal LU 8: Land uses that are compatible with military operations and military readiness, and enhance safety for military personnel and persons on the ground.	
Topic	**Policy**
Military Compatible Uses	Policy LU 8.1: Facilitate the early exchange of project-related information that is pertinent to military operations with the military for proposed actions within MOAs, HRAIZs, and within 1,000 ft. of a military installation.
	Policy LU 8.2: Evaluate the potential impact of new structures within MOAs and HRAIZs to ensure the safety of the residents on the ground and continued viability of military operations. In the review of development within MOAs and HRAIZs, consider the following: • Uses that produce electromagnetic and frequency spectrum interference, which could impact military operations; • Uses that release into the air any substance such as steam, dust and smoke, which impair pilot visibility; • Uses that produce light emissions, glare or distracting lights, which could interfere with pilot vision or be mistaken for airfield lighting; and • Uses that physically obstruct any portion of the MOA and/or HRAIZ due to relative height above ground level.
Goal LU 9: Land use patterns and community infrastructure that promote health and wellness.	
Topic	**Policy**
	Policy LU 9.1: Promote community health for all neighborhoods.

Community Wellness	Policy LU 9.2: Encourage patterns of development that promote physical activity.
	Policy LU 9.3: Encourage patterns of development that increase convenient, safe access to healthy foods, especially fresh produce, in all neighborhoods.
Goal LU 10: Well-designed and healthy places that support a diversity of built environments.	
Topic	**Policy**
Community Design	Policy LU 10.1: Encourage community outreach and stakeholder agency input early and often in the design of projects.
	Policy LU 10.2: Design development adjacent to natural features in a sensitive manner to complement the natural environment.
	Policy LU 10.3: Consider the built environment of the surrounding area and location in the design and scale of new or remodeled buildings, architectural styles, and reflect appropriate features such as massing, materials, color, detailing or ornament.
	Policy LU 10.4: Promote environmentally-sensitive and sustainable design.
	Policy LU 10.5: Encourage the use of distinctive landscaping, signage and other features to define the unique character of districts, neighborhoods or communities, and engender community identity, pride and community interaction.
	Policy LU 10.6: Encourage pedestrian activity through the following: • Designing the main entrance of buildings to front the street; • Incorporating landscaping features; • Limiting masonry walls and parking lots along commercial corridors and other public spaces; • Incorporating street furniture, signage, and public events and activities; and • Using wayfinding strategies to highlight community points of interest.
	Policy LU 10.7: Promote public spaces, such as plazas that enhance the pedestrian environment, and, where appropriate, continuity along commercial corridors with active transportation activities.
	Policy LU 10.8: Promote public art and cultural amenities that support community values and enhance community context.
	Policy LU 10.9: Encourage land uses and design that stimulate positive and productive human relations and foster the achievement of community goals.
	Policy LU 10.10: Promote architecturally distinctive buildings and focal points at prominent locations, such as major commercial intersections and near transit stations or open spaces.
	Policy LU 10.11: Facilitate the use of streets as public space for activities that promote civic engagement, such as farmers markets, parades, etc.

	Policy LU 10.12: Discourage gated entry subdivisions (“gated communities”) to improve neighborhood access and circulation, improve emergency access, and encourage social cohesion.
	Policy LU 10.13: Discourage flag lot subdivisions unless designed to be compatible with the existing neighborhood character.
Goal LU 11: Development that utilize sustainable design techniques.	
Topic	**Policy**
Energy Efficient Development	Policy LU 11.1: Encourage new development to employ sustainable energy practices, such as utilizing passive solar techniques and/or active solar technologies.
	Policy LU 11.2: Support the design of developments that provide substantial tree canopy cover, and utilize light-colored paving materials and energy-efficient roofing materials to reduce the urban heat island effect.
	Policy LU 11.3: Encourage development to optimize the solar orientation of buildings to maximize passive and active solar design techniques.
Sustainable Subdivisions	Policy LU 11.4: Encourage subdivisions to utilize sustainable design practices, such as maximizing energy efficiency through lot configuration; preventing habitat fragmentation; promoting stormwater retention; promoting the localized production of energy; promoting water conservation and reuse; maximizing interconnectivity; and utilizing public transit.
	Policy LU 11.5: Prohibit the use of private yards as required open space within subdivisions, unless such area includes active recreation or outdoor activity areas dedicated for common and/or public use.
	Policy LU 11.6: Ensure that subdivisions in VHFHSZs site open space to minimize fire risks, as feasible.
	Policy LU 11.7: Encourage the use of design techniques to conserve natural resource areas.
	Policy LU 11.8: Encourage sustainable subdivisions that meet green neighborhood standards, such as Leadership in Energy and Environmental Design–Neighborhood Development (LEED-ND).

Mobility Element Goals and Policies

Goal M 1: Street designs that incorporate the needs of all users.	
Topic	**Policy**
Complete Streets	Policy M 1.1: Provide for the accommodation of all users, including pedestrians, motorists, bicyclists, equestrians, users of public transit, seniors, children, and persons with disabilities when requiring or planning for new, or retrofitting existing, transportation corridors/networks whenever appropriate and feasible.
	Policy M 1.2: Ensure that streets are safe for sensitive users, such as seniors and children.
	Policy M 1.3: Utilize industry standard rating systems to assess sustainability and effectiveness of street systems for all users.
Goal M 2: Interconnected and safe bicycle- and pedestrian-friendly streets, sidewalks, paths and trails that promote active transportation and transit use.	
Topic	**Policy**
Active Transportation Design	Policy M 2.1: Provide transportation corridors/networks that accommodate pedestrians, equestrians and bicyclists, and reduce motor vehicle accidents through a context-sensitive process that addresses the unique characteristics of urban, suburban, and rural communities whenever appropriate and feasible.
	Policy M 2.2: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following street designs, whenever appropriate and feasible: • Lane width reductions to 10 or 11 feet in low speed environments with a low volume of heavy vehicles. • Wider lanes may still be required for lanes adjacent to the curb, and where buses and trucks are expected. • Low-speed designs. • Access management practices developed through a community-driven process. • Back in angle parking at locations that have available roadway width and bike lanes, where appropriate.

	Policy M 2.3: Accommodate pedestrians and bicyclists, and reduce motor vehicle accidents by implementing the following intersection designs, whenever appropriate and feasible: • Right angle intersections that reduce intersection skew. • Smaller corner radii to reduce crossing distances and slow turning vehicles. • Traffic calming measures, such as bulb-outs, sharrows, medians, roundabouts, and narrowing or reducing the number of lanes (road diets) on streets. • Crossings at all legs of an intersection. • Shorter crossing distances for pedestrians. • Right-turn channelization islands. Sharper angles of slip lanes may also be utilized. • Signal progression at speeds that support the target speed of the corridor. • Pedestrian push buttons when pedestrian signals are not automatically recalled. • Walk interval on recall for short crossings. • Left-turn phasing. • Prohibit right turn on red. • Signs to remind drivers to yield to pedestrians.

	Policy M 2.4: Ensure a comfortable walking environment for pedestrians by implementing the following, whenever appropriate and feasible: • Designs that limit dead-end streets and dead-end sidewalks. • Adequate lighting on pedestrian paths, particularly around building entrances and exits, and transit stops. • Designs for curb ramps, which are pedestrian friendly and compliant with the American Disability Act (ADA). • Perpendicular curb ramps at locations where it is feasible. • Pedestrian walking speed based on the latest standard for signal timing. Slower speeds should be used when appropriate (i.e., near senior housing, rehabilitation centers, etc.) • Approved devices to extend the pedestrian clearance times at signalized intersections. • Accessible Pedestrian Signals (APS) at signalized intersections. • Pedestrian crossings at signalized intersections without double or triple left or right turn lanes. • Pedestrian signal heads, countdown pedestrian heads, pedestrian phasing and leading pedestrian intervals at signalized intersections. • Exclusive pedestrian phases (pedestrian scrambles) where turning volume conflicts with very high pedestrian volumes. • Advance stop lines at signalized intersections. • Pedestrian Hybrid Beacons. • Medians or crossing islands to divide long crossings. • High visibility crosswalks. • Pedestrian signage. • Advanced yield lines for uncontrolled crosswalks. • Rectangular Rapid Flashing Beacon or other similar approved technology at locations of high pedestrian traffic. • Safe and convenient crossing locations at transit stations and transit stops located at safe intersections.

	Policy M 2.5: Ensure a comfortable bicycling environment by implementing the following, whenever appropriate and feasible: • Bicycle signal heads at intersections. • Bicycle signal detection at all signalized intersections. • Wayfinding signage. • Road diet techniques, such as lane narrowing, lane removal, and parking removal/restriction. • Appropriate lighting on all bikeways, including those in rural areas. • Designs, or other similar features, such as: shoulder bikeways, cycle tracks, contra flow bike lanes, shared use paths, buffered bike lanes, raised bike lanes, and bicycle boulevards.
	Policy M 2.6: Encourage the implementation of future designs concepts that promote active transportation, whenever available and feasible.
	Policy M 2.7: Require sidewalks, trails and bikeways to accommodate the existing and projected volume of pedestrian, equestrian and bicycle activity, considering both the paved width and the unobstructed width available for walking.
	Policy M 2.8: Connect trails and pedestrian and bicycle paths to schools, public transportation, major employment centers, shopping centers, government buildings, residential neighborhoods, and other destinations.
	Policy M 2.9: Encourage the planting of trees along streets and other forms of landscaping to enliven streetscapes by blending natural features with built features.
	Policy M 2.10: Encourage the provision of amenities, such as benches, shelters, secure bicycle storage, and street furniture, and comfortable, safe waiting areas near transit stops.
	Policy M 2.11: In urban and suburban areas, promote the continuity of streets and sidewalks through design features, such as limiting mid-block curb cuts, encouraging access through side streets or alleys, and promoting shorter block lengths.
Goal M 3: Streets that incorporate innovative designs.	
Topic	**Policy**
Innovative Street Design	Policy M 3.1: Facilitate safe roadway designs that protect users, preserve state and federal funding, and provide reasonable protection from liability.
	Policy M 3.2: Consider innovative designs when part of an accepted standard, or when properly vetted through an appropriate engineering/design review, in compliance with all state and federal laws.

	Policy M 3.3: Complete the following studies prior to the implementation of innovative design concepts: • An analysis of the current and future context of the community and neighborhood in which they are proposed; • A balanced assessment of the needs of all users and travel modes (i.e., pedestrian, bicycle, transit, vehicular, and equestrian, where appropriate); • A technical assessment of the operational and safety characteristics for each mode; and • A consistency check with transportation network plans, including the Highway Plan, Bicycle Master Plan, and Community Pedestrian Plans.
	Policy M 3.4: Support legislation that minimizes or eliminates liability associated with the implementation of innovative street designs that accommodate all users.
Goal M 4: An efficient multimodal transportation system that serves the needs of all residents.	
Topic	**Policy**
Transit Efficiency, Multimodal Transportation	Policy M 4.1: Expand transportation options that reduce automobile dependence.
	Policy M 4.2: Expand shuttle services to connect major transit centers to community points of interest.
	Policy M 4.3: Maintain transit services within the unincorporated areas that are affordable, timely, cost-effective, and responsive to growth patterns and community input.
	Policy M 4.4: Ensure expanded mobility and increase transit access for underserved transit users, such as seniors, students, low income households, and persons with disabilities.
	Policy M 4.5: Encourage continuous, direct routes through a connected system of streets, with small blocks and minimal dead ends (cul-de-sacs), as feasible.
	Policy M 4.6: Support alternatives to LOS standards that account for a multimodal transportation system.
	Policy M 4.7: Maintain a minimum LOS D, where feasible; however, allow LOS below D on a case by case basis in order to further other General Plan goals and policies, such as those related to environmental protection, infill development, and active transportation.
	Policy M 4.8: Provide and maintain appropriate signage for streets, roads and transit.
	Policy M 4.9: Ensure the participation of all potentially affected communities in the transportation planning and decision-making process.
	Policy M 4.10: Support the linkage of regional and community-level transportation systems, including multimodal networks.
	Policy M 4.11: Improve the efficiency of the public transportation system with bus lanes, signal prioritization, and connections to the larger regional transportation network.
	Policy M 4.12: Work with adjacent jurisdictions to ensure connectivity and the creation of an integrated regional network.

	Policy M 4.13: Coordinate with adjacent jurisdictions in the review of land development projects near jurisdictional borders to ensure appropriate roadway transitions and multimodal connectivity.
	Policy M 4.14: Coordinate with Caltrans on mobility and land use decisions that may affect state transportation facilities.
Travel Demand Management	Policy M 4.15: Reduce vehicle trips through the use of mobility management practices, such as the reduction of parking requirements, employer/institution based transit passes, regional carpooling programs, and telecommuting.
	Policy M 4.16: Promote mobility management practices, including incentives to change transit behavior and using technologies, to reduce VMTs.
Goal M 5: Land use planning and transportation management that facilitates the use of transit.	
Topic	**Policy**
Land Use and Transportation	Policy M 5.1: Facilitate transit-oriented land uses and pedestrian-oriented design, particularly in the first-last mile connections to transit, to encourage transit ridership.
	Policy M 5.2: Implement parking strategies that facilitate transit use and reduce automobile dependence.
	Policy M 5.3: Maintain transportation right-of-way corridors for future transportation uses, including bikeways, or new passenger rail or bus services.
Transportation Funding	Policy M 5.4: Support and pursue funding for the construction, maintenance and improvement of roadway, public transit, and equestrian, pedestrian and bicycle transportation systems.
	Policy M 5.5: Encourage financing programs, such as congestion pricing, bonding, increasing parking costs, fair share programs for each community, to implement local and state transportation systems and facilities.
Goal M 6: The safe and efficient movement of goods.	
Topic	**Policy**
Goods Movement	Policy M 6.1: Maximize aviation and port system efficiencies for the movement of people, goods and services.
	Policy M 6.2: Support the modernization of aviation systems, including LAX.
	Policy M 6.3: Designate official truck routes to minimize the impacts of truck traffic on residential neighborhoods and other sensitive land uses.
	Policy M 6.4: Minimize noise and other impacts of goods movement, truck traffic, deliveries, and staging in residential and mixed-use neighborhoods.
	Policy M 6.5: Support infrastructure improvements and the use of emerging technologies that facilitate the clearance, timely movement, and security of trade.
	Policy M 6.6: Preserve property for planned roadway and railroad rights-of-way, marine and air terminals, and other needed transportation facilities.

Goal M 7: Transportation networks that minimizes negative impacts to the environment and communities.	
Topic	**Policy**
Environmentally Sensitive Transportation Design	Policy M 7.1: Minimize roadway runoff through the use of permeable surface materials, and other low impact designs, wherever feasible.
	Policy M 7.2: Encourage the creation of wildlife underpasses and overpasses, fencing, signage, and other measures to minimize impacts to wildlife at junctures where transit infrastructure passes through or across sensitive habitats.
	Policy M 7.3: Encourage the use of sustainable transportation facilities and infrastructure technologies, such as liquid and compressed natural gas, and hydrogen gas stations, ITS, and electric car plug-in ports.
	Policy M 7.4: Where the creation of new or the retrofit of roadways or other transportation systems is necessary in areas with sensitive habitats, particularly SEAs, use best practice design to encourage species passage and minimize genetic diversity losses.
Rural Streets	Policy M 7.5: In rural areas, require rural highway and street standards that minimize the width of paving and the placement of curbs, gutters, sidewalks, street lighting, and traffic signals, except where necessary for public safety.

Air Quality Element Goals and Policies

Goal AQ 1: Protection from exposure to harmful air pollutants.	
Topic	**Policy**
Air Pollutants	Policy AQ 1.1: Minimize health risks to people from industrial toxic or hazardous air pollutant emissions, with an emphasis on local hot spots, such as existing point sources affecting immediate sensitive receptors.
	Policy AQ 1.2: Encourage the use of low or no volatile organic compound (VOC) emitting materials.
	Policy AQ 1.3: Reduce particulate inorganic and biological emissions from construction, grading, excavation, and demolition to the maximum extent feasible.
	Policy AQ 1.4: Work with local air quality management districts to publicize air quality warnings, and to track potential sources of airborne toxics from identified mobile and stationary sources.
Goal AQ 2: The reduction of air pollution and mobile source emissions through coordinated land use, transportation and air quality planning.	
Topics	**Policy**
Air Quality, Land Use, and Transportation	Policy AQ 2.1: Encourage the application of design and other appropriate measures when siting sensitive uses, such as residences, schools, senior centers, daycare centers, medical facilities, or parks with active recreational facilities within proximity to major sources of air pollution, such as freeways.
	Policy AQ 2.2: Participate in, and effectively coordinate the development and implementation of community and regional air quality programs.
	Policy AQ 2.3: Support the conservation of natural resources and vegetation to reduce and mitigate air pollution impacts.
	Policy AQ 2.4: Coordinate with different agencies to minimize fugitive dust from different sources, activities, and uses.
Goal AQ 3: Implementation of plans and programs to address the impacts of climate change.	
Topic	**Policy**
Climate Change	Policy AQ 3.1: Facilitate the implementation and maintenance of the Community Climate Action Plan to ensure that the County reaches its climate change and greenhouse gas emission reduction goals.
	Policy AQ 3.2: Reduce energy consumption in County operations by 20 percent by 2015.
	Policy AQ 3.3: Reduce water consumption in County operations.
	Policy AQ 3.4: Participate in local, regional and state programs to reduce greenhouse gas emissions.

	Policy AQ 3.5: Encourage energy conservation in new development and municipal operations.
	Policy AQ 3.6: Support rooftop solar facilities on new and existing buildings.
	Policy AQ 3.7: Support and expand urban forest programs within the unincorporated areas.
	Policy AQ 3.8: Develop, implement, and maintain countywide climate change adaptation strategies to ensure that the community and public services are resilient to climate change impacts.

Conservation and Natural Resources Element Goals and Policies

Goal C/NR 1: Open space areas that meet the diverse needs of Los Angeles County.	
Topic	**Policy**
Open Space Preservation and Conservation of Natural Areas	Policy C/NR 1.1: Implement programs and policies that enforce the responsible stewardship and preservation of dedicated open space areas.
	Policy C/NR 1.2: Protect and conserve natural resources, natural areas, and available open spaces.
Open Space Acquisition	Policy C/NR 1.3: Support the acquisition of new available open space areas. Augment this strategy by leveraging County resources in concert with the compatible open space stewardship actions of other agencies, as feasible and appropriate.
	Policy C/NR 1.4: Create, support and protect an established network of dedicated open space areas that provide regional connectivity, between the southwestern extent of the Tehachapi Mountains to the Santa Monica Mountains, and from the southwestern extent of the Mojave Desert to Puente Hills and Chino Hills.
	Policy C/NR 1.5: Provide and improve access to dedicated open space and natural areas for all users that considers sensitive biological resources.
	Policy C/NR 1.6: Prioritize open space acquisitions for available lands that contain unique ecological features, streams, watersheds, habitat types and/or offer linkages that enhance wildlife movements and genetic diversity.
Goal C/NR 2: Effective collaboration in open space resource preservation.	
Topic	**Policy**
Open Space Collaboration and Financing	Policy C/NR 2.1: Establish new revenue generating mechanisms to leverage County resources to enhance and acquire available open space and natural areas.
	Policy C/NR 2.2: Encourage the development of multi-benefit dedicated open spaces.
	Policy C/NR 2.3: Improve understanding and appreciation for natural areas through preservation programs, stewardship, and educational facilities.
	Policy C/NR 2.4: Collaborate with public, non-profit, and private organizations to acquire and preserve available land for open space.
Goal C/NR 3: Permanent, sustainable preservation of genetically and physically diverse biological resources and ecological systems including: habitat linkages, forests, coastal zone, riparian habitats, streambeds, wetlands, woodlands, alpine habitat, chaparral, shrublands, and SEAs.	
Topic	**Policy**
	Policy C/NR 3.1: Conserve and enhance the ecological function of diverse natural habitats and biological resources.

Protection of Biological Resources	Policy C/NR 3.2: Create and administer innovative County programs incentivizing the permanent dedication of SEAs and other important biological resources as open space areas.
	Policy C/NR 3.3: Restore upland communities and significant riparian resources, such as degraded streams, rivers, and wetlands to maintain ecological function—acknowledging the importance of incrementally restoring ecosystem values when complete restoration is not feasible.
	Policy C/NR 3.4: Conserve and sustainably manage forests and woodlands.
	Policy C/NR 3.5: Ensure compatibility of development in the National Forests in conjunction with the U.S. Forest Service Land and Resource Management Plan.
	Policy C/NR 3.6: Assist state and federal agencies and other agencies, as appropriate, with the preservation of special status species and their associated habitat and wildlife movement corridors through the administration of the SEAs and other programs.
	Policy C/NR 3.7: Participate in inter-jurisdictional collaborative strategies that protect biological resources.
Site Sensitive Design	Policy C/NR 3.8: Discourage development in areas with identified significant biological resources, such as SEAs.
	Policy C/NR 3.9: Consider the following in the design of a project that is located within an SEA, to the greatest extent feasible: • Preservation of biologically valuable habitats, species, wildlife corridors and linkages; • Protection of sensitive resources on the site within open space; • Protection of water sources from hydromodification in order to maintain the ecological function of riparian habitats; • Placement of the development in the least biologically sensitive areas on the site (prioritize the preservation or avoidance of the most sensitive biological resources onsite); • Design required open spaces to retain contiguous undisturbed open space that preserves the most sensitive biological resources onsite and/or serves to maintain regional connectivity; • Maintenance of watershed connectivity by capturing, treating, retaining, and/or infiltrating storm water flows on site; and • Consideration of the continuity of onsite open space with adjacent open space in project design.
	Policy C/NR 3.10: Require environmentally superior mitigation for unavoidable impacts on biologically sensitive areas, and permanently preserve mitigation sites.
	Policy C/NR 3.11: Discourage development in riparian habitats, streambeds, wetlands, and other native woodlands in order to maintain and support their preservation in a natural state, unaltered by grading, fill, or diversion activities.
Goal C/NR 4: Conserved and sustainably managed woodlands.	

Topic	Policy
Woodland Preservation	Policy C/NR 4.1: Preserve and restore oak woodlands and other native woodlands that are conserved in perpetuity with a goal of no net loss of existing woodlands.
Goal C/NR5: Protected and useable local surface water resources.	
Topic	**Policy**
Surface Water Protection	Policy C/NR 5.1: Support the LID philosophy, which seeks to plan and design public and private development with hydrologic sensitivity, including limits to straightening and channelizing natural flow paths, removal of vegetative cover, compaction of soils, and distribution of naturalistic BMPs at regional, neighborhood, and parcel-level scales.
	Policy C/NR 5.2: Require compliance by all County departments with adopted Municipal Separate Storm Sewer System (MS4), General Construction, and point source NPDES permits.
	Policy C/NR 5.3: Actively engage with stakeholders in the formulation and implementation of surface water preservation and restoration plans, including plans to improve impaired surface water bodies by retrofitting tributary watersheds with LID types of BMPs.
	Policy C/NR 5.4: Actively engage in implementing all approved Enhanced Watershed Management Programs/Watershed Management Programs and Coordinated Integrated Monitoring Programs/Integrated Monitoring Programs or other County-involved TMDL implementation and monitoring plans.
	Policy C/NR 5.5: Manage the placement and use of septic systems in order to protect nearby surface water bodies.
	Policy C/NR 5.6: Minimize point and non-point source water pollution.
	Policy C/NR 5.7: Actively support the design of new and retrofit of existing infrastructure to accommodate watershed protection goals, such as roadway, railway, bridge, and other—particularly—tributary street and greenway interface points with channelized waterways.
Goal C/NR 6: Protected and usable local groundwater resources.	
Topic	**Policy**
Groundwater Protection	Policy C/NR 6.1: Support the LID philosophy, which incorporates distributed, post-construction parcel-level stormwater infiltration as part of new development.
	Policy C/NR 6.2: Protect natural groundwater recharge areas and regional spreading grounds.
	Policy C/NR 6.3: Actively engage in stakeholder efforts to disperse rainwater and stormwater infiltration BMPs at regional, neighborhood, infrastructure, and parcel-level scales.
	Policy C/NR 6.4: Manage the placement and use of septic systems in order to protect high groundwater.

	Policy C/NR 6.5: Prevent stormwater infiltration where inappropriate and unsafe, such as in areas with high seasonal groundwater, on hazardous slopes, within 100 feet of drinking water wells, and in contaminated soils.
Goal C/NR 7: Protected and healthy watersheds.	
Topic	**Policy**
Watershed Protection	Policy C/NR 7.1: Support the LID philosophy, which mimics the natural hydrologic cycle using undeveloped conditions as a base, in public and private land use planning and development design.
	Policy C/NR 7.2: Support the preservation, restoration and strategic acquisition of available land for open space to preserve watershed uplands, natural streams, drainage paths, wetlands, and rivers, which are necessary for the healthy function of watersheds.
	Policy C/NR 7.3: Actively engage with stakeholders to incorporate the LID philosophy in the preparation and implementation of watershed and river master plans, ecosystem restoration projects, and other related natural resource conservation aims, and support the implementation of existing efforts, including Watershed Management Programs and Enhanced Watershed Management Programs.
	Policy C/NR 7.4: Promote the development of multi-use regional facilities for stormwater quality improvement, groundwater recharge, detention/attenuation, flood management, retaining non-stormwater runoff, and other compatible uses.
Goal C/NR 8: Productive farmland that is protected for local food production, open space, public health, and the local economy.	
Topic	**Policy**
Agricultural Resources	Policy C/NR 8.1: Protect ARAs, and other land identified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance by the California Department of Conservation, from encroaching development and discourage incompatible adjacent land uses.
	Policy C/NR 8.2: Discourage land uses in ARAs, and other land identified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance by the California Department of Conservation, that are incompatible with agricultural activities.
	Policy C/NR 8.3: Encourage agricultural activities within ARAs.
Goal C/NR 9: Sustainable agricultural practices.	
Topic	**Policy**
Sustainable Agricultural Practices	Policy C/NR 9.1: Support agricultural practices that minimize and reduce soil loss, minimize pesticide use, and prevent water runoff from leaching pesticide and fertilizer into groundwater and affecting water, soil, and air quality.
	Policy C/NR 9.2: Support innovative agricultural practices that conserve resources and promote sustainability, such as drip irrigation, hydroponics, organic farming, and the use of compost.

	Policy C/NR 9.3: Support farmers markets, farm stands, and community-supported agriculture.
	Policy C/NR 9.4: Support countywide community garden and urban farming programs.
	Policy C/NR 9.5: Discourage the conversion of native vegetation to agricultural uses.
Goal C/NR 10: Locally available mineral resources to meet the needs of construction, transportation, and industry.	
Topic	**Policy**
Mineral Resource Zone Protection	Policy C/NR 10.1: Protect MRZ-2s and access to MRZ-2s from development and discourage incompatible adjacent land uses.
	Policy C/NR 10.2: Prior to permitting a use that threatens the potential to extract minerals in an identified Mineral Resource Zone, the County shall prepare a statement specifying its reasons for permitting the proposed use, and shall forward a copy to the State Geologist and the State Mining and Geology Board for review, in accordance with the Public Resources Code, as applicable.
	Policy C/NR 10.3: Recognize newly identified MRZ-2s within 12 months of transmittal of information by the State Mining and Geology Board.
	Policy C/NR 10.4: Work collaboratively with agencies to identify Mineral Resource Zones and to prioritize mineral land use classifications in regional efforts.
	Policy C/NR 10.5: Manage mineral resources in a manner that effectively plans for access to, development and conservation of, mineral resources for existing and future generations. Policy C/NR 10.6: Require that new non-mining land uses adjacent to existing mining operations be designed to provide a buffer between the new development and the mining operations. The buffer distance shall be based on an evaluation of noise, aesthetics, drainage, operating conditions, biological resources, topography, lighting, traffic, operating hours, and air quality.
Goal C/NR 11: Mineral extraction and production activities that are conducted in a manner that minimizes impacts to the environment.	
Topic	**Policy**
Mineral Extraction	Policy C/NR 11.1: Require mineral resource extraction and production activities and drilling for and production of oil and natural gas to comply with County regulations and state requirements, such as SMARA, and DOGGR regulations.
	Policy C/NR 11.2: Require the reclamation of abandoned surface mines to productive second uses.
	Policy C/NR 11.3: Require appropriate levels of remediation for all publicly-owned oil and natural gas production sites based on possible future uses.
	Policy C/NR 11.4: Require that mineral resource extraction and production operations, as well as activities related to the drilling for and production of oil and natural gas, be conducted to protect other natural resources and prevent excessive grading in hillside areas.

	Policy C/NR 11.5: Encourage and support efforts to increase the safety of oil and gas production and processing activities, including state regulations related to well stimulation techniques such as hydraulic fracturing or "fracking."
Goal C/NR 12: Sustainable management of renewable and non-renewable energy resources.	
Topic	**Policy**
Energy Resources	Policy C/NR 12.1: Encourage the production and use of renewable energy resources.
	Policy C/NR 12.2: Encourage the effective management of energy resources, such as ensuring adequate reserves to meet peak demands.
	Policy C/NR12.3: Encourage distributed systems that use existing infrastructure and reduce environmental impacts.
Goal C/NR 13: Protected visual and scenic resources.	
Topic	**Policy**
Scenic Resource Protection	Policy C/NR 13.1: Protect scenic resources through land use regulations that mitigate development impacts.
	Policy C/NR 13.2: Protect ridgelines from incompatible development that diminishes their scenic value.
	Policy C/NR 13.3: Reduce light trespass, light pollution and other threats to scenic resources.
	Policy C/NR 13.4: Encourage developments to be designed to create a consistent visual relationship with the natural terrain and vegetation.
	Policy C/NR 13.5: Encourage required grading to be compatible with the existing terrain.
	Policy C/NR 13.6: Prohibit outdoor advertising and billboards along scenic routes, corridors, waterways, and other scenic areas.
	Policy C/NR 13.7: Encourage the incorporation of roadside rest stops, vista points, and interpretive displays into projects in scenic areas.
Hillside Management	Policy C/NR 13.8: Manage development in HMAs to protect their natural and scenic character and minimize risks from natural hazards, such as fire, flood, erosion, and landslides.
	Policy C/NR 13.9: Consider the following in the design of a project that is located within an HMA, to the greatest extent feasible: • Public safety and the protection of hillside resources through the application of safety and conservation design standards; • Maintenance of large contiguous open areas that limit exposure to landslide, liquefaction and fire hazards and protect natural features, such as significant ridgelines, watercourses and SEAs.

	Policy C/NR 13.10: To identify significant ridgelines, the following criteria must be considered: • Topographic complexity; • Uniqueness of character and location; • Presence of cultural or historical landmarks; • Visual dominance on the skyline or viewshed, such as the height and elevation of a ridgeline; and • Environmental significance to natural ecosystems, parks, and trail systems.
Goal C/NR 14: Protected historic, cultural, and paleontological resources.	
Topic	**Policy**
Historic, Cultural, and Paleontological Resource Protection	Policy C/NR 14.1: Mitigate all impacts from new development on or adjacent to historic, cultural, and paleontological resources to the greatest extent feasible.
	Policy C/NR 14.2: Support an inter-jurisdictional collaborative system that protects and enhances historic, cultural, and paleontological resources.
	Policy C/NR 14.3: Support the preservation and rehabilitation of historic buildings.
	Policy C/NR 14.4: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004).
	Policy C/NR 14.5: Promote public awareness of historic, cultural, and paleontological resources.
	Policy C/NR 14.6: Ensure proper notification and recovery processes are carried out for development on or near historic, cultural, and paleontological resources.

Parks and Recreation Element Goals and Policies

Goal P/R 1: Enhanced active and passive park and recreation opportunities for all users.	
Topic	**Policy**
Park Programming	Policy P/R 1.1: Provide opportunities for public participation in designing and planning parks and recreation programs.
	Policy P/R 1.2: Provide additional active and passive recreation opportunities based on a community's setting, and recreational needs and preferences.
	Policy P/R 1.3: Consider emerging trends in parks and recreation when planning for new parks and recreation programs.
	Policy P/R 1.4: Promote efficiency by building on existing recreation programs.
Park Management	Policy P/R 1.5: Ensure that County parks and recreational facilities are clean, safe, inviting, usable and accessible.
	Policy P/R 1.6: Improve existing parks with needed amenities and address deficiencies identified through the park facility inventories.
	Policy P/R 1.7: Ensure adequate staffing, funding, and other resources to maintain satisfactory service levels at all County parks and recreational facilities.
	Policy P/R 1.8: Enhance existing parks to offer balanced passive and active recreation opportunities through more efficient use of space and the addition of new amenities.
	Policy P/R 1.9: Offer more lighted playing fields using energy efficient light fixtures to extend playing time, where appropriate (eg., not in areas adjacent to open space or natural areas that can be impacted by spillover lighting).
	Policy P/R 1.10: Ensure a balance of passive and recreational activities in the development of new park facilities.
	Policy P/R 1.11: Provide access to parks by creating pedestrian and bicycle-friendly paths and signage regarding park locations and distances.
Goal P/R 2: Enhanced multi-agency collaboration to leverage resources.	
Topic	**Policy**
Collaboration and Financing	Policy P/R 2.1: Develop joint-use agreements with other public agencies to expand recreation services.
	Policy P/R 2.2: Establish new revenue generating mechanisms to leverage County resources to enhance existing recreational facilities and programs.
	Policy P/R 2.3: Build multi-agency collaborations with schools, libraries, non-profit, private, and other public organizations to leverage capital and operational resources.

	Policy P/R 2.4: Utilize school and library facilities for County sponsored and community sponsored recreational programs and activities.
	Policy P/R 2.5: Support the development of multi-benefit parks and open spaces through collaborative efforts among entities such as cities, the County, state, and federal agencies, private groups, schools, private landowners, and other organizations.
	Policy P/R 2.6: Participate in joint powers authorities (JPAs) to develop multi-benefit parks as well as regional recreational facilities.
	Policy P/R 2.7: Increase communication and partnerships with local law enforcement, neighborhood watch groups, and public agencies to improve safety in parks.
Mass Care and Shelters	Policy P/R 2.8: Evaluate and enhance facilities and amenities with respect to alternative use of parks to carry out Mass Care and Shelter operations in the wake of a disaster.
Goal P/R 3: Acquisition and development of additional parkland.	
Topic	**Policy**
Parkland Acquisition and Dedication	Policy P/R 3.1: Acquire and develop local and regional parkland to meet the following County goals: 4 acres of local parkland per 1,000 residents in the unincorporated areas and 6 acres of regional parkland per 1,000 residents of the total population of Los Angeles County.
	Policy P/R 3.2: For projects that require zone change approvals, general plan amendments, specific plans, or development agreements, work with developers to provide for local and regional parkland above and beyond their Quimby obligations.
	Policy P/R 3.3: Provide additional parks in communities with insufficient local parkland as identified through the gap analysis.
	Policy P/R 3.4: Expand the supply of regional parks by acquiring land that would: 1) provide a buffer from potential threats that would diminish the quality of the recreational experience; 2) protect watersheds; and 3) offer linkages that enhance wildlife movements and biodiversity.
	Policy P/R 3.5: Collaborate with other public, non-profit, and private organizations to acquire land for parks.
	Policy P/R 3.6: Pursue a variety of opportunities to secure property for parks and recreational facilities, including purchase, grant funding, private donation, easements, surplus public lands for park use, and dedication of private land as part of the development review process.
Parkland Development	Policy P/R 3.7: Mitigate impacts from freeways to new parks to the extent feasible.
	Policy P/R 3.8: Site new parks near schools, libraries, senior centers and other community facilities where possible.
	Policy P/R 3.9: The Department of Parks and Recreation does not accept undeveloped park sites from developers. Developers are required to provide a developed park to the County on a “turn-key” basis and receive credit for the costs of developing the public park up to and against any remaining Quimby obligation, after accounting for the net acreage dedicated to the County.
Goal P/R 4: Improved accessibility and connectivity to a comprehensive trail system including rivers, greenways, and community linkages.	

Topic	Policy
Trail System	Policy P/R 4.1: Create multi-use trails to accommodate all users.
	Policy P/R 4.2: Develop staging areas and trail heads at strategic locations to accommodate multi-use trail users.
	Policy P/R 4.3: Develop a network of feeder trails into regional trails.
	Policy P/R 4.4: Maintain and design multi-purpose trails in ways that minimize circulation conflicts among trail users.
	Policy P/R 4.5: Collaborate with other public, non-profit, and private organizations in the development of a comprehensive trail system.
	Policy P/R 4.6: Create new multi-use trails that link community destinations including parks, schools and libraries.
Goal P/R 5: Protection of historical and natural resources on County park properties.	
Topic	**Policy**
Park Resource Preservation	Policy P/R 5.1: Preserve historic resources on County park properties, including buildings, collections, landscapes, bridges, and other physical features.
	Policy P/R 5.2: Expand the collection of historical resources under the jurisdiction of the County, where appropriate.
	Policy P/R 5.3: Protect and conserve natural resources on County park properties, including natural areas, sanctuaries, and open space preserves.
	Policy P/R 5.4: Ensure maintenance, repair, rehabilitation, restoration, or reconstruction of historical resources in County parks and recreational facilities are carried out in a manner consistent with the most current Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings.
Education and Programming	Policy P/R 5.5: Preserve and develop facilities that serve as educational resources that improve community understanding of and appreciation for natural areas, including watersheds.
	Policy P/R 5.6: Promote the use of County parks and recreational facilities for educational purposes, including a variety of classes and after school programs.
	Policy P/R 5.7: Integrate a range of cultural arts programs into existing activities, and partner with multicultural vendors and organizations.
Goal P/R 6: A sustainable parks and recreation system.	
Topic	**Policy**
	Policy P/R 6.1: Support the use of recycled water for landscape irrigation in County parks.

Sustainable Parks System	Policy P/R 6.2: Support the use of alternative sources of energy, such as wind and solar sources to reduce the use of energy at existing parks.
	Policy P/R 6.3: Prolong the life of existing buildings and facilities on County park properties through preventative maintenance programs and procedures.
	Policy P/R 6.4: Ensure that new buildings on County park properties are environmentally sustainable by reducing carbon footprints, and conserving water and energy.
	Policy P/R 6.5: Ensure the routine maintenance and operations of County parks and recreational facilities to optimize water and energy conservation.

Noise Element Goals and Policies

Goal N 1: The reduction of excessive noise impacts.	
Topic	**Policy**
Reducing Noise Impacts	Policy N 1.1: Utilize land uses to buffer noise-sensitive uses from sources of adverse noise impacts.
	Policy N 1.2: Reduce exposure to noise impacts by promoting land use compatibility.
	Policy N 1.3: Minimize impacts to noise-sensitive land uses by ensuring adequate site design, acoustical construction, and use of barriers, berms, or additional engineering controls through Best Available Technologies (BAT).
	Policy N 1.4: Enhance and promote noise abatement programs in an effort to maintain acceptable levels of noise as defined by the Los Angeles County Exterior Noise Standards and other applicable noise standards.
	Policy N 1.5: Ensure compliance with the jurisdictions of State Noise Insulation Standards (Title 24, California Code of Regulations and Chapter 35 of the Uniform Building Code), such as noise insulation of new multifamily dwellings constructed within the 60 dB (CNEL or Ldn) noise exposure contours.
	Policy N 1.6: Ensure cumulative impacts related to noise do not exceed health-based safety margins.
	Policy N 1.7: Utilize traffic management and noise suppression techniques to minimize noise from traffic and transportation systems.
	Policy N 1.8: Minimize noise impacts to pedestrians and transit-riders in the design of transportation facilities and mobility networks.
	Policy N 1.9: Require construction of suitable noise attenuation barriers on noise sensitive uses that would be exposed to exterior noise levels of 65 dBA CNEL and above, when unavoidable impacts are identified.
	Policy N 1.10: Orient residential units away from major noise sources (in conjunction with applicable building codes).
	Policy N 1.11: Maximize buffer distances and design and orient sensitive receptor structures (hospitals, residential, etc.) to prevent noise and vibration transfer from commercial/light industrial uses.
	Policy N 1.12: Decisions on land adjacent to transportation facilities, such as the airports, freeways and other major highways, must consider both existing and future noise levels of these transportation facilities to assure the compatibility of proposed uses.

Safety Element Goals and Policies

Goal S 1: An effective regulatory system that prevents or minimizes personal injury, loss of life and property damage due to seismic and geotechnical hazards.	
Topic	**Policy**
Geotechnical Hazards	Policy S 1.1: Discourage development in Seismic Hazard and Alquist-Priolo Earthquake Fault Zones.
	Policy S 1.2: Prohibit construction of structures for human occupancy adjacent to active faults unless a comprehensive fault study that addresses seismic hazard risks and proposes appropriate actions to minimize the risk is approved.
	Policy S 1.3: Require developments to mitigate geotechnical hazards, such as soil instability and landslides, in Hillside Management Areas through siting and development standards.
	Policy S 1.4: Support the retrofitting of unreinforced masonry structures and soft-story buildings to help reduce the risk of structural and human loss due to seismic hazards.
Goal S 2: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property damage due to climate hazards and climate-induced secondary impacts.	
Topic	**Policy**
Climate Adaptation and Resiliency	Policy S 2.1: Explore the feasibility of community microgrids that are driven by renewable energy sources to increase local energy resilience during grid power outages, reduce reliance on long-distance transmission lines, and reduce strain on the grid when demand for electricity is high.
	Policy S 2.2: Plan for future climate impacts on critical infrastructure and essential public facilities.
	Policy S 2.3: Require new residential subdivisions and new accessory dwelling units within hazard areas to meet required evacuation standards.
	Policy S 2.4: Promote the creation of resilience hubs in frontline communities that are at highly vulnerable to climate hazards and ensure that they have adequate resources to adapt to climate-induced emergencies.
	Policy S 2.5: Promote the development of community-based and workplace groups such as Community Emergency Response Teams to improve community resilience to climate emergencies.
	Policy S 2.6: Promote climate change and resilience awareness education about the effects of climate change-induced hazards and ways to adapt and build resiliency to climate change.
	Policy S 2.7: Increase the capacity of frontline communities to adapt to climate impacts by focusing planning efforts and interventions on communities facing the greatest vulnerabilities and ensuring representatives of these communities have a role in the decision-making process for directing climate change response.
Goal S 3: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property damage due to flood and inundation hazards.	

Topic	Policy
Flood Hazards	Policy S 3.1: Strongly discourage development in the County's Flood Hazard Zones, unless it solely provides a public benefit.
	Policy S 3.2: Strongly discourage development from locating downslope from aqueducts, unless it solely provides a public benefit.
	Policy S 3.3: Promote the use of natural, or nature-based, flood protection measures to prevent or minimize flood hazards, where feasible.
	Policy S 3.4: Ensure that developments located within the County's Flood Hazard Zones are sited and designed to avoid isolation from essential services and facilities in the event of flooding.
	Policy S 3.5: Ensure that biological and natural resources are protected during rebuilding after a flood event.
	Policy S 3.6: Infiltrate development runoff on-site, where feasible, to preserve or restore the natural hydrologic cycle and minimize increases in stormwater or dry weather flows.
Goal S 4: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property damage due to fire hazards.	
Topic	**Policy**
Fire Hazards	Policy S 4.1: Prohibit new subdivisions in VHFHSZs unless: (1) the new subdivision is generally surrounded by existing or entitled development or is located in an existing approved specific plan or is within the boundaries of a communities facility district adopted by the County prior to January 1, 2022, including any improvement areas and future annexation areas identified in the County resolution approving such district; (2) the County determines there is sufficient secondary egress; and (3) the County determines the adjoining major highways and street networks are sufficient for evacuation as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County. Discourage new subdivisions in all other FHSZs.
	Policy S 4.2: New subdivisions shall provide adequate evacuation and emergency vehicle access to and from the subdivision on streets or street systems that are evaluated for their traffic access or flow limitations, including but not limited to weight or vertical clearance limitations, dead-end, one-way, or single lane conditions.
	Policy S 4.3: Ensure that biological and natural resources are protected during rebuilding after a wildfire event.
	Policy S 4.4: Reduce the risk of wildland fire hazards through meeting minimum State and local regulations for fire-resistant building materials, vegetation management, fuel modification, and other fire hazard reduction programs.
	Policy S 4.5: Encourage the use of climate-adapted plants that are compatible with the area's natural vegetative habitats.
	Policy S 4.6: Ensure that infrastructure requirements for new development meet minimum State and local regulations for ingress, egress, peak load water supply availability, anticipated water supply, and other standards within FHSZs.

	Policy S 4.7: Discourage building mid-slope, on ridgelines and on hilltops, and employ adequate setbacks on and below slopes to reduce risk from wildfires and post-fire, rainfall-induced landslides and debris flows.
	Policy S 4.8: Support the retrofitting of existing structures in FHSZs to meet current safety regulations, such as the building and fire code, to help reduce the risk of structural and human loss due to wildfire.
	Policy S 4.9: Adopt by reference the County of Los Angeles Fire Department Strategic Fire Plan, as amended.
	Policy S 4.10: Encourage the planting of native oaks in strategic locations and near existing oak woodlands, including those to be mapped in the Oak Woodlands Conservation Management Plan, to protect developments from wildfires, as well as to lessen fire risk associated with developments.
	Policy S 4.11: Support efforts to address unique pest, disease, exotic species and other forest health issues in open space areas to reduce fire hazards and support ecological integrity.
	Policy S 4.12: Support efforts to incorporate systematic fire protection improvements for open space, including the facilitation of safe fire suppression tactics, standards for adequate access for firefighting, fire mitigation planning with landowners and other stakeholders, and water sources for fire suppression.
	Policy S 4.13: Encourage the siting of major landscape features, including but not limited to large water bodies, productive orchards, and community open space at the periphery of new subdivisions to provide strategic firefighting advantage and function as lasting firebreaks and buffers against wildfires, and the maintenance of such features by respective property owners.
	Policy S 4.14: Encourage the strategic placement of structures in FHSZs that conserves fire suppression resources, increases safety for emergency fire access and evacuation, and provides a point of attack or defense from a wildfire.
	Policy S 4.15: Encourage rebuilds and additions to comply with fire mitigation guidelines.
	Policy S 4.16: Require local development standards to meet or exceed SRA Fire Safe Regulations, which include visible home and street addressing and signage and vegetation clearance maintenance on public and private roads; all requirements in the California Building Code and Fire Code; and Board of Forestry Fire Safe Regulations.
	Policy S 4.17: Coordinate with agencies, including the Fire Department and ACWM, to ensure that effective fire buffers are maintained through brush clearance and fuel modification around developments.
	Policy S 4.18: Require Fire Protection Plans for new residential subdivisions in FHSZs that minimize and mitigate potential loss from wildfire exposure and reduce impact on the community's fire protection delivery system.
	Policy S 4.19: Ensure all water distributors providing water in unincorporated Los Angeles County identify, maintain, and ensure the long-term integrity of future water supply for fire suppression needs, and ensure that water supply infrastructure adequately supports existing and future development and redevelopment, and provides adequate water flow to combat structural and wildland fires, including during peak domestic demand periods.

	Policy S 4.20: Prohibit new and intensification of existing general assembly uses in VHFHSZs unless: (1) the use is located in an existing approved specific plan or (2) the County determines there is sufficient secondary egress and the County determines the adjoining major highways and street networks are sufficient for evacuation, as well as safe access for emergency responders under a range of emergency scenarios, as determined by the County. Discourage new general assembly uses in all other FHSZs.
Goal S 5: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property damage due to extreme heat and drought impacts.	
Topic	**Policy**
Extreme Heat	Policy S 5.1: Encourage building designs and retrofits that moderate indoor temperatures during extreme heat events.
	Policy S 5.2: Encourage the addition of shade structures in the public realm through appropriate means, and in frontline communities.
	Policy S 5.3: Encourage the use of cooling methods to reduce the heat retention of pavement and surfaces.
	Policy S 5.4: Ensure all park facilities, including recreational sports complexes, include a tree canopy, shade structures and materials with low solar gain to improve usability on high heat days and reduce heat retention.
	Policy S 5.5: Encourage alternatives to air conditioning such as ceiling fans, air exchangers, increased insulation and low solar gain exterior materials to reduce peak electrical demands during extreme heat events to ensure reliability of the electrical grid.
	Policy S 5.6: Coordinate with demand-response/paratransit transit services prior to expected extreme heat days to ensure adequate capacity for customer demand for transporting to cooling centers.
	Policy S 5.7: Coordinate with local transit agencies to retrofit existing bus stops, where feasible, with shade structures to safeguard the health and comfort of transit users.
	Policy S 5.8: Enhance and sustainably manage urban forests that provide shade and cooling functions.
	Policy S 5.9: Promote greater awareness of the impacts of extreme heat exposure on the most vulnerable populations, such as seniors, people living in poverty, those with chronic conditions, and outdoor workers.
Drought	Policy S 5.10: Protect and improve local groundwater quality and supply to increase opportunities for use as a potable water source during drought periods.
	Policy S 5.11: Encourage the conservation of water by employing soil moisture sensors, automated irrigation systems, subsurface drip irrigation, and weather-based irrigation controllers.
	Policy S 5.12: Encourage water efficiency in buildings through upgrading appliances and building infrastructure retrofits.

	Policy S 5.13: Encourage the use of drought tolerant landscaping in new developments to reduce reliance on potable and recycled water resources.
	Policy S 5.14: Encourage the installation of grey water reuse systems in new developments.
Goal S 6: An effective regulatory system that prevents or minimizes personal injury, loss of life, and property damage due to human-made hazards.	
Topic	**Policy**
Human-made Hazards	Policy S 6.1: Assess public health and safety risks associated with existing oil and gas facilities in the unincorporated Los Angeles County.
	Policy S 6.2: Coordinate with State and regional air quality agencies to ensure funding and implementation of annual inspections, ongoing air monitoring, and health impact assessment data continue to be collected and used to prioritize and facilitate the timely phase out of existing wells.
	Policy S 6.3: Support State and federal policies and proposals that increase funding sources to help plug, abandon, remediate and revitalize idle and orphaned well sites, and advocate for increased funding that will provide critical relief to the County and its residents.
Goal S 7: Effective County emergency response management capabilities.	
Topic	**Policy**
Emergency Response	Policy S 7.1: Ensure that residents are protected from the public health consequences of natural or human-made disasters through increased readiness and response capabilities, risk communication, and the dissemination of public information.
	Policy S 7.2: Support County emergency providers in reaching their response time goals.
	Policy S 7.3: Coordinate with other County and public agencies, such as transportation agencies and health care providers, on emergency planning and response activities, and evacuation planning.
	Policy S 7.4: Encourage the improvement of hazard prediction and early warning capabilities.
	Policy S 7.5: Ensure that there are adequate resources, such as sheriff and fire services, for emergency response.
	Policy S 7.6: Ensure that essential public facilities are maintained during disasters, such as flooding, wildfires, extreme temperature and precipitation events, drought, and power outages.
	Policy S 7.7: Locate essential public facilities, such as hospitals, where feasible, outside of hazard zones identified in the Safety Element to ensure their reliability and accessibility during disasters.
	Policy S 7.8: Adopt by reference the County of Los Angeles All-Hazards Mitigation Plan, as amended.
	Policy S 7.9: Work cooperatively with public agencies with responsibility for flood and fire protection, and with stakeholders in planning for flood and fire hazards.

Public Services and Facilities Element Goals and Policies

Goal PS/F 1: A coordinated, reliable, and equitable network of public facilities that preserves resources, ensures public health and safety, and keeps pace with planned development.	
Topic	**Policy**
Sufficient Infrastructure	Policy PS/F 1.1: Discourage development in areas without adequate public services and facilities.
	Policy PS/F 1.2: Ensure that adequate services and facilities are provided in conjunction with development through phasing or other mechanisms.
	Policy PS/F 1.3: Ensure coordinated service provision through collaboration between County departments and service providers.
	Policy PS/F 1.4: Ensure the adequate maintenance of infrastructure.
	Policy PS/F 1.5: Focus infrastructure investment, maintenance and expansion efforts where the General Plan encourages development.
	Policy PS/F 1.6: Support multi-faceted public facility expansion efforts, such as substations, mobile units, and satellite offices.
	Policy PS/F 1.7: Consider resource preservation in the planning of public facilities.
Goal PS/F 2: Increased water conservation efforts.	
Topic	**Policy**
Water Conservation	Policy PS/F 2.1: Support water conservation measures.
	Policy PS/F 2.2: Support educational outreach efforts that discourage wasteful water consumption.
Goal PS/F 3: Increased local water supplies through the use of new technologies.	
Topic	**Policy**
Water Supply	Policy PS/F 3.1: Increase the supply of water though the development of new sources, such as recycled water, gray water, and rainwater harvesting.
	Policy PS/F 3.2: Support the increased production, distribution and use of recycled water, gray water, and rainwater harvesting to provide for groundwater recharge, seawater intrusion barrier injection, irrigation, industrial processes and other beneficial uses.
Goal PS/F 4: Reliable sewer and urban runoff conveyance treatment systems.	
Topic	**Policy**
Sanitary Sewers	Policy PS/F 4.1: Encourage the planning and continued development of efficient countywide sewer conveyance treatment systems.

	Policy PS/F 4.2: Support capital improvement plans to improve aging and deficient wastewater systems, particularly in areas where the General Plan encourages development, such as TODs.
	Policy PS/F 4.3: Ensure the proper design of sewage treatment and disposal facilities, especially in landslide, hillside, and other hazard areas.
	Policy PS/F 4.4: Evaluate the potential for treating stormwater runoff in wastewater management systems or through other similar systems and methods.
Goal PS/F 5: Adequate disposal capacity and minimal waste and pollution.	
Topic	**Policy**
Waste Management	Policy PS/F 5.1: Maintain an efficient, safe and responsive waste management system that reduces waste while protecting the health and safety of the public.
	Policy PS/F 5.2: Ensure adequate disposal capacity by providing for environmentally sound and technically feasible development of solid waste management facilities, such as landfills and transfer/processing facilities.
	Policy PS/F 5.3: Discourage incompatible land uses near or adjacent to solid waste disposal facilities identified in the Countywide Integrated Waste Management Plan.
Waste Diversion	Policy PS/F 5.4: Encourage solid waste management facilities that utilize conversion and other alternative technologies and waste to energy facilities.
	Policy PS/F 5.5: Reduce the County's waste stream by minimizing waste generation and enhancing diversion.
	Policy PS/F 5.6: Encourage the use and procurement of recyclable and biodegradable materials.
	Policy PS/F 5.7: Encourage the recycling of construction and demolition debris generated by public and private projects.
	Policy PS/F 5.8: Ensure adequate and regular waste and recycling collection services.
	Policy PS/F 5.9: Encourage the availability of trash and recyclables containers in new developments, public streets, and large venues.
Goal PS/F 6: A County with adequate public utilities.	
Topic	**Policy**
Utility Infrastructure	Policy PS/F 6.1: Ensure efficient and cost-effective utilities that serve existing and future needs.
	Policy PS/F 6.2: Improve existing wired and wireless telecommunications infrastructure.
	Policy PS/F 6.3: Expand access to wireless technology networks, while minimizing visual impacts through co-location and design.

	Policy PS/F 6.4: Protect and enhance utility facilities to maintain the safety, reliability, integrity and security of utility services.
	Policy PS/F 6.5: Encourage the use of renewable energy sources in utility and telecommunications networks.
	Policy PS/F 6.6: Encourage the construction of utilities underground, where feasible.
	Policy PS/F 6.7: Discourage above-ground electrical distribution and transmission lines in hazard areas.
	Policy PS/F 6.8: Encourage projects that incorporate onsite renewable energy systems.
	Policy PS/F 6.9: Support the prohibition of public access within, and the limitation of access in areas adjacent to natural gas storage facilities and oil and gas production and processing facilities to minimize trespass and ensure security.
	Policy PS/F 6.10: Encourage utility siting to be localized and decentralized to reduce impacts; reduce transmission losses; promote local conservation by connecting users to their systems more directly; and reduce system malfunctions.
Goal PS/F 7: A County with adequate educational facilities.	
Topic	**Policy**
Early Care and Educational Facilities	Policy PS/F 7.1: Encourage the joint-use of school sites for community activities and other appropriate uses.
	Policy PS/F 7.2: Proactively work with school facilities and education providers to coordinate land use and facilities planning.
	Policy PS/F 7.3: Encourage adequate facilities for early care and education.
Goal PS/F 8: A comprehensive public library system.	
Topic	**Policy**
Library System	Policy PS/F 8.1: Ensure a desired level of library service through coordinated land use and facilities planning.
	Policy PS/F 8.2: Support library mitigation fees that adequately address the impacts of new development.

Economic Development Element Goals and Policies

Goal ED 1: An economic base and fiscal structures that attract and retain valuable industries and businesses.	
Topic	**Policy**
Target Industries	Policy ED 1.1: Encourage a diverse mix of industries and services in each Planning Area.
	Policy ED 1.2: Encourage and foster the development of the renewable energy economic sectors.
	Policy ED 1.3: Encourage public-private partnerships to support the growth of target industries.
	Policy ED 1.4: Encourage the expansion and retention of targeted industries and other growth economic sectors, such as the entertainment industry, aerospace industry, agriculture, transportation/logistics, healthcare, biomed/biotech, hospitality and tourism.
County Incentives for Business	Policy ED 1.5: Provide quality, responsible, and business-friendly municipal services to attract and retain businesses and employees.
	Policy ED 1.6: Develop, advance, and promote competitive advantages for economic development and growth.
	Policy ED 1.7: Identify opportunities to lower the costs of doing business in Los Angeles County.
	Policy ED 1.8: Promote Los Angeles County as a national and international center for business, global trade, and development.
Goal ED 2: Land use practices and regulations that foster economic development and growth.	
Topic	**Policy**
Industrial Land	Policy ED 2.1: Protect industrial lands, especially within Employment Protection Districts, from conversion to non-industrial uses.
	Policy ED 2.2: Utilize adequate buffering and other land use practices to facilitate the compatibility between industrial and non-industrial uses.
Business and Environmental Justice	Policy ED 2.3: Ensure environmental justice in economic development activities.
	Policy ED 2.4: Ensure high standards of development and encourage environmentally sustainable practices in economic development activities.
	Policy ED 2.5: Encourage employment opportunities to be located in proximity to housing.
	Policy ED 2.6: Encourage community-serving uses, such as child care centers and personal services, to be located in proximity to employment centers.
	Policy ED 2.7: Incentivize economic development and growth along existing transportation corridors and in urbanized areas.

Streamlined Permit Processing	Policy ED 2.8: Streamline the permit review process and other entitlement processes for businesses and industries.
Agriculture	Policy ED 2.9: Support zoning incentives for the operation of farms in Agricultural Resource Areas (ARAs).
Goal ED 3: An expanded and improved infrastructure system to support economic growth and development.	
Topic	**Policy**
Infrastructure Improvements	Policy ED 3.1: Utilize capital improvement plans to prioritize infrastructure investments.
	Policy ED 3.2: Support the use of public-private partnerships to develop, fund, and deliver critical infrastructure.
	Policy ED 3.3: Work with state agencies dedicated to financing important critical infrastructure and economic development projects.
Goal ED 4: Enhanced revitalization activities.	
Topic	**Policy**
Economic Development Strategies	Policy ED 4.1: Develop a range of financial incentives and programs that encourage development and business growth.
	Policy ED 4.2: Support the development of community-level economic development strategies in line with the Los Angeles County Strategic Plan for Economic Development.
	Policy ED 4.3: Support the development of small business assistance and entrepreneurial programs that are focused on management, financial planning, and technology application.
Infill Development	Policy ED 4.4: Incentivize infill development in urban and suburban areas that revitalizes underutilized commercial and industrial areas.
	Policy ED 4.5: Direct resources to economically distressed areas to spur revitalization activities.
	Policy ED 4.6: Retrofit and reuse vacant and underutilized industrial and commercial sites in urban and suburban areas for emerging and targeted industries.
	Policy ED 4.7: Support expedited permitting for green building retrofits.
Goal ED 5: A skilled and educated workforce.	
Topic	**Policy**
Education	Policy ED 5.1: Attract and retain highly-skilled graduates, in particular, graduates of science and engineering programs.

	Policy ED 5.2: Support and create collaborative educational programs that address specific under-employed populations and workforce needs in targeted areas.
	Policy ED 5.3: Encourage outreach efforts to educational and community-learning institutions to expand workforce education programs.
	Policy ED 5.4: Expand functional literacy and English as a Second Language (ESL) programs.
	Policy ED 5.5: Support linked programs that align high schools with community colleges and four-year institutions.
	Policy ED 5.6: Engage employers earlier in the education and workforce development process to ensure work-readiness and a smooth transition from school or training to work placement.
Job Training	Policy ED 5.7: Ensure that businesses have enough skilled workers to meet their workforce needs.
	Policy ED 5.8: Prepare, train, and educate job seekers and incumbent workers to find and advance in high-value, high-wage jobs with built-in career ladders.
	Policy ED 5.9: Promote the attraction, retention and expansion of commercial and industrial firms that provide employment improvement opportunities for unskilled and semi-skilled workers.
	Policy ED 5.10: Initiate vocational training programs that provide the skills necessary for participation in the labor force.
	Policy ED 5.11: Collaborate with the private sector to identify growing workforce needs and link training initiatives to the needs of target industries.
	Policy ED 5.12: Establish employer assistance initiatives to expand skilled trades training and vocational education for high demand occupations.
	Policy ED 5.13: Play a leadership role in convening and coordinating the activities of key regional workforce development system stakeholders, including the six other WIBS that operate within Los Angeles County, as well as community colleges, businesses, K-12 institutions, philanthropic partners and others.
Goal ED 6: Collaborative efforts to implement coordinated economic development activities.	
Topic	**Policy**
Coordinated Economic Development	Policy ED 6.1: Encourage a collaborative inter-agency and inter-jurisdictional environment to align economic development activities and promote information sharing on economic trends, business cycles, best practices, and resources.
	Policy ED 6.2: Analyze emerging trends for policy modification, and maintain and update accurate labor force, market trends, and other important economic data.
	Policy ED 6.3: Strengthen cooperation with private sector organizations, economic development organizations, and community level business groups.

ATTACHMENT 17

EXCERPTS FROM THE CITY OF POMONA ZONING CODE

Sec. 530. Use Definitions

530.A. Use Interpretation

1. General

Uses are organized by use category (Household Living, Community Care Center) and then by specific use within that category (Dwelling Unit, Live/Work Unit). Use categories are used to organize specific uses with similar attributes, which may be assigned use standards in *Sec. 540. Use Standards*. Specific uses within each use category have permissions that determine if that use is allowed in a particular zoning district.

2. Determination of Similarity

a. When a proposed use is not listed, the Development Services Director has the responsibility for determining whether the proposed use is similar to an already listed use. Where a use contains a list of included uses, the uses on the list are to be considered example uses, and not all-inclusive. The Development Services Director will first determine what use category the use is most similar to and then determine what specific use within that use category the use is most similar to.

b. When determining whether a proposed use is similar to an already listed use, the Development Services Director must consider the following criteria:

1. The actual or projected characteristics of the proposed use.
2. The relative amount of lot area or floor area and equipment devoted to the proposed use.
3. Relative amounts of sales.
4. The customer type.
5. The relative number of employees.
6. Hours of operation.
7. Building and site arrangement.
8. Types of vehicles used and their parking demands.
9. The number of vehicle trips generated.
10. How the proposed use is advertised.
11. The likely impact on surrounding properties.
12. The amount of outdoor storage that might be anticipated.
13. The amount truck traffic that might be generated.

c. Where a proposed use is found by the Development Services Director to not be similar to an already listed use, the use is only permitted following a zoning text amendment as defined in *Sec. 1150.D. Zoning and Development Code Amendment*.

d. The Development Services Director must maintain a catalog that records each determination of similarity.

530.B. Residential Uses

1. Household Living

a. Dwelling Unit

Any housing accommodations serving as a primary residency or having a tenancy of 30 days or greater. Includes permanent co-living, supportive housing, transitional housing, and farmworker housing as defined in the California Health and Safety Code.

b. Manufactured Housing Park

Any site containing more than 2 manufactured housing units. A manufactured housing unit refers to a dwelling unit built with a vehicular chassis, designed and equipped for human habitation, and for being drawn by a motor vehicle, conforming to the National Mobile Home Construction and Safety Standards Act of 1974. Examples include park trailers, mobile homes, manufactured homes, and recreational vehicles.

c. Live/Work Unit

Any dwelling unit or sleeping unit in which a significant portion of the space includes a nonresidential use that is operated by the tenant or building owner. The following applies to live/work units as defined in the California Building Code *(Sec. 508.5.1.)*:

1. The live/work unit is permitted to be not greater than 3,000 square feet in area.
2. The nonresidential area is permitted to be not more than 50 percent of the area of each live/work unit.
3. The nonresidential area function must be limited to the first or main floor only of the live/work unit.
4. Not more than five nonresidential workers or employees are allowed to occupy the nonresidential area at any one time.

d. Family Day Care, Small

Any small family day care home which cares for up to 8 children, without an additional adult attendant as defined in the California Health and Safety Code *(Sec. 1597.44.)*.

e. Family Day Care, Large

Any large family day care home which cares for up to 14 children as defined in the California Health and Safety Code *(Sec. 1597.46.)*.

f. Low-Barrier Navigation Center

1. Any housing-first, low-barrier, service-enriched shelter focused on moving people into permanent housing that provides temporary living facilities while case managers connect individuals experiencing homelessness to income, public benefits, health services, shelter, and housing as defined by the as defined in the California Government Code *(Sec.*

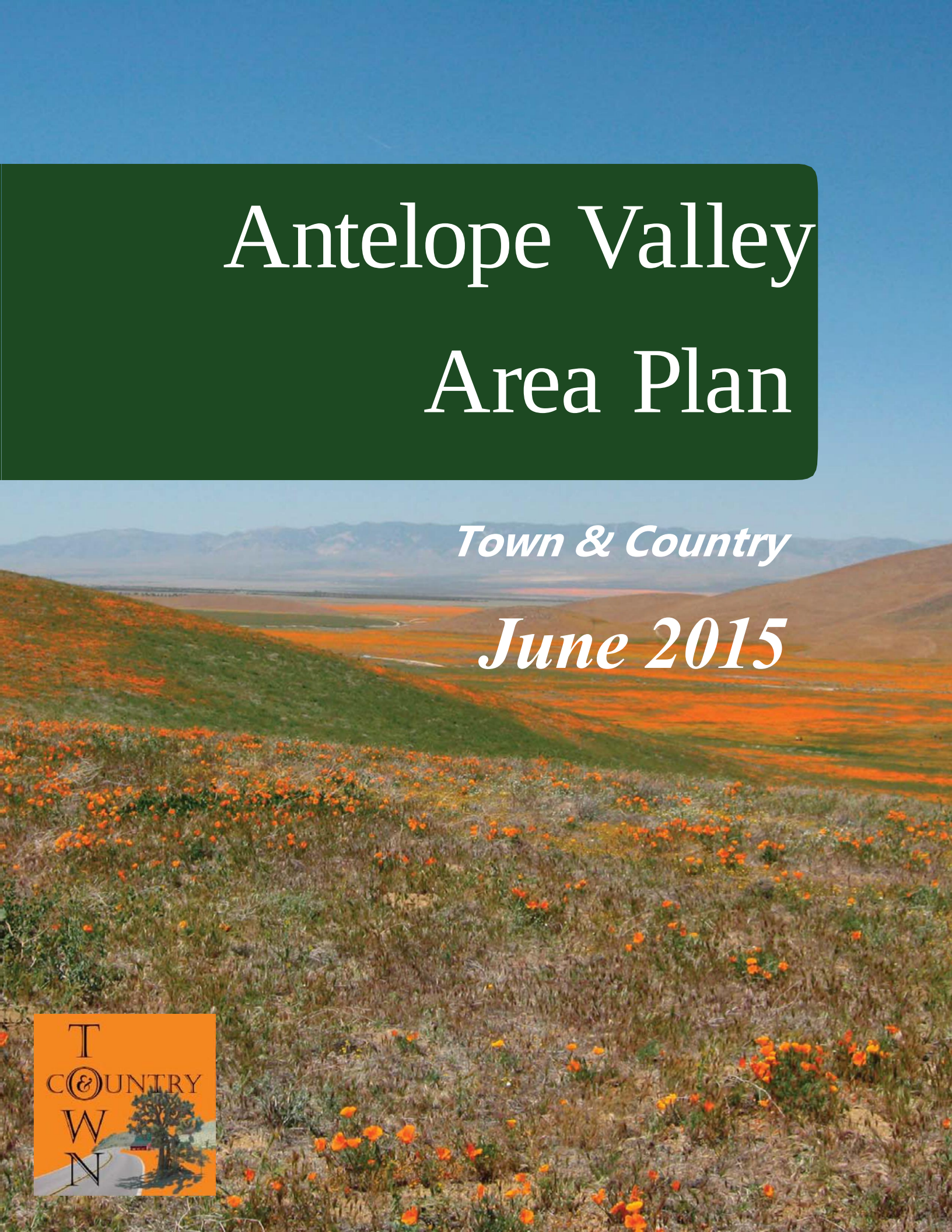
ATTACHMENT 16

THE ANTELOPE VALLEY AREA PLAN

Antelope Valley Area Plan

Town & Country

June 2015



Los Angeles County Department of Regional Planning

Antelope Valley Area Plan

Town & Country

June 2015

ñTo enrich lives through effective

ñTo improve the quality of life through innovative and resourceful physical and environmental planning, balancing

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Los Angeles County Department of Regional Planning

Antelope Valley Area Plan

Town & Country

June 2015

Chapter 1

Chapter 1: Introduction

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I. PURPOSE AND VALUES

Purpose

The purpose of the Antelope Valley Area Plan (Area Plan) is to achieve the communities' shared vision of the future through the development of specific goals, policies, land use and zoning maps, and other planning instruments. This shared vision is articulated in the Town and Country Vision Statement, which was developed by the Antelope Valley communities in various workshops in 2008. It goes:

> The Antelope Valley region is a wonderful place to live, work, play, and raise a family. The Valley is a mosaic of unique small towns in which rural lifestyles are cherished. These diverse towns are unified by an extraordinary environmental setting that includes agricultural lands, natural open spaces, expansive mountain views, diverse ecological habitats, and dark night skies. The Valley's network of trails, roads, and transit link these dispersed towns to each other and to a wide offering of local-serving businesses and quality social, educational, cultural, and recreational services and facilities.
>
> Residents, business owners, and property owners collaborate with a responsive local government to ensure that life in the Antelope Valley region will continue to be exciting, enjoyable, and rewarding. The growing population's need for additional housing and employment opportunities is balanced against the need to respect historical heritage and preserve the natural environment. Public improvements and private developments are sustainable, conserving available resources and relying on alternative energy sources, and complement the small scale of existing rural towns. A wide array of activities and opportunities for youth ensure that the Valley's high quality of life will be sustained for future generations.

The Area Plan is a blueprint for future development and conservation in the Antelope Valley that informs decision-making at all levels to help ensure that individual activities are consistent with, and supportive of, the communities' vision. It is a tool for residents, elected officials, planners, service providers, and developers. Each group will use the Area Plan in different ways, but all are guided by its vision, goals, and policies. Residents will use the Area Plan as a benchmark in attaining their aspirations for the development and preservation of their communities. Elected officials and planners will refer to the Area Plan when allocating resources to address residents' most important issues and priorities. Service providers will use the Area Plan as a guide for deciding which infrastructure and improvement projects should be undertaken and which programs should be established or improved. Developers will look to the Area Plan's goals and policies in deciding what to build, including location, character, and appearance.

As a component of the Los Angeles County General Plan, the Antelope Valley Area Plan refines the countywide goals and policies in the General Plan by addressing specific issues relevant to the Antelope Valley, such as community maintenance and appearance, and provides more specific guidance on

elements already found in the General Plan. The General Plan provides guidance on all issues not covered in the Area Plan.

The Area Plan also helps further the countywide objective of reducing greenhouse gases in order to meet the goals of the California Global Warming Solutions Act of 2006 (Assembly Bill 32) and California's Sustainable Communities and Climate Protection Act (Senate Bill 375), which aim to achieve reductions of greenhouse gases. Los Angeles County has undertaken countywide measures to address these mandates, including adoption of the Green Building, Drought Tolerant Landscaping, and Low Impact Development Ordinances in 2008. The Area Plan strengthens these efforts by including goals and policies to support local development practices and initiatives to reduce greenhouse gas emissions. Implementation of the Land Use, Mobility, and Conservation and Open Space Elements contained in this Area Plan cumulatively affect the future reduction of greenhouse gases both locally and regionally.

Values

All aspects of the Area Plan are informed by a set of core values that ground and guide the Area Plan. In order to best serve the common interests represented in this Area Plan, planning values outline the shared responsibilities of the many partners who will work together to transform goals and policies into a realized vision. The core values of the Antelope Valley Area Plan are:

1. **Collaboration**: The issues and actions identified in the Area Plan are multi-dimensional and complex. As such, it takes a collaborative effort to accomplish the Area Plan's goals. Working in partnership with individuals from public agencies, private organizations and throughout the community, participants in planning and implementation of the Area Plan can come together to achieve the community's vision.

2. **Participation:** The dedicated commitment and ongoing participation of community members, service providers and elected officials will ensure that the Area Plan's implementation over time remains in line with the communities' vision. Community participation also demonstrates to elected leaders and service providers that constituents support the implementation of the Area Plan and expect results.

3. **Accountability**: By adopting this Area Plan, elected leaders have expressed their commitment to achieving the communities' vision by adhering to the Area Plan's goals and policies and by using the implementation actions to guide their work. Land use decisions will be made to benefit the needs of the community as a whole and not individual interests. Accountability means that all stakeholders take responsibility for their respective components of the Area Plan.

4. **Stewardship**: In order for the Area Plan to be effective in achieving the community's goals, people who live, learn, work, and play in the Antelope Valley will have to take an active role in ensuring the Area Plan's timely and thorough implementation. Community members and service providers can and should provide feedback on the insights into the Area Plan's effectiveness.

5. **Balance**: As the diverse and sometimes conflicting needs of current and future stakeholders evolve, the tools within the Area Plan create a framework which allows for balanced decisions to be made. For residents of the Antelope Valley, achieving a balance will unfold gradually. This shall be achieved by encouraging growth and development in appropriate areas of the Antelope Valley and ensuring that these enhance the quality of life of the communities without compromising their rural character.

II. BACKGROUND

Setting

The Antelope Valley planning area is bounded by the Kern County border to the north, the Ventura County border to the west, the Angeles National Forest (inclusive) to the south, and the San Bernardino County border to the east. It excludes the Cities of Lancaster and Palmdale. This area covers approximately 1,800 square miles and includes over two dozen communities.

For a map of the Antelope Valley and the immediate vicinity, please see Map 1.1: Planning Area Boundary.

History

The historic development of the Antelope Valley started in 1876 with the completion of the Southern Pacific Railroad line from San Francisco to Los Angeles via the Antelope Valley. Many communities began to develop, including Lancaster, Palmdale, Rio del Llano and Littlerock, all dependent upon stock raising, dry farming and fruit orchards.

The World War II years brought the development of Edwards Air Force Base and a doubling of the Antelope Valley population. Military defense work expanded in the 1950s, and Palmdale Airport emerged as a national center for jet testing. The latter part of the decade saw the start of an economic downturn throughout the country that slowed military investments in Antelope Valley projects.

The final decades of the 20th century saw the Antelope Valley emerge with major new housing opportunities as vast acreages were subdivided for affordable tract homes. Lancaster and Palmdale incorporated as independent cities, and rural communities continued to grow. Farming regained its status as a productive employer, but the area continued to develop without balancing the growth in housing with a corresponding growth in jobs and investment in infrastructure. Today, many who live in the Antelope Valley commute to jobs in other parts of the Los Angeles Basin. New local commercial centers are expanding the shopping, entertainment and employment opportunities of Antelope Valley residents. For additional information on the setting and history of the Antelope Valley, please see Background Report.

Past and Current Planning Efforts

The previous Antelope Valley Areawide General Plan was adopted by the Los Angeles County Board of Supervisors on December 4, 1986. It contained Valleywide goals and policies pertaining to land use, housing, community revitalization, community design, human resources, circulation, public services and facilities, governmental services, environmental resource management, noise abatement, seismic safety, public safety, and energy conservation. This Area Plan replaces the previous Antelope Valley Areawide General Plan in its entirety.

This Area Plan covers issues that were important in 1986 and are still important to the communities; for example, managing growth, minimizing disruption of ecological resources, placing development away from natural hazards, and ensuring a variety of housing types and costs. This Area Plan also addresses new issues that have emerged in recent years; for example, maintaining agricultural uses, improving mobility, developing renewable energy resources, and curbing greenhouse gas emissions.

Community Participation

The Area Plan is the result of a highly inclusive and extensive community participation program launched in the fall of 2007. Through a series of 23 community meetings, residents and other stakeholders worked alongside planners to develop a shared vision of the future, identify community issues, draft proposals for the future, and prioritize their recommendations, forming the foundation of the Area Plan.

Building on the foundation laid by the communities, planners partnered with other County departments to explore the recommendations, refine the proposed goals and policies, plan for program implementation, and gather support to ensure success. Plan development is an iterative process, and in this case, the communities were included in the earliest steps of development and subsequent rounds of review. The Area Plan began with, and will be realized by, the dedicated residents and stakeholders who have committed, and will continue to commit their time, energy and interests to the Antelope Valley.

III. VISION AND STRATEGY

Vision Statement

At the heart of the County's approach to community planning is the idea that the Area Plan is an adopted version of the communities' aspirations for the future. Collectively, those aspirations amount to a community vision, based on shared values and common goals. The communities reached consensus on the following vision statement:

> The Antelope Valley region is a wonderful place to live, work, play, and raise a family. The Valley is a mosaic of unique small towns in which rural lifestyles are cherished. These diverse towns are unified by an extraordinary environmental setting that includes agricultural lands, natural open spaces, expansive mountain views, diverse ecological

habitats, and dark night skies. The Valley's network of trails, roads, and transit link these dispersed towns to each other and to a wide offering of local-serving businesses and quality social, educational, cultural, and recreational services and facilities.

Residents, business owners, and property owners collaborate with a responsive local government to ensure that life in the Antelope Valley region will continue to be exciting, enjoyable, and rewarding. The growing population's need for additional housing and employment opportunities is balanced against the need to respect historical heritage and preserve the natural environment. Public improvements and private developments are sustainable, conserving available resources and relying on alternative energy sources, and complement the small scale of existing rural towns. A wide array of activities and opportunities for youth ensure that the Valley's high quality of life will be sustained for future generations.

This vision of the Antelope Valley's future serves as a touchstone through the planning process, and it is reflected in the land use map, goals, and policies that comprise the Area Plan.

Issues

Through the planning and visioning process, the County identified issues of Valleywide significance that, it determined, were best addressed in a comprehensive and coordinated manner. In anticipation of future growth, the planning effort focused on ways to manage this growth and addressed the need for balance on the following issues:

1. Preservation and enhancement of each unique town's rural character, allowing for continued growth and development without compromising the rural lifestyle;
2. Preservation of open space around existing towns, in order to preserve hillside areas and significant ridgelines, conserve biological resources, provide opportunities for recreation, and make more efficient use of existing infrastructure in the core areas;
3. Planning for integrated circulation systems, including bikeways, walkways, and multi-purpose trails;
4. Conservation of significant resources, including agricultural lands, mineral resources, water supply, and scenic areas;
5. Preservation of public health, safety, and welfare, through identification of natural and environmental hazards, including noise, seismic, fire, and airborne emissions, and designation of land uses in an appropriate manner to mitigate these impacts; and
6. Coordination on enhancing public and community services such as law enforcement, fire protection, and parks.

Rural Preservation Strategy

The Area Plan's Rural Preservation Strategy addresses issues of Valleywide significance in a manner that builds upon the communities' vision statement. While each community in the Antelope Valley possesses its own identity, they are all unified in the pursuit of preserving the rural lifestyle and the rural

character of the region. This rural character is what makes the Antelope Valley so unique and valuable to the rest of Southern California.

The term "rural" is defined by the following characteristics:

- Living in a low density environment without high intensity land uses, such as regional commercial centers;
- A natural, peaceful, quiet setting, with the ability to find a sense of solitude;
- Views of adjacent natural areas by day, such as hillsides and ridgelines, and views of starry skies by night;
- Agricultural and equestrian uses that are sensitive to the land; and
- An absence of infrastructure generally found in urban and suburban areas, including but not limited to curbs, gutters, sidewalks, street lighting, and traffic signals.

The Rural Preservation Strategy is based on four types of environments – rural town center areas, rural town areas, rural preserve areas, economic opportunity areas – that serve different purposes. Collectively, these environments preserve the rural character of the region, conserve environmental resources, and protect residents from potential hazards while allowing for additional growth and development. For more information on these environments, please see Chapter 2: Land Use Element.

Rural town center areas are the focal points of rural communities, serving the daily needs of residents and providing local employment opportunities. The majority of new locally-oriented public facilities and new locally-oriented commercial uses should be directed to these areas. These areas will provide pleasant pedestrian environments and will be accessible by a range of transportation options to reduce vehicle trips. Some of these areas will allow for a mix of commercial and residential uses.

Rural town areas provide a transition between rural town center areas and rural preserve areas, as they are occupied by a mix of residential and light agricultural uses. Residents living in these areas are willing to forego urban infrastructure and services in order to live in a rural environment. The majority of new residential development should be directed to these areas, provided that such development is consistent with the existing community character and allows for light agricultural, equestrian, and animal-keeping uses where appropriate. These areas will provide transportation linkages to rural town center areas and other nearby destination points.

Rural preserve areas are areas outside of the Town Areas, which are largely undeveloped and generally not served by existing or planned infrastructure and public facilities. Many of these areas contain environmental resources, such as Significant Ecological Areas, Scenic Resource Areas, and Agricultural Resource Areas. In addition, many of these areas contain safety hazards, such as Seismic Zones, Very High Fire Hazard Severity Zones, and Flood Zones. The primary benefit of these areas is that they provide habitat for regionally significant biological species while simultaneously providing scenic value to residents. A secondary benefit of these areas is that they contain natural resources which provide economic opportunities. Development in these areas should be limited to single family homes at very low densities, light and heavy agricultural uses, including equestrian and animal-keeping uses, and other uses where appropriate.

Economic opportunity areas are defined clusters of land along the routes of two new proposed major infrastructure projects in the Antelope Valley, namely the High Desert Corridor and the Northwest 138 Corridor Improvement Project. These areas were identified as having tremendous potential for economic growth and development. Thus, any development induced by these two infrastructure projects should be guided to these areas so that the areas around them can be preserved and maintained at low density, or agricultural uses. This is intended to balance the growth and development which the two projects will undoubtedly bring, with the general intent of this Area Plan to preserve the ecological value and rural character of the Antelope Valley.

The Rural Preservation Strategy necessitates a "trade-off" between preserving rural character and developing additional infrastructure, as infrastructure improvements are typically funded by increased property tax revenues and developer fees. In rural town center areas and rural town areas, the amount of potential development allowed by this Area Plan will be equal to, or greater than, the amount of potential development allowed by the previous Area Plan. Therefore, those areas are likely to benefit from increased property tax revenues and developer fees, which can help fund additional infrastructure. In rural preserve areas, the amount of potential development allowed by this Area Plan will be far less than the amount of potential development allowed by the previous Area Plan. Therefore, rural preserve areas are unlikely to benefit from increased property tax revenues and developer fees, which may make it difficult to fund additional infrastructure. The Area Plan acknowledges this "trade-off" by directing additional infrastructure to rural town center areas and rural town areas, where the placement of additional infrastructure may be more cost-effective and environmentally sensitive, and not to rural preserve areas, where the placement of additional infrastructure may not be necessary. Residents of rural preserve areas should be prepared to forego additional infrastructure in order to live in a very remote rural environment and enjoy the benefits offered by such an environment. On the other hand, the economic opportunity areas provide an opportunity for the Area Plan to maximize the investment that state and regional agencies are bringing into the area, while still achieving the general goal of rural preservation in the Antelope Valley.

IV. HOW TO USE THE ANTELOPE VALLEY AREA PLAN

Definitions

The following definition shall apply only as it specifically appears in this Area Plan and shall not be used in any other context outside of this Area Plan.

> "Legal lot" means any lot created in compliance with the provisions of the Subdivision Map Act, or would qualify for a conditional certificate of compliance as provided in the Subdivision Map Act. Where a conditional certificate of compliance is reviewed by the County, the conditions imposed therein will be based on those required at the time the lot was created, including land use density and required area under the zoning code.

Area Plan Format and Content

The Area Plan is organized into eight chapters. Chapter 1 (Introduction) presents the Area Plan's purpose and values, the geographic area, and the communities' vision statement. Chapter 2 (Land Use Element) discusses how the communities' vision translates into a development pattern through the concept of land use. Chapter 3 (Mobility Element) describes the multi-modal approach to moving around the Antelope Valley. Chapter 4 (Conservation and Open Space Element) describes conservation efforts to address potential threats to natural resources. Chapter 5 (Public Safety, Services and Facilities Element) provides measures to ensure services are in place to maintain the safety and welfare of residents. Chapter 6 (Economic Development Element) provides the blueprint for the planning area to build a healthy and sustainable economic base that will drive development and private-sector led conservation and preservation of open space in the area. Chapters 2 through 6 contain goals and policies specific to each chapter's respective topic but all work jointly to comprehensively implement the overall vision. Chapter 7 (Community-Specific Land Use Concepts) highlights each established town and describes its land use form in more detail. Finally, Chapter 8 (Plan Implementation) describes future planning activities that will be undertaken to further implement the goals and policies of this Area Plan. Appendix A includes descriptions of the Significant Ecological Areas within the Antelope Valley Area Plan.

Applicability

The following provisions shall apply to complete applications filed prior to the effective date of this Antelope Valley Area Plan.

The applicant can choose whether the application will be reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan or this Antelope Valley Area Plan. In either case, approval of the application is not guaranteed.

If an application is reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan, the applicant may modify the application prior to consideration by the Regional Planning Commission, Hearing Officer, or Director. The modification will be reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan if it does not change the housing type (e.g., from single family to two family or multifamily) nor increase:

- The residential density;
- The floor area or lot coverage of non-residential space;
- The amount of grading; or
- The area of ground disturbance.

A modification may necessitate the submittal of revised, updated, or additional materials and reports, such as site plans, elevations, and oak tree reports. In addition, a modification may necessitate

additional environmental review pursuant to the California Environmental Quality Act and the County's environmental review procedures.

Modification to an application that is already approved but not used, can be reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan if it is found to be in substantial conformance with such application as determined by the Director. Otherwise a modification shall be considered a new application and shall be reviewed for consistency with this Antelope Valley Area Plan.

If an approval is used and has a grant term, the approved use may be maintained until the end of the grant term. At the end of the grant term, the use shall be subject to the Antelope Valley Area Plan policies in effect at that time. During the grant term, a modification to the approved use will be reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan if the modification is found to be in substantial conformance with such application as determined by the Director. Otherwise, a modification to the approved use shall be subject to the Antelope Valley Area Plan policies in effect at that time.

If an approval is used and does not have a grant term, the approved use may be maintained in perpetuity unless a time limit is specified in the Zoning Code. In addition, all applicable non-conforming use provisions of the Zoning Code shall apply to the approved use. A modification to the approved use will be reviewed for consistency with the previously adopted Antelope Valley Areawide General Plan if the modification is found to be in substantial conformance with the use originally approved as determined by the Director. Otherwise, a modification to the approved use shall be subject to the Antelope Valley Area Plan policies in effect at that time.

Guidance

The Antelope Valley Area Plan is a component of the Los Angeles County General Plan. All of its maps, goals, policies, and implementing actions must be consistent with the elements of the Countywide General Plan. Users should be guided by the following:

- **General Plan Applicability**: Should any areas of conflicting interpretation arise, unless specifically noted, the provisions of the Countywide General Plan shall prevail.

- **Comprehensive Area Plan**: The Land Use Policy Map is never to be interpreted as a stand-alone document, but must be interpreted in light of applicable written policies in the Area Plan.

- **Equally Weighted Policies**: No policy, whether in written or diagram form, shall be given greater weight than any other policy in evaluating the policy intent of this Antelope Valley Area Plan.

- **Vision and Rural Preservation Strategy**: The interpretation of policy should be governed by the Vision and Rural Preservation Strategy of the Antelope Valley Area Plan.

- **Established Town Descriptions**: Descriptions of established towns in Chapter 7 are intended to provide more detailed descriptions of existing land use patterns, local character, and desired local development patterns, and should be referred to in addition to the remainder of the Area Plan in planning for local projects.

- **Non-Conforming Uses**: All legally established uses in existence at the time of adoption of this Antelope Valley Area Plan are deemed to be consistent with this Area Plan, although Zoning Ordinance provisions regarding Non-Conforming Uses may apply.

- **Undersized Parcels**: Existing legal lots may be developed (following current development requirements) regardless of lot size. For example, a 10 acre parcel designated Rural Land 20 (1du/20ac) may still develop one home.

- **Pending Projects**: Completed applications filed prior to the effective date of this Area Plan shall be allowed to be reviewed for consistency with the previously adopted Area Plan. Projects may be maintained as originally approved provided the approval is still valid and has not expired. Any subsequent changes of use or intensity shall be subject to the policies of this Area Plan.

- **Community Standards Districts**: Community-specific zoning regulations shall be consistent with the goals and policies of this Area Plan. Such regulations shall be instituted only when a unique or detrimental condition exists within a community that prevents implementation of this Area Plan.

- **Regulatory Codes**: Title 21 (Subdivision) and 22 (Zoning) of the Los Angeles County Code provide detailed development guidelines that work to implement this Area Plan. Project applications shall refer to these codes, including Community Standards Districts, to ensure that development and land use activities are compatible with the zoning and to not threaten the health, safety, and welfare of the communities.

- **Staff Consultation**: While the Antelope Valley Area Plan is meant to be a guide for the public in determining allowable uses of private property, the public is encouraged to consult with members of the County's planning staff prior to investing in the preparation of development plans that might later prove to be inconsistent with the Antelope Valley Area Plan.

In addition to the direction provided by this Area Plan, new development and land use activities are regulated by many agencies other than the Department of Regional Planning. Obtaining approval for certain types of actions may require proof of the availability for public services, fair-share provisions for public facilities, and other permitting. The applicant for any such application is advised to consult with all applicable departments and agencies.

Chapter 2

LAND USE ELEMENT

Chapter 2: Land Use Element

Table of Contents

I. Background

Purpose

Land use is the act of defining compatible activities and built forms in order to determine their appropriate distribution within a given area. Land use authority is given to local governments to shape the physical environment by recognizing daily needs and directing future long-term changes in housing, business, recreation, and open space.

This Land Use Element contains two major components, the Land Use Goals and Policies, and Land Use Policy Map, which explain how development and preservation of land should occur in the Antelope Valley. The Land Use Goals and Policies articulate how the Area Plan's Vision Statement and Rural Preservation Strategy will be achieved by setting out intended land use outcomes. As a visual reflection of the Land Use Goals and Policies, the Land Use Policy Map provides land use designations that establish locations for various types and densities of land use in the unincorporated Antelope Valley. The Land Use Policy Map determines the highest intensity of future development that the land can accommodate within a certain timeframe.

Issues

Over the last few decades, the Antelope Valley experienced surges of development pressures. Policymakers and citizens gained greater knowledge of how new development contributes to environmental degradation, resource scarcity, and natural hazard risks. Accordingly, local governments needed to balance increased growth with obligations to protect existing natural resources. These new obligations, combined with a better understanding of the importance of balancing rural and urban areas in Los Angeles County, have created a new model for regional development. This new model, which directs new investment to areas with existing and/or planned services and facilities and away from areas with natural hazards and environmental resources, will shape land use in the Valley, with policies that emphasize resource efficiency, economic growth, and the preservation of rural character. Over the next 20 years, this Element will balance growth and economic development, the desires of residents to preserve their rural way of life, and the need for hazard avoidance and mitigation to determine the level of development that these factors can support.

Vision and Strategy

The Area Plan's Vision Statement sets the tone of this Element, which is intended to create opportunities for the Antelope Valley to change and grow while preserving the rural lifestyle enjoyed by current residents and support a vibrant economy. The Area Plan's Rural Preservation Strategy guides the Land Use Policy Map, creating a pattern of rural town center areas, rural town areas, rural preserve areas, and economic opportunity areas. Each town in the Valley will flow outward from vibrant town centers that offer a range of housing and local-serving activities for day-to-day living. Lower-density rural residences will surround these town centers, buffered by large contiguous open spaces that contain habitat areas, recreational spaces, and rural economic activities. In addition, the Rural Preservation Strategy and the Land Use Policy Map lay out the framework for how the Antelope Valley

will deal with the changes that result from, and take advantage of the opportunities brought on by, new state and regional infrastructure projects, particularly the High Desert Corridor and the Northwest 138 Corridor Improvement Project.

II. Goals and Policies

Goals LU 1: A land use pattern that maintains and enhances the rural character of the unincorporated Antelope Valley.

- Policy LU 1.1: Direct the majority of the unincorporated Antelope Valley's future growth to rural town center areas and identified economic opportunity areas, through appropriate land use designations, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 1.2: Limit the amount of potential development in rural preserve areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 1.3: Maintain the majority of the unincorporated Antelope Valley as Rural Land, allowing for agriculture, equestrian and animal-keeping uses, and single-family homes on large lots.
- Policy LU 1.4: Ensure that there are appropriate lands for commercial and industrial services throughout the unincorporated Antelope Valley sufficient to serve the daily needs of rural residents and to provide local employment opportunities.
- Policy LU 1.5: Provide varied lands for residential uses sufficient to meet the needs of all segments of the population, and allow for agriculture, equestrian uses and animal-keeping uses in these areas where appropriate.

Goal LU 2: A land use pattern that protects environmental resources.

- Policy LU 2.1: Limit the amount of potential development in Significant Ecological Areas, including Joshua Tree Woodlands, wildlife corridors, and other sensitive habitat areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 2.2: Except within economic opportunity areas, limit the amount of potential development within Scenic Resource Areas, including water features, significant ridgelines, and Hillside Management Areas, through appropriate land use designations, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 2.3: Except within economic opportunity areas, limit the amount of potential development in Agricultural Resource Areas, including important farmlands designated by the State of California and historical farmland areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 2.4: Except within economic opportunity areas, limit the amount of potential development in Mineral Resource Areas, through appropriate land use designations with

very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.

- Policy LU 2.5: Except within economic opportunity areas, limit the amount of potential development in riparian areas and groundwater recharge basins, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 2.6: Except within economic opportunity areas, limit the amount of potential development near the National Forests and on private lands within the National Forests, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.

Goal LU 3: A land use pattern that minimizes threats from hazards.

- Policy LU 3.1: Except within economic opportunity areas, prohibit new development on fault traces and limit the amount of development in Seismic Zones, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.2: Except within economic opportunity areas, limit the amount of potential development in Very High Fire Hazard Severity Zones, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.3: Except within economic opportunity areas, limit the amount of potential development in Flood Zones designated by the Federal Emergency Management Agency, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.4: Except within economic opportunity areas, limit the amount of potential development on steep slopes identified as Hillside Management Areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.5: Except within economic opportunity areas, limit the amount of potential development in landslide and liquefaction areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.6: Except within economic opportunity areas, limit the amount of potential residential development in airport influence areas and near military lands, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy LU 3.7: All development projects located on parcels that are within an airport influence area shall be consistent with all policies of that airport's land use compatibility plan.

Goal LU 4: A land use pattern that promotes the efficient use of existing and/or planned infrastructure and public facilities.

- Policy LU 4.1: Direct the majority of the unincorporated Antelope Valley's future growth to the economic opportunity areas and areas that are served by existing or planned infrastructure, public facilities, and public water systems, as indicated in the Land Use designations shown on the Land Use Policy Map (Map 2.1) of this Area Plan.

Goal LU 5: A land use pattern that decreases greenhouse gas emissions.

- Policy LU 5.1: Ensure that development is consistent with the Sustainable Communities Strategy adopted in 2012, an element of the Regional Transportation Plan developed by the Southern California Association of Governments.
- Policy LU 5.2: Encourage the continued development of rural town centers that provide for the daily needs of surrounding residents, reducing the number of vehicle trips and providing local employment opportunities.
- Policy LU 5.3: Preserve open space areas to provide large contiguous carbon sequestering basins.
- Policy LU 5.4: Ensure that there is an appropriate balance of residential uses and employment opportunities within close proximity of each other.

Goal LU 6: A land use pattern that makes the Antelope Valley a sustainable and resilient place to live.

- Policy LU 6.1: Periodically review changing conditions to ensure that land use policies are compatible with the Area Plan's Rural Preservation Strategy, including economic opportunity areas.
- Policy LU 6.2: Ensure that the Area Plan is flexible in adapting to new issues and opportunities without compromising the rural character of the unincorporated Antelope Valley.

III. Land Use Policy Map

The Land Use Policy Map (Map 2.1: Land Use Policy) implements the Goals and Policies through the framework of rural town center areas, rural town areas, rural preservation areas and economic opportunity areas outlined in the Area Plan's Rural Preservation Strategy (Map 2.2: Rural Preservation Strategy). These areas are described below and are further explained in the discussion of land use concepts for each community that is provided in Chapter 7: Community Specific Land Use Concepts.

Rural Town Center Areas

Rural town center areas are the focal points of rural communities, serving the daily needs of residents and providing local employment opportunities. The majority of new locally-oriented public facilities and new locally-oriented commercial uses should be directed to these areas. These areas will provide pleasant pedestrian environments and will be accessible by a range of transportation options to reduce

vehicle trips, as directed in the policies of the Mobility Element. Some of these areas will allow for a mix of commercial and residential uses.

Rural town center areas are located within the following Antelope Valley communities:

- Acton – Along Crown Valley Road between Gillespie Avenue and Soledad Canyon Road.
- Antelope Acres – Along 90th Street West between Avenue E-4 and Avenue E-12.
- Gorman – Along the Golden State Freeway surrounding the Gorman School Road interchanges.
- Lake Hughes – Along Elizabeth Lake Road between Trail I and Mountain View Road.
- Lake Los Angeles – Along Avenue O between 167th Street East and 172nd Street East, and along 170th Street East between Avenue O and Glenfall Avenue.
- Leona Valley – Intersection of Elizabeth Lake Road and 90th Street West.
- Littlerock – Along Pearblossom Highway between Little Rock Wash and 89th Street East.
- Pearblossom – Along Pearblossom Highway between 121st Street East and 133rd Street East.
- Quartz Hill – Along 50th Street West between Avenue L-6 and Avenue M-2.
- Roosevelt – Intersection of 90th Street East and Avenue J.
- Sun Village – Along Palmdale Boulevard between Little Rock Wash and 110th Street East, and along 90th Street East between Palmdale Boulevard and Avenue Q-14.

On the Land Use Policy Map, the primary land use designations in the rural town center areas include:

- Rural Commercial (CR)
- Mixed-Use – Rural (MU-R)
- Major Commercial (CM)
- Light Industrial (IL)

Rural Town Areas

Rural town areas provide a transition between rural town centers and rural preserve areas, as they are occupied by a mix of residential and a wide variety of agricultural uses. The majority of new residential development should be directed to these areas, provided that such development is consistent with the existing community character and allows for various agricultural, equestrian, and animal-keeping uses where appropriate. These areas will provide transportation linkages to rural town center areas and other nearby destination points, as directed in the policies of the Mobility Element.

On the Land Use Policy Map, rural town areas are designated as Residential or as Rural Land, depending on the density of existing residential development. These land use designations include:

- Residential 30 (H30) – Maximum density of 30 residential units for each 1 net acre of land.
- Residential 18 (H18) – Maximum density of 18 residential units for each 1 net acre of land.
- Residential 9 (H9) – Maximum density of 9 residential units for each 1 net acre of land.
- Residential 5 (H5) – Maximum density of 5 residential units for each 1 net acre of land.
- Residential 2 (H2) – Maximum density of 2 residential units for each 1 net acre of land.
- Rural Land 1 (RL1) – Maximum density of 1 residential unit for each 1 gross acre of land.

- Rural Land 2 (RL2) – Maximum density of 1 residential unit for each 2 gross acres of land.
- Rural Land 5 (RL5) – Maximum density of 1 residential unit for each 5 gross acres of land.

These maximum densities shall apply to all new land divisions. Existing legal lots may be developed with one residential unit each, regardless of lot size, provided that such development meets applicable County Code requirements, and the siting of the structure is supportive of the policies in this Area Plan.

In addition, some rural town areas are designated for commercial or industrial use. These land use designations acknowledge existing commercial or industrial uses or identify appropriate locations for future commercial and industrial uses to serve local residents.

Rural Preserve Areas

Rural preserve areas are areas of the unincorporated Antelope Valley outside of Rural Town Center and Town Areas, which are largely undeveloped and generally not served by existing infrastructure and public facilities. Many of these areas contain environmental resources, such as Significant Ecological Areas, Scenic Resource Areas, and Agricultural Resource Areas. In addition, many of these areas contain safety hazards, such as Seismic Zones, Very High Fire Hazard Severity Zones, and Flood Zones. The primary benefit of these areas is that they provide habitat for regionally significant biological species while simultaneously providing scenic values to residents. A secondary benefit of these areas is that they contain natural resources which provide economic opportunities. Development in these areas should be limited to single-family homes at very low densities, light and heavy agricultural uses, including equestrian and animal-keeping uses, and other uses where appropriate.

On the Land Use Policy Map, rural preserve areas are designated as Rural Land with a range of very low densities that reflect the underlying constraints, environmental resources, and safety hazards. These land use designations include:

- Rural Land 10 (RL10) – Maximum density of 1 residential unit for each 10 gross acres of land.
- Rural Land 20 (RL20) – Maximum density of 1 residential unit for each 20 gross acres of land.

The lowest land use densities (RL20) of the Area Plan have been used primarily for the Seismic Zones and Significant Ecological Areas, as these are areas where it is critical to limit development to ensure the safety of residents as well as the preservation of important ecological resources in the area. These maximum densities shall apply to all new land divisions. Existing legal lots may be developed with one residential unit each, regardless of lot size, provided that such development meets applicable County Code requirements, and the siting of the structure is supportive of the policies in this Area Plan.

In addition, some rural preserve areas are designated for commercial or industrial use. These land use designations acknowledge uses or identify appropriate locations for future commercial and industrial uses to serve local and regional needs.

Economic Opportunity Areas

The Land Use Policy Map of the Area Plan also identifies three economic opportunity areas (EOAs). These are areas where major infrastructure projects are being planned by state and regional agencies, which would bring tremendous opportunities for growth and economic development in the vicinity of these projects. These projects include the High Desert Corridor on the east side of the Antelope Valley, and the Northwest 138 Corridor Improvement Project on the west side. Both projects are being undertaken by Los Angeles County Metropolitan Transportation Authority (Metro) and California Department of Transportation (Caltrans).

The Area Plan identifies three EOAs located along the proposed route of the two projects. These are the East EOA, encompassing the communities of Lake Los Angeles, Sun Village, Littlerock, Pearblossom, Llano, and Crystalaire; the Central EOA, located along Avenue D, just north of William J. Fox Airfield and west of State Route 14 Freeway; and the West EOA near the Interstate 5 along State Route 138/Avenue D, immediately east and west of the California Aqueduct and including portions of the Neenach and Gorman communities.

The EOAs include areas identified as existing Rural Town Centers, or Rural Town Areas. The EOAs also include areas that have the potential to develop as future Rural Town Areas, as well as Non-Preserve Areas that may be used for a variety of rural uses compatible with the surrounding areas, such as residential, agricultural and open-space uses. Wherever appropriate, these EOAs are designated with land use designations that would allow for a balanced mix of residential, commercial, and light industrial uses, while preserving the rural character and ecological resources of the surrounding areas. A jobs-housing balance is achieved by using medium-density residential, commercial and industrial land use designations in areas appropriate for development, while designating areas with important ecological resources as open space conservation areas. The land use designations within the EOAs include:

- Residential 18 (H18) – Maximum density of 18 residential units for each 1 net acre of land.
- Residential 5 (H5) – Maximum density of 5 residential units for each 1 net acre of land.
- Residential 2 (H2) – Maximum density of 2 residential units for each 1 net acre of land.
- Rural Land 1 (RL1) – Maximum density of 1 residential unit for each 1 gross acre of land.
- Rural Land 2 (RL2) – Maximum density of 1 residential unit for each 2 gross acres of land.
- Rural Land 10 (RL10) – Maximum density of 1 residential unit for each 10 gross acres of land.
- Rural Land 20 (RL20) – Maximum density of 1 residential unit for each 20 gross acres of land.
- Conservation (OS-C)
- Rural Commercial (CR)
- Mixed Use – Rural (MU-R)
- Light Industrial (IL)
- Heavy Industrial (IH)

Public and Open Space Land

Existing open space lands throughout rural town center areas, rural town areas, rural preserve areas and EOAs are identified on the Land Use Policy Map as one of the following Open Space designations, depending on the use of the land:

- Parks and Recreation (OS-PR)
- Conservation (OS-C)
- Water (OS-W)
- Bureau of Land Management (OS-BLM)
- National Forest (OS-NF)
- Military Land (OS-ML)

Privately owned lands within the National Forest are designated on the Land Use Policy Map as Rural Land, indicating the underlying infrastructure constraints, environmental resources, and safety hazards.

Existing public and semi-public facilities are designated on the Land Use Policy Map as Public and Semi-Public Facilities (P).

Land Use Legend

Table L-1: Land Use Legend

Land Use	Code	Permitted Density or FAR	Purpose
RURAL			
Rural Land 1	RL1	Residential: Maximum 1du/1 gross ac Non-Residential: Maximum FAR 0.5	Single-family residences; equestrian and limited animal uses; and limited agricultural and related activities.
Rural Land 2	RL2	Residential: Maximum 1 du/2 gross ac Non-Residential: Maximum FAR 0.5	
Rural Land 5	RL5	Residential: Maximum 1 du/5 gross ac Non-Residential: Maximum FAR 0.5	
Rural Land 10	RL10	Residential: Maximum 1 du/10 gross ac Non-Residential: Maximum FAR 0.5	Single-family residences; equestrian and animal uses; and agricultural and related activities.
Rural Land 20	RL20	Residential: Maximum 1 du/20 gross ac Non-Residential: Maximum FAR 0.5	
RESIDENTIAL			
Residential 2	H2	Residential: 0–2 du/net ac	Single-family residences.
Residential 5	H5	Residential: 0–5 du/net ac	

Residential 9	H9	Residential: 0–9 du/net ac	
Residential 18	H18	Residential: 0–18 du/net ac	Single-family residences, two-family residences
Residential 30	H30	Residential: 0-30 du/net ac	Single-family residences, two-family residences, multifamily residences.
COMMERCIAL			
Rural Commercial	CR	Residential: 0-5 du/net ac Non-Residential: Maximum FAR 0.5	Limited, low-intensity commercial uses that are compatible with rural and agricultural activities, including retail, restaurants, and personal and professional offices.
MIXED USE			
Mixed Use - Rural	MU-R	Residential: 0-5 du/net ac Non-Residential: Maximum FAR 0.5 Mixed Use: 0-5 du/net ac and FAR 0.5	Limited, low intensity commercial uses that are compatible with rural and agricultural activities, including retail, restaurants, and personal and professional offices; residential and commercial mixed uses.
INDUSTRIAL			
Light Industrial	IL	Non-Residential: Maximum FAR: 1.0	Light industrial uses, including light manufacturing, assembly, warehousing and distribution.
Heavy Industrial	IH	Non-Residential: Maximum FAR: 1.0	Heavy industrial uses, including heavy manufacturing, refineries, and other labor and capital intensive industrial activities.
PUBLIC AND SEMI-PUBLIC			
Public and Semi-Public Facilties	P	Residential: Density Varies Non-Residential: Maximum FAR: 3.0	Public and semi-public facilities and community-serving uses, including public buildings and campuses, schools, hospitals, cemeteries, and fairgrounds; airports and other major transportation facilities. Other major public facilities, including planned facilities that may be public-serving but may not be publicly accessible, such as landfills, solid and liquid waste disposal sites, multiple use stormwater treatment facilities, and major utilities. * In the event that the public or semi-public use of mapped facilities is terminated, alternative uses that are compatible with the surrounding development, in keeping with community character, are permitted.
OPEN SPACE			

Conservation	OS-C	N/A	The preservation of open space areas and scenic resource preservation in perpetuity. Applies to land that is legally dedicated for open space and conservation efforts.
Parks and Recreation	OS-PR	N/A	Open space recreational uses, such as regional and local parks, trails, athletic fields, community gardens, and golf courses.
National Forest	OS-NF	N/A	Areas within the National Forest and managed by the National Forest Service.
Bureau of Land Management	OS-BLM	N/A	Areas that are managed by the Federal Bureau of Land Management.
Water	W	N/A	Bodies of water, such as lakes, reservoirs, natural waterways, and man-made infrastructure, such as drainage channels, floodways, and spillways. Includes active trail networks within or along drainage channels.
Military Land	ML	N/A	Military installations and land controlled by U.S. Department of Defense.
OVERLAYS			
Special Management Areas	SMA	N/A	Special Management Areas require additional development regulations due to the presence of natural resources, scenic resources, or identified hazards. Development regulations are necessary to prevent loss of life and property, and to protect the natural environment.
-- Agricultural Resource Areas	ARA	N/A	Agricultural Resource Areas consist of farmlands identified by the California Department of Conservation and farms that have received permits from the Los Angeles County Agricultural Commissioner/Weights and Measures. The County encourages the preservation and sustainable utilization of agricultural land, agricultural activities and compatible uses within these areas.
-- Mineral Resource Zones	MRZ	N/A	Mineral Resource Zones are commercially viable mineral or aggregate deposits, such as sand, gravel and other construction aggregate. The County's Mineral Resources consist of the California Geological Survey's identified deposits of regionally significant aggregate resources.
-- Significant Ecological Areas	SEA	N/A	Significant Ecological Areas are lands in the County that contain irreplaceable biological resources. Individual SEAs include undisturbed or lightly disturbed habitat supporting valuable and threatened species, linkages and corridors to promote species movement, and are sized to support sustainable populations of its component species. Note: the SEAs within the jurisdiction of cities are shown on the map for reference and visual continuity, and are intended to be used for informational purposes only.
Specific Plan	SP	N/A	Specific Plans contain precise guidance for land development, infrastructure, amenities and resource conservation. Specific plans must be consistent with the General Plan. Detailed policy and/or regulatory requirements are contained within each adopted Specific Plan document.

Irrespective of the residential densities specified for each land use category, existing prohibitions on further subdivision of previously subdivided lots shall apply and be strictly enforced.

IV. Additional Considerations

Special Management Areas

Special Management Areas, identified in the Countywide General Plan, are environmental features found throughout rural town areas and rural preserve areas. Goals and Policies regarding these Special Management Areas are provided in the other Elements of this Area Plan, as follows:

- Agricultural Resource Areas – Conservation and Open Space Element (Goal COS 6 and related policies, Goal COS 7 and related policies)
- Flood Zones – Public Safety, Services and Facilities Element (Goal PS 7 and related policies)
- Hillside Management Areas – Land Use Element (Goal LU 3 and related policies), Conservation and Open Space Element (Goal COS 5 and related policies, Goal COS 16 and related policies, Goal COS 19 and related policies), Public Safety, Services and Facilities Element (Goal PS 6 and related policies)
- Landslide Zones – Public Safety, Services and Facilities Element (Goal PS 6 and related policies)
- Liquefaction Zones – Public Safety, Services, and Facilities Element (Goal PS 6 and related policies)
- Mineral Resource Zones – Conservation and Open Space Element (Goal COS 8 and related policies)
- Scenic Resource Areas – Conservation and Open Space Element (Goal COS 5 and related policies, Goal COS 15 and related policies)
- Seismic Zones – Public Safety, Services and Facilities Element (Goal PS 6 and related policies)
- Significant Ecological Areas – Land Use Element (Goal LU 2 and related policies), Conservation and Open Space Element (Goal COS 4 and related policies, Goal COS 16 and related policies, Goal COS 18 and related policies, Goal COS 19 and related policies)
- Very High Fire Hazard Severity Zones – Conservation and Open Space Element (Goal COS 5 and related policies, Goal COS 16 and related policies), Public Safety, Services and Facilities Element (Goal PS 7 and related policies)

Major Planned Infrastructure Projects

There are two major infrastructure projects in the Antelope Valley that are in varying stages of planning and environmental review. These are the High Desert Corridor (HDC) and the Northwest 138 Corridor Improvement Project (NW138), which are both joint projects of Metro and Caltrans.

The HDC is a proposed new multi-purpose transportation link between State Route 14 in Los Angeles County and State Route 18 in San Bernardino County. This project is envisioned to connect some of the fastest growing residential, commercial and industrial areas in Southern California, including the cities of Palmdale, Lancaster, Adelanto, Victorville, and the Town of Apple Valley.

The NW138 is a proposed substantial upgrade of the existing State Route 138 segment from Interstate 5 to State Route 14. This corridor currently serves as a bypass for people and goods movement, which provides critical mobility to, from and within the western portion of the Antelope Valley.

Development of the HDC and the NW138 projects would significantly impact the land use pattern in the unincorporated Antelope Valley. Together, these two projects will connect the Antelope Valley to major economic centers in Northern and Southern California, Nevada and beyond. In some areas, these future projects could support commercial and industrial development, providing additional local employment opportunities and reducing the need for long-distance commuting.

As mentioned earlier, three EOAs have been identified along the proposed routes of these projects, where increased residential, commercial and industrial uses are encouraged. As more details of these infrastructure projects are finalized in the coming years (i.e. route alignments, location of on-off ramps, number of lanes etc.), a comprehensive study of each of these EOAs should be undertaken in order to make any necessary adjustments to the Area Plan to fit the final design of these projects. This will be undertaken through a community planning process that should carefully consider potential changes to the Area Plan, including the Land Use Policy Map, balancing the need for economic development and local employment with rural preservation and environmental priorities.

Utility-Scale Renewable Energy Production Facilities

Utility-scale renewable energy production facilities may be allowed in Rural Land designations without a Plan Amendment. However, applications for such facilities may require discretionary approval and shall be subject to the California Environmental Quality Act and the County's environmental review and public hearing procedures. Applications for such facilities must be carefully considered and must be consistent with the relevant Goals and Policies of the Area Plan, especially Goal COS 10 and related policies, Goal COS 13 and related policies, and Goal COS 14 and related policies. (For more information, see Chapter 4: Conservation and Open Space Element)

Palmdale Regional Airport

Los Angeles World Airports owns a number of parcels in the central portion of the Antelope Valley that are currently in unincorporated territory but are surrounded by the City of Palmdale. These parcels have been designated as Public and Semi-Public Facilities (P) to acknowledge the existing Palmdale Regional Airport, which will be significantly expanded to become a regional commercial airport. Policies in the Mobility Element, and the Public Safety, Services and Facilities Element support the development of Palmdale Regional Airport, and that is the primary vision for these parcels. However, at the time of this Area Plan's adoption, the airport is inactive and no commercial air service is offered. Until such time that the airport is expanded, this Area Plan recommends that commercial and industrial uses be allowed on these parcels without a Plan Amendment, as such development will offer opportunities for employment and economic growth. However, these uses must be compatible with airport operations and must not restrict or prohibit future expansion of the airport.

Amendments to the Land Use Policy Map

After the Area Plan is adopted, property owners may request amendments to the Land Use Policy Map. These applications will be subject to the County's environmental review and public hearing procedures for Plan Amendments.

Amendments to the Land Use Policy Map requested by property owners must be carefully considered and may be approved through a public hearing and recommendation by the Regional Planning Commission and subsequent public hearing and adoption by the Los Angeles County Board of Supervisors, subject to the following findings:

- The Plan Amendment is necessary to realize an unmet community need;
- The Plan Amendment will allow development that maintains and enhances rural character, protects environmental resources, minimizes threats from hazards, helps implement economic opportunity areas, and promotes the efficient use of existing infrastructure and public facilities in a manner that is equal or superior to the development allowed by the existing land use designation;
- The Plan Amendment is consistent with the relevant Goals and Policies of the various Elements of the Area Plan; and
- The Plan Amendment meets the applicable findings required by the Countywide General Plan.

Chapter 3

MOBILITY ELEMENT

Chapter 3: Mobility Element

Table of Contents

I. Background

Purpose

Mobility is the movement of people and goods. The Mobility Element outlines the improvements needed to ensure current and future mobility between land uses. The role of this Element is to identify missing linkages and alternative modes of transportation, then collaborate with government partners to implement solutions. This Element creates the framework for a balanced, multi-modal transportation system across the Antelope Valley through Goals and Policies that address three topics: regional movement of services and goods, local transportation meeting the needs of residents, and the balance required to meet the demands of both.

Issues

Within the State of California and across the country, attitudes have changed about the nature of the responsibilities governments have in assisting with overall mobility. Effective transportation systems are increasingly being seen as those that can offer diverse options for movement. The current expectation is that future citizens should gain greater access to a wider range of transportation choices to fit their needs, allowing them to be a pedestrian, equestrian, cyclist, bus or rail rider, motorist, or air passenger. In addition, this Mobility Element aims to improve the economy of the region by developing a framework where efficient modes of transit move goods and services freely through the Antelope Valley. These wider choices for both people and goods will have the added benefit of increasing the overall efficiency of regional movement, which could reduce greenhouse gas emissions.

Vision and Strategy

Upholding the Area Plan's Vision Statement, this Element will improve future mobility in the Antelope Valley by connecting local populations to activity areas and by accommodating regional pressures and demands without compromising the comfort and access of local transportation. In order to achieve the Area Plan's Rural Preservation Strategy, travel links will be provided from the Valley's rural preserve areas and rural town areas to local-serving businesses and rural town center areas, as well as identified economic opportunity areas. While the communities are currently automobile-dependent due to their largely rural character, this Element will increase access to alternative modes of travel, such as trails, bikeways, and bicycle routes.

II. Goals and Policies

Travel Demand Management

Goal M 1: Land use patterns that promote alternatives to automobile travel.

- Policy M 1.1: Direct the majority of the unincorporated Antelope Valley's future growth to rural town centers and economic opportunity areas, to minimize travel time and reduce the number of vehicle trips, as indicated in the Land Use designations shown on the Land Use Policy Map (Map 2.1) of this Area Plan.

- Policy M 1.2: Encourage the continued development of rural town center areas that provide for the daily needs of local residents, reducing the number of vehicle trips and providing local employment opportunities.
- Policy M 1.3: Encourage new parks, recreation areas, and public facilities to locate in rural town center areas, rural town areas, and economic opportunity areas.
- Policy M 1.4: Ensure that new developments have a balanced mix of residential uses and employment opportunities as well as park, recreation areas and public facilities within close proximity of each other.
- Policy M 1.5: Promote alternatives to automobile travel in rural town center areas and rural town areas by linking these areas through pedestrian walkways, trails, and bicycle routes.

Goal M 2: Reduction of vehicle trips and emissions through effective management of travel demand, transportation systems, and parking.

- Policy M 2.1: Encourage the reduction of home-to-work trips through the promotion of home-based businesses, live-work units, and telecommuting.
- Policy M 2.2: Encourage trip reduction through promotion of carpools, vanpools, shuttles, and public transit.
- Policy M 2.3: In evaluating new development proposals, require trip reduction measures to relieve congestion and reduce air pollution from vehicle emissions.
- Policy M 2.4: Develop multi-modal transportation systems that offer alternatives to automobile travel by implementing the policies regarding regional transportation, local transit, bicycle routes, trails, and pedestrian access contained in this Mobility Element.
- Policy M 2.5: As residential development occurs in communities~~,~~ require transportation routes, including alternatives to automotive transit, to link to important local destination points such as shopping, services, employment, and recreation.
- Policy M 2.6: Within rural town center areas, explore flexible parking regulations such as allowing residential and commercial development to meet parking requirements through a combination of on-site and off-site parking, where appropriate, or encouraging the provision of different types of parking spaces.

Highways and Streets

Goal M 3: An efficient network of major, secondary, and limited secondary highways to serve the Antelope Valley.

- Policy M 3.1: Implement the adopted Highway Plan for the Antelope Valley, in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis through financing programs, such as grants, congestion pricing, bonding, fair share cost assignments, etc.
- Policy M 3.2: In rural areas, require rural highway standards that minimize the width of paving and placement of curbs, gutters, sidewalks, street lighting, and traffic signals, as adopted by the Department of Public Works.

- Policy M 3.3: Implement highway improvements only when necessitated by increasing traffic or new development or for safety reasons.
- Policy M 3.4: Maintain existing highways to ensure safety, and require adequate street and house signage for emergency response vehicles.
- Policy M 3.5: As future land use changes occur, periodically review traffic counts and traffic projections and revise the Highway Plan accordingly.
- Policy M 3.6: Engage local communities and agencies in the planning and implementation of transportation improvements.

Goal M 4: A network of local streets that support the rural character of the unincorporated Antelope Valley without compromising public safety.

- Policy M 4.1: Require rural local street standards that minimize the width of paving and placement of curbs, gutters, sidewalks, street lighting, and traffic signals, as adopted by the Department of Public Works.
- Policy M 4.2: Maintain existing local streets to ensure safety, and require adequate signage for emergency response vehicles.
- Policy M 4.3: Encourage ongoing maintenance of private local streets to ensure public safety.

Truck Traffic

Goal M 5: Long-haul truck traffic is separated from local traffic, reducing the impacts of truck traffic on local streets and residential areas.

- Policy M 5.1: Support development of the High Desert Corridor and the Northwest 138 Corridor Improvement Project, to provide a route for truck traffic between Interstate 5, State Route 14, and Interstate 15.
- Policy M 5.2: Direct truck traffic to designated truck routes and prohibit truck traffic on designated scenic routes, to the greatest extent feasible.
- Policy M 5.3: Require that designated truck routes are designed and paved to accommodate truck traffic, preventing excessive pavement deterioration from truck use.
- Policy M 5.4: Add rest stops along designated truck routes to provide stopping locations away from residential uses.
- Policy M 5.5: Develop appropriate regulations for truck parking on local streets to avoid impacts to residential areas.

Regional Transportation

Goal M 6: A range of transportation options to connect the Antelope Valley to other regions.

- Policy M 6.1: Support the development of Palmdale Regional Airport and encourage a range of commercial air travel options.
- Policy M 6.2: Support the development of William J. Fox Airfield as a facility for general aviation, air cargo operations, and commuter air travel.
- Policy M 6.3: Support the development of the High Desert Corridor and the Northwest 138 Corridor Improvement Project between Interstate 5, State Route 14, and Interstate 15, and encourage the participation of private enterprise and capital.
- Policy M 6.4: Support increases in Metrolink commuter rail service, and support the expansion of commuter rail service on underutilized rail lines where appropriate.
- Policy M 6.5: Support the development of the California High Speed Rail System, with a station in Palmdale to provide links to Northern California and other portions of Southern California, and encourage the participation of private enterprise and capital.
- Policy M 6.6: Support the development of a high-speed rail system linking Palmdale to Victorville and Las Vegas, and encourage the participation of private enterprise and capital.
- Policy M 6.7: Establish a regional transportation hub in Palmdale with feeder transit service to the rural areas of the unincorporated Antelope Valley.
- Policy M 6.8: In planning for all regional transportation systems, consider and mitigate potential impacts to existing communities, and minimize land use conflicts.
- Policy M 6.9: Engage regional agencies, such as Caltrans, SCAG, Metro, and the California High Speed Rail Authority in the implementation of an effective and efficient integrated multi-modal regional transportation network. Ensure adequate funding on an ongoing basis through financing programs, such as grants, congestion pricing, bonding, fair share cost assignments, etc.

Local Transit

Goal M 7: Bus service is maintained and enhanced throughout the Antelope Valley.

- Policy M 7.1: Maintain and increase funding to the Antelope Valley Transit Authority for bus service.
- Policy M 7.2: Support increases in bus service to heavily traveled areas and public facilities, such as parks and libraries.
- Policy M 7.3: Support increases in bus service to rural communities, linking them to a regional transportation hub in Palmdale and shopping and employment centers in Lancaster and Palmdale.
- Policy M 7.4: Improve access for all people, including seniors, youth, and the disabled, by maintaining off-peak service and equipping transit services for wheelchairs and bicycles.
- Policy M 7.5: Encourage the use of advanced technologies in the planning and operation of the transit system.

Policy M 8: Alternative transit options in areas not reached by bus service.

- Policy M 8.1: Support the expansion of dial-a-ride services to rural communities, linking them to a regional transportation hub in Palmdale and shopping and employment centers in Lancaster and Palmdale.
- Policy M 8.2: Evaluate the feasibility of alternative transit options, such as community shuttle services and privately operated transit, to increase accessibility.

Bikeways and Bicycle Routes

Goal M 9: A unified and well-maintained bicycle transportation system throughout the Antelope Valley with safe and convenient routes for commuting, recreation, and daily travel.

- Policy M 9.1: Implement the adopted Bikeway Plan for the Antelope Valley in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis.
- Policy M 9.2: Along streets and highways in rural areas, add safe bicycle routes that link to public facilities, a regional transportation hub in Palmdale, and shopping and employment centers in Lancaster and Palmdale.
- Policy M 9.3: Ensure that bikeways and bicycle routes connect communities and offer alternative travel modes within communities.
- Policy M 9.4: Encourage provision of bicycle racks and other equipment and facilities to support the use of bicycles as an alternative means of travel.

Trails

Goal M 10: A unified and well-maintained multi-use (equestrian, hiking, and mountain bicycling) trail system that links destinations such as rural town centers and recreation areas throughout the Antelope Valley.

- Policy M 10.1: Implement the adopted Trails Plan for the Antelope Valley in cooperation with the cities of Lancaster and Palmdale. Ensure adequate funding on an ongoing basis.
- Policy M 10.2: Connect new development to existing population centers with trails, requiring trail dedication and construction through the development review and permitting process.
- Policy M 10.3: Maximize fair and reasonable opportunities to secure additional trail routes (dedicated multi-use trail easements) from willing property owners.
- Policy M 10.4: Ensure trail access by establishing trailheads with adequate parking and access to public transit, where appropriate and feasible.
- Policy M 10.5: Locate and design trail routes to minimize impacts to sensitive environmental resources and ecosystems.
- Policy M 10.6: Where trail connections are not fully implemented, collaboratively work to establish safe interim connections.
- Policy M 10.7: Ensure that existing trails and trailheads are properly maintained by the relevant agencies.

- Policy M 10.8: Solicit community input to ensure that trails are compatible with local needs and character.

Pedestrian Access

Goal M 11: A continuous, integrated system of safe and attractive pedestrian routes linking residents to rural town center areas, schools, services, transit, parks, and open space areas.

- Policy M 11.1: Improve existing pedestrian routes and create new pedestrian routes, where appropriate and feasible. If paving is deemed necessary, require permeable paving consistent with rural community character instead of concrete sidewalks.
- Policy M 11.2: Within rural town center areas, require that highways and streets provide pleasant pedestrian environments and implement traffic calming methods to increase public safety for pedestrians, bicyclists, and equestrian riders.
- Policy M 11.3: Within rural town center areas, promote pedestrian-oriented scale and design features, including public plazas, directional signage, and community bulletin boards.
- Policy M 11.4: Within rural town center areas, encourage parking to be located behind or beside structures, with primary building entries facing the street. Encourage also the provision of direct and clearly delineated pedestrian walkways from transit stops and parking areas to building entries.
- Policy M 11.5: Implement traffic calming methods in areas with high pedestrian usage, such as school zones.

Chapter 4

CONSERVATION AND OPEN SPACE ELEMENT

Chapter 4: Conservation and Open Space Element

Table of Contents

I. Background

Purpose

Conservation is the planned utilization and preservation of natural resources and landscapes in order to ensure their existence in the future. Many resources, including land, animals, plants, water, air, minerals, views, and energy, are fundamental components to the prosperity of the Valley. Conservation of these resources provides the most cost-effective strategy to assure a reliable supply of resources to meet current and future demands.

This Conservation and Open Space Element provides Goals and Policies to protect the Antelope Valley's environmentally significant undisturbed natural spaces, make use of natural resources, and provide open space areas for recreation and enjoyment. This Element identifies the resources and open spaces which may be developed, and gives guidance as to how sustainable development can be conducted in the future. In addition, this Element identifies areas which ought to be preserved from development, or are unsuitable for development due to hazards (see Map 4.1: Hazards and Environmental Constraints Model).

Issues

The Antelope Valley contains the largest remaining undisturbed natural and rural lands left in Los Angeles County. The Valley possesses a unique rural character that serves both residents and visitors alike, drawing from a wide range of resources, such as dark night skies, significant ridgelines, Joshua Trees, wild poppies, grazing lands, and cherry orchards. In the years to come, as the cities of Lancaster and Palmdale continue to grow, the potential lure of these rural areas in proximity to surrounding cities may create development patterns that would be incompatible with rural activities.

The natural areas of the Valley also contain valuable resources for the economic prosperity of the region. The Valley is home to most of the agricultural activities that are conducted in the County. To protect the future of the County's farming industry, it will be necessary for the County to support creative ideas and strategies that help farmers earn a livelihood. The mineral resources in the Valley help build regional roadways and construction sites and must be carefully managed and protected to ensure they remain available for future use. Alternative energy production is a growth industry and the Valley has favorable weather patterns and settings that may provide suitable sites for these activities, which will enhance the local economy. These, however, would need to be balanced with the preservation of the rural character and conservation of ecological resources in the area as utility-scale renewable energy development also present significant land use impacts on the surrounding rural areas and communities. As technologies and resources change, the Goals and Policies of this Element will be used to assist in the orderly, non-impactful and sustainable transition to reliance on renewable forms of energy, which will reduce greenhouse gas emissions.

Vision and Strategy

In order to serve the Area Pan's Vision Statement, the Antelope Valley will continue to include many open spaces that are undeveloped or developed with exceptionally low-intensity uses that respect natural environment landforms and are compatible with open space uses. When growth occurs, this Element will direct sustainable development to suitable locations in rural town areas, and rural town center areas and economic opportunity areas, with existing and/or planned infrastructure, protecting natural areas that provide sources of material and scenic value, as provided in the Area Plan's Rural Preservation Strategy. The future economic resiliency of the Antelope Valley requires careful stewardship of existing natural resources with a focus towards creative solutions, especially in regard to energy creation, minerals extraction, and agricultural pursuits.

II. Goals and Policies

Water Resources

Goal COS 1: Growth and development are guided by water supply constraints.

- Policy COS 1.1: Require that all new development proposals demonstrate a sufficient and sustainable water supply prior to approval.
- Policy COS 1.2: Limit the amount of potential development in areas that are not or not expected to be served by existing and/or planned public water infrastructure through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy COS 1.3: Limit the amount of potential development in groundwater recharge areas through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy COS 1.4: Promote the use of recycled water, where available, for agricultural and industrial uses and support efforts to expand recycled water infrastructure.

Goal COS 2: Effective conservation measures provide an adequate supply of clean water to meet the present and future needs of humans and natural ecosystems.

- Policy COS 2.1: Require new landscaping to comply with applicable water efficiency requirements in the County Code.
- Policy COS 2.2: Require low-flow plumbing fixtures in all new developments.
- Policy COS 2.3: Require onsite stormwater infiltration in all new developments through the use of appropriate measures, such as permeable surface coverage, permeable paving of parking and pedestrian areas, catch basins, and other low impact development strategies.
- Policy COS 2.4: Discourage water intensive recreational uses, such as golf courses, unless recycled water is used to sustain these uses.
- Policy COS 2.5: Discourage the use of potable water for washing outdoor surfaces.
- Policy COS 2.6: Support experiments in alternate forms of water provision and re-use, such as "air to water technology" and gray water systems.

- Policy COS 2.7: Limit use of groundwater sources to their safe yield limits.
- Policy COS 2.8: Coordinate with federal, state, regional and local agencies to develop and implement new technologies in water management.

Goal COS 3: A clean water supply untainted by natural and man-made pollutants and contaminants.

- Policy COS 3.1: Discourage the use of chemical fertilizers, herbicides and pesticides in landscaping to reduce water pollution.
- Policy COS 3.2: Restrict the use of septic systems in areas adjacent to aqueducts and waterways to prevent wastewater intrusion into the water supply.
- Policy COS 3.3: Require a public or private sewerage system for land use densities that would threaten nitrate pollution of groundwater if unsewered, or when otherwise required by County regulations.
- Policy COS 3.4: Support preservation, restoration and strategic acquisition of open space to preserve natural streams, drainage channels, wetlands, and rivers, which are necessary for the healthy functioning of ecosystems.
- Policy COS 3.5: Protect underground water supplies by enforcing controls on sources of pollutants.
- Policy COS 3.6: Support and encourage water banking facilities throughout the Antelope Valley, including within Significant Ecological Areas.

Biological Resources

Goal COS 4: Sensitive habitats and species are protected to promote biodiversity.

- Policy COS 4.1: Direct the majority of the unincorporated Antelope Valley's future growth to rural town centers and economic opportunity areas, minimizing the potential for habitat loss and negative impacts in Significant Ecological Areas.
- Policy COS 4.2: Limit the amount of potential development in Significant Ecological Areas, including the Joshua Tree Woodlands, wildlife corridors, and other sensitive habitat areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy COS 4.3: Require new development in Significant Ecological Areas to comply with applicable Zoning Code requirements, ensuring that development occurs on the most environmentally suitable portions of the land.
- Policy COS 4.4: Require new development in Significant Ecological Areas, to consider the following in design of the project, to the greatest extent feasible:
    - Preservation of biologically valuable habitats, species, wildlife corridors and linkages;
    - Protection of sensitive resources on the site within open space;
    - Protection of water sources from hydromodification in order to maintain the ecological function of riparian habitats;

    - Placement of development in the least biologically sensitive areas on the site, prioritizing the preservation or avoidance of the most sensitive biological resources onsite;
    - Design of required open spaces to retain contiguous undisturbed open space that preserves the most sensitive biological resources onsite and/or serves to maintain connectivity;
    - Maintenance of watershed connectivity by capturing, treating, retaining and/or infiltrating storm water flows on site; and
    - Consideration of the continuity of onsite open space with adjacent open space in project design.
- Policy COS 4.5: Subject to local, state or federal laws, require new development to provide adequate buffers from preserves, sanctuaries, habitat areas, wildlife corridors, State Parks, and National Forest lands, except within Economic Opportunity Areas.
- Policy COS 4.6: Encourage connections between natural open space areas to allow for wildlife movement.
- Policy COS 4.7: Restrict fencing in wildlife corridors. Where fencing is necessary for privacy or safety, require appropriate development standards that maximize opportunities for wildlife movement.
- Policy COS 4.8: Ensure ongoing habitat preservation by coordinating with the California Department of Fish and Game to obtain the latest information regarding threatened and endangered species.
- Policy COS 4.9: Ensure water bodies are well-maintained to protect habitat areas and provide water to local species.
- Policy COS 4.10: Restrict development that would reduce the size of water bodies, minimizing the potential for loss of habitat and water supply.

Scenic Resources

Goal COS 5: The Antelope Valley's scenic resources, including scenic drives, water features, significant ridgelines, buttes, and Hillside Management Areas, are enjoyed by future generations.

- Policy COS 5.1: Identify and protect natural landforms and vistas with significant visual value, such as the California Poppy Preserve, by designating them as Scenic Resource Areas.
- Policy COS 5.2: Except within economic opportunity areas, limit the amount of potential development in Scenic Resource Areas through appropriate land use designations with very low densities in order to minimize negative impacts from future development.
- Policy COS 5.3: Require new development in Hillside Management Areas to comply with applicable Zoning Code requirements, ensuring that development occurs on the most environmentally suitable portions of the land.
- Policy COS 5.4: Require appropriate development standards in Hillside Management Areas that minimize grading and alteration of the land's natural contours, ensure that development pads

mimic natural contours, and ensure that individual structures are appropriately designed to minimize visual impacts.

- Policy COS 5.5: Require adequate erosion control measures for all development in Hillside Management Areas, both during and after construction.
- Policy COS 5.6: Restrict development on buttes and designated significant ridgelines by requiring appropriate buffer zones.
- Policy COS 5.7: Ensure that incompatible development is discouraged in designated Scenic Drives by developing and implementing development standards and guidelines for development within identified viewsheds of these routes (Map 4.2: Antelope Valley Scenic Drives).

Agricultural Resources

Goal COS 6: Farming is a viable profession for Antelope Valley residents, contributing to the Valley's rural character and economic strength.

- Policy COS 6.1: Limit the amount of potential residential development in Agricultural Resource Areas (Map 4.3: Agricultural Resource Areas) through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan, minimizing the potential for future land use conflicts.
- Policy COS 6.2: Limit incompatible non-agricultural uses in Agricultural Resource Areas. Where non-agricultural uses are necessary to meet regional or community needs, require buffering and appropriate development standards to minimize potential conflicts with adjacent agricultural uses.
- Policy COS 6.3: Ensure that agricultural activities are included within the Antelope Valley's economic development strategies and pursue funding to support rural economic development and agriculture.
- Policy COS 6.4: Encourage the establishment of community farms, community gardens, and similar agricultural operations to produce local food and demonstrate the history, importance, and value of agriculture in the Antelope Valley.
- Policy COS 6.5: Encourage the establishment of local farmer markets, roadside stands, wineries and tasting rooms, and other forms of "agricultural tourism" throughout the Antelope Valley to expand potential sources of farm income.
- Policy COS 6.6: Provide educational resources to farmers.
- Policy COS 6.7: Investigate the feasibility of financial and/or zoning incentive programs for farmers, such as Williamson Act contracts, conservation easements and flexible zoning provisions.
- Policy COS 6.8: Support innovative agricultural business practices, such as agricultural tourism and farmers' cooperatives, necessary for adapting to changing economic and environmental conditions by streamlining regulations.

Goal COS 7: Farming practices are sustainable, balancing economic benefits with water and biological resource management priorities, and minimize greenhouse gas emissions and water pollution.

- Policy COS 7.1: Promote agricultural uses which sequester carbon and fix nitrogen.
- Policy COS 7.2: Support the use of alternative and renewable energy systems in conjunction with agricultural activities.
- Policy COS 7.3: Encourage sustainable agricultural and water quality best management practices such as runoff detention basins, use of vegetation filter strips, and organic farming.
- Policy COS 7.4: Ensure that agricultural activity is managed to minimize soil erosion and the release of contaminants into surface and groundwater resources.

Mineral Resources

Goal COS 8: Mineral resources are responsibly extracted.

- Policy COS 8.1: Allow new mineral resource extraction activities only in designated Mineral Resource Areas.
- Policy COS 8.2: Where new mineral resource extraction activities are allowed, ensure that applications undergo full environmental review and public noticing. Require site remediation after completion of mineral resource extraction activities.
- Policy COS 8.3: Provide strict enforcement of illegal or unpermitted mineral extraction activities.
- Policy COS 8.4: Protect MRZ-2's and access to MRZ-2's in the Antelope Valley from incompatible development and discourage incompatible adjacent land uses.
- Policy COS 8.5: Work collaboratively with agencies to identify Mineral Resource Zones in the Antelope Valley and to prioritize mineral land use classifications in regional efforts.
- Policy COS 8.6: Manage mineral resources in the Antelope Valley in a manner that effectively plans for the access to, and the development and conservation of mineral resources for existing and future generations.

Air Quality

Goal COS 9: Improved air quality in the Antelope Valley.

- Policy COS 9.1: Implement land use patterns that reduce the number of vehicle trips, reducing potential air pollution, as directed in the policies of the Land Use Element.
- Policy COS 9.2: Develop multi-modal transportation systems that offer alternatives to automobile travel to reduce the number of vehicle trips, including regional transportation, local transit, bicycle routes, trails, and pedestrian networks, as directed in the policies of the Mobility Element.
- Policy COS 9.3: In evaluating new development proposals, consider requiring trip reduction measures to relieve congestion and reduce air pollution from vehicle emissions.
- Policy COS 9.4: Promote recycling and composting throughout the Antelope Valley to reduce air quality impacts from waste disposal activities and landfill operations.
- Policy COS 9.5: Encourage the use of alternative fuel vehicles throughout the Antelope Valley.
- Policy COS 9.6: Educate Antelope Valley industries about new, less polluting equipment, and promote incentives for industries to use such equipment.

- Policy COS 9.7: Encourage reforestation and the planting of trees to sequester greenhouse gas emissions.
- Policy COS 9.8: Coordinate with the Antelope Valley Air Quality Management District and other local, regional, state, and federal agencies to develop and implement regional air quality policies and programs.

Energy

Goal COS 10: Diverse energy systems that utilize existing renewable or waste resources to meet future energy demands.

- Policy COS 10.1: Encourage the use of non-hazardous materials in all individual renewable energy systems and all utility-scale renewable energy production facilities to prevent the leaching of potentially dangerous run-off materials into the soil and watershed.
- Policy COS 10.2: Ensure that all individual renewable energy systems and all utility-scale renewable energy production facilities do not interfere with commercial and military flight operations or communication facilities. Consult with Edwards Air Force Base and U.S. Air Force Plant 42 on all proposed renewable energy projects that require discretionary approval.
- Policy COS 10.3: Encourage the safe and orderly development of biomass conversion facilities as an alternative to burning agricultural wastes.
- Policy COS 10.4: Promote methane recapture at landfills for purpose of generating energy and reducing fugitive greenhouse gas emissions.
- Policy COS 10.5: Encourage the development of emerging energy technologies, such as “solar roads.”
- Policy COS 10.6: Encourage the development of Conversion Technologies such as anaerobic digestion and gasification for converting post recycled residual waste into renewable fuels and energy.

Goal COS 11: Energy systems for use in public facilities that reduce consumption of non-renewable resources while maintaining public safety.

- Policy COS 11.1: Promote energy retrofits of existing public facilities throughout the County to complement and reduce dependence upon utility-scale renewable energy production facilities.
- Policy COS 11.2: Promote the use of solar-powered lighting for highways, streets, and public facilities, including parks and trails.
- Policy COS 11.3: Promote the use of renewable energy systems in public facilities, such as hospitals, libraries, and schools, to ensure access to power in the case of major disasters.

Goal COS 12: Individual energy systems for onsite use that reduce consumption of non-renewable resources and dependence on utility-scale energy production facilities.

- Policy COS 12.1: Promote the use of individual renewable energy systems throughout the County to complement and reduce dependence upon utility-scale renewable energy facilities.

- Policy COS 12.2: Require appropriate development standards for individual renewable energy systems to minimize potential impacts to surrounding properties. Simplify the permitting process for individual renewable energy systems that meet these development standards.

Goal COS 13: Utility-scale energy production facilities for offsite use that reduce consumption of non-renewable resources while minimizing potential impacts on natural resources and existing communities.

- Policy COS 13.1: Direct utility-scale renewable energy production facilities, such as solar facilities, to locations where environmental, noise, and visual impacts will be minimized.
- Policy COS 13.2: Restrict development of utility-scale wind energy production facilities within the vicinity of Edwards Air Force Base to limit interference with military operations.
- Policy COS 13.3: Require all utility-scale renewable energy production facilities to develop and implement a decommissioning plan, with full and appropriate financial guarantee instruments that will restore the full site to its natural state upon complete discontinuance of operations and will restore non-operational portions of the site while the remainder continues operating.
- Policy COS 13.4: Promote the use of recycled water in utility-scale renewable energy production facilities to limit impacts on the available fresh water supply.
- Policy COS 13.5: Where development of utility-scale renewable energy production facilities cannot avoid sensitive biotic communities, require open space dedication within Significant Ecological Areas as a mitigation measure.
- Policy COS 13.6: Ensure that all utility-scale renewable energy production facilities, such as solar facilities, do not create land use conflicts with adjacent agricultural lands or existing residential areas in the vicinity. Require buffering and appropriate development standards to minimize potential conflicts.
- Policy COS 13.7: Limit the aesthetic impacts of utility-scale renewable energy production facilities to preserve rural character.
- Policy COS 13.8: Coordinate with other jurisdictions to plan for utility-scale renewable energy production facilities in order to minimize impacts to sensitive biotic communities and existing residential areas.
- Policy COS 13.9: Prohibit ground-mounted utility-scale renewable energy production facilities within Significant Ecological Areas and Economic Opportunity Areas.

Goal COS 14: Energy infrastructure that is sensitive to the scenic qualities of the Antelope Valley and minimizes potential environmental impacts.

- Policy COS 14.1: Require that new transmission lines be place underground whenever physically feasible.
- Policy COS 14.2: If new transmission lines cannot feasibly be placed underground due to physical constraints, require that they be collocated with existing transmission lines, or along existing transmission corridors, whenever physically feasible.
- Policy COS 14.3: If new transmission lines cannot be feasibly be placed underground or feasibly collocated with existing transmission lines or along existing transmission corridors due to

physical constraints, direct new transmission lines to locations where environmental and visual impacts will be minimized.

- Policy COS 14.4: Discourage the placement of new transmission lines on undisturbed lands containing sensitive biotic communities.
- Policy COS 14.5: Discourage the placement of new transmission lines through existing communities or through properties with existing residential uses.
- Policy COS 14.6: Review all proposed transmission line projects for conformity with the Goals and Policies of the Area Plan, including those listed above. When the California Public Utilities Commission is the decision-making authority for these projects, provide comments regarding conformity with the Goals and Policies of the Area Plan.
- Policy COS 14.7: Require that electrical power lines in new residential developments be placed underground.

Dark Night Skies

Goals COS 15: Humans and wildlife enjoy beautiful dark Antelope Valley skies unimpeded by light pollution.

- Policy COS 15.1: Ensure that outdoor lighting, including street lighting, is provided at the lowest possible level while maintaining safety.
- Policy COS 15.2: Prohibit continuous all-night outdoor lighting in rural areas, unless required for land uses with unique security concerns, such as fire stations, hospitals, and prisons.
- Policy COS 15.3: Replace outdated, obtrusive, and inefficient light fixtures with fixtures that meet dark sky and energy efficiency objectives.
- Policy 15.4: Require compliance with the provisions of the Rural Outdoor Lighting District throughout the unincorporated Antelope Valley.

Vegetation Conservation

Goal COS 16: Native vegetation thrives throughout the Antelope Valley, reducing erosion, flooding, and wind-borne dust and sand.

- Policy COS 16.1: Except within Economic Opportunity Areas, require new development to minimize removal of native vegetation. Discourage the clear-scraping of land and ensure that a large percentage of land is left in its natural state.
- Policy COS 16.2: Maximize the use of native vegetation in landscaped areas, provided that vegetation meets all applicable requirements of the Fire Department and the Department of Public Works.

Green Building

Goal COS 17: Buildings are sustainable, conserving energy, water, and other resources, and limiting greenhouse gas emissions.

- Policy COS 17.1: Promote green building techniques for the construction and operation of public and private buildings in the unincorporated Antelope Valley.
- Policy COS 17.2: Require that new buildings be sited and designed in a manner that maximizes efficient use of natural resources, such as air and light, to reduce energy consumption, heat profiles, and greenhouse gas emissions.
- Policy COS 17.3: Promote energy retrofits of existing buildings.
- Policy COS 17.4: Promote the use of individual renewable energy systems and require appropriate development standards for such systems to minimize potential impacts to surrounding properties. Simplify the permitting process for individual renewable energy systems that meet these development standards.
- Policy COS 17.5: Protect active and passive solar design elements and systems from shading by neighboring structures and trees through appropriate development standards.
- Policy COS 17.6: Require new landscaping to comply with applicable water efficiency requirements in the County Code.
- Policy COS 17.7: Require low-flow plumbing fixtures in all new developments.
- Policy COS 17.8: Require onsite stormwater infiltration in all new developments through use of appropriate measures, such as permeable surface coverage, permeable paving of parking and pedestrian areas, catch basins, and other low impact development strategies.
- Policy COS 17.9: Require reduction, reuse, and recycling of construction and demolition debris.

Open Space

Goal COS 18: Permanently preserved open space areas throughout the Antelope Valley.

- Policy COS 18.1: Encourage government agencies and conservancies to acquire mitigation lands in the following areas and preserve them as permanent open space:
    - Significant Ecological Areas, including Joshua Tree Woodlands, wildlife corridors, and other sensitive habitat areas:
    - Hillside Management Areas;
    - Scenic Resource Areas, including water features such as the privately owned portion of Elizabeth Lake, significant ridgelines, buttes, and other natural landforms;
    - Land adjoining preserves, sanctuaries, State Parks, and National Forests; and
    - Privately owned lands within the National Forest.
- Policy COS 18.2: Ensure that open space acquisition is conducted in a fair and equitable manner.
- Policy COS 18.3: Maintain permanently preserved open space areas to ensure attractiveness and safety.
- Policy COS 18.4: Pursue funding for open space acquisition and maintenance on an ongoing basis.
- Policy COS 18.5: Provide parks and recreational facilities, as directed in the policies of the Public Safety, Services, and Facilities Element.

Goal COS 19: New development meets open space objectives while maintaining rural character.

- Policy COS 19.1: When new development is required to preserve open space, require designs with large contiguous open space areas that maximize protection of environmental and scenic resources.
- Policy COS 19.2: Allow large contiguous open space areas to be distributed across individual lots so that new development preserves open space while maintaining large lot sizes that are consistent with a rural environment, provided that such open space areas are permanently restricted through deed restrictions.
- Policy COS 19.3: Pursue innovative strategies for open space acquisition and preservation through the land development process, such as Transfers of Development Rights, Land Banking, and Mitigation Banking, provided that such strategies preserve rural character.

Chapter 5

PUBLIC
SAFETY, SERVICES AND FACILITIES ELEMENT

Chapter 5: Public Safety, Services and Facilities Element

Table of Contents

I. Background

Purpose

Public services and facilities, such as fire protection, law enforcement, libraries, schools, and parks are amenities provided by the government to ensure the health, safety, and welfare of its residents. These services and facilities help to protect the population as a whole and contribute to community maintenance.

This Public Safety, Services and Facilities Element contains Goals and Policies outlining strategies to fulfill the overall mission of the County of Los Angeles: "to enrich lives through effective and caring service." This Element identifies local hazards that include fire, geology, and floods, and then elaborates on community expectations for enhanced and efficient local services that include law enforcement, parks, schools, libraries, health facilities, and economic development.

Issues

Public services require long-range planning to account for anticipated population and environmental changes that necessitate modification of service levels. Fire and sheriff's services must anticipate the extent and location of future needs to determine what enhancements can be offered. The provision of trails, parks, and roads requires coordination among multiple government agencies to achieve service goals. Schools, libraries and health services need to be accessible to the local residents they serve. A strong economic base ensures that all these public services and facilities can continue to be offered.

The level of public services and facilities are often dependent upon population numbers. Higher population numbers equate to higher demand, and thus larger communities receive greater quantities of service. The Antelope Valley is comprised of dispersed towns with smaller populations that correspond to relatively limited service availability, which underscores the necessity of long-range planning to ensure an adequate supply of life and safety services to maintain and enhance the quality of life.

Local environmental features, such as buttes, floodplains, and forests, make the Antelope Valley a uniquely rural setting in Los Angeles County but also give rise to many of the natural hazards that can compromise the safety of residents. Remote areas pose challenges to safety personnel trying to protect residents when responding to earthquake, flood and fire disasters. While many of these hazards are pre-existing and unpreventable, there are many actions that can be taken to reduce risks.

Vision and Strategy

The Area Plan's Vision Statement requires this Element to provide quality social, education, and recreational services and facilities. To implement the Area Plan's Rural Preservation Strategy, this Element will improve the quality of life and increase residents' safety and well-being by guiding future development to rural town center areas, rural town areas, and economic opportunity areas where services are already provided or are being planned and which contain less hazardous portions of the

Antelope Valley. As changes occur in the future, Valley residents will continue to receive high-caliber public services that accommodate current and future needs.

II. Goals and Policies

Fire Hazards

Goal PS 1: Protection of the public through fire hazard planning and mitigation.

- Policy PS 1.1: Limit the amount of potential master-planned development in Very High Fire Hazard Severity Zones through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy PS 1.2: Require that all new developments provide sufficient access for emergency vehicles and sufficient evacuation routes for residents and animals.
- Policy PS 1.3: Promote fire prevention measures, such as brush clearance and the creation of defensible space, to reduce fire protection costs.
- Policy PS 1.4: Provide strict enforcement of the Fire Code and all Fire Department policies and regulations.

Geological Hazards

Goal PS 2: Protection of the public through geological hazard planning and mitigation.

- Policy PS 2.1: Limit the amount of potential development in Seismic Zones and along the San Andreas Fault and other fault traces, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy PS 2.2: Limit the amount of development on steep slopes (Hillside Management Areas) and within landslide and liquefaction areas, through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy PS 2.3: Prohibit the construction of new structures on or across a fault trace.
- Policy PS 2.4: Ensure that new development does not cause or contribute to slope instability.

Flood Hazards

Goal PS 3: Protection of the public through flood hazard planning and mitigation.

- Policy PS 3.1: Limit the amount of potential development in Flood Zones designated by the Federal Emergency Management Agency through appropriate land use designations with very low residential densities, as indicated in the Land Use Policy Map (Map 2.1) of this Area Plan.
- Policy PS 3.2: Require onsite stormwater filtration in all new developments through use of appropriate measures, such as permeable surface coverage, permeable paving of parking and pedestrian areas, catch basins, and other low impact development strategies.
- Policy PS 3.3: Review the potential local and regional drainage impacts of all development proposals to minimize the need for new drainage structures.

- Policy PS 3.4: Ensure that new drainage structures are compatible with the surrounding environment by requiring materials and colors that are consistent with the natural landscape. Discourage concrete drainage structures.

Law Enforcement

Goal PS 4: Protection of public safety through law enforcement and crime prevention strategies.

- Policy PS 4.1: Support an increased law enforcement presence in every Antelope Valley community and explore new funding mechanisms to expand law enforcement services.
- Policy PS 4.2: Support a strong law enforcement presence on highways and streets to strictly enforce speed limits and other vehicle safety laws.
- Policy PS 4.3: Promote and support neighborhood watches to create more eyes and ears in the community.
- Policy PS 4.4: Educate the public on crime prevention programs and resources offered by the Sheriff's Department.

Goal PS 5: Protection of public health, safety, and welfare through code enforcement.

- Policy PS 5.1: Support neighborhood preservation programs, such as graffiti abatement, removal of abandoned or inoperable vehicles, and removal of trash and debris.
- Policy PS 5.2: Strictly enforce laws against illegal dumping and support the Antelope Valley Illegal Dumping Task Force.
- Policy PS 5.3: Educate the public on existing codes and the value of maintaining their property, encouraging voluntary compliance.
- Policy PS 5.4: Administer code enforcement activities in a fair, equitable, respectful, and cooperative manner.
- Policy PS 5.5: Create proactive code enforcement programs where desired by community residents.

Disaster Preparedness and Emergency Response

Goal PS 6: Government officials work with community members to promote community safety.

- Policy PS 6.1: Ensure safety information is available at local public areas.
- Policy PS 6.2: Encourage residents and business owners to create an evacuation plan and maintain emergency supplies.
- Policy PS 6.3: Promote the formation and coordination of Certified Emergency Response Teams.
- Policy PS 6.4: Provide assistance to local communities that wish to create a local emergency evacuation plan.
- Policy PS 6.5: Strengthen coordination and collaboration between citizens, public agencies, and non-profit groups to plan for disaster response.

- Policy PS 6.6: Develop an inclusive master emergency plan that designates evacuation routes, emergency relief centers, emergency animal keeping shelters, and information centers in every Antelope Valley community.

Goal PS 7: Emergency services that respond in a timely manner.

- Policy PS 7.1: Require visible addresses on buildings and at entrances to properties as required by the Fire Code.
- Policy PS 7.2: Ensure that Fire Stations are adequately staffed.
- Policy PS 7.3: Strive for a timely response to every call for service.

Parks and Recreation

Goal PS 8: Antelope Valley residents enjoy access to parks and recreational facilities.

- Policy PS 8.1: Maintain existing parks to ensure attractiveness and safety and make improvements as necessary. Ensure adequate funding on an ongoing basis.
- Policy PS 8.2: Provide recreational activities at parks that serve all segments of the population.
- Policy PS 8.3: Provide new parks as additional development occurs or as the population grows, with a goal of four acres of parkland for every 1,000 residents.
- Policy PS 8.4: Prioritize new parks for existing park deficient communities.
- Policy PS 8.5: Encourage the use of school playgrounds and sporting fields for community recreation ("joint use") when school is not in session.
- Policy PS 8.6: Within rural town center areas, promote the inclusion of parks, recreational facilities, and other gathering places that allow neighbors to meet and socialize.
- Policy PS 8.7: Provide trails, bikeways, and bicycle routes for recreational purposes, as directed in the policies of the Mobility Element.
- Policy PS 8.8: Maintain existing facilities for public water recreation to ensure attractiveness and safety and make improvements as necessary. Ensure adequate funding on an ongoing basis.
- Policy PS 8.9: Provide new facilities for public water recreation in appropriate areas.

Goal PS 9: Safe spaces for the recreational use of off-road vehicles and other motorized sporting.

- Policy PS 9.1: Reduce illegal off-road vehicle use by providing off-road vehicle trails and parks in appropriate areas.
- Policy PS 9.2: Reduce illegal drag racing by providing appropriate locations for safe and properly monitored drag racing.
- Policy PS 9.3: Provide strict enforcement of illegal off-road vehicle use and illegal drag racing.

Schools

Goal PS 10: A wide range of educational opportunities for Antelope Valley residents.

- Policy PS 10.1: Coordinate with all Antelope Valley school districts to ensure that new schools are provided as additional development occurs or as the population grows.
- Policy PS 10.2: Encourage new schools to locate in rural town center areas, rural town areas, and economic opportunity areas, where they will be accessible by pedestrian walkways, trails, bikeways, and bicycle routes.
- Policy PS 10.3: Encourage new schools to locate near parks and recreational facilities.
- Policy PS 10.4: Encourage the use of school playgrounds and sporting fields for community recreation ("joint use") when school is not in session.
- Policy PS 10.5: Promote the creation of a four-year public university in the Antelope Valley to provide opportunities for continuing education and workforce development.

Libraries

Goal PS 11: Antelope Valley residents enjoy easy access to public library services.

- Policy PS 11.1: Maintain existing public libraries and make improvements as necessary. Ensure adequate funding on an ongoing basis.
- Policy PS 11.2: Expand public library collections and services to meet community needs.
- Policy PS 11.3: Provide new public libraries as additional development occurs or as the population grows.
- Policy PS 11.4: Encourage new public libraries to locate in rural town center areas, rural town areas, and economic opportunity areas, where they will be accessible by pedestrian walkways, trails, bikeways, and bicycle routes.
- Policy PS 11.5: Provide bookmobile services in areas that are not served by permanent public libraries.
- Policy PS 11.6: Encourage the use of technology in library operations to increase efficiency and accessibility.

Health Facilities

Goal PS 12: A range of facilities and service that maintain the health and well-being of Antelope Valley residents at all ages and income levels.

- Policy PS 12.1: Provide preventative health services to reduce the need for emergency medical care.
- Policy PS 12.2: Support the development of regional health care facilities in Lancaster and Palmdale.
- Policy PS 12.3: Support existing community health care clinics in rural areas by preventing the encroachment of incompatible land uses. Allow expansion when required to meet community needs.

- Policy PS 12.4: Encourage the development of new community health care clinics where required to meet community needs. Encourage these clinics to locate in rural town center areas and economic opportunity areas, where they will be accessible by pedestrian walkways, trails, bikeways, and bicycle routes.
- Policy PS 12.5: Pursue funding to support daily operations at community health care clinics.

Chapter 6

ECONOMIC DEVELOPMENT ELEMENT

Chapter 6: Economic Development Element

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I. Background

Purpose

In a market-based and private sector-led system, the primary driver of overall development in a given area is its economy. This economy is affected by local, regional and to a certain extent, national and global factors. This Economic Development Element of the Area Plan contains Goals and Policies to anticipate and plan for these factors in order to ensure that sustainable economic development is achieved throughout the Antelope Valley in the years to come. This Element also aims to balance economic growth with the preservation of the unique rural character and rich environmental resources of the Antelope Valley.

Issues

The Antelope Valley has a number of competitive advantages that can help it become the premier destination for high tech manufacturing firms in aerospace and other cutting-edge industries. These include the abundance of large, flat and relatively less expensive land; availability of a variety of transportation options such as truck, rail and air; close proximity to renewable energy sources; and other such factors. One issue facing the Antelope Valley in terms of Economic Development is its physical distance from the major urban areas of Los Angeles County. Thus, people who live in the area but work elsewhere or vice versa, may have very long home-work commutes. An improved jobs-housing balance will provide a vibrant economy in the Antelope Valley.

Vision and Strategy

The Area Plan's Vision Statement requires this Element to address the growing population's need for employment opportunities. This Area Plan provides for a jobs-to-household ratio of approximately 1.3 jobs for every household in the unincorporated Antelope Valley, a far improvement from the ratio of approximately one job for every five households established by the previous 1986 Antelope Valley Areawide General Plan.

The primary strategy of this Area Plan is to identify more areas appropriate for light and heavy industrial uses. These are areas in close proximity to major transportation corridors; and/or provide renewable energy, raw materials such as those from surface mining, a high concentration of skilled labor force, or other such important components for a successful and sustainable economy.

II. Goals and Policies

Goal ED1: A healthy and balanced economic base in the Antelope Valley that attracts a wide range of industries and businesses and provides high-paying jobs for local residents.

High-tech Manufacturing

With the availability of land, easy access to transportation corridors and proximity to renewable energy resources, the Antelope Valley is a prime destination for high-tech manufacturing to relocate to as they are more and more crowded out of their current urban locations. One of the main drivers of economic development in the Antelope Valley will be the relocation of high-tech industries to appropriate locations in the unincorporated Antelope Valley

- Policy ED 1.1: Promote the continued development of regional commercial and industrial employment centers in economic opportunity areas in the Antelope Valley.
- Policy ED 1.2: Allow the development of commercial and industrial uses at the Palmdale Regional Airport site, provided that those uses are compatible with airport operations and do not restrict or prohibit future expansion of the airport.
- Policy ED 1.3: Support the growth of "high-tech" industries to employ the Antelope Valley population's highly educated workforce.

Transportation and Logistics

As manufacturing and other industrial activities in the Antelope Valley increase, so will the demand for transportation and logistics services. With a wide expanse of relatively flat terrain and the availability of a variety of transport options such as by truck, rail or air, the Antelope Valley is poised to attract a number of companies specializing in logistics services.

- Policy ED 1.4: Support the development of the High Desert Corridor and the Northwest 138 Corridor Improvement projects to improve the east-west movement of goods, particularly between the Antelope Valley and the industrial areas of Kern and San Bernardino counties and beyond.
- Policy ED 1.5: Promote the development of an "Inland Port" in the Antelope Valley, providing additional employment in the trade and logistics sectors.
- Policy ED 1.6: Support the development of a range of travel options that better connect the Antelope Valley to existing regional trade and employment in other regions, including the High Desert Corridor and the Northwest 138 Corridor Improvement Projects.

Agriculture

The AV has vast expanses of land that are suitable for large-scale farming and other agricultural activities. The AV Area Plan will encourage and continuation and possible expansion of such activities in order to ensure that agriculture continues to be one of the main economic drivers of growth in the area.

- Policy ED 1.7: Promote farming and other agricultural activities that contribute to the Antelope Valley economy.
- Policy ED 1.8: Promote alternative sources of income for farmers, including commercial and industrial activities, to supplement their income during low production years and encourage them to continue farming in the Antelope Valley.

- Policy ED 1.9: Support water management projects, including the use of modern technology to increase available water supply in the area, in conjunction with the Integrated Regional Water Management Plan.

Renewable Energy

The demand for renewable energy in California is expected to dramatically increase in the near future. The AV has one of the most abundant sunshine in the country. This, along with the availability of undeveloped open spaces, gives the AV a lot of potential for solar energy development as well as other forms of renewable energy sources.

- Policy ED 1.10: Promote small-scale, household based renewable energy systems to enable Antelope Valley residents to become energy independent.
- Policy ED 1.11: Encourage the development of utility-scale renewable energy projects at appropriate locations and with appropriate standards to ensure that any negative impacts to local residents are sufficiently mitigated.
- Policy ED 1.12: Adopt regulations that ensure that local residents receive a fair share of the benefits of utility-scale renewable energy projects that are commensurate to their impacts.
- Policy ED 1.13: Ensure early discussions with Edwards Air Force Base and U.S. Air Force Plant 42 regarding new industries, such as utility-scale renewable energy production facilities, to limit potential impacts on mission capabilities.

Construction and Housing

The growth of the cities of Palmdale and Lancaster, as well as the increase in economic activity in the AV as a whole, will spur demand for new housing and other construction projects. The Antelope Valley Area Plan identifies the appropriate areas for this residential growth to occur and promote a variety of different types of residential development to occur there.

- Policy ED 1.14: Promote appropriate types of residential development in the vicinity of existing communities and town centers that are in reach of existing infrastructure and utilities.
- Policy ED 1.15: Where appropriate, promote residential development as part of a wider mixed-use strategy in communities that desire such uses in their areas and where plans for major infrastructure and facilities are currently underway. These areas have been identified as economic opportunity areas as shown in the Land Use Policy Map (Map 2.1) of this Area Plan.

Recreation, Tourism and Filmmaking

The vast open spaces, unique landscape and natural resources of the AV make it an ideal destination for recreational activities, tourism, filming and other industries that put a premium on preservation of the natural environment. The Antelope Valley Area Plan aims to protect and preserve these resources, while promoting compatible activities that allow landowners to derive economic benefit from their properties.

- Policy ED 1.16: Preserve the scenic resources of the Antelope Valley, including Scenic Drives, Significant Ridgelines and Significant Ecological Areas, in such a~~s~~ way that can contribute to the economic activities in the area.
- Policy ED 1.17: Promote uses and activities that rely on the natural state of the environment to take advantage of the vast areas of relatively undisturbed natural areas in the Antelope Valley. These include recreational, tourism and film-making uses.

Regional Economic Development Strategies

The Antelope Valley is the largest Planning Area in Los Angeles County. Thus, there is a need to develop comprehensive and long-term economic development plans, not just at the local, but also the regional level. This will help ensure the orderly and sustainable economic development of the area in the long-term.

- Policy ED 1.18: Coordinate with the Los Angeles County Economic Development Corporation, the Greater Antelope Valley Economic Alliance, and other organizations to create and implement regional economic development strategies.
- Policy ED 1.19: Promote the creation of a four-year public university in the Antelope Valley to provide opportunities for continuing education and workforce development.
- Policy ED 1.20: Support the development of a range of travel options that better connect the Antelope Valley to existing regional trade and employment centers in other regions, including the High Desert Corridor and the Northwest 138 Corridor Improvement Project, as directed in the policies of the Mobility Element.
- Policy ED 1.21: Ensure early discussions with Edwards Air Force Base and U.S. Air Force Plant 42 regarding new industries, such as utility-scale renewable energy production facilities, to limit potential impacts on mission capabilities.

Chapter 7

COMMUNITY-SPECIFIC LAND USE CONCEPTS

Chapter 7: Community-Specific Land Use Concepts Element

Table of Contents

I. Background

Purpose

The previous Chapters of this Area Plan set forth general goals and policies that may be applied throughout the unincorporated Antelope Valley. However, each community varies in its nature, form, and character. The Community-Specific Land Use Concepts contained in this Chapter describe in greater detail how this Area Plan, particularly the Land Use Element, is to be implemented in each community within the unincorporated Antelope Valley.

The Land Use Concepts (Concepts) attempt to provide expectations for how each rural community may change and grow throughout the life of this Area Plan. The Concepts specify the desired land uses for each area and identify potentially incompatible land uses that would not be desirable. Residents, stakeholders, and decision-makers should refer to the Concepts to familiarize themselves with the setting and character of each community and should use this information when considering the appropriateness of land use development projects, infrastructure improvements, and consideration efforts.

The following communities are addressed in this Chapter:

- Acton
- Antelope Acres
- Crystalaire
- El Dorado and White Fence Farms
- Elizabeth Lake and Lake Hughes (The Lakes)
- Fairmont
- Gorman
- Green Valley
- Juniper Hills
- Lake Los Angeles
- Lakeview
- Leona Valley
- Littlerock and Sun Village (Southeast Antelope Valley)
- Llano
- Neenach
- Pearblossom
- Quartz Hill
- Roosevelt
- Three Points

Vision and Strategy

The Area Plan's Vision Statement acknowledges that the unincorporated Antelope Valley "is a mosaic of unique small towns" and the Community-Specific Land Use Concepts are intended to reflect each community's unique nature, form, and character, as well as each community's unique vision of the future. The Area Plan's Rural Preservation Strategy seeks to achieve the Area Plan's Vision Statement

through a framework of rural town centers, rural town areas, rural preserve areas, and economic opportunity areas. The Community-Specific Land Use Concepts describe how this framework has been applied to each community and refines the framework in a manner that addresses each community's individual needs. Overall, this Chapter ensures that the Area Plan will serve as a living document that will shape future implementation efforts in a manner that is both complementary of the overall Vision Statement and Rural Preservation Strategy and relevant to, and appropriate for, each community within the unincorporated Antelope Valley.

Community Standards Districts

Some of the communities described in this Chapter are within Community Standards Districts (CSD's). CSD's are overlays in the Zoning Code that provide specific development standards with unique land use issues that are not adequately addressed by the County's Subdivision and Zoning Codes. CSD's, as well as other applicable County Code requirements, should be consulted when projects are being considered in a community.

II. Land Use Concepts

Acton

The community of Acton is located in the southwestern portion of the Antelope Valley, south of the City of Palmdale along State Route 14. The community is adjacent to the National Forest, and natural hillsides and significant ridgelines separate the community from the City of Palmdale and the remainder of the Antelope Valley. Community residents are concerned about urbanization of the area and wish to remain an unincorporated rural community with a unique identity. Some portions of the community are partially developed with a variety of agricultural uses and single-family homes on large lots. Other portions are largely undeveloped, are generally not served by existing infrastructure, contain environmental resources, such as Significant Ecological Areas and Hillside Management Areas, and are subject to safety constraints, such as Very High Hazard Severity Zones.

The community has a rural town center area along Crown Valley Road between Gillespie Avenue and Soledad Canyon Road. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities. New buildings in the rural town center area shall be limited to two stories in height and shall include Old West design elements with earth tone colors at a pedestrian-oriented scale, with primary building entries facing Crown Valley Road or adjacent local streets. New development in the rural town center that would require the installation of urban infrastructure, such as concrete curbs and gutters, street lights, and traffic signals, shall be strongly discouraged as this does not fit with the community's unique rural character and identity.

The rural town centers shall continue to be the focal point of the community and shall be linked to the surrounding rural town area through trails and pedestrian routes. Pedestrian routes shall have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as plazas and community bulletin boards, are encouraged in this area.

Some areas outside the rural town center area have also been designated as Rural Commercial (CR) to acknowledge existing uses and to provide additional commercial services and local employment opportunities. The intent of these designations is to allow low-intensity local commercial uses that

serve community residents and to prohibit high-intensity regional commercial uses that serve travelers along State Route 14. Moving west to east through the community, areas with this designation include:

- Two parcels along Sierra Highway, generally between Sand Creek Drive and Wanstead Drive, north of State Route 14;

- A parcel along Sierra Highway, east of Red Rover Mine Road and north of State Route 14;

- Several parcels surrounding the intersection of Crown Valley Road and Sierra Highway and of Crown Valley Road and Antelope Woods Road, both of which are adjacent to State Route 14;

- A parcel at the northeast corner of Soledad Canyon Road and Santiago Road;

- Several parcels at the northwest and northeast corners of the intersection of Sierra Highway and Santiago Road, north of State Route 14;

- Several parcels along the south side of Sierra Highway between San Gabriel Avenue and State Route 14; and

- Several parcels along the north side of Sierra Highway, west of State Route 14.

New buildings in these CR designations shall also be limited to two stories in height, shall include Old West design elements with earth tone colors at a pedestrian-oriented scale, and shall be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes shall have permeable paving, consistent with rural community character, instead of concrete sidewalks. Development in these CR designations that would require the installation of urban infrastructure, such as concrete curbs and gutters, street lights and traffic signals, shall be discouraged as this does not fit with the community's unique rural character and identity. New commercial uses outside of these CR designations, or outside the CR designation within a rural town center area, are also strongly discouraged, as they are not compatible with the community character.

Some areas within the community have been designated as Light Industrial (IL) to acknowledge existing uses and to provide additional local employment opportunities. Moving west to east through the community, areas with this designation include:

- Several parcels at the northeast and southeast corners of Sierra Highway and Red Rover Mine Road;

- Several parcels along Soledad Canyon Road, south of the Crown Valley Road intersection and the rural town center area;

- Several parcels along Soledad Canyon Road, northeast of the Crown Valley Road intersection, and also along Syracuse Avenue and Gillespie Avenue, all east of the rural town center area;

- Several parcels along the south side of Soledad Canyon Road between Santiago Road and Malinta Avenue; and

- Several parcels along Sierra Highway, west and north of the Vincent Grade/Acton Metrolink Station.

New buildings in these IL designations shall be limited to two stories in height, shall include Old West design elements with earth tone colors at a pedestrian-oriented scale, and shall be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes shall have permeable paving, consistent with rural community character, instead of concrete sidewalks. Development in these IL designations that would require the installation of urban infrastructure, such as concrete curbs and gutters, street lights and traffic signals shall be strongly discouraged as this does not fit with the community's unique rural character and identity. New industrial uses outside of these IL designations are also strongly discouraged, as they are not compatible with the community character.

All advertising signs shall be limited to no more than 35 feet. More restrictions on the allowed Floor Area Ratio (FAR), drive-through services and other such regulations may be adopted by the community through their Community Standards District. Please see Chapter 8 (Plan Implementation) of this Area Plan for more details.

Most of the community is considered to be a rural town area. The rural town area has been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land, Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land, and Rural Land 1 (RL1), with a maximum density of 1 residential unit for each 1 gross acre of land. Small portions of the rural town area have other designations, as follows:

- The area generally bounded by Syracuse Avenue to the north, Bartlett Street and 1st Street to the west, Cory Avenue and 9th Street to the south, and 3rd Street to the east has been designated as Residential 5 (H5), with a maximum density of 5 residential units for each 1 net acre of land. In addition, a few parcels between Syracuse Avenue and Gillespie Avenue, east of Crown Valley Road, have been designated as H5; and

- The area surrounding the H5 designation, generally bounded by Sacramento Avenue to the north, 41st Street West and 40th Street West to the west, 9th Street and Spring Avenue to the south, and Crown Valley Road to the east, has been designated as Residential 2 (H2), with a maximum density of 2 residential units for each 1 net acre of land.

- The RL5, RL2, RL1, H2, and H5 designations are intended to reflect the existing densities within various parts of the rural town area, which are developed or partially developed as the result of previous land divisions. The RL5, RL2, RL1, H2, and H5 designations are not intended to promote further land divisions. New land divisions in the rural town area shall maintain a large minimum lot size to ensure consistency with the desired community character.

The majority of new residential development in Acton shall be directed to the rural town area instead of the surrounding rural preserve area, provided that such development is consistent with existing community character. New land divisions shall maintain a large minimum lot size. Various types of agriculture, equestrian, and animal-keeping uses should be allowed through the rural town area, provided that lots meet Zoning Code requirements for those uses. Home-based occupations may also be permitted throughout the rural town area, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit per 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit per 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area shall be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Antelope Acres

The community of Antelope Acres is located in the northwestern portion of Antelope Valley, west of the City of Lancaster. Community residents are concerned about urbanization of the area and wish to remain an unincorporated rural community with a unique identity. Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas and Agricultural Resource Areas.

The community has a rural town center area located along 90th Street West between Avenue E-4 and Avenue E-12. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities. New buildings in the rural town center area should be limited to one story in height and should include Old West design elements at a pedestrian-oriented scale, with primary building entries facing 90th Street West. No other portions of the community have been designated for commercial or industrial use, and new commercial and industrial uses outside the rural town center area are strongly discouraged, as they are incompatible with the community character.

Over time, the rural town center areas should become the focal point of the Antelope Acres community and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as plazas and community bulletin boards, are encouraged in this area.

The community includes rural town areas that surround the rural town center area and are generally bounded by Avenue E and Avenue C to the north, 80th Street West to the east, Avenue F and Avenue F-8 to the south, and 95th Street West and 90th Street West to the west. These areas have been designated as Rural Land 2 (RL2), with a maximum density of 1 residential unit per 2 gross acres of land. This designation is intended to reflect the existing density of the rural town areas and is not intended to promote further land divisions. New land divisions in the rural town areas shall maintain a large minimum lot size to ensure consistency with the existing community character.

The majority of new residential development in Antelope Acres should be directed to the rural town areas instead of the surrounding rural preserve areas, provided that such development is consistent with the existing community character and allows for light agriculture, equestrian, and animal-keeping uses should be allowed through the rural town area, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be discouraged in the rural town areas because of potential impacts on existing residents. Home-based occupations are also appropriate in the rural town areas, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints and environmental resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Crystalaire

The community of Crystalaire is located in the southeastern portion of the Antelope Valley, south of Llano, and includes a golf course and a small airport which are described in more detail below. Some portions of the community are developed with single-family homes on large lots. Other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas, and are subject to safety hazards, such as Flood Zones, particularly along Big Rock Creek and Big Rock Wash..

The community currently does not have a rural town center area but a stretch of 165th Street East between East Avenue W-12 and East Avenue X, in front of Crystalaire Airport has been designated Mixed Use – Rural (MU-R) in anticipation of a future town center to develop in this area. New commercial uses outside of this MU-R designation are strongly discouraged, as they are not compatible with the community character.

The community includes a rural town area that includes the existing subdivision near the Crystalaire Country Club and adjacent lands that are generally bounded by 165th Street East to the east and Avenue Y-4 to the south. This area has been designated as Residential 2 (H2), with a maximum density of 2 residential units for each 1 net acre of land. This designation is intended to reflect the existing density of the rural town area. New land divisions in this area shall have large lot sizes that are consistent with the existing subdivision near the Crystalaire Country Club.

The majority of new residential development in Crystalaire should be directed to the rural town area instead of the surrounding rural preserve areas, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited because of potential impacts on existing residents. Home-based occupations may also be permitted in this area, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Crystalaire Airport

The Crystalaire Airport is a privately owned and operated aviation facility that occupies several parcels. These parcels have been designated as Public and Semi-Public (P) to acknowledge the existing airport use and to allow for its continued operation. However, the Area Plan acknowledges that these parcels

also contain commercial and industrial uses and are an appropriate location for such uses given its proximity to the communities of Crystalaire and Llano. Accordingly, at the time of this Area Plan's adoption, the parcels were zoned Rural Commercial – Mixed Use (MXD-RU) and Light Industrial (M-1). This Area Plan allows commercial mixed-use and industrial uses on these parcels without a Plan Amendment, provided that these are compatible with airport operations and that these do not restrict or prohibit the operations of the airport.

Crystalaire Golf Course

The Crystalaire Golf Course is a privately owned golf facility that occupies several parcels. These parcels have been designated as Open Space – Parks (OS-PR) and zoned Commercial – Recreation (C-R) to acknowledge the existing residential recreational use and its open space character on the property, and to allow for its continued operation. The Area Plan also acknowledges that some limited residential uses may be appropriate as accessory to the primary use as a golf course. Thus the Area Plan allows some limited residential uses on these parcels without a Plan Amendment, provided that the golf course is in continued operation and that the residential uses occupy not more than 10 percent of the total area. All requirements of the base zone shall apply, including but not limited to, an approved conditional use permit.

El Dorado and White Fence Farms

The communities of El Dorado and White Fence Farms are located in the central portion of the Antelope Valley and are surrounded by the cities of Lancaster and Palmdale. Although these communities are adjacent to urbanized areas, such as the Rancho Vista community and the Antelope Valley Mall, they have a distinctly rural character. The communities are partially developed with light agricultural uses and single-family homes on large lots.

These communities do not have a rural town center area, but they are served by the rural town center area in Quartz Hill and by commercial centers in the adjacent cities. Two parcels on 10th Street West and one parcel on Avenue N have been designated as Rural Commercial (CR) in recognition of existing commercial uses. No other portions of the communities have been designated for commercial or industrial use, and new commercial uses outside of these CR designations and new industrial uses are strongly discouraged, as they are not compatible with the communities' character.

The communities are considered to be a rural town area and have been designated as Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land. This designation is intended to reflect the communities' existing density and is not intended to promote further land divisions. New land divisions shall maintain a large minimum lot size to ensure consistency with the existing character of the communities.

Light agriculture, equestrian, and animal-keeping uses are appropriate in these communities, but heavy agriculture uses should be discouraged because of potential impacts on existing residents. Home-based businesses are also appropriate in these communities, provided that they meet Zoning Code requirements.

Elizabeth Lake and Lake Hughes (The Lakes)

The communities of Elizabeth Lake and Lake Hughes are located in the southwestern portion of the Antelope Valley, northwest of Leona Valley, and are partially within the National Forest. Some portions of the community are developed or partially developed with single-family homes, light agricultural uses, and a limited amount of commercial and industrial uses. Other portions are largely undeveloped, are generally not served by existing infrastructure, contain environmental resources, such as Significant Ecological Areas and Hillside Management Areas, and are subject to safety constraints, such as the San Andreas Fault and Very High Fire Hazard Severity Zones.

The communities share one rural town center area in Lake Hughes, located along Elizabeth Lake Road between Trail I and Mountain View Road, west of the Lake Hughes Community Center. The rural town center area has been designated as Rural Commercial (CR) and Light Industrial (IL) to serve the daily needs of residents and provide local employment opportunities. New buildings in the rural town center area should be limited to two stories in height and should be designed at a pedestrian-oriented scale, with primary building entries facing Elizabeth Lake Road or adjacent local streets.

The rural town center area should continue to be the focal point of the communities and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as plazas and community bulletin boards, are encouraged in this area.

Some areas outside the rural town center area have been designated as Rural Commercial (CR) to acknowledge existing uses and to provide additional commercial services and local employment opportunities. Moving west to east through the communities, areas with this designation include:

- Several parcels along Lake Hughes Road between Elizabeth Lake Road and Desswood Road (Lake Hughes); and

- Two parcels at the southwest corner of Elizabeth Lake Road and Johnson Road (Elizabeth Lake).

New buildings in these CR designations should also be limited to two stories in height, should be designed at a pedestrian-oriented scale, and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. New commercial uses outside of these CR designations, or outside the CR designations within the rural town center area, are strongly discouraged, as they are not compatible with the communities' character.

Several parcels at the southwest corner of Elizabeth Lake Road and Lake Hughes Road have been designated as Light Industrial (IL) to acknowledge an existing use. New industrial uses outside of this IL designation, or outside the IL designation within the rural town center area, are strongly discouraged, as they are not compatible with the communities' character.

The community of Elizabeth Lake includes rural town areas. The primary rural town area surrounds the Elizabeth Lake water body. North of Elizabeth Lake Road, the primary rural town area is generally bounded by Hawk Drive, Gist Drive, and hillsides to the north, Munz Ranch Road to the west, and Pekaboo Road and hillsides to the east. South of Elizabeth Lake Road, the primary rural town area is generally bounded by Sandrock Drive, Ranch Club Road, and Elizabeth Lake Road to the north, the

National Forest boundary to the west, the National Forest boundary, Ranch Club Road, and Kiptree Drive to the south, and Elizabeth Lake Road to the east. The primary rural town area has been designated as Residential 5 (H5), with a maximum density of 5 residential units for each 1 net acre of land. A few parcels north of Elizabeth Lake Road have been designated as Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land. The H5 and RL2 designations are intended to reflect the existing densities within the primary rural town area, which resulted from previous land division activities. The H5 and RL2 designations are not intended to promote further land divisions. The privately owned portion of Elizabeth Lake water body is considered to be one of the communities' rural preserve areas, which are discussed below.

A secondary rural town area in Elizabeth Lake is located north of Johnson Road between Leadhill Drive and Limeridge Drive and is partially developed as the result of previous land division activities. The secondary rural town area has been designated as Residential 9 (H9), with a maximum density of 9 residential units for each 1 net acre of land. The H9 designation is intended to reflect the existing density of this area and is not intended to promote further land divisions.

The community of Lake Hughes also includes a rural town area. The rural town area extends west from the rural town center area and is generally bounded by Elizabeth Lake Road, Elderberry Street, High Trail, Lone Pine Trail, and hillsides to the north, Muir Drive and a line approximately 1,500 feet west of Lake Hughes Road to the west, Desswood Road, New View Drive, and South Shore Drive to the south, and Mountain View Road to the east. The rural town area has been designated as Residential 5 (H5), with a maximum density of 5 residential units for each 1 net acre of land. A few parcels west of Lake Hughes Road have been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. The H5 and RL5 designations are intended to reflect the existing densities within the rural town area, which resulted from previous land division activities. The H5 and RL5 designations are not intended to promote further land divisions.

The majority of new residential development in Elizabeth Lake and Lake Hughes (collectively known as The Lakes) should be directed to the rural town areas instead of the surrounding rural preserve areas, provided that such development is consistent with existing community character. New land divisions in the rural town area shall maintain a large minimum lot size to ensure consistency with the desired community character. Light agriculture, equestrian, and animal-keeping uses should be allowed throughout the rural town ares, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited throughout the rural town areas because of potential impacts on existing residents. Home-based businesses may be permitted throughout the rural town areas, provided that they meet Zoning Code requirements.

The remaining lands in the communities are considered to be rural preserve areas and have been designated as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in rural preserve areas should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate. The privately owned portion of the Elizabeth Lake water body has been designated as RL20 and the Area Plan supports efforts to acquire this area and preserve it as open space (see Conservation and Open Space Element, Policy COS 18.1).

Fairmont

The community of Fairmont is located in the northwestern portion of the Antelope Valley, west of Antelope Acres and near the Antelope Valley California Poppy Reserve. The community is largely undeveloped and is generally not served by existing infrastructure and public facilities, but it does contain some single-family homes on large lots and some agricultural uses. The community includes environmental resources, such as Significant Ecological Areas, and is subject to safety hazards, such as fault zones.

The community does not have a rural town center area. No portion of the community has been designated for commercial or industrial use, except for a parcel along Avenue D to reflect an existing use. New commercial or industrial uses are strongly discouraged, as they are not compatible with the community character.

The entire community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Gorman

The community of Gorman is located in the far northwestern portion of Antelope Valley along the Golden State Freeway (Interstate 5). A portion of the community is partially developed with commercial uses that primarily serve travelers along the Freeway, along with some single-family homes and light agricultural uses. The remainder of the community is largely undeveloped, is generally not served by existing infrastructure, and contains environmental resources such as Hillside Management Areas and Significant Ecological Areas.

The community has a rural town center area surrounding the Golden State Freeway interchanges at Gorman School Road. The rural town center area has been designated as Major Commercial (CM) to serve the daily needs of residents and interstate travelers.

Some areas outside the rural town center area have also been designated Rural Commercial (CR) in recognition of existing commercial uses and future opportunities to serve interstate travelers. The existing Flying J Travel Plaza on Frazier Park Road and two parcels east of it also have been designated as Rural Commercial (CR). Several parcels surrounding Smokey Bear Road have been designated as Rural Commercial. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside these CR and CM designations and new industrial uses are strongly discouraged, as they are incompatible with the community character.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints and environmental resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Green Valley

The community of Green Valley is located in the southwestern portion of the Antelope Valley, south of Elizabeth Lake, and is completely within the National Forest. A large portion of the community is developed with single-family homes and commercial uses, while the remaining portion is largely undeveloped and contains scenic hillsides that are located in a Very High Fire Hazard Severity Zone.

The community does not have a rural town center area but is served by the rural town center areas in Lake Hughes Road and Leona Valley. Two areas, generally located at the intersections of Spunky Canyon Road and San Francisquito Canyon Road and of Spunky Canyon Road and Calle Olivera, have been designated as Rural Commercial (CR), recognizing existing uses that serve the daily needs of residents and provide local employment opportunities. New buildings in these areas should be limited to one story in height and should be designed at a pedestrian-oriented scale. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside these CR designations and new industrial uses are strongly discouraged, as they are incompatible with the community character.

The community includes rural town areas which are developed or partially developed as the result of previous land division activities. These areas generally extend southeast from San Francisquito Canyon Road and generally extend both north and south from Spunky Canyon Road, and are bounded by hillsides. These areas have been designated as Residential 9 (H9), with a maximum density of 9 residential units for each 1 net acre of land. The H9 designation is intended to reflect these areas' existing densities and development pattern, and is not intended to promote further land divisions.

The majority of new residential development in Green Valley should be directed to the rural town areas instead of the surrounding rural preserve area, provided that such development is consistent with existing community character. Light agriculture, equestrian and animal-keeping uses should be allowed in these areas, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited in these areas because of potential impacts on existing residents. Home-based occupations may also be permitted in these areas, provided that they meet Zoning Code requirements.

The remainder of the privately-owned land in the community is considered to be a rural preserve area and has been designated as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Juniper Hills

The community of Juniper Hills is located in the southern portion of the Antelope Valley, south of Littlerock and Pearblossom. The community is largely developed and is generally not served by existing infrastructure and public facilities, but it does contain many single-family homes on large lots and some agricultural uses. The community is adjacent to the National Forest, includes scenic hillside areas, and is subject to several safety hazards, including the San Andreas Fault and Very High Fire Hazard Severity Zones.

The community does not have a rural town center area but is served by the rural town center areas in Littlerock and Pearblossom. The Juniper Hills Community Center on 106th Street East serves as a community meeting place, in lieu of a rural town center area, and residents have expressed a desire for a Post Office. No portion of the community has been designated for commercial or industrial use, and new commercial or industrial uses are strongly discouraged, as they are not compatible with the community character.

The entire community is considered to be a rural town area and has been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural town area should be limited to single-family homes on large lots, light agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Lake Los Angeles

The community of Lake Los Angeles is in the eastern portion of the Antelope Valley. As of the 2000 Census, it had the largest population of any unincorporated community in the Valley. Many portions of the community are developed or partially developed with a wide range of uses and a distinctly rural character. The remaining portions are largely undeveloped and generally not served by existing infrastructure, include environmental resources, such as buttes and Significant Ecological Areas, and are subject to safety hazards, such as Flood Zones.

The community has a rural center area along Avenue O between 167th Street East and 172nd Street East, and along 170th Street East between Avenue O and Glenfall Avenue. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities. New buildings in the rural town center area should be limited to two stories in height and include Old West or Southwestern design elements at a pedestrian-scale, with primary building entries facing Avenue O or 170th Street East. New development in the rural town center area should not require the installation of urban infrastructure, such as concrete curbs and gutters and traffic signals.

The rural town center area should continue to be the focal point of the community and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Streetscape improvements are recommended for Avenue O and 170th Street East, including native landscaping, “Old West” style street lights that meet dark sky objectives (only where necessary for public safety), and coordinated street furniture, such as benches, bus shelters, and bicycle racks. Other public amenities, such as plazas and community bulletin boards, are also encouraged in this area.

Some areas outside of the rural town center area have also been designated as Rural Commercial (CR) to provide additional commercial services, such as feed and tack stores. These areas include the intersection of Avenue P and 170th Street East and the northwest and northeast corners of the intersection of Avenue) and 175th Street East. New buildings in these areas should also be limited to two stories in height and include Old West or Southwestern design elements at a pedestrian-oriented scale with transportation links to surrounding rural town areas. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside these CR

designations and new industrial uses are strongly discouraged, as they are incompatible with the community character.

The community includes several rural town areas. One area is generally bounded by Avenue Q to the north, 150th Street East to the west, Palmdale Boulevard to the south, and 160th Street East to the east. This area has been designated as Rural Land 1 (RL1), with a maximum density of 1 residential unit per 1 gross acre of land. This designation is intended to reflect the area's existing density and is not intended to promote further land divisions. Another similar area is generally bounded by Avenue M-8, Penfield Avenue, and Avenue N to the north, 155th Street East, 150th Street East, and 152nd Street East to the west, Avenue N and Avenue O to the south, and 160th Street East and 165th Street East to the east. This area has also been designated as RL1, and this designation is also intended to reflect the area's existing density and is not intended to promote further land divisions.

Another rural town area is generally bounded by Avenue M, Avenue M-4, and Avenue M-12 to the north, 160th Street East to the west, Avenue N to the south, and 170th Street East, 175th Street East, and 180th Street East to the east. This area has been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit per 5 gross acres of land. This designation is intended to reflect the area's existing density and is not intended to promote further land divisions. The final rural town area is generally bounded by Avenue O and Avenue N to the north, 165th Street East and 160th Street East to the west, Avenue Q, Avenue P-12, Rawhide Avenue, and Avenue P to the south, and 165th Street East, 170th Street East, 175th Street East, and 180th Street East to the east. This area has been designated as Residential 2 (H2), with a maximum density of 2 residential units per 1 net acre of land. This designation is intended to reflect the area's existing density and is not intended to promote further land divisions. However, the buttes east of 170th Street East have been designated as RL5, acknowledging the need to limit development in scenic resource areas. The buttes west of 170th Street East, which are in a Significant Ecological Area, are considered to be in the rural preserve area, which is discussed below.

The majority of new residential development in Lake Los Angeles should be directed to the rural town areas instead of the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited because of potential impacts on existing residents. Home-based businesses may also be permitted in the rural town areas, provided that they meet Zoning Code requirements. New land divisions in the rural town areas shall maintain a large minimum lot size to ensure consistency with the existing community character.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land or Rural Land 20 (RL20, with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Lakeview

The community of Lakeview is located in the southern central portion of the Antelope Valley, adjoining the City of Palmdale to the north and east, and includes Lake Palmdale. Although this community is adjacent to urbanized areas, it has a distinctly rural character. Some portions of the community are

partially developed with light agricultural uses and single-family homes on large lots. Other portions are largely undeveloped and generally not served by existing infrastructure, include environmental resources such as Hillside Management Areas, and are subject to safety hazards, such as Very High Fire Hazard Severity Zones.

The community does not have a rural town center area but is served by commercial centers in the adjacent City of Palmdale. A few parcels at the intersection of the State Route 14 and Avenue S, and two parcels along Sierra Highway between Pearblossom Highway and Barrel Springs Road, have been designated as Rural Commercial (CR). In addition, several parcels at the intersection of Pearblossom Highway and Sierra Highway, and a parcel on Avenue S west of State Route 14 have been designated as Light Industrial (IL). These designations recognize existing uses and opportunities for additional local services and employments. No other portions of the community have been designated for commercial or industrial use, and new commercial or industrial uses outside of these CR and IL designations are strongly discouraged, as they are not compatible with the community character.

The community includes a rural town area that is generally bounded by the City of Palmdale boundary to the north, the City of Palmdale boundary, Farnborough Avenue and Tovey Avenue to the west, a line approximately 1,300 feet south of Lakeview Drive and Barrel Springs Road to the south, and the City of Palmdale boundary to the east. North of Avenue S, this area has been designated as Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land. South of Avenue S, this area has been designated as Rural Land 1 (RL1), with a maximum density of 1 residential unit for each 1 gross acre of land, with the following exceptions:

- West of Tovey Avenue – RL2; and
- South of Lakeview Drive and west of El Camino Drive – RL2.

The RL1 and RL2 designations are intended to reflect this area's existing densities. New land divisions in this area shall maintain large lot sizes that are compatible with the community character.

The majority of new residential development in Lakeview should be directed to the rural town area instead of the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited because of potential impacts on existing residents. Home-based businesses may also be permitted in this area, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety hazards. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Leona Valley

The community of Leona Valley is located in the southwestern portion of the Antelope Valley, adjacent to the National Forest, and is bounded by the City of Palmdale to the north and east. Community residents are concerned about urbanization of the area and wish to remain in an unincorporated rural

community with a unique identity. Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots. Other portions are largely undeveloped, are generally not served by existing infrastructure, contain environmental resources, such as Significant Ecological Areas and Hillside Management Areas, and are subject to safety constraints, such as the San Andreas Fault and Very High Fire Hazard Severity Zones.

The community has a rural town center located at the intersection of Elizabeth Lake Road and 90th Street West. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities. New buildings in the rural town center area should be limited to one story in height and should be designed at a pedestrian-oriented scale, with primary building entries facing Elizabeth Lake Road or 90th Street West. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside of this CR designation and new industrial uses are strongly discouraged, as they are incompatible with community character.

The rural town center area should continue to be the focal point of the community and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as community bulletin boards, are encouraged in this area.

The community includes a rural town area that surrounds the rural town center. North of Elizabeth Lake Road, the rural town area is generally bounded by North Side Drive, Babia Street, and Penhaven Lane to the north, 100th Street West to the west, Elizabeth Lake Road to the south, and 86th Street West to the east. South of Elizabeth Lake Road, the rural town area is generally bounded by Leona Avenue and Elizabeth Lake Road to the north, 107th Street West, 98th Street West, and 92nd Street West to the west, hillsides and Odd Road to the south, and 86th Street West to the east. The rural town area has been designated as Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land. This designation is intended to reflect the existing density of the rural town area and is not intended to promote further land divisions.

The majority of new residential development in Leona Valley should be directed to the rural town area instead of the surrounding rural preserve area, provided that such development is consistent with existing community character. New land divisions shall maintain a large minimum lot size to ensure compatibility with the community character. Each new home should have a unique architectural design. Light agriculture, equestrian, and animal-keeping uses should be allowed throughout the rural town area, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture should be prohibited throughout the rural town area because of potential impacts on existing residents. Home-based businesses may also be permitted throughout the rural town area, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots (2.5 net acres or greater), light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Littlerock and Sun Village (Southeast Antelope Valley)

The communities of Littlerock and Sun Village are located in the southeastern portion of the Antelope Valley, east of the City of Palmdale. Residents of the communities are concerned about urbanization of the area and wish to remain as unincorporated rural communities with unique identities. Many portions of the communities are developed or partially developed with a wide range of uses and a distinctly rural character. The remaining portions are largely undeveloped and generally not served by existing infrastructure, include environmental resources such as Significant Ecological Areas, and are subject to safety hazards, such as Flood Zones.

Each community has a rural town center area. The Littlerock rural town center area is located along Pearblossom Highway between Little Rock Wash and 90th Street East. This rural town center area has been designated as Rural Commercial (CR), and Light Industrial (IL) to serve the daily needs of residents and provide local employment opportunities. This rural town center area also serves travelers along Pearblossom Highway. A possible expansion of the town center has also been identified further to the east where additional parcels have been designated Rural Commercial (CR) and Light Industrial (IL). New buildings in this rural town center area should be limited to two stories in height and include Old West or Southwestern design elements with earth tone colors at a pedestrian-oriented scale, with primary building entries facing Pearblossom Highway. The industrial designations in this rural town center have been expanded to accommodate light industrial uses appropriate for rural areas, such as truck storage facilities.

The Sun Village rural town center area is located along Palmdale Boulevard between Little Rock Wash and 95th Street East, and along 90th Street East between Palmdale Boulevard and Avenue Q-14. This rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of residents and provide local employment opportunities. New buildings in this rural town center area should be limited to three stories in height and include Southwestern, Spanish Mission, or Mediterranean design elements with earth tone colors at a pedestrian-oriented scale, with primary building entries facing Palmdale Boulevard or 90th Street East.

The two rural town center areas should continue to be the focal point of their respective communities and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Streetscape improvements are recommended for Palmdale Boulevard and 90th Street East in the Sun Village rural town center area, including native landscaping, “Southwestern” style street lights that meet dark sky objectives (only where necessary for public safety), and coordinated street furniture, such as benches, bus shelters, and bicycle racks. If Pearblossom Highway is relinquished by the State of California (Caltrans), similar streetscape improvements are recommended in the Littlerock rural town center area. Other public amenities, such as plazas and community bulletin boards, are encouraged in both rural town center areas.

Some areas outside the two town center areas have also been designated as Rural Commercial (CR) to provide additional commercial services and local employment. These areas include the intersection of Avenue T and 87th Street East and the northeast corner of Avenue S and 90th Street East. New buildings in these areas should also be limited to two stories in height and include Old West or Southwestern design elements with a pedestrian-oriented scale and transportation links to surrounding rural town areas. New commercial uses outside of these CR designations, are strongly discouraged, as they are not compatible with the communities’ character.

Several parcels near the intersection of Avenue R-8 and 90th Street East and a parcel at the northwest corner of Avenue T-8 and 80th Street East have been designated as Heavy Industrial (IH), recognizing existing uses appropriate for rural areas, such as truck storage facilities. New industrial uses outside of these IH designations, or outside the IL designations within the Littlerock rural town center area, are strongly discouraged, as they are not compatible with the communities' character.

The community includes several rural town areas. The first rural town area surrounds the Littlerock rural town center area and is generally bounded by Avenue U to the north, the Little Rock Wash to the west, the California Aqueduct and Avenue U-4 to the south, and 89th Street East and 94th Street East to the east. This area has been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land, with the following exceptions:

- The area generally bounded by Avenue U to the north, the Littlerock Wash to the west, Pearblossom Highway to the south, and 75th Street East to the east, has been designated as Residential 5 (H5), with a maximum density of 5 residential units for each 1 net acre of land.

A second rural town area surrounds the Sun Village rural town center area and is generally bounded by Avenue Q to the north, the Little Rock Wash to the west, Avenue R to the south, and 115th Street East to the east. This rural town area has been designated as Rural Land 1 (RL1), with a maximum density of 1 residential unit for each 1 gross acre of land; and Rural Land 2 (RL2), with a maximum density of 1 residential unit for each 2 gross acres of land.

A third rural town area is generally bounded by Avenue R to the north, the Little Rock Wash and 87th Street East to the west, Avenue U to the south, and 106th Street East, 116th Street East and 120th Street East to the east. This rural town area has been designated as RL1-and RL2.

The RL1, RL2, RL5 and H5 designations are intended to reflect the rural town area's existing densities and are not intended to promote further land divisions. All future land divisions must comply with any minimum lot sizes as set forth in the Southeast Antelope Valley Community Standards District.

The majority of new residential development in Littlerock and Sun Village (collectively known as Southeast Antelope Valley) should be directed to rural town areas instead of the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses, provided that lots meet Zoning Code requirements for those uses. Heavy agriculture uses should be prohibited in the rural town areas because of potential impacts on existing residents. Home-based businesses may also be permitted in the rural town areas, provided that they meet Zoning Code requirements. New land divisions in the rural town areas shall maintain a large minimum lot size to ensure consistency with the desired community character.

The remainder of the communities is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Llano

The community of Llano is located in the southeastern portion of the Antelope Valley, along Pearblossom Highway (State Route 138). Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped, generally not served by existing infrastructure, and contain environmental resources, such as Significant Ecological Areas.

The community does not have a rural town center area but is served by the rural town center area in Pearblossom. A few parcels along Pearblossom Highway have been designated as Rural Commercial (CR) or Light Industrial (IL), recognizing existing uses and opportunities for additional local services and employment. No other portions of the community have been designated for commercial or industrial use, and new commercial or industrial uses outside these CR and IL designations are strongly discouraged, as they are not compatible with the community character.

The community includes a rural town area that is generally bounded by Pearblossom Highway to the north, 170th Street East and 172nd Street East to the west, Avenue W-14 to the south, and 175th Street East on the east. This area has been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. This designation is intended to reflect the existing density of the rural town area and is not intended to promote further land divisions.

The majority of new residential development in Llano should be directed to the rural town area instead the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses. Heavy agriculture uses should be prohibited in this area because of potential impacts on existing residents. Home-based businesses may also be permitted in this area, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints and environmental resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Neenach

The community of Neenach is located in the far western portion of the Antelope Valley, along Avenue D (State Route 138). Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while other portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas and Agricultural Resource Areas.

The community does not have a rural town center area but is served by the rural town center areas in Antelope Acres and Lake Hughes. A few parcels on Avenue D have been designated as Rural Commercial (CR) or Light Industrial (IL) in recognition of existing and/or planned commercial and industrial uses. No other portions of the community have been designated for commercial or industrial use, and new

commercial and industrial uses outside of these CR and IL designations are strongly discouraged, as they may not be compatible with the community character.

The community includes rural town areas that are generally bounded by Avenue B to the north, 270th Street West and 260th Street West to the west, Avenue D to the south, and 250th Street West on the east. These areas have been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. This designation is intended to reflect the existing density of the rural town areas and is not intended to promote further land divisions.

The majority of new residential development in Neenach should be directed to the rural town areas instead of the surrounding rural preserve areas, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses. Heavy agriculture uses should be prohibited in rural town areas because of potential impacts on existing residents. Home-based businesses are also appropriate in the rural town areas, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints and environmental resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Pearblossom

The community of Pearblossom is located in the southeastern portion of the Antelope Valley, along Pearblossom Highway between Littlerock and Llano. Some portions of the community are developed with a wide range of uses and a distinctly rural character, while other portions are largely undeveloped, generally not served by existing infrastructure, and subject to safety hazards, such as Seismic Zones and Flood Zones.

The community has a rural town center area along Pearblossom Highway between 121st Street East and 133rd Street East. The rural town center area has been designated as Rural Commercial (CR) or Light Industrial (IL) to serve the daily needs of the residents and provide local employment opportunities. New buildings in the rural town center area should be limited to two stories in height and include Old West or Southwestern design elements at a pedestrian-oriented scale, with primary building entries facing Pearblossom Highway. No other portions of the community have been designated for commercial or industrial use, and new commercial and industrial uses outside of the rural town center area are strongly discouraged, as they are incompatible with the community character.

The rural town center area should continue to be the focal point of the communities and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as plazas and community bulletin boards, are encouraged in this area.

The community includes rural town areas that are generally bounded by Pearblossom Highway to the north, 121st Street East to the west, Avenue W, the California Aqueduct, and Avenue W-11 to the south, and 135th Street East on the east. North of Avenue W, these areas have been designated as Residential

2 (H2), with a maximum density of 2 residential units for each 1 net acre of land or Residential 18 (H18), with a maximum density of 18 residential units for each 1 net acres of land. South of Avenue W and west of 128th Street East, these areas have been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. South of Avenue WE and east of 128th Street East, these areas have been designated as Rural Land 1 (RL1), with a maximum density of 1 residential unit for each 1 gross acre of land. These designations are intended to reflect existing densities of the area and are not intended to promote further land divisions.

The majority of new residential development in Pearblossom should be directed to the rural town areas instead of the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses. Heavy agriculture uses should be prohibited in these areas because of potential impacts on existing residents. Home-based businesses may also be permitted in these areas, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, or Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure and safety resources. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Quartz Hill

The community of Quartz Hill is located in the central portion of the Antelope Valley and is surrounded by the cities of Lancaster and Palmdale. The community is adjacent to urbanized areas and is largely developed with a wide range of uses, but it retains a semi-rural character and residents wish to keep it an unincorporated community with a unique identity.

The community has a rural town center area along 50th Street West between Avenue L-6 and Avenue M-2. The town center area has been designated as Mixed Use – Rural (MU-R) and Light Industrial (IL) to serve the daily needs of residents and provide local employment opportunities. No other portions of the community have been designated for industrial use, and new industrial uses outside of the rural town center area are strongly discouraged, as they are incompatible with the community character. New buildings in the rural town center area should be limited to two stories in height, include Old West or Southwestern design elements with earth tone colors, and should be designed at a pedestrian-oriented scale, with primary building entries facing 50th Street West. In the MU-R designation, a vertical mix of commercial and residential uses is encouraged – for example, a building with commercial uses on the first floor and residential or office uses on the second floor. A horizontal mix of commercial and residential uses may also be appropriate – for example, a commercial building facing 50th Street West, with a residential building located towards the rear of the same lot.

The rural town center area should continue to be the focal point of the community and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Streetscape improvements are recommended for 50th Street West, including native landscaping, “Western” street lights that meet dark sky objectives, and coordinated street furniture, such as benches,

bus shelters, and bicycle racks. Other public amenities, such as plazas and community bulletin boards, are also encouraged in this area.

Some areas outside the rural town center area have also been designated as MU-R to provide additional commercial services and housing opportunities. These areas include the northwest corner of Avenue N and 50th Street West and the Avenue L corridor between 42nd Street West and 50th Street West. New buildings in these areas should also be limited to two stories in height, include Old West or Southwestern design elements with earth tone colors, and should be designed at a pedestrian-oriented scale with transportation links to surrounding rural town areas. A vertical or horizontal mix of commercial and residential uses may be appropriate in these areas. No other portions of the community have been designated for commercial use, and new commercial uses outside these MU-R designations, or outside the MU-R within the rural town center area, are strongly discouraged, as they are incompatible with the community character.

As the Avenue L corridor between 42nd Street West and 50th Street West develops over time, it will become a secondary rural town center area and should be linked to surrounding rural town areas through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Streetscape improvements are recommended for the Avenue L corridor between 42nd Street West and 50th Street West, including native landscaping, "Western" street lights that meet dark sky, and coordinated street furniture, such as benches, bus shelters, and bicycle racks. Other public amenities, such as plazas and community bulletin boards, are also encouraged in this corridor.

The remainder of the community is considered to be a rural town area. Two properties along Avenue M have been designated as Residential 30 (H30), with a maximum density of 30 residential units for each 1 net acre of land, in recognition of existing multi-family uses. Several parcels adjoining the rural town center area between Avenue L-8 and Columbia Way have been designated as Residential 18 (H18), with a maximum density of 18 residential units for each 1 net acre of land, recognizing existing multi-family units and providing additional housing opportunities. In addition, a property at the northwest corner of Avenue M and 70th Street West, and several parcels on the south side of Avenue L near 40th Street West, has been designated as H18. New multi-family buildings in the H18 designation should be limited to two stories in height and should be designed in a manner that is compatible with nearby single-family homes.

South of Avenue L, the remaining rural town area has been designated as Residential 5 (H5), with a maximum density of 5 residential units for each 1 net acre of land, or Residential 2 (H2), with a maximum density of 2 residential units for each 1 net acre of land. These designations are intended to reflect the area's existing density and are not intended to promote further land divisions, although properties along Columbia Way between 40th Street West and 45th Street West present some land division opportunities. Light agriculture, equestrian, and animal-keeping uses may be permitted in these areas, provided that lots meet Zoning Code requirements for those uses. Home-based businesses may also be permitted in these areas, provided that they meet Zoning Code requirements.

North of Avenue L, the remaining rural town area has been designated as Rural Land 1 (RL1), with a maximum density of 1 residential unit for each 1 gross acre of land. This designation is intended to reflect the area's existing density and is not intended to promote further land divisions. Light agriculture, equestrian, and animal-keeping uses are appropriate in this area, but heavy agriculture uses

should be prohibited because of potential impacts to existing residents. Home-based businesses are also appropriate in this area, provided that they meet Zoning Code requirements.

Roosevelt

The community of Roosevelt is located in the northeastern portion of the Antelope Valley, north of the City of Lancaster. Community residents are concerned about the urbanization of the area and wish to remain an unincorporated rural community with a unique agricultural identity. Some portions of the community are partially developed with light agricultural uses and single-family homes on large lots, while some portions are in Agricultural Resource Areas and are partially undeveloped with farms and heavy agricultural uses. The remaining portions are largely undeveloped and contain environmental resources, such as Significant Ecological Areas.

The community has a rural town center area located at the intersection of Avenue J and 90th Street East. The rural town center area has been designated as Rural Commercial (CR) to serve the daily needs of the residents and provide local employment opportunities. New buildings in the rural town center area should be limited to one story in height and should be designed at a pedestrian-oriented scale, with primary building entries facing Avenue J or 90th Street East.

The rural town center area should continue to be the focal point of the communities and should be linked to the surrounding rural town area through trails and pedestrian routes. Pedestrian routes should have permeable paving, consistent with rural community character, instead of concrete sidewalks. Public amenities, such as community bulletin boards, are encouraged in this area.

Two parcels on 90th Street East have been designated as CR and Light Industrial (IL) in recognition of existing commercial and industrial uses. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside of this IL designation are strongly discouraged, as they are not compatible with the community character.

The community includes rural town areas that are generally bounded by Lancaster Boulevard to the north, 85th Street East to the west, Avenue J-12 and Avenue J to the south, and 90th Street East on the east. These areas have been designated as Rural Land 5 (RL5), with a maximum density of 1 residential unit for each 5 gross acres of land. This designation is intended to reflect the existing density of the rural town areas and is not intended to promote further land divisions. New land divisions in the rural town areas shall maintain a large minimum lot size to ensure consistency with the existing community character.

The majority of new residential development in Roosevelt should be directed to the rural town areas instead of the surrounding rural preserve area, provided that such development is consistent with existing community character and allows for light agriculture, equestrian, and animal-keeping uses. Heavy agriculture uses should be prohibited in these areas because of potential impacts on existing residents. Home-based businesses may also be permitted in these areas, provided that they meet Zoning Code requirements.

The remainder of the community is considered to be a rural preserve area and has been designated as Rural Land 10 (RL10), with a maximum density of 1 residential unit for each 10 gross acres of land, and Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. These very low densities reflect the underlying infrastructure constraints and environmental resources.

Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate. Agricultural uses in Agricultural Resource Areas will be protected and promoted, as directed in the policies of the Conservation and Open Space Element.

Three Points

The community of Three Points is located in the far western portion of the Antelope Valley, south of Neenach and northwest of Lake Hughes. The community is largely undeveloped and is generally not served by existing infrastructure and public facilities, but it does contain some single-family homes on large lots and some agricultural uses. The community is adjacent to the National Forest, includes environmental resources, such as scenic hillsides and Significant Ecological Areas, and is subject to several safety hazards, including the San Andreas Fault and Very High Fire Hazard Severity Zones.

The community does not have a rural town center area but is served by the rural town center area in Lake Hughes. A parcel at the southwest corner of Three Points Road and Pine Canyon Road has been designated as Rural Commercial (CR) in recognition of an existing commercial use. No other portions of the community have been designated for commercial or industrial use, and new commercial uses outside of this CR designation and new industrial uses are strongly discouraged, as they are not compatible with the community character.

The entire community is considered to be a rural preserve area and has been designated as Rural Land 20 (RL20), with a maximum density of 1 residential unit for each 20 gross acres of land. This very low density reflects the underlying infrastructure constraints, environmental resources, and safety constraints. Development in the rural preserve area should be limited to single-family homes on very large lots, light and heavy agriculture, equestrian and animal-keeping uses, and other uses where appropriate.

Chapter 8

PLAN IMPLEMENTATION

Chapter 8: Plan Implementation

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I. Introduction

The California Government Code Section 65400 requires that upon adoption of a general plan, a planning agency shall "investigate and make recommendations to the legislative body regarding reasonable and practical means for the implementing the general plan or element of the general plan, so that it will serve as an effective guide for orderly growth and development, preservation and conservation of open-space land and natural resources, and the efficient expenditure of public funds relating to the subjects addressed in the general plan". The Antelope Valley Area Plan (Area Plan) is part of the General Plan and the two documents must be consistent with each other. The Area Plan refines countywide goals and policies in the General Plan by addressing issues specific to the Antelope Valley. This Chapter describes the intent of the Area Plan with regards to the specific implementation programs that are to be enacted after the adoption of the Area Plan, as well as provide clear guidelines as to how these programs will be designed and implemented.

II. Implementation Programs

A. Significant Ecological Areas

The Significant Ecological Areas (SEAs) in this Area Plan are based on conservation biology principles that seek to conserve habitats of unique and threatened species, and retain linkages and wildlife movement across important ecological areas. The SEA Program recognizes that many of the properties within the SEAs are privately owned. The SEA Program, as detailed in this implementation program, alongside the goals and policies of this Area Plan is created to conserve the biological resources in the SEAs while recognizing these private property rights, facilitating development compatible with the SEAs, and incentivizing conservation and preservation of these important ecological areas. The SEA Program within this Area Plan is intended to complement and where appropriate, further refine aspects of the General Plan SEA Program, and will be consistent with it.

The SEAs established in this Area Plan are intended to change gradually over time. Development and conservation within and around the SEAs will affect the ecological value and biological resources they contain. Additionally, the location or value of biological resources in the Antelope Valley may change. It is anticipated that the future will include new forms of development and new techniques in conservation planning. In order to respect the diverse ecological values of areas within the SEAs, the SEA Program must retain a flexible regulatory approach that connects levels of review to the potential impacts of individual development projects. The SEA Program is intended to change and adapt alongside the SEAs. In order to ensure the Antelope Valley SEA Program continues to remain relevant and appropriately located, the County will review the performance of the SEA Program periodically.

This implementation program may be subsumed by a more comprehensive, countywide program as part of a General Plan update and/or Zoning Ordinance amendment

Incentives for Conservation and Mitigation

As SEAs provide value as important habitat, privately owned land within SEAs can be important sources for conservation and mitigation land required for development within the Antelope Valley. Projects in the Antelope Valley that require mitigation land shall meet their mitigation requirements from land within the SEAs identified in this Area Plan, to the greatest extent feasible.

B. Agricultural Resource Areas Program

In order to encourage the continued operation of local farms in the Antelope Valley, it is the intent of this Area Plan to develop a program allowing greater flexibility for local farms to establish and operate additional compatible uses as incidental or accessory to their primary farming operation. This would allow property owners to explore and develop additional sources of income to augment their primary farming use. This program may consist of developing more flexible zoning regulations for parcels used for farming purposes ; allowing the transfer of development rights from agricultural lands with the option of retaining agricultural easements on the property; creating a more streamlined process for permits on identified farmlands; and other such incentives for continuing their farming operations on their properties.

C. Economic Opportunity Areas (EOAs)

As more details are finalized with the High Desert Corridor and the Northwest 138 Corridor Improvement projects (i.e. route alignments, location of on-ramps, number of lanes etc.), further planning activities may be necessary for each EOA to ensure that the Area Plan's Goals and Policies, as well as Land Use Policy and zoning are consistent with the final design of the two projects. Future planning activities may involve the preparation of a Community Plan or Specific Plan, with associated land use and zoning changes as well as specific goals, policies and implementing strategies that would ensure that the economic opportunities presented by these infrastructure projects are balanced with preserving the rural character and ecological value of the surrounding areas and communities. In addition, any development within the Antelope Valley Area Plan boundaries shall be required to further analyze infrastructure impacts at a project level. This may require additional feasibility engineering studies so that infrastructure development requirements can be established to the satisfaction of the County Department of Public Works (DPW).

1. East EOA

   The East EOA is located in the eastern part of the Antelope Valley, along the proposed route of the High Desert Corridor. It includes the communities of Lake Los Angeles, Sun Village, Littlerock, Pearblossom, Llano and Crystalaire, as previously described in Chapter 7 (Community-Specific Land Use Concepts). Further planning activities for the East EOA may be pursued with the development of the High Desert Corridor Project.

2. Central EOA

The Central EOA is located in the general vicinity of the intersection of Avenue D and State Route 14, north of William J. Fox Air Field. It includes areas just outside the eastern border of Antelope Acres, as well as a concentration of light and heavy industrial uses in the vicinity of the Lancaster Landfill. It is also encompasses the Lancaster Water Reclamation Plant, which provides the area with potential access to recycled water that can help support the residential, commercial and industrial uses being proposed for the area. Further planning activities for the Central EOA may be pursued with the development of the Northwest 138 Corridor Improvement Project.

3. West EOA

The West EOA is located in the northwestern part of the Antelope Valley along the proposed route of the Northwest 138 Corridor Improvement Project. The area includes large contiguous landholdings that have been proposed for master-planned developments, as well as the western portion of Neenach. Due to its proximity to Interstate 5, new retail and housing in Kern County to the north, and to ensure orderly development in the area, any master-planned community within the West EOA will require further planning activities in addition to this Area Plan.

With the number and size of contiguous parcels owned by two property owners (Tejon Ranch Company and Bruce Burrows), a Specific Plan or similar planning activity will be required for more specific master-planning activities for these specific parcels. This is necessary to ensure that development in the area occurs in an orderly and sustainable way, and that the required infrastructure and public utilities are in place at a master-planned level before these new developments are established. Thus, this Area Plan specifically requires the preparation and adoption of a Specific Plan or similar planning document for these parcels before any development of five or more residential dwelling units, any commercial use, any industrial use, or any combination thereof, can be approved. In order to allow for more flexibility in the future detailed site design of specific neighborhoods in this area, a Specific Plan for a project in the West EOA may be allowed to convert the areas designated as Residential 5 (H5) to General Commercial (CG) or Public and Semi-public (P) designations without amending this Area Plan, so long as the resulting residential densities do not exceed those provided for by this Area Plan and no change in unmitigated significant impacts occurs. The Specific Plan may also include provisions for the conversion of residential to commercial areas, provided the amount of planned commercial building square footage does not result in any new unmitigated significant impacts. The Specific Plan shall also stipulate that these provisions (i.e. converting residential to commercial or other designations) are subject to a traffic study that confirms that no new unmitigated significant traffic impacts will occur.

Overall, land use adjustments within designations are permitted as part of a Specific Plan provided that the adjustments: 1) do not increase the total number of developable acres, dwelling units or square footage; 2) increase the total amount of open space and do not decrease the total amount of natural open space; and 3) do not result in new unmitigated significant impacts.

If a complete application for a Specific Plan or similar planning document is not submitted within five years of the effective date of this Area Plan, the Department of Regional Planning may initiate a Community Plan for the West EOA.

D. Transfer of Development Rights Program

This Area Plan recognizes that increasing or limiting residential densities through Land Use designations can only go so far in terms of either encouraging development or protecting the environment, respectively, in the areas where they are appropriate. Thus, it is the intent of this Area Plan to develop a Transfer of Development Rights (TDR) Program for the Antelope Valley in order to fully realize the potential development in the EOAs and encourage preservation of SEA lands.

1. Sending Areas

   Sending Areas shall be lands designated or identified as SEAs or Seismic Zones or are otherwise located in the Rural Preserve Areas, with land use designations of Rural Land 10 (RL10) or Rural Land 20 (RL20). The Department of Regional Planning shall explore ways to give property owners incentives to take advantage of the program, such as, but not limited to, density bonuses in transferring development rights. For example, while development proposed in these areas are subject to a maximum density of 1 dwelling unit for each 10 or 20 acres of land, the development rights in these areas may be transferrable to receiving areas at densities as high as 1 dwelling unit for each two acres of land.

2. Receiving Areas

   Receiving Areas should be those areas identified as EOAs. Depending on the specific circumstances within each EOAs, development rights transferred into these areas may either be part off or in addition to those densities established by the Land Use Policy Map (Map 2.1) of this Area Plan. This shall be determined through further analysis in a comprehensive, Antelope Valley-wide TDR Program.

E. Antelope Valley Scenic Drives Program

This Area Plan has identified a number of Scenic Drives in the Antelope Valley (Map 4.2) that should be preserved to ensure that their scenic value is maintained in the years to come. Thus, it is the

intent of this Area Plan to develop and implement a program for future review of proposed developments within viewsheds of these Scenic Drives, which may include:

- Required Visual Impact Assessment for proposed development within the viewsheds of identified Scenic Drives;
- Required finding for discretionary entitlements that the proposed development is compatible with the scenic character of the route; or
- Applicable development standards for development along a Scenic Drive.

F. Antelope Valley Community Standards Districts

As indicated in Title 22 (Zoning Code) Chapter 22.44.090, the "Community Standards Districts (CSDs) are established as supplemental districts to provide a means if implementing special development standards contained in adopted neighborhood, community, area, specific and local coastal plans within the unincorporated areas, or to provide a means of addressing special problems which are unique to certain geographic areas within the unincorporated areas of Los Angeles County."

There are currently five adopted CSDs in the Antelope Valley: in the rural communities of Acton, the Lakes (Elizabeth Lake and Lake Hughes), Juniper Hills, Leona Valley, and Southeast Antelope Valley (Littlerock and Sun Village). In addition to these, the Department of Regional Planning has received proposal for six new CSDs: for the rural communities of Antelope Acres, Fairmont, Green Valley, Lake Los Angeles, Quartz Hill, and Roosevelt as well proposed amendments to the CSDs of Leona Valley and Southeast Antelope Valley (Littlerock and Sun Village).

This Area Plan is the foundational planning document for the development of the Antelope Valley for the next 20 to 30 years. As part of its implementation, this Plan shall require a comprehensive review of all the existing CSDs in the Antelope Valley. This review may also include a program to prepare and adopt any proposed new CSDs or amendments to existing CSDs in the next several years after the adoption of the Area Plan. When a comprehensive review has been conducted, and new and/or updated CSDs have been adopted, these CSDs may specify whether a variance shall be granted only under extraordinary circumstances.

Appendix A: Conservation and Open Space Element Resources

I. Open Space and Natural Areas in the Antelope Valley

Los Angeles County offers a wide variety of open space and natural areas. The following open space and natural areas are managed by the County or are located primarily within the unincorporated areas:

Angeles National Forest

The Angeles National Forest was established by Executive Order in 1892 and is managed by the U.S. Forest Service. The Forest covers over 650,000 acres. The Angeles National Forest manages the watersheds within its boundaries to provide water to Southern California and to protect surrounding communities from catastrophic floods. The land within the Angeles National Forest is diverse in appearance and terrain, and provides many opportunities for recreational and scenic enjoyment. Much of the Angeles National Forest is covered with dense chaparral, pine and fir covered slopes as elevations in the Angeles National Forest range from 1,200 to 10,064 feet.

Devil's Punchbowl Natural Area

Devil's Punchbowl is a 1,310-acre natural area that consists of rugged wilderness rock formations along the San Andreas Fault on the northern slope of the San Gabriel Mountains. The terrain climbs from 4,200 feet to 6,500 feet in elevation, with natural plant and animal communities ranging from desert scrub to pine forests. A seasonal stream runs through the natural area.

High Desert Wildlife and Wild Flower Sanctuaries

The County currently operates eight wildlife sanctuaries and one wildflower sanctuary in the high desert of Antelope Valley. Ranging from 2,500 to over 3,600 feet in elevation and encompassing more than 2,000 acres, the sanctuaries offer opportunities for spring wildflower viewing, bird watching, hiking and horseback riding. Wildlife seen on the preserves vary from horned lizards, chuckwallas and rattlesnakes, to prairie falcons and golden eagles. Insect life is most abundant during the warmer months, and in spring, the Joshua tree and other large shrubs provide nesting sites for a variety of songbirds. Other protected animals are the kit fox, desert tortoise and Mojave ground squirrel.

Michael D. Antonovich Open Space Preserve

The Michael D. Antonovich Open Space Preserve offers 500 acres of dedicated open space in the Santa Susana Mountains and is managed by the Mountains Recreation and Conservation Authority (MRCA). Located on the northern border of Los Angeles, this open space preserve contains a diversity of flora and fauna, from big cone Douglas fir, California walnut and oak trees to black bears, deer and mountain lions. The Preserve also provides important habitat connections through its numerous wilderness trails in the Rim of the Valley corridor of the Santa Clarita Woodlands Park.

II. Conservancies

The County works with various conservancies to maintain and protect open space land in Los Angeles County. Land conservancies are private, nonprofit organizations and public agencies that share a

common goal: to conserve land for the benefit of people and nature. Land conservancies are generally started by community residents who wish to preserve a certain area or piece of open space land on a local or regional scale. Land conservancies have the flexibility to acquire, hold and manage land in the public interest, and also to preserve open space through voluntary conservation agreements with landowners, which permanently protect the land from development, while the title remains with the landowner. Most conservancies work in partnership with local governments and provide various levels of educational programs and land restoration and/or land enhancement projects. In the Antelope Valley, the primary conservancy group in operation is the Antelope Valley Conservancy.

Antelope Valley Conservancy

The Antelope Valley Conservancy is a local land trust conservancy that obtains and stewards lands that are important to the community for quality of life, scenic beauty, and plant and animal habitat. AVC focuses on Joshua tree woodlands, the keystone species of the Mojave Desert, which supports a wide variety of native species. Most of the Conservancy's targeted preservation lands are in the County's designated Significant Ecological Areas. (http://www.avconservancy.org/)

III. Regional Habitat Linkages

Habitat linkages are defined as area within the overall range of a species or suite of species that possess sufficient cover, food, forage, water and other essential elements to serve as a movement pathway, or between two or more larger areas of habitat. Depending on the species, linkages vary in size. For example, a belt of coastal sage scrub traversing a golf course, connecting sage scrub habitat areas on either side, providing a safe passage zone for smaller, slower-moving species (such as lizards and rodents) to maintain population connectivity between the two sides of the golf course is one form of habitat linkage.

Wildlife corridors, which are areas of open space of sufficient width to permit larger, mobile species (such as foxes, bobcats and coyote) to pass between larger areas of open space, or to disperse from one major open space region to another, are another type of habitat linkage. Such areas are generally several hundred feet wide, unobstructed, and usually possess cover, food and water. The upland margins of a creek channel, open ridgelines, open valleys or the bottoms of drainages often serve as major corridors locally, as do riparian alignments.

Biological resources are important in a regional context, serving to connect resources in adjacent local jurisdictions. Critical biological resources are maintained through habitat connectivity, which sustains population genetic diversity, and provides refuge for migrant species. Regional habitat linkages are identified in the Conservation and Natural Resources Element. The Antelope Valley, Puente Hills, San Andreas, Santa Clara River, Santa Felicia, Santa Monica Mountains, and Santa Susana Mountains and Simi Hills SEAs serve as important regional habitat linkages. More details about linkages between and within each of these SEAs are provided below:

Antelope Valley SEA

The SEA extends from the Angeles National Forest to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages exiting the northern slope of the San Gabriel Mountain range. The geographical features of the SEA serve as a major habitat linkage and movement corridor for all wildlife species within its vicinity and, in an intergenerational sense, many of the plant species. Ecologically generalist species (such as mountain lion, bobcat, coyote, gray fox,) have the ability to move

across such vast areas and through changing habitat types. For such species, the SEA may serve as an important system for long-term and genetic exchange among populations. For smaller or less-mobile species or taxa, which are narrowly restricted in their habitat needs, the SEA can serve as a broad linkage zone, in which individual movement can take place during seasonal population dispersal or over generations. This provides essential genetic exchange within and between metapopulations. The two drainages, combined with the upland terrestrial Desert-Montane transect portion of the SEA, ensure linkage and direct movement areas for all of the wildlife species present within the County portion of the Antelope Valley.

San Andreas SEA

The SEA includes several important linkages for wildlife movement. The foothills in the western-most part of the SEA are an important linkage between the San Gabriel Mountains, the Tehachapi Mountains, and the Coastal Ranges. The linkage to the Tehachapi Mountains is important because the Tehachapis connect to the southern-most extent of the Sierra Nevada Mountains. The Tehachapi Mountains represent the only mountain linkage from the Transverse Ranges and the Coast Ranges to the Sierra Nevada Range. This feature may be an important topographic reference for migrating birds, and provides high elevation foraging grounds along the migratory route. The several ranges that meet at the western end of the SEA provide a valuable link for gene flow between divergent subspecies, varieties, and populations of many species. The SEA includes numerous drainages that extend onto the Antelope Valley floor towards resources such as the Fairmont and Antelope buttes. These washes provide an important linkage for animals traveling between the Valley floor, the buttes and the western part of the San Gabriel Mountains. In addition, Anaverde Creek, Amargosa Creek, and Pine Canyon facilitate east-west wildlife movement through the mountains, Portal Ridge, and Ritter Ridge. Tributary drainages from the Santa Clara River, such as Elizabeth Lake Canyon and San Francisquito Canyon, connect coastal drainages and the coastal ecoregion to the San Andreas Fault and interior watersheds. The frequency of valuable riparian communities along this travel route, which is located within an otherwise arid climate, further contributes to the SEA's importance for wildlife and habitat linkages in the region.

Santa Clara River SEA

Historically (and prehistorically) the riparian corridor along the Santa Clara River has served as the primary east-west linkage between the Pacific coastline, Coast Ranges, interior ranges, high desert and southern Sierra (via the Tehachapi Range). Animals moving through the Santa Clara River at one time had unobstructed passage along the river and within its tributaries. The present configuration of the tributary drainages has reduced connectivity from the Santa Clarita Valley to the north, but the Santa Clara River remains relatively intact and open. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values within the historic movement zones for all of the wildlife species present within the County portion of the Santa Clara River.

IV. Significant Ecological Areas

History of the SEA Program

Los Angeles County's Significant Ecological Areas (SEAs) Program has schematic roots in an initial General Plan guiding document, the 1970 Environmental Development Guide, which was adopted as a preliminary General Plan for the County. The Open Space Concept Plan and 1990 Open Space Policy Map depict greenbelt areas and rural lands that reasonably correspond to the current SEA map.

The original Significant Ecological Area Report was prepared in 1972 by scientists from the University of California, Los Angeles, the Los Angeles County Museum of Natural History and other local academic institutions, at the request of the Los Angeles County Department of Regional Planning (DRP). The DRP asked the report authors to identify "significant ecological areas," which due to their high biological resource value, should receive special consideration during the formulation of the 1973 General Plan. In the final report, 81 such areas were mapped and brief descriptions of the value of each were given. The 81 areas were then included on the Vegetation and Wildlife Map in the Conservation Element of the 1973 General Plan.

In 1976, following the 1975 court decision requiring the preparation of a revised General Plan, the DRP and the Environmental Systems Research Institute commissioned the Los Angeles County Significant Ecological Area Study (1976 SEA Study), from the environmental consulting firm, England and Nelson. After excluding the Channel Islands and national forest lands from the study area, the 1976 SEA Study reviewed the data and criteria used to establish the original significant ecological area list, analyzed new information, developed of a set of eight criteria to be used to select and prioritize significant ecological areas and concluded with individual maps and descriptions for each. From an initial list of 115 sites, 62 areas met the criteria and were recommended for adoption by the study. In 1980, 61 of these biologically significant areas were adopted as part of the Conservation and Open Space Element of the Los Angeles County General Plan on the Special Management Areas Policy Map and through individual descriptions of the SEAs in Technical Supplement E of the 1980 General Plan.

In 1991, supplemental studies further assessing the biological resources within seven SEAs were conducted. The Phase I Studies, conducted by Michael Brandman Associates, assessed the following SEA areas: Cold Creek Significant Ecological Area No.9, San Fransciquito Canyon Significant Ecological Area No.19, Dudleya Densiflora Population Significant Ecological Area No.45, Kentucky Springs Significant Ecological Area No.61, Las Virgenes Significant Ecological Area No.6, Tonner Canyon and Chino Hills SEA No. 15, and Tuna Canyon SEA No. 10. The studies looked at current ownership patterns, existing resources, development pressures and made recommendations into the future management of the SEAs. All of the Phase I studies found either that the SEA boundaries were adequate in size or recommended the expansion of the boundaries to better encompass and protect biotic resources.

In 2000, the DRP commissioned the Los Angeles County Significant Ecological Area Update Study (2000 Update Study) prepared by PCR Services Corporation, Frank Hovore & Associates and Forma Systems. The 2000 Update Study included an Executive Summary, Background Report and twelve biological resources assessments for the Proposed Antelope Valley SEA, Proposed Cruzan Mesa Vernal Pools SEA, Proposed East San Gabriel Valley SEA, Proposed Joshua Tree Woodlands SEA, Proposed Puente Hills SEA, Proposed San Andreas SEA, Proposed San Dimas Canyon and San Antonio Wash SEA, Proposed San Gabriel Canyon SEA, Proposed Santa Catalina Island SEA, Proposed Santa Clara River SEA, Proposed Santa Monica Mountains SEA, and the Proposed Santa Susana Mountains and Simi Hills SEA. These twelve biological resource assessment areas consolidated the 1980 unincorporated area SEAs into larger areas for study and proposed inclusion as SEAs.

The 2000 Update Study also examined the assumptions of the original eight SEA designation criteria from the 1976 SEA Study, modifying one criterion and deleting two. The modification of Class 1 changed the language from "the habitat of rare, endangered, and threatened plant and animal species," to specify "the habitat of *core populations* of rare, endangered and threatened plant and animal species." Class 6: "areas important as game species habitat or as fisheries" was removed due to the questionable contribution of these areas towards maintaining biotic diversity. Class 8: "special areas" was deleted due to the vague nature of that designation. The six SEA criteria are contained within this Appendix E, and

each SEA description lists which criteria it meets.

From 2001 to 2011, the DRP conducted public outreach, solicited additional recommendations on the SEA boundaries and checked the SEA boundaries with an expert panel ofbiologists convened in 2010.

SEA Designation Principles

Previously, areas were assigned SEA designations in an attempt to slow or modify the type of development within their boundaries. However, as the County underwent a period of unanticipated growth, many of the SEAs experienced a reduction and/or degradation of their biotic diversity. Appendix E uses the definition of biotic or biological diversity provided by the 1990 U.S. Congressional Biodiversity Act, HR1268, which is defined as a full range of variety and variability within and among living organisms and the ecological complexes in which they occur.

Currently, the design of the SEAs is based on scientifically-grounded concepts regarding size and connectivity. Where feasible, SEAs form linkages between core habitats, which are large blocks of habitat generally conforming to a significant topographical feature, such as a watershed, major river, butte, etc., in order to ensure regional species movement.

Most SEA designations do not focus on a single resource or habitat type and, over time, conservation plans have come to employ a fluid approach to conserving an everincreasing list of sensitive resources (e.g., endangered species, habitats of limited distribution, and "patchy" habitats such as coastal sage scrub). The SEA designations rely on two primary conservation principles: namely that species extinction rates are lower on larger “islands,” or blocks of land, than smaller islands; and that isolated habitat areas have less opportunity to regain species by re-colonization from other areas.

Many wildlife species, particularly carnivores and other wide ranging species, require large areas of suitable habitat for genetically and demographically viable populations. In addition, large islands are more likely to encompass diverse habitat types and are more easily buffered against potential impacts from surrounding developed lands. The SEAs are designed to provide habitat linkages between related habitat types (such as the Antelope Valley buttes, or the San Andreas Rift Zone wetlands), by encompassing areas of sufficient width to function as wildlife movement routes between these open space areas.

The current SEA designations provide local resources (such as sensitive species) and their habitats, as well as the seasonal support habitats for those resources, with connections to essential sustaining resource areas (such as corridor areas and hydrological systems). For example, zones of lower intensity human impacts that exist between essential habitat resources have been included in the current SEA designations, thereby helping to maintain the biotic diversity in the County. The designation of Coastal Resource Area (CRA) is given to those SEAs located with the California Coastal Zone.

SEA Selection Criteria

All of the County’s SEAs and CRAs must satisfy at least one of the six SEA selection criteria:

A. The habitat of core populations of endangered or threatened plant or animal species.

Intent of Criterion A: These areas are important in maintaining viable plant and/or animal populations for those species recognized by state and or federal resource agencies as being extremely low in numbers or having a very limited amount of suitable habitat available. The terms "endangered" and

"threatened" have precise meanings defined in both state and federal law. The identification of "core population"' will be determined by the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW). The term "core population" as used here is a general biological term referring to a known and/or a viable population. Other locations of endangered or threatened plant or animal species may also occur in the County, which are not within an SEA. It should also be noted that the concept of core populations is consistent with current thinking of the USFWS and the CDFW.

This criterion is not meant to constitute a recovery program for listed species, but one element of a more comprehensive conservation effort for the long term sustainment of listed species within the County. At the local level, recovery programs of both the CDFW and the USFWS have measures in place that can impose severe penalties for the "take"of listed species or their habitat.

- Federally Endangered: "any species which is in danger of extinction throughout all or a significant portion of its range...."

- Federally Threatened: "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

- State Endangered: "....a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease."

- State Threatened: "....a native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts required by this chapter." [California Code of Regulations, Title 1, Sec 670.5]

B. On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.

Intent of Criterion B: The purpose of this criterion is to identify biotic resources that are uncommon on a regional basis. The geographical region considered could be as small as the Southern California coastal plains, the Transverse Mountain Ranges, the Mojave Desert, the Southern California coastline, etc. The geographical region could also be as large as Southern California, the Pacific coast, all of California, the western United States, or even larger. The community, association, or habitat is either unique or restricted in distribution in an area larger than the political boundaries of the County (i.e., coastal sage scrub, native grasslands, or vernal pools). Resources that are limited in distribution in the region being considered, but common elsewhere, are also included under this category.

C. Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.

Intent of Criterion C: The purpose of this criterion is to identify biotic resources that are uncommon within the political boundaries of the County, regardless of their availability elsewhere. The County has a high diversity of biological components. The County and San Diego County are the only counties in the U.S. that possess coastal, montane, and desert subregions within their boundaries. It is a rich heritage that few local governments have an opportunity to preserve.

Many biotic communities that were once common in the County have been severely reduced due to urban and agricultural development. This is especially true south of the San Gabriel Mountains, and among the agricultural fields of the North County. Other biotic features have never been common.

D. Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or in the County.

Intent of Criterion D: Species or groups of species, at various points in their life cycles, tend to congregate in certain areas. These areas possess resources that are essential to the maintenance of specific wildlife species. This criterion is intended to identify those areas that are limited in distribution either regionally or in the County, and not the primary habitat of common species or groups of species.

E. Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.

Intent of Criterion E: Oftentimes scientists learn the most about a biological phenomenon by studying it at an extreme in its distribution. This frequently reveals the biological and ecological parameters under which it can survive. In addition, isolated populations and communities often are relicts of what was present in an area at some previous time, and may show genetic traits not found elsewhere in the species. These biological and ecological parameters may be useful in determining taxonomic relationships.

F. Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

Intent of Criterion F: The intent of this criterion was to identify examples of the primary biotic resources in the County. At least one example (e.g., native grassland, valley oak savannah) of each vegetation type will be selected from the various geographical regions in the County in order to preserve basic biogeographic diversity.

SEA Descriptions

The following descriptions of the 21 SEAs include descriptions of the boundaries, resources, wildlife movement, and designation criteria for each. More detailed information about the specific plant and animal species of interest for each SEA is contained within the SEA Program Guide, which is maintained by the Department of Regional Planning. The SEA descriptions, followed by the CRA descriptions, are listed in alphabetical order.

Altadena Foothills and Arroyos SEA

Boundary and Resources Description

The Altadena Foothills and Arroyos SEA is located in the westernmost portion of the San Gabriel Valley. This SEA includes incorporated and unincorporated areas. The SEA represents the lower elevation/urban interface portions of Millard, Alzada, Chiquita, Las Flores, Rubio, and Eaton canyons from the urban edge, to undeveloped wildland areas of the lower elevations of the Angeles National Forest.

The SEA is located within the Mount Wilson and Pasadena United States Geological Survey (USGS) 7.5' California Quadrangles.

On the west side of the Altadena Foothills and Arroyos, the western and southwestern boundaries track along the urban-wildland interface in the undeveloped areas of the Arroyo Seco, Fern, and El Prieto canyons, and the boundary pulls back around a small area of development at the northern-eastern edge of La Cañada-Flintridge. A developed area northeast of the junction of Millard Canyon and El Prieto is excluded. The SEA designation includes the undeveloped portions of sub-watersheds of the Arroyo Seco, and also encompasses undeveloped parts of drainages, including Alzada and Chiquita, which flow into the Devils Gate Reservoir of the Arroyo Seco. The Arroyo Seco is within the Los Angeles River watershed. This SEA includes portions of the cities of Pasadena and La Cañada-Flintridge, the unincorporated community of Altadena, and the Angeles National Forest. The eastern side of the southern boundary encompasses undeveloped areas of the sub-watersheds of Las Flores, Rubio and Eaton canyons, which are tributary to the Rio Hondo and historically to the San Gabriel River. Much, but not all, of the Rio Hondo catchment is diverted via flood-control channels to the Los Angeles River. The southern boundary of the SEA is bordered by developed properties. The southern boundary moves east along the urban-wildland interface to include undeveloped parts of watersheds, which closely follow the perimeter of Devil's Gate Reservoir, in the Hahamongna Park in Pasadena. From Hahamongna Park, the SEA boundary continues east along the edge of development into the San Gabriel River watershed. The eastern border of the SEA is the eastern ridge of Eaton Canyon near the canyon mouth. A finger of the SEA extends downstream along Eaton Wash to include the Eaton Debris Basin and Reservoir. The northern boundary is formed along ridgelines within the Angeles National Forest that define the catchment of the local canyons. Within the Angeles National Forest, development is much less dense, in the form of in-holdings and Angeles National Forest leases, and is often naturally landscaped, albeit disturbed.

The chief attribute of this SEA is a high diversity of species, which is due to the SEA's position between the mountain biome and the valley biome, caused by an abrupt change of slope formed by the thrust fault complex that borders the San Gabriel Mountains. Furthermore, the SEA has as its center the dividing ridge between the two principal rivers of the Los Angeles Basin, the Los Angeles River and the San Gabriel River.

The wide range of elevation, topography, aspect, and geology represent a diverse array of physical habitats within this SEA. In general, the topography of the SEA is moderately steep to very steep, which results in a number of very narrow corridors with elevations ranging from a high of approximately 2,400 feet above mean sea level (MSL) to a low of approximately 1,200 feet above MSL. Consequently, a variety of plant communities exist, including riparian and upland shrublands and woodlands. Within these major community types, there are many vegetation series that varyaccording to plant species dominance.

Of particular note for this SEA is its potential to accommodate lower elevation east-west linkages. This is significant because of the constraints of development at lower elevations, the very steep terrain, and seasonal snow storms above the SEA, beginning at about 3000 feet—all of which limit potential movement for many species. There is also potential for north-south wildlife movement between the Angeles National Forest and the Verdugo Mountains via the Arroyo Seco and the San Rafael Hills. The Arroyo Seco is the eastern limit of this link and creates a potential movement corridor from the Angeles National Forest, over and under the Interstate-210. Across the Interstate-210, the linkage enters the San Rafael Hills, where blocks of habitat remain in the cities. Some are conserved in natural open space, such as the Cherry Canyon Park and Open Space Preserve of the City of La Cañada-Flintridge, just south of the County Descanso Gardens. These open spaces are interspersed with residential development and are not part of the SEA. From the San Rafael Hills, linkage potential may be traced to the west across State Route-2 and Verdugo Wash, past enclaves of residential development to access the Verdugo Mountains.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms. First, due to the extremely steep intervening topography, considerable movement of wildlife up and down the drainages, which course through this SEA to connect the forest interior with foothill areas, is expected. Consequently, this type of movement occurs on a seasonal basis, particularly for large mobile mammalsthat typically meet their full range of habitat needs over broad areas.

The second major type of movement occurs across the flanks of the foothills in an east-west direction. Particularly for riparian-obligate and riparian-favoring migratory birds, the corridor linking lower elevation riparian habitats in the SEA are of high importance and heavily utilized.

Regional Biological Value

The SEA meets important SEA designation criteria and supports many regional biological values. Each criterion and how it is met is described below.

CRITERIA ANALYSIS OF THE ALTADENA FOOTHILLS AND ARROYOS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not Met	None within this SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA is designating one of the principle ecotones of the Southern California coastal areas: the area where the sediment of the coastal alluvial fans from the mountain streams and drainages is exiting the abrupt upthrust rock of the mountains. Here one finds the biotic communities of the mountains meeting the communities of the coastal plain areas, combining with the organisms that are only found at the junction. The natural habitats of this kind of biological area are fast dwindling as urban communities expand to the limits of easily buildable space.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA is designating one of the principle ecotone areas of the County coastal exposure: the area where the sediment of the alluvial fans from the mountain streams and drainages is adding to the mile-deep sediments of the Los Angeles Basin, as the watercourses exit the abrupt upthrust rock of the San Gabriel Mountains. It is an area where one can often encounter flora that is characteristic of the Peninsular Ranges to the south and flora of the coastal ranges and

Criterion		Status	Justification
			Sierra Nevada to the north, among typical flora of the Transverse Ranges. The SEA contains prime examples of coastal sage scrub and other kinds of chaparral, riparian oaks, woodlands of the canyon oak of the mountains, woodlands of the coast live oak, which occurs both in the lower mountains and the valleys, good stands of the San Gabriel endemic oak (*Quercus dumosa* var. *gabrielensis*), diverse and beautiful flora characteristic of the continually changing beds of the mountain streams, both perennial and intermittent, and the wildlife that reside in these various habitats.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The SEA provides a low-elevation constrained corridor. The SEA serves as the only corridor to provide interacting component habitat areas for species to feed, rest, and migrate from low basin and foothill elevations to the sub-alpine elevations of the high San Gabriel Mountains.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Not met	None within this SEA.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Areas encompassed within the SEA represent the only remaining stands of low-elevation foothill scrub, chaparral, and canyon woodland communities within the north San Gabriel Valley. These communities once extended throughout what are now the communities of the north San Gabriel Valley, bridging the transition between high chaparral on the southern slope of the San Gabriel Mountains to the alluvial fans extending beneath the mountains to the coastal basin.

In conclusion, the area is an SEA because it contains (B - C) a good example of the biotic communities typical of the area where the abrupt upthrust of the mountains meets the alluvial fans of the valleys, a natural habitat that is limited in availability in the County and the coastal Southern California region; (D) it has a constrained connective corridor area near the Devil's Gate Dam where the freeway underpasses provide access between the San Rafael Hills and the San Gabriel Mountains; and (F) it supports intact remant stands of low-elevation chaparral and scrub communities that were once more widespread within the region.

Antelope Valley SEA

Boundary and Resources Description

The Antelope Valley SEA is located in the central portion of the Antelope Valley, primarily east of the cities of Palmdale and Lancaster, within a predominantly unincorporated area of the County. The SEA is focused on the principal watercourses of the area: Little Rock Wash and Big Rock Wash and tributaries, such as Mescal Creek. Audubon California recognizes the area of Edwards Air Force Base as a Globally Important Bird Area (IBA), which is visited by tens of thousands of migrant birds during the spring and fall migratory seasons, and supports the breeding of rare and endangered birds during the spring and summer months.

The SEA is located, at least partially, in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Rosamond, Rosamond Lake, Redman, Rogers Lake South, Jackrabbit Hill, Lancaster East, Alpine Butte, Hi Vista, Adobe Mountain, Palmdale, Littlerock, Lovejoy Buttes, El Mirage, Pacifico Mountain, Juniper Hills, Valyermo, and Mescal Creek.

Watercourses and water features, such as dry lakes and springs, are the focus for desert wildlife and central to connectivity and biodiversity in this region. The SEA was delineated to emphasize the importance of the Little Rock Wash and Big Rock Wash watersheds to the surface and subsurface hydrology of the Antelope Valley and to the dry lakes. The western portion of the SEA extends along the margin of the Little Rock Wash and floodplain zone, while the eastern margin follows a tributary of Big Rock Wash, which is Mescal Creek Wash and its tributaries. The origins of the watercourses in the Angeles National Forest are an important aspect of their diversity and connectivity, and the importance of the diverse forest vegetation of this SEA is discussed below. The SEA includes several major buttes and numerous minor ones, which have highly diverse biota along with diverse desert habitats, which range from sand dunes formed from the wind-blown dust that the buttes collect, to rocky crags, which are home to various raptors. The SEA includes the County's portion of the watershed basin for dry lakes, which are the destination for the watercourses. There are three dry lakes and their adjacent plains (protected as part of Edwards Air Force Base) included in the SEA: Rosamond Dry Lake with the adjacent Piute Ponds, Buckhorn Lake, and Rogers Lake. These lakes and ponds are often flooded during the rainy winter-spring seasons, and are the principal resting areas in the region on the Pacific Flyway. The northeastern portion of the SEA encompasses some agricultural cropland (portions of which are fallow) and dispersed rural residential uses; however, the underlying hydrology of the washes remains intact throughout the entire SEA.

Three main watercourse segments originate in the San Gabriel Mountains and flow through the Antelope Valley to dry lakes near the northern County boundary: 1) Little Rock Wash; 2) Big Rock Wash; and 3) Desert-Montane. Desert-Montane centers on Mescal Creek and includes adjacent drainages. The flows of all three drainages are subsurface for much of the year and may be on the surface during rain and snowmelt.

The Little Rock Wash segment (the westernmost segment), goes north from Little Rock-Palmdale Dam as its southern barrier. Upstream from the reservoir is critical habitat for the endangered arroyo toad (*Anaxyrus californicus* FE, SSC). The toad could occur from time to time in the downstream area of the SEA. Heading north to Mount Emma Road, the boundaries follow the flood zone of the Little Rock Wash and also incorporate some of the vegetated slopes that drain to the wash. North from Mount Emma Road, the boundaries generally follow Federal Emergency Management Agency (FEMA) boundaries. On the west side, south of Edwards Air Force Base and north of Avenue F, the SEA boundary follows the

Economic Opportunity Area boundary.

All of Edwards Air Force Base that is in the County is included in the SEA because the restricted entry and use protect the dry lakes and their neighboring areas. Many desert plants and wildlife species once found broadly across the Antelope Valley are now found only or primarily within Edwards Air Force Base. The ponds and dry lakes have distributed habitat of marshy alkali grassland, alkali flats, and cattail and bulrush marsh augmented by wastewater treatment facilities that have additional ponds. Some of the nesting rare and uncommon birds include white-faced ibis (*Plegadis chihi*), tricolored blackbird (*Agelaius tricolor*), redhead (*Aythya americana*), gadwall (*Anas strepera*), yellow-headed blackbird (*Xanthocephalus xanthocephalus*), least bittern (*Ixobrychus exilis*), and federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*).

The Big Rock Wash area has western and eastern segments in the SEA. The western arm of the Big Rock Wash segment begins near the northern boundary of the Angeles National Forest, heads north out of the Forest along Pallett Creek. The SEA includes parts of Cruthers and Holmes creeks near their junctions with Pallett Creek. SEA boundaries follow the braided stream channel toward the confluence with Big Rock Wash. From the aqueduct at Big Rock Wash to Edwards Air Force Base, the western boundary line follows recently active braids of Big Rock Wash, encompassing Alpine Butte, and joining to the Little Rock Wash segment within Edwards Air Force Base. On the eastern arm of the Big Rock Wash segment, the SEA boundaries head north from the Angeles National Forest headwaters of Dorr Canyon (a Big Rock Wash tributary) and the headwater area of Big Rock Wash near State Route-2. The boundaries travel through the Angeles National Forest and follow the wash area of the streams toward their confluence with Pallett Creek. The Angeles National Forest floodplain of the widened area of South Fork of Big Rock Wash is included in the SEA.

South Fork of Big Rock Wash is part of the federally-designated critical habitat of the mountain yellow-legged frog (*Rana muscosa*, FE, SE). This frog is known in the County from only a few high-mountain streams in the San Gabriel Mountains. A fungal pathogen is principally responsible for its decline; however, climate change, air pollution and non-native predators are also likely contributing factors.

Another broad area of the San Andreas Fault Zone near the Valyermo Ranch follows the FEMA boundaries and includes a nesting area for gray vireos near Bobs Gap. Between the Angeles National Forest and the aqueduct, the SEA boundaries follow FEMA boundaries. The eastern boundary generally follows the FEMA boundary and recently active braids along the main course of Big Rock Wash to the vicinity of Avenue Q East, at which point it projects east to encompass Lovejoy Buttes. At Avenue O, the eastern boundary rejoins the main active portion of Big Rock Wash, continuing northeastward to skirt development in Lake Los Angeles. In the vicinity of Avenue M, the boundary projects eastward from about 156th Street East to 180th Street East) to encompass Rocky, Piute, and Saddleback Buttes, and connect with the Desert-Montane transect segment.

The Desert-Montane Transect segment begins in the Angeles National Forest along the ridge of Table Mountain at the San Bernardino-Los Angeles County line. Table Mountain is known for its diverse flora, which includes desert and mountain elements, and some unusual limestone-obligate species. The SEA southern boundary along the ridgeline meets the western boundary as it skirts the camp developments along the southern base of Table Mountain. The boundary turns north along the western ridge of the Mescal Creek drainage, crossing the California Aqueduct with the State Route-138. From the aqueduct to Avenue R, the western boundary buffers the westernmost portion of the drainage by 200 feet, protecting the braided area of the watercourse. This part of the SEA includes Black Butte and the Three Sisters Buttes, and many smaller unnamed buttes, as well as Mescal and Theodore Payne County wildlife

sanctuaries. The east side of the transect is the San Bernardino-Los Angeles County line. At about Avenue U East, the eastern boundary veers off the San Bernardino-Los Angeles County line to the north-northwest, buffering the Puzzle Creek watercourse by about 200 feet, protecting the braiding of the easternmost drainages. Near Avenue R, the boundary trends north, and goes north-northwest near Avenue P to include Moody Butte, lesser unnamed rises, and Blue Rock Butte.

The Desert-Montane segment largely avoids drainages that flow into and out of the Lake Los Angeles community, but the transect includes diffuse watercourses on the south side of Saddleback Butte, Saddleback Butte and the surrounding Saddleback Butte State Park, the Antelope Valley Indian Museum State Park at the base of Piute Butte, and Piute Butte. At about Avenue H and 170th Street East, the boundary turns to the northeast following natural vegetation to the County boundary near Avenue C. Here the boundary turns north along the line to where San Bernardino, Kern and Los Angeles counties meet. This northeastern part of the SEA has WEMO conservation areas for the threatened desert tortoise and state-threatened Mojave ground squirrel. The northeastern area has some BLM land and the County Phacelia Wildlife Sanctuary, which is also County Wildflower Preserve A. The SEA includes large parts of County Wildflower Preserve F.

On Edwards Air Force Base, north to south between Avenues B and E East, and west to east between 140th Street East and the San Bernardino-Los Angeles County line, there is federally-designated critical habitat for the state and federally-threatened desert tortoise (*Gopherus agassizii*). At 190th Street, the critical habitat widens to extend north beyond the County and the SEA into Kern County. At 200th Street, the critical habitat widens to the south to extend to Avenue H and then goes east across the San Bernardino-Los Angeles County line. The desert tortoise critical habitat area on Edwards Air Force Base is included in the SEA, and much of the SEA area north of Avenue H in the eastern drainages of the SEA is designated critical habitat for the tortoise.

The SEA traverses the Antelope Valley from the foothills of the San Gabriel Mountains, to the low elevations of the dry lake basins, and its expanse and considerable topographical relief is reflected in its relatively high floral and faunal diversity. The SEA includes playa lake, alkali marsh, alluvial fan scrub, a mosaic of xeric desert scrubs, Joshua tree woodland, desert riparian woodlands, juniper scrub, pinyon pine, chaparral and mixed conifer, oak, and riparian communities of higher elevations. Transitional zones (ecotones) between these communities often contain unusual species compositions, such as pinyon pine, juniper and Joshua trees together, or Joshua trees adjacent to cottonwood forest.

Edwards Air Force Base has the only good stands of mesquite (*Prosopis glandulosa*) remaining in the County. It has areas of Mojave spineflower (*Chorizanthe spinosa*), creosote bush scrub, alkali sink, and the transition vegetation between the two. Rosamond Lake has the best example of the shadscale scrub and alkali sink biotic communities in the County. Shadscale scrub needs heavy soil with underlying hardpan between 3000-6000 feet elevation, which is unusual in the County, and more common in the north Mojave Desert and Owens Valley. In addition, the playa has the southernmost extension of the Great Basin kangaroo rat (*Dipodomys microps*), which is an isolated geographic population of scientific interest.

The southernmost portions of the three “legs” of the SEA lie within the Angeles National Forest, and include the upper tributary watersheds and streams for Little Rock Wash, Big Rock Wash, and Mescal Creek. These areas support multi-species oak and conifer woodlands that are common to the middle-elevation zones on the north face of the San Gabriel Mountains. The creeks are higher energy systems at those elevations, as they collect water from the surrounding terrain, and are typically lined with woodlands of alder, willow, sycamore and cottonwood, with varying densities and with various

compositions of species.

As the creeks drop north of the pressure ridges of the San Andreas Fault Zone, they lose gradient and widen, and most of the flow becomes sub-surface, except during high energy storms or in the spring (depending upon rainfall totals in the watersheds). The vegetation becomes sparser and less evenly distributed along the channel margins. Crossing the lowlands of the Antelope Valley, the channels support a variety of desert scrub vegetation within the alluvial plains. Where the alluvial plains are wide and shallow, cottonwood-willow woodland and sycamore woodland vegetation communities often occur within the overall floodplain on stable terraces; around oxbow flow zones in the Antelope Valley; or where the groundwater table is replaced or augmented by agricultural runoff. The surrounding upland habitats are primarily desert scrubs, including creosote and chenopod scrubs, sand sheets (chiefly around the buttes), and Joshua tree woodland. Intact Joshua tree woodland, with native understories present, supports a relatively high diversity of annual wildflowers, reptiles and mammals. The Joshua trees also provide nest sites for many resident and migratory bird species.

Lovejoy, Alpine, Piute, Black and Saddleback buttes, along with other, smaller unnamed buttes, form most of the topographical relief within the SEA. These areas offer different ecological conditions that are associated with rock shelter, perching sites, nesting sites, denning areas, wind protection and sand sheet accumulation areas. Local and migratory bat species roost and reproduce in the caves and crevices of the butte formations. The higher buttes provide local nesting sites for owls and other birds of prey.

Alpine Butte is the least disturbed butte in the County, with excellent stands of Joshua tree woodland and creosote bush scrub, and impressive wildflower displays when rainfall creates appropriate conditions. Lovejoy Butte has Joshua tree woodland and creosote bush scrub, with a central wind-blown sand community for a good mixture of rock and sand habitats. In addition, the close proximity of Lovejoy Butte to Big Rock Wash increases the diversity of habitats in the area. Nevertheless, it also suffers from impact from the Lake Los Angeles community, which borders the butte on three sides. The clustering of buttes in the SEA may be important to the abundant, diverse wildlife that inhabits the various vegetation communities around and in the buttes. Saddleback Butte and Piute Butte together are protected as a state park, but Saddleback Butte is also subject to development for campsites and hiking trails. Piute Butte has a prehistoric site that may protect it from much future recreational development. All of the buttes harbor diverse wildlife and flora. Most of them are critical habitat for the state and federally-threatened desert tortoise. Some buttes within the desert tortoise's critical habitat are not included in the SEA.

The acitive and fallow open agricultural lands support a diversity of wildlife species, which essentially regard the fields and ditches as irrigated desert. Birds of prey frequently hunt over the open agricultural areas, including fallow fields; wide-ranging predators also find excellent hunting conditions in and around agricultural areas. A spectrum of local and migratory bat species feed over the irrigated fields in the spring and summer, when insect numbers are the highest, and at least one sensitive bat species, the pallid bat, forages in open scrub or ruderal desert habitats.

The northern portion of the SEA contains several unique habitat types, including mesquite bosque (threatened locally by lowering water tables and harvest for firewood), clay pan pools, vernal pools, alkali grasslands, alkali and freshwater marshes, and permanent ponds. Hundreds of bird species have been recorded from the pond and marsh habitats around the dry lakes and ponds, and numerous species nest on the playa margins or in the associated riparian habitats. The open creosote scrub and other xeric habitats on the slopes surrounding the lake playas serve as important wintering areas for many raptor species, as well as large numbers of songbirds.

Wildlife Movement

The SEA extends from the Angeles National Forest to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages exiting the northern slope of the San Gabriel Mountain range. The geographical features of the SEA serve as a major habitat linkage and movement corridor for all wildlife species within its vicinity and in an intergenerational sense, many of the plant species. Ecologically generalist species (mountain lion, bobcat, coyote, gray fox, etc.) have the ability to move across such vast areas and through changing habitat types. For such species, the SEA may serve as an important system for long-term and genetic exchange among populations. For smaller or less-mobile species or taxa, which are narrowly restricted in their habitat needs, the SEA can serve as a broad linkage zone, in which individual movement can take place during seasonal population dispersal or over generations. This provides essential genetic exchange within and between metapopulations. The two drainages, combined with the upland terrestrial Desert-Montane transect portion of the SEA, ensure linkage and direct movement areas for all of the wildlife species present within the County portion of the Antelope Valley.

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE ANTELOPE VALLEY SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Critical habitat for the only known Antelope Valley population of the federally-endangered arroyo toad is adjacent to Little Rock Reservoir, upstream in Little Rock Creek, and some may still be found downstream of the dam in the SEA. The SEA encompasses much of the County ranges of the federally-threatened California desert tortoise, including much of the County critical habitat for the tortoise. The state-threatened Mohave ground squirrel occurs throughout much of the SEA. The SEA includes some of the critical habitat of mountain yellow-legged frog in the South Fork of Big Rock Creek. It includes habitat designated in the Western Mojave Plan (WEMO) for the alkali mariposa lily, which is a rare lily of the desert floor.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The mesquite bosque, sand sheet, rocky butte, desert riparian woodland, and alluvial fan sage scrub habitats are unique and regionally restricted biotic communities encompassed by the SEA. Desert species not, or rarely, found elsewhere in the County, such as verdin, black-throated sparrow, Mojave rattlesnake, desert banded gecko, Leech's prionid borer, and mesquite borer, occur within these habitats. Additionally, the

Criterion		Status	Justification
			ponds and other riparian and wetland systems in the northern portion of the SEA support numerous water birds and raptors not found elsewhere in the County.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The desert alluvial fan sage scrub, Joshua tree woodland, desert riparian woodland, mesquite bosque, alkali meadow/marsh, desert freshwater marsh, playa lake and seasonal pool habitats are located within, are unique to, or best represented within, the SEA.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or in the County.	Met	The freshwater habitats within and around Rosamond, Buckhorn and Rogers dry lake basins have large concentrations of migratory and resident waterfowl and birds of prey, providing them with essential seasonal and permanent resources. The rocky desert buttes are unique roosting, sheltering, perching and nesting sites for birds of prey and bats. This SEA is centered on migratory routes for both plants and animals along principal desert washes and buttes that connect the mountains to freshwater playas.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The mesquite bosque that is located within the SEA is clearly at an extreme of its geographical range, along with its associated biota, such as the mesquite borer. Edge populations usually represent an unusual genetic variation in a population or community, and therefore meet the criterion of scientific interest as well as the criterion of a population at the extreme physical/geographical limit of its range.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The SEA encompasses some of the most biotically intact acreages of Joshua tree woodland, desert riparian woodland, and desert alluvial fan sage scrub remaining in the County. Mesquite was formerly widely distributed in the Antelope Valley, but due to harvesting and drawdown of groundwater, is now limited to a few protected areas, such as the Edwards Air Force Base.

In conclusion, the area described is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) populations of scientific interest at the edge of their range including the desert tortoise, the mesquite bosque, and the Mojave ground squirrel; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in

the County.

Joshua Tree Woodlands SEA

Boundary and Resources Description

The Joshua Tree Woodlands SEA is located in the western portion of the Antelope Valley west and northwest of the Antelope Valley California Poppy Reserve in an unincorporated area of the County. This SEA encompasses many of the remaining old-growth stands of Joshua trees (*Yucca brevifolia*) on the west side of the Antelope Valley. Joshua tree woodland is a complex biological community of the gradual slopes of higher elevation desert are as that once covered much of this part of the Antelope Valley around the Antelope Wash. Joshua trees only occur within the Mojave Desert, and Los Angeles County populations are at the the western limit of the species' range.

Because Joshua trees live in areas that are easily developed for residences and agriculture, this habitat has become very fragmented in the County. The SEA consists of eight separate units, seven of which are in close proximity to each other between the Kern-Los Angeles County line to the north, and the California Aqueduct and Fairmont Butte to the south. The eighth unit is in an arroyo on the north side of the principal western ridgeline of Liebre Mountain, which is near the furthest western extent of Joshua tree woodland in Southern California. This woodland is located partially within the Angeles National Forest, and east and adjacent to the Interstate-5. The eighth unit is bordered on three sides by the San Andreas SEA.

All of the SEA except Unit 8 is within an area designated as the Antelope Valley Globally Important Bird Area (IBA) by Audubon California.This part of the Antelope Valley is very important as a resource area that supports spring and fall migration of birds, from the small passerines to the larger raptors, such as the state-threatened Swainson's hawk (*Buteo swainsoni*) and turkey vultures (*Cathartes aura*). The Joshua tree woodland is a very important resource to these migrations by supplying perches and food for these animals on their journeys. The SEA is near the San Andreas SEA, the Antelope Valley California Poppy Reserve, the Arthur B. Ripley Desert Woodland State Park, and the County George F. Bones Desert Pines Wildlife Reserve State Natural Reserve; however, many of these areas are not contiguous with one another nor with the SEA. Unit 2 of the SEA includes much of the Arthur B. Ripley Desert Woodland State Park. Unit 8 of the SEA is contiguous with the San Andreas SEA.

Fragmentation is a concern because the Joshua trees depend on a small moth for reproduction. Only two species of moth can successfully pollinate Joshua trees, and in the SEA, there is only the yucca moth (*Tegeticula synthetica*). The moth may have limited dispersal abilities, and the Joshua trees cannot reproduce from seeds without pollination from this particular moth. Cross pollination is regarded as essential to a species' genetic diversity, which is essential to adaptation to environmental change.

The Joshua trees in the seven units have the growth form of the lower elevation woodlands of the flatter areas, and somewhat spaced from one another and less clumped. The Joshua trees in the eighth unit have a growth form that is more common in the hilly areas, where the individuals sprout from connected rhizomes and are clumped.Many times, these clumps are clones, with individuals all sharing the same genetic identity.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Neenach School, Fairmont Butte, Black Mountain, and Lebec.

The SEA is composed of eight units. The overall boundaries are as follows: The western boundary for

units 1-7 terminates at 220th Street West (the border between Ranges 15W and 16W). The eastern boundary is 145th Street West. The northern boundary is on Avenue A at the Kern-Los Angeles Countyline. The southern boundary straddles the California Aqueduct, touches the Los Angeles Aqueduct, and is approximately on Avenue F. The southernmost area is located close to the foothills of the western San Gabriel Mountains.

Unit 1: The northernmost unit is bounded by Avenue A on the Kern-Los Angeles County line on the north between 200th Street West and approximately on 218th Street West. It extends irregularly to the south along a desert wash contour, about a 0.7 mile at its greatest extent. The current southern boundary is determined by agricultural clearing. This unit has a Joshua tree woodland with many shrub components of the biological community intact, including a floor covered by the wildflower slender goldfields (*Lasthenia gracilis*) in the spring.

Unit 2: Another unit is located between Avenue C to the north and Avenue F to the south (straddling part of State Route-138 on Avenue D and part of Lancaster Road on Avenue E), and east to west from about 200th Street to about 220th Street West. Vegetation clearance in various parcel units accounts for this unit's irregular shape. Agricultural clearing on both sides of the Antelope Wash has separated this unit from Unit 1 to the north. The intervening area is a broad wash plain with rich alluvial soils. The former agricultural fields may now become fields of photovoltaic panels to generate renewable energy. This unit has a southern square mile that straddles the California Aqueduct and touches the Los Angeles Aqueduct at the base of the San Gabriel Mountains. In the northern area, this unit has old-growth Joshua tree woodlands on a rocky ridge that grades into stands of Joshua trees and woodland that includes California junipers (*Juniperus californica*) in flatter areas toward the south. The southern and eastern parts of this unit overlap with much of the Arthur B. Ripley Desert Woodland State Park. The California Aqueduct is open in this area and is an important resource for bird migration along the desert slopes of the western San Gabriel Mountains, particularly waterfowl. The Los Angeles Aqueduct is generally in concrete pipe for most of its extent, and in this area, is covered by a berm and road. A colony of burrowing owls (*Athene cunicularia*), which is a state species of special concern, was discovered during surveys for an adjacent photovoltaic panel development, and probably other colonies or individuals of the owl live within this unit.

Unit 3: Another unit is located between Avenue D to the north and Avenue E to the south, and between 190th Street and 195th Street West. It is on the broad outwash alluvial area of Kings Canyon and adjacent drainages. This outwash area is somewhat blocked by the aqueducts, but both aqueducts are provided with underpass channels for outflow of the canyons onto the desert floor. The SEA includes a central cleared area that is regenerating the Joshua tree woodland and a residence with less than 40 acres cleared. The area next to Avenue D that has been cleared of Joshua trees is not included.

Unit 4: The square mile between Avenue C and Avenue D, and between 180th Street and 190th Street West has a good stand of Joshua tree and juniper woodland. This is also in the Kings Canyon alluvial wash area. There is a known area of Joshua tree regeneration to the east that is not included in the SEA.

Unit 5: The quarter square mile between Avenue C-5 and Avenue E, and between 180th Street and 185th Street West, is also on the Kings Canyon alluvial wash area and has a good stand of Joshua tree and juniper woodland.

Units 6: An area of a little over one-eighth square mile is located at the corners of both units 4 and 5. It is between Avenues D and E and between 180th Street and what would be 174th Street West. This is also in the Kings Canyon alluvial wash area and has a good stand of Joshua tree and juniper woodland.

Unit 7: A large irregular unit is located roughly between Avenue B, Avenue C5, 145th Street and 180th Street West.It has an extensive area of Joshua tree-juniper woodland that grades into stands of Joshua trees towards the east.There is a known area of Joshua tree regeneration in former agricultural fields between 160thStreet West and 170thStreet West that is not included in the SEA. The alluvial wash in the SEA is a combined area of outflow from Kings Canyon, unnamed canyons, and Broad Canyon.

Unit 8: The eighth unit is in an arroyo on the north side of the principal western ridgeline of Liebre Mountain, which is near the furthest western extent of Joshua tree woodland in Southern California. This woodland is located partially within the Angeles National Forest. It is east and adjacent to the Interstate-5. The eighth unit is bordered on three sides by the San Andreas SEA.This woodland has the clonal growth that is typical of Joshua trees in hilly areas.

The SEA is located primarily on the western Antelope Valley floor between the Tehachapi Mountains and the western San Gabriel Mountains. The topography of the SEA is extremely flat with the land sloping less than 200 feet in approximately five miles. The location and orientation of the SEA represents a matrix of remnant stands of Joshua tree woodland among a patchwork of disturbed areas. Nearly all of the land within the SEA is undisturbed and vegetated. Most of the land surrounding the SEA is disturbed by agricultural use, and also has some scattered rural residences. The SEA is entirely within the unincorporated area of the County.

Wildlife Movement

Wildlife movement within the SEA is possibly limited to local movement, but large-scale movement across the Antelope Valley floor is probably much facilitated by the Joshua tree habitat as island-like stepping stones. Typically in burned-over areas, animal paths tend to orient toward the Joshua tree habitat. Birds, and possibly bats, and other aerial organisms that use the habitat linkage along the desert side of the San Gabriel Mountains probably use the woodland in the SEA for resting and feeding. Animals foraging within the SEA are unlikely to occur in concentrated numbers due to the heterogeneity of the topography and habitat of the SEA. However, local movement to and from the different SEA areas, as well as to and from the San Gabriel Mountains and the Tehachapi Mountains may be restricted due to the disturbed nature of the Antelope Valley floor.Wildlife movement is likely to converge in areas where movement is still possible, which produces concentrated movement areas or "bottlenecks."

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE JOSHUA TREE WOODLANDS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not Met	Although there are several listed species that occur within the SEA, this criterion is not met due to the lack of known core population areas.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either	Met	The SEA contains large patches of undisturbed Joshua tree woodland habitat, which has

	unique or are restricted in distribution.		become increasingly rare in the region.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	As stated above, Joshua tree woodlands have become rare in the region, and are even more rare in the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The habitat within the SEA has been studied for how it may serve as a concentrated breeding, feeding, resting, or migrating ground for any species.Some cross-desert migratory routes depend, in part, on the cover and habitat of the Joshua tree woodland. The units 1-7 of the SEA on the Antelope Valley floor are in a globally IBA, known as a bird migration route. The Joshua tree woodland is an important component of resources that supports this migration.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	Due to the scarcity of Joshua tree woodland, specimens of the quality found in the SEA are important to science and have become living laboratories. The SEA contains the most westerly extent of this habitat type.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The Joshua tree woodland contained within the SEA is an excellent example of this community type.

In conclusion, the area is an SEA because it contains: B-C) Joshua tree woodland, a rare community both regionally and within the County; D) habitat important to breeding, feeding, and migration; E) the geographic limit of Joshua tree woodland; and F) an excellent undisturbed example of Joshua tree woodland.

San Andreas SEA

Boundary and Resources Description

The San Andreas SEA is located in the western portion of the Antelope Valley in an unincorporated area of the County. The SEA is the second largest SEA and includes many diverse habitats. This is in large part due to the northwestern area being a meeting place for several diverse biomes and wildlife corridors. There are five ecoregions that meet in this area and have biological species that extend along the SEA and San Andreas Fault in the County. These ecoregions include California Coastal Mountains; California Central Valley; Tehachapi Mountains, which extend to the southern Sierra Nevada; San Gabriel Mountains, which extend to other ranges in the Transverse Ranges; and the Antelope Valley, which is the western limit of the Mojave Desert. Wildlife corridors extend along the courses of the mountain ranges, as well as along the San Andreas Fault and Garlock Fault, which provide a great variety of

habitats and frequent emergent water that is important for wildlife, plant movement and connectivity. The location and orientation of the SEA coincides with a segment of the San Andreas Fault Zone. The SEA includes a small portion of the western south-facing Tehachapi foothills, which are known for wildflower field displays in years of good rainfall. The SEA extends east and south across grasslands at the western tip of the Antelope Valley, and includes Quail Lake, a sag pond enhanced to receive water from the West Branch of the California Aqueduct. From Quail Lake, the SEA extends up the northern foothills of Liebre Mountain, Sawmill Mountain, and includes Portal Ridge; large portions of Leona Valley; Ritter Ridge, Fairmont and Antelope buttes; and portions of Anaverde Valley. It also includes a disjunct area that encompasses water bodies along the fault, Lake Palmdale, and Una Lake, with a terminus at Barrel Springs.

The Antelope Valley and adjacent desert slopes of the SEA are recognized by Audubon California as the Antelope Valley (Lancaster) Globally Important Bird Area (IBA). Near Lake Palmdale in the disjunct eastern section of the SEA is part of the Antelope Valley (Lancaster) IBA and near Barrel Springs is part of the Santa Clara River IBA.

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Frazier Mountain, Lebec, La Liebre Ranch, Neenach School, Fairmont Butte, Little Buttes, Black Mountain, Liebre Mountain, Burnt Peak, Lake Hughes, Del Sur, Lancaster West, Sleepy Valley, Ritter Ridge, and Palmdale.

The northwestern tip of the SEA encompasses south-facing foothills at the western end of the Tehachapi Mountains, in the northwest corner of the County, on the eastern side of Tejon Pass.

From the Tehachapi Foothills, the southern boundary goes south-southeast along Interstate-5, including much of Peace Valley in the Gorman area, which is the broad faulted area that includes Gorman Creek. The SEA boundary crosses the Western Branch of the California Aqueduct, which is south of the junction of Interstate-5 and State Route-138. The boundary continues south along Interstate-5 until the point where the Liebre Mountain ridgeline dips to the highway, and the SEA boundary turns eastward and follows the ridgeline along the northern side of Liebre Mountain.

Along this section of Interstate-5 are several large underpasses for stream courses that are extremely important for wildlife connectivity across Interstate-5. The Angeles National Forest boundary is just east of the highway, and south of the aqueduct. Just north of the Liebre Mountain ridgeline, the San Andreas SEA borders the north, east, and south sides of the eighth unit of the Joshua Tree Woodlands SEA. This woodland is in an unnamed arroyo, and contains a population of the clonal growth form that Joshua trees (*Yucca brevifolia*) exhibit in colder and more fire-prone areas, sometimes referred to as *Yucca brevifolia* var. *jaegeriana*. The woodland is located near the westernmost limit of the range of the species, with a small number of stands and individuals known west of the Interstate-5. The SEA includes the northern slope area of the Angeles National Forest with its diversity of chaparral, grasslands, and oak and conifer forests.

After turning east from Interstate-5 and climbing uphill on the northern slope of Liebre Mountain, the SEA boundary crosses the ridgeline to the south to incorporate natural pristine areas of headwaters for all the branches of Liebre Gulch, which are part of the headwaters for Piru Creek, the largest tributary of the Santa Clara River in Ventura County. The SEA boundary returns to the north face of Liebre Gulch in the vicinity of Sandberg. The boundary tracks the Sawmill Mountain-Maxwell Road, along the broad ridgeline of the mountains and generally trends in a southeasterly direction. This ridgeline is the headwaters of Castaic Creek, which is the largest tributary of the Santa Clara River in Los Angeles

County. Castaic Creek is above the Castaic Reservoir, which extends into Cienega Canyon and Fish Creek, which is federally-designated critical habitat for the endangered arroyo toad (*Anaxyrus californicus*). In addition, maintenance of clean water in the source areas is critical for the species.

The boundary turns northeast where it meets Lake Hughes Road. This is an extremely important area of connectivity as the canyon along the Lake Hughes Road (Elizabeth Lake Canyon) drains to Castaic Creek and the Santa Clara River, whereas the Amargosa Creek that goes east and west from the Lake Hughes Road in the fault valley drains to the Antelope Valley in both directions. The junction is topographically broad and well-vegetated though residential, which is excellent for wildlife connectivity in spite of a few houses.

The SEA boundary goes north at the junction with Lake Hughes Road and then skirts the Lake Hughes community's extension into Pine Canyon along the San Andreas Fault. In Pine Canyon, the boundary turns north and returns to its southeasterly direction, skirting the Lake Hughes development along the southern edge of Portal Ridge. Portal Ridge is entirely included in the SEA. A side extension of the southern boundary includes Lake Hughes, which is important for migrating waterfowl, with its sheltered position in the Fault valley. The boundary extends along the southern edge of Lake Hughes, Munz Lake, and Elizabeth Lake, and then trends southeast to go along the Leona Divide, including a large portion of Leona Valley.

The entire area along the San Andreas Fault is rich in wetlands and bogs, but Leona Valley has these in abundance, even in many yards. All of the wetlands in the San Andreas Fault valley and Portal Ridge are home to the greatest concentration of the tricolored blackbird in Southern California, many of which are year-round residents. This bird species has experienced great population declines in recent years and is proposed for listing at both state and federal levels. In the community of Leona Valley, the southern SEA boundary goes along Lost Valley Creek and then along Leona Road to exclude some of the denser residential area in this section. The included area in Leona Valley has many of the bogs that line the Fault and the less populated farm areas along Portal Ridge north of Leona Road.

North of the Bouquet Canyon watershed, the southern SEA boundary dips south around an expansive area of drainages and bogs used by the tricolored blackbird on the old Ritter Ranch. From Ritter Canyon to the east, the boundary follows the old Ritter Ranch high road along the Sierra Pelona, crosses from 40th Street to the California Aqueduct along vegetation in the Anaverde Valley (where the boundary transitions from the Amargosa Creek drainage to the Anaverde Creek drainage), and then follows the aqueduct to the area where Anaverde Creek exits from the Fault valley. At the Lancaster Landfill boundary, the SEA boundary goes north and becomes the north SEA boundary at Verde Point.

The northern boundary of the SEA begins at Tejon Pass next to Interstate-5 and follows the Kern-Los Angeles County line eastward to its intersection with the western branch of the California Aqueduct in the western Tehachapi Foothills. This area along the Kern-Los Angeles County line is coincident with the designated critical habitat for the federally-endangered California condor (*Gymnogyps californicus*), which is a bird that nearly went extinct and was saved by prodigious efforts in captive breeding. The boundary then generally follows the Tehachapi foothills southward to Quail Lake. Here the northern SEA boundary crosses Highway 138 to include the northern foothills of the liebre Mountains and fallow agricultural fields, which are important for raptor foraging. These fields are often oriented along the Los Angeles Aqueduct, which is a little south of the California Aqueduct in this area, or along the California Aqueduct itself.

The boundary eventually tracks along the northeast edge of Fairmont Reservoir (another breeding site

for the tricolored blackbird), and turns northeast to include a patchwork of farmed areas between the Fairmont and Antelope buttes, which are known to have tricolored blackbird feeding grounds. The boundary makes an inclusive path to encompass the Broad Canyon Wash, the Fairmont and Antelope buttes, and the Antelope Valley California Poppy Reserve State Natural Reserve. These desert buttes are concentrated wintering grounds for birds of prey, and provide roosting sites that are surrounded by cultivated fields that support a plentiful food supply of rodents, rabbits, and hares. They are the most westerly buttes in the Mojave Desert, and with their proximity to the San Gabriel Mountains, have unique ecological relationships of scientific interest. Near the southern area of the buttes, the boundary follows agricultural fields along 130th Street West and then 135th Street West south to Munz Ranch Road (Willow Springs Road on some maps). Along 135th Street West, the boundary crosses Myrick Canyon where it spreads out onto the plain of the desert floor. The upstream areas of Myrick Canyon are included in the SEA.

The boundary tracks along the northwest side of Munz Ranch Road and then crosses to include Willow Springs Canyon, where Willow Springs Canyon is in its most undisturbed state. Where Willow Springs Canyon crosses the California Aqueduct, the northern SEA boundary turns east along the California Aqueduct as it passes along the northern base of Portal Ridge. Following the southern edge of the California Aqueduct, the boundary continues in a southeasterly direction to the east side of Ritter Ridge to Leona Siphon. A development along Joshua Tree Ranch Road near the summit of Ritter Ridge is excluded from the SEA. The SEA northern boundary turns east for roughly one quarter mile along the southern edge of a tributary to Amargosa Creek. Where the Amargosa Creek terminates Ritter Ridge, the SEA boundary crosses the creek and ascends along the ridgeline of an unnamed ridge to where it meets the southern boundary at Verde Point.

East across the State Route-14 is a disjunct part of the SEA that incorporates Lake Palmdale and Una Lake and extends along the Fault to 37th Street East, including the ridgelines north and south of Barrel Springs Road, which includes the sag ponds or Barrel Springs. The Palmdale Ditch is included in this part of the SEA. Many migrant birds using the desert water features can be observed at these artificial lakes and the natural springs of this area during the spring and fall migration.

The gap between the two portions of the SEA includes the Antelope Valley Landfill, disturbed lots, and State Route-14.

The majority of land within the SEA lies within unincorporated area of the County. Other jurisdictions include the Angeles National Forest, the City of Palmdale, and the City of Lancaster.

Wildlife Movement

The SEA includes several important linkages for wildlife movement. The foothills in the western-most part of the SEA are an important linkage between the San Gabriel Mountains, the Tehachapi Mountains, and the Coastal Ranges. This linkage to the Tehachapi Mountains is important because they connect to the southern-most extent of the Sierra Nevada Mountains. The Tehachapi Mountains represent the only mountain linkage from the Transverse Ranges and the Coast Ranges to the Sierra Nevada Range. This feature may be an important topographic reference for migrating birds, as well as providing high elevation foraging grounds along the migratory route. The several ranges that meet at the western end of the SEA, provide a valuable link for gene flow between divergent subspecies, varieties, and populations of many species. The SEA includes numerous drainages that extend onto the Antelope Valley floor towards resources, such as the Fairmont and Antelope buttes. These washes provide an important linkage for animals traveling between the Valley floor, the buttes and the western part of the

San Gabriel Mountains. In addition, Anaverde Creek, Amargosa Creek, and Pine Canyon facilitate east-west wildlife movement through the mountains, Portal Ridge, and Ritter Ridge. Tributary drainages from the Santa Clara River, such as Elizabeth Lake Canyon and San Francisquito Canyon, connect coastal drainages and the coastal ecoregion to the Fault and interior watersheds. The frequency of valuable riparian communities along this travel route, which are located within an otherwise arid climate, further contributes to the SEA's importance for wildlife and habitat linkages in the region.

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SAN ANDREAS SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not met Met in Future?	Although there are several listed species that occur within the SEA, this criterion is not met due to the lack of known core population areas. The far northwestern border with Kern Countyis the edge of critical habitat for the California condor. The tricolored blackbird may soon be listed and has its largest population in Southern Californiawithin the SEA.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA encompasses a series of marshes and sinks concentrated along the San Andreas Fault Zone, which are both unique and restricted in distribution. The Fairmont and Antelope buttes represent a unique habitat due to their location, as the most westerly buttes of the Mojave Desert and their close proximity to several geographic regions. As the confluence of a number of major geographical areas, the Mojave Desert, the San Gabriel Mountains of the Transverse Ranges, the Coastal Ranges, and the Tehachapi Mountains produces a unique and regionally rare flora that represents a transition between desert, foothill, and several montane environments.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The confluence of five major geographical areas–the Mojave Desert, the San Gabriel Mountains, the Coastal Ranges, the Tehachapi Mountains, and the Central Valley–has produced the most unique and diverse flora found in the County, and represents a transition between desert, foothill, and montane environments. The SEA also includes the southern limit of the foothill woodland community, blue oak, gray or foothill pine,

Criterion		Status	Justification
			and California buckeye, rare relic stands of Great Basin sagebrush scrub, and rare wildflower fields.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The Fairmont and Antelope buttes provide vital habitat to many wide ranging species, which forage in outlying habitat, but use the buttes for nesting, roosting, denning, and refuge. The buttes also serve as concentrated wintering grounds for birds of prey, which are rare in the County, and which forage on grassland and agricultural fields in the vicinity. Lakes and other wetland areas along the Fault and throughout the SEA provide breeding habitat for amphibians and feeding habitat for migrating birds that traverse the slopes adjacent to the Mojave Desert. The Fault is one of the principle wildlife corridors and connective areas for in the County. Major drainages (Santa Clara River, San Francisquito Canyon, and Lake Elizabeth Canyon) run from the coast through the San Gabriel Mountains and end at the Fault, which also has extensive riparian habitat that facilitates migration. The Fault provides the final westernmostlinkage to the Mojave Desert (Antelope Valley). The tricolored blackbird is a year-round resident of the SEA.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The transition of several habitat types including: creosote bush scrub, Joshua tree/California juniper mixed woodland, and desert chaparral, makes the SEA valuable for educational and scientific reasons. The close proximity of the Fairmont and Antelope buttes to the San Gabriel Mountains renders them unique in their species composition and ecological relationships and, therefore, of interest to scientists. The concentrated diversity of vegetation types, particularly in the western half of the SEA, creates an outstanding opportunity for educational use. This area also harbors the southern limit of the foothill woodland community, blue oak, gray or foothill pine, and California buckeye, as well as rare relic stands of great basin sagebrush scrub.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the	Met	The slopes of Ritter Ridge support one of the most pristine mixed stands of Joshua tree and California juniper in Los Angeles County. The location of theSEA

Criterion		Status	Justification
	original natural biotic communities in the County.		at the confluence of five major geographical areas, the Mojave Desert, the Central Valley, the San Gabriel Mountains of the Transverse Ranges, the Coastal Ranges, and the Tehachapi Mountains has produced a community-rich area with desert, foothill, and montane environments. The SEA encompasses large, mostly undisturbed examples of all of these communities.

In conclusion, the area is an SEA because it contains: B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

San Dimas Canyon and San Antonio Wash SEA

Boundary and Resources Description

The San Dimas Canyon and San Antonio Wash SEA is located along the cismontane foothills of the eastern San Gabriel Mountains. Generally, the SEA is centered on the mouths of four major canyons, which flow from the mountains and interconnecting terrain. From east to west, these canyons include San Antonio Canyon above the City of Claremont as one component; and Live Oak, Marshall, and San Dimas canyons above the cities of La Verne and San Dimas as a second component. The SEA incorporates areas with diverse natural habitat ranging from high elevations to the foothill alluvial areas of two of the major drainages of the San Gabriel Mountains. San Dimas Canyon is a tributary of the San Gabriel River. San Antonio Wash is a tributary of the Santa Ana River.

The SEA is found within the Mount Baldy and Ontario U.S. Geological Survey (USGS) 7.5' California Quadrangles.

Over most of its boundaries, particularly to the north, east, and west of both the San Dimas Canyon and San Antonio Wash components, the SEA is bordered by open space within the Angeles National Forest. Generally to the south, however, the borders are mostly defined by the edge of urban development within the San Gabriel Valley. The San Dimas Canyon component covers approximately 5,500 acres and includes portions of Live Oak, Marshall, and San Dimas canyons.The smaller component, San Antonio Canyon, covers approximately 1,200 acres of the San Antonio Canyon alluvial outwash.In total, this SEA encompasses 6,727 acres.

In general, the topography of the SEA is severe, consisting of steep-walled canyons and narrow ridgelines.Elevations range from a high of approximately 3,000 feet above mean sea level (MSL) along the ridges of San Dimas Canyon, to a low of approximately 451 feet above MSL in San Antonio Wash.Several major drainages and numerous tributaries exit the San Gabriel Mountains through this

SEA.

The wide range of elevation, topography, slope aspect, and geology represent a wide array of physical habitats within this SEA.Consequently, a number of plant communities exist, including grasslands, riparian, shrublands, woodlands, and forests.Within these major community types, there are many sub-communities, which vary according to plant species dominance.This area contains the last remaining relatively well-developed lower montane riparian habitat in the eastern County. Dammed drainages have created significant reservoirs or flood control basins in the SEA. The SEA is within several jurisdictions including: the Angeles National Forest, the unincorporated area of the County, the City of Claremont, the City of Glendora, the City of La Verne, and the City of San Dimas.

The more westerly component of this SEA generally includes portions of the lower watersheds of San Dimas, Marshall, and Live Oak canyons, which is part of the San Dimas Canyon component. The San Dimas Canyon watershed is part of the Experimental Forest section of the Angeles National Forest.Experiments were conducted and data was collected here during the latter half of the 20th century to determine the relationships among rainfall, topography, vegetation, and runoff. Much of the work and results influenced flood control in the Los Angeles Basin and even other areas of the U.S. The area was carefully protected through very limited and monitored access.The terrain chiefly includes undisturbed natural habitats of rocky canyon walls and canyon forest, riparian areas of many vegetation types, coniferous and oak forest, chaparral, and grassland.A few slopes were altered with vegetation removal in order to experiment on the effect of vegetation, and some of these are still grassland.

This SEA area on the border of the granitic San Gabriel Mountains has unusual rock strata, such as the Glendora Volcanics.Much of the grassland is natural and has unusual vegetation, such as wildflowers that prefer clay substrates.Not too distant from this area are critical habitat areas for the endangered thread-leaved brodiaea (*Brodiaea filifolia*). Some of these brodiaea and other rare wildflowers could occur in appropriate habitat of the SEA in undiscovered populations.

Beginning at Johnstone Peak in the west, the western boundary follows the ridgeline separating Big Dalton Canyon and San Dimas Canyon. Just before this ridgeline is intersected by Big Dalton Canyon Road, the SEA boundary turns east. From the area of Big Dalton Canyon Road, the northern boundary follows and crosses over a series of ridgelines to include the upper portions of several tributary canyons.It continues in this fashion in a southeasterly direction eventually meeting and following the Sunset Ridge Fire Road (Sunset Peak Motorway), which separates Wolfskill and Marshall canyons.The tributaries San Dimas Canyon include Lodi, West Fork of San Dimas, and San Dimas from near the junction with Wolfskill Canyon. The lower section of Wolfskill Canyon with and below the Wolfskill Falls is included in the SEA. The upper section of Wolfskill is not included in the SEA, but much of Marshall Canyon watershed is included, along with watersheds of Live Oak and Webb canyons in the City of Claremont.

A large lobe of the SEA extends from the Sunset Ridge Fire Road on the dividing ridgeline, to include lush canyon forests and chaparral of the slopes above the City of La Verne and City of Claremont. Most of this lobe is in municipal or private ownership. The Angeles National Forest boundary is about a 0.1 mile south of the Sunset Ridge Fire Road. The eastern boundary leaves the fire road and travels south along a ridgeline, including Live Oak Canyon in the SEA, but separating out the more developed watersheds of Palmer, Cobal, Burbank, and Gail canyons in the City of Claremont.A finger of the SEA includes the lush riparian oak forest of Webb Canyon to the edge of adevelopment.The lobe of the SEA excludes an area around the residences and equestrian areas that surround Live Oak Reservoir.Live Oak Canyon Reservoir and its riparian oak woodland is included as far south as Base Line Road.The ridges and dissected

canyons that border Live Oak Reservoir are included as far south as Base Line Road.However, the flat area of the ridge around Live Oak Reservoir and development in the periphery are excluded.The northwestern edge of the lobe includes the riparian area and slopes of Marshall Creek, but excludes developed areas, such as the Marshall Canyon Regional Park and Golf Course.The lobe boundary returns north into the Angeles National Forest at the Sunset Ridge Fire Road along the edge of Marshall Creek and the western ridge of Marshall Canyon.

From Sunset Ridge Fire Road, the southern boundary of the SEA is within the Angeles National Forest and follows the ridgeline that includes the watershed of San Dimas Canyon.The San Dimas Reservoir, with good habitat for waterfowl, is included in the SEA.The SEA extends a finger out of the Angeles National Forest along San Dimas Canyon road to include the riparian habitat along the watercourse, which is a rare example of the lowland riparian community.From the Angeles National Forest boundary and rocky cliffs above the west side of San Dimas Canyon, the SEA boundary follows the ridge of Lodi Canyon (tributary of San Dimas Canyon) to Johnstone Peak.

The eastern, disjunct segment of the SEA (San Antonio Wash) follows the San Bernardino-Los Angeles County line as its eastern boundary from about a 0.5 mile upstream of the San Antonio Dam through the San Antonio debris basin, past the San Antonio Dam, to the natural extent of alluvial fan vegetation south of the Interstate-210. This is at an area about a 0.1 mile north of Base Line Road.Downstream of the San Antonio Dam has the best example of arroyo or wash vegetation that remains in the County, and it extends onto the adjacent alluvial fan.The vegetation is a dry form of coastal sage scrub, with included desert plants that are adapted to coarse substrate.The vegetation is much more dense and stable than the alluvial fan in the arroyos behind Santa Fe Dam (San Gabriel Canyon SEA) and Hansen Dam (Tujunga Valley-Hansen Dam SEA).From its southern point, the SEA turns north to include the natural alluvial fan vegetation and border on the existing residential development on the alluvial fan.At the intersection of the San Antonio Wash with Mount Baldy Road, the SEA boundary follows the southeast side of Mount Baldy Road to the watershed of Chicken Canyon, which is a tributary of San Antonio Wash.The boundary crosses the road and includes the undeveloped part of Chicken Canyon. The boundary follows the minor ridgeline up to Potato Mountain, and goes along the south ridge of Evey Canyon back to cross Mount Baldy Road and return to the San Bernardino-Los Angeles County line in the San Antonio Debris Basin.Evey Canyon is outside the SEA, but is a preserve of the Claremont Colleges, and has excellent riparian canyon habitat. The SEA designation acknowledges the need to protext the Evey Canyon watershed. Small tributary watersheds of San Antonio Canyon with chaparral vegetation are included with the Chicken Canyon area.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms.First, due to the extreme intervening topography, it is logical to expect considerable movement of wildlife up and down the many sizeable drainages, which course through this SEA and connect the forest interior with foothill areas.The larger the watershed of the drainages, the greater the volume of movement.Consequently, this type of movement occurs on a seasonal and more frequent basis, particularly for large mobile mammals, such as American black bear, mountain lion, coyote (*Canis latrans*), bobcat (*Lynx rufus*) and mule deer (*Odocoileus hemionus*), whose full range of habitat needs are typically met over broad areas.

The second major type of movement occurs across the flanks of the foothills and lower mountains, in an east-west direction.Particularly for riparian-favoring migratory birds, a corridor linking lower elevational riparian habitats in the SEA is expected to be of high use and importance.In addition to providing essential habitat for resident riparian birds, this SEA contains some of the best developed riparian

habitat for birds, which are seasonal visitors to the cismontane region of the County.

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

Criteria Analysis of the San Dimas Canyon and San Antonio Wash SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Not Met	Although the SEA contains rare plant populations, it does not contain a core population of a listed species and therefore does not meet this criterion. The lower slopes in and around San Dimas Canyon support one of the largest populations of the coastal cactus wren in the County, which is a subspecies that is very threatened throughout its range, although not officially recognized by listing.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains habitat of the rare rock monardella.In addition, several plant communities within this SEA are CDFW highest priority communities due to their restricted distribution in the Southern California region, including: walnut woodland, oak riparian woodland, southern willow scrub, coastal sage scrub, and alluvial fan scrub.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution	Met	All of the plant communities and habitats mentioned as being restricted in distribution on a regional basis, are also restricted in distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The major canyons within this SEA support well-developed and diverse riparian woodlands, as well as a source of perennial water. These represent important stopover and overwintering areas for a wide variety of migratory birds, as well as essential habitat for resident species of fauna and flora. These canyons also support seasonal and more frequent movement for wide-ranging mammals, which must move over large areas to fulfill their habitat requirements. The federally-threatened California gnatcatcher has been sighted (2010) in the Glendora foothills, and

			probably maintains a small population along the lowest slopes of the San Gabriel Mountains.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Not Met	The SEA does not contain biotic resources that are clearly an extreme in physical/geographical limitations, or represent unusual variation in a population or community, and therefore does not meet this criterion.However, the extreme localization of several species of plants in the SEA may indicate geographical processes that are not well understood at this time that merit scientific inquiry.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Virtually all of the native biotic communities within this SEA are relatively undisturbed over most of their extent. Because urbanization throughout much of the County's foothill regions has removed large expanses of these communities, those in the SEA are particularly important to the County's natural heritage.

In conclusion, the area is an SEA because it contains: B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; and F) areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.

San Gabriel Canyon SEA

Boundary and Resources Description

The San Gabriel Canyon Significant Ecological Area (SEA) is located along the cismontane foothills of the eastern section of these mountains.Generally, the SEA is centered on the mouths of three major canyons, which flow from the mountains and interconnecting terrain. From west to east these include, Santa Anita, Monrovia and Sawpit, and San Gabriel canyons, which are located above the cities of Sierra Madre, Arcadia, Monrovia, Duarte, Bradbury, Irwindale, and Azusa.A substantial part of the eastern and southern part of the SEA along the San Gabriel River is in the California Audubon-designated State Important Bird Area (IBA) of the Los Angeles Flood Control Basin IBA. The San Gabriel River has largely been dammed and channelized, but with infrequent clearing of the detention basins and wash areas, substantial parts of the San Gabriel River have reverted to riparian habitat or the even more rare alluvial fan habitat, and this attracts many resident birds, as well as numerous spring and winter migrants.

The SEA is found within the, Mount Wilson, Azusa, San Dimas, and Glendora U.S. Geological Survey (USGS) 7.5' California Quadrangles.

Over most of its boundaries (north, east, and west), the SEA is bordered by open space within the Angeles National Forest. However, generally to the south, the borders are defined by the edge of urban development within the San Gabriel Valley. The SEA begins in the west at the peak of Mount Wilson within the Angeles National Forest.Traveling east, the northerly boundary follows a major east-west

trending ridgeline to Pine Mountain. This ridgeline defines the separation between the watershed of the San Gabriel River West Fork to the north, and the Santa Anita, Sawpit, and lower San Gabriel canyons to the south. These front-range canyons are tributaries of the San Gabriel River.

At Pine Mountain, the boundary turns south to follow the ridgeline that is the western border of the San Gabriel River, and turns east onto a secondary ridge, and descends towards the San Gabriel River near the Morris Reservoir Dam. This easterly boundary crosses the San Gabriel Canyon at Morris Dam and climbs the adjacent ridgeline to Glendora Ridge and the Glendora Ridge Motorway. The southerly boundary follows the motorway to the west, to the point near the mouth of the San Gabriel Canyon where the motorway leaves the ridgeline. The SEA boundary turns north towards the San Gabriel River, and descends to the opening of the San Gabriel Canyon into the Los Angeles Basin. This is between the Glendora Ridge and the mountains near Fish Canyon.The boundary turns along the southeast side of the San Gabriel River floodplain and follows the east side of the San Gabriel River flood control channel.A development near the mouth of Roberts Canyon that is just north of the river mouth has been excluded from the SEA.

In the mouth of the San Gabriel Canyon is a population of the San Gabriel Mountains live-forever (*Dudleya densiflora*), which is unusual in that it has multiple dense flower clusters, whereas other live-forevers have one or several flower stalks with spaced blooms. This live-forever is extremely limited in rangeand occurs only on the slopes of granitic rubble and canyon walls in the nearby south face of the San Gabriel Mountains. Another population is on private land about one mile upstream of the canyon mouth, on the north-side slope of the Glendora Ridge.Another live-forever population is upstream in nearby Fish Canyon, which is a little downstream of the Fish Canyon Falls. Collections have been made from Mystic Canyon to the east, and Van Tassel Canyon to the west.

The mouth of San Gabriel Canyon and nearby canyons are the principle area for the San Gabriel bedstraw (*Galium grande*), which is another local endemic. The only known populations of the bedstraw and the San Gabriel Mountains live-forever on the planet occur in the County in this small area of the San Gabriel Mountains.

The Los Angeles Flood Control Basin IBA covers all of the SEA in the San Gabriel River and downstream at the Santa Fe Dam Recreation Area. Furthermore, the IBA extends upstream beyond the SEA to the confluence area of the West, North, and East forks of the San Gabriel River in the Angeles National Forest, and it extends downstream beyond Santa Fe Dam to the Whittier Narrows Dam.

A finger of the SEA extends along the San Gabriel River, south of its confluence area with Fish and Van Tassel canyons to pass under the Interstate-210. The finger boundary enlarges around the Santa FeFlood Control Basin and Recreation Area to include one of the last remaining natural alluvial fan habitats in the County. The Santa Fe Flood Control Basin is one of the most unusual vegetation habitats in the County, and has special sensitive species.

The main SEA boundary continues just west of the Van Tassel Canyon confluence along the north side of the Encanto Equestrian Center, along the northern extent of development in the City of Duarte. A lobe of the SEA encloses the natural habitat of the steep watershed areas of Spinks and Maddox canyons, extending to the edge of development in the City of Bradbury. The ridge bordering the southeast side of Bliss Canyon is the western edge of the lobe, and the boundary crosses Bliss Canyon at its upper end near the Van Tassel Truck Trail. At this point the boundary of the SEA has reentered the Angeles National Forest.After crossing Bliss Canyon, the boundary follows the southern ridgeline of Spanish Canyon westward to cross out of the Angeles National Forest, tracking around the northern arm of the

City of Monrovia. The Sawpit Debris Basin is included in the SEA as is the undeveloped part of Monrovia Canyon Park. To the west of Monrovia Canyon, a lobe of the SEA extends along the undeveloped ridges of the San Gabriel Mountains bordered by the urban edges of the City of Monrovia and City of Arcadia.These communities extend into the mountains where the cities have municipal water rights. The southern boundary skirts the edge of development in Santa Anita Canyon, but includes the Santa Anita Debris Basin, Arcadia Natural Park, Big Santa Anita Dam and Reservoir, and the Santa Anita Canyon stream course above the Dam, which has numerous lease-hold cabins north of the 1600 feet elevation contour. The boundary reenters the Angeles National Forest just north of Arcadia Natural Park.

The southern ridge of Sawpit Canyon, from its dam to about a 0.5 mile upstream has a population of the endangered San Gabriel bedstraw (*Galium grande)*, which is an endemic species of highly restricted distribution.It occurs only on the south slopes of the western section of the San Gabriel Mountains.

Within the SEA, just to the south of Arcadia Natural Park is a Santa Anita Canyon tributary, Clamshell Canyon. On the south banks and ridge of Clamshell Canyon is critical habitat for the federally-endangered Braunton's milk-vetch (*Astragalus brauntonii*), which is a locoweed that prefers interbedded sandstone and carbonate substrate, probably deposited near the coastline of former oceans. Very limited areas of this substrate occur at the boundary of the San Gabriel Mountains in this area. Most of the rocks of the San Gabriel Mountains are igneous granites and metamorphic rocks.

Santa Anita Canyon has some stands of Pacific madrone (*Arbutus menziesii*), which is a plant known elsewhere from the Pacific coast north of Santa Barbara to British Columbia. The Santa Anita stands are isolated occurrences, which is one of the few places madrone is found between Santa Barbara and Baja California.

Near the confluence with Winter Creek in the vicinity of Chantry Flats, the southern boundary of the SEA turns west and climbs the southern ridgeline of Winter Creek, including Winter Creek watershed in the SEA and excluding San Olene Canyon on the south. The boundary follows the ridgeline, marking the southern limits of the Winter Creek watershed to Mount Harvard, and then travels along the Harvard ridgeline to Mount Wilson.

The SEA is comprised of three major canyons: San Gabriel, Sawpit, and Santa Anita. In general, the topography of the SEA is severe, consisting of steep-walled canyons and narrow ridgelines. Elevations range from a high of approximately 5,710 feet above mean sea level (MSL) at Mount Wilson, to a low of approximately 660 feet above MSL in San Gabriel Canyon. Numerous drainages and tributaries of the main canyons are included in the SEA and exit the San Gabriel Mountains into the Los Angeles Basin through this SEA.

The wide range of elevation, topography, slope aspect, and geology represent a wide array of physical habitats within this SEA.Consequently, a number of plant communities exist, including grasslands, riparian, shrublands, woodlands, and forests. Within these major community types, there are many sub-communities, which vary according to plant species dominance. Of particular note, this SEA contains the last remaining relatively well-developed lower montane riparian habitats in the eastern County and dammed drainages that have created significant reservoirs or flood control basins in Sawpit and Santa Anita canyons. Enclaves of sensitive plant species and vegetation habitats are found here.Other jurisdictions within the SEA include the unincorporatedarea of the County, the City of Arcadia, City of Monrovia, City of Bradbury, City of Irwindale, City of Duarte,City of Azusa, and the City of Glendora.

Wildlife Movement

Wildlife movement within the SEA takes on two major forms.First, due to the extreme intervening topography, it is logical to expect considerable movement of wildlife up and down the sizeable drainages, which course through this SEA to connect the forest interior with foothill areas.Consequently, this type of movement occurs on a seasonal and more frequent basis, particularly for large mobile mammals whose full range of habitat needs are typically met over broad areas, including American black bear, mountain lion, coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), gray fox (*Urocyon cinereoargenteus*) and other medium-sized mammals.

The second major type of movement occurs across the flanks of the foothills and lower mountains, in an east-west direction. Particularly for riparian-favoring migratory birds, a corridor linking lower elevation riparian habitats in the SEA is of high use and importance. In addition to providing essential habitat for resident riparian birds, this SEA contains some of the best developed riparian habitat for birds, which are seasonal visitors to the cismontane region of the County.

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SAN GABRIEL CANYON SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The SEA contains a core habitat area for the endangered plant Braunton's milkvetch. The upper San Gabriel River is a core habitat of several native fishes, one of the last areas where three of five original natives occur together: federally-threatened Santa Ana sucker, and the arroyo chub and Santa Ana speckled dace, which is of state concern. All three live in the San Gabriel River in the SEA area. A local population of the speckled dace is known from the mouth of Fish Canyon. The very rare San Gabriel bedstraw and San Gabriel Mountains live-forever only occur in this area of the world.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The SEA contains habitat of extremely rare plants: San Gabriel bedstraw and the San Gabriel Mountains dudleya. In addition, several plant communities within this SEA are CDFW highest priority communities due to their restricted distribution in the Southern California region. These communities include walnut woodland, oak riparian woodland, southern willow scrub, coastal sage scrub, and alluvial fan scrub. The federally-endangered California gnatcatcher has been recently sighted in the Glendora foothills, and probably maintains a small population along the lowest slopes of the San Gabriel

Criterion		Status	Justification
			Mountains.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	All of the plant communities and habitats mentioned as being restricted in distribution on a regional basis, are also restricted in distribution within the County.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally or in the County.	Met	The three major canyons within this SEA support well-developed and diverse riparian woodlands, as well as year-round water sources. These represent important stopover and overwintering areas for a wide variety of migratory birds, as well as essential habitat for resident species. These canyons also support seasonal and more frequent movement for wide-ranging mammals, which must move over large areas to fulfill their habitat requirements.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The SEA contains biotic resources that are of scientific interest for their very restricted distributions: Braunton's milkvetch San Gabriel bedstraw, San Gabriel Mountains live-forever, and a local isolated population of Pacific madrone. The population of Santa Ana speckled dace in Fish Canyon may be the remaining extreme western extent of its population.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	Virtually all of the native biotic communities within this SEA are relatively undisturbed over most of their extent. Because urbanization throughout much of the County's foothill regions has removed large expanses of these communities, those in the SEA are particularly important to the County's natural heritage.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, and migrating grounds, which are limited in availability in the County; E) populations of scientific interest because of very restricted distributions and isolated populations; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Santa Clara River SEA

Boundary and Resources Description

The Santa Clara River SEA extends along the entire County reach of the Santa Clara River, primarily within unincorporated areas of the County. The SEA encompasses a wide variety of topographic features and habitat types, as well as major tributaries—all of which contribute to this diversity. It is a major biotic corridor for the County (and Ventura County). The orientation and extent of the SEA depends upon the surface and subsurface hydrology of the Santa Clara River, from its headwaters, tributaries, and watershed basin, to the point at which it exits the County's jurisdiction. Nearly all of the SEA is designated by Audobon California as a Globally Important Bird Area (IBA). The Santa Clara River IBA extends beyond the SEA in both upstream and downstream directions (across Soledad Pass to the Barrel Springs area in the Antelope Valley and through Ventura County to the mouth of the River at the Pacific Ocean).

The SEA is located at least partially in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles:Pacifico Mountain, Acton, Agua Dulce, Sunland, San Fernando, Mint Canyon, Oat Mountain, Newhall, and Val Verde.

The SEA covers a wide variety of topographic features and habitat types, including parts of the watershed tributaries. The biological and ecological functionality of the SEA is integrally linked to the Santa Clara River basin for its entire length. The bio-geographic limits of the SEA would extend downstream through Ventura-Los Angeles County line to its mouth at the Pacific Ocean, and encompass significant tributary drainages of Ventura County (Piru Creek, Sespe Creek, Santa Paula Creek, Wheeler Creek, etc.).

The eastern portion of the SEA follows natural contours at the headwaters of the watershed to incorporate much of upper watershed of Soledad Canyon (which becomes the Santa Clara River), the Kentucky Springs and the Aliso Canyon basins, and the downstream unnamed tributaries of the Santa Clara River to Arrastre Creek.This includes the watershed southern headwater areas within the Angeles National Forest.The headwaters of both Kentucky Springs and Aliso Canyon are in the Angeles National Forest, in semi-arid chaparral and desert scrub habitat; however, the drainages themselves support vegetation of desert and interior riparian habitat, which ranges from Great Basin sagebrush in Kentucky Springs Wash to dense, mature, willow-cottonwood-sycamore woodlands along permanent streams in Aliso Canyon. The surrounding uplands in the basins support pinyon-juniper woodlands, chamise, mountain mahogany, and manzanita-dominated chaparral, buckwheat scrub, and ruderal lands.The alluvial plain formed along the southern margin of the Santa Clara River basin below these canyons supports intact, high diversity xeric alluvial fan sage scrub. Alluvial terraces within both drainages have been extensively cultivated for orchard crops and dryland agriculture, and in more recent years, rural and urban-type residential developments have encroached on the watersheds. The Kentucky Springs basin has a large population of Parish's Great Basin sagebrush (*Artemisia tridentata* ssp. *parishii*), which is considered rare and sensitive in the County. A population of the federally-threatened red-legged frog (*Rana draytonii* FT, SC) is known to inhabit and breed in the Aliso Canyon watershed. Blum Ranch and another area on Aliso Canyon Road are disturbed, with farming development, but important to continuity of the SEA. The Santa Clara River IBA extends in a branch upstream to include Blum Ranch.

The boundary follows the Santa Clara River channel downstream through the Acton basin, paralleling Soledad Canyon Road on the north side, following the toe of the slope of the San Gabriel Mountains to the south. Boundaries continue along the channel margins to the southwest from Acton to Arrastre

Creek, where the southern boundary follows watershed contours to take in four upper tributary channels (Arrastre, Moody, and Bootleggers). Downstream from Acton, there are developed areas as along the Santa Clara River. From a little upstream of the Arrastre Creek confluence to a little downstream in the vicinity of the railroad stop of Lang (about 13 miles of river), the floodplain of the Santa Clara River is designated critical habitat for the federally-endangered arroyo toad (*Anaxyrus californicus*). Some of the confluence area of Mill Canyon is also critical habitat for the arroyo toad. Part of the area of critical habitat for the toad was also proposed as critical habitat for the state and federally-endangered unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), which is a small three-inch fish that essentially only occurs in the County. It once was widespread throughout the Los Angeles Basin and beyond, but is now restricted to the upper Santa Clara River. The proposal for critical habitat was never approved, and this is now referred to as "essential habitat" for the fish.The type area for the fish is the Arrastre Creek, where it was first collected and described with a museum specimen.

The habitat along the Santa Clara River supports the largest community of riparian-obligate birds between Santa Ynez River in Santa Barbara County and the Prado Basin in Riverside County. In the Soledad Canyon stretch are breeding summer tanager (*Piranga rubra*) and other desert species, along with some instances of least Bell's vireos (*Vireo bellii pusillus*), coastal cactus wrens (*Campylorhynchus brunneicapillus sandiegensis*), and southwestern willow flycatchers (*Empidonax traillii extimus*) from the coastal influence areas.The area is notable for having a combination of species that are characteristic of the desert and characteristic of coastal-influence.

Just west of the confluence with Arrastre Creek the northern boundary loops up to the slopes of Parker Mountain and the eastern watershed of Hughes Canyon around the basal contours of significant rock outcroppings above the river basin, and on the south side, around the Mill Canyon tributary basin. The rocky buttes on the north side of the river, while only a minor part of the watershed of the river, provide important nesting, roosting, and sheltering habitat values for bats, birds of prey, and other sensitive species foraging along the river corridor. The boundaries stay at the river margins west to the watersheds of two northern tributaries, Nellus and Bobcat canyons. These drainages were identified by the South Coast Wildlands Project as important to connectivity across the Santa Clara River between the western and eastern highland areas of the San Gabriel Mountains.

At the Agua Dulce Canyon drainage, the northern boundary loops around the watershed, including the Vasquez Rocks County Natural Area. Agua Dulce Canyon has a permanent stream and supports high quality riparian habitat from the confluence with the river to the intersection with State Route-14. The Santa Clara River IBA extends upstream to include about one mile of the Agua Dulce Canyon.

The Agua Dulce underpass of State Route-14 is an important crossing of the highway barrier for wildlife. From that point, north riparian areas exist where the creeks (Agua Dulce and Escondido) pass through Vasquez Rocks County Natural Area. The Agua Dulce Canyon extension was included in the SEA for its value as a wildlife corridor to provide connectivity across the Santa Clara River between the western and eastern highland areas of the San Gabriel Mountains.The extension includes the watershed of Bee Canyon, which is a downstream tributary of the Santa Clara River. Bee Canyon has an important population of the federally-endangered slender-horned spineflower (*Dodecahema leptoceras*) in its broad, floodplain area. In the Bee Canyon slopes of coastal sage chaparral, the federally-threatened coastal California gnatcatcher (*Polioptila californica californica*) is sometimes resident. The Bee Canyon area has some underpasses of the State Route-14 that could be used by smaller wildlife if maintained unclogged. The extension includes upper watersheds of Spring and Tick canyons to enhance the connective area. Beyond upper areas of Tick Canyon, the SEA boundaries cross Mint Canyon into the

Angeles National Forest and the watershed of Rowher Canyon. The SEA continues to the upper reaches of Rowher Canyon onto the main ridgeline of the Sierra Pelona.At the Mint Canyon crossing, just southwest of the community of Sleepy Valley, a lobe of the SEA extends along Mint Canyon to capture riparian woodlands of coast live oak, with a number of heritage trees (diameters greater than 36 inches).Residences are scattered and the natural communities of chaparral are intact on the canyon slopes.

The southern boundary of the SEA opposite the confluence with Agua Dulce Canyon includes the flood plain. The SEA dips southward into the lower portion of Bear Canyon (tributary of Santa Clara River) and includes undeveloped alluvial terrace slopes of the river downstream of Bear Canyon. The flood plain is a narrowed part of the SEA in the vicinity of Lang, which is a railroad stop on the transcontinental railroad line that runs the length of the Soledad Canyon. Downstream from Lang, the SEA expands to the southern slopes between Lang and Oak Spring Canyon, adjacent to the river channel. Downstream of Oak Canyon, the SEA narrows to the flood plain, passes Sand Canyon, and reaches the west ridge of Sand Canyon. A broad finger of the SEA goes south along the ridgeline of the Sand Canyon watershed, where the finger expands when it reaches the watershed of Placerita Canyon.

The alluvial fans of Oak Springs Canyon and Sand Canyon are important recharge grounds for the river aquifer. Surface flows from both canyons enter the Santa Clara River basin through natural, unconfined channels. Recognizing the importance of the Sand Canyon drainage, the SEA boundaries are drawn to encompass the entire upper Sand Canyon watershed, which is largely natural with scattered residences, as well as the Sand Canyon tributary, Bear Canyon.Most of the upper Sand Canyon and its Bear Canyon tributary are within the Angeles National Forest, and Sand Canyon originates on the peak of Magic Mountain.These canyons form a natural movement zone for wildlife traversing among the western end of the San Gabriel Mountains, the eastern end of the Santa Susana Mountains, and the Santa Clara River basin. Together, they encompass a spectrum of significant and unique habitat, vegetation and wildlife resources. The major habitat linkage zones and watersheds between the river basin and the Angeles National Forest, and the protected areas of the County (Placerita Canyon Natural Area), have also been included within the SEA boundary. Near the peak of Magic Mountain, the boundary contours to the southwest, and then proceeds west along the Santa Clara Divide to its intersection with the junction of Interstate-5 and State Route-14. Natural areas of the Sand Canyon watershed, along with the major topography of ridgelines, earthquake escarpments, grasslands, and canyon habitat features and watersheds of Bear, Placerita, Whitney, and Elsmere canyons are the important features of the wildlife linkage. Existing rural residential developments are excluded from the SEA, but the remaining natural highland areas of the western banks of the Sand Canyon watershed are included. These are integral parts of the river basin recharge system and functional ecosystem.

Parts of this area have coastal sage scrub and are critical habitat for the threatened coastal California gnatcatcher. The watershed of Placerita Canyon southeast of the State Route-14 is generally critical habitat for the federally-threatened coastal California gnatcatcher. An area of development surrounding the Placerita Creek near State Route-14 is excluded from the critical habitat. The critical habitat area for the gnatcatcher extends along the east side of State Route-14 beyond Placerita Creek and envelops watersheds into the Angeles National Forest along Whitney Canyon, Elsmere Canyon, and southward over the main ridge of the San Gabriel Mountains, into Grapevine Canyon in its upper natural watershed. Upper areas of these canyons with oaks and big-cone Douglas fir are habitat for the California spotted owl (*Strix occidentalis*)

The eastern half of the Los Piñetos undercrossing of State Route-14 on old oil development roads is included, and focuses on a major wildlife conduit connecting the Santa Susana Mountains to the San

Gabriel Mountains, and to the Santa Clara River. The adjacent part of the Santa Susana Mountainsand Simi Hills SEA includes the west half of the Los Piñetos undercrossing of State Route-14, connecting through the natural oak woodlands and drainages adjacent to the San Fernando Pass. This area, once called “San Francisco” or “Newhall Wedge,” is north and west of the junction of Interstate-5 and State Route-14 with The Old Road running through it. The Newhall Wedge area is nearly all critical habitat for the coastal California gnatcatcher. This critical habitat of the Newhall Wedge is adjacent to the gnatcatcher critical habitat across State Route-14 in the SEA, but is in the Santa Susana Mountains and Simi Hills SEA.

The SEA boundary borders State Route-14 from the north ridge of Grapevine Canyon and heads northeast from the Los Piñetos undercrossing, on the natural side of existing development east of State Route-14. The area around development along Running Horse Road off Placerita Canyonhas been excluded from the SEA. The movie-shoot ranch at the junction of State Route-14 and Placerita Canyon has much area with development or staging excluded, but there is a connected finger of the SEA in Placerita Canyon that leads to the Placerita Canyon watercourse underpass. Much of the watercourse underpass is used by wildlife to transition between the natural areas of Placerita Canyon and the oil field area on the west side of State Route-14. The SEA narrows to the western hills of Sand Canyon beyond the movie-shoot ranch, to avoid developed areas, and continues back to the river margin at Humphreys railway stop, about a 0.4 mile west of its previous point of departure from the river channel.The boundary was drawn to avoid existing major development, but connect the uplands to the river basin.The narrow aperture for the linkage at the Santa Clara River reflects the remnant nature of the last unobstructed terrestrial passageway between the upland areas and the river.

West of Sand Canyon, the river has been intermittently armored to allow for development within flood hazard zones. From Sand Canyon westward through the residential neighborhoods of Santa Clarita, the SEA boundary continues on the margins of the flood plain to the confluence with San Francisquito Canyon. The segment of the Santa Clara River passing through the City of Santa Clarita is a dry channel, except during seasonal runoff flows. Some irregular extensions go north into tributaries that have remnant riparian habitat and probable outflows from irrigation runoff that flows into neighborhood storm drains. Regardless of the intermittent nature of water, the river bed elevated areas among braided channels support relatively intact stands of alluvial sage scrub, riparian woodland, and southern riparian scrub. The dry zones are essential to the continued genetic isolation and integrity of the unarmored three-spine stickleback population in the upper reaches of the Santa Clara River.

The boundary extends northward upstream into the reaches of San Francisquito Creek (formerly a separate SEA, but now included with the SEA), following the approved development setback limits, north into the Angeles National Forest (Santa Clara/Mojave Rivers District).The SEA continues nearly the length of the San Francisquito Creek to beyond the junction with South Portal Creek in the vicinity of the community of Green Valley. The Santa Clara River IBA extends in a branch upstream in close proximity to the crossing of Copper Hill Drive.

As the channel enters the Angeles National Forest, flows become less seasonal, and riparian resources expand and diversify. San Francisquito Creek supports dense and mature southern riparian scrub and riparian woodland formations, along with small areas of freshwater marsh, which provide essential wintering areas and resident habitat for waterfowl, wading birds, marshland birds, and a variety of other vertebrate species. The headwaters of San Francisquito Creek are on a low ridge that bounds the San Andreas Fault Zone, and this is an important connective element of the SEA, in that it completes the path from the Pacific Ocean through the mountains to the Mojave Desert. The sub-watershed and flood plain of the San Francisquito Creek perennial flow in the Angeles National Forest jurisdiction is

designated critical habitat for the federally-threatened red-legged frog, which extends from about the Angeles National Forest southern boundary to about one mile south of the junction with Bee Canyon.Much of the San Francisquito Creek is considered essential habitat (one of three areas) for the endangered unarmored threespine stickleback, although the fish has not been found in the San Francisquito Canyon in recent years.

The boundaries west of the confluence with San Francisquito Creek follow the river margins under the Interstate-5 to the Castaic Creek confluence, at which point the northern setback line has been drawn around the lower portion of Castaic Creek, which embraces the riparian habitat areas around and above the confluence. Castaic Creek is the tributary with the largest watershed for the Santa Clara River in the County. The SEA boundaries go upstream about four miles along the watercourse of Castaic Creek to the crossing of Lake Hughes Road, which is just downstream of Castaic Lagoon. The Santa Clara River IBA extends in a branch upstream into Castaic Creek for approximately one mile.

Relatively extensive areas of willow-cottonwood forest and southern riparian scrub occur west of San Francisquito Creek and within the junction zone of Castaic Creek and the Santa Clara River. These river forests support numerous sensitive species and provide multi-layered riparian habitat for a wide diversity of wildlife species, particularly birds of prey and riparian-obligate song birds, such as the federally-endangered least Bell's vireo (*Vireo bellii pusillus*) and the southwestern willow flycatcher (*Empidonax traillii extimus*).

Federally-designated critical habitat for the endangered arroyo toad extends from the east side of Interstate-5, from the junction of the Santa Clara River with San Francisquito Creek, under the Interstate-5, about 5.8 miles to the confluence, with an unnamed drainage just upstream of the confluence of the river with San Martinez Chiquito. The critical habitat area for the toad also includes the flood plain of Castaic Creek as far upstream as the Interstate-5 undercrossing (about 2.5 miles), and for about one mile upstream into the natural area of Hasley Canyon, a tributary of Castaic. Coincident with the critical habitat for the toad is critical habitat for the endangered least Bell's vireo (FE, SE). Critical habitat for the vireo extends along the floodplain from the Rye Canyon undercrossing of the river (west side of Interstate-5), over the Ventura-Los Angeles County line, to about a mile short of the confluence of the Santa Clara River with Piru Creek in Ventura County (about 9 miles). The river area from near Interstate-5 towards the Ventura-Los Angeles County line is "essential habitat" for the threespine stickleback.A disjunct SEA area is on a ridge south of the river bend at Castaic Junction (interchange of Interstate-5 and State Route-126). This area supports a population of the federal candidate and state-endangered San Fernando Valley Spineflower (*Chorizanthe parryi* var. *fernandina*, FC, SE), which is a diminuitive, once-common flower of slopes within the San Fernando Valley and adjacent passes and mountain ranges. The plant became so rare that it was believed to be extinct until it was rediscovered during required surveys for development.

Beyond the confluence with Castaic Creek, the boundaries of the SEA follow the margins of the Santa Clara River channel to the Ventura-Los Angeles County line. The Santa Clara River IBA has a lobelike expansion opposite the confluence with San Martin Chiquito, extending south to cover diverse topography from river cliffs to confluence flood plains in the area around Potrero Canyon.

The Santa Clara River channel and its alluvial terraces and tributary creeks together form the single most important and natural wildlife movement zone through the County. Mobile species can enter the river basin anywhere along its length (outside of developed areas) and proceed in either direction without having to pass through narrow culverts or blind channels, with continuous vegetative cover and only short stretches of dry substrates. The overall drainage course provides a continuum of aquatic and

terrestrial movement opportunities, shelter, forage, and resident habitat from the mouth of the river at Ventura County and the Pacific Ocean, to the Antelope Valley. The drainage course connects to both districts of the Angeles National Forest, and links together three large public resource preserves (Vasquez Rocks and Placerita County Natural Areas and the Angeles National Forest).

Wildlife Movement

Historically (and prehistorically) the riparian corridor along the Santa Clara River has served as the primary east-west linkage between the Pacific coastline, coast ranges, interior ranges, high desert and southern Sierra (via the Tehachapi Range). Animals moving through the Santa Clara drainage had unobstructed passage along the river and within the riparian systems between the coastal lowlands of Ventura County and the Mojave Desert. The tributary routes extend south into the Santa Susana Mountains, south and north into the San Gabriel Mountains, northward via Castaic, Bouquet and San Francisquito tributaries (over the coastal ranges and San Gabriel Mountains of the Transverse Ranges and into the San Joaquin Valley), west into the central coast ranges, or east through the Tehachapi Mountains, and into the southern Sierra Nevada. The present configuration of the tributary drainages has impinged upon connectivity from the Santa Clarita Valley to the north, but the Santa Clara River remains relatively intact and open. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values within the historic movement zones for all of the wildlife species present within the County portion of the Santa Clara River, including mountain lion, coyote, bobcat, and several medium-sized mammals, as well as birds, reptiles, amphibians, and fishes.

Regional Biological Value

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

CRITERIA ANALYSIS OF THE SANTA CLARA RIVER SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	The only existing natural population of the federally-endangered unarmored three-spine stickleback is within the Santa Clara River and its tributaries, and all of its essential habitat is in this SEA. The federally-threatened Santa Ana sucker occurs in the river, as does the state species of concern, the arroyo chub. The population of state and federally-endangered slender-horned spineflower in Bee Canyon is one of fewer than seven known occurrences for this species, one of only two known occurrences in the County, and one of its largest populations. San Francisquito Creek has a breeding area for the endangered red-legged frog. The San Fernando Valley spineflower (at Newhall Ranch in Interstate-5 vicinity) is found in only a few nearby places. Some of the critical

Criterion		Status	Justification
			habitat for the threatened California coastal gnatcatcher is included in this SEA. Western spadefoot, which is a species of concern, is extremely rare and local in the County away from this SEA. One of the largest, if not largest populations of least Bell's vireo in the County occurs along the river in the vicinity of the crossing of Interstate-5 near Newhall Ranch. Many RPR-listed rare plants occur within the SEA. Critical habitat occurs in the SEA for the listed arroyo toad, the red-legged frog, the coastal California gnatcatcher, and the least Bell's vireo.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The low-elevation bigcone Douglas fir-canyon oak forests above Placerita Canyon, the vernal pool in the Placerita Canyon-Sand Canyon divide, the native grassland on the Golden Valley Ranch (upper Placerita Canyon), and the alluvial fans with sage scrub in lower San Francisquito Canyon, Kentucky Springs and Acton are unique and regionally restricted biotic communities. Additionally, the riparian forests and woodlands along the Santa Clara River are among the most extensive, diverse and intact vegetative stands of this type in Southern California.Rare aquatic species, such as the unarmored three-spined stickleback, Santa Ana sucker, red-legged frog, least Bell's vireo, summer tanager, spineflower, and many others represented within the SEA are found nowhere else in the region.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The cottonwood-willow forests and woodlands, alluvial fan sage scrub, and coast live oak riparian forest are best represented in the County within the SEA. The lower elevation examples of bigcone Douglas fir-canyon oak forest communities where they mix with low-elevation biota are restricted to the edges of mountain habitat communities, which are regionally rare and also designated in this SEA.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, or migrating grounds and is limited in availability either regionally	Met	The Santa Clara River is simultaneously an oasis running through a dry landscape and an extension of coastal conditions into the dry interior. For this reason, it supports unique populations of aquatic and amphibious species, as well as aridlands species extending towards the coast and coastal species' extension inland. It is a principle migratory route for the County plants and animals and a center of diversity for the County. The Santa Clara River and its

Criterion		Status	Justification
	or in the County.		tributaries provide breeding opportunities for numerous species otherwise not known to breed within the County, including California red-legged frog, summer tanager, southwestern willow flycatcher, and the unarmored three-spined stickleback . The extensive riparian areas shelter dozens of migrant songbird species during winter, including high concentrations of white-crowned and golden-crowned sparrows, fox sparrow, yellow-rumped warbler, dark-eyed junco, and sharp-shinned hawk. The SEA embraces the river corridor and the linkage zones that are considered essential to ensuring connectivity and resource values for many of the wildlife species that are present within the County portion of the Santa Clara River.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The Santa Clara River represents a unique example of a drainage that stretches from the desert to the coast through the mountains. Its resources are, by definition, present at their geographic extremes. Plants such as western juniper, snake cholla, basin sagebrush, and birds, such as summer tanager are at the southwestern edges of their ranges along the river. Coastal taxa extend to the headwaters in the Acton area. High elevation species, such as bigcone Douglas fir, spotted owl, and Steller's jay occur at fairly low elevations at the edges of Santa Clara River valley, on north facing slopes that remain cool all summer.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The SEA encompasses some of the highest quality, least disturbed and biotically intact acreage of bigcone Douglas-fir-canyon oak forest, riparian forest and woodland, coastal sage scrub, and alluvial fan sage scrub that remains in the County, and one of the three known vernal pools along the river.Vernal pools are rare everywhere in California.

In conclusion, the area is an SEA because it contains: A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) numerous examples of species at their habitat extremes as the coastal and desert influences meet; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

VI. Watersheds

Antelope Valley Watershed

The southern half of the Lahontan hydrologic region is located in the Antelope Valley. Unlike the coastal watersheds in Los AngelesCounty, it is a closed basin onthe edge of the Mojave Desert, having no outlet to the ocean or major river system. Numerous streams drain the north-facing San Gabriel Mountains, carrying rainfall and snow melt from the Angeles National Forest into the Antelope Valley. Significant stream systems in the Antelope Valley are Amaroosa Creek, Big Rock Creek, and Little Rock Creek.

During most years, the rainfall in the Antelope Valley is scant, averaging less than eight inches per year. Every few years, major storms cause flooding, sending sheets of water flow across the eastern portion of the Antelope Valley to the dry lakebeds of Rosamond and Rodgers lakes in Kern County. Uninhibited by development, the sheet flow filters into the groundwater basin or evaporates on the lakebeds, leaving the surface smooth and flat. This natural runoff process is important for two reasons: 1) it benefits the local communities with groundwater recharge; and 2) it seasonally resurfaces the dry lake beds, which are used for aircraft landings at Edwards Air Force Base.

The Lahontan Regional Water Quality Control Board monitors the Antelope Valley watershed through its Basin Plan for the region. The Basin Plan calls for land use controls to help reduce pollutants in stormwater runoff. In particular, the Basin Plan advocates for limiting impervious surfaces, restoring natural vegetation and protecting the headwaters of stream channels and riparian areas.

Los Angeles River Watershed

The Los Angeles River watershed covers approximately 870 square miles, a small part of which extends into Ventura County. It includes the San Fernando Valley and is the largest watershed in the Los Angeles Basin. The river extends 51 stream miles, from the confluence of Bell Creek and Arroyo Calabasas, to the Pacific Ocean. The first 32 miles of the river flow through the cities of Los Angeles, Burbank, and Glendale, and then, subsequently, through Vernon, Commerce, Maywood, Bell, Bell Gardens, Lynwood, Compton, South Gate, Paramount, Cudahy, and Long Beach. Numerous tributaries feed the Los Angeles River, as it flows through the San Fernando Valley and the coastal plain to the Long Beach Harbor. These tributaries include Tujunga Wash, Verdugo Wash, Arroyo Seco, Rio Hondo, and Compton Creek. Several important biotic communities exist in the northern tributaries that feed the river, including freshwater marsh areas in Tujunga Canyon and the Hansen Flood Control Basin. The natural habitat in these tributaries provides a semi-protected corridor for wildlife between the Angeles National Forest, Santa Monica Mountains National Area, and the Los Angeles River.

By 1960, the Los Angeles River was lined with concrete along most of its length by the U.S. Army Corps of Engineers in order to prevent the loss of lives and property from flood damage. As a result, the Los Angeles River's sole purpose for years was efficient water conveyance—carrying stormwater from the land to the ocean as quickly as possible. Efforts continue under the auspices of the Los Angeles County Flood Control District to capture as much stormwater as possible and redirect it to regional groundwater recharge areas to replenish groundwater basins, saving thousands of acre-feet of water every year.

The volume of pollutants that enters the Los Angeles River is extremely high due to accumulated urban stormwater runoff from the hundreds of square miles of impervious land uses that flank the Los AngelesRiver. To address these problems, the County, the Flood Control District, local jurisdictions, a variety of stakeholders, and the Los Angeles Regional Water Quality Control Board are implementing

programs to reduce the number and concentration of pollutants that enter the Los Angeles River.

Over the past two decades, interest the Los Angeles River's recreational and ecological functions has reemerged, culminating in a riverwide planning effort in the 1990s, which resulted in the adoption of the *Los Angeles River Master Plan* by the Board of Supervisors in 1996. The Plan was created through a cooperative effort by the County and many river stakeholder groups for the enhancement of aesthetic, recreational, flood protection and environmental functions of the Los Angeles River. The Plan seeks to do so by expanding bikeway, walking and equestrian trails to and along the Los Angeles River, enhancing existing trails and habitat with landscaping, and promoting economic development opportunities. Since the adoption of the Plan, an advisory committee has overseen many new projects, including bike trails, pocket parks, equestrian trail enhancements, art and signage. So much public interest in the river has been generated that many more improvements are anticipated in the future. The County's Bicycle Master Plan also prioritizes the Los Angeles River bike path.

The County is also working with various organizations and agencies that are involved in watershed-related planning activities, such as the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy, the Council for Watershed Health, and the Flood Control District. The attention being paid to the watershed has resulted in a better understanding of its functions and generated an unprecedented network of residents, private organizations and government entities dedicated to watershed management. The County has also partnered with the City of Los Angeles on implementation of its 2007 Los Angeles River Revitalization Master Plan.Subsequently, the County Board of Supervisors and Los Angeles City Council adopted the Los Angeles River Memorandum of Understanding, which established the Los Angeles River Cooperation Committee to prioritize cooperative implementation of Los Angeles River projects. In addition, the County is a partner in the U.S. Army Corps of Engineers' Los Angeles River Ecosystem Restoration Feasibility Study (started in 2006 for which the City of Los Angeles is serving as primary local sponsor). The County is also a partner with the U.S. Bureau of Reclamation on the Los Angeles Basin Study to prioritize stormwater capture and infiltration that will result in watershed-wide conservation.

San Gabriel River Watershed

The San Gabriel River watershed encompasses part of the Angeles National Forest, the San Gabriel Valley, and large urban areas in southeast portion of Los AngelesCounty. It is bounded by the Los Angeles River on much of its western flank, and extends to San Bernardino and Orange counties. Totaling more than 640 square miles, the watershed has extensive areas of un-channeled tributaries, which support riparian and woodland habitats. Its northern reaches in the Angeles National Forest are dramatically different from the developed 167 square miles in the Los Angeles Basin. The U.S. Congress has preserved two wilderness areas within this watershed: the San Gabriel Wilderness Area, 36,215 acresalong the west fork of the San Gabriel River, and Sheep Mountain Wilderness Area, 31,680 acres along the east fork of the San Gabriel River.

The main watercourse in this watershed is the San Gabriel River. The San Gabriel River extends 59 stream miles from the Angeles National Forest to the Pacific Ocean, draining 350 square miles of land. It also recharges groundwater tables in several basins. The major tributaries that feed the San Gabriel River include Coyote Creek, Walnut Creek, Puente Creek and San Jose Creek. The upper section of the San Gabriel River and its tributaries are still considered relatively pristine. However, intensive recreational use and erosion due to wildfires in this area may threaten water quality and wildlife that depend on the river. The middle section of the river has been extensively modified throughout the San Gabriel Valley to diminish flood damage and encourage groundwater recharge. The lower section,

similar to the Los Angeles River, is lined with concrete from Firestone Boulevard to the bay. In contrast to the upper and middle sections of the river, dry weatherflow in the lower section stems primarily from urban runoff and treated effluent from municipal wastewater treatment facilities.

A clear link exists between the health of this watershed and the quality of life for millions of Los Angeles County residents. The upper reaches of the San Gabriel River support wildlife, deliver drinking water and provide a myriad of recreational opportunities. To protect and enhance the multiple benefits of this resource a riverwide planning effort entitled *San Gabriel River Master Plan* was adopted in 2006. This effort, spearheaded by the County, brings together a dynamic group of stakeholders, including the 13 cities along the San Gabriel River, residents, environmental groups and many business and community leaders.

The County is working with stakeholders, such as the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy, the Santa Monica Mountains Conservancy, and the Flood Control District. Together, stakeholders developed a watershed and open space plan in 2001 entitled *Common Ground: From the Mountains to the Sea* that provides general guidelines for improvement of the San Gabriel and Lower Los Angeles Rivers watersheds through community development, public awareness, preservation of open space and creation of recreational opportunities—particularly along the rivers.

Santa Clara River Watershed

The Santa Clara River watershed is an extensive hydrologic system that encompasses the western portion of the Angeles National Forest in Los Angeles County and the eastern portion of Los Padres National Forest in Ventura County. The Santa Clara River—an essential component of this watershed—recharges local groundwater, provides riparian habitat and supplies water to downstream agricultural lands in Ventura County. It is the largest relatively unaltered river system in Southern California, and the single most important natural wildlife corridor in Los Angeles County. The Santa Clara River and its tributaries provide drainage for approximately 654 square miles of the upper watershed within Los Angeles County. The Santa Clara River's major tributaries include Soledad Canyon, Castaic Creek, San Francisquito Canyon Creek, Bouquet Canyon Creek, Sand Canyon Creek, Mint Canyon Creek and Santa Clara River South Fork. Several endangered species are found in this watershed, including thearroyo toad and the unarmored three-spine stickleback. Another important stretch of the Santa Clara River supports a variety of riparian-obligate songbirds and birds of prey between Castaic Junction and Blue Cut near the Ventura County line, where the groundwater basin thins and narrows, forcing groundwater toward the surface.

A link exists between the health of this watershed, particularly its tributaries, and development in the area. Urban expansion in the 1990s and early 2000s impacted the watershed on several levels, including a reduction in local water supplies and disappearing open space. Furthermore, the land use activities in this area have created many square miles of impervious surfaces, which have created more urban runoff and reduced the amount of water that would naturally percolate into groundwater basins. By employing watershed management techniques, the County aims to curb this trend.

VI. Agricultural Resources

Agricultural Resource Areas Methodology

Map 4.3 in the Conservation and Open Space Element shows the Agricultural Resource Areas (ARAs), where the County promotes the preservation of agricultural activities. The ARA boundaries were derived

from farmland identified by the State Department of Conservation, including Prime Farmland, Farmland of Statewide Importance, Farmland of Local Importance, and Unique Farmland. In addition, the ARAs include lands that received permits from the Los Angeles County Agricultural Commissioner/Weights and Measures.

To reflect changes in land uses and address environmental concerns, the following were excluded from the ARAs:

- Significant Ecological Areas (SEA) and Ecological Transition Areas (ETA);
- Approved specific plan areas;
- Approved large-scale renewable energy facilities;
- Lands outside of the Antelope Valley, where farming is concentrated; and
- Lands that are designated Public and Semi-Public (P).

Data from the U.S. Census of Agriculture

Table E.1: Change in Number and Acreage of Farms in Los Angeles County, 1987-2007

	1987	1992	1997	2002	2007
Farms (number)	2,035	1,446	1,226	1,543	1,734
Change from previous year	-	-589	-220	317	191
Percent change from previous year	-	-28.94%	-15.21%	25.86%	12.38%
Land in farms (acres)	280,156	183,569	130,838	111,458	108,463
Change from previous year	-	-96,587	-52,731	-19,380	-2,995
Percent change from previous year	-	-34.48%	-28.73%	-14.81%	-2.69%

Source: U.S. Census of Agriculture, 1987-2007.

ATTACHMENT 18

CAISO REPORT TO GOVERNING BOARD IDENTIFYING VINCENT TRANSFORMER FIRE.

CALIFORNIA ISO

Memorandum

To: ISO Board of Governors

From: Anjali Sheffrin, Ph.D., Director of Market Analysis

cc: ISO Officers, ISO Board Assistant

Date: April 18, 2003

Re: Market Analysis Report for March 2003

This is a status report only. No Board Action is required.

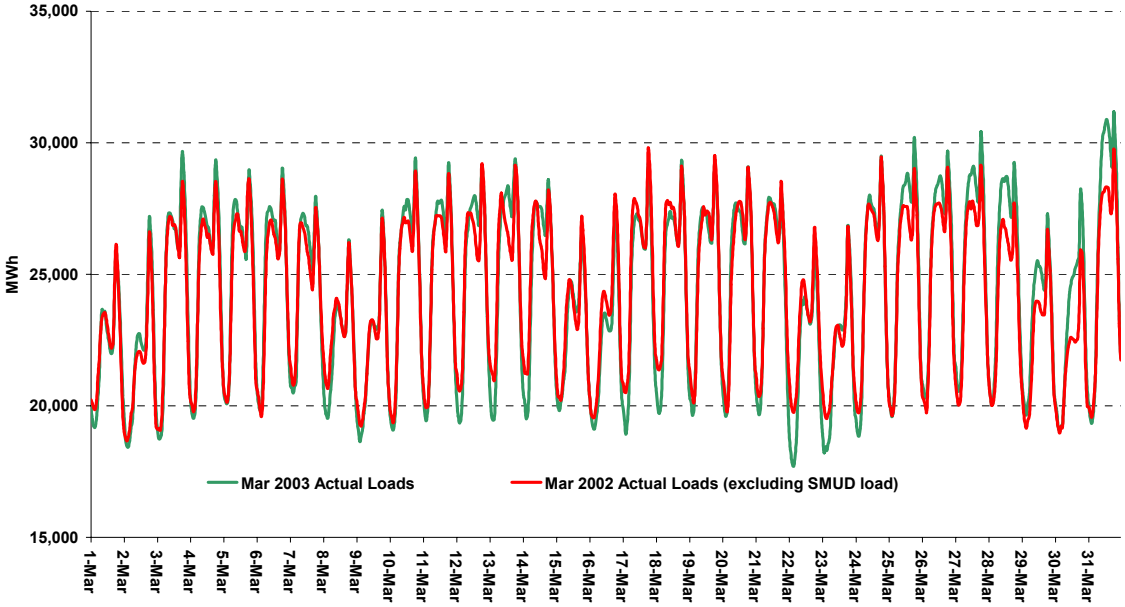
Executive Summary

During March, natural gas prices receded to the January levels of $4 to $5/MMBtu from the high prices that occurred in late February and early March. Day-ahead bilateral electricity prices fell in step with the lower fuel costs. Several price spikes occurred in March due to the need to dispatch higher cost peaking units to meet evening load ramps and during late evening hours when standard bilateral contract products for peak-hour energy deliveries end. In addition, on March 21, an explosion of a transformer bank at the Vincent substation in Southern California resulted in the ISO having to completely derate Path 26, a key transmission artery between Northern and Southern California. ISO operators and utility workers worked to partially restore flows on Path 26 to 600-925 MW by March 23, and were able to restore the path to its full capacity of 2500-3000 MW by early April. The capacity derates on Path 26 caused significant interzonal and intrazonal congestion around the State through the end of the month.

I. Electricity Market Trends through Q1 2003

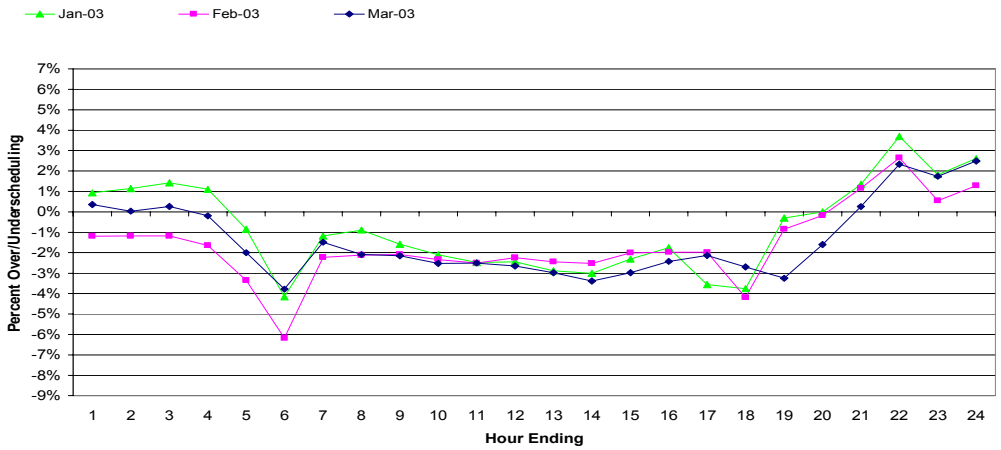
Loads and Schedules. Loads during March 2003 were slightly higher than those seen in March 2002, due primarily to warm temperatures during the final week of the month, and on March 31 in particular. Daily load averaged 24,334 MW or 0.7 percent above the average for March 2002. The actual peak load of 31,151 MW occurred on March 31, 2003. The March 2003 peak load was 4.7 percent higher than the March 2002 peak. Energy consumption was 2.0 percent higher than that of March 2002. The following chart compares actual hourly loads in March 2002 and 2003.

Figure 1. Actual Hourly Loads in March



Forward schedules have increasingly diverged from actual load during the winter and spring evening load ramps as actual load rises sharply between 6:00 and 8:00 p.m. (hours ending (HE) 19:00 and 20:00) and again as daily bilateral contract products for peak-hour blocks end just after 10:00 p.m. (during HE 22:00). This has caused ramp planning challenges at those times when ISO operators must dispatch imbalance energy resources to meet the rapidly changing load, often necessitating that ISO operators dispatch peaking units. Deviations in HE 19:00, HE 20:00, HE 23:00, and HE 24:00 have increased since February. The following chart shows monthly average scheduling deviations by hour of day since January.

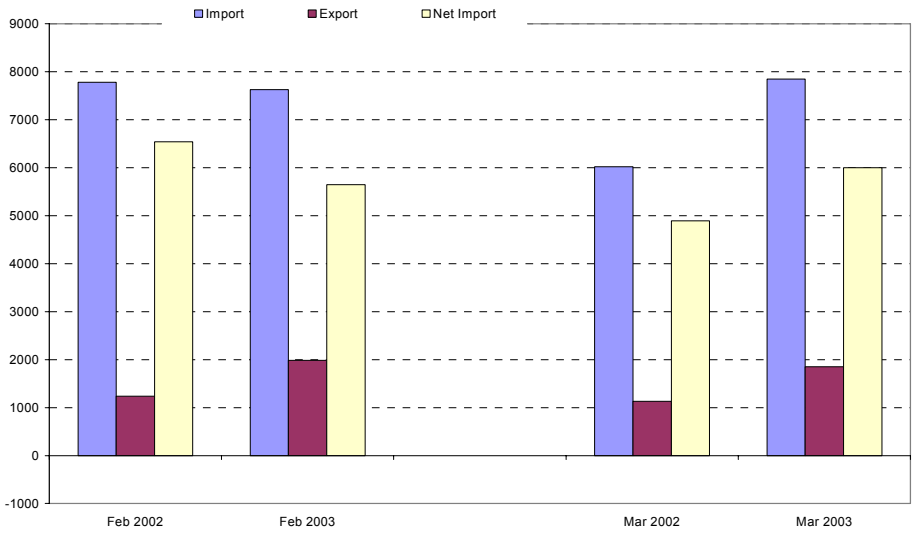
Figure 2. Average Scheduling Deviations by Hour of Day, January through March 2003



Imports and Exports. Imports averaged approximately 7,900 MW in March 2003, similar to the level seen in February but substantially more than approximately 6,000 MW in March 2002. This increase in imported energy is primarily due to the recent increase in hydroelectric energy

production in the Pacific Northwest. The following chart compares imports, exports, and net imports in February and March for this year and last year.

Figure 3. Imports and Exports, 2002 vs. 2003[1]



II. Real-Time Market Performance

Average Real-Time Imbalance Prices and Volumes. Incremental and decremental prices in the ISO's real-time Balancing Energy Ex-Post Price auction market (the BEEP Stack) averaged $78.49 and $28.72/MWh respectively in March, compared to $73.88 and $28.28/MWh in February. Total real-time volume remained almost constant on the INC side, at 188 GWh in March, or an average of 252 MW in all hours, compared to 170 GWh (average volume of 253 MW) in February. Total real-time DEC volume increased to 158 GWh (average volume of 212 MW) in March, compared to 115 GWh (average volume of 171 MW) in February. The following chart shows real-time prices and volumes and average loads and underscheduling in March.

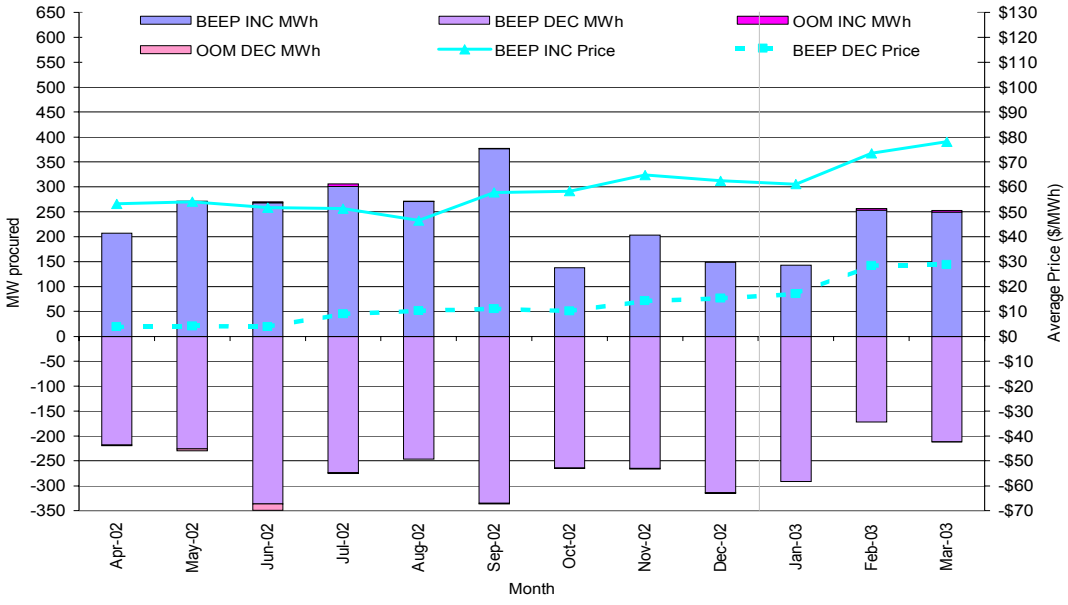
[1] The substantial increase in exports is due to flows into SMUD in 2003, which was part of the ISO control area in 2002.

Table 1. Real-Time Prices and Volumes, and Loads and Underscheduling in March[2]

	Avg. BEEP Price and Total Volume		Avg. Out-of-Market Price and Total Volume		Overall Avg. Real-Time Price and Total Volume		Avg. System Loads (MW) and Pct. Underscheduling
	Inc	Dec	Inc	Dec	Inc	Dec	
Peak	$ 77.28	$ 32.57	$114.42	$50.91	$ 77.34	$ 32.57	26,205 MW
	150 GWh	101 GWh	*	*	150 GWh	101 GWh	1.0%
Off-Peak	$ 81.63	$ 21.90	$102.82	$16.21	$ 81.99	$ 21.89	20,592 MW
	35 GWh	57 GWh	*	*	36 GWh	57 GWh	0.1%
All Hours	$ 78.11	$ 28.74	$106.00	$16.91	$ 78.24	$ 28.73	24,334 MW
	185 GWh	157 GWh	*	*	186 GWh	158 GWh	1.0%

The following chart shows monthly average BEEP volumes and prices from April 2002 through March 2003.

Figure 4. Monthly Average BEEP Prices and BEEP and OOM Volumes



Review of Price Spikes. Several price spikes in March were due to ramp planning difficulties. The difference between the actual demand and the amount scheduled to be generated must be acquired for the most part in the imbalance market. This can be difficult to manage during volatile hours, such as in the early evening, when energy usage increases rapidly, and just after 10:00

[2] * indicates less than 1 GWh

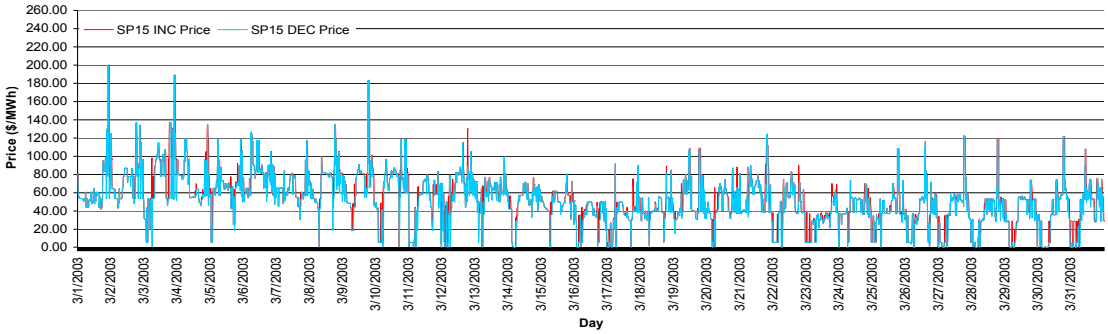
p.m., when 16-hour bulk peak contracts end, causing generation to decline rapidly. Meanwhile, units that are dispatched from the BEEP Stack sometimes decline the dispatch instruction or deviate from their instructions. At times, ISO operators have had to call on peaking resources to manage these volatile ramping periods.

To remedy this problem, uninstructed deviation penalties will be implemented as part of in MD02 Phase 1b. In the meantime, the only disincentive against failure to follow dispatch instructions is the spread of the INC and DEC prices (uninstructed deviations are paid the uninstructed price). This has not been a significant disincentive to suppliers, particularly during the hours in which price spikes occur. In the most spike-prone hours between 6:00 p.m. and 11:00 p.m. (HE 19:00 through 23:00), the pricing spread existed in only 32.4 percent of pricing intervals in March. That is, in the other 67.6 percent of intervals, there was effectively no penalty for uninstructed deviations.

In addition to the price spikes during daily ramping periods, a series of spikes also occurred beginning March 21 as a consequence of a transformer bank explosion at the Vincent substation, at the southern end of Path 26, a key electric transmission artery between Northern and Southern California. ISO operators were required to work around the resultant derate (to zero MW on some days) of Path 26, and other related outages, occasionally calling on higher-cost peaking generation units.

The following chart shows BEEP ten-minute interval prices in SP15 in March. Discussion of some individual spikes follows below.

Figure 5. Ten-Minute BEEP Prices in SP15 for March 2003



On March 1 between 10:00 and 10:50 p.m. (HE 23:00), the BEEP market-clearing price (MCP) was set at $200/MWh by a peaking unit in Southern California. This unit, which was called upon during a period of slow response from units dispatched through the BEEP Stack, had an estimated marginal cost of $105/MWh during the hour. With a reference price of $78.77/MWh, this was the first known instance of a price-setting unit that had failed the AMP Conduct Test. However, the unit's price setting bid was not sufficiently above the next-highest unit's bid to fail the AMP Impact Test. The estimated cost of this spike was approximately $90,000.[3] . The daily average net real-time energy cost (inclusive of spikes) was $323,010 in March.

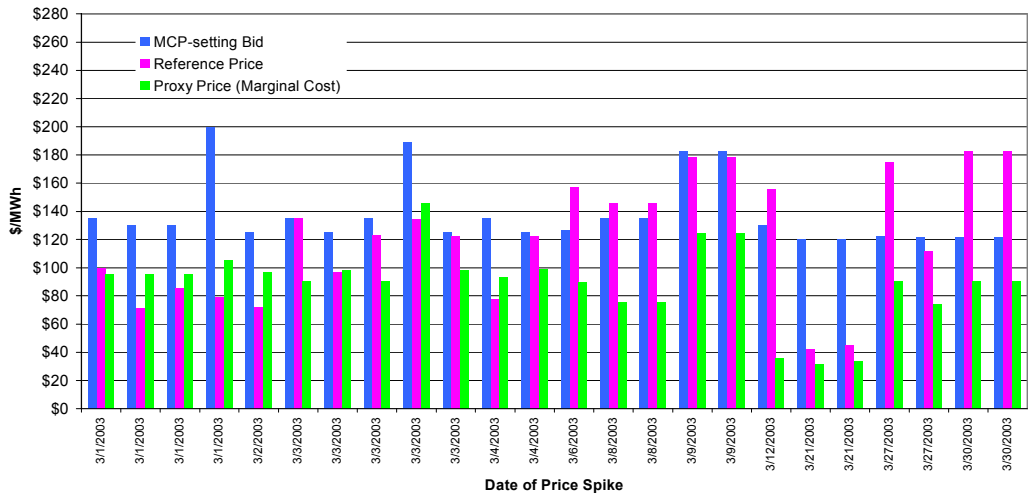
[3] The cost of a spike is estimated as the total of the procurement costs in SP15 and NP15 during the price spike, less the cost to procure the same volume at the monthly average price.

On March 3, between 9:50 and 10:50 p.m. (HE 22:00 and 23:00), the MCP varied between $180.70 and $189.24/MWh and was set by another high cost peaking unit. This unit was dispatched after a lower-priced unit claimed that it had not received a dispatch instruction. This spike cost approximately $92,000.

On March 9, between 6:30 and 7:30 p.m. (HE 19:00 and 20:00), the MCP was $182.97/MWh, set by yet another high cost peaking unit. The unit's reference price and marginal cost respectively were $178.68 and $124.50/MWh. This spike occurred due to ramping difficulties where operators dispatched high cost units to meet the rapidly changing load requirements. This spike cost approximately $100,000.

The following chart shows the ten-minute interval price spikes, compared to the price-setters' marginal AMP reference prices and estimated marginal costs.

Figure 6. BEEP Price Spikes, with Corresponding AMP Reference Prices and Marginal Costs, March 2003



Out-of-Market (OOM) Calls. There was a series of incremental OOM calls on March 4, 5, 8, 9, 22, and 23, to a reliability must-run (RMR) Condition 2 unit for a total of 3257 MWh. The calls were due, in part, to an absence of bids from the unit in the BEEP stack because of an error on the part of the unit's owner.

Out-of-Sequence (OOS) Calls. There were two significant decremental OOS dispatches in March due to work on the Pittsburg substation and the Magunden Pastoria No. 2 line. A total of 4,038 MWh of decremental dispatches were called out of sequence at a cost of approximately $163,000.

Several units were incrementally dispatched extensively to alleviate an overload at the Sylmar substation in northern Los Angeles. A total of 104,611 MWh of incremental dispatches were called OOS at a total cost of approximately $8.3 million.

Total net intrazonal congestion costs – the costs in excess of the market clearing price – for both incremental and decremental dispatches for the month of March amounted to $830,701. Most were incurred as a result of operational problems caused by the damage to the Vincent substation.

AMP Performance. Bidders failed the AMP Conduct Test in 135 distinct hours in March, mostly during ramping hours in the first ten days of the month, as the gas price spike persisted. By mid-March, natural gas prices were considerably lower. However, the monthly gas price inflator of $7.27/MMBtu in March, based upon California hub bid week prices, kept AMP reference prices high, allowing generators to offer higher prices without failing the Conduct Test. April's $4.83/MMBtu index will be considerably more restrictive for gas fired thermal generation units as it will lower the bid thresholds above which a bidder would fail the Conduct Test.

The following table shows the number of Conduct Test failures by day in March.

Table 2. AMP Conduct Test Failures in March

Date	No. of Hours
3/1/2003	5
3/2/2003	13
3/3/2003	15
3/4/2003	11
3/5/2003	6
3/6/2003	15
3/7/2003	15
3/8/2003	7
3/9/2003	8
3/10/2003	7
3/12/2003	1
3/15/2003	2
3/18/2003	1
3/19/2003	7
3/20/2003	5
3/21/2003	10
3/24/2003	1
3/29/2003	3
3/31/2003	3

The Department of Market Analysis continues to monitor trends in reference levels. The levels for both gas-fired and non-gas fired generation increased significantly in March, primarily due to the aforementioned spike in gas prices. However, DMA found the reference levels of gas-fired generators are stable when adjusting for gas prices. Non-gas-fired generators' reference levels have also increased although those units comprise a relatively small quantity of real-time generation. The following charts show (a) average unadjusted reference levels by generation type; and (b) reference levels for thermal generators, normalized to the October 2002 gas price index.

Figure 7a. Average Reference Levels by Generation Type, Not Adjusted for Changes in Gas Prices

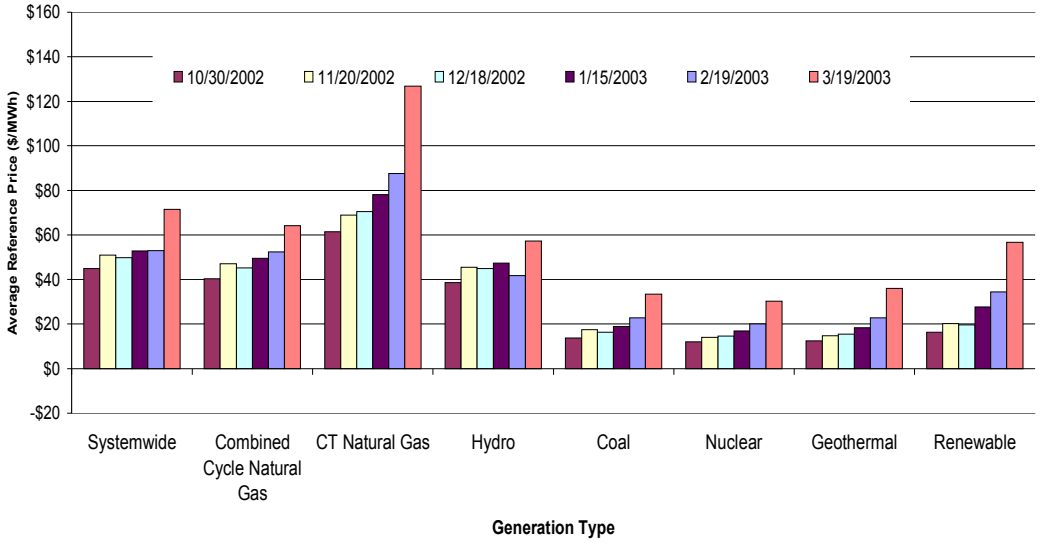
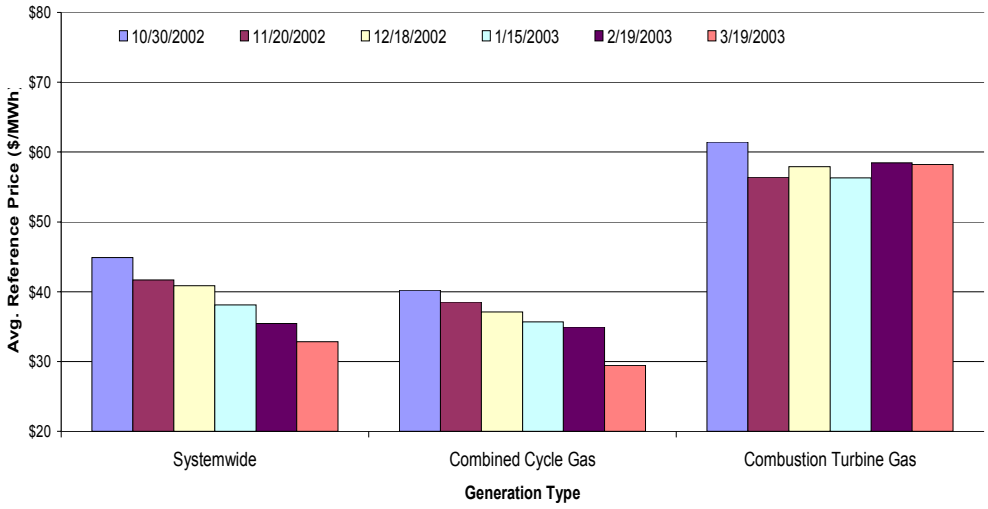


Figure 7b. Average Reference Levels by Generation Type for Gas-Fired Generation, Normalized to October 2002 Gas Price



III. Ancillary Services Market Performance

Average ancillary services prices were higher in March than in February for four out of the five ancillary services due to less bid volume and an increase in the share of higher priced bids. The day-ahead and hour-ahead quantity weighted average price of upward regulation (RU) was

$17.25/MWh in March, compared to $14.34/MWh in February. The average price of regulation (RD) was $14.91/MWh in March, an increase from $10.80/MWh in February. The average spinning (SP) service price was $4.59/MWh in March, slightly higher than price of $3.26/MWh in February. Finally, the non-spinning (NS) service price averaged $2.21/MWh, less than the $2.41/MWh in February. Self-provided AS accounted for 84.2 percent of total AS volume in March. Table 3 shows average ancillary service prices and volumes by market in March.

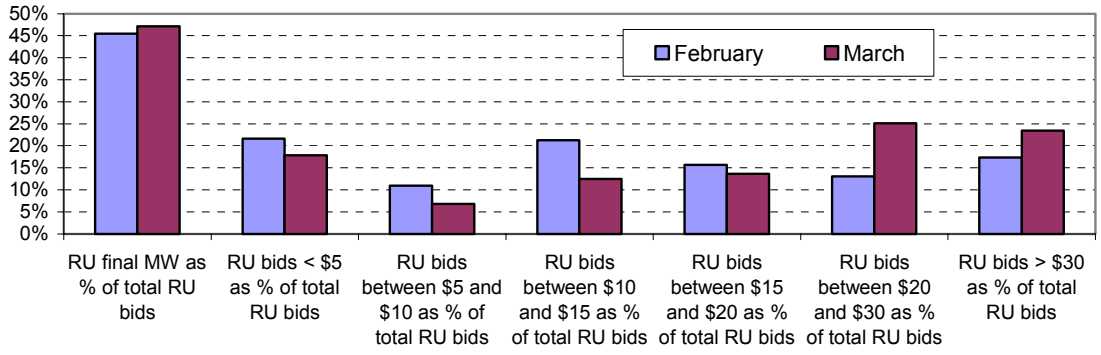
Table 3. Average AS Prices and Volumes by Market in March

	Day-Ahead Market	Hour-Ahead Market	Quantity Weighted Price	Average Hourly MW Day Ahead	Average Hourly MW Hour Ahead	Percent Purchased in Day Ahead
Regulation Up	$ 17.25	$ 17.92	$ 17.31	354	35	90%
Regulation Down	$ 14.91	$ 19.09	$ 15.41	363	50	87%
Spin	$ 4.59	$ 5.93	$ 4.65	664	34	95%
Non-Spin	$ 2.21	$ 3.23	$ 2.24	664	24	96%
Replacement	$ 2.31	$ 1.96	$ 2.31	22	*	99%

The average hourly Regulation Up (RU) bid volume was 819 MW in March, down from 857 MW in February. Marginal RU bid prices were $10 - $15/MWh in February and $15 - $20/MWh in March. Average hourly volume of bids with prices below $15/MWh was 472 MW in February, compared to 304 MW in March. In contrast, the average hourly volume of bids priced above $15/MWh was 515 MW, compared to 241 MW in February.

The charts below compares ancillary service bid sufficiency in February and March. Bids lower than $15/MWh accounted for 37.1 percent of total RU bids in March, a decrease from 53.8 percent in February. Bids between $15 and $20/MWh accounted for 12.5 percent of total RU bids in March, compared to 21.3 percent in February.

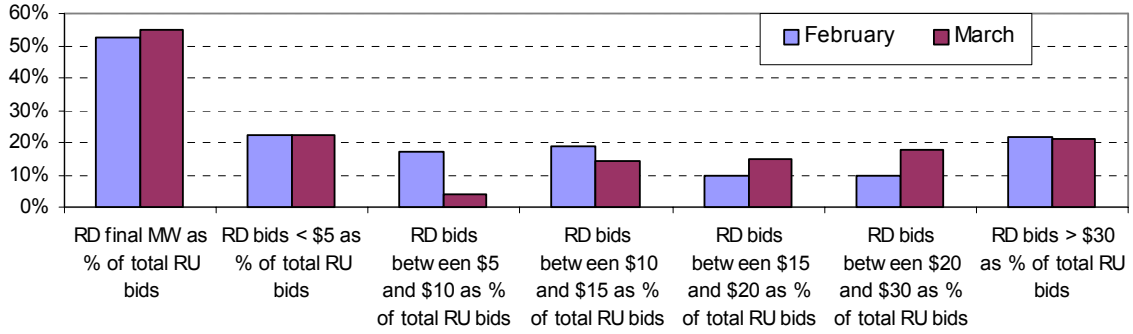
Figure 8a. Monthly Average Upward Regulation Bids by Price Bin



A similar situation occurred in the Regulation Down (RD) market. The chart below shows the daily average RD bids by price bin for February and March. Average hourly RD bid volume was 744

MW in March, a decrease from 803 MW in February. Marginal RD bids accepted were in the $10 - $15/MWh range in February while in March marginal RD bids were in the $15 - $20/MWh range.

Figure 8b. Downward Regulation - Average Hourly Bid Quantities and Purchases (Day-Ahead plus Hour-Ahead Market)



IV. Interzonal Congestion

Congestion costs in March were higher than in the previous two months. Of $1.4 million in interzonal congestion costs incurred, about $612,000 was due to congestion in the import direction, while about $800,000 was incurred in the export direction. In the import direction, congestion on COI, NOB, and Palo Verde resulted in costs of $200,000, $160,000, and $160,000 respectively. COI reported a significant amount of hour-ahead congestion, especially in the later half of the month. In most hours, schedules have been very close to the import capacity of the line. There was a significant increase in the flow on NOB in the import direction in the last week of March, causing congestion in the import direction. This is likely directly associated with the Vincent fire, which caused a significant derate on Path 26. NOB was the only other major path available to bring energy from the Pacific Northwest to the SP15 region. Flows on Palo Verde were near line capacity in most of the hours of the month, resulting in congestion in some hours.

In the export direction, Path 26, Sylmar-AC, and Victorville incurred congestion costs of $273,000, $367,000, and $157,000, respectively. Path 26 was completely derated on March 22, due to the Vincent substation fire. The congestion on Sylmar was due primarily to significant increases in hour-ahead schedules on March 20, from midnight to 6:00 am, with congestion prices reaching $250/MWh for several hours. Similarly, the congestion costs on Victorville were due to the hour-ahead price spikes, again associated with the Vincent fire on March 22 from midnight to 5:00 a.m. (HE 1:00 through 5:00) with congestion prices as high as $249/MWh. In all, a total of $590,000 in congestion costs (incurred on Path 26, Victorville, and NOB) was due primarily to the Vincent fire.

Firm Transmission Rights Market

FTR scheduling. On some paths, FTRs were used to establish scheduling priority in the day-ahead markets. As shown in the following table, a high percentage of FTRs was scheduled on certain paths (86% on Eldorado, 70% on IID-SCE, 72% on Palo Verde, and 100% on Silver Peak

in the import direction). FTRs on these paths are held primarily by the Southern California Edison Company (SCE1).

Table 4. FTR Scheduling Statistics for January, 2003

	Direction	MW FTR Auctioned	Avg. MW FTR Sch.	Max MW FTR Sch.	Max Single SC FTR Schedule	% FTR Schedule
COI	Import	678	53	200	150	8%
Eldorado	Import	793	678	710	710	86%
IID-SCE	Import	600	417	453	453	70%
Mead	Import	522	40	114	75	8%
NOB	Import	734	30	160	150	4%
Palo Verde	Import	1192	853	954	579	72%
Silver Peak	Import	10	10	10	10	100%
NOB	Export	181	15	23	23	8%
Path 26	Export	1586	20	319	319	1%

* only those paths on which 1% or more of FTRs were attached are listed

FTR Revenue per Megawatt. The FTRs released in January 2002, expired on March 31, 2003. On April 1, 2003, a new FTR cycle begins, as FTRs released in the primary auction of January 2003 go into effect. Only one FTR had a direct, positive financial benefit in the previous FTR cycle. On Victorville, total revenue per MW was $1,609, greater than its auction clearing price of $1,118. FTR revenues on several other paths were also significant and approached their auction prices. For instance, the total FTR revenue on COI per MW was almost $12,000, while its auction price was $17,600 per MW. FTR holders enjoy, not only the direct benefit of FTR revenue from an instrument that can be used to hedge against spikes in congestion prices, but also the right to establish scheduling priority in the day-ahead market. The following table summarizes FTR revenue per MW for FTRs in the previous cycle.

Table 5. FTR Revenue Per MW ($/MW)

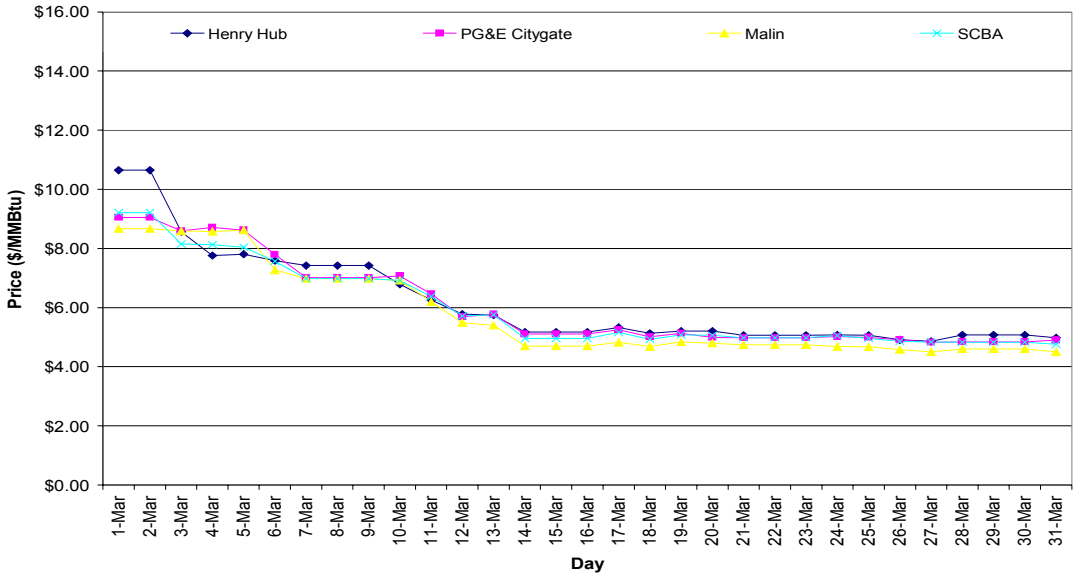
Branch Group	Direction	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Cumm. Net REV	FTR Auction Price
CFE	IMPORT	0	0	0	0	0	0	0	0	0	15	0	0	15	165
COI	IMPORT	1,088	888	4,129	4,278	581	562	153	15	0	10	0	173	11,879	17,610
Eldorado	IMPORT	268	26	2	10	0	37	1,255	1,178	38	103	584	11	3,511	8,432
IID-SCE	IMPORT	0	0	0	0	0	0	0	2	0	0	0	0	2	275
Lugo-Mona	IMPORT	0	0	0	0	0	0	0	0	0	0	0	30	30	0
Mead	IMPORT	0	0	0	0	0	0	0	0	0	17	19	2	38	4,488
NOB	IMPORT	19	22	0	0	0	0	97	166	23	0	75	0	402	5,990
Palo Verde	IMPORT	13	0	48	472	14	5	32	1	31	6	4	106	735	14,868
Path 26	IMPORT	23	839	0	0	4	86	226	376	887	42	32	86	2,601	3,222
Mead	EXPORT	0	0	0	262	31	0	0	0	0	0	0	0	293	7,465
Path 26	EXPORT	61	134	125	1703	116	114	23	35	178	191	71	159	2,910	5,907
Victorville	EXPORT	0	249	724	0	0	0	0	0	0	0	0	636	1,609	1,118

* Pro-rated Annual FTR revenue is estimated based on the actual FTR revenue collected in this FTR cycle and assuming that FTRs would collect same rate of revenue in the remaining months of this FTR cycle.

V. Regional Natural Gas Markets

Natural gas prices decreased steadily throughout March from a high of around $9.00/MMBtu at California hubs and $10.75/MMBtu at the national reference bus at Henry Hub to $5.00/MMBtu nationwide by March 14, where prices remained steady through the end of the month. Much of this was due to reduced heating demand resulting from more moderate temperatures throughout much of the continental U.S. Average bid week prices, which are the forward contracts for April, were $4.92, $4.60, and $4.98 for SoCal Gas, Malin, and PG&E Citygate, respectively, a decrease 29, 39, and 32 percent from March bid week prices. The following chart shows regional natural gas prices for March.

Figure 9. Regional Daily Natural Gas Prices in March



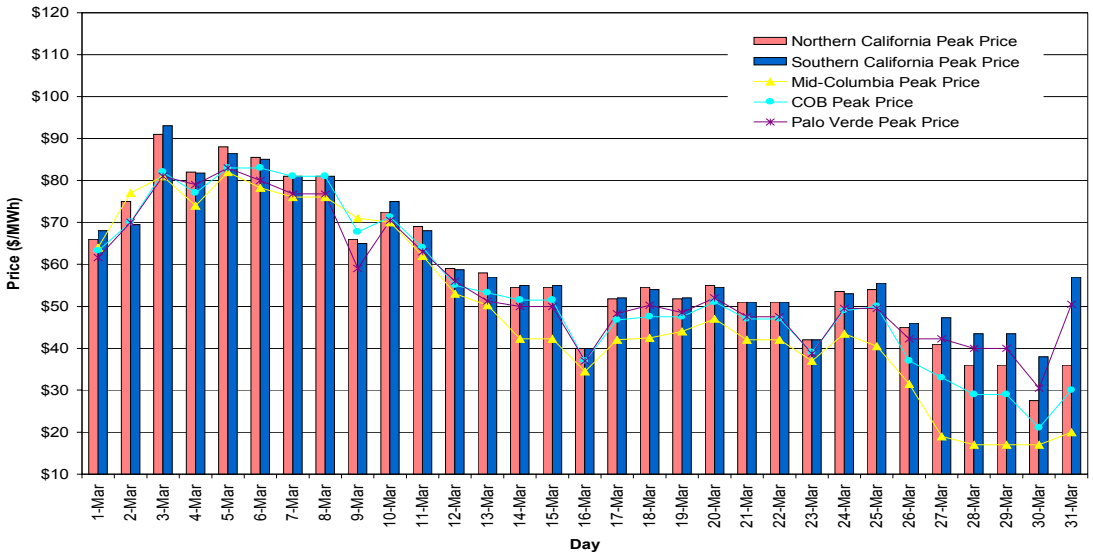
VI. Regional Bilateral Electricity Markets

Regional day-ahead electricity prices were reduced as natural gas prices declined during March but were also less favorably impacted by ongoing system constraints that occurred throughout the month. Prices increased for March 3 due to a forced outage at Columbia Generating Station (1,115 MW) in Washington, and other outages throughout the West. Prices declined after March 10 following the decline in natural gas prices throughout the continental U.S.

The Vincent substation fire on March 21 created some differentials between northwest and southwest prices but these differences were not immediately significant. Prices in the northwest also decreased as a result of increased hydroelectric generation. The ongoing transmission outages at Vincent substation, Path 26, and at Sylmar resulted in sharply increased pricing

differentials between Northern and Southern California. By month's end, there was a $20/MWh spread between Northern California and Southern California prices. The following chart shows regional day-ahead bilateral contract prices for peak-hour blocks of electricity in March.

Figure 10. Regional Day-Ahead Bilateral Peak Electricity Prices in March



VII. Issues under Review

On March 26, FERC Staff issued the Final Report on Price Manipulation in Western Markets (Docket No. PA02-2-000). The report contained two key recommendations to the Commission pertaining to both the FERC Refund Proceeding and the Enron-style trading and scheduling strategies and other investigative work the ISO has performed regarding market manipulation and market power. Specifically, FERC Staff recommended that the Commission find the following:

- Enron-style trading and scheduling strategies were in violation of anti-gaming provisions in the ISO tariff and that proceedings should be initiated to disgorge profits from these strategies for the period January 1, 2000 through June 21, 2001. Disgorged profits will be in addition to amounts identified in the refund proceeding.
- The natural gas pricing methodology in the refund proceeding should be altered from published price indices that were found to be manipulated to producing-area prices plus transportation cost, with the caveat that actual gas costs can be recovered provided sufficient documentation that actual costs differed and will be allowed on a dollar-for-dollar basis not to impact the mitigated market price used in the refund methodology.

ATTACHMENT 19

KERN COUNTY FIRE DEPARTMENT INCIDENT REPORTS FROM SANBORN BESS FIRE EVENTS.

NFIRS-1 Basic

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	09	18	2024	K14 (14)	2443063	0

B **Location Type**

Census tract:

- [x] Street Address
- [ ] Intersection
- [ ] In Front Of
- [ ] Rear Of
- [ ] Adjacent To
- [ ] Directions
- [ ] US National Grid

Number	Prefix	Street or Highway	Street Type	Suffix
9900		LONE BUTTE	RD-Road	

Apt./Suite/Room	City	State	Zip Code
	Kern County	CA	93501

Cross Street: TROTTER AVE / UNNAMED

C **Incident Type**

111-Building fire

D **Aid Given Or Received**

- [ ] 1 Mutual Aid Received
- [ ] 2 Auto. Aid Received
- [ ] 3 Mutual Aid Given
- [x] 4 Auto. Aid Given
- [ ] 5 Other Aid Given
- [ ] None

Their FDID: Edwards AFB 412 (15830)
Their State: California
Their Incident Number: 2443063

E1 **Dates and Times**

Alarm	09	18	2024	22:29
Arrival	09	18	2024	22:33
Controlled				
Last Unit Cleared	09	19	2024	02:44

E2 **Shifts and Alarms**

Shift or Platoon	Alarms	District
C Shift		

E3 **Special Studies**

ID#	Value

F **Actions Taken**

74-Provide apparatus

Primary Action Taken

G1 **Resources**

- [x] Apparatus or Personnel Module is used.

	Apparatus	Personnel
Suppression	7	15
EMS	1	2
Other	0	0

- [ ] Resource counts include aid received resources.

G2 **Estimated Dollar Losses and Values**

Losses:	Required for all fires if known. Optional for all non-fires.	None
Property:	$ 3,000,000.00	[ ]
Contents:	$ 6,000,000.00	[ ]
Pre-Incident Values: Optional		None
Property:	$ 3,000,000.00	[ ]
Contents:	$ 6,000,000.00	[ ]

Completed Modules

- [ ] 2 - Fire
- [ ] 3 - Structure Fire
- [ ] 4 - Civilian Fire Cas.
- [ ] 5 - Fire Service Cas.
- [ ] 6 - EMS
- [ ] 7 - HazMat
- [ ] 8 - Wildland Fire
- [ ] 9 - Apparatus
- [ ] 10 - Personnel
- [ ] 11 - Arson

H1 **Casualties** [x] None

	Deaths	Injuries
Fire Service	0	0
Civilian	0	0

H2 **Detector**

Required for Confined Fires

- [ ] 1 - Detector Alerted Occupants
- [ ] 2 - Detector Did Not Alert Them
- [ ] 3 - Unknown

H3

Hazardous Materials Release

- [ ] 1 - Natural Gas
- [ ] 2 - Propane Gas
- [ ] 3 - Gasoline
- [ ] 4 - Kerosene
- [ ] 5 - Diesel Fuel / Fuel Oil
- [ ] 6 - Household Solvents
- [ ] 7 - Motor Oil
- [ ] 8 - Paint
- [ ] 0 - Other
- [x] None

I **Mixed Use Property**

- [x] Not Mixed
- [ ] 10 - Assembly Use
- [ ] 20 - Education Use
- [ ] 33 - Medical Use
- [ ] 40 - Residential Use
- [ ] 51 - Row Of Stores
- [ ] 53 - Enclosed Mall
- [ ] 58 - Business and Residential
- [ ] 59 - Office Use
- [ ] 60 - Industrial Use
- [ ] 63 - Military Use
- [ ] 65 - Farm Use
- [ ] 00 - Other Mixed Use

J **Property Use** [ ] None

Structures

- [ ] 131 Church, Place of Worship
- [ ] 161 Restaurant or Cafeteria
- [ ] 162 Bar/Tavern or Nightclub
- [ ] 213 Elementary School, Kindegarten
- [ ] 215 High School, Junior High
- [ ] 241 College, Adult Education
- [ ] 311 Nursing Home
- [ ] 331 Hospital
- [ ] 341 Clinic, Clinic-Type Infirmary
- [ ] 342 Doctor/Dentist Office
- [ ] 361 Prison or Jail, Not Juvenile
- [ ] 419 1- or 2-Family Dwelling
- [ ] 429 MultiFamily Dwelling
- [ ] 439 Rooming/Boarding House
- [ ] 449 Commerical Hotel or Motel
- [ ] 459 Residential, Board and Care
- [ ] 464 Dormitory/Barracks
- [ ] 519 Food and Beverage Sales
- [ ] 539 Household Goods, Sales, Repairs
- [ ] 571 Gas or Service Station
- [ ] 579 Motor Vehicle/Boat Sales/Repairs
- [ ] 599 Business Office
- [ ] 615 Electric-Generating Plant
- [ ] 629 Laboratory/Science Laboratory
- [ ] 700 Manufacturing Plant
- [ ] 819 Livestock/Poultry Storage (Barn)
- [ ] 882 Non-Residential Parking Garage
- [ ] 891 Warehouse

Outside

- [ ] 124 Playground or Park
- [ ] 655 Crops or Orchard
- [ ] 669 Forest (Timberland)
- [ ] 807 Outdoor Storage Area
- [ ] 919 Dump or Sanitary Landfill
- [x] 931 Open Land or Field
- [ ] 936 Vacant Lot
- [ ] 938 Graded/Cared for Plot of Land
- [ ] 946 Lake, River, Stream
- [ ] 951 Railroad Right-of-Way
- [ ] 960 Other Street
- [ ] 961 Highway/Divided Highway
- [ ] 962 Residential Street/Driveway
- [ ] 981 Construction Site
- [ ] 984 Industrial Plant Yard

Property Use:

Description

Look up and enter a Property Use code and description only if you have NOT checked a Property Use box.

K2

Owner

Local Option | Person/Entity Type | Business Name (if applicable) | Phone Number

Mr., Ms., Mrs. | First Name | MI | Last Name | Suffix

Number | Prefix | Street or Highway | Street Type | Suffix

Post Office Box | Apt./Suite/Room | City

State | Zip Code

L **Remarks:**

FIRE ALRM GOING OFF
SPRINKLERS GOING OFF
RP PUT ME ON PHONE
BATTERY SITE ***
POWER SITE ***
BATTERY CONEX SITE
RP CAN NOT PROVIDE LL OR CROSS ST JUST DIRECT ADDRESS
RP CONTS TO PUT DISP ON HOLD
RP CALLING FRM TERRAGINE NOT AN ALRM CO
RP DISC
TECH NRT UNKNW WHAT THEY ARE DRVING UNKWN ETA SHOULD BE ARRIVING SOON PER ORIGINAL RP
RP ADVSD BEST ACCESS WILL PROB BE THE FRONT
CO14-NOTH SHW
12 14 15 KB1 RESP-CX BAL
14 OS-COUPLE HUNDRERD YARDS AWAY-ESS UNIT SMOKING-LONEVIEW IC
ENV HEALTH ADVD TO CALL KB1
IC-1 UNIT THAT CAUGHT FIRE-SENDING DRONE UP TO MAKE SURE
IC-POWER SHUTG OFF
KB1-1 UNIT STILL SMOULDERING FROM SAT-PLANT PERSONELLE ON FIRE WATCH-NTF ENV HEALTH-IF ONCALL NUMBER FOR PREVENTION CALL CELL-ALL UNITS COMPLETE
KB1- E14 IS ENRT BACK OUT, NTF EDWARDS THAT THE FIREE IS GOING AGAIN, NTF EDWARDS
KB1 IS OS
EAFB ADVD
EDWARDS SENDING ENG20-BB1-WT17 RESPONDING AS WELL
Narrative added from associated Call #: 567 - RP REPORTING A FIRE DOES NOT SEE ANY UNITS OS
KB1-EDWARDS OS-ASSUMING BUTTE IC-ADVD IC IF ANYTHING SUBSTANTIAL COMES IN FOR 14 OR 15 AREA
Narrative added from associated Call #: 576 - 2 CFA ALRMS
Narrative added from associated Call #: 576 - ZONE E2 , FCT1 , 45B2 FRIE ALRMS
Narrative added from associated Call #: 576 - ZONE 240
Narrative added from associated Call #: 576 - HOT GAS ALRM
KB1- IN UNIFIED COMMAND W/ EDWARDS SINCE THEIR ARRIVAL
EDWARDS FIRE REQ POC FOR CO THAT OWNS SOLAR FARM, ADV RP
ADV RP'S #
KB1 AV ON SCENE SWITCHING TO KERN 1
KB1 - COMPLETE SC...

Full primary narrative can be found in NFIRS 1S - Supplemental

M **Authorization**

K0955	Dean, Michael	Fire Captain		09/19/2024
Officer In Charge ID	Signature	Position or Rank	Assignment	Date
K0955	Dean, Michael	Fire Captain		09/19/2024
Member Making Report ID	Signature	Position or Rank	Assignment	Date

NFIRS-2 Fire

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	09	18	2024	K14 (14)	2443063	0

B

Property Details

B1 ☐ Not Residential

Estimated number of residential living units in the building of origin whether or not all units became involved

B2 ☐ Buildings Not Involved

Number of buildings involved

B3 ☑ None ☐ Less than 1 acre

Acres burned (outside fires)

C

On-Site Materials Or Products

On-Site Materials Storage Use

D

Ignition

D1 Undetermined

Area of Fire Origin

D2 Undetermined

Heat Source

D3 Undetermined

Item First Ignited

D4

Type of Material First Ignited

E1

Cause of Ignition

☐ 1 - Intentional
☐ 2 - Unintentional
☑ 3 - Failure of Equipment or Heat Source
☐ 4 - Act of Nature
☐ 5 - Cause Under Investigation
☐ U - Cause Undetermined After Investigation

E2

Factors Contributing to Ignition

Undetermined

Factor Contributing to Ignition

E3

Human Factors Contributing to Ignition

Check all applicable boxes

☑ None
☐ 1 - Asleep
☐ 2 - Possibly impaired by alcohol or drugs
☐ 3 - Unattended person
☐ 4 - Possibly Mentally Disabled
☐ 5 - Physically Disabled
☐ 6 - Multiple Persons Involved

☐ 7 - Age Was A Factor

Estimated Age of Person Involved

☐ Male ☐ Female

F1

Equipment Involved In Ignition

☑

Equipment Involved

Brand

Model

Serial #

Year

F2

Equipment Power Source

☑

Equipment Power Source

F3

Equipment Portability

☐ 1 - Portable
☐ 2 - Stationary

Portable equipment normally can be moved by one or two persons.

G

Fire Suppression Factors

H1

Mobile Property Involved

☐ 1 - Not involved in ignition, but burned
☐ 2 - Involved in ignition, but did not burn
☐ 3 - Involved in ignition and burned
☑ None

H2

Mobile Property Type and Make

Mobile Property Type

Mobile Property Make

Mobile Property Model

Year

State

License Plate Number

VIN

Local Use

☐ Pre-Fire Plan Available
☐ Arson Report Attached
☐ Police Report Attached
☐ Coroner Report Attached
☐ Other Reports Attached

NFIRS-3 Structure Fire

I1

Structure Type

- [x] 1 - Enclosed Building
- [ ] 2 - Portable/Mobile Structure
- [ ] 3 - Open Structure
- [ ] 4 - Air-Supported Structure
- [ ] 5 - Tent
- [ ] 6 - Open Platform
- [ ] 7 - Underground Structure
- [ ] 8 - Connective Structure
- [ ] 0 - Other

I2

Building Status

- [ ] 1 - Under Construction
- [x] 2 - In Normal Use
- [ ] 3 - Idle, Not Routinely Used
- [ ] 4 - Under Major Renovation
- [ ] 5 - Vacant and Secured
- [ ] 6 - Vacant and Unsecured
- [ ] 7 - Being Demolished
- [ ] 0 - Other
- [ ] U - Undetermined

I3

Building Height

1
Number of Stories At/Above Grade

1
Number of Stories Below Grade

I4

Main Floor Size

450
Total Square Feet

OR

____ BY ____
Length (ft) X Width (ft)

J1

Fire Origin

1 [ ] Below Grade
Story of Fire Origin

J2

Fire Spread

- [ ] Confined to Object of Origin
- [x] 2 - Confined to Room of Origin
- [ ] 3 - Confined to Floor of Origin
- [ ] 4 - Confined to Building of Origin
- [ ] 5 - Beyond Building of Origin

J3

Number of Stories Damaged By Flame

____ Number of Stories w/Minor Damage (1-24%)
____ Number of Stories w/Significant Damage (25-49%)
____ Number of Stories w/Heavy Damage (50-74%)
____ Number of Stories w/Extreme Damage (75-100%)

*Count the roof as part of the highest story

K

Type of Material Contributing Most to Flame Spread

K1 __
Item Contributing Most to Flame Spread

K2 __
Type of Material Contributing Most To Flame Spread

L1

Presence of Detectors

- [ ] N - None Present
- [x] 1 - Present
- [ ] U - Undetermined

L2

Detector Type

- [ ] 1 - Smoke
- [x] 2 - Heat
- [ ] 3 - Combination of Smoke and Heat
- [ ] 4 - Sprinkler, Water Flow Detection
- [ ] 5 - More Than One Type Present
- [ ] 0 - Other
- [ ] U - Undetermined

L3

Detector Power Supply

- [x] 1 - Battery Only
- [ ] 2 - Hardwire Only
- [ ] 3 - Plug-In
- [ ] 4 - Hardwire With Battery
- [ ] 5 - Plug-In With Battery
- [ ] 6 - Mechanical
- [ ] 7 - Multiple Detectors & Power Supplies
- [ ] 0 - Other
- [ ] U - Undetermined

L4

Detector Operation

- [ ] 1 - Fire Too Small To Activate
- [ ] 2 - Operated
- [ ] 3 - Failed To Operate
- [x] U - Undetermined

L5

Detector Effectiveness

- [ ] 1 - Alerted Occupants, Occupants Responded
- [ ] 2 - Alerted Occupants, Occupants Failed to Respond
- [ ] 3 - There Were No Occupants
- [ ] 4 - Failed to Alert Occupants
- [ ] U - Undetermined

L6

Detector Failure Reason

- [ ] 1 - Power Failure, Shutoff, or Disconnect
- [ ] 2 - Improper Installation or Placement
- [ ] 3 - Defective
- [ ] 4 - Lack of Maintenance, Dirty
- [ ] 5 - Battery Missing or Disconnected
- [ ] 6 - Battery Discharged or Dead
- [ ] 0 - Other
- [ ] U - Undetermined

M1

Presence of Automatic Extinguishing System

- [x] N - None Present
- [ ] 1 - Present
- [ ] 2 - Partial System Present
- [ ] U - Undetermined

M2

Type of Automatic Extinguishing System

- [ ] 1 - Wet-Pipe Sprinkler
- [ ] 2 - Dry-Pipe Sprinkler
- [ ] 3 - Other Sprinkler System
- [ ] 4 - Dry Chemical System
- [ ] 5 - Foam System
- [ ] 6 - Halogen-Type System
- [ ] 7 - Carbon Dioxide System
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range of AES

M3

Operation of Automatic Extinguishing System

- [ ] 1 - Operated/Effective
- [ ] 2 - Operated/Not Effective
- [ ] 3 - Fire Too Small To Activate
- [ ] 4 - Failed To Operate
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range

M4

Number of Sprinkler Heads Operating

____
Required if system operated

M5

Reason for Automatic Extinguishing System Failure

- [ ] 1 - System Shut Off
- [ ] 2 - Not Enough Agent Discharged
- [ ] 3 - Agent Discharged But Did Not Reach Fire
- [ ] 4 - Wrong Type of System
- [ ] 5 - Fire Not In Area Protected
- [ ] 6 - System Components Damaged
- [ ] 7 - Lack of Maintenance
- [ ] 8 - Manual Intervention
- [ ] 0 - Other
- [ ] U - Undetermined

Required if system failed or not effective

NFIRS-9 Apparatus or Resources

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	09	18	2024	K14 (14)	2443063	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:59	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: E13 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: E14 Type: 11-Engine	Dispatch: 09/18/2024 23:48 Arrival: 09/18/2024 23:56 Clear: 09/19/2024 02:02	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	
ID: E15 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: 09/18/2024 22:52 Clear: 09/18/2024 23:11	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	92-Standby or Staged/Released
ID: KB1 Type: 92-Chief officer car	Dispatch: 09/18/2024 23:48 Arrival: 09/18/2024 23:48 Clear: 09/19/2024 02:44	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	81-Incident command
ID: KB8 Type: 92-Chief officer car	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	
ID: MS15 Type: 76-ALS unit	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	2	☐ Suppression ☑ EMS ☐ Other	
ID: SF3 Type: 00-Other apparatus/resource	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

NFIRS-10 Personnel

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	09	18	2024	K14 (14)	2443063	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:59	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1447	Sexton, Brandon	Fire Engineer		☐	☐
K0805	Franchere, Andrew	Fire Captain		☐	☐
K1644	Lapeer, Tyler	Firefighter		☐	☐

ID: E13 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1667	Ball, Chandler	Firefighter		☐	☐
K1157	Estep, Craig	Fire Engineer		☐	☐
K0749	Anderson, Richard	Fire Captain		☐	☐

ID: E14 Type: 11-Engine	Dispatch: 09/18/2024 23:48 Arrival: 09/18/2024 23:56 Clear: 09/19/2024 02:02	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0955	Dean, Michael	Fire Captain		☐	☐
K1052	Sandoval, Nicholas	Firefighter		☐	☐
K1415	Nelson, Mark	Firefighter		☐	☐

ID: E15 Type: 11-Engine	Dispatch: 09/18/2024 22:29 Arrival: 09/18/2024 22:52 Clear: 09/18/2024 23:11	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	92-Standby or Staged/Released

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1136	Ricker, Jacob	Fire Captain		☐	☐
K0975	Weitz, Joseph	Fire Engineer		☐	☐
K1610	Epperly, Joshua	Firefighter		☐	☐

ID: KB1 Type: 92-Chief officer car	Dispatch: 09/18/2024 23:48 Arrival: 09/18/2024 23:48 Clear: 09/19/2024 02:44	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	81-Incident command

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0671	Tucker, Duane	Fire Battalion Chief		☐	☐

ID: KB8 Type: 92-Chief officer car	Dispatch: 09/18/2024 22:29 Arrival: Clear: 09/18/2024 22:46	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0788	Ratekin, Mark	Fire Battalion		☐	☐

Chief

ID: MS15
Type: 76-ALS unit
Dispatch: 09/18/2024 22:29
Arrival:
Clear: 09/18/2024 22:46
Sent
2
Suppression
EMS
Other

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1560	Woessner, Cody	Firefighter			
K0772	Niquete, Felipe	Fire Captain			

ID: SF3
Type: 00-Other apparatus/resource
Dispatch: 09/18/2024 22:29
Arrival:
Clear: 09/18/2024 22:46
Sent
1
Suppression
EMS
Other
93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0710	Trammell, Jonathan	Fire Captain	5588010-Captain		

NFIRS-1S Supplemental

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	09	18	2024	K14 (14)	2443063	0

Additional Narrative (#1 of 1):

E14 arrived on scene to find an ESS unit smoking. E14 named the incident lone butte. The unit number that was smoking was 45B1. The unit had its power shut off on Saturday and the valve for water turned off due to a problem with the unit. Usually the water would be injected into the system but that valve is off. The company was going to have a fire watch for the rest of the night. Units were not going close to the unit due to the health hazards it presents. To put that fire out it would take more water than was available on scene so units watched from a distance.

The unit caught fire as units were leaving. E14 and B1 returned to the scene. E14 sent the drone to make sure none of the other units were on fire. The ESS units to the east, south and west did not catch fire. Environmental health was notified. E14 monitored the air with a five gas meter and all readings were normal. All were zero and oxygen levels at 20.5. E14 went to trotter area and monitored the air due to residents in the area. All readings were the same. The company was going to stay on scene with Edward's fire department and monitor throughout the night.

Apparatus Narrative for E12:

Cancelled en route.

Apparatus Narrative for E13:

Cancelled en route.

Apparatus Narrative for E15:

E15 arrived on scene and staged near E14. E15 was cleared shortly after by BC1. E15 completed.

Apparatus Narrative for KB1:

Enroute I made contact with Environmental Health (EH). The facility had a fire on Saturday 9/14/2024 in the same enclosure 45B1. I advised EH I would give them more information when I arrived on scene. Based on the size up with CO-14 I cancelled the Structure Fire Reinforced and then eventually cancelled E-12. I arrived on scene and made contact with the IC-CO14 and the Operations Manager Cole Berman from Terra-Gen. Crews had already deployed their drone and at that time there were no immediate life safety hazards. Light smoke was coming from enclosure 45B1. I made contact with EH again and they advised Cole to make all the proper notifications again, due to this being a new incident. KCFD monitored with Edwards Fire Department for over an hour. Crews completed and left scene with Terra-Gen to stay on 24hr fire watch.

While leaving the facility and still on the property I was notified by CO-14 that the enclosure was now on fire. E-14 and Battalion 1 responded back to scene along with Edwards Fire Department. I assumed Butte Command. We set up an ICP and crews monitored the area with a five gas monitor. Crews deployed the drone again to make sure no exposures caught fire. I went into unified command with Edwards Fire Department Battalion Chief. Crews stayed on scene approximately two hours monitoring the incident. I had 14 get me a reading with their five gas monitor at the nearest housing tract to the incident. No hazardous materials were detected and the O2 level was appropriate. I stayed into the enclosure had minimal flames and then the scene was left with Edwards Fire Department and Terra-Gen. I made contact with Kern County Fire Department Prevention and they advised they were going to respond to the scene.

Apparatus Narrative for SF3:

Cancelled en route

NFIRS-1 Basic

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	22	2024	K14 (14)	2408035	0

B **Location Type**

Census tract:

- [x] Street Address
- [ ] Intersection
- [ ] In Front Of
- [ ] Rear Of
- [ ] Adjacent To
- [ ] Directions
- [ ] US National Grid

Number	Prefix	Street or Highway	Street Type	Suffix
9900		LONE BUTTE	RD-Road	

Apt./Suite/Room	City	State	Zip Code
	Kern County	CA	93501

Cross Street: TROTTER AVE / UNNAMED

C **Incident Type**

112-Fires in structure other than in a building (incl. Fences, Rail Beds, Power Poles)

D **Aid Given Or Received**

- [ ] 1 Mutual Aid Received
- [x] 2 Auto. Aid Received
- [ ] 3 Mutual Aid Given
- [ ] 4 Auto. Aid Given
- [ ] 5 Other Aid Given
- [ ] None

Their FDID: California City Fire Dept (15065) | Their State:

Their Incident Number:

E1 **Dates and Times**

Alarm	02	22	2024	16:09
Arrival	02	22	2024	16:24
Controlled				
Last Unit Cleared	02	22	2024	20:28

E2 **Shifts and Alarms**

Shift or Platoon	Alarms	District
A Shift		

E3 **Special Studies**

ID#	Value

F **Actions Taken**

Primary Action Taken: 55-Establish safe area

Additional Action Taken: 81-Incident command

G1 **Resources**

- [x] Apparatus or Personnel Module is used.

	Apparatus	Personnel
Suppression	8	16
EMS	1	2
Other	1	1

- [ ] Resource counts include aid received resources.

G2 **Estimated Dollar Losses and Values**

Losses:	Required for all fires if known. Optional for all non-fires.	None
Property:	$	[x]
Contents:	$ 1,050,000.00	[ ]
Pre-Incident Values: Optional		None
Property:	$ 10,000.00	[ ]
Contents:	$ 3,500,000.00	[ ]

Completed Modules

- [ ] 2 - Fire
- [ ] 3 - Structure Fire
- [ ] 4 - Civilian Fire Cas.
- [ ] 5 - Fire Service Cas.
- [ ] 6 - EMS
- [ ] 7 - HazMat
- [ ] 8 - Wildland Fire
- [ ] 9 - Apparatus
- [ ] 10 - Personnel
- [ ] 11 - Arson

H1 **Casualties** [x] None

	Deaths	Injuries
Fire Service	0	0
Civilian	0	0

H2 **Detector**

Required for Confined Fires

- [ ] 1 - Detector Alerted Occupants
- [ ] 2 - Detector Did Not Alert Them
- [ ] 3 - Unknown

H3

Hazardous Materials Release

- [ ] 1 - Natural Gas
- [ ] 2 - Propane Gas
- [ ] 3 - Gasoline
- [ ] 4 - Kerosene
- [ ] 5 - Diesel Fuel / Fuel Oil
- [ ] 6 - Household Solvents
- [ ] 7 - Motor Oil
- [ ] 8 - Paint
- [ ] 0 - Other
- [x] None

I **Mixed Use Property**

- [x] Not Mixed
- [ ] 10 - Assembly Use
- [ ] 20 - Education Use
- [ ] 33 - Medical Use
- [ ] 40 - Residential Use
- [ ] 51 - Row Of Stores
- [ ] 53 - Enclosed Mall
- [ ] 58 - Business and Residential
- [ ] 59 - Office Use
- [ ] 60 - Industrial Use
- [ ] 63 - Military Use
- [ ] 65 - Farm Use
- [ ] 00 - Other Mixed Use

J **Property Use** [ ] None

Structures

- [ ] 131 Church, Place of Worship
- [ ] 161 Restaurant or Cafeteria
- [ ] 162 Bar/Tavern or Nightclub
- [ ] 213 Elementary School, Kindegarten
- [ ] 215 High School, Junior High
- [ ] 241 College, Adult Education
- [ ] 311 Nursing Home
- [ ] 331 Hospital
- [ ] 341 Clinic, Clinic-Type Infirmary
- [ ] 342 Doctor/Dentist Office
- [ ] 361 Prison or Jail, Not Juvenile
- [ ] 419 1- or 2-Family Dwelling
- [ ] 429 MultiFamily Dwelling
- [ ] 439 Rooming/Boarding House
- [ ] 449 Commerical Hotel or Motel
- [ ] 459 Residential, Board and Care
- [ ] 464 Dormitory/Barracks
- [ ] 519 Food and Beverage Sales
- [ ] 539 Household Goods, Sales, Repairs
- [ ] 571 Gas or Service Station
- [ ] 579 Motor Vehicle/Boat Sales/Repairs
- [ ] 599 Business Office
- [ ] 615 Electric-Generating Plant
- [ ] 629 Laboratory/Science Laboratory
- [ ] 700 Manufacturing Plant
- [ ] 819 Livestock/Poultry Storage (Barn)
- [ ] 882 Non-Residential Parking Garage
- [ ] 891 Warehouse

Outside

- [ ] 124 Playground or Park
- [ ] 655 Crops or Orchard
- [ ] 669 Forest (Timberland)
- [ ] 807 Outdoor Storage Area
- [ ] 919 Dump or Sanitary Landfill
- [ ] 931 Open Land or Field
- [ ] 936 Vacant Lot
- [ ] 938 Graded/Cared for Plot of Land
- [ ] 946 Lake, River, Stream
- [ ] 951 Railroad Right-of-Way
- [ ] 960 Other Street
- [ ] 961 Highway/Divided Highway
- [ ] 962 Residential Street/Driveway
- [ ] 981 Construction Site
- [ ] 984 Industrial Plant Yard

Property Use:

610-Energy production plant, other

Description

Look up and enter a Property Use code and description only if you have NOT checked a Property Use box.

K2

Owner

Local Option	Person/Entity Type	Business Name (if applicable)	Phone Number

Mr., Ms., Mrs.	First Name	MI	Last Name	Suffix

Number	Prefix	Street or Highway	Street Type	Suffix

Post Office Box	Apt./Suite/Room	City

State	Zip Code

L **Remarks:**

CFA - 3 ALRMS 44B 5 HIGH GAS ALARMS / 1 PUMP RUNNING / EXHAUST SYSTEM ACTIVE / NO CX NO RESET / [redacted]
[redacted]
ATT CB
PREM ADVS UNK REASON FOR ACTIVATION
ENCLOSURE TEMP NOT RUNNING HIGH / ADSV NO RESP NEEDED
PREM ADSV ACTIVE CONFIRMED FIRE PER OPERATOR
UNIT 44B5
FIRE SHOWING ON CAMERA / SMK AND FLAMES VIS
PREM RECON AFTER ADVS NO FIRE NEEDED ON CB
[redacted]
14- NOTH SHOW
LFT VMAIL/JEREMIAH
14- SMOLDERING , LT SMK, BEING LEAD IN TO THE PANEL. WILL EVAC FAC AND MAKE A PLAN
14 MOJAVE IC.
14- HAVE HAZMAT MONITOR
IC-AT THE PANEL, ISOLATED. ALL UNITS STAGE ON LONEBUTTE
KB1- HAVE HAZMAT CALL CELL
HAZMAT65 MONITORING
KB1-IC, E14 FIRE ATT
IC- FIRE IS OUT. SUPPRESSION SYSTEM FUNCTIONING, CX ALL UNITS EXCEPT KB1, E14, MS15,
CALL CLOSED IN ERROR
IC - NOTIFICATION TO ENV HEALTH AND EPA
ENV HEALTH ADV
ENRMNTL HEALTH 2 HR ETA
IC - WT12 RESPOND CODE 2
Narrative added from associated Call #: 236 - 44B5 GAS ALARM
Narrative added from associated Call #: 236 - 44B5 FIRE ALARM
Narrative added from associated Call #: 236 - [redacted]

M **Authorization**

Officer In Charge ID	Signature	Position or Rank	Assignment	Date
K0984	Harris, Zachary	Fire Battalion Chief	B1A	03/03/2024

Member Making Report ID	Signature	Position or Rank	Assignment	Date
K0984	Harris, Zachary	Fire Battalion Chief	B1A	03/03/2024

NFIRS-2 Fire

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	22	2024	K14 (14)	2408035	0

B

Property Details

B1 ☐ Not Residential

Estimated number of residential living units in the building of origin whether or not all units became involved

B2 ☐ Buildings Not Involved

Number of buildings involved

B3 ☑ None ☐ Less than 1 acre

Acres burned (outside fires)

C

On-Site Materials Or Products

626-Electrical parts, supplies, equipment

On-site material (1)

On-Site Materials Storage Use

☐ 1 - Bulk Storage or warehousing
☑ 2 - Processing or manufacturing
☐ 3 - Packaged goods for sale
☐ 4 - Repair or service
☐ U - Undetermined

D

Ignition

D1 61-Machinery room or area; elevator machinery room

Area of Fire Origin

D2 Undetermined

Heat Source

D3 Undetermined

Item First Ignited

D4 Undetermined

Type of Material First Ignited

E1

Cause of Ignition

☐ 1 - Intentional
☐ 2 - Unintentional
☑ 3 - Failure of Equipment or Heat Source
☐ 4 - Act of Nature
☐ 5 - Cause Under Investigation
☐ U - Cause Undetermined After Investigation

E2

Factors Contributing to Ignition

Undetermined

Factor Contributing to Ignition

E3

Human Factors Contributing to Ignition

Check all applicable boxes

☑ None
☐ 1 - Asleep
☐ 2 - Possibly impaired by alcohol or drugs
☐ 3 - Unattended person
☐ 4 - Possibly Mentally Disabled
☐ 5 - Physically Disabled
☐ 6 - Multiple Persons Involved

☐ 7 - Age Was A Factor

Estimated Age of Person Involved

☐ Male ☐ Female

F1

Equipment Involved In Ignition

☑

Equipment Involved

Brand

Model

Serial #

Year

F2

Equipment Power Source

☑

Equipment Power Source

F3

Equipment Portability

☐ 1 - Portable
☐ 2 - Stationary

Portable equipment normally can be moved by one or two persons.

G

Fire Suppression Factors

H1

Mobile Property Involved

☐ 1 - Not involved in ignition, but burned
☐ 2 - Involved in ignition, but did not burn
☐ 3 - Involved in ignition and burned
☑ None

H2

Mobile Property Type and Make

Mobile Property Type

Mobile Property Make

Mobile Property Model

Year

State

License Plate Number

VIN

Local Use

☐ Pre-Fire Plan Available
☐ Arson Report Attached
☐ Police Report Attached
☐ Coroner Report Attached
☐ Other Reports Attached

NFIRS-3 Structure Fire

I1

Structure Type

- [ ] 1 - Enclosed Building
- [ ] 2 - Portable/Mobile Structure
- [ ] 3 - Open Structure
- [ ] 4 - Air-Supported Structure
- [ ] 5 - Tent
- [ ] 6 - Open Platform
- [ ] 7 - Underground Structure
- [ ] 8 - Connective Structure
- [x] 0 - Other

I2

Building Status

- [ ] 1 - Under Construction
- [x] 2 - In Normal Use
- [ ] 3 - Idle, Not Routinely Used
- [ ] 4 - Under Major Renovation
- [ ] 5 - Vacant and Secured
- [ ] 6 - Vacant and Unsecured
- [ ] 7 - Being Demolished
- [ ] 0 - Other
- [ ] U - Undetermined

I3

Building Height

[1] Number of Stories At/Above Grade

[0] Number of Stories Below Grade

I4

Main Floor Size

[ ] Total Square Feet

OR

[ ] BY [ ] Length (ft) X Width (ft)

J1

Fire Origin

[ ] ☐ Below Grade Story of Fire Origin

J2

Fire Spread

- [ ] Confined to Object of Origin
- [x] 2 - Confined to Room of Origin
- [ ] 3 - Confined to Floor of Origin
- [ ] 4 - Confined to Building of Origin
- [ ] 5 - Beyond Building of Origin

J3

Number of Stories Damaged By Flame

[ ] Number of Stories w/Minor Damage (1-24%)

[ ] Number of Stories w/Significant Damage (25-49%)

[ ] Number of Stories w/Heavy Damage (50-74%)

[ ] Number of Stories w/Extreme Damage (75-100%)

*Count the roof as part of the highest story

K

Type of Material Contributing Most to Flame Spread

K1 [ ] Item Contributing Most to Flame Spread

K2 [ ] Type of Material Contributing Most To Flame Spread

L1

Presence of Detectors

- [ ] N - None Present
- [x] 1 - Present
- [ ] U - Undetermined

L2

Detector Type

- [ ] 1 - Smoke
- [ ] 2 - Heat
- [x] 3 - Combination of Smoke and Heat
- [ ] 4 - Sprinkler, Water Flow Detection
- [ ] 5 - More Than One Type Present
- [ ] 0 - Other
- [ ] U - Undetermined

L3

Detector Power Supply

- [ ] 1 - Battery Only
- [ ] 2 - Hardwire Only
- [ ] 3 - Plug-In
- [ ] 4 - Hardwire With Battery
- [ ] 5 - Plug-In With Battery
- [ ] 6 - Mechanical
- [ ] 7 - Multiple Detectors & Power Supplies
- [ ] 0 - Other
- [x] U - Undetermined

L4

Detector Operation

- [ ] 1 - Fire Too Small To Activate
- [x] 2 - Operated
- [ ] 3 - Failed To Operate
- [ ] U - Undetermined

L5

Detector Effectiveness

- [ ] 1 - Alerted Occupants, Occupants Responded
- [ ] 2 - Alerted Occupants, Occupants Failed to Respond
- [x] 3 - There Were No Occupants
- [ ] 4 - Failed to Alert Occupants
- [ ] U - Undetermined

L6

Detector Failure Reason

- [ ] 1 - Power Failure, Shutoff, or Disconnect
- [ ] 2 - Improper Installation or Placement
- [ ] 3 - Defective
- [ ] 4 - Lack of Maintenance, Dirty
- [ ] 5 - Battery Missing or Disconnected
- [ ] 6 - Battery Discharged or Dead
- [ ] 0 - Other
- [ ] U - Undetermined

M1

Presence of Automatic Extinguishing System

- [ ] N - None Present
- [x] 1 - Present
- [ ] 2 - Partial System Present
- [ ] U - Undetermined

M2

Type of Automatic Extinguishing System

- [x] 1 - Wet-Pipe Sprinkler
- [ ] 2 - Dry-Pipe Sprinkler
- [ ] 3 - Other Sprinkler System
- [ ] 4 - Dry Chemical System
- [ ] 5 - Foam System
- [ ] 6 - Halogen-Type System
- [ ] 7 - Carbon Dioxide System
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range of AES

M3

Operation of Automatic Extinguishing System

- [x] 1 - Operated/Effective
- [ ] 2 - Operated/Not Effective
- [ ] 3 - Fire Too Small To Activate
- [ ] 4 - Failed To Operate
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range

M4

Number of Sprinkler Heads Operating

[1]

Required if system operated

M5

Reason for Automatic Extinguishing System Failure

- [ ] 1 - System Shut Off
- [ ] 2 - Not Enough Agent Discharged
- [ ] 3 - Agent Discharged But Did Not Reach Fire
- [ ] 4 - Wrong Type of System
- [ ] 5 - Fire Not In Area Protected
- [ ] 6 - System Components Damaged
- [ ] 7 - Lack of Maintenance
- [ ] 8 - Manual Intervention
- [ ] 0 - Other
- [ ] U - Undetermined

Required if system failed or not effective

NFIRS-9 Apparatus or Resources

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	22	2024	K14 (14)	2408035	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 02/22/2024 16:09 Arrival: 02/22/2024 16:44 Clear: 02/22/2024 17:17	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	
ID: E13 Type: 11-Engine	Dispatch: 02/22/2024 16:10 Arrival: 02/22/2024 16:45 Clear: 02/22/2024 17:16	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	92-Standby or Staged/Released
ID: E14 Type: 11-Engine	Dispatch: 02/22/2024 17:22 Arrival: 02/22/2024 17:22 Clear: 02/22/2024 20:17	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	41-Identify, analyze hazardous materials
ID: E15 Type: 11-Engine	Dispatch: 02/22/2024 16:09 Arrival: 02/22/2024 16:28 Clear: 02/22/2024 17:19	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	
ID: HM65 Type: 93-HazMat unit	Dispatch: 02/22/2024 16:45 Arrival: Clear: 02/22/2024 17:15	☐ Sent	1	☐ Suppression ☐ EMS ☑ Other	
ID: KB1 Type: 92-Chief officer car	Dispatch: 02/22/2024 17:21 Arrival: 02/22/2024 17:21 Clear: 02/22/2024 20:28	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	81-Incident command
ID: KB8 Type: 92-Chief officer car	Dispatch: 02/22/2024 16:10 Arrival: 02/22/2024 17:12 Clear: 02/22/2024 17:15	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	
ID: MS15 Type: 76-ALS unit	Dispatch: 02/22/2024 17:22 Arrival: 02/22/2024 17:22 Clear: 02/22/2024 19:08	☐ Sent	2	☐ Suppression ☑ EMS ☐ Other	
ID: SF4 Type: 00-Other apparatus/resource	Dispatch: 02/22/2024 16:10 Arrival: Clear: 02/22/2024 17:17	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: WT12 Type: 10-Ground fire suppression, other	Dispatch: 02/22/2024 18:31 Arrival: 02/22/2024 19:23 Clear: 02/22/2024 19:32	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	

NFIRS-10 Personnel

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	22	2024	K14 (14)	2408035	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 02/22/2024 16:09 Arrival: 02/22/2024 16:44 Clear: 02/22/2024 17:17	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1424	Ruiz, Jeremy	Fire Engineer		☐	☐
K0822	Smith, Keegan	Fire Captain		☐	☐
K1581	Wright, Kody	Firefighter		☐	☐

ID: E13 Type: 11-Engine	Dispatch: 02/22/2024 16:10 Arrival: 02/22/2024 16:45 Clear: 02/22/2024 17:16	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	92-Standby or Staged/Released

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1585	Mauricio, Fabian	Firefighter		☐	☐
K0948	Latta, Nicholas	Fire Engineer		☐	☐
K0749	Anderson, Richard	Fire Captain		☐	☐

ID: E14 Type: 11-Engine	Dispatch: 02/22/2024 17:22 Arrival: 02/22/2024 17:22 Clear: 02/22/2024 20:17	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	41-Identify, analyze hazardous materials

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0784	Kingsbury, Byron	Fire Captain		☐	☐
K1494	Lewis, Zachary	Firefighter		☐	☐
K1408	Stevens, Sean	Fire Engineer		☐	☐

ID: E15 Type: 11-Engine	Dispatch: 02/22/2024 16:09 Arrival: 02/22/2024 16:28 Clear: 02/22/2024 17:19	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1604	Spears, Jacob	Firefighter		☐	☐
K0834	Filion, Nathan	Fire Captain		☐	☐
K1495	Perez, Andres	Fire Engineer		☐	☐

ID: HM65 Type: 93-HazMat unit	Dispatch: 02/22/2024 16:45 Arrival: ☐ ☐ Clear: 02/22/2024 17:15	☐ Sent	1	☐ Suppression ☐ EMS ☑ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0689	Stroub, Christopher	Fire Captain		☐	☐

ID: KB1 Type: 92-Chief officer car	Dispatch: 02/22/2024 17:21 Arrival: 02/22/2024 17:21 Clear: 02/22/2024 20:28	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	81-Incident command

Personnel ID	Name	Rank	Role	Attend	Actions Taken

K0984	Harris, Zachary	Fire Battalion Chief	☐	☐

ID: KB8 | Type: 92-Chief officer car

Dispatch: 02/22/2024 16:10 | Arrival: 02/22/2024 17:12 | Clear: 02/22/2024 17:15

☐ Sent | 1

☑ Suppression ☐ EMS ☐ Other

☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0947	Stout, Travis	Fire Battalion Chief		☐	☐

ID: MS15 | Type: 76-ALS unit

Dispatch: 02/22/2024 17:22 | Arrival: 02/22/2024 17:22 | Clear: 02/22/2024 19:08

☐ Sent | 2

☐ Suppression ☑ EMS ☐ Other

☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1056	Barboa, Daniel	Fire Captain		☐	☐
K1074	Schilling, Christopher	Fire Captain		☐	☐

ID: SF4 | Type: 00-Other apparatus/resource

Dispatch: 02/22/2024 16:10 | Arrival: | Clear: 02/22/2024 17:17

☐ Sent | 1

☑ Suppression ☐ EMS ☐ Other

93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0801	Lozano, Joel	Fire Captain		☐	☐

ID: WT12 | Type: 10-Ground fire suppression, other

Dispatch: 02/22/2024 18:31 | Arrival: 02/22/2024 19:23 | Clear: 02/22/2024 19:32

☐ Sent | 1

☑ Suppression ☐ EMS ☐ Other

☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1581	Wright, Kody	Firefighter		☐	☐

NFIRS-1S Supplemental

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	22	2024	K14 (14)	2408035	0

Additional Narrative (#1 of 1):

On February 22nd, 2024, at approximately 1600 hours, fire personnel from Kern County Fire and Cal City Fire were dispatched to reports of a fire within a BESS (Battery Energy Storage System) container at Terra Gen's Edwards site. Upon arrival, firefighters observed smoke developing from the reported location. Company 14 (Co14) made direct contact with the on-site representative, who guided them to the affected area. The representative shared surveillance footage showing the fire inside the container. Co14 confirmed that all personnel on site were accounted for and there were no immediate concerns for life safety.

Engine 14 (E14) and Medic Squad 15 (MS15) arrived at the designated Incident Command Post (ICP) with the site representatives to witness the smoke subsiding. On-site staff informed them that the cooling system within the container was actively circulating water. It was decided to maintain a distance of approximately 1000 feet from the burning container at the ICP, allowing the cooling system to continue its operation and prevent further entry. KCFD crews assisted on-site personnel in shutting down the system when the water tank reached critical levels. Approximately 2000 gallons remained in the 12,000-gallon tank. The cooling system successfully extinguished the fire.

E14 remained on the scene alongside KB1 until the Site Manager, General Manager, and Assistant Fire Marshal arrived. KB1 contacted the Environmental Health (EH) department and the US Environmental Protection Agency (EPA) to ensure compliance with all necessary protocols and procedures. The plan moving forward involved leaving the scene under the care of Terra Gen, implementing an approved "Fire Watch" until the water system was restored, all batteries were removed from the container, and the affected container's fire alarm and water system were fully operational. The estimated timeframe for completion ranged from 14 to 30 days. Terra Gen would open the container at a later date once all required criteria were met.

Apparatus Narrative for E12:

Staged then cancelled.

Apparatus Narrative for E13:

Staged and then released

Apparatus Narrative for E14:

E14 arrived to a large solar farm that also had multiple Battery Energy Storage Systems (BESS)in use. 14 was met at the entrance by an employee who stated that one of the BESS was smoking and he provided cell phone video of it. 14 confirmed with that employee that all other employees were evacuating from the premises. E14 became Mojave command. We were then led about a mile into the facility where the alarm panel was located, which was about 1000' from the affected BESS. From that distance we could see that the smoke was dissipating. The employees confirmed that a water suppression system had been activated. Battalion 1 arrived on scene and took command and assigned E14 Fire Attack. E14 then made a reconnaissance drive around the facility and confirmed that there was still water left in the suppression tank and that no more smoke was coming from the BESS. We then continued to monitor with the employees from a distance for the next couple of hours.

Apparatus Narrative for HM65:

KB1 contacted Co65 to confer about incident hazards.

Apparatus Narrative for KB1:

KB1 arrived on scene, assumed command. Throughout the incident, KB1 made contact with Div1, HM65, EH, EPA, Terra Gen Site and General Managers, to ensure that our plan could be implemented, accounting for the protection of Life, Property, and the Environment.

Apparatus Narrative for MS15:

Assisted E14 with isolation and denying entry.

Apparatus Narrative for SF4:

SF4 was dispatched and responded to a fire in 14's area. SF4 was canceled enroute by Battalion 1.

Apparatus Narrative for WT12:

WT12 arrived on scene with the intent of water supply. The operation changed and WT12 was no longer needed and was completed.

NFIRS-1 Basic

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	29	2024	K14 (14)	2408967	0

B Location Type

Census tract:

- [x] Street Address
- [ ] Intersection
- [ ] In Front Of
- [ ] Rear Of
- [ ] Adjacent To
- [ ] Directions
- [ ] US National Grid

Number	Prefix	Street or Highway	Street Type	Suffix
44920		Lone Butte Rd.		

Apt./Suite/Room	City	State	Zip Code
	Mojave	CA	93501

Cross Street: DEAD END / ALTUS AVE, LONE BUTTE RD

C Incident Type

162-Outside equipment fire

D Aid Given Or Received

- [ ] 1 Mutual Aid Received
- [ ] 2 Auto. Aid Received
- [ ] 3 Mutual Aid Given
- [ ] 4 Auto. Aid Given
- [ ] 5 Other Aid Given
- [x] None

Their FDID | Their State

Their Incident Number

E1 Dates and Times

Alarm	02	29	2024	08:57
Arrival	02	29	2024	09:11
Controlled				
Last Unit Cleared	02	29	2024	09:49

E2 Shifts and Alarms

Shift or Platoon	Alarms	District
C Shift		

E3 Special Studies

ID# | Value

F Actions Taken

Primary Action Taken: 86-Investigate (incl. Attempt to Locate)

Additional Action Taken: 92-Standby

Additional Action Taken: 00-Action taken, other

G1 Resources

- [x] Apparatus or Personnel Module is used.

	Apparatus	Personnel
Suppression	7	15
EMS	1	2
Other	0	0

- [ ] Resource counts include aid received resources.

G2 Estimated Dollar Losses and Values

Losses:	Required for all fires if known. Optional for all non-fires.	None
Property:	$ 50,000.00	
Contents:	$	

Pre-Incident Values: Optional		None
Property:	$ 50,000.00	
Contents:	$	

Completed Modules

- [ ] 2 - Fire
- [ ] 3 - Structure Fire
- [ ] 4 - Civilian Fire Cas.
- [ ] 5 - Fire Service Cas.
- [ ] 6 - EMS
- [ ] 7 - HazMat
- [ ] 8 - Wildland Fire
- [ ] 9 - Apparatus
- [ ] 10 - Personnel
- [ ] 11 - Arson

H1 **Casualties** [x] None

	Deaths	Injuries
Fire Service	0	0
Civilian	0	0

H2 **Detector**

Required for Confined Fires

- [ ] 1 - Detector Alerted Occupants
- [ ] 2 - Detector Did Not Alert Them
- [ ] 3 - Unknown

H3

Hazardous Materials Release

- [ ] 1 - Natural Gas
- [ ] 2 - Propane Gas
- [ ] 3 - Gasoline
- [ ] 4 - Kerosene
- [ ] 5 - Diesel Fuel / Fuel Oil
- [ ] 6 - Household Solvents
- [ ] 7 - Motor Oil
- [ ] 8 - Paint
- [ ] 0 - Other
- [x] None

I **Mixed Use Property**

- [x] Not Mixed
- [ ] 10 - Assembly Use
- [ ] 20 - Education Use
- [ ] 33 - Medical Use
- [ ] 40 - Residential Use
- [ ] 51 - Row Of Stores
- [ ] 53 - Enclosed Mall
- [ ] 58 - Business and Residential
- [ ] 59 - Office Use
- [ ] 60 - Industrial Use
- [ ] 63 - Military Use
- [ ] 65 - Farm Use
- [ ] 00 - Other Mixed Use

J **Property Use** [ ] None

Structures

- [ ] 131 Church, Place of Worship
- [ ] 161 Restaurant or Cafeteria
- [ ] 162 Bar/Tavern or Nightclub
- [ ] 213 Elementary School, Kindegarten
- [ ] 215 High School, Junior High
- [ ] 241 College, Adult Education
- [ ] 311 Nursing Home
- [ ] 331 Hospital
- [ ] 341 Clinic, Clinic-Type Infirmary
- [ ] 342 Doctor/Dentist Office
- [ ] 361 Prison or Jail, Not Juvenile
- [ ] 419 1- or 2-Family Dwelling
- [ ] 429 MultiFamily Dwelling
- [ ] 439 Rooming/Boarding House
- [ ] 449 Commerical Hotel or Motel
- [ ] 459 Residential, Board and Care
- [ ] 464 Dormitory/Barracks
- [ ] 519 Food and Beverage Sales
- [ ] 539 Household Goods, Sales, Repairs
- [ ] 571 Gas or Service Station
- [ ] 579 Motor Vehicle/Boat Sales/Repairs
- [ ] 599 Business Office
- [ ] 615 Electric-Generating Plant
- [ ] 629 Laboratory/Science Laboratory
- [ ] 700 Manufacturing Plant
- [ ] 819 Livestock/Poultry Storage (Barn)
- [ ] 882 Non-Residential Parking Garage
- [ ] 891 Warehouse

Outside

- [ ] 124 Playground or Park
- [ ] 655 Crops or Orchard
- [ ] 669 Forest (Timberland)
- [ ] 807 Outdoor Storage Area
- [ ] 919 Dump or Sanitary Landfill
- [ ] 931 Open Land or Field
- [ ] 936 Vacant Lot
- [ ] 938 Graded/Cared for Plot of Land
- [ ] 946 Lake, River, Stream
- [ ] 951 Railroad Right-of-Way
- [ ] 960 Other Street
- [ ] 961 Highway/Divided Highway
- [ ] 962 Residential Street/Driveway
- [ ] 981 Construction Site
- [ ] 984 Industrial Plant Yard

Property Use:

600-Ind., utility, defense, agriculture, mining, other

Description

Look up and enter a Property Use code and description only if you have NOT checked a Property Use box.

K1

Person/Entity Involved

Local Option	Person/Entity Type	Business Name (if applicable)	Phone Number
	Employee	Sanborn	[redacted]

Mr., Ms., Mrs.	First Name	MI	Last Name	Suffix
	Cole		Burman	

Number	Prefix	Street or Highway	Street Type	Suffix

Post Office Box	Apt./Suite/Room	City

State	Zip Code

K2

Owner

Local Option	Person/Entity Type	Business Name (if applicable)	Phone Number

Mr., Ms., Mrs.	First Name	MI	Last Name	Suffix

Number	Prefix	Street or Highway	Street Type	Suffix

Post Office Box	Apt./Suite/Room	City

State	Zip Code

L **Remarks:**

F3 PV - VISUAL OF SMOKE AND FIRE
RESP NAME [redacted]
COLE
POSS INSIDE THE FACILITY
ATTMPT C/B TO RESP
RESP OS ADVD THERE IS SMOKE AND FIRE ON THE PREMISE
KB1 - REQ WT FROM EDWARDS AFB
E14 - ACCESS FROM 58 TO THE FRONT GATE
EDWARDS AFB WT18 WILL BE NRT
E14 - OS IN THE SOLAR FIELD ASSUM + IC REDUCE ALL INCOM CODE 2
CORR* ASSUM SUNBORNE
CORRR**** SANBORNE IC********
IC - INVERTED BOX BTN PANELS IN THE FIELD STILL HAVE POWER CANH W/ CO14'S EQUIP
EDWARDS WAS ADVD TO CX

M **Authorization**

K0770	Baldwin, Trevor	Fire Captain		02/29/2024
Officer In Charge ID	Signature	Position or Rank	Assignment	Date
K0770	Baldwin, Trevor	Fire Captain		02/29/2024
Member Making Report ID	Signature	Position or Rank	Assignment	Date

NFIRS-2 Fire

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	29	2024	K14 (14)	2408967	0

B

Property Details

B1 ☐ Not Residential

Estimated number of residential living units in the building of origin whether or not all units became involved

B2 ☐ Buildings Not Involved

Number of buildings involved

B3 ☑ None ☐ Less than 1 acre

Acres burned (outside fires)

C

On-Site Materials Or Products

626-Electrical parts, supplies, equipment

On-site material (1)

On-Site Materials Storage Use

☐ 1 - Bulk Storage or warehousing
☐ 2 - Processing or manufacturing
☐ 3 - Packaged goods for sale
☐ 4 - Repair or service
☑ U - Undetermined

D

Ignition

D1 63-Switchgear area, transformer vault

Area of Fire Origin

D2 Undetermined

Heat Source

D3 Undetermined

Item First Ignited

D4

Type of Material First Ignited

E1

Cause of Ignition

☐ 1 - Intentional
☐ 2 - Unintentional
☑ 3 - Failure of Equipment or Heat Source
☐ 4 - Act of Nature
☐ 5 - Cause Under Investigation
☐ U - Cause Undetermined After Investigation

E2

Factors Contributing to Ignition

Undetermined

Factor Contributing to Ignition

E3

Human Factors Contributing to Ignition

Check all applicable boxes

☑ None
☐ 1 - Asleep
☐ 2 - Possibly impaired by alcohol or drugs
☐ 3 - Unattended person
☐ 4 - Possibly Mentally Disabled
☐ 5 - Physically Disabled
☐ 6 - Multiple Persons Involved

☐ 7 - Age Was A Factor

Estimated Age of Person Involved

☐ Male ☐ Female

F1

Equipment Involved In Ignition

☑

Equipment Involved

Brand

Model

Serial #

Year

F2

Equipment Power Source

☑

Equipment Power Source

F3

Equipment Portability

☐ 1 - Portable
☐ 2 - Stationary

Portable equipment normally can be moved by one or two persons.

G

Fire Suppression Factors

H1

Mobile Property Involved

☐ 1 - Not involved in ignition, but burned
☐ 2 - Involved in ignition, but did not burn
☐ 3 - Involved in ignition and burned
☑ None

H2

Mobile Property Type and Make

Mobile Property Type

Mobile Property Make

Mobile Property Model

Year

State

License Plate Number

VIN

Local Use

☐ Pre-Fire Plan Available
☐ Arson Report Attached
☐ Police Report Attached
☐ Coroner Report Attached
☐ Other Reports Attached

NFIRS-9 Apparatus or Resources

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	29	2024	K14 (14)	2408967	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: E13 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: E14 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: 02/29/2024 09:11 Clear: 02/29/2024 09:49	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	
ID: E15 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: KB1 Type: 92-Chief officer car	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: KB8 Type: 92-Chief officer car	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route
ID: MS15 Type: 76-ALS unit	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:13	☐ Sent	2	☐ Suppression ☑ EMS ☐ Other	
ID: SF3 Type: 00-Other apparatus/resource	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

NFIRS-10 Personnel

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	29	2024	K14 (14)	2408967	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E12 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1509	Van Surksum, Brandon	Firefighter		☐	☐
K1175	Bojorquez, Robert	Fire Engineer		☐	☐
K0822	Smith, Keegan	Fire Captain		☐	☐

ID: E13 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1667	Ball, Chandler	Firefighter		☐	☐
K1157	Estep, Craig	Fire Engineer		☐	☐
K0749	Anderson, Richard	Fire Captain		☐	☐

ID: E14 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: 02/29/2024 09:11 Clear: 02/29/2024 09:49	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0770	Baldwin, Trevor	Fire Captain		☐	☐
K0769	Buchanan, Daryl	Fire Engineer		☐	☐
K1415	Nelson, Mark	Firefighter		☐	☐

ID: E15 Type: 11-Engine	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1136	Ricker, Jacob	Fire Captain		☐	☐
K0975	Weitz, Joseph	Fire Engineer		☐	☐
K1610	Epperly, Joshua	Firefighter		☐	☐

ID: KB1 Type: 92-Chief officer car	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0614	Ostrinski, Kevin	Fire Battalion Chief		☐	☐

ID: KB8 Type: 92-Chief officer car	Dispatch: 02/29/2024 08:57 Arrival: Clear: 02/29/2024 09:12	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0788	Ratekin, Mark	Fire Battalion Chief		☐	☐

ID: MS15
Type: 76-ALS unit
Dispatch: 02/29/2024 08:57
Arrival:
Clear: 02/29/2024 09:13
☐ Sent
2
☐ Suppression
☑ EMS
☐ Other
☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0772	Niquete, Felipe	Fire Captain		☐	☐
K1593	Ayala-Garcia, Johnny	Firefighter		☐	☐

ID: SF3
Type: 00-Other apparatus/resource
Dispatch: 02/29/2024 08:57
Arrival:
Clear: 02/29/2024 09:12
☐ Sent
1
☑ Suppression
☐ EMS
☐ Other
93-Cancelled en route

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0710	Trammell, Jonathan	Fire Captain	5588010-Captain	☐	☐

NFIRS-1S Supplemental

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	02	29	2024	K14 (14)	2408967	0

Additional Narrative (#1 of 1):

E14 responded to a report of smoke and fire seen from the Sanborn Solar field on Lone Butte. E14 arrived at front gate and was led into the facility. E14 met with site operations manager Cole Burman and reduced all in coming code 2 while we investigated. This was the Sanborn fire and Co14 was Sanborn **I**C. Manager stated they had a fire in an invertor box in section S302. Fire was contained to the metal box(8'x10') and all employees were accounted for with no injuries. They had secured the area and everyone was at a safe distance. 14 advised Batt 1 that we could handle with 14's equipment. **I**t was determined that invertor box still had power to it and no water was going to be used to extinguish. Site manager was going to have his crew be on fire watch and wait till fire was out to be able to shut down the system. Facility was going to monitor and would call E14 back out if needed. No action taken and Batt 1 was notified.

Apparatus Narrative for E12:

Reduced to code 2 then cancelled.

Apparatus Narrative for SF3:

Cancelled en route

NFIRS-1 Basic

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	07	14	2024	K14 (14)	2431514	0

B **Location Type**

Census tract:

- [x] Street Address
- [ ] Intersection
- [ ] In Front Of
- [ ] Rear Of
- [ ] Adjacent To
- [ ] Directions
- [ ] US National Grid

Number	Prefix	Street or Highway	Street Type	Suffix
9900		LONE BUTTE	RD-Road	

Apt./Suite/Room	City	State	Zip Code
	Kern County	CA	93501

Cross Street: TROTTER AVE / UNNAMED

C **Incident Type**

120-Fire in mobile prop. used as a fixed struc., other

D **Aid Given Or Received**

- [ ] 1 Mutual Aid Received
- [ ] 2 Auto. Aid Received
- [ ] 3 Mutual Aid Given
- [ ] 4 Auto. Aid Given
- [ ] 5 Other Aid Given
- [x] None

Their FDID | Their State

Their Incident Number

E1 **Dates and Times**

Alarm	07	14	2024	17:02
Arrival	07	14	2024	17:24
Controlled				
Last Unit Cleared	07	14	2024	21:19

E2 **Shifts and Alarms**

Shift or Platoon	Alarms	District
A Shift		

E3 **Special Studies**

ID# | Value

F **Actions Taken**

00-Action taken, other

Primary Action Taken

G1 **Resources**

- [x] Apparatus or Personnel Module is used.

	Apparatus	Personnel
Suppression	4	8
EMS	0	0
Other	1	7

- [ ] Resource counts include aid received resources.

G2 **Estimated Dollar Losses and Values**

Losses:	Required for all fires if known. Optional for all non-fires.	None
Property:	$ 2,000,000.00	[ ]
Contents:	$ 2,000,000.00	[ ]
Pre-Incident Values: Optional		None
Property:	$ 2,000,000.00	[ ]
Contents:	$ 2,000,000.00	[ ]

Completed Modules

- [ ] 2 - Fire
- [ ] 3 - Structure Fire
- [ ] 4 - Civilian Fire Cas.
- [ ] 5 - Fire Service Cas.
- [ ] 6 - EMS
- [ ] 7 - HazMat
- [ ] 8 - Wildland Fire
- [ ] 9 - Apparatus
- [ ] 10 - Personnel
- [ ] 11 - Arson

H1 **Casualties** [x] None

	Deaths	Injuries
Fire Service	0	0
Civilian	0	0

H2 **Detector**

Required for Confined Fires

- [x] 1 - Detector Alerted Occupants
- [ ] 2 - Detector Did Not Alert Them
- [ ] 3 - Unknown

H3

Hazardous Materials Release

- [ ] 1 - Natural Gas
- [ ] 2 - Propane Gas
- [ ] 3 - Gasoline
- [ ] 4 - Kerosene
- [ ] 5 - Diesel Fuel / Fuel Oil
- [ ] 6 - Household Solvents
- [ ] 7 - Motor Oil
- [ ] 8 - Paint
- [ ] 0 - Other
- [x] None

I **Mixed Use Property**

- [x] Not Mixed
- [ ] 10 - Assembly Use
- [ ] 20 - Education Use
- [ ] 33 - Medical Use
- [ ] 40 - Residential Use
- [ ] 51 - Row Of Stores
- [ ] 53 - Enclosed Mall
- [ ] 58 - Business and Residential
- [ ] 59 - Office Use
- [ ] 60 - Industrial Use
- [ ] 63 - Military Use
- [ ] 65 - Farm Use
- [ ] 00 - Other Mixed Use

J **Property Use** [ ] None

Structures

- [ ] 131 Church, Place of Worship
- [ ] 161 Restaurant or Cafeteria
- [ ] 162 Bar/Tavern or Nightclub
- [ ] 213 Elementary School, Kindegarten
- [ ] 215 High School, Junior High
- [ ] 241 College, Adult Education
- [ ] 311 Nursing Home
- [ ] 331 Hospital
- [ ] 341 Clinic, Clinic-Type Infirmary
- [ ] 342 Doctor/Dentist Office
- [ ] 361 Prison or Jail, Not Juvenile
- [ ] 419 1- or 2-Family Dwelling
- [ ] 429 MultiFamily Dwelling
- [ ] 439 Rooming/Boarding House
- [ ] 449 Commerical Hotel or Motel
- [ ] 459 Residential, Board and Care
- [ ] 464 Dormitory/Barracks
- [ ] 519 Food and Beverage Sales
- [ ] 539 Household Goods, Sales, Repairs
- [ ] 571 Gas or Service Station
- [ ] 579 Motor Vehicle/Boat Sales/Repairs
- [ ] 599 Business Office
- [x] 615 Electric-Generating Plant
- [ ] 629 Laboratory/Science Laboratory
- [ ] 700 Manufacturing Plant
- [ ] 819 Livestock/Poultry Storage (Barn)
- [ ] 882 Non-Residential Parking Garage
- [ ] 891 Warehouse

Outside

- [ ] 124 Playground or Park
- [ ] 655 Crops or Orchard
- [ ] 669 Forest (Timberland)
- [ ] 807 Outdoor Storage Area
- [ ] 919 Dump or Sanitary Landfill
- [ ] 931 Open Land or Field
- [ ] 936 Vacant Lot
- [ ] 938 Graded/Cared for Plot of Land
- [ ] 946 Lake, River, Stream
- [ ] 951 Railroad Right-of-Way
- [ ] 960 Other Street
- [ ] 961 Highway/Divided Highway
- [ ] 962 Residential Street/Driveway
- [ ] 981 Construction Site
- [ ] 984 Industrial Plant Yard

Property Use:

Description

Look up and enter a Property Use code and description only if you have NOT checked a Property Use box.

K2

Owner

Local Option	Person/Entity Type	Business Name (if applicable)	Phone Number

Mr., Ms., Mrs.	First Name	MI	Last Name	Suffix

Number	Prefix	Street or Highway	Street Type	Suffix

Post Office Box	Apt./Suite/Room	City

State	Zip Code

L **Remarks:**

E3 FCP1 31A-4 HIGH GAS ALARM , PUMP RUNNING 31-A4 FIRE ALARM PLANT 3 --- NO RESETS
EDWARDS E-1A & E-13[redacted]
START 2 ENG , HAZ MAT TO MONITOR
KB1- ENRT, NTF SAFETY14- ON SCN, 1 HEAVY SMK SHOW
IC- GO TO LONE BUTTE ENRT
KB1 - NTFY ENV HEALTH, HAVE THEM NTFY US EPA
KB1 - START ENV HEALTH
ENV HEALTH ADVD WILL CALL E14 CELL
ALARM CO ADVD ZONE E-3FCP1 31A3 HIGH GAS ALARM ZONE 3BF
IC - 1 CONTAINER FREE BURNING STAGE, VENTED OUT OF BOTH SIDES
Fire contained to original container, no exposures threatened.

M **Authorization**

Officer In Charge ID	Signature	Position or Rank	Assignment	Date
K0784	Kingsbury, Byron	Fire Captain		07/15/2024

Member Making Report ID	Signature	Position or Rank	Assignment	Date
K0784	Kingsbury, Byron	Fire Captain		07/15/2024

NFIRS-2 Fire

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	07	14	2024	K14 (14)	2431514	0

B

Property Details

B1 ☐ Not Residential

Estimated number of residential living units in the building of origin whether or not all units became involved

B2 ☐ Buildings Not Involved

Number of buildings involved

B3 ☑ None ☐ Less than 1 acre

Acres burned (outside fires)

C

On-Site Materials Or Products

626-Electrical parts, supplies, equipment

On-site material (1)

On-Site Materials Storage Use

☑ 1 - Bulk Storage or warehousing
☐ 2 - Processing or manufacturing
☐ 3 - Packaged goods for sale
☐ 4 - Repair or service
☐ U - Undetermined

D

Ignition

D1 00-Other area of fire origin

Area of Fire Origin

D2 10-Heat from powered equipment, other

Heat Source

D3 81-Electrical wire, cable insulation

Item First Ignited

D4

Type of Material First Ignited

E1

Cause of Ignition

☐ 1 - Intentional
☐ 2 - Unintentional
☑ 3 - Failure of Equipment or Heat Source
☐ 4 - Act of Nature
☐ 5 - Cause Under Investigation
☐ U - Cause Undetermined After Investigation

E2

Factors Contributing to Ignition

20-Mechanical failure, malfunction, other

Factor Contributing to Ignition

E3

Human Factors Contributing to Ignition

Check all applicable boxes

☑ None
☐ 1 - Asleep
☐ 2 - Possibly impaired by alcohol or drugs
☐ 3 - Unattended person
☐ 4 - Possibly Mentally Disabled
☐ 5 - Physically Disabled
☐ 6 - Multiple Persons Involved

☐ 7 - Age Was A Factor

Estimated Age of Person Involved

☐ Male ☐ Female

F1

Equipment Involved In Ignition

☑

Equipment Involved

Brand

Model

Serial #

Year

F2

Equipment Power Source

☑

Equipment Power Source

F3

Equipment Portability

☐ 1 - Portable
☐ 2 - Stationary

Portable equipment normally can be moved by one or two persons.

G

Fire Suppression Factors

H1

Mobile Property Involved

☐ 1 - Not involved in ignition, but burned
☐ 2 - Involved in ignition, but did not burn
☐ 3 - Involved in ignition and burned
☑ None

H2

Mobile Property Type and Make

Mobile Property Type

Mobile Property Make

Mobile Property Model

Year

State

License Plate Number

VIN

Local Use

☐ Pre-Fire Plan Available
☐ Arson Report Attached
☐ Police Report Attached
☐ Coroner Report Attached
☐ Other Reports Attached

NFIRS-3 Structure Fire

I1

Structure Type

- [x] 1 - Enclosed Building
- [ ] 2 - Portable/Mobile Structure
- [ ] 3 - Open Structure
- [ ] 4 - Air-Supported Structure
- [ ] 5 - Tent
- [ ] 6 - Open Platform
- [ ] 7 - Underground Structure
- [ ] 8 - Connective Structure
- [ ] 0 - Other

I2

Building Status

- [ ] 1 - Under Construction
- [x] 2 - In Normal Use
- [ ] 3 - Idle, Not Routinely Used
- [ ] 4 - Under Major Renovation
- [ ] 5 - Vacant and Secured
- [ ] 6 - Vacant and Unsecured
- [ ] 7 - Being Demolished
- [ ] 0 - Other
- [ ] U - Undetermined

I3

Building Height

1
Number of Stories At/Above Grade

0
Number of Stories Below Grade

I4

Main Floor Size

300
Total Square Feet

OR

____ BY ____
Length (ft) X Width (ft)

J1

Fire Origin

1 [ ] Below Grade
Story of Fire Origin

J2

Fire Spread

- [ ] Confined to Object of Origin
- [ ] 2 - Confined to Room of Origin
- [ ] 3 - Confined to Floor of Origin
- [x] 4 - Confined to Building of Origin
- [ ] 5 - Beyond Building of Origin

J3

Number of Stories Damaged By Flame

____ Number of Stories w/Minor Damage (1-24%)
____ Number of Stories w/Significant Damage (25-49%)
____ Number of Stories w/Heavy Damage (50-74%)
____ Number of Stories w/Extreme Damage (75-100%)

*Count the roof as part of the highest story

K

Type of Material Contributing Most to Flame Spread

K1 __
Item Contributing Most to Flame Spread

K2 __
Type of Material Contributing Most To Flame Spread

L1

Presence of Detectors

- [ ] N - None Present
- [x] 1 - Present
- [ ] U - Undetermined

L2

Detector Type

- [ ] 1 - Smoke
- [ ] 2 - Heat
- [ ] 3 - Combination of Smoke and Heat
- [x] 4 - Sprinkler, Water Flow Detection
- [ ] 5 - More Than One Type Present
- [ ] 0 - Other
- [ ] U - Undetermined

L3

Detector Power Supply

- [ ] 1 - Battery Only
- [ ] 2 - Hardwire Only
- [ ] 3 - Plug-In
- [ ] 4 - Hardwire With Battery
- [ ] 5 - Plug-In With Battery
- [ ] 6 - Mechanical
- [x] 7 - Multiple Detectors & Power Supplies
- [ ] 0 - Other
- [ ] U - Undetermined

L4

Detector Operation

- [ ] 1 - Fire Too Small To Activate
- [x] 2 - Operated
- [ ] 3 - Failed To Operate
- [ ] U - Undetermined

L5

Detector Effectiveness

- [ ] 1 - Alerted Occupants, Occupants Responded
- [ ] 2 - Alerted Occupants, Occupants Failed to Respond
- [x] 3 - There Were No Occupants
- [ ] 4 - Failed to Alert Occupants
- [ ] U - Undetermined

L6

Detector Failure Reason

- [ ] 1 - Power Failure, Shutoff, or Disconnect
- [ ] 2 - Improper Installation or Placement
- [ ] 3 - Defective
- [ ] 4 - Lack of Maintenance, Dirty
- [ ] 5 - Battery Missing or Disconnected
- [ ] 6 - Battery Discharged or Dead
- [ ] 0 - Other
- [ ] U - Undetermined

M1

Presence of Automatic Extinguishing System

- [ ] N - None Present
- [x] 1 - Present
- [ ] 2 - Partial System Present
- [ ] U - Undetermined

M2

Type of Automatic Extinguishing System

- [x] 1 - Wet-Pipe Sprinkler
- [ ] 2 - Dry-Pipe Sprinkler
- [ ] 3 - Other Sprinkler System
- [ ] 4 - Dry Chemical System
- [ ] 5 - Foam System
- [ ] 6 - Halogen-Type System
- [ ] 7 - Carbon Dioxide System
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range of AES

M3

Operation of Automatic Extinguishing System

- [x] 1 - Operated/Effective
- [ ] 2 - Operated/Not Effective
- [ ] 3 - Fire Too Small To Activate
- [ ] 4 - Failed To Operate
- [ ] 0 - Other
- [ ] U - Undetermined

Required if fire was within designed range

M4

Number of Sprinkler Heads Operating

4
Required if system operated

M5

Reason for Automatic Extinguishing System Failure

- [ ] 1 - System Shut Off
- [ ] 2 - Not Enough Agent Discharged
- [ ] 3 - Agent Discharged But Did Not Reach Fire
- [ ] 4 - Wrong Type of System
- [ ] 5 - Fire Not In Area Protected
- [ ] 6 - System Components Damaged
- [ ] 7 - Lack of Maintenance
- [ ] 8 - Manual Intervention
- [ ] 0 - Other
- [ ] U - Undetermined

Required if system failed or not effective

NFIRS-9 Apparatus or Resources

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	07	14	2024	K14 (14)	2431514	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E14 Type: 11-Engine	Dispatch: 07/14/2024 17:02 Arrival: 07/14/2024 17:24 Clear: 07/14/2024 21:19	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	
ID: E15 Type: 11-Engine	Dispatch: 07/14/2024 17:34 Arrival: 07/14/2024 17:51 Clear: 07/14/2024 19:02	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	73-Provide manpower
ID: HM65 Type: 93-HazMat unit	Dispatch: 07/14/2024 17:37 Arrival: Clear: 07/14/2024 18:30	☐ Sent	7	☐ Suppression ☐ EMS ☑ Other	81-Incident command
ID: KB1 Type: 92-Chief officer car	Dispatch: 07/14/2024 17:34 Arrival: 07/14/2024 18:09 Clear: 07/14/2024 19:30	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	
ID: SF1 Type: 00-Other apparatus/resource	Dispatch: 07/14/2024 17:36 Arrival: Clear: 07/14/2024 18:39	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	

NFIRS-10 Personnel

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	07	14	2024	K14 (14)	2431514	0

B **Apparatus/Resource**	Dates/Times	Sent	Number of People	Apparatus Use	Actions Taken
ID: E14 Type: 11-Engine	Dispatch: 07/14/2024 17:02 Arrival: 07/14/2024 17:24 Clear: 07/14/2024 21:19	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K1589	Heffner, Zachary	Firefighter		☐	☐
K0784	Kingsbury, Byron	Fire Captain		☐	☐
K1100	Fox, Ryan	Fire Captain		☐	☐

ID: E15 Type: 11-Engine	Dispatch: 07/14/2024 17:34 Arrival: 07/14/2024 17:51 Clear: 07/14/2024 19:02	☐ Sent	3	☑ Suppression ☐ EMS ☐ Other	73-Provide manpower

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0834	Filion, Nathan	Fire Captain		☐	☐
K0975	Weitz, Joseph	Fire Engineer		☐	☐
K1610	Epperly, Joshua	Firefighter		☐	☐

ID: HM65 Type: 93-HazMat unit	Dispatch: 07/14/2024 17:37 Arrival: Clear: 07/14/2024 18:30	☐ Sent	7	☐ Suppression ☐ EMS ☑ Other	81-Incident command

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0632	Theobald, Roger	Fire Captain		☐	☐
K1454	Lowe, Chad	Fire Engineer		☐	☐
K0689	Stroub, Christopher	Fire Captain		☐	☐
K1189	Taylor, Justin	Firefighter		☐	☐
K0888	Pudiwitr, Dustin	Fire Engineer		☐	☐
K1401	Schultz, Joshua	Fire Engineer		☐	☐
K1557	Beaty, Cole	Firefighter		☐	☐

ID: KB1 Type: 92-Chief officer car	Dispatch: 07/14/2024 17:34 Arrival: 07/14/2024 18:09 Clear: 07/14/2024 19:30	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0984	Harris, Zachary	Fire Battalion Chief		☐	☐

ID: SF1 Type: 00-Other apparatus/resource	Dispatch: 07/14/2024 17:36 Arrival: Clear: 07/14/2024 18:39	☐ Sent	1	☑ Suppression ☐ EMS ☐ Other	☐

Personnel ID	Name	Rank	Role	Attend	Actions Taken
K0782	Sanchez, Greg	Fire Captain	5588010-Captain	☐	☐

NFIRS-1S Supplemental

A

FDID	State	Month	Day	Year	Station	Number	Exposure
15010	CA	07	14	2024	K14 (14)	2431514	0

Additional Narrative (#1 of 1):

E14 responded to a fire alarm at 9900 Lone Butte road, which is a solar and energy storage facility. E14 was led in by an on scene maintenance worker. Upon approaching the B.E.S.S. Area of the facility, smoke was visible from a distance. Crews remained upwind and stayed at a safe distance to identify that there was a fire in one of the units. A structure response was then started. The wind was out of the west pushing the smoke east where there were no homes for 20 to 30 miles. With the arrival of the site S.M.Es, a plan would be put into place to shut down the fire pump before the tank would run dry. When the smoke started to dissipate, crews went to the fire pump which was located upwind from the involved unit, and were able to shut it off. The water supply tank was found empty. At that time the pump had been running for 1 and half hours. E14 remained on scene with the facility employees until Fire prevention and Kern County Health Department arrived.

Apparatus Narrative for E15:

E15 staged on-scene and then released by IC

ATTACHMENT 21

LETTER FROM MARIN CLEAN ENERGY STATING THAT HUMIDOR GENERATION HAS BEEN PURCHASED TO SERVE ELECTRICAL CUSTOMERS IN NORTHERN CALIFORNIA.

MCE Empowering Our Clean Energy Future

CONTRA COSTA | MARIN | NAPA | SOLANO

MARIN COUNTY | NAPA COUNTY | UNINCORPORATED CONTRA COSTA COUNTY | UNINCORPORATED SOLANO COUNTY
BENICIA | CONCORD | DANVILLE | EL CERRITO | FAIRFIELD | LAFAYETTE | MARTINEZ | MORAGA | OAKLEY
PINOLE | PITTSBURG | PLEASANT HILL | RICHMOND | SAN PABLO | SAN RAMON | VALLEJO | WALNUT CREEK

Dear Los Angeles County Board of Supervisors,

MCE supports the Los Angeles County staff recommendation to grant the Hecate Grid Humidor energy storage project a franchise agreement to utilize the Los Angeles County ROW.

MCE will be purchasing resource adequacy from the 300-megawatt Humidor project once it is online. Resource adequacy is a type of energy resource that provides additional energy supply during times when the grid is strained. This helps reduce outages and lowers the need for use of fossil-fuel peaker plants during these events, which are most often caused by extreme heat events.

The Hecate Grid Humidor project is expected to be a helpful resource in reducing the risk of power outages and improving air quality in the Los Angeles area. The project is a material part of MCE's near-term procurement plan and will contribute significantly to meet the ever-growing need for clean, reliable energy in California.

MCE fully supports the franchise agreement to utilize the LA County ROW for the Hecate Grid Humidor energy storage project for its ability to reduce greenhouse gas emissions, improve air quality in LA, and reduce the risk of outages for customers across the state. We welcome any questions about this project and MCE's role.

Sincerely,

Dawn Weisz
CEO, MCE

ATTACHMENT 22

ARTICLE ADDRESSING LFP BESS FROM PV MAGAZINE.

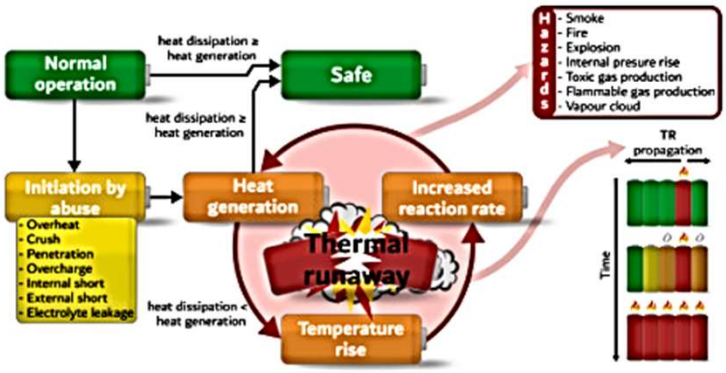
https://www.pv-magazine.com/2024/04/10/how-safe-are-lithium-iron-phosphate-batteries/

How safe are lithium iron phosphate batteries?

Researchers in the United Kingdom have analyzed lithium-ion battery thermal runaway off-gas and have found that nickel manganese cobalt (NMC) batteries generate larger specific off-gas volumes, while lithium iron phosphate (LFP) batteries are a greater flammability hazard and show greater toxicity, depending on relative state of charge (SOC).

APRIL 10, 2024 MARIJA MAISCH

DISTRIBUTED STORAGE | ELECTRIC VEHICLES | ENERGY STORAGE | TECHNOLOGY | TECHNOLOGY AND R&D | UTILITY SCALE STORAGE | UNITED KINGDOM



Thermal runaway from initiation to propagation and resulting hazards

Image: Creative Commons CC BY 4.0

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It is often said that LFP batteries are safer than NMC storage systems, but recent research suggests that this is an overly simplified view.

In the rare event of catastrophic failure, the off-gas from lithium-ion battery thermal runaway is known to be flammable and toxic, making it a serious safety concern. But while off-gas generation has been widely investigated, until now there has been no comprehensive review on the topic.

In a new paper, researchers from the University of Sheffield, Imperial College London, and the University of St Andrews in the United Kingdom have conducted a detailed meta-analysis of 60 papers to investigate the most influential battery parameters and the probable off-gas characteristics to determine what kind of battery would be least hazardous.

They have found that while NMC batteries release more gas than LFP, but that LFP batteries are significantly more toxic than NMC ones in absolute terms.

Toxicity varies with state of charge (SOC). Generally, a higher SOC leads to greater specific gas volume generation.

When comparing the previous findings for both chemistries, the researchers found that LFP is more toxic at lower SOC, while NMC is more toxic at higher SOC. Namely, while at higher SOC LFP is typically shown to produce less off-gas than other chemistries, at lower SOC volumes can be comparable between chemistries, but in some cases LFP can generate more.

Prismatic cells also tend to generate larger specific off-gas volumes than offer cell forms.

The composition of off-gas on average is very similar between NMC and LFP cells, but LFP batteries have greater hydrogen content, while NMC batteries have greater carbon monoxide content.

To assess the fire hazard of each chemistry, the researchers calculated and compared the lower flammability limit (LFL) of the off-gasses. They have found that LFL for LFP and NMC are 6.2% and 7.9% (in an inert atmosphere) respectively. Given the LFL and the median off-gas volumes produced, LFP cells breach the LFL in a volume 18% smaller than NMC batteries.

"Hence LFP presents a greater flammability hazard even though they show less occurrence of flames in cell thermal runaway tests," the researchers said.

They discussed their findings in "Review of gas emissions from lithium-ion battery thermal runaway failure – Considering toxic and flammable compounds," which was recently published in the *Journal of Energy Storage*.

Popular content

Powerchina switches on 100 MW solar tower in South Africa

25 SEPTEMBER 2024

Powerchina has switched on a 100 MW solar tower in South Africa. The concentrated solar power (CSP) project will supply 480 GWh of clean energy to the...

Share

MARIJA MAISCH

Marija has years of experience in a news agency environment and writing for print and online publications. She took over as the editor of pv magazine Australia in 2018 and helped establish its online presence over a two-year period.

More articles from Marija Maisch

ATTACHMENT 23

LFP BESS SAFETY DATA SHEET.

battery energy
power solutions for tomorrow's world

EnerLIFE

Safety Data Sheet

SUMMARY: This SDS is intended for several ranges of Battery Energy Lithium type batteries.

20 July 2022

BE-GE-SDS018-Rev3

Section 1 - Identification of the Material and Supplier

Battery Energy Power Solutions Pty Ltd
96 Fairfield Street
Fairfield NSW, 2165, AUSTRALIA

Phone: (02) 9681 3633
Fax: (02) 9632 4622
Email: customer.service@batteryenergy.com.au

Trade Name:	**EnerLIFE**
Other Names:	This SDS is intended for several ranges of Lithium Iron Phosphate Rechargeable Battery.
Product Code:	A variety of codes - see table at the end of this SDS
Product Use:	Lithium Iron Phosphate batteries for use in electric storage and solar energy installations. (Electric storage Battery)
Creation Date:	**October, 2019**
This version issued:	**October, 2022** and is valid for 5 years from this date.

Poisons Information Centre: Phone 13 1126 from anywhere in Australia

Section 2 - Hazards Identification

Statement of Hazardous Nature

Based on OSHA 29 CFR 1910.1200, these products meet the definition of an "article" and they are not subject to the hazards normally associated with the individual components when used as intended.

DG Classification: Class 9: Miscellaneous Dangerous Goods.
UN Number: 3480 Lithium ion Batteries



GHS Signal word: DANGER

CAS No: 1333-86-4

CLASSIFICATION ACCORDING TO GHS

Self-heating substances and mixtures (1)
Carcinogenicity (2)
Specific target organ toxicity, repeated exposure (1) (lung)

HAZARD STATEMENTS:

H251: Self-heating; may catch fire.
H351: Suspected of causing cancer.
H372: Causes damage to organs through prolonged or repeated exposure (lung).

PREVENTION:

P235: Keep cool.
P201: Obtain special instructions before use.
P202: Do not handle until all safety precautions have been read and understood.
P280: Wear protective gloves, protective clothing, eye protection and face protection.
P260: Do not breathe dust.
P264: Wash skin and clothing thoroughly after handling.
P270: Do not eat, drink or smoke when using this product.

RESPONSE:

P308 + P313: If exposed seek medical attention.
P314: Seek medical attention if you feel unwell.

STORAGE:

P407: Maintain air gap between stacks or pallets.
P413: Store bulk masses greater than …kg/…lbs at temperatures not exceeding …C.
P420: Store separately.
P405: Store locked up.

DISPOSAL:

P501: Contents require disposal at approved waste treatment plants.

Poisons Information Centre: 13 1126 from anywhere in Australia, (0800 764 766 in New Zealand)

Battery Energy Power Solutions Pty Ltd A.B.N. 83 003 325 139
96 Fairfield Street, FAIRFIELD NSW 2165

CAS No: 7440-50-8

CLASSIFICATION ACCORDING TO GHS

Sensitisation skin (1, 1A, 1B)

Specific target organ toxicity, single exposure (1) (digestive system)

Specific target organ toxicity, single exposure; Respiratory tract irritation (30)

HAZARD STATEMENTS:

H317: May cause allergic skin reaction.

H370: Causes damage to organs (digestive system).

H335: May cause respiratory irritation.

PREVENTION:

P260: Do not breathe dust, fume.

P272: Contaminated work clothing should not be allowed out of the workplace.

P280: Wear protective gloves, eye protection, face protection.

P264: Wash skin and clothing thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

RESPONSE:

P302+P352: IF ON SKIN: Wash with plenty of water.

P333 + P313: If skin irritation or rash occurs: Seek medical attention.

P321: Specific treatment (See additional emergency instructions).

P362 + P364: Take off contaminated clothing and wash it before reuse.

P308 + P311: IF exposed or concerned: Call a POISION CONTROL CENTER.

P312: Call a POISION CENTER if you feel unwell.

STORAGE:

P403 + P233: Store in a well-ventilated place, keep container tightly closed.

P405: Store locked up.

DISPOSAL:

P501: Contents handling to approved waste treatments.

CAS No: 7429-90-5

CLASSIFICATION ACCORDING TO GHS

Substances and mixtures which, in contact with water, emit flammable gases (2, 3)

Specific target organ toxicity, repeated exposure (1) (Lung)

Hazardous to the aquatic environment, long-term hazard (4)

HAZARD STATEMENTS:

H261: In contact with water releases flammable gas.

H372: Causes damage to organs through prolonged or repeated exposure (Lung).

H413: May cause long lasting harmful effects to aquatic life.

PREVENTION:

P223: Do not allow contact with water.

P231 + P232: Handle and store contents under inert gas, protect with moisture.

P280: Wear protective gloves and clothing thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P273: Avoid release to the environment.

RESPONSE:

P302 + P335 + P334: IF ON SKIN: Brush off loose particles from skin and immerse in cool water.

P370 _ P378: In case of fire: use the appropriate media to put out the fire.

P314: Seek medical attention if you feel unwell.

STORAGE:

P402 + P404: Store in a dry place. Store in a closed container.

DISPOSAL:

P501: Contents handling to approved waste treatment plants.

Emergency Overview

This product contains a chemical substance. Safety information is given for exposure to the product as sold. Intended use of the product should not result in exposure to the chemical substance. This is a battery. In case of rupture, the above hazards exist (see section 2).

Section 3 - Composition/Information on Ingredients

Ingredients	CAS No	Wt %
Lithium Iron Phosphate (LifePO4)	15365-14-7	38.09
Carbon	1333-86-4	13.97
Copper	7440-50-8	14.73
Aluminium	7429-90-5	7.65
Aluminium Laminated Film	N/A	5.0
Electrolyte	N/A	22.95
Separator	N/A	2.0
Tab (other)	N/A	2.0

NOTE: CAS Number is Chemical Abstract Service Registry Number
N/A: Not applicable

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Section 4 - First Aid Measures

Eye	Do not rub eyes. Immediately flush eyes with water continuously for at 15 minutes. Seek medical attention.
Skin	Remove contaminated clothes and shoes immediately. Wash off extraneous matter or contact region with soap and plenty of water.
Inhalation	Remove from exposure and move to fresh air immediately. Use oxygen if available.
Ingestion	Induce vomiting, unless patient is unconscious. Call a physician.

Section 5 - Fire Fighting Measures

Characteristics of Hazard	Dusts at sufficient concentrations can form explosive mixtures with air. Combustion generates toxic fumes.
Hazard Combustion Products	Carbon dioxide.
Fire-extinguishing Methods and Extinguishing Media	For small fires, use water spray, dry chemical, carbon dioxide or chemical foam.
Attention in Fire-extinguishing	Wear self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Poisons Information Centre: 13 1126 from anywhere in Australia, (0800 764 766 in New Zealand)

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Section 6 - Accidental Release Measures

Personal Precautions, protective equipment, and emergency procedures	In case of rupture. Attention! Corrosive material. Avoid contact with skin, eyes and clothing. Ensure adequate ventilation. Use personal protective equipment as required. Evacuate personnel to safe areas. Keep people away from and upwind of spill/ leak.
Environmental Precautions	Prevent product from contaminating soil and from entering sewers or waterways.
Methods and materials for Containment	Stop the leak if safe to do so. Contain the spilled liquid with dry sand or earth. Clean up spills immediately.

Section 7 - Handling and Storage

Handling: The battery may explode or cause burns if disassembled, crushed or exposed to fire or high temperatures. Do not short or install with incorrect polarity. Accidental short circuit for a few seconds will not seriously affect the battery. However, this battery is capable of delivering very high short circuit currents. Prolonged short circuits will cause high temperature that can cause skin burns. Sources of short circuits include jumbled batteries in bulk containers, and metal covered tables or metal belts used for assembly of batteries into devices. If soldering or welding to the battery is required, use of tab lead on the batteries is recommended. Do not open the battery. The negative electrode material may be inflammable. Should an individual cell from a battery become disassembled, spontaneous combustion of the negative electrode is possible. There can be a delay between exposure to air and spontaneous combustion.

Storage: Store in a cool, dry and well ventilated area. Keep them away from incompatible substances. Store locked up. In case of rupture, handle in accordance with good industrial hygiene and safety practice. Avoid contact with skin, eyes or clothing. Use personal protection equipment.

Section 8 - Exposure Controls and Personal Protection

The following Australian Standards will provide general advice regarding safety clothing and equipment: Respiratory equipment: **AS/NZS 1715**, Protective Gloves: **AS 2161**, Occupational Protective Clothing: AS/NZS 4501 set 2008, Industrial Eye Protection: **AS1336** and **AS/NZS 1337**, Occupational Protective Footwear: **AS/NZS2210**.

No special equipment is usually needed when occasionally handling small quantities. The following instructions are for bulk handling or where regular exposure in an occupational setting occurs without proper containment systems.

Ventilation: Use adequate ventilation to keep airborne concentrations low. Otherwise, no special ventilation requirements are normally necessary for this product. However make sure that the work environment remains clean and that dusts are minimised.

Eye Protection: Use goggles or protective glasses designed to protect against liquid splashes. Emergency eye wash facilities must also be available in an area close to where this product is being used.

Skin and body Protection: None required for consumer use. If there is a Hazard of contact, wear protective gloves and protective clothing.

Protective Material Types: We suggest that protective clothing be made from the following materials: neoprene or PVC.

Respiratory Protection: No protective equipment is needed under normal use conditions. If exposure limits are exceeded or irritation is experienced, ventilation and evacuation may be required.

Safety deluge showers should, if practical, be provided near to where this product is being handled commercially.

Section 9 - Physical and Chemical Properties:

Appearance/ State:	Cylindrical - Solid
Odour:	No odour.
Boiling Point:	N/A
Volatiles:	N/A
Specific Gravity:	N/A
Water Solubility:	N/A unless individual components exposed.
pH:	N/A
Vapour Pressure:	N/A
Relative Density:	N/A unless individual components exposed.
Flash Point:	N/A unless individual components exposed.
Flammability:	N/A unless individual components exposed.

Section 10 - Stability and Reactivity

Reactivity: No data available.

Stability: Stable under recommended storage conditions, and during normal operation.

Conditions to Avoid: Exposure to air or moisture over prolonged periods.

Incompatible materials: Acids, Oxidizing agents, Bases.

Hazardous Decomposition Products: Carbon dioxide, carbon monoxide, lithium oxide fumes.

Section 11 - Toxicological Information

Irritation: In case of exposure to internal contents, vapour fumes may be very irritating to the eyes and skin

Sensitisation: No data available

Reproductive Toxicity: No data available

Section 12 - Ecological Information

Do not allow undiluted product or large quantities of it reach water course or sewage system.

Section 13 - Disposal Considerations

Disposal: Recycle or dispose of in accordance with government, state and local regulations. Deserted batteries shouldn't be treated as ordinary trash or thrown into fire or placed in high temperature. Shouldn't be dissected, pierced, crushed or treated similarly.

Best disposal method is recycling.

Section 14 - Transport Information

Dangerous according to IATA criteria

UN Number: 3480, Lithium ion Batteries
Dangerous Goods Class: Class 9: Miscellaneous Dangerous Goods.
Packing Group: No packing group specified.
Packing Instruction: PI 965

Special precautions which a user needs to be aware of, or needs to comply with, in connection with transport or conveyance either within or outside their premises;

ICAO / IATA: Can be shipped by air in accordance with International Civil Aviation Organization (ICAO), TI or International Air Transport Association (IATA), DGR Packing Instructions (PI) 965 Section IB appropriate of IATA DGR 60th (2019 Edition) for transportation.

Section 15 - Regulatory Information

Dangerous Goods Regulations

National Fire Protection Association (NFPA)

National Paint & Coatings Association/ Hazardous Materials Identification System (NPCA/HMIS)

National Toxicology Program (NTP)

Occupational Safety and Health Administration (OSHA)

Recommendations on the Transport of Dangerous Goods-Manual of Tests and Criteria International Air Transport Association (IATA)

Toxic Substance Control Act (TSCA) Code of Federal Regulations In accordance with all Federal, State and local laws

Section 16 - Other Information

This SDS contains only safety-related information. For other data see product literature.

Acronyms:

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail (7th edition)
AICS	Australian Inventory of Chemical Substances
SWA	Safe Work Australia, formerly ASCC and NOHSC
CAS number	Chemical Abstracts Service Registry Number
Hazchem Code	Emergency action code of numbers and letters that provide information to emergency services especially firefighters
IARC	International Agency for Research on Cancer
NOS	Not otherwise specified
NTP	National Toxicology Program (USA)
R-Phrase	Risk Phrase
SUSMP	Standard for the Uniform Scheduling of Medicines & Poisons
UN Number	United Nations Number

Section 16 - Other Information

THIS SDS SUMMARISES OUR BEST KNOWLEDGE OF THE HEALTH AND SAFETY HAZARD INFORMATION OF THE PRODUCT AND HOW TO SAFELY HANDLE AND USE THE PRODUCT IN THE WORKPLACE. EACH USER MUST REVIEW THIS SDS IN THE CONTEXT OF HOW THE PRODUCT WILL BE HANDLED AND USED IN THE WORKPLACE.

IF CLARIFICATION OR FURTHER INFORMATION IS NEEDED TO ENSURE THAT AN APPROPRIATE RISK ASSESSMENT CAN BE MADE, THE USER SHOULD CONTACT THIS COMPANY SO WE CAN ATTEMPT TO OBTAIN ADDITIONAL INFORMATION FROM OUR SUPPLIERS

BATTERY ENERGY POWER SOLUTIONS PTY LTD MAKES NO WARRANTY OR MERCHANTABILITY, FITNESS FOR PURPOSE OR ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO SUCH INFORMATION AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. FOR THIS AND OTHER REASONS, WE DO NOT ASSUME RESPONSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THE PRODUCT.

Please read all labels carefully before using product.

This SDS is prepared in accord with the SWA document “Preparation of Safety Data Sheets for Hazardous Chemicals - Code of Practice” (Feb 2016)

Section 16 - Other Information

Type	Volts	C/10	Height (mm)	Length (mm)	Width (mm)	Weight (kg)	Bolt size	Case material
BESS 48-80	48	80	222	460	240	36	Surelock	Steel
BESS 48-100 GenIII	48	100	317	558	170	45	Surelock	Steel
BESS 48-100 GenIV	48	100	133	552	483	47	Surelock	Steel

Poisons Information Centre: 13 1126 from anywhere in Australia, (0800 764 766 in New Zealand)

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ATTACHMENT 24

REPORT OF TECHNICAL FINDINGS ON THE VICTORIA BESS FIRE.

January 25, 2022

Victorian Big Battery Fire: July 30, 2021

REPORT OF TECHNICAL FINDINGS

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Background

The Victorian Big Battery (VBB) is a 300-Megawatt (MW)/450-Megawatt hour (MWh) grid-scale battery storage project in Geelong, Australia. VBB is one of the largest battery installations in the world and can power over one million Victorian homes for 30 minutes during critical peak load situations.[1] It is designed to support the renewable energy industry by charging during times of excess renewable generation. The VBB is fitted with 212 Tesla Megapacks to provide the 300-MW/450-MWh of energy storage. The Megapack is a lithium-ion battery energy storage system (BESS) consisting of battery modules, power electronics, a thermal management system, and control systems all pre-manufactured within a single cabinet that is approximately 7.2 meters (m) in length, 1.6 m deep and 2.5 m in height (23.5 feet [ft] x 5.4 ft x 8.3 ft).

On Friday, July 30th, 2021, a single Megapack at VBB caught fire and spread to a neighboring Megapack during the initial installation and commissioning of the Megapacks. The fire did not spread beyond these two Megapacks and they burned themselves out over the course of approximately six hours. There were no injuries to the general public, to site personnel or to emergency first responders as the Megapacks failed safely (i.e., slowly burned themselves out with no explosions or deflagrations), as they are designed to do in the event of a fire. Per the guidance in Tesla's Lithium-Ion Battery Emergency Response Guide[2] (ERG), emergency responders permitted the Megapack to burn and consume itself while nearby exposures were being monitored at a safe distance. The total impact to the site was two out of the 212 Megapacks were fire damaged, or less than 1% of the BESS.

Following the emergency response, a detailed, multi-entity fire investigation commenced on August 3, 2021. The investigation process included local regulatory entities, Tesla, outside third-party engineers and subject matter experts. The investigation process involved analyzing both the fire origin and cause as well as the root cause of the fire propagation to the neighbor Megapack. In addition, given this is the first fire event in a Megapack installation to date, a review of the emergency response has been performed to identify any lessons learned from this fire event.

This report summarizes those investigations and analyses and has been prepared by Fisher Engineering, Inc. (FEI) and Energy Safety Response Group (ESRG), two independent engineering and energy storage fire safety consulting firms. In addition, this report provides a list of lessons learned from the fire and also highlights the procedural, software and hardware changes that have been implemented based on those lessons learned.

Incident Timeline

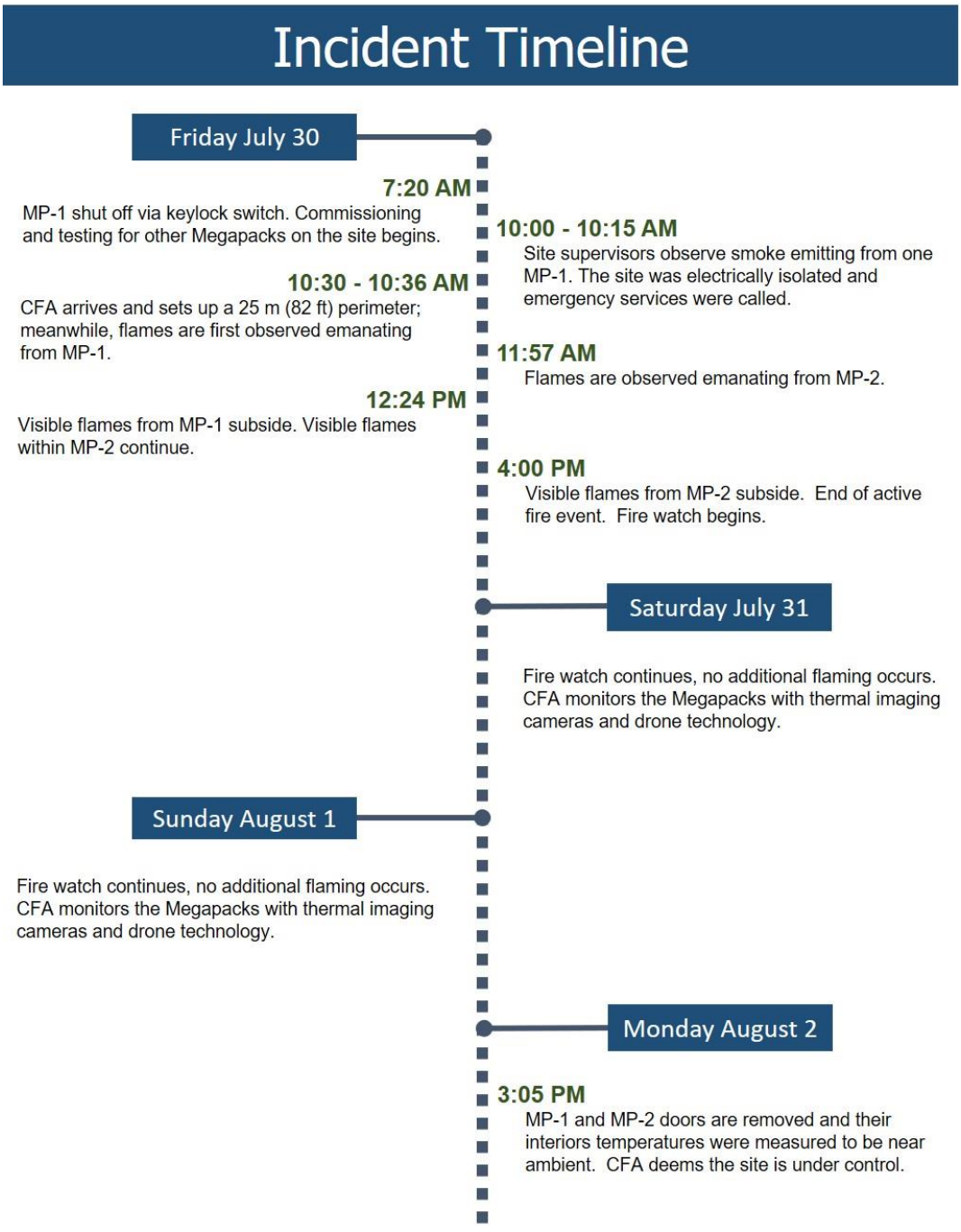
At the time of the fire, the VBB was fitted with approximately one-half of the 212 total Megapacks intended for the site. The Megapacks that were installed at VBB were undergoing routine testing and commissioning on the day of the fire. At 7:20 AM Australian Eastern Standard Time (AEST) on the morning of July 30, 2021, commissioning and testing of a number of Megapacks commenced. One such Megapack (denoted herein as MP-1), was not going to be tested that day and was therefore shut off manually by means of the keylock switch.[3] At the time MP-1 was shut down via the keylock switch, the unit displayed no abnormal conditions to site personnel. Around 10:00 AM, smoke was observed emitting from MP-1 by site personnel. Site personnel

[1] https://victorianbigbattery.com.au/

[2] https://www.tesla.com/sites/default/files/downloads/Lithium-Ion_Battery_Emergency_Response_Guide_en.pdf

[3] The keylock switch is a type of "lock out tag out" switch on the front of the Megapack that safely powers down the unit for servicing.

electrically isolated all the Megapacks on-site and called emergency services: Country Fire Authority (CFA). The CFA arrived shortly thereafter and set up a 25 m (82 ft) perimeter around MP-1. They also began applying cooling water to nearby exposures as recommended in Tesla's ERG. The fire eventually spread into a neighbor Megapack (MP-2) installed 15 centimeters (cm), or 6 inches (in), behind MP-1. The CFA permitted MP-1 and MP-2 to burn themselves out and did not directly apply water into or onto either Megapack, as recommended in Tesla's ERG. By 4:00 PM (approximately six hours after the start of the event), visible fire had subdued and a fire watch was instituted. The CFA monitored the site for the next three days before deeming it under control on August 2, 2021, at which time, the CFA handed the site over for the fire investigation to begin.



Note: The time stamp is AEST (UTC+10) which is 19 hours ahead of USA PDT (UTC-7)

Investigation

A multi-entity fire investigation commenced on August 3, 2021. The VBB fire investigation process involved analyzing both the root cause of the initial fire in MP-1 as well as the root cause of the fire propagation into MP-2. The investigations included on-site inspections of MP-1 and MP-2 by the CFA, Energy Safe Victoria[4] (ESV), Work Safety Victoria[5] (WSV), local Tesla engineering/service teams and a local third-party independent engineering firm. In addition to the on-site work immediately after the incident, the root cause investigations also included data analysis, thermal modeling and physical testing (electrical and fire) performed by Tesla at their headquarters in California, USA and their fire test facility in Nevada, USA.

Fire Cause Investigation

On-site inspections commenced on August 3, 2021 and concluded on August 12, 2021. MP-1 and MP-2 were documented, inspected and preserved for future examinations, if necessary. Concurrently, all available telemetry data (such as internal temperatures and fault alarms) from MP-1 and MP-2 were analyzed and a series of electrical fault and fire tests were performed. The on-site investigation findings, the telemetry data analysis, electrical fault tests and fire tests, when combined, identified a very specific series of fault conditions present on July 30, 2021 that could lead to a fire event.

Fire Origin and Cause Determination

The origin of the fire was MP-1 and the most likely root cause of the fire was a leak within the liquid cooling system of MP-1 causing arcing in the power electronics of the Megapack's battery modules. This resulted in heating of the battery module's lithium-ion cells that led to a propagating thermal runaway event and the fire.

Other possible fire causes were considered during the fire cause investigation; however, the above sequence of events was the only fire cause scenario that fits all the evidence collected and analyzed to date.

Contributory Factors

A number of factors contributed to this incident. Had these contributory factors not been present, the initial fault condition would likely have been identified and interrupted (either manually or automatically) before it escalated into a fire event. These contributory factors include:

1. The supervisory control and data acquisition (SCADA) system for a Megapack required 24 hours to setup a connection for new equipment (i.e., a new Megapack) to provide full telemetry data functionality and remote monitoring by Tesla operators. Since VBB was still in the installation and commissioning phase of the project (i.e., not in operation), MP-1 had only been in service for 13 hours prior to being switched off via the keylock switch on the morning of the fire. As such, MP-1 had not been on-line for the required 24 hours, which prevented this unit from transmitting telemetry data (internal temperatures, fault alarms, etc.) to Tesla's off-site control facility on the morning of the fire.
2. The keylock switch for MP-1 was operated correctly on the morning of the fire to turn MP-1 off as the unit was not required for commissioning and testing that morning; however, this action caused telemetry systems, fault monitoring, and electrical fault safety devices[6] to be disabled or operate with

[4] Victoria's energy safety regulator

[5] Victoria's health and safety regulator

[6] These elements include, among other devices, fuses at the cell and module level for localized fault current interruption and a battery module pyro disconnect that severs the electrical connection of the battery module when a fault current is passing through the battery module.

only limited functionality. This prevented some of the safety features of MP-1 from actively monitoring and interrupting the electrical fault conditions before escalating into a fire event.

3. The exposure of liquid coolant onto the battery modules likely disabled the power supply to the circuit that actuates the pyro disconnect.[7] With a power supply failure, the pyro disconnect would not receive a signal to sever and would not be able to interrupt a fault current passing through the battery module prior to it escalating into a fire event.

Fire Propagation Investigation

The VBB fire investigation process involved analyzing not only the root cause of the initial fire in MP-1 but also the root cause of the fire propagation into MP-2. The Megapack has been designed to be installed in close proximity to each other without fire propagating to adjacent units. The design objective of the Megapack in terms of limiting fire propagation was mainly reliant on the thermal insulation of the Megapack's exterior vertical steel panels and the sheer mass of the battery modules acting as a heat sink (i.e., they are difficult to heat up). With this thermal insulation, the Megapack spacing can be as close as 15 cm (6 in) to the sides and back of each unit with 2.4 m (8 ft) aisles in front of each Megapack, as shown in Figure 1. This product spacing has been validated in UL9540A unit level tests.[8] Similar to the fire origin and cause investigation, the on-site inspections were supported simultaneously with an analysis of telemetry data (such as internal temperatures) from MP-2 and fire testing. The on-site investigation findings, the telemetry data analysis and fire tests, when combined, identified a scenario where Megapack to Megapack fire propagation can occur.

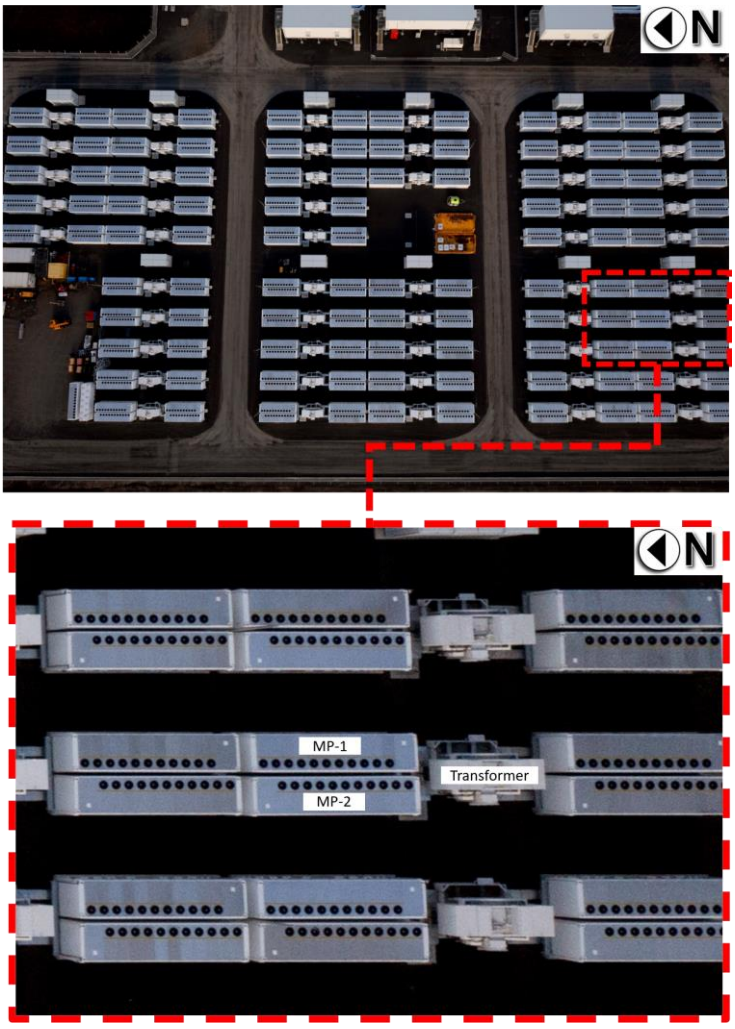


Figure 1 VBB Megapack layout (top) and area of fire origin (bottom)

[7] The pyro disconnect is a Tesla proprietary shunt-controlled pyrotechnic fuse that allows for rapid one-time actuation. There is one pyro disconnect per battery module.

[8] UL9540A, *Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems*. UL9540A is a test method developed by UL to address fire safety concerns with BESS. The test method provides a method to evaluate thermal runaway and fire propagation at the cell level, module level, and unit level. In addition to cell and module level tests, Tesla performed unit level tests to evaluate, among other fire safety characteristics, the potential for fire propagation from Megapack-to-Megapack. During unit level testing, fire propagation did not occur between Megapacks when they were installed with a spacing of 15 cm (6 in) to the sides and back of each unit.

Fire Propagation Determination

Flames exiting the roof of MP-1 were significantly impacted by the wind conditions at the time of the fire. Wind speeds were recorded between 20-30 knots[9] which pushed the flames exiting the roof of MP-1 towards the roof of MP-2. This direct flame impingement on the top of the thermal roof of MP-2 ignited the internal components of MP-2, most notably, the plastic overpressure vents that seal the battery bay[10] from the thermal roof. Once ignited, the overpressure vents provided a direct path for flames and hot gases to enter into the battery bays, thus exposing the battery modules of MP-2 to fire and/or elevated temperatures. Exposed to temperatures above their thermal runaway threshold of 139°C (282°F), the cells within the battery modules eventually failed and became involved in the fire.

Other possible fire propagation root causes were considered during the investigation; however, the above sequence of events was the only fire propagation scenario that fits all the evidence collected and analyzed to date. Of note, at the time when fire was observed within the thermal roof of MP-2, internal cell temperature readings of MP-2 had only increased by 1°C (1.8°F) from 40°C to 41°C (104°F to 105.8°F)[11] Around the same time that fire was observed within the thermal roof of MP-2, around 11:57 AM (approximately 2 hours into the fire event), communication was lost to the unit and no additional telemetry data was transmitted. However, given the internal cell temperatures of MP-2 had only recorded a 1°C (1.8°F) temperature rise 2 hours into the fire event and while the unit's roof was actively on fire, fire propagation across the 15 cm (6 in) gap via heat transfer is not the root cause of the fire propagation. Furthermore, this telemetry data from MP-2 demonstrates that the Megapack's thermal insulation can provide significant thermal protection in the event of a fire within an adjacent Megapack installed only 15 cm (6 in) away.

Contributory Factors

The wind was the dominant contributory factor in the propagation of fire from MP-1 to MP-2. At the time of the fire, a 20-30 knot (37-56 km/hr, 23-35 mph) wind was recorded out of the north. The wind conditions at the time of the fire pushed the flames exiting out of the top of MP-1 towards the top of MP-2 leading to direct flame impingement on the thermal roof of MP-2. This type of flame behavior was not observed during previous product testing or regulatory testing per UL9540A. In UL9540A unit level testing, the maximum wind speed permitted[12] during the test is 10.4 knots (19.3 km/hr, 12.0 mph); whereas, wind conditions during the VBB fire were two to three times greater in magnitude. As such, the wind conditions during the VBB fire appear to have identified a weakness in the Megapack's thermal roof design (unprotected, plastic overpressure vents in the ceiling of the battery bays) that allows Megapack-to-Megapack fire propagation. This weakness was not identified previously during product or regulatory testing and does not invalidate the Megapack's UL9540A certification, as the cause of fire propagation was primarily due to an environmental condition (wind) that is not captured in the UL9540A test method.

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9 This equates to 37-56 kilometers per hour (km/hr) or 23-35 miles per hour (mph).

10 The battery bay is an IP66 enclosure that houses the battery modules. It is distinct from the thermal roof installed above it. Plastic overpressure vents are installed in the ceiling of the battery bay, sealing the two enclosures from one another.

11 As a reference, the Megapack's normal operating cell temperature is between 20-50°C and cell thermal runaway does not occur until 139°C (98°C above cell temperatures of MP-2 before telemetry data was lost).

12 This threshold is necessary for test reliability and reproducibility. If wind conditions are not bounded in some fashion in an outdoor fire test, large variances on product performance could be introduced due to varying wind conditions.

Mitigations

The investigation of the VBB fire identified several gaps in Tesla's commissioning procedures, electrical fault protection devices and thermal roof design. Since the fire, Tesla has implemented a number of procedural, firmware, and hardware mitigations to address these gaps. These mitigations have been applied to all existing and any future Megapack installations and include:

Procedural Mitigations:

- Improved inspection of the coolant system for leaks during Megapack assembly and during end-of-line testing to reduce the likelihood of future coolant leaks.
- Reduce the telemetry setup connection time for new Megapacks from 24 hours to 1 hour to ensure new equipment is transmitting telemetry data (internal temperatures, fault alarms, etc.) to Tesla's off-site control facility for remote monitoring.
- Avoid utilizing the Megapack's keylock switch during commissioning or operation unless the unit is actively being serviced. This procedural mitigation ensures telemetry, fault monitoring, and electrical fault safety devices (such as the pyro disconnect) are active while the Megapack is idle (such as during testing and commissioning).

Firmware Mitigations:

- Added additional alarms to the coolant system's telemetry data to identify and respond (either manually or automatically) to a possible coolant leak.
- Keep all electrical safety protection devices active, regardless of keylock switch position or system state. This firmware mitigation allows electrical safety protection devices (such as the pyro disconnect) to remain in an active mode, capable of actuating when electrical faults occur at the battery modules, no matter what the system status is.
- Active monitoring and control of the pyro disconnect's power supply circuit. In the event of a power supply failure (either through an external event such as a coolant exposure or some other means), the Megapack will automatically actuate the pyro disconnect prior to the loss of its power supply.

Hardware Mitigations

- Installation of newly designed, thermally insulated steel vent shields within the thermal roof of all Megapacks. These vent shields protect the plastic overpressure vents from direct flame impingement or hot gas intrusion, thus keeping the IP66 battery bay enclosures isolated from a fire above in the thermal roof. Their performance was validated through a series of fire tests, including unit level fire testing of entire Megapack units.[13] The vent shields are placed over the top of the overpressure vents and will come standard on all new Megapack installations. For existing Megapacks, the vent shields can be installed in the field (retrofit) with minimal effort or disruption to the unit. At the time of this report, the vent shields are nearing production stage and will be retrofitted to applicable Megapack sites shortly.

[13] The tests confirmed that, even with the entire thermal roof fully involved in fire, the overpressure vents will not ignite and the battery modules below remain relatively unaffected by the fire above. For instance, the cells within the battery modules saw a less than 1°C temperature rise while the entire thermal roof was fully involved in fire.

Emergency Response

Beyond the origin and cause and propagation investigations, another key aspect of the VBB fire was the emergency response. The CFA is the responsible fire service organization for VBB, and the facility is in their initial response jurisdiction. The location of the VBB facility is in a semi-rural location. The nearest fire station is the CFA Lovely Banks, approximately 4 km (2.5 miles) distance from VBB and thus relatively close, though other resources had more extended travel distances.

Upon arrival around 10:30 AM, CFA immediately established incident command (IC) in accordance with their protocols, and the IC worked closely with the facility representatives and subject matter experts (SMEs). This close coordination continued throughout the entire event. The facility was evacuated and all-site personnel accounted-for upon notification of the emergency event and the commencement of fire service operations. A 25 m (82 ft) perimeter was established around MP-1 while water application and cooling strategies were discussed with facility representatives and subject matter experts (SMEs). The decision was made to provide exposure protection to Megapacks and transformers adjacent to MP-1 and MP-2 using water hose lines, as recommended in Tesla's ERG. The fire eventually propagated into MP-2; however, flame spread did not advance any further than MP-1 and MP-2. The two Megapacks were permitted to burn themselves out, during which time the CFA did not directly apply water into or onto either Megapack. By 4:00 PM (approximately six hours after the start of the event), visible flames had subdued and a fire watch was instituted. The CFA continued to monitor the site for the next three days before deeming it under control on August 2, 2021, at which time, the fire investigation began.

Key Takeaways

A thorough review of the VBB fire emergency response yielded the following key takeaways:

- Effective Pre-incident Planning: VBB had both an Emergency Action Plan (EAP) and an Emergency Response Plan (ERP). Both plans were available to emergency responders and were effectively used during the VBB fire. For example, all site employees and contractors followed proper evacuation protocols during the fire and as a result, no injuries occurred to those personnel.
- Coordination with SMEs: VBB had thorough pre-incident plans that clearly identified the SMEs, how to contact them, their role and other key tasks. It was reported that the facility SMEs stayed in close contact with the CFA IC throughout the VBB fire, providing valuable information and expertise for the CFA to draw upon. For example, site representatives and SMEs worked closely with the CFA in determining water application and cooling strategies of adjacent exposures.
- Water Application: A key question regarding water application is the necessary amount and duration for effective fire containment. Tesla's design philosophy is based on inherent passive protection (i.e., thermal insulation), with minimal dependence on active firefighting measures like external hose lines. As such, water was not aimed at suppressing the fire but rather protecting the exposures as directed by Tesla's ERG and the SMEs on site. All available data and visual observations of the fire indicates water had limited effectiveness in terms of reducing or stopping fire propagation from Megapack-to-Megapack. The thermal insulation appears to be the dominant factor in reducing heat transfer between adjacent Megapacks. However, water was effectively used on other exposures

(transformers, electrical equipment, etc.) to protect that equipment, which are not designed with the same level of protection as a Megapack is (i.e., thermal insulation).[14]

- The fire protection design approach of the Megapack has inherent advantages over other BESS designs in terms of safety to emergency responders. The Megapack approach minimizes the likelihood of fire spread using passive compartmentation and separation, eliminates the danger to fire fighters of an overpressure event due to design features and a lack of confinement (e.g., outdoor versus indoor), does not rely on active firefighting measures like external hose lines and minimizes the dangers from stranded electrical energy to those involved with overhaul and de-commissioning with a fire response approach permitting the Megapack to burn itself out.

Environmental Concerns

The Environment Protection Authority Victoria (EPA) deployed two mobile air quality monitors within 2 km (1.2 miles) of the VBB site. Locations were chosen where there was potential to impact the local community. The EPA monitors confirmed "good air quality in the local community" after the incident; however, the measurements were not taken during the peak of the fire event. They were sampled around 6:00 PM, or approximately 2 hours after the fire was out. Therefore, the data cannot be used to understand the airborne hazards during the actual fire event. The data does demonstrate that two hours after the fire event, the air quality in the surrounding area was "good" and no long-lasting air quality concerns arose from the fire event.[15]

During the fire event, the CFA coordinated with site personnel to control the water run-off from fire hoses into a catchment. Water samples, collected by Tesla site personnel under the supervision of CFA, were extracted from the catchment. Laboratory results from those samples indicated that the likelihood of the fire having a material impact on the water was minimal. After the incident, as a precaution, the water was removed from the catchment, via suction trucks, and was transported to a licensed waste facility for treatment and disposal. It is estimated that approximately 900,000 liters of water was disposed of from the site after the event.

Community Concerns

Neoen, the project developer and owner, pro-actively engaged with the local community during and following the VBB fire. These engagements included door-to-door visits, phone calls and emails with the residential and agricultural properties within a 2-3 km (1.2-1.9 mile) radius of the VBB site. Neoen found their prior community outreach during the project planning stages to be invaluable as this outreach provided up-to-date contact information for Neoen when reaching out to the local community during and following the fire. In addition, Neoen formed an executive stakeholder steering committee compromising of key organizations within 24 hours of the incident. With multiple parties involved in the emergency response to the fire event

[14] At the time of this report, final fire department reports were not available for review and inclusion. As that information becomes available, additional information regarding water usage and effectiveness may require inclusion in this report. Although the effectiveness of external water in a Megapack fire may be limited, water should still be made available for exposure protection and other unanticipated events in the future, as required by any applicable regulatory requirements.

[15] It should be noted that prior regulatory testing (UL 9540A module level fire testing) has shown that the products of combustion of a Megapack battery module can include flammable and nonflammable gases. Based on those regulatory tests, the flammable gases were found to be below their lower flammable limit (LFL) and would not pose a deflagration or explosion risk to first responders or the general public. The nonflammable gases were found to be comparable to the smoke you would encounter in a typical Class A structure fire and do not contain any unique, or atypical, gases beyond what you would find in the combustion of modern combustible materials.

actively participating in the steering committee, this helped ensure that from the outset communication was timely, efficient, well-coordinated across different organizations and accurate.

In addition to the community outreach, Neoen and Tesla also briefed multiple industry, State and Federal Government Departments and Agencies immediately following the VBB fire and at the conclusion of the investigation process. These briefings helped ensure the wider energy sector with interests in BESS were able to be kept directly informed as information became available.

Overhaul and Remediation

On July 29, 2021 nearly half of the Megapacks had been installed and the site was in the testing and commissioning stage of the project. Following the fire event on July 30, 2021, fire department personnel, regulatory agencies and other emergency responders remained on-site for precautionary purposes until August 2, 2021. At that time the site was turned over for regulatory fire investigations to begin. On-site fire investigations started on August 3, 2021 and continued until August 12, 2021. During this time, starting on August 6, 2021, the site was permitted to continue the installation of Megapacks while the area around MP-1 remained cordoned off for the investigation. On September 23rd, 2021, less than two months after the fire, VBB was re-energized and testing and commissioning restarted. Remediation of the damaged equipment followed shortly after, and lasted a total of three days. All testing and commissioning efforts were completed without any further incidents and on December 8, 2021, VBB officially opened.

Lessons Learned

The VBB fire exposed a number of unlikely factors that, when combined, contributed to the fire initiation as well as its propagation to a neighboring unit. This collection of factors had never before been encountered during previous Megapack installations, operation and/or regulatory product testing. This section summarizes those factors as well as the emergency response to the fire, discusses the lessons learned from this fire event, and highlights the mitigations Tesla has implemented in response.

1. Commissioning Procedures

Lessons learned related to commissioning procedures include: (1) limited supervision/monitoring of telemetry data during the first 24 hours of commissioning and (2) the use of the keylock switch during commissioning and testing. These two factors prevented MP-1 from transmitting telemetry data (internal temperatures, fault alarms, etc.) to Tesla's control facility and placed critical electrical fault safety devices (such as the pyro disconnect) in a state of limited functionality, reducing the Megapack's ability to actively monitor and interrupt electrical fault conditions prior to them escalating into a fire event.

Since the VBB fire, Tesla has modified their commissioning procedures to reduce the telemetry setup connection time for new Megapacks from 24 hours to 1 hour and to avoid utilizing the Megapack's keylock switch unless the unit is actively being serviced.

2. Electrical Fault Protection Devices

Lessons learned related to electrical fault protection devices include: (1) coolant leak alarms; (2) the pyro disconnect being unable to interrupt fault currents when the Megapack is off via the keylock switch and (3) the pyro disconnect likely being disabled due to a power supply loss to the circuit that actuates it. These three factors prevented the pyro disconnect of MP-1 from actively monitoring and interrupting the electrical fault conditions before escalating into a fire event.

Since the VBB fire, Tesla has implemented a number of firmware mitigations that keep all electrical safety protection devices active, regardless of keylock switch position or system state, and to actively monitor and control the pyro disconnect's power supply circuit. Furthermore, Tesla has added additional alarms to better identify and respond (either manually or automatically) to coolant leaks. Additionally, although this fire event was likely initiated by a coolant leak, unexpected failures of other internal components of the Megapack could create similar damage to the battery modules. These new firmware mitigations do not only address damage from a coolant leak. They also permit the Megapack to better identify, respond, contain and isolate issues within the battery modules due to failures of other internal components, should they occur in the future.

3. Fire Propagation

Lessons learned related to fire propagation include: (1) the significant role external, environmental conditions (such as wind) can have on a Megapack fire and (2) the identification of a weakness in the thermal roof design that permits Megapack-to-Megapack fire propagation. These two factors led to direct flame impingement on the plastic overpressure vents that seal the battery bay from the thermal roof. With a direct path for flames and hot gases to enter into the battery bays, the cells within the battery modules of MP-2 failed and became involved in the fire.

Since the VBB fire, Tesla has devised (and validated through extensive testing) a hardware mitigation that protects the overpressure vents from direct flame impingement or hot gas intrusion via the installation of new, thermally insulated, steel vent shields. The vent shields are placed on top of the overpressure vents and will come standard on all new Megapack installations. For existing Megapacks, the vent shields can be easily installed in the field. At the time of this report, the vent shields are nearing production stage and will be retrofitted to applicable Megapack sites shortly.

4. Megapack Spacing

Lessons learned related to Megapack spacing include: no changes are required to the installation practices of the Megapack with the vent shield mitigation (as described above) in place. Based on an analysis of telemetry data within MP-2 during the VBB fire, the Megapack's thermal insulation can provide significant thermal protection in the event of a fire within an adjacent Megapack installed 15 cm (6 in) away. The internal cell temperatures of MP-2 only increased by 1°C (1.8°F), from 40°C to 41°C (104°F to 105.8°F), before communication was lost to the unit, presumably due to fire, around 11:57 AM (approximately 2 hours into the fire event). Fire propagation was triggered by the weakness in the thermal roof, as described above in #3, and not due to heat transfer via the 15 cm (6 in) gap between Megapacks. With the vent shield mitigation in place, the weakness has been addressed and validated through unit level fire testing (i.e., tests involving the ignition of the Megapack's thermal roof). These tests confirmed that, even with the thermal roof fully involved in a fire, the overpressure vents will not ignite and the battery modules remain relatively unaffected with internal cell temperatures rising less than 1°C.

5. Emergency Response

Lessons learned from the emergency response to the VBB fire include: (1) effective pre-incident planning is invaluable and can reduce the likelihood of injuries; (2) coordination with SMEs, either on site or remotely, can provide critical expertise and system information for emergency responders to draw upon; (3) the effectiveness of applying water directly to adjacent Megapacks appears to provide limited benefits; however, water application to other electrical equipment, with inherently less fire protection built into their designs (such as transformers), can be a useful tactic to protect that equipment; (4) the fire protection design

approach of the Megapack has inherent advantages over other BESS designs in terms of safety to emergency responders; (5) the EPA indicated that there was “good” air quality 2 hours after the fire demonstrating that no long-lasting air quality concerns arose from the fire event; (6) water samples indicated that the likelihood of the fire having a material impact on firefighting water was minimal; (7) prior community engagement during the project planning stages is invaluable as it enabled Neoen to quickly update the local community and address immediate questions and concerns; (8) early, factual and where possible, face-to-face engagement with the local community is essential when a fire event is unfolding to keep the general public informed; (9) an executive stakeholder steering committee from the key organizations involved in the emergency response can help ensure that any pubic communications are timely, efficient, coordinated and accurate; and (10) effective coordination between stakeholders at the site allowed for rapid and thorough handover process after the incident, the swift and safe decommissioning of the damaged units and the site’s quick return to service.

In summary, the VBB fire event proceeded in accordance with its fire protection design and pre-incident planning. It presented no unusual, unexpected, or surprising characteristics (i.e., explosions) or resulted in any injuries to site personnel, the general public or emergency responders. It was isolated to the units directly involved, had minimal environmental impact, did not adversely impact the electrical grid, and had appreciably short mission interruption.

ATTACHMENT 25

BESS QUALITY RISKS: A SUMMARY OF THE MOST COMMON BATTERY ENERGY STORAGE SYSTEM MANUFACTURING DEFECTS.

CEA
Clean Energy Associates
INSIGHTS

BESS Quality Risks

A summary of the most common Battery Energy Storage System manufacturing defects

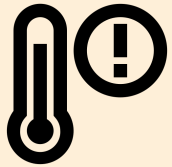
February 2024

The Past Several Years Have Shown That Thermal Runaway Poses a Significant Risk to the Energy Storage Industry

Data collected from CEA's factory quality inspections of BESS systems has found that these risks still exist:

26%

of inspected energy storage systems had quality issues related to the fire detection and suppression system.



18%

of inspected systems had quality issues related to the thermal management system.

The following report highlights the safety issues above as well as a host of other quality concerns.

CEA Has Conducted Factory Quality Audits On Over 30 GWh of Lithium-Ion Energy Storage Projects

- 320+ inspections in 52+ Battery Energy Storage System (BESS) factories
- 64% of tier 1* BESS cell manufacturers audited worldwide
- 1300+ total manufacturing issues identified

Locations of CEA factory audits

Here are our key findings...

*Tier 1: definition is based on BMI (Benchmark Mineral Intelligence)

Our Audit Process: CEA Assigns a Severity to Each Finding Depending On the Risk Level of the Issue

A **finding** is an issue identified during inspection that indicates deviation from standard best practices, processes or product specifications.

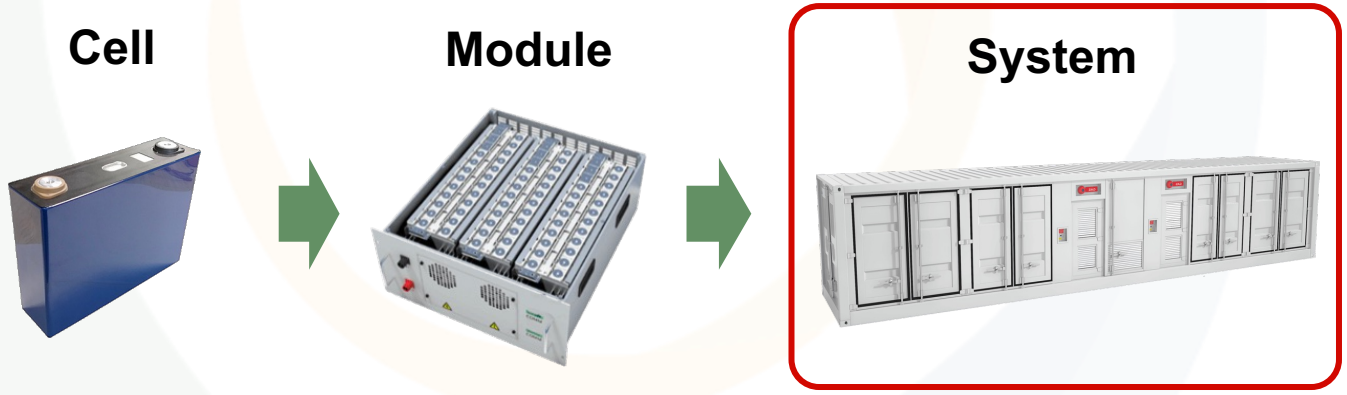
Finding Severity	Definition
Critical	Findings that may result in severe safety risks and hazardous conditions. Critical findings are likely to cause damage to other products or property, trigger non-compliance regulatory issues, and generally constitute a breach of mandatory regulations.
Major	Findings that may reduce the battery's functionality or impact safety in either short or long term.
Minor	Findings which do not pose a clear risk of production failure, but rather fall outside the quality requirements.

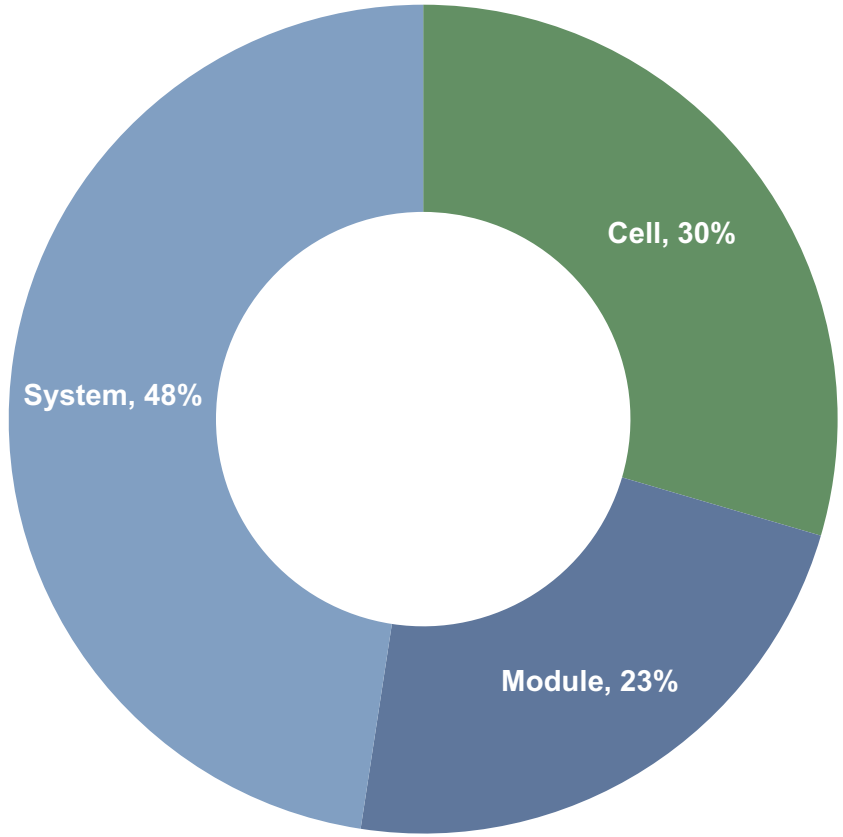
Distribution of Total Findings

With so much industry attention focused on cell selection, system integration should not be overlooked as a potential source of problems. **System-level defects accounted for nearly 50% of our QA findings.**

The large number of system-level issues is mainly caused by the following two contributors:

- The BESS integration process is highly manual and labor-intensive, with less stringent quality control procedures.
- Systems are very complex and are vulnerable to underlying problems originating from defects in upstream components that were not caught during earlier quality checks.

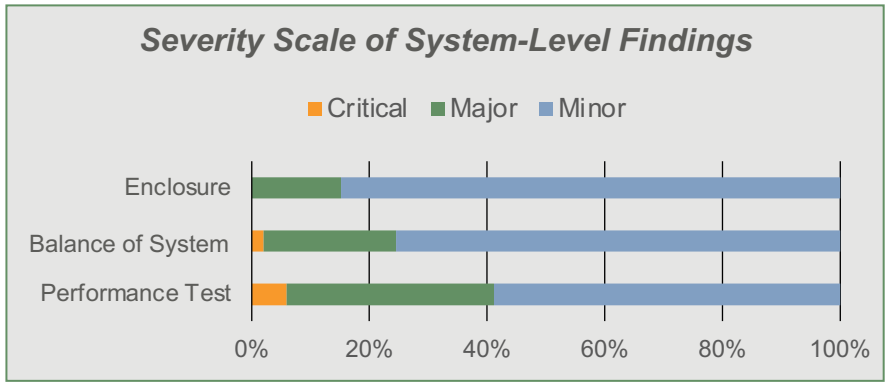




Distribution of all BESS Findings

Breakdown of System-level Findings

The majority of system-level findings occurred in the **Balance of System** and **enclosure**. **Performance test** findings usually indicate larger or more complex problems.



58% of system-level findings are Balance of System related

Why/How Does It Happen

Component defects and improper system integration procedures.

Example

- Liquid coolant leakage due to deformed flange plates, defective valves, loose pipe connections within the coolant circulation system
- Malfunctioning temperature, smoke, gas sensors, audible and visual alarms due to internal mis-wiring
- Live conductor exposed within the AC/DC distribution

34% of system-level findings are enclosure related

Why/How Does It Happen

Defects from enclosure manufacturing process and mishandling during transportation.

Example

- Poor strength and rigidity: lifting provision test, structural deformation, etc.
- Poor wiring and cabling arrangement
- Grounding mechanism defects
- Water ingress issue
- Appearance defects: painting specifications, markings, nameplate, openings, etc.

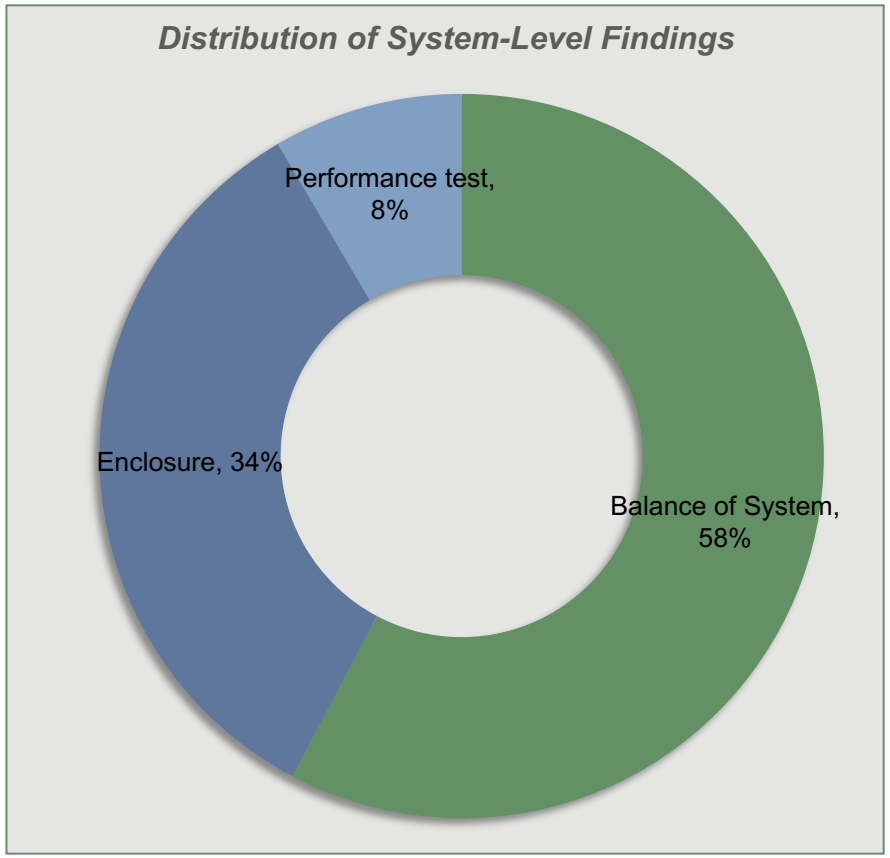
8% of system-level findings are performance test related

Why/How Does It Happen

A wide variety of manufacturing defects and/or improper system integration.

Example

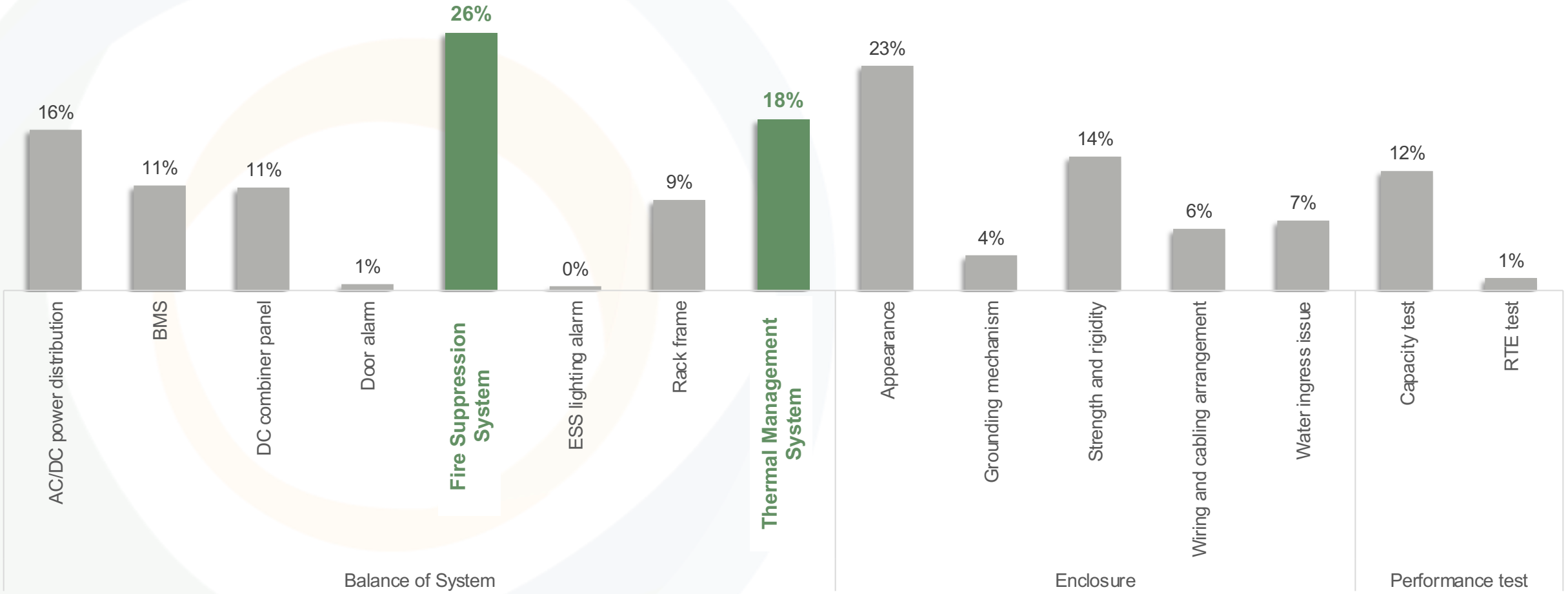
- Underachieving capacity and Round Trip Efficiency results from abnormally large temperature and voltage variations among battery cells within a module, due to high impedance from poorly welded wiring connections
- Charging/discharging failure due to wiring issues in battery rack's high voltage boxes



26% of BESS units that CEA inspected had defects in the **Fire Suppression System**, while **18% of units** had **Thermal Management System** defects.

*Fire suppression and thermal management systems are critical for functional safety, and defects in these systems can lead to **increased risk of fire**.*

Frequency of system-level BESS defects over total inspected units



Case Study – Common Fire Suppression System Findings

26% of inspected BESS units had fire suppression system defects

Non-responding release actuator for the fire extinguishing agent

Why/How Does It Happen

A diode within the actuator was faulty.

Risk

A malfunctioning actuator will not respond to the command of releasing a fire extinguishing agent, potentially allowing the fire to further propagate.

Example

Fire alarm abort button was not functional

Why/How Does It Happen

The fire alarm abort button was not responding to the user commands due to incorrect wiring.

Risk

The abort button allows user to deactivate an improperly triggered fire alarm; failure to deactivate can lead to unwanted fire extinguishing agent or sprinkler system activation which can cause serious damage to equipment.

Example

Non-responding smoke & temperature sensors

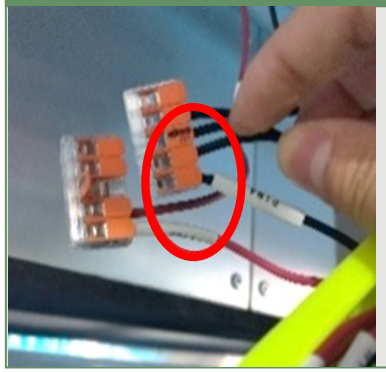
Why/How Does It Happen

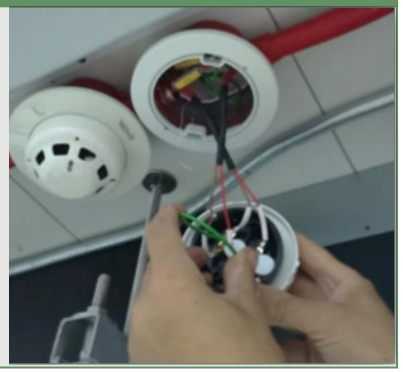
The smoke sensor was incorrectly wired, and a temperature sensor was reversely connected to power source.

Risk

An incorrectly wired smoke sensor cannot detect the presence of smoke within the system. A reversely connected temperature sensor can have a false reading. Malfunctioning of these sensors can pose a high fire and explosion risk.

Example





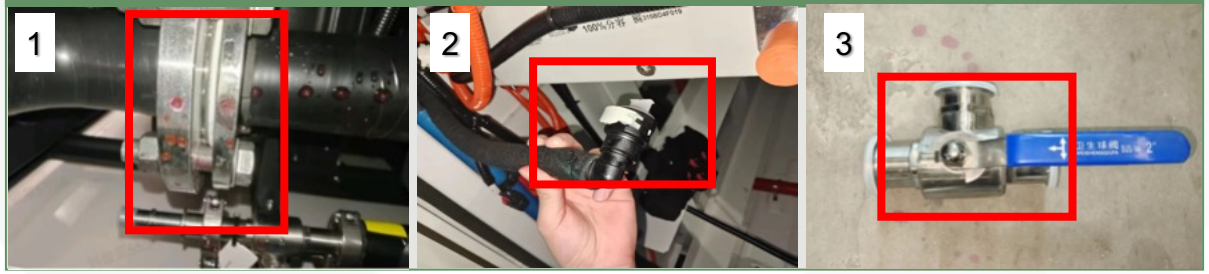
Case Study – Common Thermal Management System Findings

18% of inspected BESS units had thermal management system defects

Circulation System Components Failure

Why/How Does It Happen		
1. Flange plates are deformed from overtightening due to a loosely defined screw mounting Standard Operating Procedure (SOP).	2. Loose pipe connection: the fastener was not fastened from operator's mis-installation and not following SOP.	3. Defective incoming material: the valve comes with a loose stem.
Risk		
1. Internal short circuiting and thermal runaway initiation from continuous coolant leakage.	2. Severe short-circuiting events and thermal runaway initiation from potential massive coolant leakage.	3. Faster battery degradation from insufficient coolant flow control and internal short circuiting and thermal runaway initiation from continuous coolant leakage.

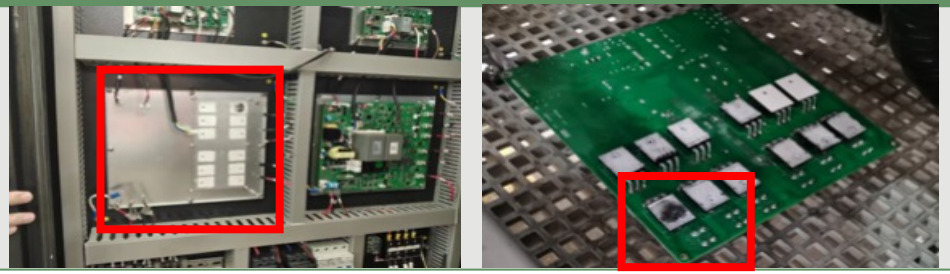
Example



Compressor mainboard short circuiting

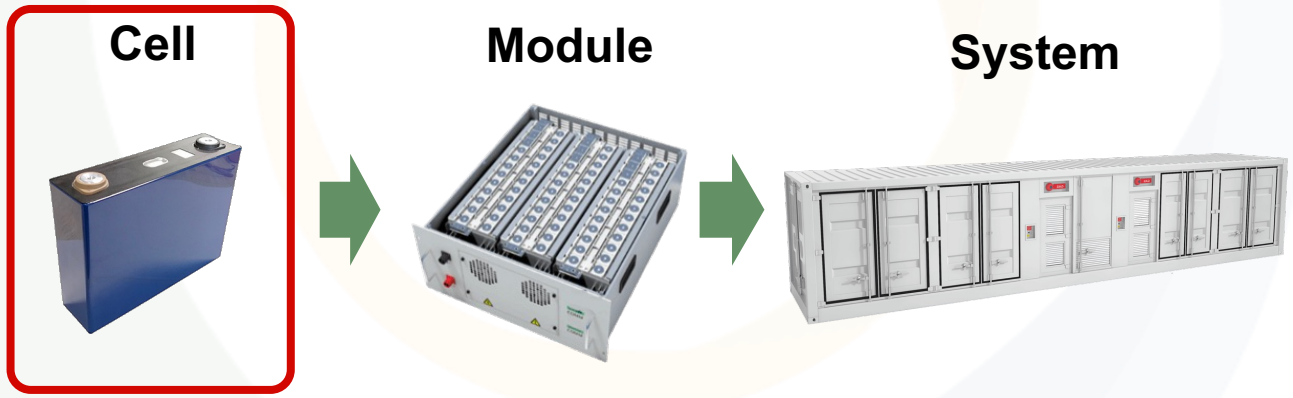
Why/How Does It Happen
Defective mainboard with a burned MOS (Metal Oxide Semiconductor) tube for compressor control.
Risk
1. Faster battery degradation from dysfunctional liquid cooling system. 2. Initiating thermal runaway or explosion with sparking from burned components.

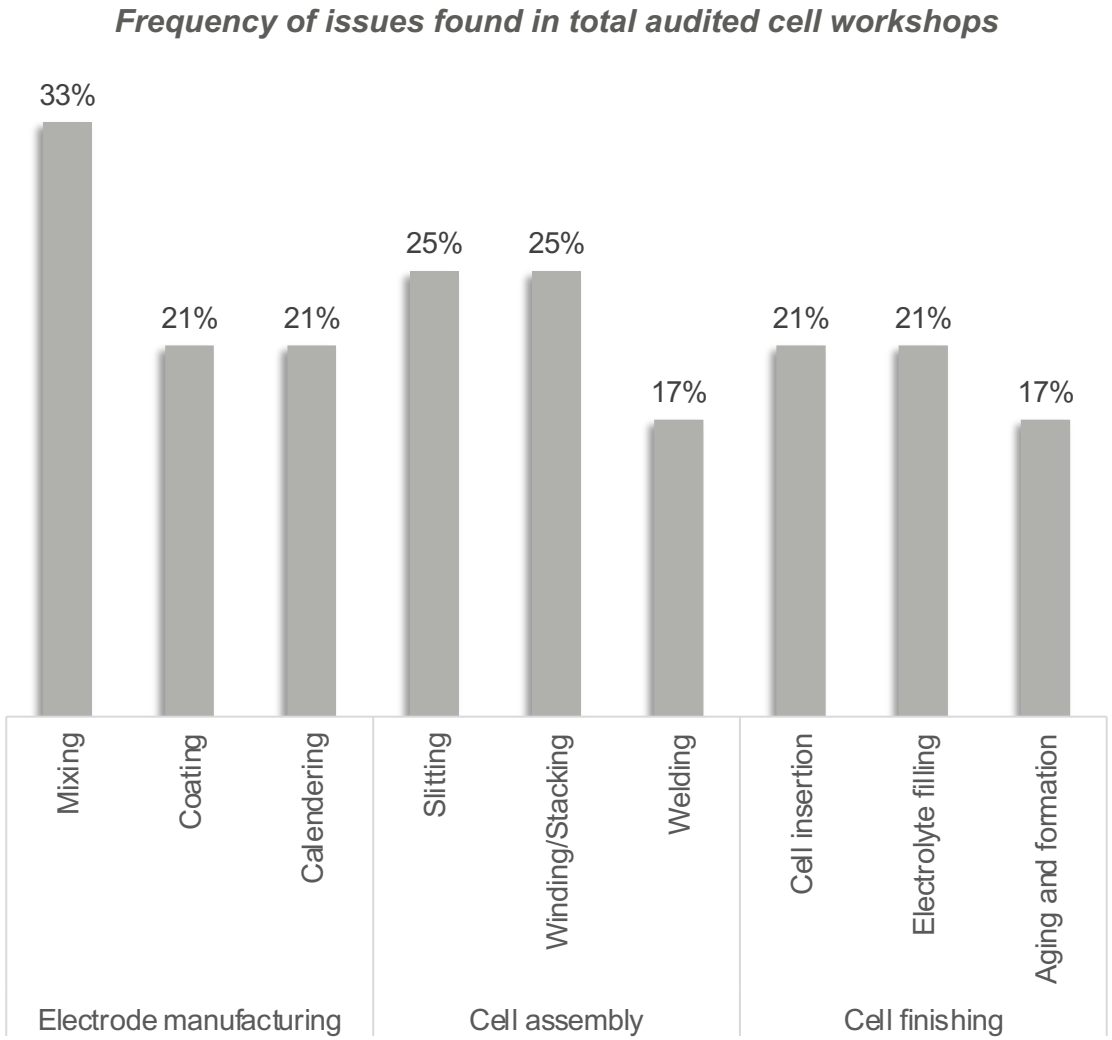
Example



30% of the Total Findings Occurred During Battery Cell Manufacturing

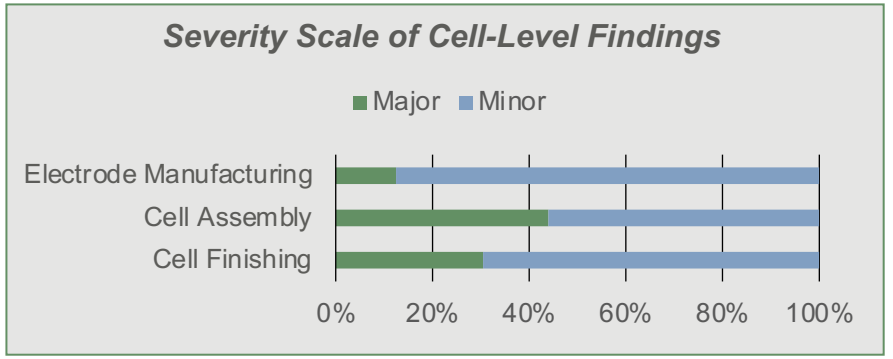
- Although battery cell factories have the highest level of automation, they make up a larger number of findings (compared to battery modules) due to their lengthy production processes and higher precision requirements, leading to more room for error.
- Audit findings on cells typically have a higher severity rating as cells are the building blocks of the energy storage system, and defects can be detrimental to system performance and safety.





Breakdown of Battery Cell Findings

Findings are evenly distributed due to strict precision and safety requirements throughout the entire cell manufacturing process.



32% of cell findings occur during electrode manufacturing

Why/How Does It Happen

Improper measurement system analysis and process control

Example

- Mixing: out-of-calibration viscosity meter, lack of expiration control record over the mixed active material
- Coating: missing key coating quality measurements such as surface density, coating thickness, and moisture content.
- Calendaring: deformed electrode sheets due to roller misalignment

38% of cell findings occur during cell assembly

Why/How Does It Happen

Improper process and quality control execution

Example

- Slitting: lack of burr size control, lack of monitoring on the cutter status and remaining life
- Stacking/winding: lack of inline electrode alignment inspection
- Welding: uncalibrated welding strength test that are conducted manually without well-defined pass/fail criteria

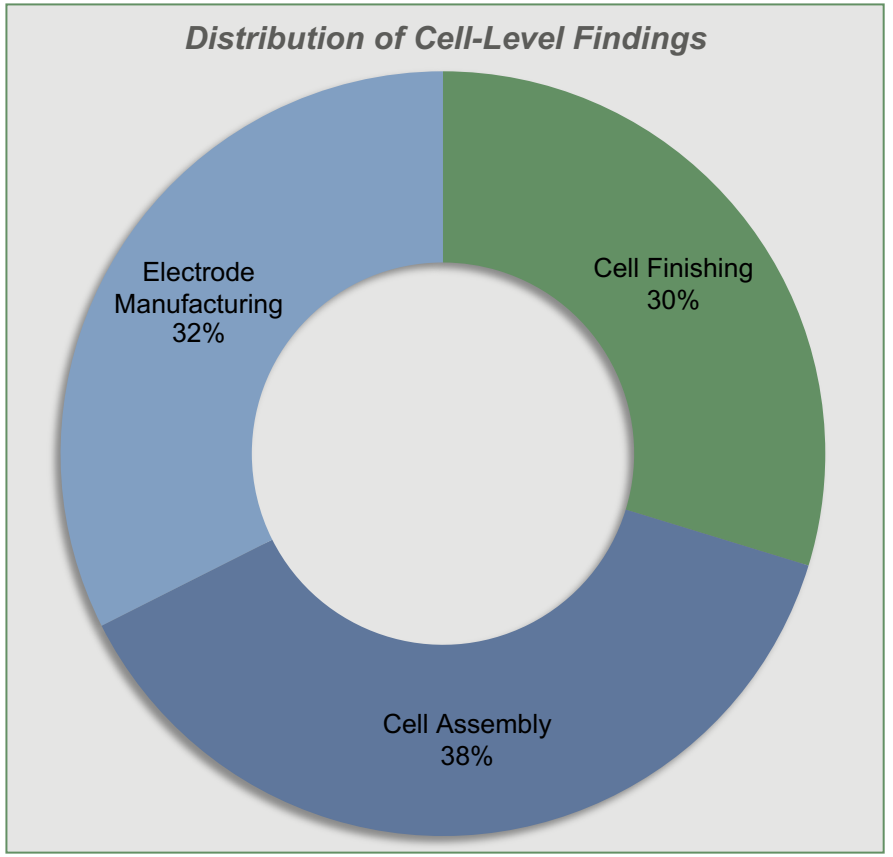
30% of cell findings occur during cell finishing

Why/How Does It Happen

Improper process and quality control execution

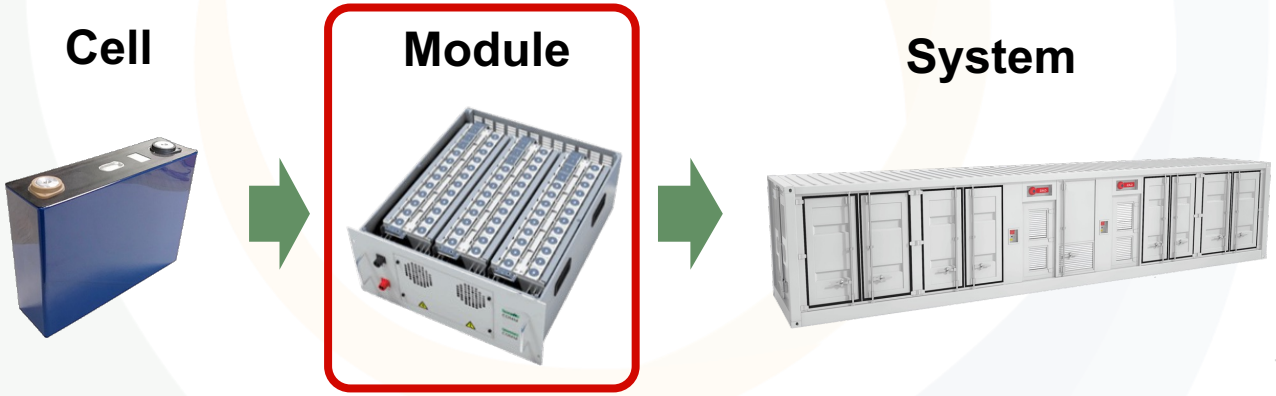
Example

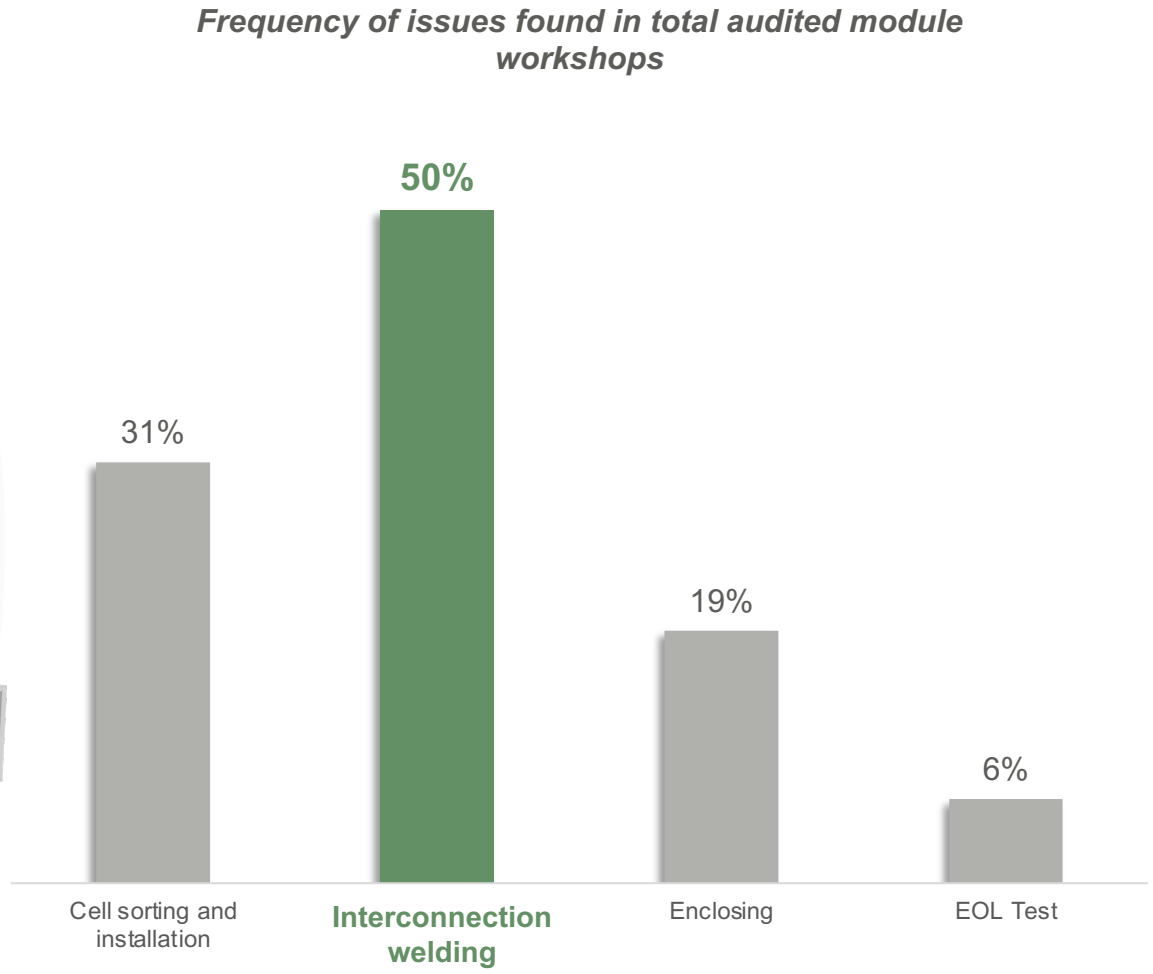
- Cell (jelly-roll/stack) insertion: lack of laser welding parameter verification, lack of inline alignment and clearance inspection after the aluminum cap is welded on
- Electrolyte filling: Loose control of environmental conditions (temperature and humidity), lack of sealing quality inspection which can lead to electrolyte leakage



23% of the Findings Occurred During Module Manufacturing, Largely Due to More Manual Production Lines

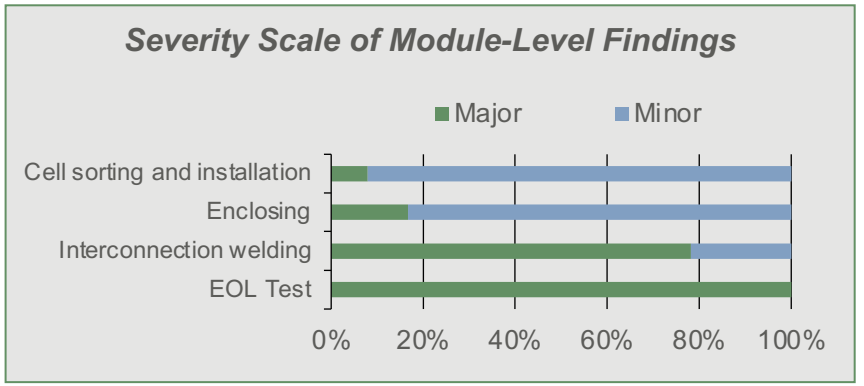
Module manufacturing issues often occur because lines are less automated, which creates room for imprecision in material handling and inferior welding quality.





Breakdown of Module-Level Findings

The automation level of module production varies among manufacturers. Welding quality issues and environmental control pitfalls can lead to end-of-line (EOL) test failures.



45% of module findings occur at cell sorting and installation

Why/How Does It Happen	Example
Manufacturing inconsistency due to manual operation and improper quality control protocols	• Lack of error-proofing measures to ensure cells are assembled with the right orientation • Inconsistent glue usage and position • Unqualified BOM (Bill of Materials) change on insulation layers within the module.

41% of module findings occur during interconnection welding

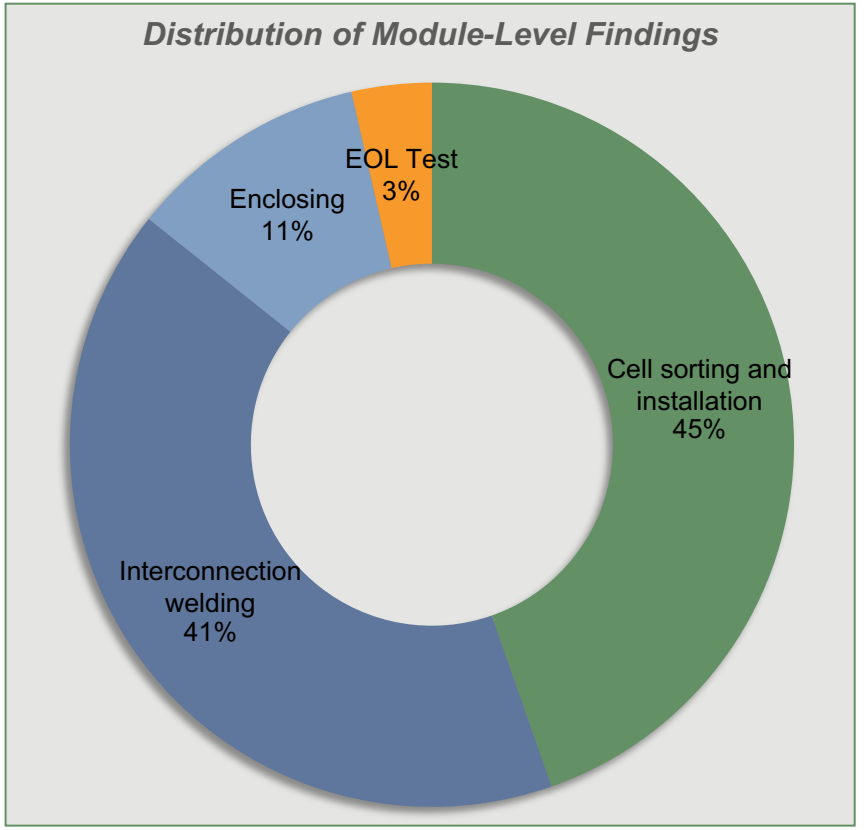
Why/How Does It Happen	Example
Lack of efficient quality control procedures and mis-operation risks due to a highly manual process	• Mislocated welding position • Non-calibrated welding strength test • Lack of procedure of cleaning up welding slags.

11% of module findings occur during enclosing

Why/How Does It Happen	Example
Lack of efficient quality control procedures and mis-operation risks due to a highly manual process	• Inconsistent cell group placement • Mechanical damages to fixtures and cooling plates.

3% of module findings occur during EOL testing

Why/How Does It Happen	Example
Cell manufacturing inconsistency and mis-wiring from highly manual processes	• Failed dielectric withstand voltage test due to poor internal wiring insulation and wiring arrangement • Abnormal cell voltage difference due to defective cells.



What Can You Do To Ensure the Long-term Financial Health of Your BESS Assets?

Golden FAT

- **Closing the Gaps**: We review your procurement contract, project requirements, and FAT checklist to ensure your energy system is safe and performs well, preventing any surprises.
- **Early Detection**: We identify risks in the supplier's checklists early to save costs and extend your system's operational life.
- **Expert Check-Up**: Our experts verify adherence to key safety and performance standards for a reliable energy system.
- **Negotiation Support**: We support you in negotiating and adjusting the FAT checklist deviations.

Factory QA

- **Factory Audit (FA):** Engineers check factories with a 300+ point checklist, assess risks, and recommend fixes.
- **Inline Production Monitoring (IPM)**: Engineers monitor production in real-time, ensure quality, spot issues, and suggest corrections.
- **Pre-Shipment Inspection (PSI):** Engineers inspect and test a random sample of finished products, record findings, and advise on improvements.
- **Factory Acceptance Test (FAT):** Engineers inspect and test finished products for performance and suggest corrective actions.

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ATTACHMENT 26

SCIENTIFIC STUDY: TOXIC FLUORIDE GAS EMISSIONS FROM LITHIUM-ION BATTERY FIRES.

SCIENTIFIC REPORTS

Correction: Author Correction

OPEN

Toxic fluoride gas emissions from lithium-ion battery fires

Fredrik Larsson[1,2], Petra Andersson[2], Per Blomqvist[2] & Bengt-Erik Mellander[1]

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Lithium-ion battery fires generate intense heat and considerable amounts of gas and smoke. Although the emission of toxic gases can be a larger threat than the heat, the knowledge of such emissions is limited. This paper presents quantitative measurements of heat release and fluoride gas emissions during battery fires for seven different types of commercial lithium-ion batteries. The results have been validated using two independent measurement techniques and show that large amounts of hydrogen fluoride (HF) may be generated, ranging between 20 and 200 mg/Wh of nominal battery energy capacity. In addition, 15–22 mg/Wh of another potentially toxic gas, phosphoryl fluoride (POF_3), was measured in some of the fire tests. Gas emissions when using water mist as extinguishing agent were also investigated. Fluoride gas emission can pose a serious toxic threat and the results are crucial findings for risk assessment and management, especially for large Li-ion battery packs.

Lithium-ion batteries are a technical and a commercial success enabling a number of applications from cellular phones to electric vehicles and large scale electrical energy storage plants. The occasional occurrences of battery fires have, however, caused some concern especially regarding the risk for spontaneous fires and the intense heat generated by such fires[1–5]. While the fire itself and the heat it generates may be a serious threat in many situations, the risks associated with gas and smoke emissions from malfunctioning lithium-ion batteries may in some circumstances be a larger threat, especially in confined environments where people are present, such as in an aircraft, a submarine, a mine shaft, a spacecraft or in a home equipped with a battery energy storage system. The gas emissions has however only been studied to a very limited extent.

An irreversible thermal event in a lithium-ion battery can be initiated in several ways, by spontaneous internal or external short-circuit, overcharging, external heating or fire, mechanical abuse etc. This may result in a thermal runaway caused by the exothermal reactions in the battery[6–10], eventually resulting in a fire and/or explosion. The consequences of such an event in a large Li-ion battery pack can be severe due to the risk for failure propagation[11–13]. The electrolyte in a lithium-ion battery is flammable and generally contains lithium hexafluorophosphate ($LiPF_6$) or other Li-salts containing fluorine. In the event of overheating the electrolyte will evaporate and eventually be vented out from the battery cells. The gases may or may not be ignited immediately. In case the emitted gas is not immediately ignited the risk for a gas explosion at a later stage may be imminent. Li-ion batteries release a various number of toxic substances[14–16] as well as e.g. CO (an asphyxiant gas) and CO_2 (induces anoxia) during heating and fire. At elevated temperature the fluorine content of the electrolyte and, to some extent, other parts of the battery such as the polyvinylidene fluoride (PVdF) binder in the electrodes, may form gases such as hydrogen fluoride HF, phosphorus pentafluoride (PF_5) and phosphoryl fluoride (POF_3). Compounds containing fluorine can also be present as e.g. flame retardants in electrolyte and/or separator[17], in additives and in the electrode materials, e.g. fluorophosphates[18,19], adding additional sources of fluorine.

The decomposition of $LiPF_6$ is promoted by the presence of water/humidity according to the following reactions[20,21];

$$LiPF_6 \rightarrow LiF + PF_5 \quad (1)$$

$$PF_5 + H_2O \rightarrow POF_3 + 2HF \quad (2)$$

$$LiPF_6 + H_2O \rightarrow LiF + POF_3 + 2HF \quad (3)$$

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Battery	Numbers of batteries per test	Type	Nominal capacity per battery (Ah)	Nominal voltage per battery (V)	Cell packaging
A	5–10	LCO ($LiCoO_2$)	6.8	3.75	Prismatic hard Al-can
B	2	LFP ($LiFePO_4$)	20	3.2	Pouch
C	5	LFP ($LiFePO_4$)	7	3.2	Pouch
D	9	LFP ($LiFePO_4$)	3.2	3.2	Cylindrical
E	5	LFP ($LiFePO_4$)	8	3.3	Cylindrical
F	2	NCA-LATP ($LiNiCoAlO_2$-$LiAlTiPO_4$)	30	2.3	Pouch
G	2	Laptop pack*	5.6	11.1	Cylindrical

Table 1. Details of the tested Li-ion battery cells. *Each laptop battery pack has 6 cells of type 18650; arranged 2 in parallel and 3 in series.

Of these PF_5 is rather short lived. The toxicity of HF and the derivate hydrofluoric acid is well known[22–24] while there is no toxicity data available for POF_3, which is a reactive intermediate[25] that will either react with other organic materials or with water finally generating HF. Judging from its chlorine analogy $POCl_3$/HCl[24], POF_3 may even be more toxic than HF. The decomposition of fluorine containing compounds is complex and many other toxic fluoride gases might also be emitted in these situations, however, this study focuses on analysis of HF and POF_3.

Although a number of qualitative and semi-quantitative attempts have been made in order to measure HF from Li-ion batteries under abuse conditions, most studies do not report time dependent rates or total amounts of HF and other fluorine containing gases for different battery types, battery chemistries and state-of-charge (SOC). In some measurements reported, HF has been found, within limited SOC-variations, during the abuse of Li-ion battery cells[15,16,26], as well as detected during the abuse of battery packs[27]. However, time-resolved quantitative HF gas emission measurements from complete Li-ion battery cells undergoing an abusive situation have until now only been studied to a limited extend; for a few SOC-values, including larger commercial cells[28,29], a smaller-size commercial cell[30] and a research cell (i.e. non-commercial cell)[31]. Time-resolved quantitative HF measurements on the gas release from complete electric vehicles including their Li-ion battery packs during an external fire have also been performed[32]. Other types of gas emissions from Li-ion cells during abuse have been the subject of a somewhat larger number of investigations[33–41]. Since the electrolyte typically is the primary source of fluorine, measurements of fluorine emissions from battery type electrolytes have been studied. For example, fire or external heating abuse tests have been performed on electrolytes[42–46] and the quantitative amounts of HF and POF_3 have been measured in some cases[45,46]. Other studies of electrolytes exposed to moderate temperatures, 50–85 °C, show the generation of various fluorine compounds[20,21,47–49] and some studies include both electrolyte and electrode material[50,51,52].

Our quantitative study of the emission gases from Li-ion battery fires covers a wide range of battery types. We found that commercial lithium-ion batteries can emit considerable amounts of HF during a fire and that the emission rates vary for different types of batteries and SOC levels. POF_3, on the other hand, was found only in one of the cell types and only at 0% SOC. The use of water mist as an extinguishing agent may promote the formation of unwanted gases as in eqs (2)–(3) and our limited measurements show an increase of HF production rate during the application of water mist, however, no significant difference in the total amount of HF formed with or without the use of water mist.

Lithium-ion battery fire tests. The experiments were performed using an external propane burner for the purpose of heating and igniting the battery cells as described in the Methods section. Seven different types of batteries, type A-G, were investigated, from seven manufacturers and with different capacity, packaging type, design and cell chemistry, as specified in Table 1. Type A had a lithium cobalt oxide (LCO) cathode and carbon anode, types B to E had lithium-iron phosphate (LFP) cathode and carbon anode, type F had nickel cobalt aluminum oxide (NCA) and lithium aluminum titanium phosphate (LATP) electrodes while type G was a laptop battery pack with unspecified battery chemistry. All electrolytes contained $LiPF_6$. Most of the cells were tested for different SOC levels, from fully charged, 100% SOC, to fully discharged, 0% SOC. The study included large-sized automotive-classed cells, i.e. series production cells of high industry quality, with long life time etc.

The heat release rate (HRR) and the emitted HF for B-type cells with different SOC values are shown in Fig. 1. Only the 100% SOC cells show several distinct peaks, corresponding to intense flares, when the cells vented and the emitted gas burn, for all other cells the heat release as a function of time is more smooth. These behaviors are reproducible also for the other tested cell types, e.g., only the 100% SOC cells show the more violent heat release peaks with intense flares.

The measurements of the gas emissions during the fire tests show that the production of HF is correlated to the increase in HRR although somewhat delayed. From Fig. 1b it is evident that the higher SOC value, the higher values for the peak HF release rate. The total amount of HF varies considerably for the different battery types, see Fig. 2a. The amount of HF produced, expressed in mg/Wh, where Wh is the nominal battery energy capacity, is approximately 10 times higher for the cell with the highest values compared to the cells with the lowest values. The different relative amount of electrolyte and filler materials in the cells could be the simple explanation of this variation but information on those amounts are difficult to access for commercial batteries. The highest HF values are found for the pouch cells, a possible explanation would be that hard prismatic and cylindrical cells can build a

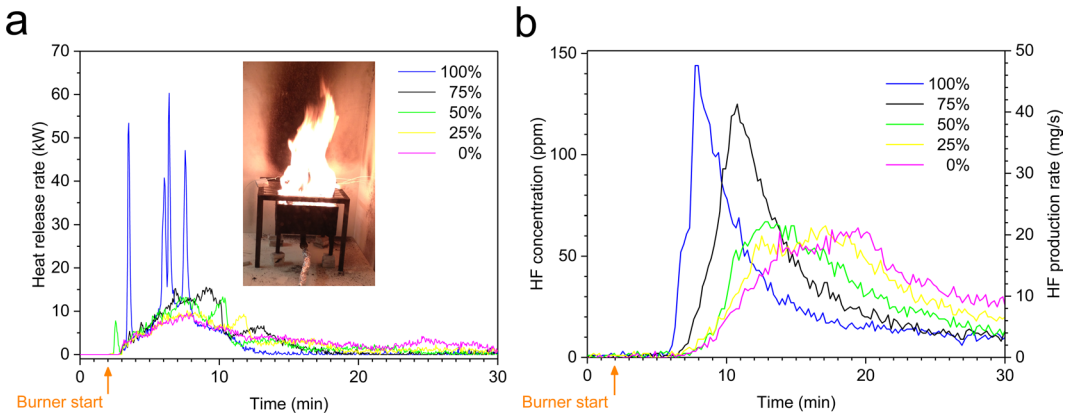

Figure 1. Results for type B cells, for 0–100% SOC with intermediate SOC-steps of 25%, exposed to an external propane fire; (**a**) showing the heat release rate (burner HRR contribution is subtracted), the inset photo shows burning battery cells during the test; (**b**) showing the HF release both as the measured concentrations as well as the calculated HF production rates. The HF production rates are calculated from the measured HF concentration by the Ideal gas law taking into account the ventilation flow, see Methods. The starting time of the heating process is marked on the time axis.

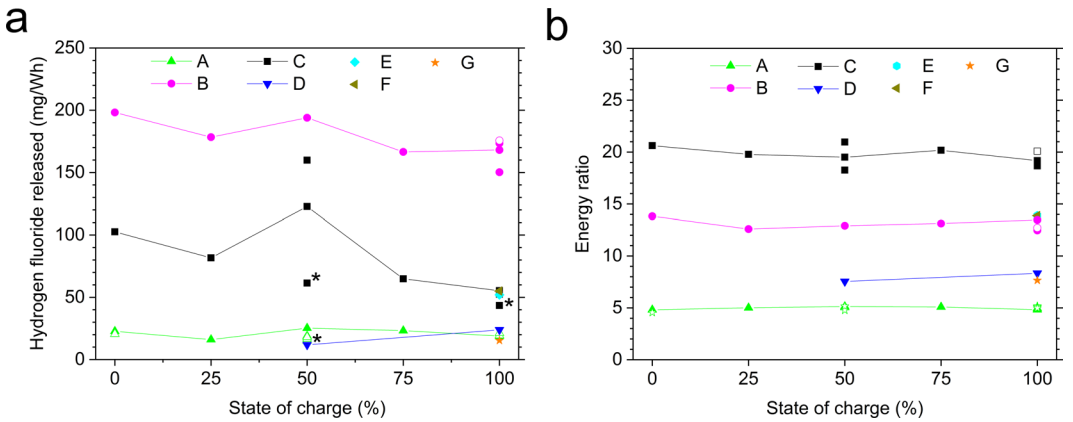

Figure 2. Total amount of HF measured by FTIR, normalized to nominal electrical energy capacity (**a**) and the energy ratio (**b**), for seven types of Li-ion battery cells and with various state of charge levels. Non-filled symbols indicate a repetition variant, e.g. applying water mist. The lines are intended as a guide for the eye. The energy ratio is a dimensionless value calculated by taking the total heat release from the battery fire divided by the nominal electrical energy capacity. Note that for 100% SOC the values are overlapping for type C, E and F as well as for type A, D and G in (**a**) and type B, E and F in (**b**). *Low value for type C at 50% and 100% SOC and type D at 50% SOC due to that a pre HF-saturation was not applied, therefore a part of the HF release was likely to be saturated in the gas sampling system, see Methods.

higher pressure before bursting, rapidly releasing a high amount of gases/vapors from the electrolyte. Due to the high velocity of the release and thus the short reaction time, combustion reactions might be incomplete and less reaction products might be produced. In the test involving type G the cylindrical cells were layered horizontally, thus having a different venting direction and possibly increased wall losses, which combined with a very energetic response, might suggest why HF was detected only from the filter analysis and not detected by FTIR-analysis. The tested pouch cells of type B and C burned for longer time and with less intensity. The pouch cell of type F, however, burned faster, possibly due to its different electrode materials. The SOC influence on the HF release was less significant and the trend in Fig. 2a shows higher HF values for 0% than for 100% SOC, however with clear peaks at 50% SOC. Although these results are reproducible, they are difficult to explain. In other studies[30,31], significantly narrower in test scope, involving smaller-sized cells and using a somewhat different abuse method, it was found that the total amount of HF measured by real-time FTIR was higher for decreasing SOC (tests conducted at 100%, 50% and 0% SOC).

The HRR curve is used to calculate the total heat release (THR) which corresponds to the energy released from the burning battery. THR is obtained by integrating the measured HRR (with the burner contribution subtracted) over the complete test time. Fig. 2b shows the energy ratio, that is how much energy is produced by the burning

Battery	Nominal energy capacity (Wh)	Normalized total HF detected with FTIR (mg/Wh)	Normalized maximum HRR (W/Wh)	Normalized THR (kJ/Wh)
A	128	15–25	243–729	17–19
B	128	150–198	78–633	45–50
C	112	43–160	116–491	66–75
D	92	12–24	207–315	27–30
E	132	52	235	50
F	138	55	384	50
G	124	15	460	28

Table 2. Main test results normalized to nominal energy capacity, when applicable including various SOC-levels.

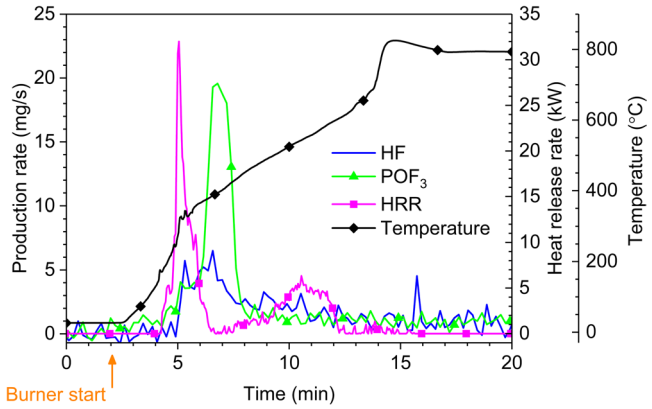

Figure 3. Results for a test with 5 type A cells at 0% SOC showing HF and POF_3, HRR and average surface temperature of the battery cells.

battery, compared to the amount of nominal electrical energy capacity a fully charged battery can deliver to an external circuit. The energy ratio is therefore a comparison between the chemical and the electrical energy of the Li-ion battery cell. The energy ratio varies considerably for the different cell types but is approximately constant for each cell, independent of SOC level. There are some similarities in Fig. 2a and b for the pouch cells, type B and C, which give the highest values in both cases, although in reverse order. This might indicate a higher amount of combustibles, e.g. electrolyte, in these cells compared to the other cells. It is also interesting to see that the energy ratio varies significantly between the tested cells, ranging from 5 to 21. This is important knowledge for fire protection and fire fighting. The energy ratio thus refers to a nominal fully charged battery while in normal use only a part of the SOC-window is used, for example half (50%) of the SOC-window (corresponding to cycling the battery between e.g. 30% and 80% SOC). If instead, the total heat release divided by the used electric battery capacity in the specific application is considered, higher energy ratio values are obtained. A summary of the results is shown in Table 2.

The measured heat release from an overheated battery may include several aspects, e.g. the battery temperature increase and the combustion of released gases. Variations due to the type of battery cell, the initiation method, e.g. if the test is done as an external fire test, an external heating or an overcharge test, and the test method, e.g. access to ambient oxygen (inert, under-ventilated or well-ventilated fire), and the presence of an external igniter, can greatly affect the amount of measured heat release. Energy release from a internal cell event in a confined environment can, for example, be lower than the energy release from the same cell in case of external fire. Thus energy ratios published using other methods and other types of Li-ion cells can be significantly different[7,52,53].

For all tested battert types and selected SOC-levels, POF_3 could only be measured quantitatively for type A battery cells at 0% SOC. Repeated measurements confirmed the presence of POF_3 only for type A and only for 0% SOC. No POF_3 could thus be detected in any of the other tests. POF_3 is an intermediate compound and the local combustion conditions in every test, will influence the amounts of POF_3 generated. This shows the importance of investigating many different set-ups when evaluating emitted gases.

In Fig. 3 the HRR, the average surface temperature of the five cells as well as the HF and POF_3 production rates are shown for type A cells at 0% SOC. The POF_3 curve is less noisy than the HF curve due to different signal-to-noise ratios of the FTIR instrumentation at the different wavenumbers. There is a secondary peak in HRR approximately 5 minutes after the main heat event, this peak does not correspond to any peaks in the mass flow of HF or POF_3. The explanation for this could be that the second peak in the heat release rate involves burning of mainly non-fluorine containing compounds. The temperature curve shows a rapid increase above the

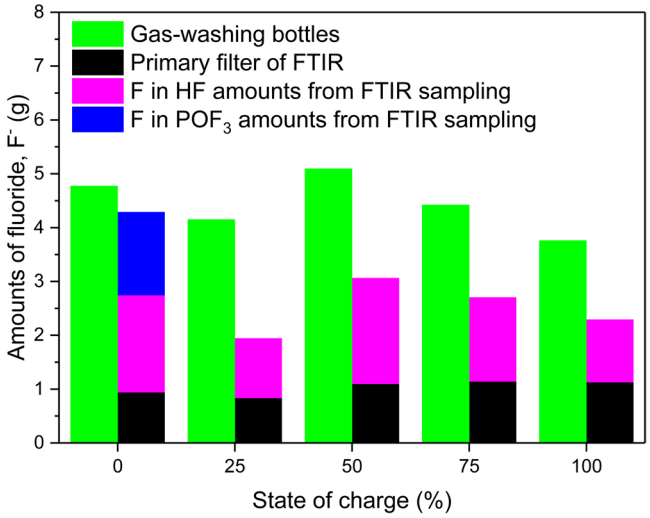

Figure 4. Total amount of measured fluoride, F^-, for type A, for 0–100% SOC with intermediate steps of 25%. The amount of F^- from the FTIR is calculated from the measurement results for POF_3 and HF, while the amount of fluoride from gas-washing bottles and primary filter analyses is measured as water soluble fluoride.

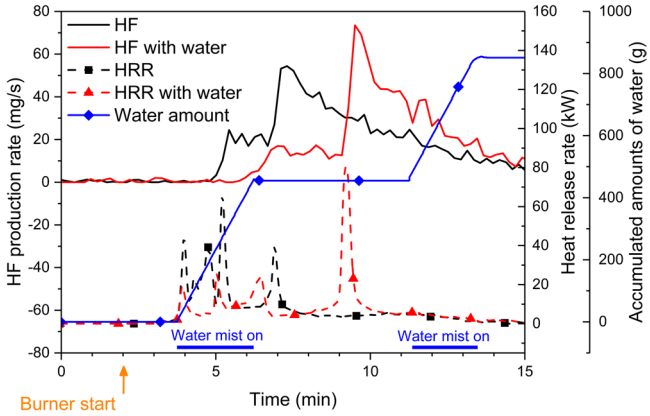

Figure 5. Results for type B cells at 100% SOC with and without the use of water mist.

melting temperature of the alumina cell case at about 660 °C. At these temperatures the alumina is molten and has formed a puddle on the burner bed beneath the battery cells. The thermal conditions in and around the thermocouples and the remains of the batteries have therefore changed considerably causing the apparent temperature increase.

In addition to the time resolved measurements with the FTIR, gas-washing bottles were used to determine the total fluorine content in the gas emissions during the tests. A comparison between the different measurement methods used can be seen in Fig. 4 for type A cells. Note that the FTIR measurements are performed only to detect HF and POF_3, other fluoride compounds are not included. It is interesting to note that for 0% SOC the total amount of fluoride measured by the gas-washing bottle technique matches rather well with the FTIR and primary filter analysis. For other SOC values the fluoride content is higher from the gas-washing bottle measurements. Still, the general trend observed in the FTIR measurements for different SOC values is more or less confirmed by the gas-washing bottle measurements.

Gas-washing bottles were also used for some of the tests involving battery types B and C. These batteries showed higher amounts of released HF compared to type A. The ratio between the total values of released flouride from FTIR plus filter analysis and from the gas-washing bottles for type B and C was between 0.89 and 1.02, indicating a better correlation between FTIR and gas-washing bottles measurement when HF gas emissions are higher.

The total amount of POF_3 measured by FTIR for type A at 0% SOC was 2.8 g (for 5-cells) and 3.9 g (for 10 cells). Hence, the normalized total POF_3 production was 15–22 mg/Wh of nominal battery energy capacity. Abuse studies measuring POF_3 are few, Andersson *et al.*[46] found both HF and POF_3 when burning mixtures of propane and Li-ion battery electrolytes with a HF:POF_3 production ratio between 8:1 and 53:1. Besides HF and POF_3 measurements, several distinct non-assigned peaks were found in the FTIR measurements, e.g. at 1027 cm^{-1}

Battery	SOC (%)	Number of tests	Normalized total HF detected (mg/Wh)		Normalized maximum HRR (W/Wh)	Normalized THR (kJ/Wh)
			From FTIR	From gas-washing bottles		
A	100	6	19.8 ± 1.2 [3]	29.1 ± 3.1 [5]	612 ± 102	18.1 ± 0.46
	50	7	18.5 ± 3.9 [6]	36.7 ± 3.3 [6]	416 ± 39 [6]	18.0 ± 0.61 [6]
	0	2	21.6 ± 1.5	38.3 ± 1.6	214 ± 53	16.8 ± 0.66
B	100	4	166.8 ± 11.5	191.3 ± 11.3 [2]	538 ± 77	46.9 ± 1.9
C	100	3	53.9 ± 2.0 [2]*	N/A	461 ± 27	69.5 ± 2.6
	50	3	141.3 ± 26.3 [2]*	N/A	149 ± 5	70.5 ± 4.9

Table 3. Detailed results for all available repetitions. Values presented as mean values followed by the standard deviation, in case the data parameter was not measured in all tests the value in bracket declares the number of available tests used for the specific data parameter value. *For FTIR data for battery type C, one data point of 50% and one data point at 100% SOC are excluded as outliers since they were low due to that a pre HF-saturation was not applied in the test, see Methods.

and 1034 cm^{-1}, which have also been seen in other studies[46]. They are compatible with the typical C-O stretching energies of low molecular weight alcohols in gas phase but also with in-plane stretching of aromatic compounds. This indicates the complexity and the limited knowledge in this area.

Water mist measurements. In order to study the effects of water on gas emissions, fire tests have also been performed where a water mist was applied during the fire. The reason for this experiment is that water is the preferred extinguishing agent for a lithium-ion battery fire. The intention in this study was however not to extinguish the fire completely. One potential problem regarding the use of water mist is that the addition of water may, in principle, increase the rate of formation of HF, see Eqs (2) and (3).

Figure 5 shows the results for type B cells with and without exposure to water mist, note that both the HRR and HF production are delayed when water mist is used. In this limited study, the peak of the HF production rate increased by 35% when using water, however no significant change in the total amounts of the HF release could be seen. A similar result has been reported in a previous study[28]. The water mist was applied during two different periods of time, as marked in Fig. 5, adding a total of 851 g of water in the reaction zone, however, several other large sources of water were also present in the experiment, i.e. water production from the propane combustion and from humidity in the air. The water mist is cooling the fire and the top surface of the pouch cell was for some time partly covered with liquid water; this is the reason that the battery fire is delayed as seen in Fig. 5. The water mist might actually also clean the air by collecting fume particles and HF can be bound to water droplets, thus possibly lowering the amount of HF in the smoke duct and increasing the non-measured amount of very toxic hydrofluoric acid on the test area surfaces (e.g. walls, floor, smoke duct walls).

Repeatability

Repeated tests were performed for battery types A-C for selected SOC-levels. Some of the repetitions included a variant, e.g. including water mist; see Methods. In Fig. 2 all available test data are presented. Since the test repetitions are not clearly observable in Fig. 2 the results are also presented in Table 3 showing the mean values and standard deviations and the number of performed tests. While the ranges in Table 2 include data for all tested SOC-values, Table 3 shows test data for repeated measurements including repetition variants.

Figure 6 shows the repeatability results for four tests of battery type B for 100% SOC. The time evolution of HRR varies in the fire tests as seen in Fig. 6a. In fire tests there are always natural variations, however comparing the tests with 100% SOC, in Fig. 6a, with those with lower SOC-values presented in Fig. 1a, the repeatability of the 100% SOC tests is significant. The third repetition (black line) in Fig. 6a is delayed due to that it included an application of water mist, as discussed above. Although the appearance of the HRR plots of the four tests differs in Fig. 6a the THR (the integrated HRR) values are rather similar. Fig. 6b shows the HF release for the same four tests of type B at 100% SOC. Repetition 2 and 3 were performed in the third test period, without secondary FTIR filter, and therefore Repetition 2 occurs earlier while Repetition 3 is delayed due to the applied water mist, as discussed above. For the four tests of type B at 100% SOC the mean value of the total FTIR detected HF release is 166.8 mg/Wh with a standard deviation of 11.5 mg/Wh, as seen in Table 3. Comparing Fig. 1b and Fig. 6b, shows that for 100% SOC the HF release is faster and reaches a higher value. Repetition 1 in Fig. 6b shows lower HF release peak values, however, the total HF release value from the FTIR measurement of 168 mg/Wh is close to the average value (166.8 mg/Wh, as seen in Table 3).

Conclusions

This study covered a broad range of commercial Li-ion battery cells with different chemistry, cell design and size and included large-sized automotive-classed cells, undergoing fire tests. The method was successful in evaluating fluoride gas emissions for a large variety of battery types and for various test setups.

Significant amounts of HF, ranging between 20 and 200 mg/Wh of nominal battery energy capacity, were detected from the burning Li-ion batteries. The measured HF levels, verified using two independent measurement methods, indicate that HF can pose a serious toxic threat, especially for large Li-ion batteries and in confined environments. The amounts of HF released from burning Li-ion batteries are presented as mg/Wh. If extrapolated for large battery packs the amounts would be 2–20 kg for a 100 kWh battery system, e.g. an electric

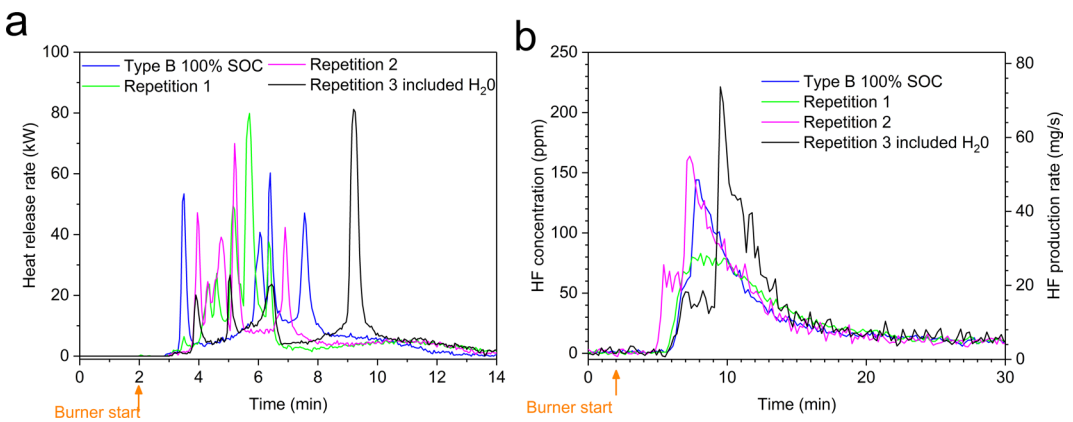

Figure 6. Repeatability for four tests of type B cells at 100% SOC, (**a**) shows the heat release rate (burner HRR contribution is subtracted) and (**b**) shows the HF release, both as the measured concentrations as well as the calculated HF production rates.

vehicle and 20–200 kg for a 1000 kWh battery system, e.g. a small stationary energy storage. The immediate dangerous to life or health (IDLH) level for HF is 0.025 g/m^3 (30 ppm)[22] and the lethal 10 minutes HF toxicity value (AEGL-3) is 0.0139 g/m^3 (170 ppm)[23]. The release of hydrogen fluoride from a Li-ion battery fire can therefore be a severe risk and an even greater risk in confined or semi-confined spaces.

This is the first paper to report measurements of POF_3, 15–22 mg/Wh, from commercial Li-ion battery cells undergoing abuse. However, we could only detect POF_3 for one of the battery types and only at 0% SOC, showing the complexity of the parameters influencing the gas emission. No POF_3 could be detected in any of the other tests.

Using water mist resulted in a temporarily increased production rate of HF but the application of water mist had no significant effect on the total amount of released HF.

The research area of Li-ion battery toxic gas emissions needs considerable more attention. Results as those presented here are crucial to be able to conduct a risk assessment that takes toxic HF gas into account. The results also enable strategies to be investigated for counteractions and safety handling, in order to achieve a high safety level for Li-ion battery applications. Today we have a rapid technology and market introduction of large Li-ion batteries but the risks associated with gas emissions have this far not been possible to take into consideration due to the lack of data.

Methods

Seven types of Li-ion batteries were exposed to an external propane fire. Fire characteristics, gas emissions, battery temperatures and cell voltages were measured. In total 39 fire tests were conducted of which 20 were within the base test matrix, 19 were repeated measurements of selected battery types and SOC-levels of which 10 included a variant, e.g. water mist for fire-fighting. The amounts of emitted fluoride gases were measured with two parallel and independent techniques, FTIR (time resolved concentration measurements and total values achieved by integration of the time resolved curve) and gas-washing bottles (total values). The experimental setup is schematically shown in Fig. 7. The gas collecting system and measurement system of the *Single Burning Item (SBI) method* (EN 13823[54]), which is normally used for reaction-to-fire classification of construction products according to EN 13501-1[55] was used in the tests. The tests were performed in three different test periods; the second test period was conducted about 1 year after the first and the third test period was conducted about 2.5 years after the first. Each test period involved several days of testing. The measurement equipment, as specified in the text below, was somewhat varying between the three test periods.

Batteries. Six different types of Li-ion battery cells, type A-F, and one Li-ion battery pack, type G, were tested as seen in Table 1. The number of cells used in each test was varied in order to achieve similar electrical energy capacity per test. The batteries were placed on wire gratings just above a 16 kW propane burner. The wire grating was made of steel wire about 2 mm thick over a surface of about 300 × 300 mm. The quadrants of the grating were 40 × 100 mm. The cells were not electrically connected to each other (except the laptop packs of type G, see note in Table 1). Type A-F was pure battery cells while type G was a complete laptop battery pack which included plastics box, electronics and cables. The chemical content of the polymer materials in the auxiliary components of the battery pack of battery type G is not known. It is possible, however not likely, that fluorine was included in some of the components, which in that case could have resulted in the production of HF. For battery type A, 5 cells/test was used except in two variant tests in which 10 cells/test were used.

The influence of different state of charge was investigated, for some battery types the complete SOC-window ranging from 0% to 100%, with intermediate steps of 25%, was investigated. The SOC levels included for each battery type and the numbers of repetitions per test type, i.e. the fire test matrix, is seen in Table 4. All parameters were not measured in all of the tests. Measurement of HRR and corresponding THR was conducted in 38 tests, FTIR in 35 tests and gas-washing bottles were used in 19 tests.

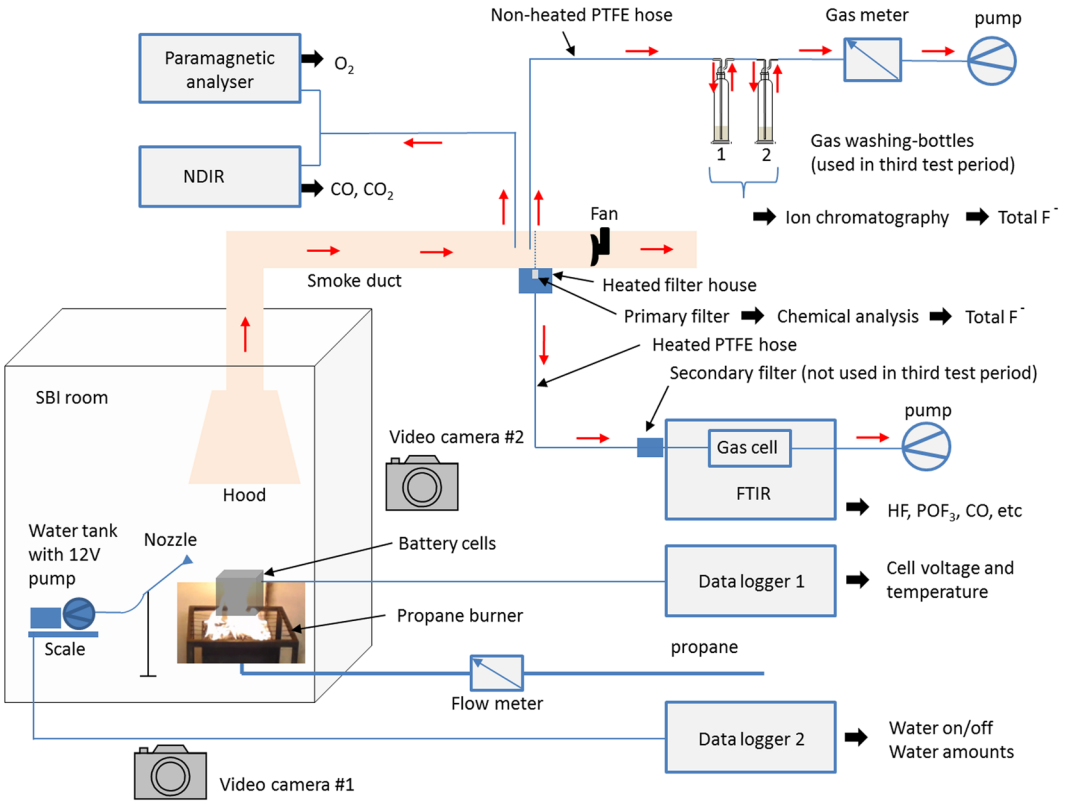

Figure 7. Schematic illustration of the experimental setup.

Battery	Number of tests per SOC-level					Number of tests
	0%	25%	50%	75%	100%	
A	1 + 1*	1	3 + 4*	1	3 + 3*	17
B	1	1	1	1	3 + 1*	8
C	1	1	3	1	2 + 1*	9
D			1		1	2
E					1	1
F					1	1
G					1	1
Total number of tests						39

Table 4. Detailed test matrix of the fire tests. *repetition includes a variant, e.g. water mist or 2 × 5-cell-pack (for battery type A).

The selected SOC level in each test was set using a charge/discharge procedure using ordinary laboratory equipment as well as dedicated battery test equipment, i.e. a *Digatron battery tester* and *Metrohm Autolab PGSTAT302N* with 20 A booster module. The cells were first fully charged by constant current followed by constant voltage (CC-CV) according to the manufacturer's instructions. For cells intended for tests with less than 100% SOC, the cell was discharged to the selected SOC level, using constant discharge current (CC). A relative low current rate, about C/5, was used and voltage and current rates were within the manufacturer limits. In most cases each battery type was tested during the same test period. However, the tests for type C and D were split in several test periods, for type C repetitions on 50% SOC were conducted in all three test periods, and for type B repetitions at 100% SOC were made in two test periods, the latter one included a water mist test.

All batteries were unused and the calendar life time of the cells before the tests were approximately 6–12 months for type A, F and G and between approximately 2–3 years for type B-E. The pouch cells; type B, C and F was mechanically tied together with steel wires (0.8 mm diameter). The type A hard prismatic cells were tight together in packs of five cells, "5-cell-pack", using steel straps (1 × 13 mm). The hard prismatic and cylindrical cells were placed in boxes to protect test personnel from potential projectile hazards in case of cell explosions due to excessive pressure. The 5-cell-pack of type A was placed standing up, with the cell safety vents releasing straight upright in direction to the hood and smoke duct, inside a custom-made steel-net-box, see Fig. 8. Additionally, the 5-cell-pack of type A was fastened to the bottom of the steel-net-box with steel wire (0.8 mm diameter) in the

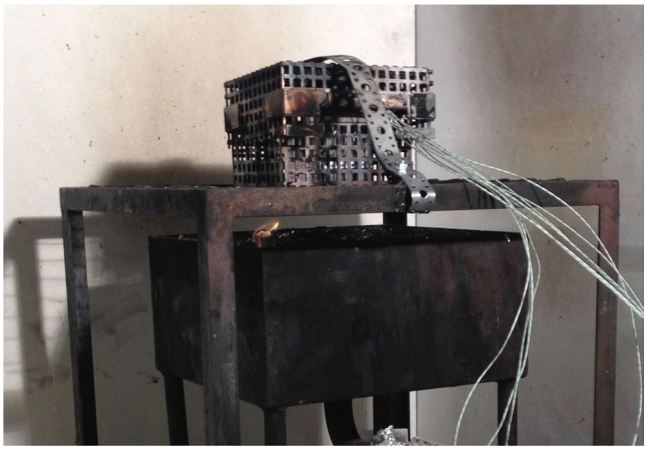

Figure 8. Photo of test type A, showing the 5-cell-pack inside a steel-net-box placed on the wire gratings. The sand bed for the propane burner is underneath the wire grating, a pilot flame (seen in front left corner of the burner) is used to ignite the propane gas.

corners to avoid it moving around due to e.g. explosion/rupture/venting. Type D and E cells were placed standing up in custom-made boxes made of non-combustible silica board and steel net at the top and bottom. Type G was placed in a steel net. The protective boxes and steel net were fastened in the wire gratings with steel wire and steel straps to avoid movement due to response to the fire. Care was taken to avoid external short circuiting when placing the battery on the wire gratings as well as avoiding accidental external electrical inter-cell-connections, e.g. for pouch cells the electrical tab terminals were cut. Still the battery test setup allowed that the separators and electrical insulation in the cells could melt due to the heat exposure which could cause various internal and external electrical contacts.

The battery surface temperature was measured with several type K thermocouples; the number of sensors varied for the different battery types. Battery cell surface temperature values presented in this paper are average values over the cell. Cell voltages were measured for type A, B, C and F battery tests. Cell voltage and thermocouple readings was sampled with 1 Hz using two types of data loggers, *Agilent 34972 A using an Agilent 34902 A reed multiplexer module* (for the third test period) and *Pico Technology ADC-24* (for the first and second test period).

Test procedure. The propane burner was started 2 minutes into each test, as indicated with arrows in the result figures in the paper. The burner was active as long as there was a heat contribution from the burning batteries; therefore, the burner was active for different durations of time for different batteries and SOC-levels. When the heat release from the batteries was no longer detectable, the power of the propane burner was doubled, i.e. to 32 kW, in order to be sure to fully burn out any residues of the batteries, for increased personnel safety. The fire emissions were collected in the hood and transferred in the smoke duct having a ventilation flow of 0.4 m^3/s, with the exception that 0.6 m^3/s was used in two tests with 100% SOC for type C. For these cases the values were scaled down to the lower flow values making the results from the two flow rates comparable. The SBI-room, see Fig. 7, had a ventilation inlet from an adjacent indoor laboratory hall (which had fresh air inlet from the ventilation system in the building), supplying ambient air with temperature about 20 °C entering beneath the propane burner. We consider the amount of ambient air to be sufficient to provide an oxygen-rich environment and thereby consider the battery fire as well-ventilated. However for some tests, during the rapid and energetic gas outbursts, a full combustion might not have occurred in these short time periods.

All tests were video recorded and for the majority of the tests an additional camera was used set at 90 degree angle from the other video camera, allowing simultaneous recording from two sides of the battery fire.

A part of the smoke duct flow was sampled to a *Servomex 4100 Gas purity analyser* where the oxygen content was measured by a *paramagnetic analyser* and CO and CO_2 were measured by a *non-dispersive infrared sensor (NDIR)*. By combing these two measurements, the heat release rate (HRR) is calculated using the oxygen consumption method corrected by CO_2[54]. Each test day started with a blank test, i.e. using only the propane burner, to measure the HRR of the burner alone and measure blanks for FTIR and gas-washing bottles. In the presented HRR values of the battery tests the burner contribution to the HRR (about 16 kW, with slight daily variations, established by the blank tests) has been subtracted. The combined expanded uncertainty is ±5 kW for the HRR-values. By integrating the HRR values over the entire test, subtracting the HRR from the burner, the total heat release (THR) from the battery cells could be established. The oxygen consumption method is common in fire calorimetry, however when using it with batteries, the joule heating from electrical discharge within the cells is not accounted for, therefore the values of HRR and THR do not include the Joule heating. During the external fire tests, it is difficult to measure how much a battery cell is electrically discharged when the separator is melting. The energy ratios presented in Fig. 2b do not include any Joule heating as clearly stated by its definition. For 0% SOC the influence from Joule heating is in principle zero, however small amounts of joule heating might possibly be liberated when going to zero voltage even though other processes might occur. Li-ion cells can also release oxygen during thermal runaway and this could affect the measured O_2 levels. The amount of oxygen release varies

Spectral bands (cm^{-1})	Type of band
POF_3	
868–874	P-F symmetric stretching mode[20]
1413–1418	P-O stretching mode[20]
HF	
4172–4175	HF R-branch stretching mode[58]
4202–4203	HF R-branch stretching mode[58]

Table 5. FTIR spectral band used for measurements of POF_3 and HF.

for different electrode materials, e.g. LFP typically releases less oxygen than LCO. However, the ventilation flow is large and the O_2 released from the battery cells is regarded as negligible.

Gas measurements. Besides the gas measurements in the SBI apparatus, measurements of gases were also conducted by online Fourier transform infrared spectroscopy (FTIR). The FTIR offers broad and diverse spectra of gases, the focus was however on fluoride gas emissions. The FTIR used was a *Thermo Scientific Antaris IGS analyzer (Nicolet)* with a gas cell. The gas cell was heated to 180 °C and had a volume of 0.2 L, 2.0 m path length and a cell pressure of 86.7 kPa which was maintained during the tests. The spectral resolution of the FTIR was 0.5 cm^{-1} (accuracy 0.01 cm^{-1}) and 10 scans where used to collect a spectrum every 12 s, giving both accurate intensity, as well as relatively rapid measurements with its five spectrum per minute rate. A part of the duct flow, taken along the full duct pipe width (in the mid height of the pipe) from around 15 sampling holes (about 2 mm diameter, directed opposite to flow, pipe end was closed), was taken to online FTIR measurement. This sub-flow was extracted through a primary filter inside a heated filter house (180 °C) and then extracted through an 8.5 m sampling PTFE hose, heated to 180 °C, and then through a secondary filter and finally through the gas cell of the FTIR. The sub-flow was selected to be 3.5 L/min using a pump located after the FTIR gas cell. Between each test the FTIR sampling system was flushed with N_2 gas and a new background spectrum was measured. There is a natural delay time between the FTIR and the heat release measurement. In order to time synchronize them the (CO_2 measurements from both the FTIR and the NDIR) part of the heat release rate measurement, were overlayed.

One primary filter (M&C ceramic filter, type "F-2K") was used per test and was chemically analysed for fluoride content after the test. It is known that HF may be partly adsorbed by this type of filter[56]. The fluoride amount absorbed by the filter was determined by leaching the filter in an ultrasonic water bath for at least 10 min and thereafter the fluoride content in the water was measured by ion chromatography with a conductive detector, according to the method B.1 (b) of the SS-ISO 19702:2006 Annex B standard. The amount of HF is calculated by assuming that all fluoride ions present in the filter derives from HF. The secondary filter (M&C sintered steel filter), heated to 180 °C, was the same in all tests in the first and second test period. In the third test period the secondary filter was removed in order to decrease delay time and losses. The third test period started with burning 10 cells of type A in order to saturate the FTIR sampling system with HF and it was conducted because in the first and the second test period the first tests had indicated low HF values, HF was potentially lost during saturation of the gas collecting system.

The FTIR was calibrated[29,57] for HF and POF_3. The minimum detection limit (MDL) for HF was 1.7 ppm and the limit of quantification (LOQ) was established to 5.7 ppm. The detection limit for POF_3 was 6 ppm[29]. PF_5 was also qualitatively detectable by the FTIR[29] but not quantitatively calibrated. A classical least square (CLS) method was used for the quantification of HF and POF_3 using the spectral bands specified in Table 5. The relative error of the HF prediction is lower than 10 rel-%.

For all measurements, except type G, the measured ppm levels of HF were above the detection level. For POF_3, the maximum concentration was 11 ppm (5-cells) and 19 ppm (10-cells).

When the FTIR measurement stopped, HF levels were, in some of the tests, still somewhat above the detection limit, even though no HRR contribution was measured from the batteries. It is also possible that the HF was temporarily clogged in the sampling system. Some HF might not have been collected in the measurements and the effect of this error is largest for the batteries that give the lowest values. Thus the reported values might underestimate the released gas emissions.

In order to further improve the accuracy of the FTIR measurements, a data offset determination and a subsequent adjustment of the HF values was performed. The improvement was greatest for tests with lower concentrations, closer to the MDL value, e.g. type A with 5 cells with low values during relatively short periods of time. With 10 cells per test, the type A batteries gave higher signal-to-noise levels. The FTIR measurements started around 8 minutes before the burner was started. The calculated average HF ppm noise level was treated as an offset that had both negative and positive values, ranging from extreme values of about −2 to 3.5 ppm. This offset was compensated for by assuming a constant offset value and adding positive or negative offset values to the total HF release value. Note that the reported concentration values in ppm are only valid for the measurements in the smoke duct of our specific test equipment and method. The HF and POF_3 concentration values (in ppm) were used for calculating the corresponding production rates (in mg/s) using the ideal gas law and taking into account the measured ventilation flow rate in the smoke duct.

In the third test period the total amounts of water soluble fluorides were determined using gas-washing bottle technique. This was made in order to validate the results from the FTIR measurements with a separate measurement technique. The water soluble fluorides were collected in the bottles and the amount of HF was calculated by assuming that all fluoride ions present derives from HF. The sample gas was extracted from the center of

the smoke duct using a non-heated 6 mm (o.d.) diameter PTFE sampling tube with a length of about 1.5 m. The sampling was made using two gas-washing bottles connected in series each containing 40 mL of an alkaline buffer solution (20 mM Na_2CO_3/20 mM $NaHCO_3$). The second bottle was used to capture any losses from the first bottle. The sampling flow was 1.0 normal-L/min and the total sampled volume during a test was measured by a calibrated gas volume meter. The sampling flow rate was checked before the start of each test using a *Gilian Gilibrator-2 NIOSH Primary Standard Air Flow Calibrator* gas flow meter. The procedure during a test was to continuously sample during the full test time. When the test was completed, the sampling tube was disconnected from the exhaust duct to allow rinsing of the tube with buffer solution, about 30 mL in the first gas-washing bottle, to collect any fluoride deposited on the inner walls of the tubing, in order to minimize losses in the tube. Since the tube was rinsed, heating of the tube was not necessary (any condensation in tube was collected anyhow). Analysis of fluorine content of the absorption solutions was made using High Performance Ion Chromatography (HPIC). The contents of the two gas-washing bottles were analyzed separately. The bottles were rinsed with distilled water between each test in order to minimize any interference between tests.

Water mist test. In the water mist tests, a custom-made equipment was constructed, including a 12 V automotive pump and water container which was placed on a scale measuring the weight of the water. The scale readings and the on/off manual switching (of the 12 V) was recorded with 1 Hz using *Pico Technology ADC-24* with a custom-made *LabVIEW* program. The water mist was sprayed on or above the batteries using a metal nozzle. In order for precise time synchronization, the on/off 12 V signal was recorded by both data loggers (data logger 1 and data logger 2). A blank test, i.e. using only the propane burner and without batteries, was performed in order to calibrate the setup. The water flow was around 190 g water per min and consisted of deionized water.

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Author Contributions

F. Larsson planned the experiments, partially together with P. Andersson and B.-E. Mellander. P. Andersson made the initial data process of the SBI heat release data. P. Blomqvist planned and performed the FTIR and gas-washing bottles measurements and made the initial data processing. F. Larsson prepared the batteries and performed the measurement and data analyses of temperature, cell voltage and water mist, and did the post-measurements and final data processing. Water mist setup was planned and constructed by B.-E. Mellander and F. Larsson. All four authors were involved in the analyses of the data and wrote the paper.

Additional Information

Competing Interests: The authors declare that they have no competing interests.

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ATTACHMENT 27

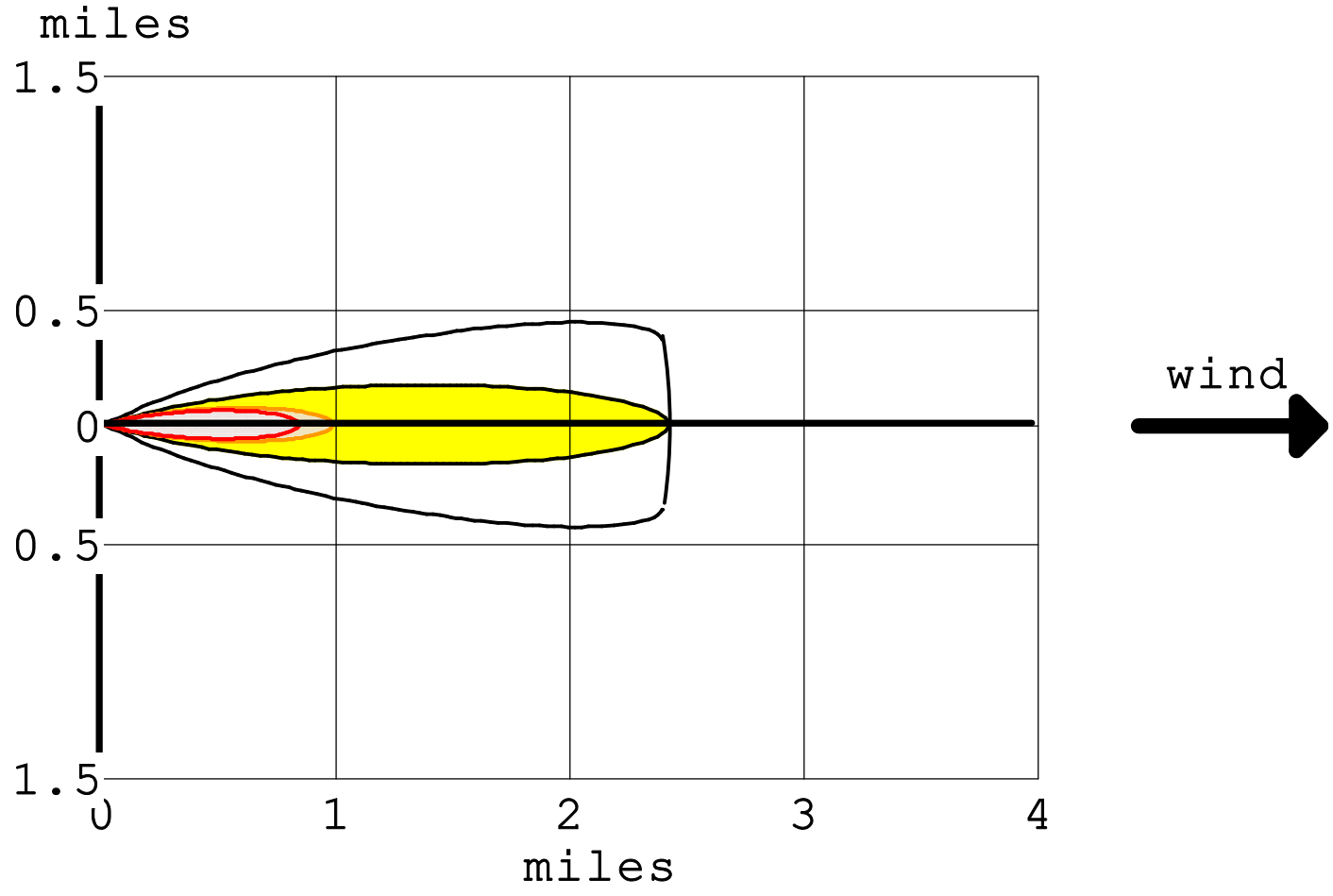
DISPERSION MODELING RESULTS OF HF RELEASE FROM BESS CONTAINER.

Time: December 6, 2023 1325 hours PST (using computer's clock)

Chemical Name: HYDROGEN FLUORIDE
Warning: HYDROGEN FLUORIDE can react with water and/or water vapor. This can affect the evaporation rate and downwind dispersion. ALOHA cannot accurately predict the air hazard if this substance comes in contact with water.

Wind: 10 miles/hour from 270° true at 5 meters

THREAT ZONE: (GAUSSIAN SELECTED)
Model Run: Gaussian
Red : 1491 yards --- (30 ppm = IDLH)
Orange: 1750 yards --- (20 ppm = ERPG-2)
Yellow: 2.4 miles --- (2 ppm = ERPG-1)



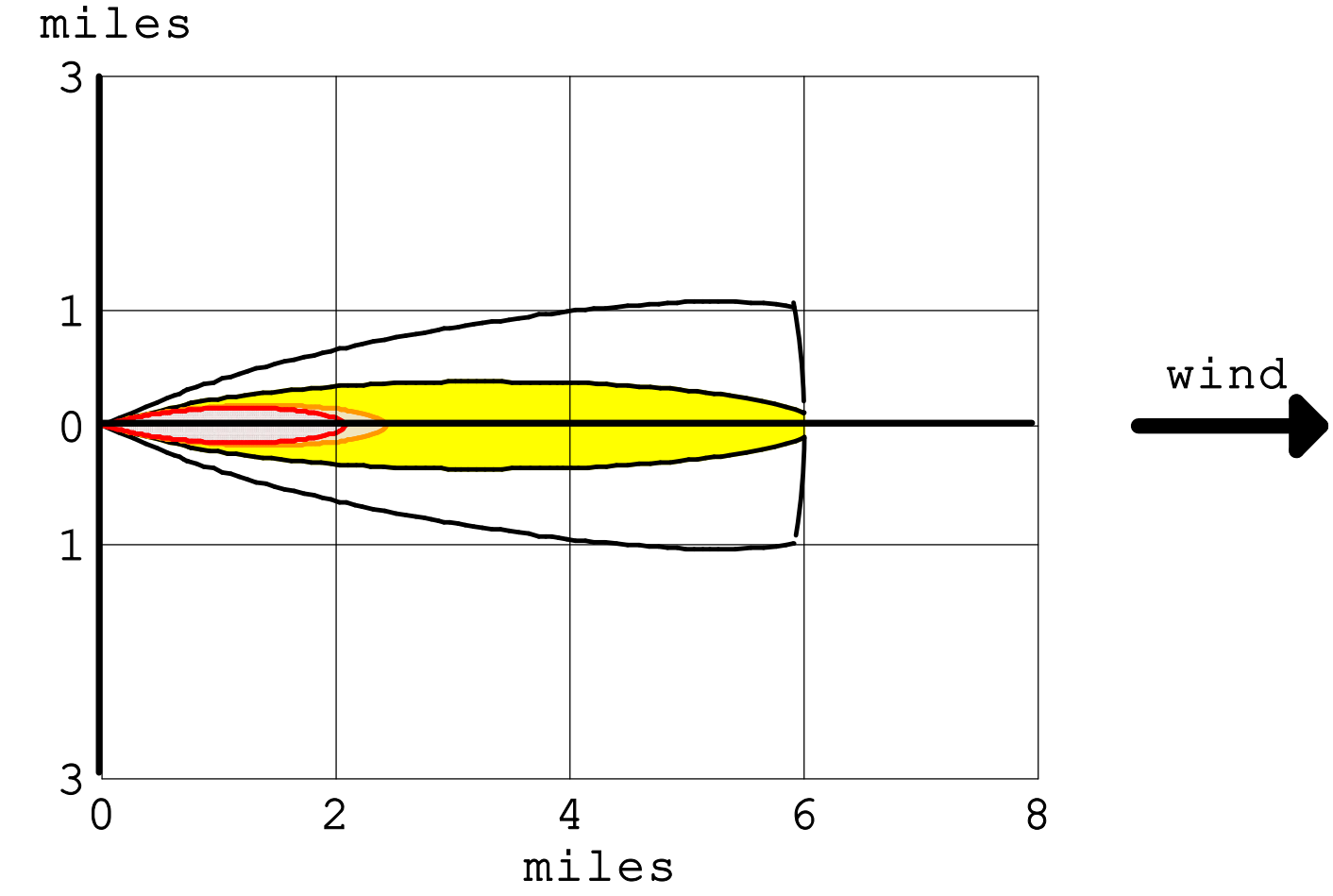
```
SITE DATA:
  Location: ACTON, CALIFORNIA
  Building Air Exchanges Per Hour: 0.89 (unsheltered single storied)
  Time: December 6, 2023  1325 hours PST (using computer's clock)

CHEMICAL DATA:
  Warning: HYDROGEN FLUORIDE can react with water and/or water vapor.  This
  can affect the evaporation rate and downwind dispersion.  ALOHA cannot
  accurately predict the air hazard if this substance comes in contact with
  water.
  Chemical Name: HYDROGEN FLUORIDE
  CAS Number: 7664-39-3                  Molecular Weight: 20.01 g/mol
  AEGL-1 (60 min): 1 ppm   AEGL-2 (60 min): 24 ppm   AEGL-3 (60 min): 44 ppm
  IDLH: 30 ppm
  Ambient Boiling Point: 61.8° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 10 miles/hour from 270° true at 5 meters
  Ground Roughness: open country         Cloud Cover: 0 tenths
  Air Temperature: 85° F                 Stability Class: D
  No Inversion Height                    Relative Humidity: 5%

SOURCE STRENGTH:
  Direct Source: 152 kilograms/min       Source Height: 8 feet
  Release Duration: 1 minute
  Release Rate: 5.59 pounds/sec
  Total Amount Released: 335 pounds
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red   : 1491 yards --- (30 ppm = IDLH)
  Orange: 1750 yards --- (20 ppm = ERPG-2)
  Yellow: 2.4 miles --- (2 ppm = ERPG-1)
```

Time: December 6, 2023 1325 hours PST (using computer's clock)

Chemical Name: HYDROGEN FLUORIDE
Warning: HYDROGEN FLUORIDE can react with water and/or water vapor. This can affect the evaporation rate and downwind dispersion. ALOHA cannot accurately predict the air hazard if this substance comes in contact with water.

Wind: 10 miles/hour from 270° true at 5 meters

THREAT ZONE: (GAUSSIAN SELECTED)
Model Run: Gaussian
Red : 2.1 miles --- (30 ppm = IDLH)
Orange: 2.4 miles --- (20 ppm = ERPG-2)
Yellow: 6.1 miles --- (2 ppm = ERPG-1)



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SITE DATA:
  Location: ACTON, CALIFORNIA
  Building Air Exchanges Per Hour: 0.89 (unsheltered single storied)
  Time: December 6, 2023  1325 hours PST (using computer's clock)

CHEMICAL DATA:
  Warning: HYDROGEN FLUORIDE can react with water and/or water vapor.  This
  can affect the evaporation rate and downwind dispersion.  ALOHA cannot
  accurately predict the air hazard if this substance comes in contact with
  water.
  Chemical Name: HYDROGEN FLUORIDE
  CAS Number: 7664-39-3                  Molecular Weight: 20.01 g/mol
  AEGL-1 (60 min): 1 ppm   AEGL-2 (60 min): 24 ppm   AEGL-3 (60 min): 44 ppm
  IDLH: 30 ppm
  Ambient Boiling Point: 61.8° F
  Vapor Pressure at Ambient Temperature: greater than 1 atm
  Ambient Saturation Concentration: 1,000,000 ppm or 100.0%

ATMOSPHERIC DATA: (MANUAL INPUT OF DATA)
  Wind: 10 miles/hour from 270° true at 5 meters
  Ground Roughness: open country         Cloud Cover: 0 tenths
  Air Temperature: 85° F                 Stability Class: D
  No Inversion Height                    Relative Humidity: 5%

SOURCE STRENGTH:
  Direct Source: 1520 kilograms/min      Source Height: 8 feet
  Release Duration: 1 minute
  Release Rate: 55.9 pounds/sec
  Total Amount Released: 3,351 pounds
  Note: This chemical may flash boil and/or result in two phase flow.
     Use both dispersion modules to investigate its potential behavior.

THREAT ZONE: (GAUSSIAN SELECTED)
  Model Run: Gaussian
  Red   : 2.1 miles --- (30 ppm = IDLH)
  Orange: 2.4 miles --- (20 ppm = ERPG-2)
  Yellow: 6.1 miles --- (2 ppm = ERPG-1)
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ATTACHMENT 29

REPORT ON LOW FREQUENCY NOISE AND ANNOYANCE.

Low frequency noise and annoyance

Article *in* Noise and Health · April 2004

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Low Frequency Noise and Annoyance

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Low frequency noise, the frequency range from about 10Hz to 200Hz, has been recognised as a special environmental noise problem, particularly to sensitive people in their homes. Conventional methods of assessing annoyance, typically based on A-weighted equivalent level, are inadequate for low frequency noise and lead to incorrect decisions by regulatory authorities.

There have been a large number of laboratory measurements of annoyance by low frequency noise, each with different spectra and levels, making comparisons difficult, but the main conclusions are that annoyance of low frequencies increases rapidly with level. Additionally the A-weighted level underestimates the effects of low frequency noises.

There is a possibility of learned aversion to low frequency noise, leading to annoyance and stress which may receive unsympathetic treatment from regulatory authorities. In particular, problems of the Hum often remain unresolved.

An approximate estimate is that about 2.5% of the population may have a low frequency threshold which is at least 12dB more sensitive than the average threshold, corresponding to nearly 1,000,000 persons in the 50-59 year old age group in the EU-15 countries. This is the group which generates many complaints.

Low frequency noise specific criteria have been introduced in some countries, but do not deal adequately with fluctuations. Validation of the criteria has been for a limited range of noises and subjects.

Keywords: Noise, low frequency noise, annoyance, subjective efforts, disturbance

Introduction

Low frequency noise, considered as the frequency range from about 10Hz to 200Hz, causes extreme distress to a number of people who are sensitive to its effects. The sensitivity may be a result of heightened sensory response, within the whole or part of the auditory range, or may be acquired. Onset of low frequency noise annoyance tends to occur in middle age. The noise levels are often low, in the region of a subject's hearing threshold, where there are large differences between individuals. The problem arises both in homes and in offices, or similar, premises. Whilst noise sources causing annoyance in the home may be unknown, in offices they are often fans or pumps in the building services. Similar plant, in those apartment blocks which have central services, may be the source of the noise in these premises, but a core of low frequency noise problems remain, of unknown origin, which continue to cause considerable annoyance. Low frequency noise problems also occur in industry, but generally at levels well above threshold, presenting a different noise problem to those in homes and offices.

Attempts to assess low frequency noise by conventional wide-band noise methods often fail, so illustrating the inadequacy of these methods for low frequencies. In particular, the regulatory dominance of A-weighted levels, leads to dismissal of valid problems of low frequency noise, so compounding the difficulties of some complainants

The World Health Organization recognizes the special place of low frequency noise as an environmental problem. Its publication on

Community Noise (Berglund et al., 2000) makes a number of references to low frequency noise, some of which are as follows

"It should be noted that low frequency noise, for example, from ventilation systems can disturb rest and sleep even at low sound levels"

"For noise with a large proportion of low frequency sounds a still lower guideline (than 30dBA) *is recommended"*

"When prominent low frequency components are present, noise measures based on A-weighting are inappropriate"

"Since A-weighting underestimates the sound pressure level of noise with low frequency components, a better assessment of health effects would be to use C-weighting"

"It should be noted that a large proportion of low frequency components in a noise may increase considerably the adverse effects on health"

"The evidence on low frequency noise is sufficiently strong to warrant immediate concern"

Annoyance

The meaning of annoyance

Annoyance has roots in a complex of responses, which are moderated by personal and social characteristics of the complainant. (Belojevic and Jokovljevic, 2001; Benton and Leventhall, 1982; Fields, 1993; Grime, 2000; Guski, 1999; Guski et al., 1999; Kalveram, 2000; Kalveram et al., 1999; Stallen, 1999).

For example, Guski (1999) proposes that noise annoyance is partly due to acoustic factors and partly due to personal and social moderating variables as follows:

Personal Moderators: Sensitivity to noise. Anxiety about the source. Personal evaluation of the source. Coping capacity with respect to noise.

Social Moderators: Evaluation of the source. Suspicion of those who control the source. History of noise exposure. Expectations

Noise annoyance in the home is considered as leading to a long-term negative evaluation of living conditions, dependent on past disturbances and current attitudes and expectations. Annoyance brings feelings of disturbance, aggravation, dissatisfaction, concern, bother, displeasure, harassment, irritation, nuisance, vexation, exasperation, discomfort, uneasiness, distress, hate etc, some of which combine to produce the adverse reaction.

Figure 1, modified from Guski (1999) in order to emphasise the central nature of the personal factors, summarises the interactions. The interpretation of Figure 1 is as follows. The noise load causes activity interference (e.g. to communication, recreation, sleep), together with vegetative reactions (e.g. blood pressure changes, defensive reactions). Interference with activity develops into annoyance and disturbance. Prolonged vegetative reactions may lead to effects on health. The personal factors interact with the outer boxes of Figure 1, moderating the complainant's complex of responses. The social factors moderate how the complainant interacts with external authorities in attempting to deal with the annoyance. Social factors may also interact with health effects, as some social classes may more readily seek medical assistance. The personal and social moderating factors are so variable that Grime (2000) questions the feasibility of developing a national noise policy.

Annoyance and the "meaning" of noise

Kalveram (2000) points out that much psychoacoustical noise research has limitations, because it is based upon the correlation between annoyance ratings and physical measurements of sound energy, often equivalent level, leading to noise dose. But equivalent level, A-weighted or linear, is only a part of the total process. Noise level and noise dose approaches neglect the "meaning" of a noise and are contrary to the interactive model in Figure 1. The noise level / noise dose assessment reduces Figure 1 to Figure

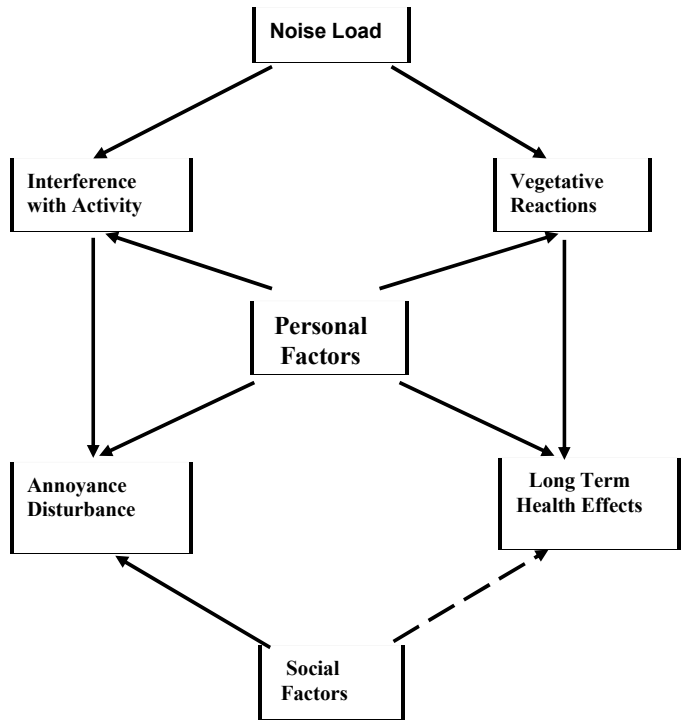

Figure 1. Factors moderating noise annoyance

2, in which the personal factors are constrained to those of the average person, so that only a limited number of subjects are protected by criteria which are developed from the assessment.

Kalveram proposes an "ecological" approach, which emphasises the psychological functions of sounds. Annoyance originates from acoustical signals which are not compatible with, or which disturb, these psychological functions. In particular, disturbance of current activities is a primary effect of noise exposure, producing a potential loss of fitness in the subject with respect to those behaviour patterns which permit coping with changes in the environment. Presence of a harmful sensory variable in the environment leads to actions which interrupt current behaviour, in an attempt by the subject to reduce the sensory input. This tests the coping capacity of the individual.

Those who have experienced long-term exposure to low frequency noise may recognise this within themselves. However, a few persons are known to have modified their responses to low frequency noise, thereby removing it from the category of a challenge and threat.

Most field work on noise annoyance has been where there is a known source, for example air or road transport. The particular circumstances of some low frequency noise problems, where the noise source is not known, adds an additional element to annoyance. Those affected suffer extreme frustration and may find it necessary to assume a source, thus enabling themselves to cope through provision of a focus for anger and resentment. Assumed sources have included neighbours, gas pipelines, radio transmissions and defence establishments.

Annoyance Measurements

Annoyance measurements are generally of the type described by Kalveram (2000), an attempt to relate annoyance ratings directly to measured noise levels. As described above, these measurements are limited in their results, since they deal with only part of the annoyance complex.

Laboratory determinations

There have been a large number of laboratory determinations of annoyance of low frequency sounds, mainly measurements using either 'normal' or 'sensitive' subjects. Stimuli have included tones, bands of noise or specially

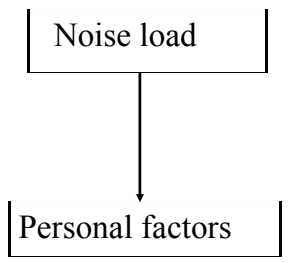

Figure 2. Noise dose interaction

developed spectra. There is, of course, a wide range of possible stimuli, which experimenters have chosen according to their experience of what is required (Adam, 1999; Andresen and Møller, 1984; Broner and Leventhall, 1978; Broner and Leventhall, 1984; Broner and Leventhall, 1985; Goldstein, 1994; Goldstein and Kjellberg, 1985; Inukai et al., 2000; Kjellberg and Goldstein, 1985; Kjellberg et al., 1984; Møller, 1987; Nakamura and Inukai, 1998; Persson and Bjorkman, 1988; Persson-Waye, 1985; Poulsen, 2002; Poulsen and Mortensen, 2002). Some of the laboratory studies have used recordings of real noises as stimuli, whilst others have worked with recordings of the actual noises as experienced by subjects in their own work places or homes. (Holmberg et al., 1993; Landström et al., 1994; Manley et al., 2002; Mirowska, 1998; Mortensen and Poulsen, 2001; Poulsen and Mortensen, 2002; Tesarz et al., 1997; Vasudevan and Gordon, 1977; Vasudevan and Leventhall, 1982).

Most determinations have been aimed at relating the A-weighted level, or some other derivative of the spectrum of the low frequency noise, to its annoyance. Whilst they are adequate studies, and have shown some general factors in low frequency noise annoyance, they are limited in that their results apply only to the particular noises investigated, often with a small number of subjects. It is unlikely that continued studies of this kind will result in step changes in our understanding of low frequency noise annoyance. However, Poulsen and Mortensen (2002) are an advance on previous work, as they compare subjective assessments with criteria, which have been developed in some European countries, specifically for assessment of low frequency noise.

Experimental methods

The responses required from subjects vary with experimental method. In laboratory investigations, subjects may be asked to '"imagine" themselves relaxing in their homes in the evening and to rate annoyance by, for example, choice on a semantic scale ranging from 'Not Annoying' to 'Extremely Annoying'. Other methods include marking the level of annoyance on an unnumbered linear scale at a point between 'Not at all annoying' and 'Very annoying', or assigning a number to a reference noise and appropriate numbers to other noises in order to estimate their magnitudes. These psychological techniques are well established, but need care in their performance, as they are sensitive to experimental factors.

Equal annoyance contours

The main results of this work are as follows. Møller (1987) investigated contours of equal annoyance for pure tones in the frequency range 4Hz to 31.5Hz. The annoyance contours are influenced by the narrowing of the range of equal loudness contours at low frequencies. Møller's results are shown in Figure 3. The vertical scale is the annoyance rating in terms of the distance marked for the tone along a 150mm linear scale. The lowest frequencies must be at a higher level than other frequencies in order to become audible but, once they are audible, their annoyance increases rapidly. For example, the scale rating range at 4Hz is about 10dB between extremes of annoyance. 8Hz and 16Hz have a 20dB range, whilst 31.5Hz has nearly 40dB range. The 1000Hz comparison, which is for an octave band of noise, has a range of nearly 60dB. These findings are important, as they confirm that the hearing contours are reflected in annoyance, although loudness and annoyance are not necessarily the same. Figure 3 gives averages for 18 subjects with normal hearing.

Individual annoyance functions

Broner and Leventhall (1978) measured individual annoyance functions for 20 subjects using ten low frequency noise stimuli. The

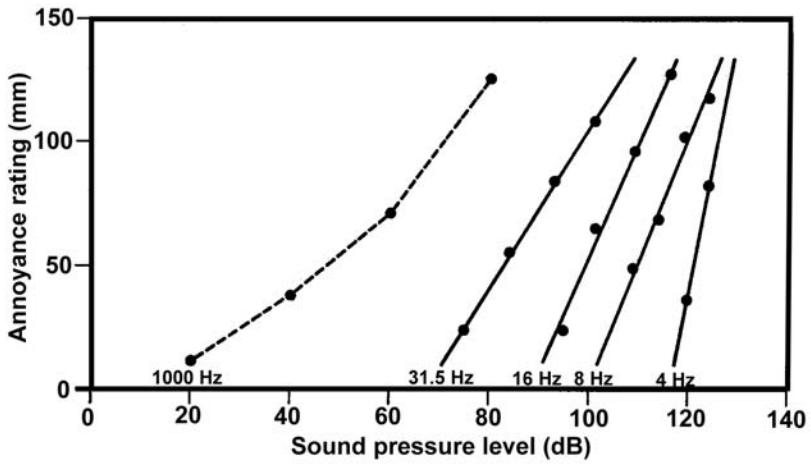

Figure 3. Annoyance rating, showing rapid growth at low frequencies

psychophysical function was assumed to be a simple power function

$$\psi = k\varepsilon^{\beta}$$

Where ψ represents the estimation of psychological magnitude, ε is the stimulus intensity and β a subject-specific exponent. It was shown that there was a wide range of individual exponents, β, from a low of 0.045 to a high of 0.4 and three groupings of individual differences were identified. Previous work at higher frequencies had also shown individual loudness functions (Barbenza et al., 1970) and had posed the question of whether one set of regulations should be applied to all people (Bryan and Tempest, 1973).

Annoyance and the dBA

A comparison of a band of noise peaking at 250Hz with a band peaking at 100Hz, whilst both were adjusted to the same A-weighted level, showed that the annoyance from the low frequency noise was greater than that from the higher frequency noise at the same A-weighted level (Persson et al., 1985) . This work was subsequently extended (Persson and Bjorkman, 1988; Persson et al., 1990) using a wider range of noises, for example, peaking at 80Hz, 250Hz. 500Hz and 1000Hz, leading to the following conclusions:

* There is a large variability between subjects.

*The dBA underestimates annoyance for frequencies below about 200Hz.

For broadband low frequency noise, the underestimate was found to be 3dB for levels around 65dB(Linear) and 6dB for levels around 70dB(Linear). Similar results had been obtained in earlier work (Kjellberg et al., 1984). Two broadband noises were investigated, in which one was dominated by energy in the 15-50Hz range. Twenty subjects compared the two noises within the dynamic range 49-86dBA. At equal A-weighted levels, the noise dominated by the low frequency component was perceived as 4-7dB louder and 5-8dB more annoying.

The energy input to the subjects was, of course, greater for the low frequency noises due to the attenuating effect of A-weighting, and it might be expected that there would be a greater effect, perhaps suggesting that loudness, assumed related to the A -weighting, differs from annoyance at low frequencies.

Unpleasantness

The “unpleasantness” of low frequency noise has also been estimated (Inukai et al., 2000; Nakamura and Inukai, 1998). Nakamura and Inukai used a stimulus sound of a pure tone in 20 conditions from 3Hz to 40Hz and sound pressure levels from 70dB to125dB, with evaluation by 17 subjects. There were four main subjective factors in response to low frequency noise: auditory perception, pressure on the eardrum, perception through vibration of the chest and more general feeling of vibration. Analysis of the responses showed that auditory perception was the controlling factor. That is, although high levels of low frequency noise may produce other sensations, the ear is the most sensitive receptor.

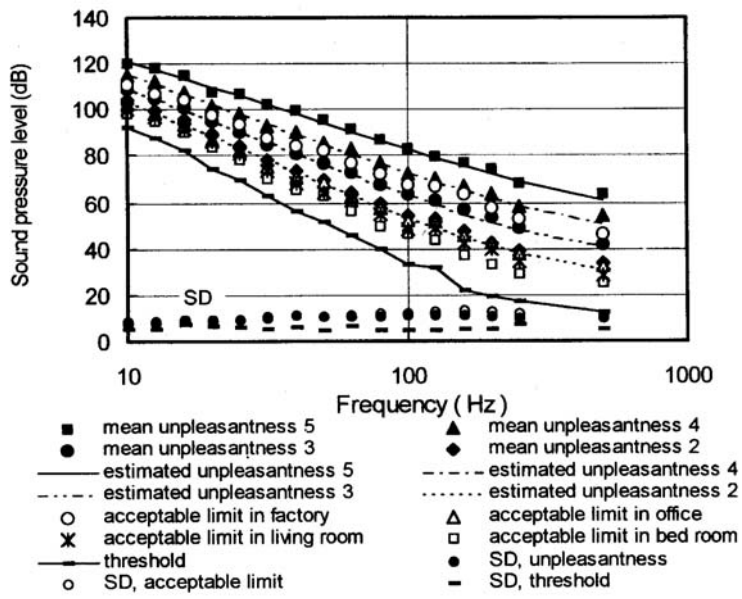

Figure 4. Equal unpleasantness contours and acceptable limits (Inukai)

Inukai et al (2000) determined "equal unpleasantness" contours for 39 subjects over a tone frequency range of 10Hz to 500 Hz. A verbal scale was used ranging through: *Not at all unpleasant (1) - somewhat unpleasant (2) – unpleasant(3) – quite unpleasant(4) – very unpleasant(5)*. Subjects in a test chamber were asked to assume different home and work situations and adjust the level of a tone to match a level on the scale, as requested by the experimenter. For example if instructed to match to level 4 (*quite unpleasant*), subjects would adjust the tone until they judged that this level was reached. Results are shown in Figure 4. The numbers 1,2,3,4,5 refer to the unpleasantness level. All levels of unpleasantness are approximately linear with a negative slope of 5 - 6dB per octave. The acceptable limits for different locations are all above the hearing threshold in this laboratory setting. For example, the self-adjusted acceptable limit in an assumed bedroom is more than 10dB above threshold, but this might not be replicated for long term exposure at night in a real bedroom.

Spectrum balance

The work by Inukai et al (2000) was for single tones. Spectrum balance has also been considered a factor in noise annoyance of a wideband spectrum. Correlation of a number of complaints with the corresponding spectra (Bryan, 1976) led to the conclusion that, for spectra which averaged as shown in Figure 5, a fall off above 32Hz of 5.7dB/octave was acceptable, whilst a fall off from 63Hz at 7.9 dB/octave was unacceptable. Work on acceptable spectra of air conditioning noise in offices led to similar conclusions (Blazier, 1981). Blazier found that, on average, acceptable office environments had a fall off of 5dB/octave. An excess of low frequency noise led to rumble, an excess of mid frequency noise led to roar, whilst an excess of high frequency noise led to hiss. Later work (Blazier, 1997) developed a "Quality Assessment Index" for an HVAC noise through the balance of low, mid and high frequencies.

(dBC – dBA) weighting.

The difference between C- and A-weightings has also been considered as a predictor of annoyance (Broner, 1979; Broner and Leventhall, 1983; Kjellberg et al., 1997), as this difference is an indication of the amount of low frequency energy in the noise. If the difference is greater than 20dB, there is the potential for a low frequency noise problem. Kjellberg et al used existing noise in work places (offices, laboratories, industry etc) with 508 subjects. Three sub- groups were obtained with a maximum difference in low and high frequency exposure. The conclusions on correlations of (dBC – dBA) difference and annoyance were that the difference is of limited value, but, when the difference exceeds 15dB, an addition of 6dB to the A-weighted level is a simple rating procedure. However, the difference breaks down

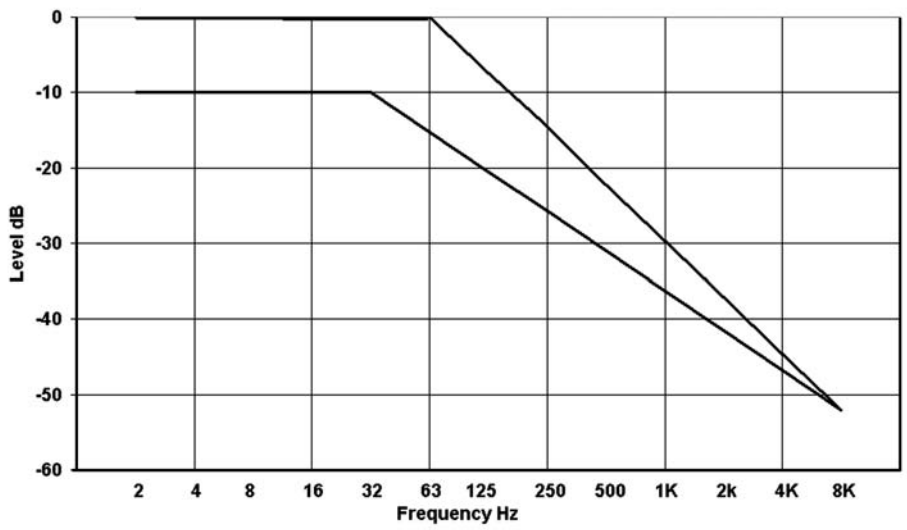

Figure 5. Acceptable and unacceptable spectrum slopes

when the levels are low, since the low frequencies may then be below threshold. The (dBC – dBA) difference cannot be used as an annoyance predictor, but is a simple indicator of whether further investigations may be necessary.

Home and work environments

Other studies, have assessed low frequency noise in real or assumed work environments or in the home (Bryan, 1976; Cocchi et al., 1992; Holmberg et al., 1997; Holmberg et al., 1993; Holmberg et al., 1996; Landström et al., 1993; Landström et al., 1994; Lundin and Ahman, 1998; Mirowska, 1998; Vasudevan and Gordon, 1977; Vasudevan and Leventhall, 1982).

Homlberg et al (1996 and 1997) assessed noise in real environments. The 1996 paper compared responses of about 240 subjects with the noise measures which might be available on a sound level meter i.e. dBLIN, dBA, dBB, dBC and dBD and the difference (dBC-dBA). Additionally, Zwicker loudness (ISO532, 1975) and Low Frequency Noise Rating (LFNR) (Broner and Leventhall, 1983) were calculated. There was poor correlation between the sound level meter weightings and annoyance. Similarly, the loudness in sones and the difference (dBC – dBA) did not correlate well.

The LFNR did separate out annoying and not annoying noises, but no more effectively than the (dBC – dBA).

Level variations

Holmberg et al (1997) investigated noise in workplaces, using the (dBC – dBA) difference as an indicator. Low frequency noise exposure was found in a group of 35 out of a total of 337 persons. Measurements of temporal variation of the levels of low frequency noise at the workplaces, averaged over 0.5, 1.0 or 2.0 seconds, was correlated with subjective annoyance. Significant correlation was found between the irregularity of the noise levels and annoyance.

This work represents an advance, in that it shows the importance of fluctuations in noise level. A limitation of much work on assessment of low frequency noise has been that long term averaged measurements were used and, consequently, information on fluctuations was lost, although complaints of low frequency noise often refer to its throbbing or pulsing nature. Broner and Leventhall(1983) had noted the importance of fluctuations and suggested a fluctuation penalty of 3dB in the Low Frequency Noise Rating Assessment. The importance of fluctuations has also been assessed in laboratory experiments (Bradley, 1994). Subjects listened first to steady wideband noises which peaked at 31.5Hz and adjusted the overall level of these to be equally annoying to a reference spectrum which fell at 5dB/octave. It was found that the more prominent the low frequency noise, the greater the reduction in level required for

equality of annoyance with the reference spectrum. The test spectra were now amplitude modulated, in the low frequency region only, at modulation frequencies of 0.25, 0.5, 1.0, 2.0 and 4.0Hz and depths of 10dB and 17dB. Subjects again adjusted the level of the noises to produce equal annoyance with the unmodulated reference noise. The reductions varied with modulation frequency and modulation depth. An example is that, for the highest modulation depth at 2.0Hz modulation frequency, the level was reduced by 12.9dB averaged over the subjects. This work confirms the importance of fluctuations as a contributor to annoyance, and the consequent limitation of those assessment methods which do not include fluctuations .

Field investigations

Vasudevan and Gordon (1977) carried out field measurements and laboratory studies of persons who complained of low frequency noise in their homes. A number of common factors were shown:

* The problems arose in quiet rural or suburban environments
* The noise was often close to inaudibility and heard by a minority of people
* The noise was typically audible indoors and not outdoors
* The noise was more audible at night than day
* The noise had a throb or rumble characteristic
* The main complaints came from the 55-70 years age group
* The complainants had normal hearing.
* Medical examination excluded tinnitus.

These are now recognised as classic descriptors of low frequency noise problems.

Further work in the laboratory showed that gradually falling spectra, as measured in the field and simulated in the laboratory, possessed a rumble characteristic. Figure 6 compares a measured noise on the left with a simulated noise on the right. Both fell at 7 – 8 dB/octave and had similar rumble characteristics. It is also known that a rapidly falling spectrum, such as one which follows the curve of the NR or NC ratings has an unpleasant quality. This was one reason for the development of the PNC rating as an improvement of the NC rating (Beranek et al., 1971). Further work (Vasudevan and Leventhall, 1982), confirmed that levels close to threshold caused annoyance, which increased if the noise also fluctuated. This work included spectra with tonal peaks and emphasised that the nature (quality) of the noise was important. Fluctuating noises are more annoying than predicted by their average sound levels.

Recent work on annoyance to people in their homes has been by Mirowska (1998) and Lundin and Ahman (1998). Both these papers considered annoyance due to plant or appliances, installed in, or adjacent to, living accommodation. Mirowska found problems from machinery, including transformers in electricity substations, ventilation fans, refrigeration units and central heating pumps. Lundin and Ahman investigated a husband and wife who experienced typical symptoms of aversion to low frequency noise. Refrigerators and freezers were suspected as the source of the offending noise which, in some parts of the building, was high at 50Hz. The time varying pattern of the noise, due to equipment cycling, was considered to add to its annoyance. However, there was no totally convincing link between effects on health and the noise.

Development of enhanced susceptibility.

It is known that different regions of the brain are responsible for different functions. The brain also possesses "plasticity", in the sense that parts within the same region may change their function. For example, extensive training in a frequency discrimination task in small mammals leads to improved discrimination ability and an expansion of the cortical area responsive to the frequencies which were used during training. (Schnupp and Kacelnick, 2002).

In humans, there is considerable plasticity in the brain during its early development, requiring appropriate stimuli for proper growth. Plastic adaptation is slower in the adult brain. Two examples of plastic adaptation are:

London taxi drivers are required to memorise many routes through London. Magnetic resonance imaging showed that the part of the brain associated with spatial navigation, the posterior hippocampus, enlarged at the expense

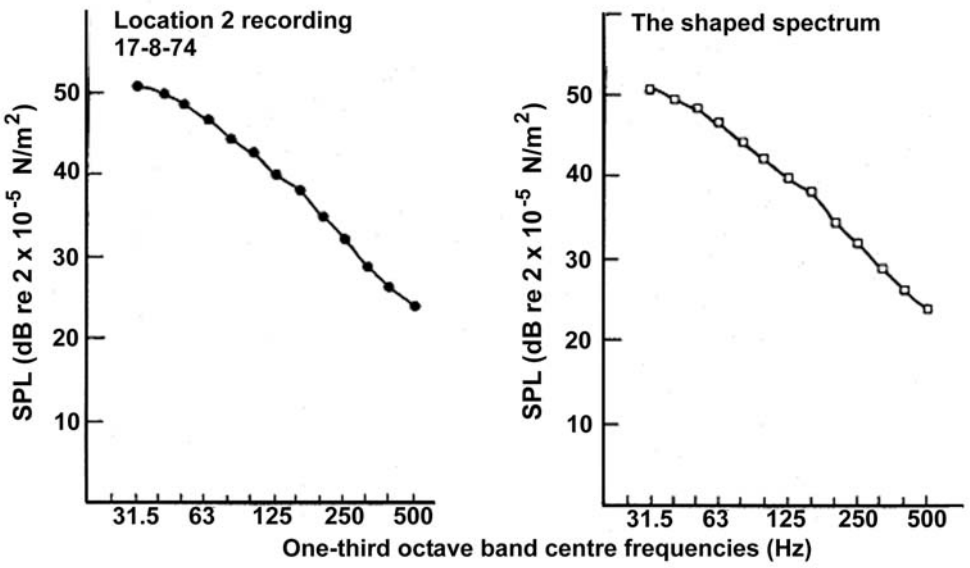

Figure 6. Measured spectrum (left) and simulated spectrum (right)

of neighbouring regions.(Maguire et al., 2000). There has been a similar finding for skilled musicians (Pantev et al., 1998). Cortical reorganisation was greater the younger the age at which music training began.

The significance of these findings for low frequency noise annoyance is:
There is clear evidence that the brain is able to adapt to stimuli.
If complainants spend a great deal of time listening to, and listening for, their particular noise, it is possible that they may develop enhanced susceptibility to this noise.

Enhanced susceptibility is therefore a potential factor in long-term low frequency noise annoyance.

Low frequency noise annoyance and stress

Stresses may be grouped into three broad types: cataclysmic stress, personal stress and background stress. Cataclysmic stress includes widespread and devastating physical events. Personal stress includes bereavements and other personal tragedies. Cataclysmic and personal stresses are evident occurrences, which are met with sympathy and support, whilst their impacts normally reduce with time. Background stresses are persistent events, which may become routine elements of our life. Constant low frequency noise has been classified as a background stressor (Benton, 1997; Benton and Leventhall, 1994). Whilst it is acceptable, under the effects of cataclysmic and personal stress, to withdraw from coping with normal daily demands, this is not permitted for low level background stresses. Inadequate reserves of coping ability then leads to the development of stress symptoms. In this way, chronic psychophysiological damage may result from long-term exposure to low-level low frequency noise.

Changes in behaviour also follow from long-term exposure to low frequency noise. Those exposed may adopt protective strategies, such as sleeping in their garage if the noise is less disturbing there. Or they may sleep elsewhere, returning to their own homes only during the day. Others tense into the noise and, over time, may undergo character changes, particularly in relation to social orientation, consistent with their failure to recruit support and agreement from the regulatory authority that they do have a genuine noise problem. Their families, and the investigating officer, may also become part of their problem. The claim that their "lives have been ruined" by the noise is not an exaggeration, although their reaction to the noise might have been modifiable at an earlier stage.

The HUM

Occurrence

Hum is the name given to a low frequency noise

which is causing persistent complaints, but often cannot be traced to a single, or any, source. If a source is located, the problem moves into the category of engineering noise control and is no longer "the Hum", although there may be a long period between first complaint and final solution. The Hum is widespread, affecting scattered individuals, but periodically a Hum focus arises where there are multiple complaints within a town or area. There has been the Bristol Hum (England), Largs Hum (Scotland), Copenhagen Hum (Denmark), Vancouver Hum (Canada), Taos Hum (New Mexico USA), Kokomo Hum (Indiana USA) etc. A feature of these Hums is that they have been publicised in local and national press, so gathering a momentum which otherwise might not have occurred, possibly increasing the number of adverse reactions. Although the named Hums, such as Kokomo, have gained much attention, they should not be allowed to detract from the individuals who suffer on their own.

Hum character

The sound of the Hum differs between individuals. Even in the areas of multiple complaints, the description is not completely consistent, although this may be because people use different words to describe the same property of a noise. Publicity tends to pull the descriptions together. The general descriptors of the sound of the Hum include: a steady hum, a throb, a low speed diesel engine, rumble and pulsing. A higher pitch, such as a hiss, is sometimes attributed. The effects of the Hum may include pressure or pain in the ear or head, body vibration or pain, loss of concentration, nausea and sleep disturbance. These general descriptions and effects occur internationally, with close similarity.

Unsympathetic handling of the complaint leads to a build-up of stress, which exacerbates the problems. Hum sufferers tend to be middle aged and elderly, with a majority of women. They may have a low tolerance level and be prone to negative reactions. The knowledge that complaints are being taken seriously by the authorities helps to reduce personal tensions, by easing the additional stresses consequent upon not being believed. This is particularly so when, as is often the case, only one person in a family is sensitive to the noise. Whilst some Hum sufferers may have tinnitus, they will, of course, also be troubled by intruding noise at a different frequency from their tinnitus. Tinnitus should not be used as a reason to reject a complaint of low frequency noise annoyance.

Psychological aspects of the Hum

Psychosocial factors affect the physiological impact of noise (Hatfield et al., 2001). Adverse physiological consequences may be mediated by psychological factors related to the noise exposure. It is plausible that excessive noise exposure promotes negative psychological reactions, leading to adverse physiological effects, as was shown by Hatfield et al.(2001). Therefore, psychological factors must be addressed to help ameliorate the annoyance of low frequency noise.

Some Hum sufferers have achieved this for themselves, saying that they have "learnt to live with the Hum" so that it no longer worries them. Others are "cured" by prescription of relaxant drugs. For a few, the Hum goes away after a time. Some escape the Hum by moving house. One long term sufferer, and leading campaigner for official help with low frequency noise problems, decided that it was time to leave the low frequency forest of chaotic emotions and now has no problem, remaining detached from low frequency noise and of the opinion that to become involved with other sufferers heightens ones awareness of the noise. Some sufferers accept that the noises are not at a high level, but that their reactions are equivalent to those which might be expected from a high level of noise – "As soon as I hear the noise, something builds up inside me". This is a similar response to that of hyperacusis sufferers, although more specialised in its triggers. A form of hyperacusis may be indicated.

Combined acoustical and psychological studies (Kitamura and Yamada, 2002) have explored involvement of the limbic system of the brain in

annoyance responses[1]. The limbic system commands survival and emotional behaviours, which we cannot always control, although we may learn to do so.

The Hum remains a puzzling aspect of low frequency noise. No widespread Hum has been unequivocally traced to specific sources, although suspicion has pointed at industrial complexes, especially fans.

In the absence of known sources, Hum sufferers often search their neighbourhoods for a source, walking or driving around at night. It is important for them to find a target for their frustrations. Some general ones include their neighbours, the main gas pipelines, radio transmissions (particularly pulsed signals for navigation), defence establishments etc.

Auditory sensitivity

Special difficulties arise when, despite persistent annoyance, there is no "measurable" noise or, as might occur in urban areas, the noise levels at low frequencies are in the 40 - 50dB range, well below the average threshold (ISO:226, 1987). Van den Berg supports tinnitus as an explanation in these circumstances (van den Berg, 2001). With respect to audibility, the average ISO:226 threshold levels must be interpreted carefully. Van den Berg's choice of a limit criterion is the low frequency binaural hearing threshold level for 10% of the 50 – 59 year old population, which is 10-12 dB below their average hearing level (van den Berg and Passchier-Vermeer, 1999a). This may be too restrictive a cut off, since 10% of the age group has more sensitive hearing. For example, the population of the EU-15 countries is 379,000,000. There are differences between north and southern European countries, but approximately 10% of the population is in the 50 – 59 year age group. Thus, about 3,800,000 of the 50 – 59 year age group of the European population (10% of 10% of the total) will be more sensitive than the suggested cut-off for assessment of low frequency noise for this age group. A smaller number will have greater sensitivity. Yamada found one subject to be 15dB more sensitive than the average (Yamada, 1980), whilst recent work (Kitamura and Yamada, 2002), gives two standard deviations from the average threshold as about 12dB. However, the average threshold of the complainants in this work is somewhat higher than the ISO 226 threshold, as might be expected for older people. A range of two standard deviations covers 95% of people. Of the remaining 5%, half are more sensitive than two standard deviations from the average and half are less sensitive. In the EU-15 countries, 2.5% of the population is about 10,000,000 persons of whom around 1,000,000 are in the 50-59 year old age group, who might have very sensitive low frequency hearing and be prone to annoyance from sounds which are not heard by most people and which are difficult to measure. The unfortunate association of one of these people with a low level, low frequency noise leads to considerable distress for the person concerned. A "rule of thumb" may be to take 15 - 20dB below the ISO 226 threshold as the cut off for perception, but this may be a generous level, depending on the complainants' individual threshold at low frequencies.

The preceding deductions on numbers of persons are clearly approximate, but are sufficient to give an "engineering" indication of the extent of the problem.

Criteria for low frequency noise control.

A number of criteria have been developed for assessment of low frequency noise. (Broner and Leventhall, 1983; Challis and Challis, 1978; Inukai et al., 1990; Vercammen, 1989; Vercammen, 1992).

In recent years, some European countries have adopted national criteria for low frequency

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[1] *The human brain has three layers representing its three stages of development. The primitive (reptilian) brain is connected with self preservation. The intermediate (old mammalian) brain is the brain of the inferior animals and related to emotions. This is the limbic system. The superior (new mammalian) brain is related to rational thought and intellectual tasks. The limbic system is activated by perceived threats.*

Table 1. Test noises

No	Name	Description	Tones, characteristics
1	Traffic	Road traffic noise from a highway	None – broadband, continuous
2	Drop forge	Isolated blows from a drop forge transmitted through the ground	None – deep, impulsive sound
3	Gas turbine	Gas motor in a C HP plant	25 Hz, continuous
4	Fast ferry	High speed ferry; pulsating tonal noise	57 Hz, pass-by
5	Steel factory	Distant noise from a steel rolling plant	62 Hz, continuous
6	Generator	Generator	75 Hz, continuous
7	Cooling	Cooling compressor	(48 Hz, 95 Hz) 98 Hz, continuous
8	Discotheque	Music, transmitted through a building	None, fluctuating, loud drums

noise, including Sweden ((Socialstyrelsen-Sweden, 1996)), Denmark (Jakobsen, 2001) Netherlands ((N S G, 1999) Germany (DIN:45680, 1997) , Poland (Mirowska, 2002). Some of these methods assume a threshold curve for limitation of annoyance, based approximately on the ISO226 threshold, or a curve parallel to this threshold, but extended to frequencies below 20Hz.

The criteria have been compared under laboratory conditions for some specific noises (Poulsen, 2002; Poulsen and Mortensen, 2002). Noises used were eight recorded samples of different types as shown in Table 1.

The noises were judged by 18 otologically normal young listeners and by four older people (41-57 years) who had made complaints of annoyance by low frequency noise. Judgements were made under assumed listening circumstances of day, evening and night. The complaint group rated the noises to be more annoying than the other group did. Overall, the Danish method gave highest correlation between objective and subjective assessments, but only when a 5dB penalty for impulsive sounds was included.

Conclusions

Regulatory authorities must accept that annoyance by low frequency noise presents a real problem which is not addressed by the commonly used assessment methods. In particular, the A-weighted level is very inadequate, as are the NR and NC criterion curves. Assessment methods specific to low frequency noise are emerging, but a limitation of existing methods is that they do not give full assessment of fluctuations. It is possible that application of noise quality concepts, in particular fluctuation and roughness (Zwicker and Fastl, 1999), may be a way forward.

Acknowlegement

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ATTACHMENT 28

BESS NOISE ASSESSMENT REPORT.

ATTACHMENT Q: ACOUSTIC ASSESSMENT REPORT

Acoustic Assessment Report

Hop Hill Solar and Storage Project

December 2022

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Acronyms and Abbreviations

AC	alternating current
BESS	battery energy storage system
BPA	Bonneville Power Administration
CadnaA	Computer-Aided Noise Abatement
dB	decibel
dBA	A-weighted decibel
dBL	linear decibel
DC	direct current
EDNA	Environmental Designation for Noise Abatement
EFSEC	Energy Project Site Evaluation Council
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration
gen-tie line	generation-tie transmission line
HOHI	HOHI bn, LLC, a subsidiary of BNC DEVCO, LLC, which is a joint venture between BrightNight and Cordelio Power
Hz	hertz
ISO	International Organization for Standardization
kV	kilovolt
L_{dn}	day-night average sound level
L_{eq}	equivalent sound level
L_{max}	maximum sound level
LP	sound pressure level
L_w	sound power level
µPa	microPascal
NSR	noise sensitive receptor
POI	point of interconnection
Project	Hop Hill Solar and Storage Project
PV	photovoltaic
Tetra Tech	Tetra Tech, Inc.
WAC	Washington Administrative Code

1.0 INTRODUCTION

HOHI bn, LLC (HOHI), a subsidiary of BNC DEVCO, LLC, which is a joint venture between BrightNight and Cordelio Power, is seeking to develop the Hop Hill Solar and Storage Project (Project) on up to 6,000 acres of agricultural land located approximately 11 miles north of the city of Prosser, Washington, in unincorporated Benton County. The Project would generate up to 500 megawatts (MW) of solar power coupled with up to 500 MW of battery storage and include related interconnection and ancillary support infrastructure. The Project will consist of a solar photovoltaic energy generation system and associated supporting Project facilities such as the battery energy storage system (BESS), network of electrical collector lines, inverter units, step-up transformers, collector substation and transformer, approximately 17.8-mile-long overhead generation-tie transmission line (gen-tie line; a portion of which will occur on U.S. Department of Energy land), internal access roads, operations and maintenance (O&M) structure, and temporary laydown (i.e., staging) areas for construction.

Tetra Tech, Inc. (Tetra Tech) has prepared this acoustic assessment for the Project, evaluating potential sound impacts relative to the applicable noise regulations prescribed in the Washington Administrative Code (WAC). The existing ambient acoustic environment was characterized based on land use, population density, and proximity to major roadways. An acoustic modeling analysis was conducted simulating sound produced during both construction and operation. Operational sound sources consisted primarily of the inverters, step-up transformers, battery storage, and transformer at the on-site substation. The overall objectives of this assessment were to 1) identify Project sound sources and estimate sound propagation characteristics, 2) computer-simulate sound levels using internationally accepted calculation standards, and 3) confirm that the Project will operate in compliance with the applicable noise regulations.

1.1 Project Area

The Project Siting Area is approximately 22,020 acres that encompasses the boundaries of 58 assessor parcels for which HOHI has executed or is pursuing Lease or Easement Option Agreements with the underlying property owner. The Siting Area consists of mostly vacant rangeland with some farmland, farmsteads, and residences. The following terms describe areas associated with Project development:

- Solar Array Siting Area: This is a subset of the "Siting Area" described above. The Solar Array Siting Area is the approximately 11,179-acre buildable area encompassed by the boundaries of 21 privately owned assessor parcels within the Siting Area (Figure 1). The Solar Array Siting Area is the focus of analysis provided in this acoustic assessment.
- Transmission Line Corridor Siting Area: This area is a subset of the "Siting Area" described above. The Project's overhead 230-kilovolt (kV) / 500-kV gen-tie line, approximately 150-foot-wide gen-tie line corridor, three point of interconnection (POI) options, and two switchyard options are within the Transmission Line Corridor Siting Area shown on Figure 1. The Project will use up to two POI and switchyard options depending on the outcome of HOHI's interconnection studies with the Bonneville Power Administration (BPA). These interconnection facilities will be located along the proposed gen-tie routes and the final design will be located within the approximately 340-acre 150-foot-wide gen-tie line corridor

that occurs within the approximately 10,841-acre Transmission Line Corridor Siting Area. The Transmission Line Corridor Siting Area includes additional area along the gen-tie line corridor to accommodate siting flexibility for development of the final POI and selected switchyard option(s). The Transmission Line Corridor Siting Area is larger than the Project's anticipated final developed footprint to allow for minor rerouting and optimization of the overhead 230-kV / 500-kV gen-tie line at final design.

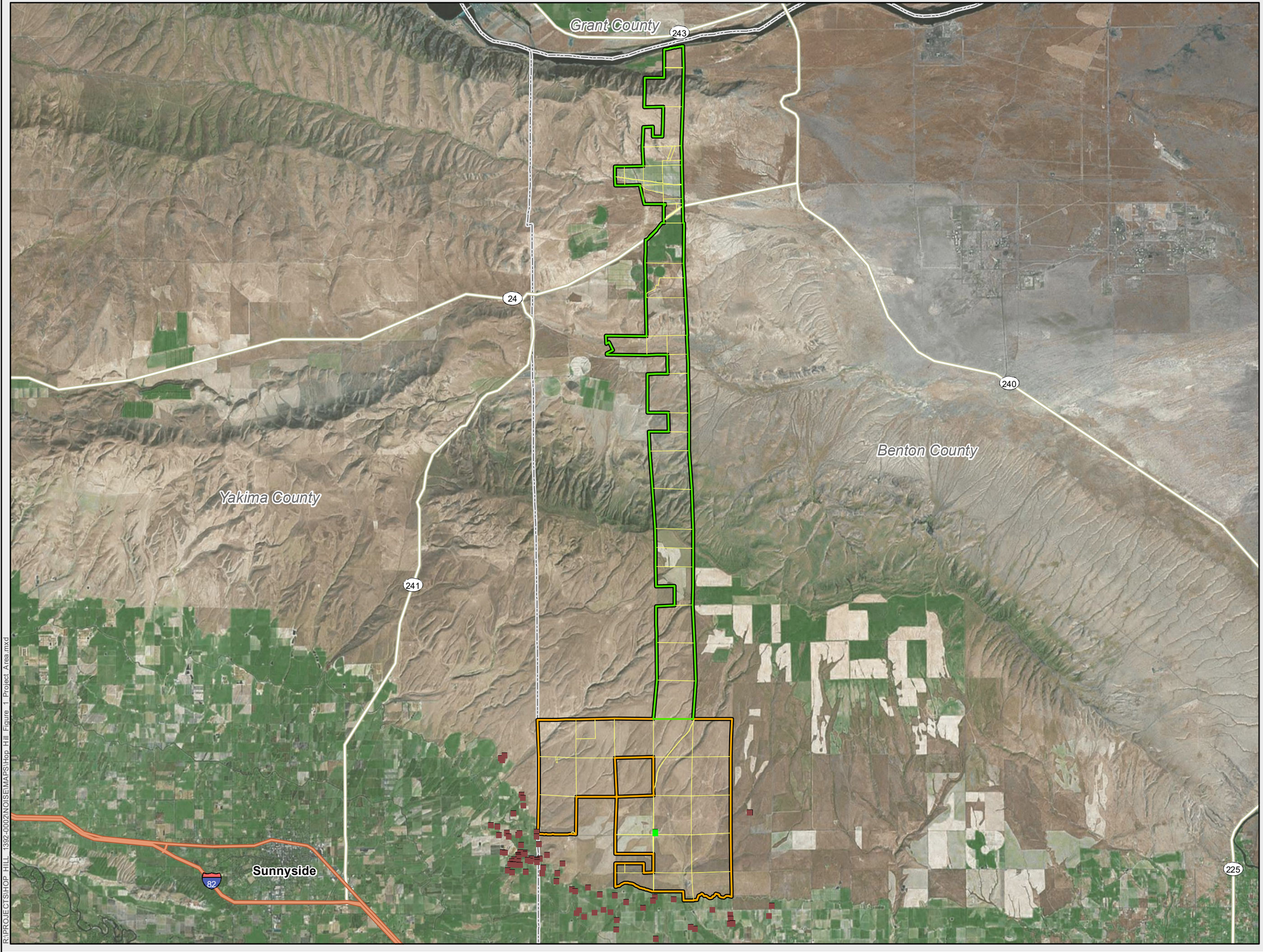
- Project Area: This area is a subset of the "Solar Array Siting Area" and "Transmission Line Corridor Siting Area" described above, and includes up to approximately 6,000 acres where the solar array and associated supporting components, which incorporate the overhead 230-kV / 500-kV gen-tie line, will be sited during final engineering design. HOHI is considering various solar array design layouts within the Project Area and the final design of the solar array and associated supporting components will not exceed approximately 6,000 acres. The Project Area may shift within the Solar Array Siting Area to allow for site optimization of the final design.

Figure 1 provides an overview of the Project Siting Area, Solar Array Siting Area, and Transmission Line Corridor Siting Area and provides the locations of nearby residences, which are considered noise sensitive receptors (NSRs).

Hop Hill Solar and Storage Project

Figure 1
Project Area Extent

Benton County, Washington



- Siting Area
- Solar Array Siting Area
- Transmission Line Corridor Siting Area

Receptor

- Participating
- Non-Participating

- Project Parcels
- County Boundary

N

0 1 2 4

Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HOP_HILL_1392-0002\NOI\SEIMAPS\Hop_Hill_Figure_1_Project_Area.mxd

1.2 Acoustic Metrics and Terminology

All sounds originate with a source, whether it is a human voice, motor vehicles on a roadway, or a combustion turbine. Energy is required to produce sound, and this sound energy is transmitted through the air in the form of sound waves – tiny, quick oscillations of pressure just above and just below atmospheric pressure. These oscillations, or sound pressures, impinge on the ear, creating the sound we hear. A sound source is defined by a sound power level (L_W), which is independent of any external factors. By definition, sound power is the rate at which acoustical energy is radiated outward and is expressed in units of watts.

A source sound power level cannot be measured directly. It is calculated from measurements of sound intensity or sound pressure at a given distance from the source outside the acoustic and geometric near-field. A sound pressure level (L_P) is a measure of the sound wave fluctuation at a given receiver location and can be obtained through the use of a microphone or calculated from information about the source sound power level and the surrounding environment. The sound pressure level in decibels (dB) is the logarithm of the ratio of the sound pressure of the source to the reference sound pressure of 20 microPascals (µPa), multiplied by 20.1. The range of sound pressures that can be detected by a person with normal hearing is very wide, ranging from about 20 µPa for very faint sounds at the threshold of hearing, to nearly 10 million µPa for extremely loud sounds such as a jet during take-off at a distance of 300 feet.

Broadband sound includes sound energy summed across the entire audible frequency spectrum. In addition to broadband sound pressure levels, analysis of the various frequency components of the sound spectrum can be completed to determine tonal characteristics. The unit of frequency is hertz (Hz), measuring the cycles per second of the sound pressure waves. Typically, the frequency analysis examines 11 octave bands ranging from 16 Hz (low) to 16,000 Hz (high). Since the human ear does not perceive every frequency with equal loudness, spectrally-varying sounds are often adjusted with a weighting filter. The A-weighted filter is applied to compensate for the frequency response of the human auditory system and is represented in A-weighted decibels (dBA).

Sound can be measured, modeled, and presented in various formats, with the most common metric being the equivalent sound level (L_{eq}). The L_{eq} has been shown to provide both an effective and uniform method for comparing time-varying sound levels and is widely used in acoustic assessments in the state of Washington. Estimates of noise sources and outdoor acoustic environments, and the comparison of relative loudness, are presented in Table 1. Table 2 presents additional reference information on terminology used in the report.

Table 1. Sound Pressure Levels and Relative Loudness of Typical Noise Sources and Acoustic Environments

Noise Source or Activity	Sound Level (dBA)	Subjective Impression
General		
Vacuum cleaner (10 feet)	70	Moderate
Passenger car at 65 miles per hour (25 feet)	65	
Large store air-conditioning unit (20 feet)	60	
Light auto traffic (100 feet)	50	Quiet
Quiet rural residential area with no activity	45	
Bedroom or quiet living room; bird calls	40	Faint
Typical wilderness area	35	
Quiet library, soft whisper (15 feet)	30	Very quiet
Wilderness with no wind or animal activity	25	Extremely quiet
High-quality recording studio	20	
Acoustic test chamber	10	Just audible
	0	Threshold of hearing
Agricultural Related Activities		
Shotgun	150	Threshold of pain
Hand Grinding of Metal	108	Uncomfortably loud
Unsilenced Air Discharge	105	
Chainsaw	100	
Circular Saw	100	
Petrol-driven Grass Mower	96	
Tractor Cab Maximum	90	
Electrical Drill	87	Loud
Modern Tractor Cab	80	

Adapted from: Beranek (1988) and EPA (1971a), HSE

Table 2. Acoustic Terms and Definitions

Term	Definition
Noise	Typically defined as unwanted sound. This word adds the subjective response of humans to the physical phenomenon of sound. It is commonly used when negative effects on people are known to occur.
Sound Pressure Level (LP)	Pressure fluctuations in a medium. Sound pressure is measured in dB referenced to 20 µPa, the approximate threshold of human perception to sound at 1,000 Hz.
Sound Power Level (LW)	The total acoustic power of a sound source measured in dB referenced to picowatts (one trillionth of a watt). Noise specifications are provided by equipment manufacturers as sound power as it is independent of the environment in which it is located. A sound level meter does not directly measure sound power.
Equivalent Sound Level (L_{eq})	The L_{eq} is the continuous equivalent sound level, defined as the single sound pressure level that, if constant over the stated measurement period, would contain the same sound energy as the actual monitored sound that is fluctuating in level over the measurement period.
A-Weighted Decibel (dBA)	Environmental sound is typically composed of acoustic energy across all frequencies. To compensate for the auditory frequency response of the human ear, an A-weighting filter is commonly used for describing environmental sound levels. Sound levels that are A-weighted are presented as dBA in this report.
Unweighted Decibels (dBL)	Unweighted sound levels are referred to as linear. Linear decibels are used to determine a sound's tonality and to engineer solutions to reduce or control noise as techniques are different for low and high frequency noise. Sound levels that are linear are presented as dBL in this report.

Term	Definition
Propagation and Attenuation	Propagation is the decrease in amplitude of an acoustic signal due to geometric spreading losses with increased distance from the source. Additional sound attenuation factors include air absorption, terrain effects, sound interaction with the ground, diffraction of sound around objects and topographical features, foliage, and meteorological conditions including wind velocity, temperature, humidity, and atmospheric conditions.

1.3 Noise Regulations and Guidelines

1.3.1 Federal Regulations

There are no federal noise regulations applicable to the Project.

1.3.2 Washington Administrative Code State Regulations

Environmental noise limits have been established by the Washington Administrative Code (WAC 173-60). WAC 173-60 establishes noise limits based on the Environmental Designation for Noise Abatement (EDNA) of the sound source and the receiving properties.

- Class A EDNA – Lands where people reside and sleep. They typically include residential property; multiple family living accommodations; recreational facilities with overnight accommodations such as camps, parks, camping facilities, and resorts; and community service facilities including orphanages, homes for the aged, hospitals, and health and correctional facilities.
- Class B EDNA – Lands involving uses requiring protection against noise interference with speech. These typically will include commercial living accommodations; commercial dining establishments; motor vehicle services; retail services; banks and office buildings; recreation and entertainment property not used for human habitation such as theaters, stadiums, fairgrounds, and amusement parks; and community service facilities not used for human habitation (e.g., educational, religious, governmental, cultural and recreational facilities).
- Class C EDNA –Lands involving economic activities of a nature that noise levels higher than those experienced in other areas are normally to be anticipated. Typical Class A EDNA uses generally are not permitted in such areas. Typically, Class C EDNA include storage, warehouse, and distribution facilities; industrial property used for the production and fabrication of durable and nondurable man-made goods; and agricultural and silvicultural property used for the production of crops, wood products, or livestock.

Land use that is considered agricultural is defined as Class C receiving properties. Conversely, agricultural properties principally used for residential purposes with no clearly visible farming or ranching activities are identified as Class A receiving properties. The WAC does maintain flexibility for interpretation in the classification of the appropriate EDNA on both the state and local level. In this assessment, receiving properties consist of Class C Lands and Class C Lands containing Class A residential structures. Between the hours of 10:00 p.m. and 7:00 a.m., the noise limitations are reduced by 10 dBA for receiving property within Class A EDNAs. WAC 173.60.050 exempts temporary construction noise from the state noise limits.

The noise level limits by EDNA classifications are presented in Table 3. The WAC allows these limits to be exceeded for certain periods of time: 5 dBA for no more than 15 minutes in any hour, 10 dBA for no more than 5 minutes of any hour, and 15 dBA for no more than 1.5 minutes of any hour; these are commonly presented as L_n statistical sound levels as well as maximum sound levels (L_{max}), as shown in Table 4.

Table 3. Washington State Environmental Noise Limits

EDNA of Source Property	EDNA of Receiving Property		
	Class A Land Day/Night	Class B Land	Class C Land
Class A Land	55/45	57	60
Class B Land	57/47	60	65
Class C Land	60/50	65	70

Source: WAC 173-60-040

Table 4. L_n Environmental Noise Limits for Class C Sources

EDNA of Source Property	Statistical Sound Level Limits			
	LN_{25}	$LN_{8.3}$	$LN_{2.5}$	L_{MAX}
Class A Land	60/50	65/55	70/60	75/65
Class B Land	65	70	75	80
Class C Land	70	75	80	85

Source: WAC 173-60-040 (b) and (c)

The Project Siting Area is located on land zoned GMAAG (Benton County), which is considered Class C land. Adjacent land also is zoned GMAAG in Benton County, and zoned Agriculture in Yakima County immediately to the west of the Solar Array Siting Area boundary. Agricultural land is considered Class C under the definitions provided above; however, some of these agricultural lands contain residential structures. This analysis conservatively considers agricultural lands with non-participating residences to be Class A receptors. Table 3 shows that the applicable daytime and nighttime noise limits will vary based on each abutting land use class and will be assessed at the Project Siting Area boundary. For Class C land containing non-participating Class A residential structures, limits of 60 dBA and 50 dBA apply to daytime and nighttime hours, respectively. For Class C land containing participating Class A residential structures, the daytime limit of 60 dBA and the nighttime limit of 50 dBA may be waived. For Class C land, a daytime and nighttime limit of 70 dBA is applicable. The WAC regulatory limits are absolute and independent of the existing acoustic environment; therefore, a baseline noise survey is not requisite to determine conformance.

1.3.3 Benton County Code

Chapter 6A.15 in the Benton County Code regulates noise as a public nuisance and does not provide numerical decibel limits.

2.0 EXISTING SOUND ENVIRONMENT

The degree of audibility of a new or modified sound source is dependent, in a large part, on the relative level of the ambient noise. A range of noise settings occurs within the Project Siting Area. Variations in acoustic environment are due, in part, to existing land uses, population density, and proximity to transportation corridors. Elevated existing ambient sound levels in the region occur near major transportation corridors such as interstate highways and in areas with higher population densities. Nearby rural airstrips and airports, including the Desert Aire Regional Airport and Sunnyside Municipal Airport, also contribute to ambient noise levels in both surrounding urban and rural areas. Principal contributors to the existing acoustic environment likely include motor vehicle traffic, mobile farming equipment, all-terrain vehicles, local roadways, periodic aircraft flyovers, and natural sounds such as birds, insects, and leaf or vegetation rustle during elevated wind conditions. Diurnal effects result in sound levels that are typically quieter during the night than during the daytime, except during periods when evening and nighttime insect noise dominates in warmer seasons.

The analysis area is inclusive of areas that could be potentially affected by construction or operational noise resulting from the Project. The analysis area for noise around the Project was defined as the area bounded by a perimeter extending approximately 1.2 miles (2 kilometers) from the Solar Array Siting Area. NSRs within the acoustic assessment analysis area were identified using Benton County Assessor records and aerial imagery. Assessor parcel information is based on current Benton County assessment records last updated by the County on March 2, 2022. In the absence of ambient measurement data, the existing sound level environment in the vicinity of Project was estimated with a method published by the Federal Highway Administration (FHWA) in its Transit Noise and Vibration Impact Assessment (FHWA 2006). This document presents the general assessment of existing noise exposure based on the population density per square mile and proximity to area sound sources such as roadways and rail lines.

The proposed Project is approximately 11 miles (17.7 kilometers) north of the city of Prosser, which has a population density of 1,302 per square mile according to the U.S. Census Bureau (2020). Table 5 indicates the estimated baseline sound levels based on population density for daytime, evening, and nighttime L_{eq}, as well as the day-night average sound level (L_{dn}). The L_{dn} is the average equivalent sound level over a 24-hour period, with a 10 dB penalty added for noise during the nighttime hours of 10:00 p.m. – 7:00 a.m.

Table 5. Estimated Baseline Sound Levels in Proximity to the Project

Average Sound Level (dBA)	L_{eq} (Day)	L_{eq} (Evening)	L_{eq} (Night)	L_{dn}
	50	45	40	50

3.0 PROJECT CONSTRUCTION

Construction of the Project is expected to be typical of other solar power generating facilities in terms of schedule, equipment, and activities. Construction is anticipated to occur over approximately 24 months and would require a variety of equipment and vehicles.

3.1 Noise Calculation Methodology

Acoustic emission levels for activities associated with Project construction were based on typical ranges of energy equivalent noise levels at construction sites, as documented by the U.S. Environmental Protection Agency (EPA; 1971b) and the EPA's "Construction Noise Control Technology Initiatives" (EPA 1980). The EPA methodology distinguishes between type of construction and construction stage. Using those energy equivalent noise levels as input to a basic propagation model, construction noise levels were calculated at a series of set reference distances.

The basic model assumed spherical wave divergence from a point source located at the closest point of the Project site. Furthermore, the model conservatively assumed that all pieces of construction equipment associated with an activity would operate simultaneously for the duration of that activity. An additional level of conservatism was built into the construction noise model by excluding potential shielding effects due to intervening structures and buildings along the propagation path from the site to receiver locations.

3.2 Projected Noise Levels During Construction

Construction work will not consist of a phased approach. Table 6 summarizes the expected equipment to be used during Project construction. Table 6 also shows the maximum noise level at 50 ft.

Table 6. Project Construction Equipment Noise Levels

Construction Equipment	Maximum (L_{max}) Equipment Noise Level at 50 feet
Pickup Truck	55
Crane	85
Excavator	85
Dozer	85
Backhoe	80
Trencher	82
Compactor	80
Forklift	80
Telescopic Handler	85
Loader	80
Grader	85
Concrete Mixer	85
Semi-Truck	84
Generator	82
Hydraulic Driller	84

Table 7 shows the projected noise levels from Project construction at all NSRs. Periodically, sound levels may be higher or lower than those presented in Table 7.

Noise levels resulting from the construction activities would vary significantly depending on several factors such as the type and age of equipment, specific equipment manufacturer and model, the operations being performed, and the overall condition of the equipment and exhaust system mufflers.

Project construction would generally occur during the day, Monday through Friday. Furthermore, all reasonable efforts would be made to minimize the impact of noise resulting from construction activities including implementation of standard noise reduction measures. Due to the infrequent nature of loud construction activities at the site, the limited hours of construction and the implementation of noise mitigation measures identified in Section 3.3, the temporary increase in noise due to construction is considered to be a less than significant impact.

Table 7. Project Construction Noise Levels

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 11		Received Noise Level, dBA
		Easting	Westing	
NSR-1	Non-participant	277458	5138066	71
NSR-2	Non-participant	277405	5138167	67
NSR-3	Non-participant	277569	5138263	67
NSR-4	Non-participant	278217	5136576	77
NSR-5	Non-participant	278261	5136439	76
NSR-6	Non-participant	278267	5136115	78
NSR-7	Non-participant	287788	5135417	74
NSR-8	Non-participant	277845	5135822	73
NSR-9	Non-participant	276856	5135353	53
NSR-10	Non-participant	277122	5135285	67
NSR-11	Non-participant	277193	5134919	67
NSR-12	Non-participant	277514	5134986	70
NSR-13	Non-participant	277515	5135011	70
NSR-14	Non-participant	277589	5134853	66
NSR-15	Non-participant	277985	5134895	72
NSR-16	Non-participant	278050	5134958	73
NSR-17	Non-participant	278095	5134463	67
NSR-18	Non-participant	278766	5134992	77
NSR-19	Non-participant	278770	5134806	73
NSR-20	Participant	278848	5134468	70
NSR-21	Participant	283759	5134718	93
NSR-22	Non-participant	283767	5134776	94
NSR-23	Non-participant	279795	5133604	68
NSR-24	Non-participant	279165	5134005	70
NSR-25	Non-participant	278853	5133855	70
NSR-26	Non-participant	278716	5133834	66

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 11		Received Noise Level, dBA
		Easting	Westing	
NSR-27	Non-participant	278744	5133786	66
NSR-28	Non-participant	278742	5133716	65
NSR-29	Non-participant	278487	5133872	69
NSR-30	Non-participant	278446	5133774	65
NSR-31	Non-participant	278343	5133818	68
NSR-32	Non-participant	278242	5134140	70
NSR-33	Non-participant	278216	5134079	70
NSR-34	Non-participant	278050	5134154	67
NSR-35	Non-participant	277954	5134046	66
NSR-36	Non-participant	277944	5134006	66
NSR-37	Non-participant	277966	5133960	68
NSR-38	Non-participant	277933	5133790	67
NSR-39	Non-participant	277773	5133872	67
NSR-40	Non-participant	277664	5133793	66
NSR-41	Non-participant	277312	5134191	64
NSR-42	Non-participant	277396	5134167	64
NSR-43	Non-participant	277481	5133428	60
NSR-44	Non-participant	277664	5133345	61
NSR-45	Non-participant	277831	5133643	65
NSR-46	Non-participant	277619	5133686	65
NSR-47	Non-participant	277698	5133668	65
NSR-48	Non-participant	277734	5133662	65
NSR-49	Non-participant	277999	5133636	64
NSR-50	Non-participant	278248	5133325	62
NSR-51	Non-participant	278932	5133241	64
NSR-52	Non-participant	279003	5133469	66
NSR-53	Non-participant	279571	5133209	66
NSR-54	Non-participant	279525	5132871	64
NSR-55	Non-participant	284420	5131888	73
NSR-56	Non-participant	283622	5132022	72
NSR-57	Non-participant	283539	5131881	71
NSR-58	Non-participant	282416	5131862	69
NSR-59	Non-participant	281956	5132172	69
NSR-60	Non-participant	281318	5132241	68
NSR-61	Non-participant	280836	5132553	72
NSR-62	Non-participant	280155	5132499	64
NSR-63	Non-participant	280292	5132430	64
NSR-64	Non-participant	280418	5131617	62
NSR-65	Non-participant	280305	5131497	61
NSR-66	Non-participant	280616	5131330	62

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zoning 11		Received Noise Level, dBA
		Easting	Westing	
NSR-67	Non-participant	281061	5131492	64
NSR-68	Non-participant	281442	5131595	66
NSR-69	Non-participant	281732	5131480	66
NSR-70	Non-participant	281983	5131130	65
NSR-71	Non-participant	283116	5131598	69
NSR-72	Non-participant	286022	5131394	67
NSR-73	Non-participant	286781	5131164	64
NSR-74	Non-participant	286794	5130967	63
NSR-75	Non-participant	288542	5131439	59
NSR-76	Non-participant	288409	5131023	58
NSR-77	Non-participant	286732	5130761	62
NSR-78	Non-participant	286854	5130757	62
NSR-79	Non-participant	286854	5130769	62
NSR-80	Non-participant	286855	5130782	62
NSR-81	Non-participant	285263	5130609	65
NSR-82	Non-participant	285096	5130693	66
NSR-83	Non-participant	283595	5130262	63
NSR-84	Non-participant	281952	5130733	63
NSR-85	Non-participant	284582	5129847	61
NSR-86	Non-participant	284725	5129834	52
NSR-87	Non-participant	284919	5129834	54

3.3 Construction Noise Mitigation

Since construction equipment operates intermittently, noise emitted during construction would be mobile and highly variable, making it challenging to control. The construction management protocols would include the following noise mitigation measures to minimize noise impacts:

- Maintain all construction tools and equipment in good operating order according to manufacturers' specifications;
- Limit use of major excavating and earth-moving machinery to daytime hours per WAC 173.60.050;
- To the extent practicable, schedule construction activity during normal working hours on weekdays when higher sound levels are typically present and are found acceptable. Some limited activities, such as concrete pours for transformer pad foundations or the parking area if needed, would be required to occur continuously until completion;
- Equip any internal combustion engine used for any purpose on the job or related to the job with a properly operating muffler that is free from rust, holes, and leaks;

- For construction devices that utilize internal combustion engines, ensure the engine's housing doors are kept closed, and install noise-insulating material mounted on the engine housing consistent with manufacturers' guidelines, if possible;
- Limit possible evening shift work to low noise activities such as welding, wire pulling, and other similar activities, together with appropriate material handling equipment; and
- Utilize a complaint resolution procedure to address any noise complaints received from residents.

4.0 OPERATIONAL NOISE

This section describes the model used for the assessment, input assumptions used to calculate noise levels due to the Project's normal operation, a conceptual noise mitigation strategy, and the results of the noise impact analysis.

4.1 Noise Prediction Model

The CadnaA (Computer-Aided Noise Abatement) computer noise model was used to calculate sound pressure levels from the operation of the Project equipment in the vicinity of the Project site. An industry standard CadnaA was developed by DataKustik GmbH to provide an estimate of sound levels at distances from sources of known emission. It is used by acousticians and acoustic engineers due to the capability to accurately describe noise emission and propagation from complex facilities consisting of various equipment types like the Project, and in most cases, yields conservative results of operational noise levels in the surrounding community.

The outdoor noise propagation model is based on the International Organization for Standardization (ISO) 9613, Part 2: "Attenuation of Sound during Propagation Outdoors" (1996). The method described in this standard calculates sound attenuation under weather conditions that are favorable for sound propagation, such as for downwind propagation or atmospheric inversion, conditions which are typically considered worst-case. The calculation of sound propagation from source to receiver locations consists of full octave band sound frequency algorithms, which incorporate the following physical effects:

- Geometric spreading wave divergence;
- Reflection from surfaces;
- Atmospheric absorption at 10 degrees Celsius and 70 percent relative humidity;
- Screening by topography and obstacles;
- The effects of terrain features including relative elevations of noise sources;
- Sound power levels from stationary and mobile sources;
- The locations of noise-sensitive land use types such as residential land uses;
- Intervening objects including buildings and barrier walls, to the extent included in the design;
- Ground effects due to areas of pavement and unpaved ground;
- Sound power at multiple frequencies;
- Source directivity factors;

- Multiple noise sources and source type (point, area, and/or line); and
- Averaging predicted sound levels over a given time.

CadnaA allows for three basic types of sound sources to be introduced into the model: point, line, and area sources. Each noise-radiating element was modeled based on its noise emission pattern. Larger dimensional sources such as the transformers and inverters were modeled as area sources.

Off-site topography was obtained using the publicly available U.S. Geological Survey digital elevation data. A default ground attenuation factor of 0.5 was assumed for off-site sound propagation over acoustically "mixed" ground. A conservative ground attenuation factor of 0.25 for a reflective surface was assumed onsite.

The output from CadnaA includes tabular sound level results at selected receiver locations and colored noise contour maps (isopleths) that show areas of equal and similar sound levels.

4.2 Input to the Noise Prediction Model

The Project's general arrangement was reviewed and directly imported into the acoustic model so that on-site equipment could be easily identified, buildings and structures could be added, and sound emission data could be assigned to sources as appropriate. The primary noise sources during operations are the inverters, their integrated step-up transformers, BESS units, and substation transformers. Electronic noise from inverters can be audible but is often reduced by a combination of shielding, noise cancellation, filtering, and noise suppression. The Project layout includes 150 step-up transformers and inverters distributed throughout the solar array areas. BESS units will be located in an approximately 40,000 square feet area 200 feet west of the substation. The substation will have two 250 MVA transformers.

Substations have switching, protection, and control equipment, as well as a main power transformer, which generate the sound generally described as a low humming. There are three chief noise sources associated with a transformer: core noise, load noise, and noise generated by the operation of the cooling equipment. The core is the principal noise source and does not vary significantly with electrical load. The load noise is primarily caused by the load current in the transformer's conducting coils (or windings), and consequently, the main frequency of this sound is twice the supply frequency: 120 Hz for 60 Hz transformers. The cooling equipment (fans and pumps) may also be an important noise component, depending on fan design. During air-forced cooling method, cooling fan noise is produced in addition to the core noise. The resulting audible sound is a combination of hum and the broadband fan noise. Breaker noise is a sound event of very short duration, expected to occur only a few times throughout the year. Just as horsepower ratings designate the power capacity of an electric motor, a transformer's megavolt amperes rating indicates its maximum power output capacity.

Reference sound power levels input to CadnaA were provided by equipment manufacturers, based on information contained in reference documents or developed using empirical methods. The source levels used in the predictive modeling are based on estimated sound power levels that are generally deemed to be conservative. The projected operational noise levels are based on HOHI-supplied sound power level data for the major sources of equipment. Table 8 summarizes the equipment sound power level data used as inputs to the acoustic modeling analysis. For the purpose of the analysis, it

was assumed that all equipment would operate consistently during the daytime, while only the substation transformers and BESS units will operate during the nighttime.

Table 8. Modeled Octave Band Sound Power Level for Major Pieces of Project Equipment

Sound Source	Sound Power Level (L_W) by Octave Band Frequency dBL									Broadband Level
	31.5	63	125	250	500	1k	2k	4k	8k	dBA
Step-up Transformer	73	79	81	76	76	70	65	60	53	77
Inverter	106	99	104	98	94	94	94	101	92	104
BESS	109	94	101	95	88	82	75	68	63	91
Substation Transformer	102	109	110	105	106	100	95	90	83	106

In this table, dBL refers to unweighted sound level

Details pertaining to the transmission line design have not been finalized and have not been included in the modeling analysis. Sound generated from the operation of the transmission line is not expected to impact sensitive receptors. Once the details of the Project's overhead 230-kV / 500-kV gen-tie line have been finalized, the noise analysis can be updated after further review. Transmission lines generate sound referred to as corona. The level of corona noise generated by a transmission line is highly dependent on weather conditions (i.e., foul weather), electrical gradient, altitude, and condition of the conductor wires. The corona effect is initiated where the conductor's electric field is concentrated by imperfections in the conductor surface such as nicks or scratches, or by substances on the lines such as water droplets, dirt or dust, and bird droppings. Corona activity increases with increasing altitude, and with increasing voltage in the line, but is generally not affected by system loading.

4.3 Noise Prediction Model Results

Broadband (dBA) sound pressure levels were calculated for expected normal Project operation assuming that all components identified previously are operating continuously and concurrently at the representative manufacturer-rated sound power level. For the purpose of the analysis, it was assumed that all equipment would operate consistently during the daytime, while only the substation transformers and BESS units will operate during the nighttime. After calculation, the sound energy was then summed to determine the equivalent continuous A-weighted downwind sound pressure level at a point of reception. Sound contour plots displaying broadband (dBA) sound levels presented as color-coded isopleths are provided in Figure 2 for full daytime operations and Figure 3 for nighttime operations. The sound contours are graphical representations of the cumulative noise associated with operation of the equipment and show how operational noise would be distributed over the surrounding area of the Project site. The contour lines shown are analogous to elevation contours on a topographic map (i.e., the sound contours are continuous lines of equal noise level around some source, or sources, of sound).

Table 9 shows the projected exterior sound levels resulting from full, normal operation of the Project during daytime and reduced operation during nighttime hours, at all nearby NSRs. The Project is located on Class C land while the adjacent properties consist of a mix of both Class C land with Class A

residential structures, which has a daytime limit of 60 dBA and nighttime limit of 50 dBA, and Class C land, which has a daytime and nighttime limit of 70 dBA.

Table 9 shows that the Project will significantly comply with the 60 dBA daytime limit and 50 dBA nighttime limit at all non-participating NSRs. In addition, based on the results displayed in Figures 2 and 3, the Project will comply with all WAC noise limits at the land use zones adjacent to the Project Solar Array Siting Area. Once the details of the Project's overhead 230-kV / 500-kV gen-tie line have been finalized, the noise analysis can be updated after further review.

Table 9. Acoustic Modeling Results Summary

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zone 11		Operational Sound Levels (dBA)	
		Easting	Northing	Daytime Operations	Nighttime Operations
NSR-1	Non-participant	277458	5138066	29	19
NSR-2	Non-participant	277405	5138167	25	18
NSR-3	Non-participant	277569	5138263	25	18
NSR-4	Non-participant	278217	5136576	32	19
NSR-5	Non-participant	278261	5136439	31	18
NSR-6	Non-participant	278267	5136115	33	21
NSR-7	Non-participant	287788	5135417	30	20
NSR-8	Non-participant	277845	5135822	29	20
NSR-9	Non-participant	276856	5135353	18	12
NSR-10	Non-participant	277122	5135285	26	18
NSR-11	Non-participant	277193	5134919	26	18
NSR-12	Non-participant	277514	5134986	27	19
NSR-13	Non-participant	277515	5135011	27	19
NSR-14	Non-participant	277589	5134853	25	18
NSR-15	Non-participant	277985	5134895	28	19
NSR-16	Non-participant	278050	5134958	28	19
NSR-17	Non-participant	278095	5134463	25	19
NSR-18	Non-participant	278766	5134992	31	20
NSR-19	Non-participant	278770	5134806	28	20
NSR-20	Non-participant	278848	5134468	25	17
NSR-21	Participant	283759	5134718	40	25
NSR-22	Participant	283767	5134776	41	25
NSR-23	Non-participant	279795	5133604	24	16
NSR-24	Non-participant	279165	5134005	26	17
NSR-25	Non-participant	278853	5133855	27	19
NSR-26	Non-participant	278716	5133834	23	15
NSR-27	Non-participant	278744	5133786	23	15
NSR-28	Non-participant	278742	5133716	23	15
NSR-29	Non-participant	278487	5133872	26	19
NSR-30	Non-participant	278446	5133774	23	15
NSR-31	Non-participant	278343	5133818	26	18
NSR-32	Non-participant	278242	5134140	27	19

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zone 11		Operational Sound Levels (dBA)	
		Easting	Northing	Daytime Operations	Nighttime Operations
NSR-33	Non-participant	278216	5134079	26	18
NSR-34	Non-participant	278050	5134154	25	18
NSR-35	Non-participant	277954	5134046	25	18
NSR-36	Non-participant	277944	5134006	25	18
NSR-37	Non-participant	277966	5133960	25	18
NSR-38	Non-participant	277933	5133790	25	18
NSR-39	Non-participant	277773	5133872	25	18
NSR-40	Non-participant	277664	5133793	25	17
NSR-41	Non-participant	277312	5134191	24	17
NSR-42	Non-participant	277396	5134167	24	17
NSR-43	Non-participant	277481	5133428	21	14
NSR-44	Non-participant	277664	5133345	22	17
NSR-45	Non-participant	277831	5133643	24	18
NSR-46	Non-participant	277619	5133686	24	17
NSR-47	Non-participant	277698	5133668	24	17
NSR-48	Non-participant	277734	5133662	24	17
NSR-49	Non-participant	277999	5133636	24	18
NSR-50	Non-participant	278248	5133325	22	15
NSR-51	Non-participant	278932	5133241	23	18
NSR-52	Non-participant	279003	5133469	24	19
NSR-53	Non-participant	279571	5133209	23	15
NSR-54	Non-participant	279525	5132871	22	14
NSR-55	Non-participant	284420	5131888	27	16
NSR-56	Non-participant	283622	5132022	25	16
NSR-57	Non-participant	283539	5131881	25	16
NSR-58	Non-participant	282416	5131862	24	16
NSR-59	Non-participant	281956	5132172	24	16
NSR-60	Non-participant	281318	5132241	23	16
NSR-61	Non-participant	280836	5132553	27	19
NSR-62	Non-participant	280155	5132499	22	14
NSR-63	Non-participant	280292	5132430	22	14
NSR-64	Non-participant	280418	5131617	21	14
NSR-65	Non-participant	280305	5131497	21	14
NSR-66	Non-participant	280616	5131330	21	14
NSR-67	Non-participant	281061	5131492	21	15
NSR-68	Non-participant	281442	5131595	22	15
NSR-69	Non-participant	281732	5131480	22	15
NSR-70	Non-participant	281983	5131130	22	15
NSR-71	Non-participant	283116	5131598	24	15
NSR-72	Non-participant	286022	5131394	23	15
NSR-73	Non-participant	286781	5131164	22	14

NSR ID	Participation Status	UTM Coordinates (meters) NAD83 UTM Zone 11		Operational Sound Levels (dBA)	
		Easting	Northing	Daytime Operations	Nighttime Operations
NSR-74	Non-participant	286794	5130967	21	14
NSR-75	Non-participant	288542	5131439	20	13
NSR-76	Non-participant	288409	5131023	20	13
NSR-77	Non-participant	286732	5130761	21	14
NSR-78	Non-participant	286854	5130757	21	14
NSR-79	Non-participant	286854	5130769	21	14
NSR-80	Non-participant	286855	5130782	21	14
NSR-81	Non-participant	285263	5130609	22	16
NSR-82	Non-participant	285096	5130693	23	17
NSR-83	Non-participant	283595	5130262	22	14
NSR-84	Non-participant	281952	5130733	21	14
NSR-85	Non-participant	284582	5129847	21	13
NSR-86	Non-participant	284725	5129834	17	11
NSR-87	Non-participant	284919	5129834	18	11

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Hop Hill Solar and Storage Project

Figure 2
Operational Received Sound Levels – Daytime Operations

Benton County, Washington

Grant County
Yakima County
Benton County
Sunnyside
243
24
241
240
225
82

Siting Area
Solar Array Siting Area
Transmission Line Corridor Siting Area

Receptor
- Participating
- Non-Participating

Collector Substation
Battery Energy Storage System

Received Sound Levels (dBA):
- 30-35
- 35-40
- 40-45
- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- > 70

Project Parcels
County Boundary

N

0 1 2 4
Miles

NOT FOR CONSTRUCTION

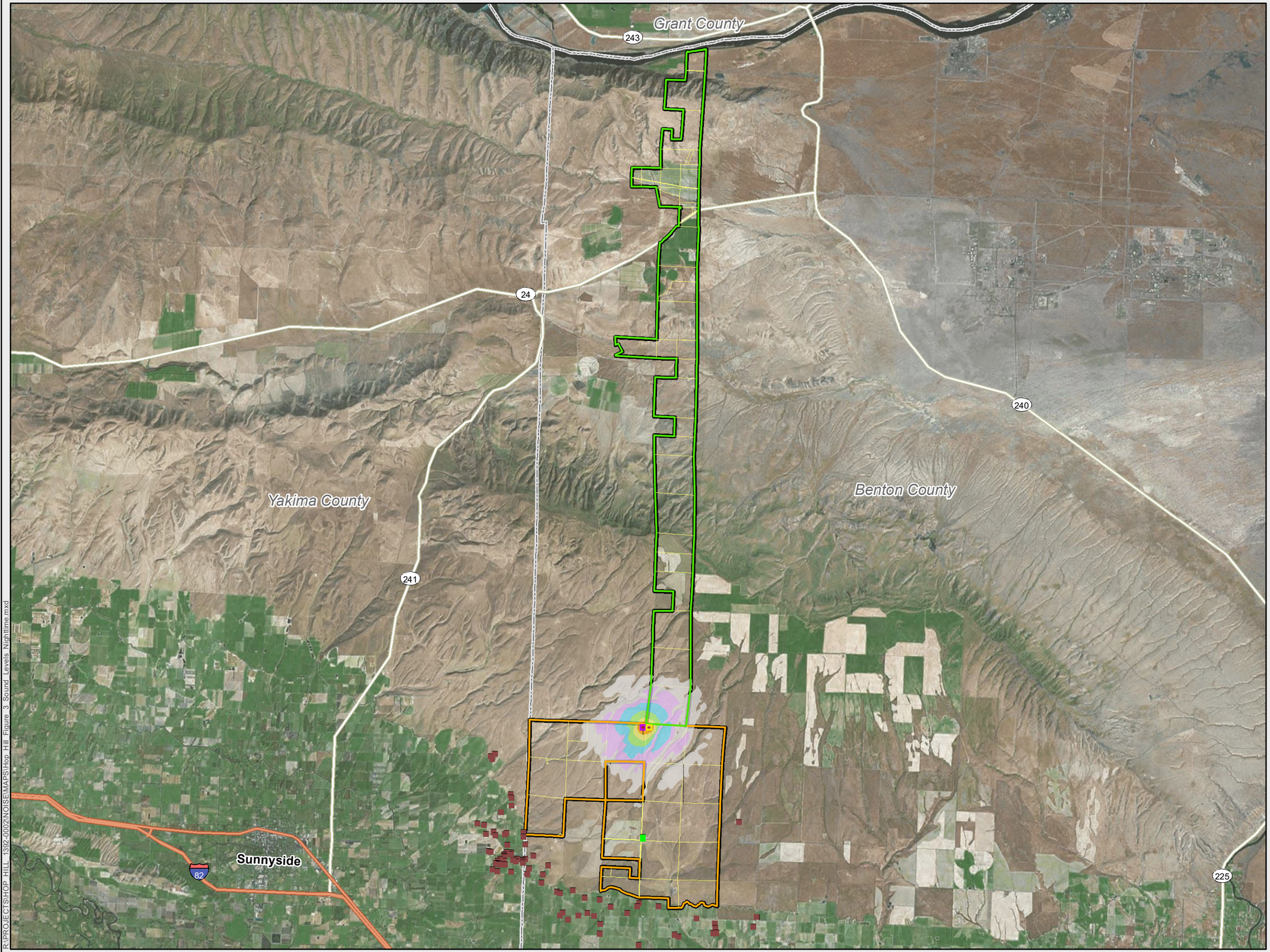
WA
OR

R:\PROJECTS\HOP_HILL_1392-0002\NOISE\MAPS\Hop_Hill_Figure_2_Sound_Levels_Daytime.mxd

Hop Hill Solar and Storage Project

Figure 3
Operational
Received Sound Levels – Nighttime Operations

Benton County, Washington



- Siting Area
- Solar Array Siting Area
- Transmission Line Corridor Siting Area

Receptor

- Participating
- Non-Participating

- Collector Substation
- Battery Energy Storage System

Received Sound Levels (dBA):

- 30-35
- 35-40
- 40-45
- 45-50
- 50-55
- 55-60
- 60-65
- 65-70
- > 70
- Project Parcels
- County Boundary

N

0 1 2 4

Miles

NOT FOR CONSTRUCTION

R:\PROJECTS\HOP_HILL_1392-0002\NOISE\MAPS\Hop_Hill_Figure_3_Sound_Levels_Nighttime.mxd

5.0 CONCLUSION

Tetra Tech completed a detailed acoustic assessment of the HOHI Project proposed in Benton County, Washington. The assessment included an evaluation of potential Project sound level impacts during construction and operation phases.

The construction noise assessment conservatively indicated that construction noise would be periodically audible at off-site locations; however, that noise would be temporary and minimized to the extent practicable through implementation of best management practices and noise mitigation measures as identified in Section 3.3. Traffic noise generated during construction onsite and offsite would also add to overall sound levels, but would be intermittent and short-term.

Operational sound levels were modeled and evaluated at nearby NSRs. Anticipated Project sound sources consist of the collector substation main power transformers, inverter and transformer units, and BESS units. Incorporating a number of conservative assumptions, acoustic modeling results indicate that the Project will significantly comply with the 60 dBA daytime limit and 50 dBA nighttime limit at all non-participating NSRs. In addition, the Project is predicted to comply with all the applicable WAC regulatory limits at the Project Siting Area boundary. Once the details of the Project's overhead 230-kV / 500-kV gen-tie line have been finalized, the noise analysis can be updated after further review.

Sound generated from existing sound sources in the Project Area, such as the operation of agricultural equipment shown in Table 1, would be expected to be relatively higher than Project operations. Overall, sound emissions associated with the Project are expected to remain at a low level, consistent with other solar energy facilities of similar size and design.

6.0 REFERENCES

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CALIFORNIA

Lithium-ion batteries causing fires, dangers on California freeways, sparking calls for safety improvements

A truck carrying lithium-ion batteries crashed and caught fire in July on Interstate 15 near Baker. (San Bernardino County Fire)

By Clara Harter
Staff Writer

Oct. 28, 2024 3 AM PT

For more than two days, a vital shipping passageway in the Port of L.A. was shut down, and the cause was surprising to some. A big rig overturned, sparking a fierce lithium-ion battery blaze that spewed toxic gases, snarled port traffic and resulted in what one official said was massive economic losses from delayed shipments.

The incident focused new attention, and fears, on the fuel cells helping drive the state's clean energy transition.

But how dangerous are these batteries really? And should you be scared of your e-bike, vape pen or electric car?

Here is what you need to know.

BUSINESS

Battery storage is a key piece of California's clean energy transition. But there's a problem with fires

Oct. 12, 2023

Safety basics

These batteries are generally safe with proper care and storage, said Robert Rezende, San Diego Fire-Rescue Department battalion chief and the region's first lithium-ion battery safety coordinator. But there is serious reason to worry about a crash involving a truck transporting these batteries or a battery storage facility catching fire — two types of incidents that can generate massive blazes, emitting toxic gases for several days, he said.

Problems on roadways

In May, the San Diego Fire-Rescue Department spent 14 days battling a hazardous fire that ignited at a lithium-ion battery storage facility in Otay Mesa. And a smaller fire was sparked in September 2023 at a battery storage unit in Valley Center in San Diego County, prompting evacuation orders.

For the record:

7:04 a.m. Oct. 28, 2024 *An earlier version of this article said a lithium-ion battery fire occurred on Interstate 15 near Bakersfield. It was near Baker.*

In July, a lithium-ion battery fire set off by an overturned truck on Interstate 15 near Baker left drivers trapped for hours in 109-degree heat. Then in last month's incident, a fire in an overturned big rig carrying the batteries by way of the Vincent Thomas Bridge caused millions of dollars in shipping delays, according to L.A. City Councilmember Tim McOsker.

More to Read

Highway 47 reopens after battery-laden trailer that crashed and caught fire is moved off road

Sept. 27, 2024

Big rig with lithium ion batteries flips in San Pedro, sparking hazardous fire, closing freeway

Sept. 26, 2024

Opinion: Imperial County residents deserve to benefit from a potential lithium boom

Sept. 26, 2024

Fire rises from an overturned big rig on Sept. 26 on the Vincent Thomas Bridge. (KTLA-TV)

The cause of fires

Lithium-ion batteries are widely used in portable electronic devices and electric vehicles, including cellphones, e-bikes, laptops, wireless headphones, scooters, trucks and cars.

Fires can be caused by overcharging, overheating, physical damage or product defects, which trigger a process known as thermal runaway — where excessive heat inside a battery creates a self-sustaining chemical reaction that can then easily spread to adjacent batteries.

The best way to stay safe is to purchase devices only from reputable manufacturers, store them in a cool, dry place and use a charger with the correct voltage, Rezende said.

Once thermal runaway starts, the process cannot be stopped, and batteries will continue to burn for hours. In the case of large, multiple-battery fires, they can burn for days, all the while releasing toxic gases such as hydrogen fluoride, hydrogen chloride, carbon monoxide and carbon dioxide.

WORLD & NATION

After a deadly battery factory fire, attention turns to the safety of migrant workers

June 28, 2024

Growing demand

Fueled in part by a desire to transition away from fossil fuels, the use of lithium-ion batteries has skyrocketed over the last two decades — but so too has the number of battery fires and, as a result, the number of people calling for safety solutions.

In San Diego, Rezende says his department responds to an average of two to three lithium-ion battery fires a week. After the Otay Mesa incident, he took on a newly created role, studying how best to respond to lithium-ion fires and other alternative-energy safety risks.

“We realized we needed [to devote] a lot more attention to the challenge, because it was moving, and still is moving, very fast,” he said. “It’s moving at a rate that regulatory frameworks and permits and municipalities can’t keep up with.”

CALIFORNIA

Tesla big-rig battery ignites after crash, spewing fumes and shutting California freeway

Aug. 19, 2024

Assemblymember Tom Lackey (R-Palmdale) said he was alarmed by the impact of July’s I-15 fire, which took place in his district. Shortly thereafter, he and several Republican colleagues sent a letter to Gov. Gavin Newsom urging him to hit the brakes on his Advanced Clean Fleets rule, which requires large trucking fleets be all-electric by 2045 and most trucks at state ports to be all-electric by 2035.

First, Lackey wants safety regulations to be implemented statewide and fire departments to be educated on how to combat these blazes.

“I have no beef with moving toward electric vehicles,” Lackey told The Times. “But I say let’s put everything on hold for a few minutes until we know that we’re being able to implement this policy in a safe, nonthreatening manner.”

Councilmember McOsker, for his part, doesn’t want to put a pause on the rollout of electric vehicles but agrees that the state needs legislation guiding the safe storage and transport of these batteries.

Construction proceeds on a giant lithium-ion battery bank along Westside Main Canal on Aug. 31, 2022, in the Imperial Valley. (Robert Gauthier / Los Angeles Times)

“I do not want to slow down the efforts we have made to decarbonize,” he said.

“I want us to use all of our ingenuity and all of our lessons learned to make sure that we keep moving as quickly, but as safely, as possible.”

Safety inspections the answer?

McOsker supported a bill introduced this year by Assemblymember Mike Gipson (D-Carson) that would have required a basic safety inspection of all trucks before they leave port terminals; the bill, however, died in the Assembly. After the September big-rig fire, McOsker introduced a City Council motion to explore the feasibility of implementing such a policy at the Port of L.A.

Currently, the only trucks that are required to do safety inspections before departing a terminal are those that have bargaining agreements with the International Longshore and Warehouse Union, he said. Independent or privately owned truck operators have an incentive to depart and deliver their goods as quickly as possible, he said.

“I don’t think we should depend upon the free market system to ensure the safety of our traveling public and our neighborhoods,” said McOsker. “I think that a local rule would be very important, but I would really prefer a statewide rule, and I think ultimately federal legislation on how to transport and utilize these batteries across the nation would be very important.”

CALIFORNIA

In Acton, rural serenity threatened by planned battery facilities, costlier fire insurance

May 14, 2024

Improving safety

Rezende said there were several things that could be done to increase transportation safety. They include using lowboy trailers that are at a lower risk of tipping over, as well as adhering to the recommendation that batteries should be transported at a 30% charge — which is already a requirement for batteries shipped by air — and reduces the chance of a fire.

In addition, manufacturers are working to develop newer, safer batteries and storage systems. For example, they are enclosing batteries in thicker cases and increasing the space between batteries to lower the risk of fires spreading, Rezende said.

“Over the course of 10 years, we’ve improved our safety standards significantly,” he said. “So the new systems that are going into place are like apples and oranges compared to the old systems.”

Still, people should be wary of older batteries in the resale market or sitting in storage facilities, he cautioned.

But with a combination of improved technology, new regulations and more fire department education, he believes California can meet the challenge of safely managing these powerful batteries.

Clara Harter

Clara Harter is a breaking news reporter at the Los Angeles Times. Previously, she covered politics and education for the L.A. Daily News. While at the Daily News, she published a series on fentanyl addiction that won a first-place investigative journalism award from the L.A. Press Club. Harter majored in political science and Middle Eastern studies at Columbia University. She loves surfing and, when not reporting, can most likely be found in the ocean.

From: Ruth Brock
To: PublicComments
Cc: Barger, Kathryn
Subject: Opposition to HUMIDOR LLC Franchise Agreement Ordinance
Date: Monday, October 21, 2024 3:47:41 PM
Attachments: How safe are lithium iron phosphate batteries – pv magazine International.pdf

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Please accept these comments in opposition to the adoption of the Hecate Humidor LLC Franchise Agreement Ordinance (Agenda item #53 on 10/8/24) and to the Humidor BESS project approval from 8/1/23.
Thank you,
Ruthie Brock

Dear Supervisor Barger,

I'm writing in opposition to the resolution of intent to adopt the Franchise Agreement ordinance for the Hecate Humidor BESS project in the community of Acton.

The residents of Acton are against this project approval for many reasons:

1) The BESS will utilize thousands Lithium-Iron-Phosphate batteries which are a fire risk, difficult to impossible to extinguish, can go into Thermal Runaway and expel large amounts of highly toxic gases that include Hydrogen Fluoride, Hydrogen Chloride, Hydrogen Cyanide, Methane, Ethane, Carbon Dioxide and Carbon Dioxide.

2) A failure at this BESS facility could result in soil and groundwater contamination from water runoff used to protect adjacent exposures. The approved Humidor site plan has not provided a design to contain water runoff should there be an incident. The Acton Water Basin basin serves the private wells of many Acton residents and is literally beneath this BESS project and the head waters of the Santa Clara River are adjacent to it.

3) In the event of a fire/failure incident, the State Route 14, Metro Rail and all roads serving this corridor of East Acton will be closed. This residential area has very limited ingress and egress so residents will have difficulty evacuating quickly. Many equine, livestock and other domestic animals also will need to be evacuated. Because of this area having limited escape routes, people may not be able to evacuate in time and may become trapped in close proximity to this dangerous off-gassing.

4) Acton residents will receive none of the benefit of the stored power that will be supporting the grid but must bear all of the fire and health risks and financial burdens of this project.

5) Properties may become devalued and far more difficult if not impossible to sell.

6) Fire insurance, which is already becoming very difficult to obtain may become impossible to obtain. Policy premiums have already doubled and tripled in this area under the CA "Fair Plan" as compared to what residents were previously paying under their now canceled or non-renewed policies. Without fire insurance these residents could lose their homes as all mortgage lenders REQUIRE fire insurance.

7) There is NO NEED for a BESS to be located near the substation to which it will connect. The only benefit is to the developer who will save money on a transmission line that spans a much shorter distance. As far as the function of the BESS, there is no reason to be near the substation. In the case of the Humidor, the developer insists it is necessary in order for them to serve the grid. This is absolutely untrue. If this were true, solar and wind farms with integrated battery storage would not be out

in the remote areas of the desert away from substations. This is all about PROFITS OVER PEOPLE.

8) In San Diego County there have been 3 BESS fires in the past year alone. In Sept. 2023, the Valley Center BESS burned. In May of this year the Gateway BESS in Otay Mesa burned for 11 days. And just on Sept. 5th the BESS owned by and located at San Diego Gas & Electric burned for several days. All three fires resulted in evacuations and shelter in place orders for residents as well as closures of hundreds of businesses, closure of schools and of course road closures. These failure events are extremely disruptive due to the risks of toxic off-gassing to the surrounding areas.

9) Very importantly, the location of the Humidor puts the power grid itself at risk due to being very close to critical 500kV overhead transmission lines that make up the southern terminus of the Pacific AC Intertie. A fire at the Humidor would potentially produce smoke that could cause the 500kV lines to arc and short-circuit. The short-circuiting could melt the insulators on the lines and result in the tripping of the grid system. This tripping can then cause additional tripping as a safety response on other interconnected systems and could result in taking down the grid in many western states. It could take days to weeks and possibly up to $1B to restore the power following an event like this. This scenario was brought to Acton's attention by two transmission specialists (Large System Operators) with a combined 75+ years experience and we conveyed this information to Congressman Mike Garcia. He has spoken about this poorly sited BESS and the risks to the grid and the residents of Acton from the floor of the House.
Rep. Mike Garcia Floor Speech for Battery Electric Storage Systems

The people of Acton have been very vocal and have spoken very clearly on their opposition to this project and sadly the County and the Board of Supervisors have thus far completely ignored our concerns. This project could still serve the grid and provide revenue to LA County if it were sited away from residents who are being put in harms way by placing it further out in the open desert.

Alternatively, if the County were to demand that Hecate deploy a SAFE battery technology for this project such as Iron Air or Iron Flow batteries which have no fire or toxicity risk and are capable of longer duration storage, this would mitigate all risks to residents. Recently Sacramento approved a 5 MW project which will utilize long duration energy storage batteries (LDES) that are Iron Flow technology. This project which will provide up to 100 hours of power also received $30M in grant money from the CEC.
https://www.energy.ca.gov/news/2023-12/cec-awards-30-million-100-hour-long-duration-energy-storage-project

The approval for the BESS itself was based on a "similarity determination" which was totally inaccurate. This BESS should never have been declared "similar to an electric distribution system". Why? Because this Humidor BESS will receive energy over a 230kV AC (Alternating Current) transmission line and convert/step down the energy to 34 DC (Direct Current) power for storage in the batteries.
The BESS will then, when needed, convert or step up the energy back to 230kV AC to transmit power back to the Vincent Substation via the connected transmission line. The substation then steps it down to a lower voltage and sends it out at a lower AC voltage that can be utilized by households and other consumers.

Fact #1–Any voltage over 200 kV is considered "TRANSMISSION" voltage. Humidor receives electricity at 230 kV AC.
Fact #2–The stored DC power CANNOT be utilized by households and other consumers who can only receive AC power, so therefore the BESS cannot "distribute" this power.
Fact #3–"Distribution voltage" is considered 50 kV AC or less, but never DC! The Humidor stores energy at 34 kV DC.
Fact #4–The BESS cannot "distribute" energy that is "transmission" level based on the 230 kV voltage at which it returns power back to the Vincent Substation.

Please consider the significant risks associated with siting this project which will utilize millions of watts of risky Lithium-Iron-Phosphate batteries in a designated Very High Fire Hazard Severity Zone in proximity to residences, animal rescues, equine facilities and kennels.
Lithium-Iron-Phosphate are touted as "safe" by developers as compared to Lithium-ion batteries, but there is information and

studies that contradict this. (See attachment below)

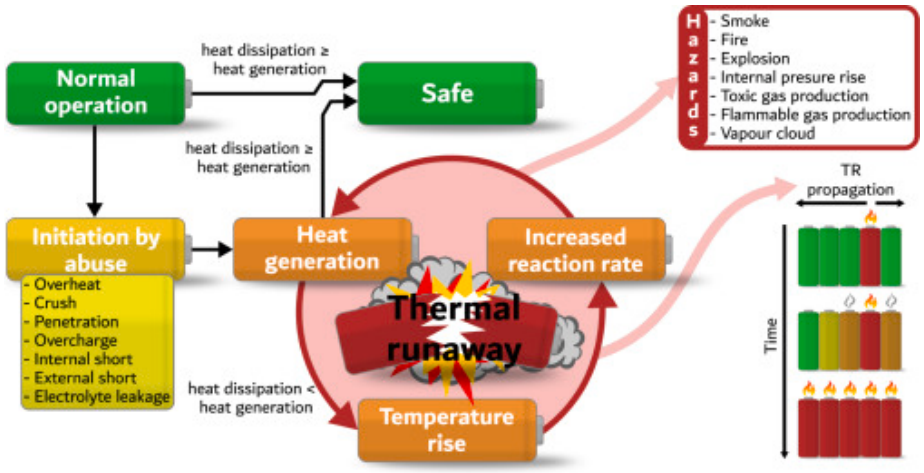
Please do not approve the Franchise Agreement ordinance that would allow the Humidor 400 MW lithium-iron-phosphate BESS to be developed in ACTON.

Thank you,
Ruthie Brock
Acton Takes Action
32 year Acton resident

How safe are lithium iron phosphate batteries?

Researchers in the United Kingdom have analyzed lithium-ion battery thermal runaway off-gas and have found that nickel manganese cobalt (NMC) batteries generate larger specific off-gas volumes, while lithium iron phosphate (LFP) batteries are a greater flammability hazard and show greater toxicity, depending on relative state of charge (SOC).

APRIL 10, 2024 **MARIJA MAISCH**



Thermal runaway from initiation to propagation and resulting hazards

Image: Creative Commons CC BY 4.0

Share

It is often said that LFP batteries are safer than NMC storage systems, but recent research suggests that this is an overly simplified view.

In the rare event of catastrophic failure, the off-gas from lithium-ion battery thermal runaway is known to be flammable and toxic, making it a serious safety concern. But while off-gas generation has been widely investigated, until now there has been no comprehensive review on the topic.

In a new paper, researchers from the University of Sheffield, Imperial College London, and the University of St Andrews in the United Kingdom have conducted a detailed meta-analysis of 60 papers to investigate the most influential battery parameters and the probable off-gas characteristics to determine what kind of battery would be least hazardous.

They have found that while NMC batteries release more gas than LFP, but that LFP batteries are significantly more toxic than NMC ones in absolute terms.

Toxicity varies with state of charge (SOC). Generally, a higher SOC leads to greater specific gas volume generation.

When comparing the previous findings for both chemistries, the researchers found that LFP is more toxic at lower SOC, while NMC is more toxic at higher SOC. Namely, while at higher SOC LFP is typically shown to produce less off-gas than other chemistries, at lower SOC volumes can be comparable between chemistries, but in some cases LFP can generate more.

Prismatic cells also tend to generate larger specific off-gas volumes than offer cell forms.

The composition of off-gas on average is very similar between NMC and LFP cells, but LFP batteries have greater hydrogen content, while NMC batteries have greater carbon monoxide content.

To assess the fire hazard of each chemistry, the researchers calculated and compared the lower flammability limit (LFL) of the off-gasses. They have found that LFL for LFP and NMC are 6.2% and 7.9% (in an inert atmosphere) respectively. Given the LFL and the median off-gas volumes produced, LFP cells breach the LFL in a volume 18% smaller than NMC batteries.

"Hence LFP presents a greater flammability hazard even though they show less occurrence of flames in cell thermal runaway tests," the researchers said.

They discussed their findings in "Review of gas emissions from lithium-ion battery thermal runaway failure – Considering toxic and flammable compounds," which was recently published in the *Journal of Energy Storage*.

Popular content

Powerchina switches on 100 MW solar tower in South Africa

25 SEPTEMBER 2024

Powerchina has switched on a 100 MW solar tower in South Africa. The concentrated solar power (CSP) project will supply 480 GWh of clean energy to the...

MARIJA MAISCH

Marija has years of experience in a news agency environment and writing for print and online publications. She took over as the editor of pv magazine Australia in 2018 and helped establish its online presence over a two-year period.
More articles from Marija Maisch

Related content

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9 comments

Jon Darian REPLY

April 11, 2024 at 4:45 am

The headline suggests this article is about how safe the batteries are, when actually it is about their relative toxicities once they are burning. Surely any discussion of their safety would involve the risk of them burning in the first place. Which is more likely to burn?

Kirk Chapman

April 11, 2024 at 7:37 pm

It seems LFP is more likely to burn according to this statement, mainly due to LFP breaching the LFL at lower volumes than NMC:

To assess the fire hazard of each chemistry, the researchers calculated and compared the lower flammability limit (LFL) of the off-gasses. They have found that LFL for LFP and NMC are 6.2% and 7.9% (in an inert atmosphere) respectively. Given the LFL and the median off-gas volumes produced, LFP cells breach the LFL in a volume 18% smaller than NMC batteries.

"Hence LFP presents a greater flammability hazard even though they show less occurrence of flames in cell thermal runaway tests," the researchers said.

Marija Maisch

April 12, 2024 at 12:02 pm

This is correct, thanks for your comment, Kirk.

This paper does not analyze the likelihood of a thermal runaway in different chemistry types but rather the relative risks and considerations in case a cell enters a thermal runaway. As a results of an analysis of TR gas emissions, it concludes that LFP batteries show a tendency for greater flammability (and the more flammable the gas is, the more likely it is to lead to explosions) and toxicity hazards.

Lance REPLY

April 11, 2024 at 8:58 am

As per.previous comment that's exactly what I thought.... what we need to know is which chemistry is more likely to cause a fire in normal everyday use. And I'm still of thrbmind that NMC present a significant danger which LFP do not.

Brian Woodford REPLY

April 11, 2024 at 10:42 am

I agree, which one is more likely to catch fire, under what extreme daily use, are we reliant on the electronic safty circuits, which if fail a fire will ensue??

Pingback: Quão seguras são as baterias de fosfato de ferro de lítio? – pv magazine Brasil

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Salvatore Sepulveda REPLY

April 11, 2024 at 4:03 pm

I have six 100AH LiFePO4 Batteries. If I'm not using them, I run them all down to 70% capacity, then store them away. My top number one question is how do I protect the BMS (Battery Management system) in the event of an EMP and how do I know when the BMS has failed before something catastrophic happens? I've purchased an EMP Shield at EMPShield.com, but they're expensive. So, is there a cheaper way to protect the BMS? Let me know.

Ian Tucker REPLY

April 11, 2024 at 7:03 pm

The key factor is the pyrolysis temperature and for lifepo4 this is over 1100C and far in excess of that achieving a home fire. Nimc is lower and more fires have been reported with this technology.

DAVID ROBERT PACHOLOK REPLY

April 12, 2024 at 12:22 am

You need what is called a Faraday Cage. Remove the BMS from the battery. Wrap it in aluminum foil completely, folding over the edges. Now a note re BMS systems:
They ALL draw some parasitic current even if only a few microamps. I lost a 1kwh 25.6 volt LFP pack 10 years ago. I didn't realize the BMS started drawing excessive parasitic current.
This was a custom pack I had made for a project, and cost $500. Pack totally ruined. I disassembled one cell with 0.1 volts remaining. The copper anode was totally corroded, and I could see a coppery color on the cathode.
Very expensive electroplating. So a year ago I built my own pack for $80 thanks to Battery Hookup in PA. Great prices. My BMS is now connectorized, 2P8S, so 9 pins. Long storage I disconnect the BMS.
To test for parasitic draw charge battery and let it sit for a week or so. Verify that each cell is within 0.01 volt of each other. Using a digital multimeter set to current, break the connection between each wire and battery taps and measure the current. For your 100 ah pack I would like to see all currents below 0.001 Amp,
ie 1mA. So at 1 mA you will lose 1 AH in 1000 hours, or 100 AH in 100,000 hours. Each year has 8640 hours, so if each cell has less than 1 mA leakage current, you should be OK for years without having to charge. BUT I would check each cell voltage every 6 months to be sure. If I had done that I would have written off a $500 battery.
Hope this helps

Leave a Reply

Please be mindful of our community standards.

Your email address will not be published. Required fields are marked *

Comment *

Name *

Email *

Website

Save my name, email, and website in this browser for the next time I comment.

Post Comment

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From: Alex
To: Barger, Kathryn
Subject: Urgent Opposition to Humidor BESS Project - Acton Community Safety at Risk
Date: Tuesday, October 8, 2024 4:09:15 PM

Dear Supervisor Barger,

I am writing to urgently express my strong opposition to the Humidor Battery Energy Storage System (BESS) project planned for our community of Acton. While I understand the need for renewable energy solutions, the potential dangers associated with BESS technology, especially in a residential area like ours, cannot be ignored.

Safety must be the top priority. There have been numerous reports of fires, explosions, and other catastrophic incidents involving BESS systems worldwide. These risks pose an unacceptable threat to the health, safety, and well-being of our families and the surrounding environment.

Our community is not an appropriate location for such a hazardous facility, given the high fire danger in this region. The presence of a BESS facility would not only increase the likelihood of fires but could also overwhelm our local emergency response capabilities.

I respectfully urge you to oppose this project and seek alternative locations that do not endanger residential areas like Acton. Our community deserves to be protected from these risks.

Thank you for your time and consideration.

Alex Bar

From: Amanda Buchan
To: Barger, Kathryn
Subject: AGENDA ITEM #53
Date: Monday, October 7, 2024 2:51:01 PM
Attachments: Hecate letter.docx

AGENDA ITEM #53

Hecate Grid Humidor Storage 1

LLC Proprietary Electrical Transmission Franchise

Supervisor Barger,

My name is Amanda Buchan. I own the house at 34410 Angeles Forest Highway, literally across the street from the proposed project. This stone home was build in the 1940's and is part of the Vincent Hill Mining history of the area. I have been working with LA County Building & Safety for the better part of a year to add a 350sf bedroom addition that would attach what is currently a detached bathroom to the main house. The Fire Department has been the big stumbling block for this project, as they are requiring an over-the-top fire sprinkler system that goes above and beyond the required 10-minutes needed to evacuate the house in case of a fire, the purpose being to protect lives.

It is beyond imagining to me that somehow a massive lithium battery storage facility that poses catastrophic danger to the area can be built across the street. There are a multitude of dangers posed by this facility:

This facility is a ticking time bomb, that when it goes off, will cause massive wildfires and loss of homes and property (hopefully not lives) due to the difficulty involved in suppression.

It is located in an area that relies on ground water for the surrounding homes. A fire and the chemicals that would be needed to suppress it would contaminate the ground water for decades to come. I have seen nothing of a plan to remediate that threat.

It is located on a main commercial rail line that moves product across California. Any issues with the facility would disrupt that line, impacting rail service across southern CA. That same railway provides Metrolink service from the Antelope Valley to the Los Angeles Basin. Peoples ability to get to work would be disrupted.

It is located within an 1/8 of a mile from I-14, the only major connector between the Antelope & San Fernando Valleys, as well as a major north/south truck route. Any fire at the facility would have an extreme negative impact on traffic. And the other alternative routes would be impacted also – Angeles Forest Highway would be impassable, Soledad Canyon Rd would be impassable, Sierra Highway would be impassable.

Most homes in this area house livestock. If all the access points are shut down due to a fire, what evacuation plan has been put in place? There isn't one, for people or animals.

When were the environmental studies done? When were the traffic studies done? What kind of extensive disaster mitigation plans have been put n place. They weren't. Why is it that the

State of California can decide to put a project like this in a residential area? Just because we are in the high desert on large parcels does not mean this project is in the middle of nowhere. There are thousands upon thousands of vacant acres that would be more suitable for this type of project that would have minimal impact on lives and infrastructure should the unthinkable happen.

I do understand that the company wants to be able to place the plant in a place that has easily accessible infrastructure and that it is located close to the transmission plant. But the inhabitants of the area should not have to shoulder those potential burdens, especially when we will not even be the ones benefitting from the power produced! We already have had multiple power shut-offs due to limited power supplies, wind events, etc.

And we are not even talking about impacts to property values in the area. As a Certified Residential Real Estate Appraiser who has been working in the Santa Clarita & Antelope Valleys for 30+ years, the negative impact on home values within the impact area is not even calculable at this point. But it stands to reason that anyone willing to risk living in an area that could be high risk for fire, water contamination, etc. is gong to be expecting to pay a much-reduced price for a home in that area. Who is going to reimburse the current homeowners from that loss in value? And it is nearly impossible to find homeowner's insurance for fire in the area now, with many people paying upwards of $12,000/year, who is going to cover the additional cost – if insurance can even be found?

This is an incredibly ill-conceived plan and, given the unpredictability of the stability of lithium batteries in general, the dangers to our community and the additional costs that homeowners will be facing, should NEVER be allowed to be placed here.

Sincerely,

Amanda & Gorden Buchan

A printable word document of this letter is attached.

AGENDA ITEM #53

Hecate Grid Humidor Storage 1

LLC Proprietary Electrical Transmission Franchise

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When were the environmental studies done? When were the traffic studies done? What kind of extensive disaster mitigation plans have been put n place. They weren't. Why is it that the State of California can decide to put a project like this in a residential area? Just because we are in the high desert on large parcels does not mean this project is in the middle of nowhere. There are thousands upon thousands of vacant acres that would be more suitable for this type of project that would have minimal impact on lives and infrastructure should the unthinkable happen.

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This is an incredibly ill-conceived plan and, given the unpredictability of the stability of lithium batteries in general, the dangers to our community and the additional costs that homeowners will be facing, should NEVER be allowed to be placed here.

Sincerely,

Amanda & Gorden Buchan

From: Amy J. Bodek
To: Jacqueline Ayer
Cc: Barger, Kathryn; Saraiya, Anish; Kathy Park
Subject: RE: The Humidor BESS capacity is actually 545 MW
Date: Monday, October 7, 2024 6:17:28 PM
Attachments: Screenshot BESS Approval Notes.PNG
Screenshot BESS Note 1.PNG

Ms. Ayer –
Thank you for your email. To confirm, Regional Planning approved a project for 400 MW only. We did not and do not approve a project that would be for more than 400 MW.

I have attached a screenshot of the approval notes that were required to be on the site plan as Note 1.

We will ensure that any building or fire permits submitted to the County for review are for the maximum capacity of 400 MW (not 400 batteries).

Thank you for bringing this to our attention.

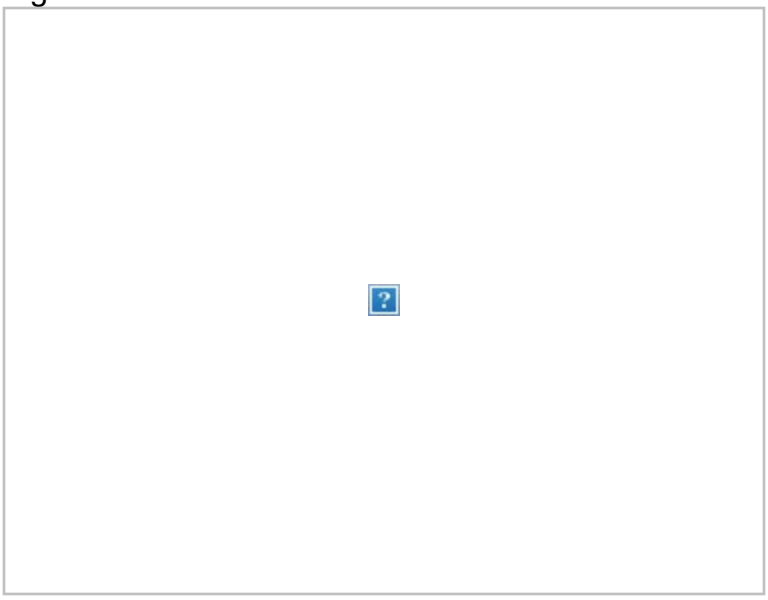
AMY J. BODEK, AICP (she/her/hers)
DIRECTOR

From: Jacqueline Ayer <sortacton@gmail.com>
Sent: Monday, October 7, 2024 3:33 PM
To: Amy Bodek <ABodek@planning.lacounty.gov>
Cc: Barger, Kathryn <Kathryn@bos.lacounty.gov>; Saraiya, Anish <ASaraiya@bos.lacounty.gov>
Subject: The Humidor BESS capacity is actually 545 MW

Dear Director Bodek;
When the Humidor BESS site plan was approved on August 1, 2024, Regional Planning represented to the public that the capacity of the facility was 400 MW (see highlighted portion in Figure 1 below). However, the equipment and facilities that Regional Planning *actually* approved on the site plan is a **545 MW** BESS consisting of 440 battery containers in which each container has a generation capacity of 1.236 MW (see highlighted portion in Figure 2 below, and note that 440 containers x 1.236 MW per container = 544.84 MW total). It is not known if Regional Planning was aware that the actual capacity of the equipment that was approved by the site plan was 545 MW rather than the 400 MW represented to the public.

Figure 1:

Figure 2:



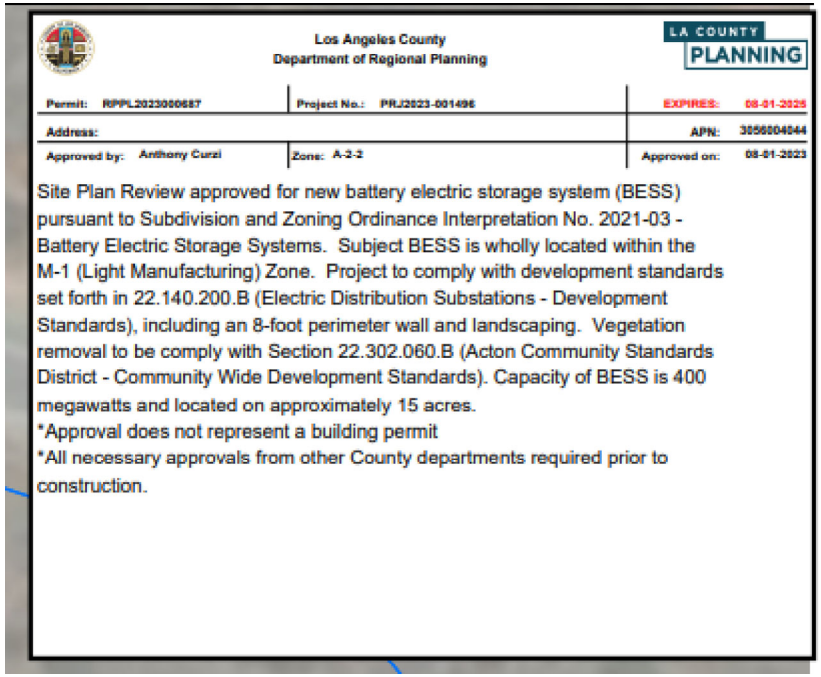
Hecate has a proven track record of misrepresenting the facts of the Humidor project to County agencies and to the Department of Regional Planning in particular. For instance, Regional Planning approved the original site plan in 2022 based on Hecate's assurance that the project was located entirely on industrially zoned property; the residents of Acton had to go to great lengths to prove to Regional Planning staff that the project was not limited to just industrially zoned property and that it extended into agriculturally zoned land as well. It was only after this significant community effort that Regional Planning rescinded the 2022 approval and informed the Community of Acton that the Humidor BESS would undergo the Conditional Use Permit process; unfortunately, this did not occur.

The new realization that the actual capacity of the approved Humidor BESS project is more than half a gigawatt is the latest in a string of misrepresentations and mischaracterizations that have been uncovered regarding the Humidor Project. More importantly, this proves beyond any doubt that the Humidor Project is nothing like a

distribution substation because the capacity of a distribution substation is typically less than 100 MW (although in some rare instances, they can approach 200 MW). This is because utility planning standards do not accommodate distribution substations with capacities exceeding 500 MW (or even 400 MW) because the risk to load is too great (given that a mishap would result in the loss of electrical service to an unacceptably high number of customers). These material facts conclusively demonstrate that Regional Planning erred in applying "Interpretation 2021-03" to approve the Humidor BESS as a "distribution substation", and I present them to you based on my nearly 20 years of experience in participating in electrical proceedings before the CPUC and the FERC which involved extensive electrical system analyses and expert witness testimony.

Based on these facts, I request that Regional Planning rescind the Humidor BESS approval that was issued on August 1, 2024.

Respectfully submitted;
Jacqueline Ayer, Director
Save Our Rural Town



Los Angeles County
Department of Regional Planning

LA COUNTY PLANNING

Permit: RPPL2023000687	Project No.: PRJ2023-001496	EXPIRES:	08-01-2025
Address:		APN:	3056004044
Approved by: Anthony Curzi	Zone: A-2-2	Approved on:	08-01-2023

Site Plan Review approved for new battery electric storage system (BESS) pursuant to Subdivision and Zoning Ordinance Interpretation No. 2021-03 - Battery Electric Storage Systems. Subject BESS is wholly located within the M-1 (Light Manufacturing) Zone. Project to comply with development standards set forth in 22.140.200.B (Electric Distribution Substations - Development Standards), including an 8-foot perimeter wall and landscaping. Vegetation removal to be comply with Section 22.302.060.B (Acton Community Standards District - Community Wide Development Standards). Capacity of BESS is 400 megawatts and located on approximately 15 acres.

*Approval does not represent a building permit

*All necessary approvals from other County departments required prior to construction.

NOTES

1. EQUIPMENT DEPICTED IS PRELIMINARY ONLY. MAXIMUM NAMEPLATE CAPACITY OF THE BESS IS 400MW.
2. BATTERY SYSTEM SIZED PER MANUFACTURER AUGMENTATION RECOMMENDATION OF 43% CELL ADDITION, ALLOWING FULL POWER OUTPUT AT END OF LIFE BASED ON A 20-YEAR LIFESPAN.
3. BATTERY SYSTEM SIZED UNDER FOLLOWING ASSUMPTIONS:
   4 HOUR RUN TIME AT END OF LIFE.
4. RETAINING WALLS REQUIRED AS INDICATED ON DRAWING. EARTHWORK TO REMAIN UNDER 100,000 CY TOTAL.
5. LIGHTING WILL COMPLY WITH CHAPTER 22.80 (RURAL OUTDOOR LIGHTING DISTRICT) OF THE LOS ANGELES COUNTY CODE
6. PARCEL M1 ZONING BOUNDARY LOCATION PER L.A. COUNTY GIS.
7. SITE IS TO BE CONSTRUCTED PER CURRENT CALIFORNIA FIRE CODE (2022), NATIONAL FIRE PROTECTION AGENCY 855 (NFPA-2020), AND LA COUNTY FIRE CODE (2023).
8. ALL CONTAINERS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH UL 9450A.
12. ALL ROADS TO BE ALL-WEATHER ACCESS AND CONFORM TO LA COUNTY FIRE CODE (2023) 503 AND 501.4. INTERIOR RADIUS TO BE 19', CENTER RADIUS 45', AND EXTERIOR RADIUS 45'. WIDTH TO BE 26'.
13. ALL CONTAINERS TO BE SET BACK FROM LOT LINES A MINIMUM OF 10'.
14. PROPOSED LANDSCAPING VEGETATION TO BE COMPLIANT WITH LA COUNTY FIRE DEPARTMENT FUEL MODIFICATION REQUIREMENTS.

From:	Brooke Messerly
To:	Barger, Kathryn
Subject:	[SUSPECTED SPAM]AGENDA ITEM #13 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Fanchise
Date:	Monday, October 7, 2024 8:59:53 PM

Good Evening Mrs Barger,
I hope this email finds you well. I am writing to you regarding the Hecate Grid Humidor Storage facility or BESS that is up for a resolution tomorrow, Agenda Item #13. I like so many, strongly oppose this facility and all the other BESS storage facilities trying to come into Acton. As someone who does believe that we must find alternative energy solutions, I feel that not enough time and energy has been spent on how even one of these facilities will impact our small town. As someone who grew up in Acton, works in Acton, my children go to Acton schools, my family is deeply involved in our beautiful community. My concern above all else is the safety of my family, my friends, animals (domestic and wild). As we have seen in recent news, these storage facilities are catching fire and becoming absolutely dangerous to be in the vicinity of. The proposed location of the Humidor project is near ranches, a train station, Angeles Forest Highway and the 14 freeway. Should just one of these storage containers catch fire, it will cause evacuations, stop the metrolink, close Angeles Forest Highway and the 14 freeway. Not to mention
contamination of the groundwater that feeds the wells of nearby ranches. This will have devastating and potentially long lasting effects. I pray that you hear us. That you see us. That you listen to the people of Acton and that you stand with us. We oppose any BESS in our town!

Best Regards,

Brooke Messerly

From: callierippleeffect
To: Barger, Kathryn
Subject: Agenda 53 please read.
Date: Monday, October 7, 2024 1:19:33 PM
Importance: High

Good afternoon, I am a resident of acton ca. I have some extreme.concerns with this battery substation that's supposed to be built.
In our area we suffer dramatics with major fires every year and extreme heat at times reaching tripple digits.
I am aware of a power battery substation that is supposed to be built in our area.
I am stating it's a bad idea. Not only do the people not want it here we all agree on it. But the planners are trying to put it rt next to an arena where we all have competition and ride our horses. If something happens you'll ne looking at a mass casualty as it's over 100 of us riding there roping cattle.
If something goes wrong not only will it take out half a mountain with that kind of power but it'll start a fire we can't put out at that magnitude. And in an area where population is relevant I feel it would be a very unsafe decision. I know people have probably written you in anger out of this, I do not I come to you with facts. This station can not be placed near people. If you need a place to put it. There's plenty of empty space near lake LA where it's berron and there is electrical near by If needed.

We can not have this kind of risk near people. We all know how a tesla fire works it burns for hours and house and can't be put out. Imagine the magnitude of all these batteries if they over heated or something happen. We are scared as residents. And are asking to please take this email into consideration and place this battery plant elsewhere. thank you for your time.

From: Arlene Diaz
To: Barger, Kathryn
Subject: Agenda Item #53
Date: Monday, October 7, 2024 8:11:14 PM

CAUTION: External Email. Proceed Responsibly.

AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Supervisor Barger, I am a community member in Acton Ca and I oppose this the Bess project proposed for our ommunity because it is a danger to my family. . We live in a high risk fire area and we already pay $8,000 year in fire insurance to protect our homes. Your project would make us uninsurable.

Arlene Diaz
Acton Community Member
Sent from my iPhone

From: brettavazian@gmail.com
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 12:59:05 PM

CAUTION: External Email. Proceed Responsibly.

Regarding Bess project:

I have lived in Acton since 1988. Our community has has been deprived of many resources for many years due to us being a rural community. Now Bess wants to put a project in our community that really has no local benefits only huge safety risks. We are on well water, we can barely get fire insurance due to us being in a high fire risk community now you have opportunity to back what you and most everyone in our community knows is a huge risk for us, our children's health risk if something happens to one of these. I understand they fire suppression system very well. It is not 100% self containment. If something happens within their control or outside their control(Mother Nature) our community would never recover. Who ever reads this please speak for us as you wouldn't allow this in your backyard so please don't allow in ours. Thank you very much.

Sent from my iPhone

From: califkd2@gmail.com
To: Barger, Kathryn
Subject: Agenda item #53 Hecate Grid Humidor storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 2:25:22 PM

CAUTION: External Email. Proceed Responsibly.

To whom it may concern;

I am a 27 year resident of Acton and am very concerned about the fire danger this facility will pose. As a homeowner, I am already dealing with homeowner insurance companies who no longer write policies for this area… and this is before the added danger this proposed facility will cause. I am not alone in this concern. Most of my neighbors have also been cancelled by their insurance company because of high fire risk. This project only increases our already high risk.

Concerned Acton resident,
Carol Ozbun-Smith

Sent from my iPhone

From: Charlie Piccaro
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 3:04:08 PM

Dear supervisor, Barger,

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC
Proprietary Electrical Transmission
Franchise

Please oppose this agenda item number 53.

The location of the proposed item is dangerous. If it were to have a failure, it would close the Angeles Crest Highway, Sierra Highway, the railway and the 14 freeway.
There are other places for it to be placed. This is just too dangerous for all involved.

I oppose this agenda item number 53 and I hope you will too.
Charles Piccaro
Retired Los Angeles County Lifeguard
Retired Los Angeles County Firefighter

From: Amanda Buchan
To: Barger, Kathryn
Subject: AGENDA ITEM #53
Date: Monday, October 7, 2024 2:51:01 PM
Attachments: Hecate letter.docx

AGENDA ITEM #53

Hecate Grid Humidor Storage 1

LLC Proprietary Electrical Transmission Franchise

Supervisor Barger,

My name is Amanda Buchan. I own the house at 34410 Angeles Forest Highway, literally across the street from the proposed project. This stone home was build in the 1940's and is part of the Vincent Hill Mining history of the area. I have been working with LA County Building & Safety for the better part of a year to add a 350sf bedroom addition that would attach what is currently a detached bathroom to the main house. The Fire Department has been the big stumbling block for this project, as they are requiring an over-the-top fire sprinkler system that goes above and beyond the required 10-minutes needed to evacuate the house in case of a fire, the purpose being to protect lives.

It is beyond imagining to me that somehow a massive lithium battery storage facility that poses catastrophic danger to the area can be built across the street. There are a multitude of dangers posed by this facility:

This facility is a ticking time bomb, that when it goes off, will cause massive wildfires and loss of homes and property (hopefully not lives) due to the difficulty involved in suppression.

It is located in an area that relies on ground water for the surrounding homes. A fire and the chemicals that would be needed to suppress it would contaminate the ground water for decades to come. I have seen nothing of a plan to remediate that threat.

It is located on a main commercial rail line that moves product across California. Any issues with the facility would disrupt that line, impacting rail service across southern CA. That same railway provides Metrolink service from the Antelope Valley to the Los Angeles Basin. Peoples ability to get to work would be disrupted.

It is located within an 1/8 of a mile from I-14, the only major connector between the Antelope & San Fernando Valleys, as well as a major north/south truck route. Any fire at the facility would have an extreme negative impact on traffic. And the other alternative routes would be impacted also – Angeles Forest Highway would be impassable, Soledad Canyon Rd would be impassable, Sierra Highway would be impassable.

Most homes in this area house livestock. If all the access points are shut down due to a fire, what evacuation plan has been put in place? There isn't one, for people or animals.

When were the environmental studies done? When were the traffic studies done? What kind of extensive disaster mitigation plans have been put n place. They weren't. Why is it that the

State of California can decide to put a project like this in a residential area? Just because we are in the high desert on large parcels does not mean this project is in the middle of nowhere. There are thousands upon thousands of vacant acres that would be more suitable for this type of project that would have minimal impact on lives and infrastructure should the unthinkable happen.

I do understand that the company wants to be able to place the plant in a place that has easily accessible infrastructure and that it is located close to the transmission plant. But the inhabitants of the area should not have to shoulder those potential burdens, especially when we will not even be the ones benefitting from the power produced! We already have had multiple power shut-offs due to limited power supplies, wind events, etc.

And we are not even talking about impacts to property values in the area. As a Certified Residential Real Estate Appraiser who has been working in the Santa Clarita & Antelope Valleys for 30+ years, the negative impact on home values within the impact area is not even calculable at this point. But it stands to reason that anyone willing to risk living in an area that could be high risk for fire, water contamination, etc. is gong to be expecting to pay a much-reduced price for a home in that area. Who is going to reimburse the current homeowners from that loss in value? And it is nearly impossible to find homeowner's insurance for fire in the area now, with many people paying upwards of $12,000/year, who is going to cover the additional cost – if insurance can even be found?

This is an incredibly ill-conceived plan and, given the unpredictability of the stability of lithium batteries in general, the dangers to our community and the additional costs that homeowners will be facing, should NEVER be allowed to be placed here.

Sincerely,

Amanda & Gorden Buchan

A printable word document of this letter is attached.

From: Catherine von Kleinsmid
To: Barger, Kathryn
Subject: AGENDA ITEM $53 Acton Hecate
Date: Monday, October 7, 2024 2:04:03 PM

As a resident of Acton, I hope and would appreciate you supporting our concerns over the possibility of a toxic and dangerous BESS facility being placed so close to homes and to our community when it could be placed more remotely. Please do not give in to additional profits over the safety of our communities. I know that you have heard all of the concerns, ie: runaway fires, groundwater contamination, toxic gases in case/when there is a fire, property fire insurance and values, quality of life, proximity to the San Andreas and major traffic corridors - the list goes on. Please don't let them take the easy way out by sacrificing the quality of life for thousands of people.

Sincerely,
Catherine von Kleinsmid

From:	Beth Cooke
To:	Barger, Kathryn
Cc:	xrnorm@gmail.com
Subject:	Agenda Item 53, Hecate Grid Humidor Storage
Date:	Monday, October 7, 2024 3:01:48 PM

Dear Ms. Barger,

As current Acton residents, my husband and I are vehemently opposed to having the Hecate Grid Humidor Storage project basically in our front yard! Not only will it destroy property values in the area but it's proximity to our home puts our health and lives directly in danger. It's proximity to the 14 freeway… already notoriously bad for congestion and accidents would be a disaster waiting to happen. Absolutely zero about this project's proposed siting makes sense; it would be much better suited for the uninhabited desert areas in Palmdale, Lancaster and Rosemond where a problem with the facility would not put humans and livestock at risk. Please fight for your Acton residents and oppose this!!

Thank you in advance,

Elizabeth Cooke
Norman Cooke
902 Searchlight Ranch Road
Acton, CA 93510

From: Casey Cantrell
To: Barger, Kathryn
Subject: BESS Project
Date: Tuesday, October 8, 2024 12:38:09 PM

Dear Supervisor Barger,

Each year more and more of my neighbors have their homeowner's insurance cancelled because of fire danger.

At the same time we frequently hear of fires caused by problems with lithium batteries.

Building a storage facility in a high fire danger is irresponsible, and will likely result in more cancellations and higher insurance rates for Acton residents.

Thank you for your attention.

Sincerely,

Casey Cantrell
Acton resident

From: Chuck Mercier
To: Barger, Kathryn
Subject: BESS
Date: Tuesday, October 8, 2024 7:53:16 AM

CAUTION: External Email. Proceed Responsibly.

With all the problems of the storage batteries and fire possibilities and the location right next to the 14 Freeway and Sierra Highway the only way to get into the antelope Valley from the San Fernando Valley. That's ridiculous. at that location could burn for a month and could be very toxic for the People that live and commute in the area. Too many problems with these batteries, it should be located 2 miles south of that area away from the freeway doesn't make any sense. Chuck Mercier. I lived in Acton for 42 years.
Sent from my iPad

From: anne williams
To: Barger, Kathryn
Subject: Fwd: Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 5:06:43 PM

---------- Forwarded message ---------
From: **anne williams** <anneybeth01@gmail.com>
Date: Mon, Oct 7, 2024 at 5:02 PM
Subject: Fwd: Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
To: <kathryn@boss.lacounty.gov>

---------- Forwarded message ---------
From: **anne williams** <anneybeth01@gmail.com>
Date: Mon, Oct 7, 2024 at 4:55 PM
Subject: Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
To: <kathyrn@bos.lacounty.gov>

Good afternoon,
I have been an Acton resident for 30 years now and am opposed to these storage units in our small town. We have been cancelled by two fire insurance companies this year as we are in a fire stone. Please help our small community as they storage units will be detrimental to our town. Please help!

Anne and David Eassa
818.281.0917

From: Bobby Howard
To: Barger, Kathryn
Cc: Saraiya, Anish
Subject: Hecate Grid Escondido Information
Date: Monday, October 7, 2024 4:59:27 PM
Attachments: Hecate Grid Update_2024.10.07.pdf

Honorable Supervisor Barger,

Please find enclosed information related to planned design and installation standards of the Humidor battery storage project compared to the project at Escondido.

Thank you,
Bobby

Bobby Howard
Sr. Manager - Development & Origination
Hecate Grid
617-610-3679

Hecate Grid LLC
600 W Fulton Street, Suite 510
Chicago, IL 60661

Honorable Supervisor Barger,

We are pleased to provide more information on the Humidor project as it relates to the recent fire in Escondido. For your convenience, an executive summary is as follows:

- **Humidor Project:** Will be a cutting-edge battery energy storage system (BESS) using the latest technology unavailable in earlier projects with safety issues.
- **Escondido BESS (2017):** Once the largest lithium-ion battery storage system globally, newer projects are now over 25 times larger.
- **Industry Growth:** Since 2017, technology, safety protocols, and industry standards for BESS have significantly improved.
- **Safety Improvements:** Between 2018-2023, the rate of safety incidents in BESS projects fell by 97%, despite a massive increase in deployments.
- **Lessons from Incidents:** The 2019 Arizona BESS fire incident provided key lessons on fire mitigation, particularly using defensive water strategies.
- **Regulatory Advancements:** Since 2017, important safety codes and standards have emerged, including the International Fire Code, NFPA 855, and UL 9540A.
- **Humidor Project Safety:** With nearly a decade of additional knowledge, updated standards, and enhanced safety measures, the Humidor project is expected to bring significant benefits to Los Angeles County, minimizing perceived risks.

Hecate Grid's Humidor storage project will be a state-of-the-art facility that utilizes the most advanced technology that was unavailable to projects with recent safety incidents. For instance, SDG&E's Escondido Battery Energy Storage System ("Escondido BESS") began operations in the first quarter of 2017. Since then, technology, BESS designs, industry standards. and knowledge of how to respond to safety incidents have all improved.

At the time, the Escondido BESS was – according to energy news publication Utility Drive – the "single biggest lithium-ion battery in service on a utility grid in the world". There are now projects more than 25 times larger than Escondido BESS in operation. Every new project, large and small, that has come online since 2017 contributes to the ever-growing industry knowledge of how to safely build and operate BESS facilities.

Our industry has grown while prioritizing safety, partly why the rates of BESS safety incidents continue to plummet. According to a recent study from Pacific Northwest National Laboratory and others, from 2018 to 2023, the rate of failure incidents on a per GW basis fell by 97%. This represents a period of tremendous growth where new BESS projects learned from the

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600 W Fulton Street, Suite 510
Chicago, IL 60661

first generation of BESS, came online, and have been far more likely to be operating safely ever since. This period also encapsulates the time since four firefighters were injured at a 2019 BESS incident in Surprise, Arizona. Investigation reports from that time revealed how to safely mitigate future fire incidents, namely by using water defensively rather than offensively. Despite the number of U.S. energy storage deployments increasing 18-fold from 2017 to 2022, there has yet to be another reported American BESS incident with an injury. We hope to see this trend continue.

Codes and standards now exist that simply did not in 2017. The first addition of a chapter on energy storage to the International Fire Code came in 2018. The first edition of NFPA 855 – the foundational standard which the industry relies on for safely and responsibly installing energy storage systems – came out in 2019. Since then, NFPA has come out with a 2023 edition and has already started on a 2026 edition. UL 9540A, Underwriters Laboratories' "Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems" was released in November 2017, almost a year after Escondido BESS was completed. These new codes and standards are why, unlike in 2017, there is now mention of energy storage in the California Fire Code, the NYFD has a selective list of approved technologies for BESS facilities, and Counties like Los Angeles are able to confidently site BESS knowing it will safely decarbonize and stabilize our grids.

Our Humidor project will have roughly a decade of additional industry knowledge compared to the Escondido BESS. It will have more standards to meet, more safety consultants to speak to, and more datapoints to study. This allows us to confidently say this project will be built and operated and bring tremendous benefits to Los Angeles County that far outweigh any perceived risks or costs.

Sincerely,

Bobby Howard

Humidor Project Manager

Hecate Grid LLC

Hecate Grid LLC
600 W Fulton Street, Suite 510
Chicago, IL 60661

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Sincerely,

Bobby Howard

Humidor Project Manager

Hecate Grid LLC

From: ashleyteno@aol.com
To: Barger, Kathryn
Subject: I oppose the Hecate BESS Project in Acton
Date: Monday, October 7, 2024 7:51:38 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC
Proprietary Electrical Transmission Franchise

I hope this message finds you well. I am writing to express my concerns regarding the proposed Humidor Hecate BESS Project in our rural community of Acton. Acton is classified as a high fire zone, and the implications of such a facility in our area raise significant risk for both our residents and the environment.

The safety of our community must be the primary concern. With our town's susceptibility to wildfires, a large-scale battery energy storage system poses an increased risk. These systems have been known to experience thermal runaway, leading to fires that can spread rapidly, especially in areas with dry vegetation and high winds. The potential for a catastrophic event in a high fire zone is a risk that our community cannot afford to take. Many homeowners are already struggling to secure affordable homeowner's insurance. The proposed Humidor Hecate BESS Project could further intensify these concerns.

The environmental consequences of thermal runaway associated with battery energy storage systems cannot be overlooked. In the event of a fire caused by such an incident, hazardous materials and chemicals can contaminate the soil and water sources. This could lead to irreversible damage for our community. A more remote location for the facility needs to be considered.

In conclusion, I urge you to reconsider the placement of the battery energy storage system. I am not a supporter of the Humidor Hecate BESS Project in my community.

Sincerely,

Ashley Bayer

Concerned Acton Resident

From: cheeb27
To: Barger, Kathryn
Subject: NO to BESS project in Acton, CA
Date: Tuesday, October 8, 2024 10:48:24 AM

I've been a homeowner in Acton for 27 years. I adamantly oppose the proposed lithium battery project in Acton, CA.

We are a high fire danger community already; my family personally has already evacuated from fires several times. This project would create a ticking time bomb in our community, that already has a hard time obtaining fire insurance. My husband worked hard to pay our house off, which took over 20 years. Please don't let this project go through. It doesn't belong in our residential community. We are also retired seniors now and have horses. Thank you.

Sincerely,

Cynthia and Ronald Heeb
2650 Trails End Rd
Acton, CA 93510

From: Christina Nave
To: Barger, Kathryn
Subject: No to bess
Date: Monday, October 7, 2024 1:09:01 PM

We are opposed to have this in our community! Safety is what's important and this is definitely not safe. Please we don't want this is our community. We are a high fire risk community.

From: Charleen Mullin
To: Barger, Kathryn
Subject: Please vote to oppose the Bess project
Date: Monday, October 7, 2024 3:23:49 PM

To whom it may concern,

As a resident of Agua Dulce and a local Realtor, I am opposed to Hecate Grid Humidor storage facility, Agenda Item #53. Please vote against this project it is not safe in our high fire area, this could be catastrophic to our community.

Thank you,
Charleen Mullin
Re/max of Santa Clarita
25129 The Old Road #114
Santa Clarita, Ca 91381
Certified Distressed Property Expert
CMA Resource Network, Board Member
Remax Hall of Fame Member
DRE # 00911849
661-713-8216 cell
661-284-5464 direct line
661-268-1204 home

Checkout my REMAX page https://rem.ax/2kx1Mtb
Please remember I am never too busy for any of your referrals!

From: Christine Furman
To: Barger, Kathryn
Subject: Proposed Site in Acton for a Lithium Battery Storage Facility
Date: Tuesday, October 8, 2024 7:24:01 AM

CAUTION: External Email. Proceed Responsibly.

Dear Ms. Barger,

Please fight for the residents of Acton who are opposed to the very dangerous battery site that could be built here in Acton, CA. Since the recent battery fires that have shut down freeways and evacuated residents due to the toxic fumes, I can't image how Acton is even being considered a place to build such a dangerous site so close to our community.

As you are well aware, Acton is a high fire area and we are having difficulty getting fire insurance as it is. The Santa Ana winds are very strong here, making it even more dangerous when a fire breaks out. Houses are close by to the proposed site. Many of the houses are on wells that supply their drinking water and many have livestock. You are also aware that lithium fires effect ground water. I am certain there are other areas where it will be safer to build a lithium battery storage site.

The proposed site is on the street below my home. Please stop this facility from being built here in Acton. We need you help and support. You will be saving Acton, and all of Acton will be grateful.

Thank you,
Christine Furman

From: Amy J. Bodek
To: Jacqueline Ayer
Cc: Barger, Kathryn; Saraiya, Anish; Kathy Park
Subject: RE: The Humidor BESS capacity is actually 545 MW
Date: Monday, October 7, 2024 6:17:28 PM
Attachments: Screenshot BESS Approval Notes.PNG
Screenshot BESS Note 1.PNG

Ms. Ayer –
Thank you for your email. To confirm, Regional Planning approved a project for 400 MW only. We did not and do not approve a project that would be for more than 400 MW.

I have attached a screenshot of the approval notes that were required to be on the site plan as Note 1.

We will ensure that any building or fire permits submitted to the County for review are for the maximum capacity of 400 MW (not 400 batteries).

Thank you for bringing this to our attention.

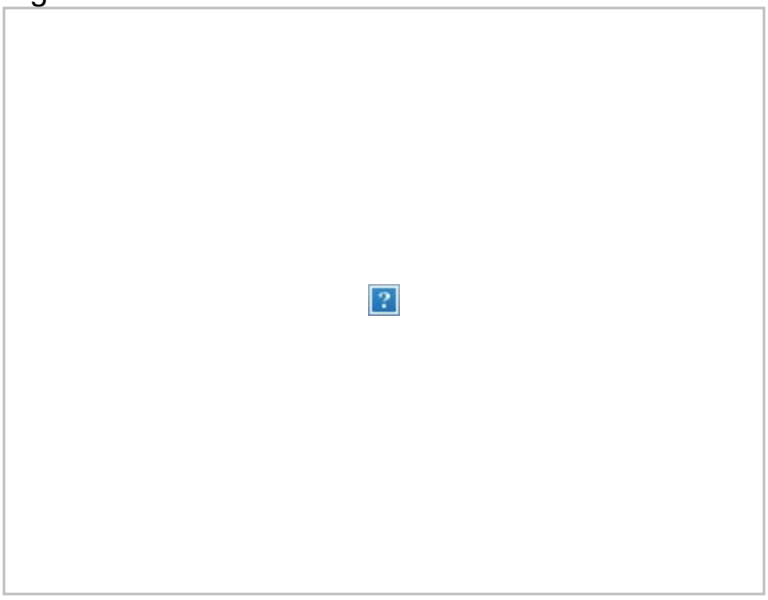
AMY J. BODEK, AICP (she/her/hers)
DIRECTOR

From: Jacqueline Ayer <sortacton@gmail.com>
Sent: Monday, October 7, 2024 3:33 PM
To: Amy Bodek <ABodek@planning.lacounty.gov>
Cc: Barger, Kathryn <Kathryn@bos.lacounty.gov>; Saraiya, Anish <ASaraiya@bos.lacounty.gov>
Subject: The Humidor BESS capacity is actually 545 MW

Dear Director Bodek;
When the Humidor BESS site plan was approved on August 1, 2024, Regional Planning represented to the public that the capacity of the facility was 400 MW (see highlighted portion in Figure 1 below). However, the equipment and facilities that Regional Planning *actually* approved on the site plan is a **545 MW** BESS consisting of 440 battery containers in which each container has a generation capacity of 1.236 MW (see highlighted portion in Figure 2 below, and note that 440 containers x 1.236 MW per container = 544.84 MW total). It is not known if Regional Planning was aware that the actual capacity of the equipment that was approved by the site plan was 545 MW rather than the 400 MW represented to the public.

Figure 1:

Figure 2:



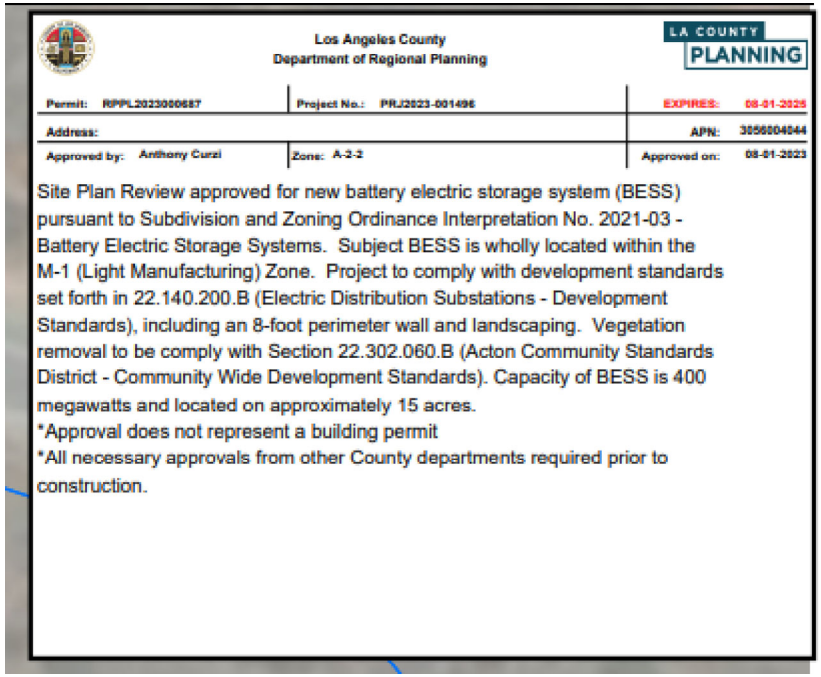
Hecate has a proven track record of misrepresenting the facts of the Humidor project to County agencies and to the Department of Regional Planning in particular. For instance, Regional Planning approved the original site plan in 2022 based on Hecate's assurance that the project was located entirely on industrially zoned property; the residents of Acton had to go to great lengths to prove to Regional Planning staff that the project was not limited to just industrially zoned property and that it extended into agriculturally zoned land as well. It was only after this significant community effort that Regional Planning rescinded the 2022 approval and informed the Community of Acton that the Humidor BESS would undergo the Conditional Use Permit process; unfortunately, this did not occur.

The new realization that the actual capacity of the approved Humidor BESS project is more than half a gigawatt is the latest in a string of misrepresentations and mischaracterizations that have been uncovered regarding the Humidor Project. More importantly, this proves beyond any doubt that the Humidor Project is nothing like a

distribution substation because the capacity of a distribution substation is typically less than 100 MW (although in some rare instances, they can approach 200 MW). This is because utility planning standards do not accommodate distribution substations with capacities exceeding 500 MW (or even 400 MW) because the risk to load is too great (given that a mishap would result in the loss of electrical service to an unacceptably high number of customers). These material facts conclusively demonstrate that Regional Planning erred in applying "Interpretation 2021-03" to approve the Humidor BESS as a "distribution substation", and I present them to you based on my nearly 20 years of experience in participating in electrical proceedings before the CPUC and the FERC which involved extensive electrical system analyses and expert witness testimony.

Based on these facts, I request that Regional Planning rescind the Humidor BESS approval that was issued on August 1, 2024.

Respectfully submitted;
Jacqueline Ayer, Director
Save Our Rural Town



Los Angeles County
Department of Regional Planning

LA COUNTY PLANNING

Permit: RPPL2023000687	Project No.: PRJ2023-001496	EXPIRES:	08-01-2025
Address:		APN:	3056004044
Approved by: Anthony Curzi	Zone: A-2-2	Approved on:	08-01-2023

Site Plan Review approved for new battery electric storage system (BESS) pursuant to Subdivision and Zoning Ordinance Interpretation No. 2021-03 - Battery Electric Storage Systems. Subject BESS is wholly located within the M-1 (Light Manufacturing) Zone. Project to comply with development standards set forth in 22.140.200.B (Electric Distribution Substations - Development Standards), including an 8-foot perimeter wall and landscaping. Vegetation removal to be comply with Section 22.302.060.B (Acton Community Standards District - Community Wide Development Standards). Capacity of BESS is 400 megawatts and located on approximately 15 acres.

*Approval does not represent a building permit

*All necessary approvals from other County departments required prior to construction.

NOTES

1. EQUIPMENT DEPICTED IS PRELIMINARY ONLY. MAXIMUM NAMEPLATE CAPACITY OF THE BESS IS 400MW.
2. BATTERY SYSTEM SIZED PER MANUFACTURER AUGMENTATION RECOMMENDATION OF 43% CELL ADDITION, ALLOWING FULL POWER OUTPUT AT END OF LIFE BASED ON A 20-YEAR LIFESPAN.
3. BATTERY SYSTEM SIZED UNDER FOLLOWING ASSUMPTIONS:
   4 HOUR RUN TIME AT END OF LIFE.
4. RETAINING WALLS REQUIRED AS INDICATED ON DRAWING. EARTHWORK TO REMAIN UNDER 100,000 CY TOTAL.
5. LIGHTING WILL COMPLY WITH CHAPTER 22.80 (RURAL OUTDOOR LIGHTING DISTRICT) OF THE LOS ANGELES COUNTY CODE
6. PARCEL M1 ZONING BOUNDARY LOCATION PER L.A. COUNTY GIS.
7. SITE IS TO BE CONSTRUCTED PER CURRENT CALIFORNIA FIRE CODE (2022), NATIONAL FIRE PROTECTION AGENCY 855 (NFPA-2020), AND LA COUNTY FIRE CODE (2023).
8. ALL CONTAINERS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH UL 9450A.
12. ALL ROADS TO BE ALL-WEATHER ACCESS AND CONFORM TO LA COUNTY FIRE CODE (2023) 503 AND 501.4. INTERIOR RADIUS TO BE 19', CENTER RADIUS 45', AND EXTERIOR RADIUS 45'. WIDTH TO BE 26'.
13. ALL CONTAINERS TO BE SET BACK FROM LOT LINES A MINIMUM OF 10'.
14. PROPOSED LANDSCAPING VEGETATION TO BE COMPLIANT WITH LA COUNTY FIRE DEPARTMENT FUEL MODIFICATION REQUIREMENTS.

From: Charlie Piccaro
To: Barger, Kathryn
Subject: STOP Acton BESS Project
Date: Monday, October 7, 2024 2:50:03 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

I am a retired Los Angeles County Lifeguard & Firefighter.
I worked for the County for 38 years since I was 17 years old.
My little town of Acton is being threatened by the BESS project.
Safety wise the BESS project in that certain location is an extreme hazard that could be avoided by letting it tie into the line somewhere where it wouldn't cause havoc if it melted down.
If the BESS project had a failure (as many battery holding facilities do), IT WOULD CUT OFF THE RAILWAY (which transports humans (ie Metro) & containers of goods from LA ports & our LA industry) AND THE 14 FREEWAY IN A MATTER OF MINUTES.
Please oppose this measure.
Thank you for your consideration,
Charles Piccaro

From: Connie Lindeman
To: Barger, Kathryn
Subject: AGENDA ITEM #53
Date: Tuesday, October 8, 2024 8:47:52 AM

AGENDA ITEM #53

Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Supervisor Barger,

I am an Acton resident and I strongly opposed the BESS project being developed in our community of Acton!

Please support our community and vote no on this item.

Thank you!

With Regard,

Connie Lindeman

From:	D Buczynski
To:	Barger, Kathryn
Subject:	Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date:	Monday, October 7, 2024 3:50:26 PM

Supervisor Barger

As a resident of the city of Acton California I oppose the project. Due to the safety concerns of living in a high fire zone, we don't need the additional chances of uncontrollably fires breaking out in our town and community. There are many other places these storage can be built that won't impact people's towns or communities.

Thank you

David Buczynski
Acton Resident.

From: D Jacoby
To: Barger, Kathryn
Subject: AGENDA ITEM #53-Can we rename it the Katheryn Barger Bess?
Date: Sunday, October 13, 2024 4:20:12 PM
Attachments: The Bad Actor Factor.doc

Katherine,

The attached document, prepared for and submitted to the staff of Rep Mike Garcia, will explain why I would want everyone to know and remember who pushed this through.

You can read it in about the same amount of time as it would take any knowledgeable 'Bad Actor' to make it happen.

D L Jacoby

The Bad Actor Factor

As an employee of the **Los Angeles Department of Water & Power** (**LADWP**) for 28 years I served in many capacities involving bulk and distribution power system operations.

In 1984 through 1986 I served as first operator during the construction and commissioning of the Intermountain Power Project 500 Kv **High Voltage Direct Current** (**HVDC**) transmission system and their associated HVDC converter stations in Adelanto California, and Delta Utah. There were several instances where accidental and deliberate actions on the part of construction, maintenance and operations personnel required re-engineering, repair, and/or rebuilding of tens of millions of dollars worth of primary and secondary systems.

In the capacity of Distribution Operator, building new substation around the city of Los Angeles, I had occasion to determine the size of the gap between designing and engineering of those stations in the abstract, and the requirements for having a safe and functional operating environment at those stations when the construction and commissioning was complete.
When the next station of similar or identical design came along, that point was highlighted by the realization that the flaws pointed out and corrected the first time around came back to me in the initial construction packets of the new stations. I was compelled once again to point out the lessons learned and insist that this time the corrections be made by reviewing the past projects before money was spent making the same mistakes over again.
Whenever new types of systems or equipment were being installed, part of this job was to write equipment descriptions and operating procedures so operations staff could use this new equipment safely and effectively.

When working as a Training Operator, both in the field and in the classroom, my job was to train and evaluate the knowledge and field performance of operations and other personnel (maintenance, construction, system protection, even janitorial and landscape groups). This is done to ensure that all employees had a full and realistic understanding of the hazards of their environment and duties so they could protect themselves, their fellow employees, their customers and equipment, and go home safely to their families after work.
Training operators to follow the procedures developed by the department for safe operations of these facilities was really only half the task. It was perhaps even more important to teach how and what to inspect before initiating a procedure, since equipment compromise or failure could turn a 'safe procedure' into a potential death trap. Safe operation of facilities that control enough energy to keep a city running requires the full attention and dedication of every person in the facility, regardless of the task being performed.
While working as field trainer at **Rinaldi Receiving Station** (**RS Rinaldi**) at the start of the first Gulf War (early 1990's) my operational supervisor called me into his office one Friday and said he had been asked by his boss downtown to generate a report evaluating the safety and security of our stations and system in general. They wanted to know if we would be vulnerable to compromise by 'Bad Actors' intent on causing fires, explosions, outages etc. I said I would give it some thought and get back to him. When I returned Monday my response was, with the right prints, cable schedules, some Mylar sheeting, a white hard hat, and $500.00 in cash I could black out the interconnection of the 11 western states included in **Western Electricity Coordinating Council** (aka **WECC**) while melting the RS Rinaldi

high voltage buses to the ground.
His response was that I was doing an excellent job training the operators, and I should focus on that, he would find someone else to spend their time writing reports – which at the time was LADWP speak for 'That's not what downtown wants to hear'.

In 1987 I trained to be a Load Dispatcher, or what the **North american Electrical Reliability Corporation** (aka **NERC**) refers to as a Bulk Electrical System Operator. I was already proficient in protection systems intended to protect station and power line equipment from overloads that would cause failures resulting in fires, meltdown etc., this was my first exposure to protection schemes designed to protect the integrity of the power system as a whole. Protection of Interconnected Power Systems is a balancing act between many resources (ie. Generation, Power Factor correction, and flow control etc.) and load centers (towns and cities, large industrial, and geographically remote loads). It was at this point that I first became familiar with what WECC refers to as '**The Pacific AC Intertie**' (aka **Path 66)**

In a **High Voltage Alternating Current** (aka **HVAC**) power system, power flow is dynamic, meaning that power flows from every interconnected source to every interconnected load in proportion to the impedance of the system between the two. Every change in system configuration (addition/loss of a transmission line, generation source, transformer tap change, or load change) re-configures the flow accordingly.
Equipment protection schemes protect individual stations and pieces of equipment, so that if a shift in bulk system configuration causes an overload, the equipment protections will de-energise that component to prevent damage.
Path protection schemes protect the interconnected system. When a component of the power system fails or opens under heavy load conditions to protect a piece of equipment (for WECC this mostly occurs during summer heat waves), the scheme ensures there will always be sufficient alternate paths to maintain the interconnection. If the path protection is not properly configured, or fails for some reason, the interconnection fails. This results in 'Islanding', the break up of the interconnection into smaller interconnections, each of which then sheds *either* loads *or* generation resources until balance is re-established within each island.
A quick aside to this primer; Unlike transmission in dynamic HVAC power systems (described above) HVDC transmission systems are non-dynamic, meaning that the controls determine exactly how much power will flow and exactly where it will flow to, on or off - similar to a light switch.

Path 66 the Pacific HVAC Intertie was built specifically to offset the Pacific HVDC Intertie, an HVDC transmission system designed to bring low-cost Hydro-electric power from the Pacific Northwest to Los Angeles.
Path 66 was built to prevent islanding of the WECC interconnection if the HVDC fails under heavy load conditions. The northern portion involves 500Kv HVAC transmission lines brought together from a number of sources on different Right(s) of Way, each near significant load and/or generation resources, and culminates in the south at *incent S itching Station,* the only place where all the circuits of Path 66 share a physical proximity and several or all the lines of path 66 can be affected by a single event, causing islanding the path was built to prevent. The cost of this event is predicted to be ten or more billions of dollars, and includes the hazards associated with sudden regional blackouts and the resulting loss of; traffic signals (with potential deaths and injuries), power supply to hospitals and other critical infrastructure, loss of some or all communications in affected areas, potential damage to power system equipment, and days, weeks, or in some cases months to fully recover.

Note that *incent S itching Station* Owned and Operated by **Southern California Edison** (aka **SCE**) is also a critical nexus of a Path commonly referred to as **Victorville Switching Station to Los Angeles** (aka**Vic-LA**) that makes a significant contribution (at times more than 50%) to supplying loads in Los Angeles and a number of other Southerner California municipalities collectively referred to as **Southern California Public Power Authority** (aka **SCAPPA**)
Path 66 and Vic-LA are well known and constantly studied as being a focus of vulnerability on the WECC interconnection. A quick trip to the internet furnishes abundant information concerning these matters.

Integrity of the WECC Power System demands that careful study be given to all aspects of safety and security of the *incent S itching Station*. This would include operations, expansion, and physical protection of this resource from both internal and external threats, be they deliberate and targeted or incidental/accidental. SCE does not have independent resources, power, or authority to provide protections here.

Recently an ambiguous consortium of interests known as Hecate LLC has developed a plan to build the Humidor **Battery Energy Storage System** (aka **BESS**) beneath the 500 Kv Transmission line Right(s) of Way less than a mile from the station. They have already managed to gain provisional approval of this project bypassing the local Acton Town Council, and with the apparent enthusiastic support of LA County Board of Supervisors . – If you review the public hearing on December 19th 2023 please note that the Supervisors gave short shrift to hearing community concerns, while ignoring comment time limits on parties supporting the project. Also curious was the appearance at the meeting of thirty or more journeyman electricians - at what cost? borne by whom? - to support the idea of building this specific project, I know of no other hearing that warranted this sort of attention.

BESS facilities are being encouraged by any number of political and power industry groups. For optimum utilization BESS's should be placed near the load centers which will utilize them. That way they can be charged at relatively low cost during times of low demand when transmission costs are minimal and surplus (low cost) power from non-dispatchable resources (solar/wind farms) is available to be stored. That way the BESS feeds loads when demand is high. Placing them where congestion charges will be caused during high demand (such as near *incent S itching Station*) is sub-optimal at best.
Bess facilities are also under scrutiny from an ever expanding list of old and new Electric Design and Protection Organizations, as well as Universities Study programs to address their vulnerability to *Thermal una ay*, a condition that results in Lithium Ion battery cells causing fire spontaneously during normal operation, that cannot be quenched with normal firefighting procedures.
Everyone is familiar with the old adage that states 'Where there is smoke, there is fire', but Burrell Eveland, longtime power system operator and manager for various Southern California utilities points out that in the case of BESS's the corollary 'Where there is fire, there is smoke' is more on point.
Why?
Because Smoke, not fires, is the cause of electrical transmission systems failures as the ionized path of the smoke particles breach the insulation between the energized conductors or the conductors and ground, causing flash overs and relay operations that will protect the lines, but in this case *cause* the islanding Path 66 was built to prevent.

In the WECC interconnection it would be hard to find a more dangerous or inappropriate location than that proposed for the Humidor BESS. A couple weeks (far less time than learning to pilot a jet) at any of the facilities studying the causes and effects of Thermal Runaway would be sufficient for a determined and intelligent individual with knowledge of power system operations to reverse engineer the steps being taken to prevent runaway, essentially giving them a fuse to burn the Humidor BESS down and take WECC interconnection along with it.

Does the Hecate group, championing the project, have that in mind, or are they simply ignorant, or greedy, or indifferent enough to want it built anyway? We have no way to be certain, but once built we can be certain that there are plenty of Bad Actors in the world who are watching, and waiting for us to make a mistake of this magnitude and won't think twice about using it to its full detrimental effect.

From: Daniel Cotten
To: Barger, Kathryn
Subject: Humidor BESS project
Date: Saturday, October 12, 2024 4:22:30 PM

CAUTION: External Email. Proceed Responsibly.

I am protesting this project due to the location in our neighborhood. I live on Hillside Dr. next door to this project, there are 8-10 homes in the affected area. The property at 33440 Angeles Forest Hwy. was sold to the BESS contractor in October. We all get our water from wells , the well at this home has been dry for more than 10 years they were getting trucked water. The Otay Mesa battery plant caught fire last may , the Fire Dept. used 5 million gallons of water to try to put it out , then let it burn for 2 weeks. If this project proceeds tell me where they plan on getting water the nearest hydrant is at the Vincent Hill MetroLink station 2 miles away. We already live in a high fire zone a lot of us in the area have lost our Homeowners Insurance or had our policy triple. This would give the Insurance Companies reason to cancel all of us. There are many areas better suited for this type of project NOT IN NEIGHBORHOODS !

Daniel Cotten
33207 N.Hillside Dr.
Acton, Ca.
Sent from my iPad

From: Darlene Ehrich
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor storage
Date: Monday, October 7, 2024 6:20:34 PM

Hello,

I am a 7 year resident of Acton, California. I am very concerned about the changes that are being proposed for our area. I fear the increased fire danger from the Hecate Grid Humidor storage facility. My husband and I leave two children in Acton every morning and work down in the antelope valley. I fear one day being separated from them due to a fire which will cut off our way back into Acton. I fear that the school district, which is already struggling to manage bus capacity and has limited staff, will not be able to respond quickly to make sure that the 1250 students at the three schools will be transported to safety in an emergency. It is a parent's worst nightmare for their children to be suspectable to harm.

Sincerely,
Darlene Ehrich

From: David Dzaich
To: Barger, Kathryn
Subject: Agenda Item # 53
Date: Monday, October 7, 2024 1:08:25 PM

Hello Kathryn,

I appreciate many things you have done as our representative. I am sending this email as a resident of Acton in opposition to the BESS project. There is no gain for the community that is worthwhile plus it is a potential health hazard of the site ever caught fire. The amount of money they sent out on the mailer probably exceeded the proposed money that would go to the community. None of this project directly benefits out community. It poses a health and safety issue. Plus it potentially will affect out home values. I am opposed.

David Dzaich
6124-Escondido-Canyon-Rd
Acton CA 93510.

Thank you

From: Dawn Deans
To: Barger, Kathryn
Subject: AGENDA ITEM #53-Hecate Grid Humidor Storage LLC, proprietary electrical transmission franchise
Date: Monday, October 7, 2024 1:02:15 PM

Dear Supervisor Barger:

Regarding AGENDA ITEM #53-Hecate Grid Humidor Storage LLC-Proprietary Electrical Transmission Franchise, my husband and I are strongly opposed to the BESS project being developed in our community of Acton for the following reasons:
1. SAFETY- This project is not safe for our community due to the risk of fire and lack of resources to fight any fire.
2. FIRE- These batteries are highly flammable- cases in point- the recent shutdown of the 15 and the St. Thomas bridge. Insurance costs in Acton are extremely costly due to us being in a high fire zone. Our annual insurance cost last year was nearly $7,000.00. If this project goes through, these costs will surely rise again forcing many of us from our homes.
3. LACK OF WATER RESOURCES-As the former Executive Assistant for the Palmdale Water District for over 35 years, I know all too well how precious our water resources are. Where will the water come from to fight the fires that will result from these batteries?
4. AIR QUALITY-What happens to our air quality from fires from these batteries? Who would be responsible for future health problems resulting from the toxic odors emitted?

Thank you for your time and consideration for how dangerous this project will be to our community. Please let me know if you have questions.

Sincerely
Dawn Deans
661-236-7398
Ddeans@sbcglobal.net

From: dloporchio
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 7:29:01 PM

CAUTION: External Email. Proceed Responsibly.

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

PLEASE do not allow this project to take place. This is such a huge safety concern, we cannot believe that this project is potentially going to take place in our town. This could potentially wipe out the town of Acton. There is so much vacant land out in the Antelope Valley that it could be built there. It doesn't need to be built on top of the residents of Acton. I have lived in this town for 36 years and I know there's others that have lived here longer than me. I have no plans to move anywhere else. This is where I will stay unless the town gets burnt down.
Thank you
Donna Loporchio

From: Don Wright
To: Barger, Kathryn
Subject: Acton BESS
Date: Monday, October 7, 2024 9:57:57 PM

CAUTION: External Email. Proceed Responsibly.

Supervisor Barger,

It is with a sense of urgency that I write this. It has come to my attention that there will be crucial meeting tomorrow regarding the proposed BESS located in Acton. As a long term resident of the community I must protest the concept of placing this technology in our small community.

I am a retired Battalion Chief for the Glendale Fire Department. I have been the incident commander on several large hazardous materials incidents and have an understanding of the potential ramifications of what happens when things go wrong.

The current thoughts on managing any lithium ion battery emergency involve isolating the defective device and allowing it to burn out. As evidenced by the incident on the Vincent Thomas bridge, these incidents disrupt the surrounding area for an extended period of time.

As you are well aware, there have been an increasing number of disturbing incidents involving lithium ion batteries in various industries, including storage systems, that have resulted in catastrophic destruction of equipment, uncontrolled release of hazardous byproducts and major disruption of daily routines as these batteries are allowed to burn themselves out. Considering the scope of the project under consideration for Acton, perhaps a pause is in order until the potential negative impacts are better understood. Perhaps even consideration of a different technology is in order.

Thank you for your time

Don Wright
Acton

Sent from my iPad

From: dtsmithfamily@gmail.com
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage in Acton (Oppose)
Date: Monday, October 7, 2024 3:18:11 PM

CAUTION: External Email. Proceed Responsibly.

Dear Ms. Barger,

We are vehemently opposed to AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise in the Acton area.

This proposed battery storage is dangerous for our extreme high fire community. We are already paying exorbitant fire insurance rates and we fear insurance companies will only increase these rates if this hazardous battery storage facility is allowed in our area. At present we pay $10,956/year in the so called Fair plan for a 2,000 sq ft home. This alone is unsustainable.

In addition to the dangers, this storage facility is next to a restaurant and other businesses and recreational areas (community equestrian arena) and ruins the rural beauty of our area of Acton.

Please do not support this project in the Acton community.

Sincerely,

Dan and Terri Smith
31735 Indian Oak Rd
Acton CA.

Sent from my iPhone

From: Ed KE6BNL
To: Barger, Kathryn
Subject: Humidor BESS transmission line
Date: Friday, October 11, 2024 10:18:53 AM

Do you want to be responsible for the biggest disaster to occur in this community do you want this to be on your name this is going to be a danger to the entire community. We already can't afford to live in Acton and Agua Dulce area because of the fire danger and increase insurance rates and you're going to add to that we won't even be able to keep our houses any longer

From: Edwardo Vieyra
To: Barger, Kathryn
Subject: AGENDA ITEM 53
Date: Monday, October 7, 2024 10:36:00 PM

Save ACTON!!

Locating any BESS facility in Acton – an area designated as a HIGH FIRE DANGER AREA – or the surrounding region is unacceptable. Featured at right are 4 more critical reasons why BESS facilities should not be located anywhere in the Acton region.

Sent from my iPhone

From: Elizabeth Moreno
To: Barger, Kathryn
Subject: Acton Bess project
Date: Monday, October 7, 2024 12:49:53 PM

Agenda item #53
Hecate Grid humidor storage 1
LLC proprietory electrical transmission franchise

Hi Kathrn,

As a Acton resident it is very important for the safety of our community that we dont allow this BESS project. I'm in opposition to this it will endanger our environment.

Thank you,
Elizabeth Moreno

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Please support the Humidor Battery Energy Storage System (BESS)
Date:	Monday, October 7, 2024 10:35:36 PM
Attachments:	Humidor BESS benefits information letter (09_jh, 26 Aug 2024).pdf

The following correspondence is being forwarded to you for your review/information.

From: Craig Lewis <craig@clean-coalition.org>
Sent: Friday, September 27, 2024 3:45 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Please support the Humidor Battery Energy Storage System (BESS)

Dear Chair Horvath and Board Supervisors:

The Clean Coalition is a very technical nonprofit with a mission to accelerate the transition to renewable energy and a modern grid. As the Executive Director of the Clean Coalition, I am writing to express the Clean Coalition's support for the Humidor Battery Energy Storage System (BESS). I also plan to express support verbally at the Board of Supervisors meeting on 8 October, at which the necessary franchise agreement for the Humidor BESS is expected to be on the agenda.

Importantly, the Humidor BESS is being sited at an ideal location, near the massive Vincent Substation in north Los Angeles County where the BESS is poised to deliver numerous location-specific benefits that include the following:

- Enhancing a key intersection of the grid by reducing grid congestion and improving grid reliability.
- Maximizing the delivery of renewable energy and minimizing the use of gas-fired generators.
- Utilizing disturbed land in an industrial zone and ensuring that fewer deployments of future BESS will be needed on pristine lands.

The Humidor BESS will deliver many additional benefits, and the attached group support letter from the Clean Coalition, NRDC, Climate Resolve, Permacity Foundation, and Elders Climate Action highlights the details.

I am happy to answer any questions you might have for me, including via email and/or during the 8 October Board of Supervisors meeting at which I plan to participate by making verbal comments that reinforce the Clean Coalition's support for the very important Humidor BESS.

Overall, the Clean Coalition strongly encourages the County to fully support the Humidor BESS, including by approving its necessary franchise agreement.

Sincerely,

Craig Lewis
Executive Director
Clean Coalition
Santa Barbara | Menlo Park | Colorado Springs
650-796-2353 mobile
craig@clean-coalition.org

Humidor Storage Project – SUPPORT

To whom it may concern,

The Clean Coalition (clean-coalition.org), a technical nonprofit organization with a mission to accelerate the transition to renewable energy and a modern grid, is supporting the Los Angeles County Board of Supervisors approval of a franchise agreement that will allow for the approved Humidor Battery Energy Storage System (BESS) to connect to the grid at the existing Vincent Substation with an approximately one-mile, undergrounded electrical line. This 400-megawatt (MW) & 1,200-megawatt-hour (MWh) BESS has an approved site plan review and will be located on disturbed land near the existing Vincent Substation in Acton, California. The connection of Humidor to the grid is key to maximizing renewable energy generation, reducing grid congestion, and improving grid reliability throughout Los Angeles County – and even across the entire State of California. The Vincent Substation serves as a vital intersection of transmission & distribution lines that tie renewable energy from the Central Valley to loads throughout Los Angeles County. As noted, the County has already approved the BESS itself. All that remains is for the Board of Supervisors to allow the gen-tie line to be installed in an existing utility corridor in a public street.

Humidor will be an essential enhancement to the Vincent Substation by reducing congestion at this vital location on the grid, while maximizing the ability for renewable energy to be delivered to loads – and thereby minimizing the curtailment (i.e., waste) of renewable energy. Humidor will also minimize the need for dirty gas-fired plants to operate, including during periods of peak electricity demand, which will prevent pollution that would otherwise spew into impacted communities across the Los Angeles region.

Proven BESS technology will be incorporated in Humidor, and large buffer zones and comprehensive safety plans will ensure community-friendly operations. Furthermore, the substantial investment in Humidor will drive significant economic stimulation in the form of local job creation, tax revenue generation, and indirect spending. Additionally, $100,000 per year has been committed to community initiatives. In short, Humidor aligns with California's commitment to resilience, sustainability, and prosperity.

There are five key reasons to support the franchise agreement for Humidor:

1. Critical location near the existing Vincent Substation to enhance renewable energy delivery, grid reliability, and resilience.

2. Community-friendly deployment, sited on disturbed land in an industrial zone and already approved by the County, with significant distances to the Acton town center.

3. Safe BESS technology that is already proven throughout the United States and beyond.

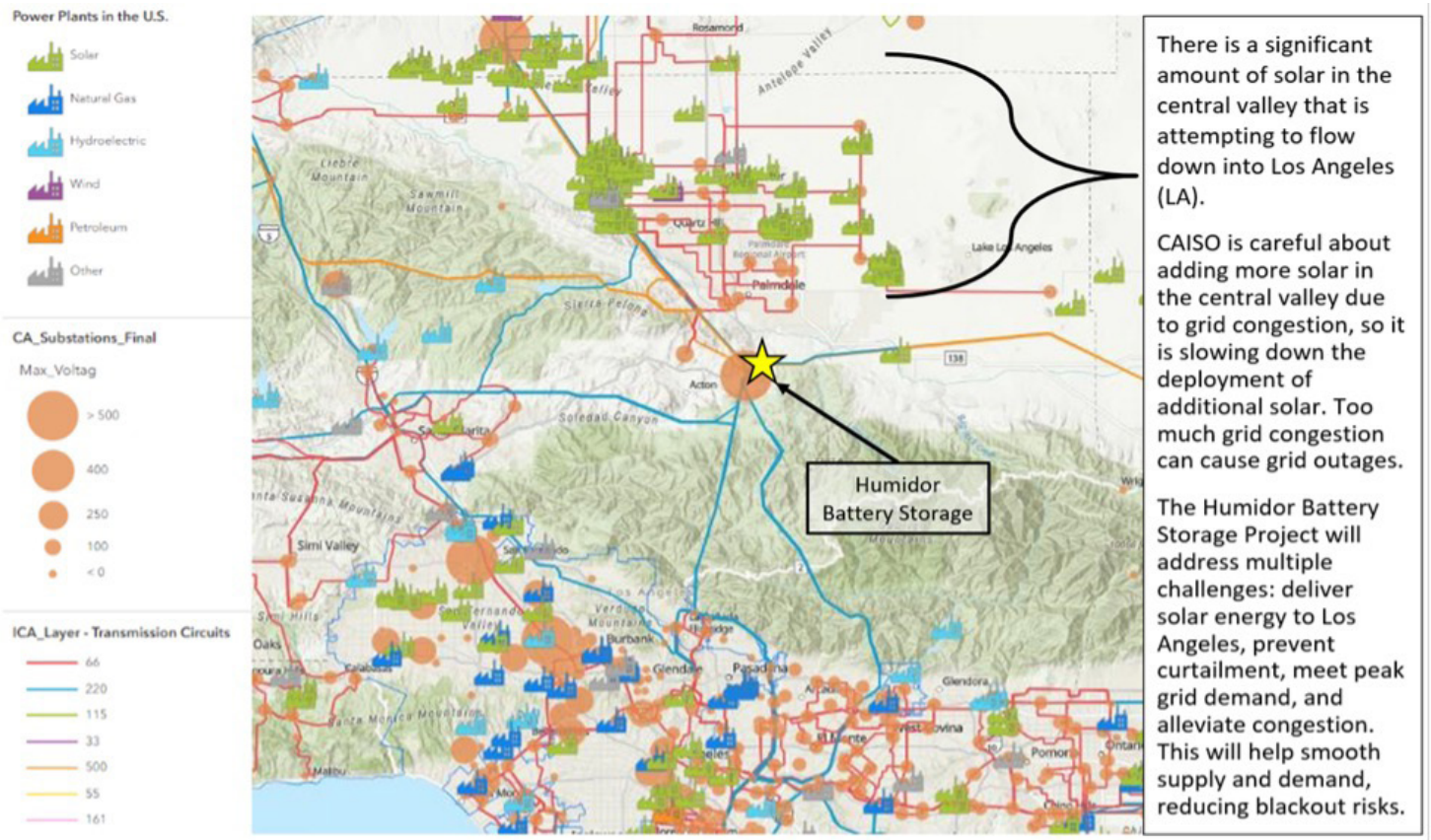
4. Significant economic stimulation to the region.

5. Targeted benefits for the Acton community.

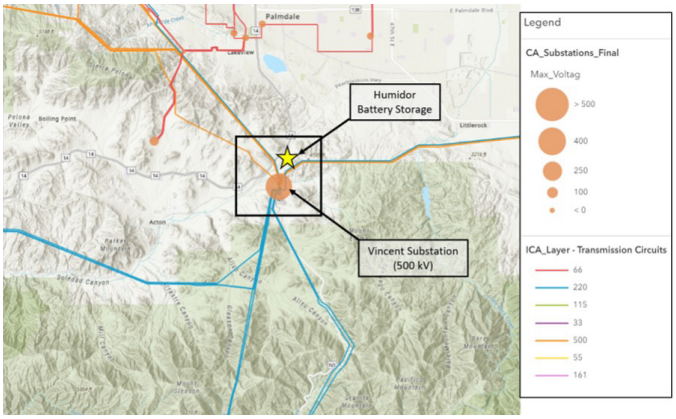
Important location to provide reliability and meet energy demand

■ Reduce grid congestion by storing solar energy and other renewables from the Central Valley that would otherwise be curtailed during times of grid congestion and delivering it to loads in the Los Angeles region, thereby preventing gas-fired generation that otherwise pollutes impacted communities.

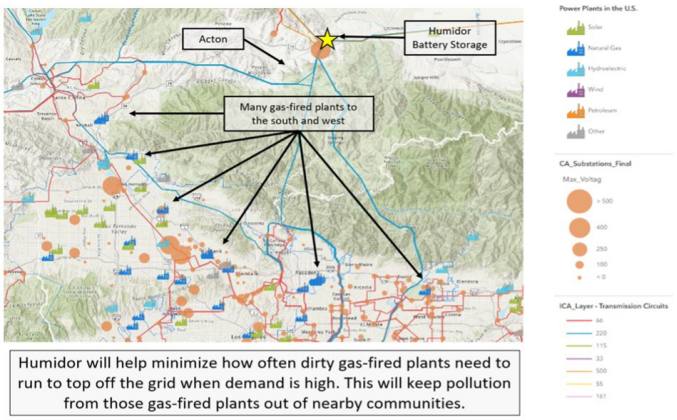
■ Improve reliability system-wide during the hottest hours of the year and decrease the runtime of dirty gas-fired plants.



Humidor is in the perfect location to reduce grid congestion and improve reliability



Humidor is located at a major grid intersection



Humidor will keep pollution from nearby gas-fired plants out of nearby communities

Significant distances from other facilities, including housing

In its approved location, Humidor will:

■ Use already disturbed industrial land recently used for commercial trucking and as an electrical subcontractor yard.

■ Be buffered by roadways, rail lines, and industrial facilities.

■ Be visually screened by local, native vegetation and well-secured by a 8-foot-high perimeter wall and internal security fence.

FAR AWAY FROM RESIDENTIAL NEIGHBORHOODS

ADJACENT TO GRID INFRASTRUCTURE

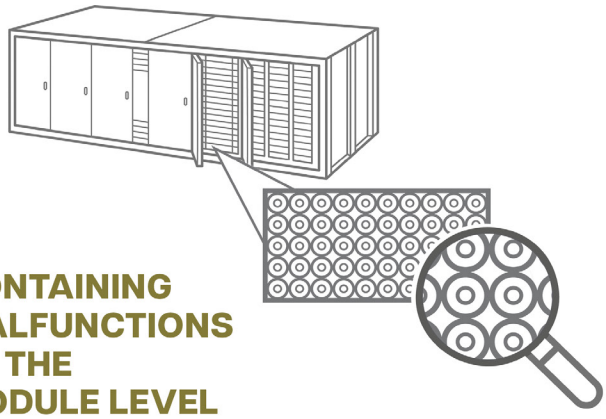
AN INDUSTRIAL AREA BETWEEN A FREEWAY AND RAIL LINE

FAR AWAY FROM RESIDENTIAL NEIGHBORHOODS

Humidor's approved location is on already disturbed industrial land buffered by industrial infrastructure

A rendering of the approved Humidor BESS with attractive natural screening

Same safe BESS technology that is already deployed across the United States



24/7
MONITORING

EXTERNAL FIRE
ALARM CONTROL
PANELS

CONTAINING MALFUNCTIONS AT THE MODULE LEVEL

TECHNOLOGY CAN COMPARTMENTALIZE, DETECT AND SUPPRESS, MITIGATING ANY SPREAD OF CELL FAILURES. BMS CAN DISCONNECT INDIVIDUAL MODULES AS NEEDED TO ISOLATE AN ISSUE.

SMOKE AND GAS
DETECTION
SYSTEMS

VENTILATION +
TEMPERATURE
CONTROL
SYSTEMS

MEET OR EXCEED ALL LOCAL
AND STATE FIRE CODES

SITE-SPECIFIC
ANNUAL TRAINING

BATTERY STORAGE TECHNOLOGY HAS RAPIDLY ADVANCED

A MODERN, TESTED AND PROVEN APPROACH TO FIRE SAFETY

EMERGENCY PLANNING + LOCAL COORDINATION

COLLABORATE WITH LOCAL EMERGENCY RESPONDERS THROUGH TRAINING AND EDUCATION TO DEVELOP A COMPREHENSIVE EMERGENCY RESPONSE PLAN.

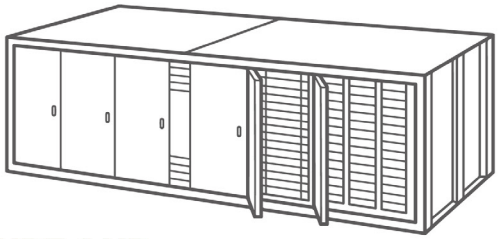
■ Hecate Grid is working with the LA County Fire Department to exceed code requirements at Humidor and develop a site-specific emergency response plan to train on the project equipment.

■ A joint study* by the Electric Power Research Institute, the Pacific Northwest National Laboratory, and TWAICE, determined that problems with system components other than battery cells and modules were responsible for most BESS failures. That the "common storyline… that failures are almost all attributable to battery modules'' is inaccurate.
*https://www.epri.com/research/products/000000003002030360

■ Hazard studies* from similar battery projects concluded that the probability is very low that a battery failure would ever require a Fire Department response. It was also determined that any conceivable fire-related event would be of similar concern as a Class A Fire, which is a fire involving ordinary combustibles such as wood, paper, fabric, and plastic.
*https://drive.google.com/file/d/1iDpar4MLq6ecinXIURFKM-KdSeaP-Zog/view?usp=sharing

■ Other hazard studies* revealed that risks from any potential exhaust from a battery issue would be of little concern beyond 15 feet from the source battery cabinet, in part due to the simple fact that warm exhaust quickly rises and scatters.
*https://drive.google.com/file/d/1i4WxNY0DVxXDd6b2yl1C42w8pEKR8PAE/view?usp=sharing

Same safe BESS technology that is already deployed across the United States

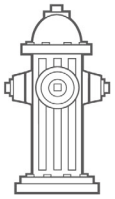


SECURE AND CONTAINTED ENCLOSURES

PROPERLY MAINTAINED AND UTILIZED BATTERY STORAGE SYSTEMS ARE NOT A THREAT TO THE ENVIRONMENT, OR GROUNDWATER.

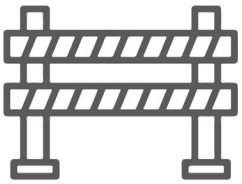
DECOMMISSIONING

WHEN THE PROJECT REACHES THE END OF ITS USEFUL LIFE, IT WILL BE DECOMMISSIONED, AND ALL THE COMPONENTS WILL BE CLEARED AND PROPERLY RECYCLED OR DISPOSED OF WITHOUT COST TO LOCAL.

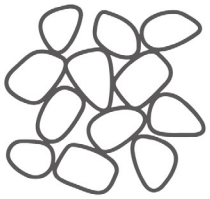


READILY AVAILABLE WATER SUPPRESSION TOOLS

DESIGN AND INSTALL FIRE HYDRANT NETWORK TO BE USED TO CONTAIN AND COOL BATTERY ENCLOSURES TO AVOID AND OR MITIGATE AGAINST ANY ISSUES.

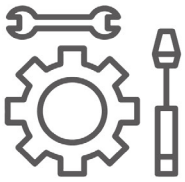


SAFETY ZONE AROUND THE PERIMETER OF THE FACILITY



GRAVEL BREAKS AND MASONRY WALL

SUBSTANTIAL SETBACKS FROM PARCEL BOUNDARIES



REGULAR MAINTENANCE

SEISMICALLY BRACED AND PROTECTED

THE PROJECT WILL NOT USE GROUNDWATER AND WILL SOLELY USE LA COUNTY PUBLIC WORKS WATER

ADDITIONAL PHYSICAL SAFETY DESIGN FEATURES

ENHANCEMENTS TO ADDRESS FIRE RISKS

Respect for environmental & cultural resources

The site will use LA County public water from District 37; water connections already exist.

Humidor has no impact on sensitive biological areas or species.

Humidor has no impact on cultural resources or artifacts.

Significant economic benefits to the local community

Will create approximately 100 union construction jobs.

Will employ 2 to 4 maintenance staff in addition to a 24/7 remote operations team.

Approximately $2,000,000/year in annual tax benefits to LA County.

$100,000 per year for community initiatives.

Humidor aligns perfectly with California's commitment to resilience, sustainability, and prosperity – and I hope you will join the Clean Coalition in allowing this approved project to connect to the Grid by the approval of a franchise agreement.

Thank you for your consideration.

Sincerely,

Craig Lewis Founder & Executive Director Clean Coalition	**Jonathan Port** Founder Permacity Foundation	**Merrian Borgeson** Policy Director, California, Climate & Energy Natural Resources Defense Council (NRDC)	**Jonathan Parfrey** Executive Director Climate Resolve	**Richard Burke** Leader Elders Climate Action SoCal and NorCal

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Re: Grid Reliability/Enable Renewables
Date:	Monday, October 7, 2024 10:22:17 PM

The following correspondence is being forwarded to you for your review/information.

-----Original Message-----
From: Michael Gruberger <michaelgruberger@gmail.com>
Sent: Thursday, October 3, 2024 9:56 AM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject:

CAUTION: External Email. Proceed Responsibly.

Grid Reliability/Enable Renewables

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the Los Angeles area.

California is no stranger to brownouts or even blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you.
Sent from my iPhone

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Support for Storage Project to Enhance Grid Reliability
Date:	Monday, October 7, 2024 9:20:44 PM

The following correspondence is being forwarded to you for your review/information.

From: Mallory Mead <mallory.r.mead@gmail.com>
Sent: Friday, October 4, 2024 5:57 AM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Support for Storage Project to Enhance Grid Reliability

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the Los Angeles area.

California is no stranger to brownouts or even blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

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I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you.

Mallory Mead

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Grid
Date:	Monday, October 7, 2024 8:27:42 PM

The following correspondence is being forwarded to you for your review/information.

-----Original Message-----
From: Matthew Correia <mcc.creativedesigns@gmail.com>
Sent: Monday, October 7, 2024 11:38 AM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Grid

CAUTION: External Email. Proceed Responsibly.

Grid Reliability/Enable Renewables (subject line)

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the Los Angeles area.

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By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you.

Citizen MC Correia
Sent from my iPhone

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Grid Reliability/Enable Renewables
Date:	Monday, October 7, 2024 8:26:19 PM

The following correspondence is being forwarded to you for your review/information.

-----Original Message-----
From: Julie dC Lowe <juliedclowe@gmail.com>
Sent: Monday, October 7, 2024 12:04 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Grid Reliability/Enable Renewables

CAUTION: External Email. Proceed Responsibly.

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the Los Angeles area.

California is no stranger to brownouts or even blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most.

Areas surrounding my home have been affected several times these past few months causing personal friends and their families and pets to be displaced for hours at a time, not to mention their weekly supply of groceries to be negatively impacted. The financial implications to families who are already struggling to put food on the table creates an avalanche of detrimental effects.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Without forethought and planning, we are planning to fail. As elected officials whose constituents have placed their faith in you to do what is right and in the best interest of the people, I implore you to grant this agreement.

Thank you.

Sincerely,

Julie Lowe

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Grid Reliability/Enable Renewables
Date:	Monday, October 7, 2024 8:25:04 PM

The following correspondence is being forwarded to you for your review/information.

From: Eric Velazquez <jinroh170@hotmail.com>
Sent: Monday, October 7, 2024 1:05 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Grid Reliability/Enable Renewables

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the local community.

Here in Palmdale, we are familiar with brownouts and blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you.

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Battery Energy Storage Brings Grid Reliability
Date:	Monday, October 7, 2024 8:24:15 PM

The following correspondence is being forwarded to you for your review/information.

-----Original Message-----
From: Ashleigh G <ashleighmgallant@gmail.com>
Sent: Monday, October 7, 2024 2:21 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Battery Energy Storage Brings Grid Reliability

CAUTION: External Email. Proceed Responsibly.

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the Los Angeles area.

California is no stranger to brownouts or even blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most. I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you,

Ashleigh Gallant

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: IBEW 11 in Support of Hecate Grid "s Humidor Battery Energy Storage System Letter
Date:	Monday, October 7, 2024 8:18:08 PM
Attachments:	Hecate Grid's Humidor Battery Energy Storage System.pdf

The following correspondence is being forwarded to you for your review/information.

From: Compliance <compliance@ibew11.org>
Sent: Monday, October 7, 2024 3:09 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Cc: Tommy Faavae <faavae@ibew11.org>
Subject: IBEW 11 in Support of Hecate Grid 's Humidor Battery Energy Storage System Letter

Good Afternoon Chair Horvath and Board of Supervisors,

Please find attached a letter in support of the Humidor Battery Storage Project, scheduled for discussion during tomorrow's meeting under agenda items #53 and #107. I kindly ask you to take a moment to review it.

Thank you for your time and consideration.

Best Regards,

Roxxann Roman | Compliance Administrator
IBEW/NECA/LMCC | Executive Assistant to Director of Business Development
297 N. Marengo Ave. | Pasadena, CA 91101
Office:(626) 449-8058 | Fax:(626) 449-8125
compliance@la-ibew-neca.com

IBEW Local Union Number 11

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, AFL-CIO

ROBERT CORONA, BUSINESS MANAGER/FINANCIAL SECRETARY

The Honorable Lindsey Horvath
Chair, Los Angeles County Board of Supervisors
500 West Temple Street, Room 383
Los Angeles, CA 90012

September 11, 2024

Dear Chair Horvath and Board Supervisors:

This letter is written on behalf of the International Brotherhood of Electrical Workers Local Union 11 in support of Hecate Grid's Humidor Battery Energy Storage System, located in Los Angeles County in the unincorporated Acton area, and their franchise agreement.

The IBEW Local Union 11 represents more than 12,000 local electricians, communications and systems installers, transportation systems journeyman, civil service electricians, apprentices, construction wireman and construction electricians. We are the dynamic voice of the electrical construction industry in Los Angeles. We work with business, labor, community and environmental organizations as well as clergy and those who are working towards making a better Los Angeles, including Hecate Grid.

Hecate Grid's Project Humidor, and others like it, help enable the use of renewable energy and lessen the strain on the energy grid. Additionally, they have many positive impacts to the community during both construction and throughout future operation.

During construction, the project will create 100 valuable, skilled union construction jobs in the clean energy industry. These are good paying, family-sustaining jobs that anchor Los Angeles' union families and provide economic activity throughout the supply chain.

This project will also bring significant economic benefits to the town of Acton and to the Los Angeles County area through tax revenue.

I urge you to continue to support Hecate Grid's Humidor Battery Energy Storage System and grant them their franchise agreement.

Sincerely,

Robert Corona
Business Manager/Financial Secretary

RC/bcm opeiu#537 afl-cio

From: flyingshamrockranch
To: Barger, Kathryn
Subject: Agenda Item 53~ BESS Humidor Project ~Acton
Date: Monday, October 7, 2024 1:22:34 PM

Hello Supervisor Barger,

I wonder how we homeowners in Acton will ever be able to renew our homeowners insurance policies with the BESS project, which you support, located in my backyard.

I live on Angeles Forest Hwy and will be in direct line when this facility catches fire.

I support solar energy but not BESS facilities in residential areas, near a major freeway, near a Metrolink station and in a high fire danger area. An example of the danger is the recent Escondido BESS fire last month. The technology of these facilities is not yet safe. They need to be placed away from homes, businesses and major transportation corridors.

I hope you change your mind about this project and protect Acton residents and AV commuters.

Sincerely,

Karen O'Reilly
32210 Angeles Forest Hwy
Palmdale, CA 93550

From: garryconner1@roadrunner.com
To: Barger, Kathryn
Subject: Bess Plant in Acton
Date: Monday, October 7, 2024 6:00:43 PM

I am against the BESS project being developed in our community of Acton! Why can't they do this type of fire hazard project farther out by Mojave where the population and land values are far less and if there was a fire it might not be as big of a problem.
Thank you, Garry Conner

From: Ginger Balkcom
To: Barger, Kathryn
Subject: NO BESS in ACTON
Date: Monday, October 7, 2024 2:34:59 PM

Good afternoon Ms. Barger,
As a 21 year resident of Acton, with 2 children and elderly parents living with us,
I URGE you to vote against the Hecate Grid Humidor Storage site.
We are absolutely against this site! You talk to anyone in Acton and they will tell you the same thing. I was shocked to find out that you previously voted FOR this site.
If I am mistaken on that, I apologize.

BUT WE THE PEOPLE OF ACTON ARE ABSOLUTELY AGAINST THIS SITE AND WE NEED YOU TO SUPPORT US IN VOTING NO.

I have always voted for you Ms. Barger. We need you to support your constituents and not go against the majority of Acton. Please do not vote FOR this site.

Thank you for your time.
Ginger Balkcom
805-404-1701
1734 Mary Road
Acton, CA 93510

From: Grace Chapman McCarty
To: Barger, Kathryn
Subject: BESS in Acton
Date: Monday, October 7, 2024 4:09:03 PM

CAUTION: External Email. Proceed Responsibly.

Dear supervisor Barger,

I'm writing to ask that you vote against the placement of the BESS battery facility in our local community of Acton. This is very dangerous in any neighborhood but in a high fire risk area such as ours it's wildly unsafe to all of us. This facility will be supplying energy to the city of Los Angeles but nothing for us. We take all the risk of an out of control fire that can't be easily put out, sends toxic out gassing into the surrounding area and poisons the groundwater. Almost all of us use well water. This BESS facility will lower our home values and raise our insurance which is already sky high.

Acton and Agua Dulce do not want BESS placed anywhere near us. The increase in these facilities is making more and more news for dangerous, runaway fires. I ask you as your constituent to please stop this BESS facility from being built in our area. No neighborhood should have to be used as a testing ground for what's clearly a new and unsafe technology

Sincerely ,

Grace McCarty
Agua Dulce, Ca. 91390

Sent from my iPhone

From: h2oskur
To: Barger, Kathryn
Cc: actontakesaction@att.net
Subject: Humidor Hecate Bess in Acton
Date: Monday, October 7, 2024 5:22:15 PM

Dear Surpevisor Barger.

I am writing you to express my STRONG opposition to this BESS project and all proposed BESS projects to be located in Acton. WHEN one of these units catch fire, they are almost impossible to extinguish and will spread to adjacent units. The amount of water used will destroy the aqufuir rendering our homes uninhabitable like the homes in Hinkley, CA. We will all have to evacuate due to t he toxic smoke from the fire. Our fire insurance, which is already hard to obtain and exorbitantly priced, will be even harder to get and more expensive. It's also too close to all of our evacuation routes. The location of these projects are in the middle of our only escape routes....the 14 freeway, Angeles Forest rd. and the metrology line. On top of all these very valid reasons, Acton gets zero benefit from placing BESS projects in our community. Coming from a LOS ANGELES CITY firefighter with 25 years experience, please consider all my concerns.

Thank you,
Doug Bayer
Acton resident of 31 years

Sent from my Galaxy

From: haileysartwork@aol.com
To: Barger, Kathryn
Subject: NO HUMIDOR BESS Project
Date: Wednesday, September 18, 2024 11:46:19 AM

I OPPOSE this HUMIDOR BESS project and therefore DO NOT SUPPORT the adoption of the Franchise Agreement! This project is extremely dangerous. And, I do **NOT** want it built in our town of Acton, PERIOD.

Thank you,
Mrs. Deborah Guild
Acton, CA

From: Ingrid R.
To: Barger, Kathryn
Subject: No in Acton BESS Project please!!!
Date: Monday, October 7, 2024 6:45:52 PM

CAUTION: External Email. Proceed Responsibly.

Dear supervisor,

Please vote no on the BESS project. We beg that you don't put our sleepy community in danger. Many neighbors have retired here and are already having a hard time with getting home insurance and this new project will make things worse for us!

We need you to say no and keep BESS from compromising the safety of our beloved community!

Thank you!

Ingrid & Robert Rueda
Sent from my iPhone

From: j2ikathy@gmail.com
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 2:52:46 PM

CAUTION: External Email. Proceed Responsibly.

AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Good afternoon,
I am writing to express my opposition to this project AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise.
My concerns are for the health and safety of the Acton community residents as well as the animals who reside here.

My husband and I own and operate an Animal Sanctuary less than 2 miles away from this proposed site.
The risk to the health and safety of us, our animals and our neighbors is unacceptable.

Sincerely,

Kathy

~.~

Be the difference you want to see.

smalllogo

Journey to Independence, LLC
1575 Sierra Highway, Acton, CA 93510
office: 661-269-0665
fax: 661-269-1389

Kathy Lange, MS PhDc
Director Journey to Independence, LLC
661-269-0665

From: Jacqueline Ayer
To: Amy J. Bodek
Cc: Barger, Kathryn; Saraiya, Anish; Kathy Park
Subject: Re: The Humidor BESS capacity is actually 545 MW
Date: Tuesday, October 8, 2024 11:06:19 AM

Dear Director Bodek;
Thank you very much for your prompt reply; it is greatly appreciated.
The problem is, the approval issued by Regional Planning does not limit the capacity of the project to 400 MW; it merely states an understanding pertaining to the capacity of the Humidor Project. If Regional Planning had intended to limit the capacity of the project, then the approval would include a definitive statement to this effect such as "the maximum electrical storage capacity of this facility shall not exceed 400 MW"; however, the approval includes no such statement and it imposes no such restrictions. Additionally, the notes to which you refer regarding nameplate capacity are not conditions imposed by Regional Planning; rather they are merely applicant statements. Any attorney of reasonable competency will successfully argue that, despite the apparently incongruous applicant statement on the site plan regarding nameplate capacity, the County nonetheless approved ***all*** the equipment and facilities depicted on the site plan and did not impose any limitations on these equipment and facilities; therefore, Hecate has a vested right to construct ***all*** the equipment depicted on the approved site plan. It appears that Hecate's attorneys are reasonably competent and will therefore successfully oppose any attempt by Regional Planning to prevent them from constructing ***all*** the equipment and facilities that were approved on the site plan even if their combined capacity exceeds 400 MW.
It may be that the reason Hecate withdrew the Fleaflicker project from the CAISO queue is because they may no longer require it. This is because CAISO approved system impact studies for Humidor at 300 MW and the adjacent Fleaflicker at 200 MW for a combined capacity of 500 MW (all of which was going to be delivered by one transmission line); if instead Hecate just constructs the Humidor Project with a 545 MW capacity, the Flea Flicker project is arguably redundant and Hecate need not incur the cost or aggravation associated with its entitlement. That is certainly how it looks to people "on the outside".
Thank you again for seriously considering the concerns I raised; it is greatly appreciated. I completely understand if you are unable to substantively respond to this email; I send it only because I think it is important to share perspectives with you regarding "community critical" projects.

Sincerely;
Jacqueline Ayer, Director
Save Our Rural Town

On Mon, Oct 7, 2024 at 6:17 PM Amy Bodek <ABodek@planning.lacounty.gov> wrote:

> Ms. Ayer –
>
> Thank you for your email. To confirm, Regional Planning approved a project for 400 MW only. We did not and do not approve a project that would be for more than 400 MW.
>
> I have attached a screenshot of the approval notes that were required to be on the site plan as Note

1.

We will ensure that any building or fire permits submitted to the County for review are for the maximum capacity of 400 MW (not 400 batteries).

Thank you for bringing this to our attention.

AMY J. BODEK, AICP (she/her/hers)

DIRECTOR

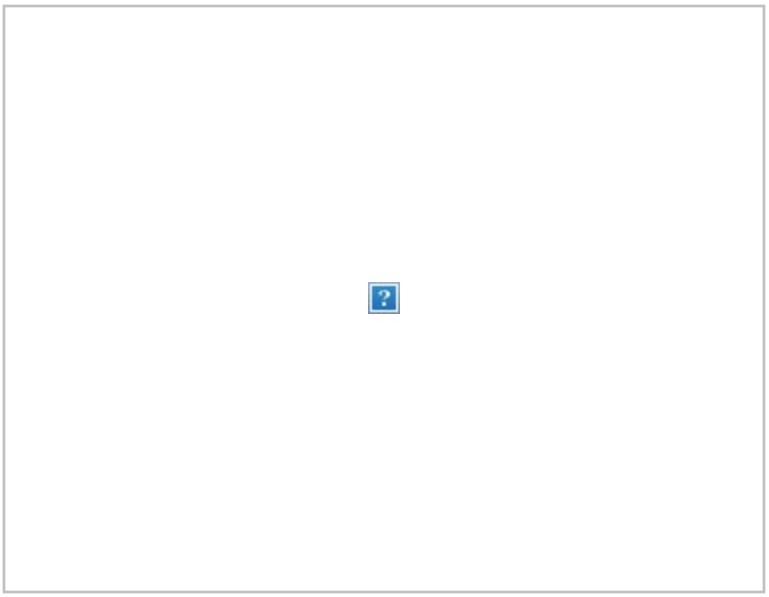
From: Jacqueline Ayer <sortacton@gmail.com>
Sent: Monday, October 7, 2024 3:33 PM
To: Amy Bodek <ABodek@planning.lacounty.gov>
Cc: Barger, Kathryn <Kathryn@bos.lacounty.gov>; Saraiya, Anish <ASaraiya@bos.lacounty.gov>
Subject: The Humidor BESS capacity is actually 545 MW

Dear Director Bodek;

When the Humidor BESS site plan was approved on August 1, 2024, Regional Planning represented to the public that the capacity of the facility was 400 MW (see highlighted portion in Figure 1 below). However, the equipment and facilities that Regional Planning *actually* approved on the site plan is a **545 MW** BESS consisting of 440 battery containers in which each container has a generation capacity of 1.236 MW (see highlighted portion in Figure 2 below, and note that 440 containers x 1.236 MW per container = 544.84 MW total). It is not known if Regional Planning was aware that the actual capacity of the equipment that was approved by the site plan was 545 MW rather than the 400 MW represented to the public.

Figure 1:

Figure 2:



Hecate has a proven track record of misrepresenting the facts of the Humidor project to County agencies and to the Department of Regional Planning in particular. For instance, Regional Planning approved the original site plan in 2022 based on Hecate's assurance that the project was located entirely on industrially zoned property; the residents of Acton had to go to great lengths to prove to Regional Planning staff that the project was not limited to just industrially zoned property and that it extended into agriculturally zoned land as well. It was only after this significant community effort that Regional Planning rescinded the 2022 approval and informed the Community of Acton that the Humidor BESS would undergo the Conditional Use Permit process; unfortunately, this did not occur.

The new realization that the actual capacity of the approved Humidor BESS project is more

than half a gigawatt is the latest in a string of misrepresentations and mischaracterizations that have been uncovered regarding the Humidor Project. More importantly, this proves beyond any doubt that the Humidor Project is nothing like a distribution substation because the capacity of a distribution substation is typically less than 100 MW (although in some rare instances, they can approach 200 MW). This is because utility planning standards do not accommodate distribution substations with capacities exceeding 500 MW (or even 400 MW) because the risk to load is too great (given that a mishap would result in the loss of electrical service to an unacceptably high number of customers). These material facts conclusively demonstrate that Regional Planning erred in applying "Interpretation 2021-03" to approve the Humidor BESS as a "distribution substation", and I present them to you based on my nearly 20 years of experience in participating in electrical proceedings before the CPUC and the FERC which involved extensive electrical system analyses and expert witness testimony.

Based on these facts, I request that Regional Planning rescind the Humidor BESS approval that was issued on August 1, 2024.

Respectfully submitted;

Jacqueline Ayer, Director

Save Our Rural Town

From: Jacqueline Ayer
To: Amy J. Bodek
Cc: Barger, Kathryn; Saraiya, Anish
Subject: The Humidor BESS capacity is actually 545 MW
Date: Monday, October 7, 2024 3:33:51 PM

Dear Director Bodek;

When the Humidor BESS site plan was approved on August 1, 2024, Regional Planning represented to the public that the capacity of the facility was 400 MW (see highlighted portion in Figure 1 below). However, the equipment and facilities that Regional Planning *actually* approved on the site plan is a **545 MW** BESS consisting of 440 battery containers in which each container has a generation capacity of 1.236 MW (see highlighted portion in Figure 2 below, and note that 440 containers x 1.236 MW per container = 544.84 MW total). It is not known if Regional Planning was aware that the actual capacity of the equipment that was approved by the site plan was 545 MW rather than the 400 MW represented to the public.

Figure 1:

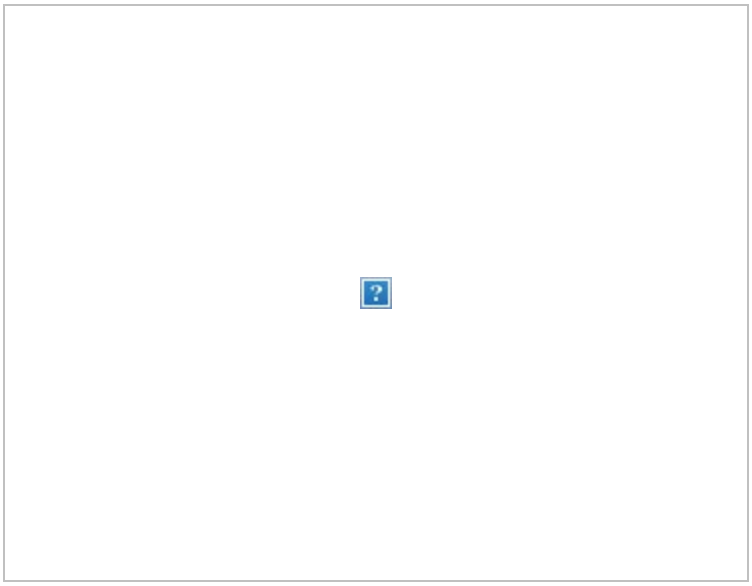
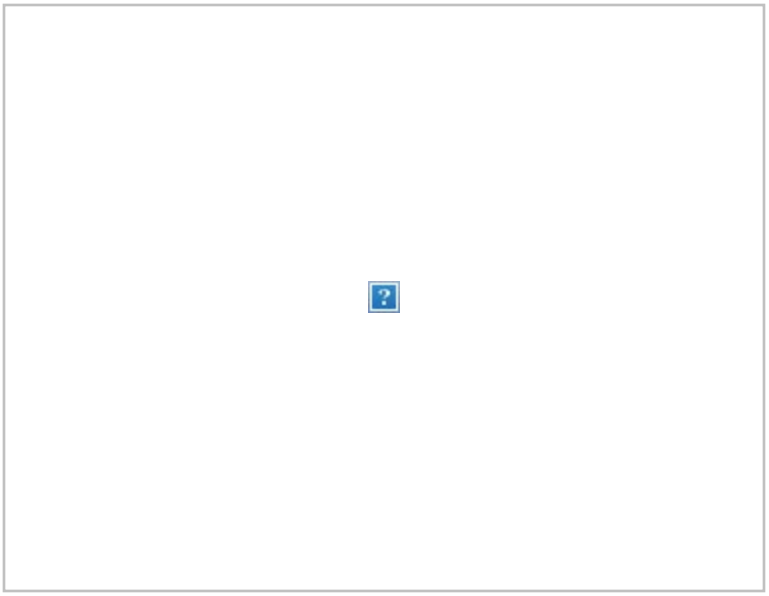


Figure 2:



Hecate has a proven track record of misrepresenting the facts of the Humidor project to County agencies and to the Department of Regional Planning in particular. For instance, Regional Planning approved the original site plan in 2022 based on Hecate's assurance that the project was located entirely on industrially zoned property; the residents of Acton had to go to great lengths to prove to Regional Planning staff that the project was not limited to just industrially zoned property and that it extended into agriculturally zoned land as well. It was only after this significant community effort that Regional Planning rescinded the 2022 approval and informed the Community of Acton that the Humidor BESS would undergo the Conditional Use Permit process; unfortunately, this did not occur.

The new realization that the actual capacity of the approved Humidor BESS project is more than half a gigawatt is the latest in a string of misrepresentations and mischaracterizations that have been uncovered regarding the Humidor Project. More importantly, this proves beyond any doubt that the Humidor Project is nothing like a distribution substation because the capacity of a distribution substation is typically less than 100 MW (although in some rare instances, they can approach 200 MW). This is because utility planning standards do not accommodate distribution substations with capacities exceeding 500 MW (or even 400 MW) because the risk to load is too great (given that a mishap would result in the loss of electrical service to an unacceptably high number of customers). These material facts conclusively demonstrate that Regional Planning erred in applying "Interpretation 2021-03" to approve the Humidor BESS as a "distribution substation", and I present them to you based on my nearly 20 years of experience in participating in electrical proceedings before the CPUC and the FERC which involved extensive electrical system analyses and expert witness testimony.

Based on these facts, I request that Regional Planning rescind the Humidor BESS approval that was issued on August 1, 2024.

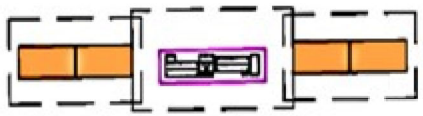
Respectfully submitted;

Jacqueline Ayer, Director

Save Our Rural Town

LEGEND

PROJECT AREA THIS PAGE: 523,493 SQFT, 12.018 ACRES



4-LITHIUM IRON PHOSHPATE (LFP) BATTERY CONTAINERS
(1236kW/ 5365kWh PER BATTERY)
WITH 2 INVERTERS AND 34.5KV GSU

QTY THIS PAGE: 110 (TOTAL BATTERY CONTAINERS: 440)

- PROPOSED SITE FENCE
- PROPOSED ROAD EDGES
- (OH) PROPOSED OVERHEAD ELECTRICAL
- (UG) PROPOSED UNDERGROUND ELECTRICAL
- ROAD CENTERLINE
- RETAINING WALL
- 8' MASONRY WALL
- PROPERTY LINES AND ZONING DEMARCATION

From: Janine Regoli
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 3:22:44 PM

CAUTION: External Email. Proceed Responsibly.

I would like to let it be known that I am opposed to the Bess project being developed in Acton.
First and foremost is the Safety of our families and livestock.
I could go on but the Safety risk alone should be enough to not approve this.
I really appreciate your time.
Janine Regoli

Sent from my iPhone

From: Jennifer
To: Barger, Kathryn
Subject: BESS Acton
Date: Monday, October 7, 2024 3:50:07 PM

There is nothing good about this project being built in Acton right near homes and the 14 freeway. You keep fighting to keep sex offenders from being sent to AV, so fight for us. We are in a fire zone and we do not need this project here. It can be built somewhere else that's not near homes or a freeway that is heavily used.

Thank you,

Newly retired Westside Union School District teacher and Mother of Chadd & Branden Owen (sons of Sgt. Steve Owen),

Jennifer Taylor

From: Jennifer Wallace
To: Barger, Kathryn
Subject: Concerned Acton resident
Date: Monday, October 7, 2024 5:06:39 PM

Dear Kathryn Barger,

I am really worried about the proposed battery site that is to be built in Acton. There are a slew of potential hazards and risks if it happens-- fires, potential environmental and air quality problems that could lead to serious issues for residents. Just the fire risk alone is very concerning. We are considered a very high risk area and can have rather wicked Santa Ana winds, especially in the fall and winter. Most all residents have already lost their fire insurance plans and had to go to the CA fair plan. Obviously, if we can't be insured it is because of the extreme risk. We cannot put a potential flammable hazard here. Acton also runs along the San Andreas fault. What would happen if we had a large earthquake?

I am raising my three young children here. Please don't let them do this.

Can something like this be built in the middle if the desert, away from people and properties? It is not worth the risk.

I grew up in West Hills, CA. It was near the old Rocketdyne site at the Santa Susana Field Labratory. While I realize these are two very different things. I personally know people that have gotten cancer from growing up there. In fact, one of my elementary and junior high school friend's lost his 5 year old daughter to cancer from the long term exposure to the harmful chemicals there.

I hope you can appreciate and understand why I do not want a potential toxic and dangerous hazard going near me or my family (not to mention any other family).

Thank you!

Jennifer Wallace

From: Jill Agui
To: Barger, Kathryn
Subject: Bess
Date: Saturday, October 12, 2024 8:10:25 PM

I have been a resident of Acton, California for over twenty years . I am opposed to having a storage of lithium batteries In our community. They explode and don't belong here!! I have been seeing the media about several explosions with these batteries. They do not belong here in Acton. Kathryn Barger! You wouldn't want them in your community either!!

Roberto Aguilar

From:	Jillian Liberman
To:	Barger, Kathryn
Subject:	AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date:	Monday, October 7, 2024 6:51:06 PM

Dear Ms. Barger,

Please stand with the Acton residents in opposition of the Hecate Grid Humidor Storage Facility and ALL battery storage facilities in high fire risk areas. The Hecate BESS facility is a massive threat to the safety of not just our small rural community in Acton, but to the Palmdale, Santa Clarita, and La Crescenta regions as well.

The fire risk these storage facilities pose is not just theoretical, it is happening with more frequency as we see fires such as the one that shut down the freeway in the greater LA area earlier last week. We do not have the luxuries of swift emergency response as cities do and our region is highly flammable with limited escape routes to main roads.
Many of the BESS facilities proposed in our area are on routes with only one main access road, which threatens the safety of both our residents and first responders. Is Acton- Agua Dulce going to be the next Paradise/ Camp fire disaster? Because that is what is at stake.

The Hecate storage site also poses an environmental safety hazard in numerous ways. The aquifer in which most Acton residents get their water from, whether that is trucked in or directly from wells, is extremely close to the proposed site in East Acton. Water is a human right in the state of California, and this facility threatens access to a reliable and safe water source in a regularly drought stricken area. If a major earthquake along the San Andreas fault that is mere miles from the proposed site damages the storage facility, that site becomes a superfund after it catches fire. The groundwater will be contaminated and we will have a major environmental disaster zone along an extremely important corridor in the high desert that connects the whole of the high desert to Los Angeles and San Bernardino County via Angeles Crest Highway, Sierra Highway, Pearblossom Highway and the 14 freeway. If just one of these access routes are cut off due to disaster or construction of this site, the livelihoods of the residents- your constituents, will deeply affect them economically and environmentally. Please oppose this site and all sites in the area.

Thank you,
Jillian Liberman

From: Jim Klosterman
To: Barger, Kathryn
Subject: Batteries
Date: Tuesday, October 8, 2024 9:58:37 AM

CAUTION: External Email. Proceed Responsibly.

To Kathryn Barger,
Re agenda item #53
Hecate grid humidifier storage 1 LLC proprietary
Electrical transmission franchise
There are a lot of safety issues regarding batteries. They are causing so many fires and Acton is in a high fire danger area. Please Halt the development of the battery plant in Acton.
Mary Klosterman
James Klosterman
Sent from my iPhone

From:	Joan Millar
To:	Barger, Kathryn
Subject:	Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date:	Monday, October 7, 2024 11:22:15 PM

To the honorable Supervisor Badger,

We are strongly opposed to the Humidor BESS project being developed in Acton. It is not safe to store lithium ion batteris in a residential community. These batteries are volatile and are fires ignited by them are regularly reported in the news. A fire at this facility would be catastrophic, highly probable of causing a runaway event igniting adjacent batteries which cannot be extinguished by water. It would burn for days if not weeks emitting toxic fumes in our community and potentially polluting the ground water, our drinking water. There are additional safety concerns including fire spreading in the community, closure of the 14 freeway and metro link and so much more.

While it may be convenient to have a BESS facility in such close proximity to the Vincent Substation. It is undoubtedly a cost saving measure, but at what cost? The cost of human health and lives? We respectfully ask you and the other supervisors to put people first. Put the health and well being of your constituents above dollars. This facility can be located elsewhere far from residential communities and transmission lines (albeit with a hefty price tag) to connect to the Vincent or another substation. Somehow we can always find money for what we value. I respectfully ask you to oppose the Humidor BESS project being developed in Acton and value people over dollars.

Sincerely,

Mike and Joan Millar
Acton residents for 31 years

From: Joanne Ulbrich
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 1:40:01 PM

Dear Supervisor Barger,

I am very concerned about the fact that a vote is coming up for a battery Storage location to be placed in my neighborhood in Acton, CA. We moved to this small rural community to get away from the harmful affects of living in the city. To live in an area that is safe from crime, environmental factors, etc. the safety issues that go along with this project. We made sacrifices to be here and live a rural life. We live in a very high fire district, pay extremely high insurance premiums, and are meticulous at clearing brush because of the fire danger. Seems like placing the humidor in our small town heightens this danger. Many people are already having a hard time finding a company to cover their insurance many carriers are already canceling policies.

I am sure you are aware of the extra effort and resources the County will endure to mitigate fires that do occur. Even an electrical vehicle fire takes a lot. Imagine a whole facility full of these dangerous batteries. It is terrifying. I encourage you to support the residents of Acton and vote NO!!!!!

Thank you for your time.
Sincerely,

Joanne Ulbrich

From: John Farrar
To: Barger, Kathryn
Subject: Humidor BESS proposal
Date: Monday, October 7, 2024 3:21:25 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

Firstly, permit me to compliment you for all you've done and continue to do for our District's homeowners, business and residents. Thank YOU very much! I would also like to recognize and thank Chuck Bostwick for all he has been able to accomplish in our community. It seems he is always available for a phone call or email to assist. He is a great asset to us all!

Kathryn, regarding this Humidor BESS project/proposal, I am pleading with you to vote against it in the upcoming Board meeting. It is terribly unsafe in our community for a large variety of reasons, including, but not limited to, its projected location in a high fire risk area in the Vincent Hill area. Further, as I am certain you are aware, the extreme fire danger created by this installation must be recognized. These batteries are an extreme threat and fires that emanate from them are nearly impossible to extinguish. What a horrific threat to Acton and surrounding communities! Additionally, the heavy winds that often blow through this highway 14 Corridor, make this threat even more deadly.

Let's not forget the San Andreas Fault passes nearby as well and carries with it the huge prospect of "The Big One"... the monstrous earthquake that could occur at any time.

Further, Highway 14 is a critically important exit route for us as well as the massive population of Los Angeles County in the event of any major disaster. It absolutely must remain open for passage for the safety of our locals as well the broader general population in the region. If this proposed BESS installation explodes, Highway 14 will very likely be severely impacted. There is no alternative route through the area.

Please Katheryn, vote against this horrific BESS proposal! Yes, there is a need for it, but absolutely not in this location with all its inherent issues of fire, earthquake, proximity to thriving communities, critically important highways, etc. This facility should be built out in an open area far away from fire risk zones, critically important access thoroughfares, etc. Locations that come to mind include areas of open desert of which there are many not very far away.

Katheryn, we support and love you and are so appreciative of all you've done as you care deeply about all of us. I'm certain there are thousands of us and even more who are pleading with you to bring this Humidor project to a halt in or anywhere near our homes and businesses. BESS must be stopped!

My sincerest thank you and my vote of appreciation for all you've done to help keep our communities safe and a great place to live and raise our families. Thank YOU!

Best regards!

John

John Farrar
32935 Poppy Lane
Acton, CA 93510
(661) 212-2559
jefarrar2@gmail.com

From: John HAYWARD
To: Barger, Kathryn
Subject: Bess
Date: Monday, October 7, 2024 8:58:48 PM

CAUTION: External Email. Proceed Responsibly.

Please don’t do this to our community.

Sent from my iPhone

From: John Sisco
To: Barger, Kathryn
Subject: Bess Project
Date: Tuesday, October 8, 2024 7:07:14 PM

CAUTION: External Email. Proceed Responsibly.

Please no battery project in Acton. Residential neighborhood. Fire area!!!
John Sisco
Acton Resident

From: Jorge Meneses
To: Barger, Kathryn
Subject: About Hummidor BESS agenda item #53
Date: Monday, October 7, 2024 2:40:25 PM

Supervisor Barger,

I wanted to take a few minutes to write to you. I understand that the board of supervisors will be discussing intent to adopt the franchise agreement for this project. I own property in the vecinity of the proposed location and I am very concerned about the SAFETY RISKS that this project will bring to the community. This is a HIGH FIRE RISK AREA. I ask that you please take into consideration that the benefits from building this project do not outweight the potential disastrous outcome if something was to go wrong at this facility. I and many of our neighbors OPPOSE this project and we ask that you please STOP them from going forward with this.

From: joseph whiteley
To: Barger, Kathryn
Subject: BESS in Acton
Date: Monday, October 7, 2024 12:22:32 PM

Dear Kathryn,
The proposed site for the BESS Humidor Project is Acton is NOT the right decision. Battery projects are good as long as they are in the PROPER AREA. And this is not. It is located in a Class 4 Fire Zone and only 200 feet from the hillside off Angeles Forrest Highway.
If a fire was to break out and it will eventually, you will be taking out valuable property and homes in the area.
It will also shut down the 14 freeway, Angeles Forrest Highway, Metrolink train, Pearblossom Highway.
I urge you to reconsider this and take proper Action. You are supposed to represent your local community not downtown L.A.
Don't let the greed for county money impair the right thing to do.
I don't want you to look back a few years from now and say to yourself " I made the wrong Decision"

Concerned Resident
Joe Whiteley
1230 Soledad Pass Rd
Acton, CA.

OH by the way I just received a letter a few days ago they cancelled my home owners Insurance tor the second time.

From: K C
To: Barger, Kathryn
Subject: Fwd: STOP THE HUMIDOR BESS!!!
Date: Monday, October 7, 2024 4:16:34 PM

I forgot to mention this in my email. This is regarding:

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Begin forwarded message:

> **From:** K C <just4kcoughlin@gmail.com>
> **Date:** October 7, 2024 at 2:21:21 PM PDT
> **To:** Kathryn Barger <kathryn@bos.lacounty.gov>
> **Subject: STOP THE HUMIDOR BESS!!!**
>
> Dear Supervisor Barger,
>
> I ask that you please hear what your Acton constituents are trying to say to you! Please STOP the Hecate Humidor BESS project proposed for Acton!!! And that also goes for any other projects coming down the pipeline.
>
> I am very much opposed to this project. Acton is already a very high fire risk area. This would be a HUGE SAFETY RISK for our area. It terrifies me that we will become the next Paradise with our whole town burning down! I'm sure you have seen plenty of media coverage on lithium battery fires and the devastation they can create. This BESS facility should not be located in our Acton area, PERIOD! It is NOT SAFE! PLEASE, PLEASE STOP THIS FROM HAPPENING!!!
>
> Our town is in your hands - please don't let us down!!
>
> Thank you for your time!
>
> Kathy Coughlin
> (Acton Resident)
>
> Sent from my iPhone

From: K C
To: Barger, Kathryn
Subject: STOP THE HUMIDOR BESS!!!
Date: Monday, October 7, 2024 2:21:31 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

I ask that you please hear what your Acton constituents are trying to say to you! Please STOP the Hecate Humidor BESS project proposed for Acton!!! And that also goes for any other projects coming down the pipeline.

I am very much opposed to this project. Acton is already a very high fire risk area. This would be a HUGE SAFETY RISK for our area. It terrifies me that we will become the next Paradise with our whole town burning down! I'm sure you have seen plenty of media coverage on lithium battery fires and the devastation they can create. This BESS facility should not be located in our Acton area, PERIOD! It is NOT SAFE! PLEASE, PLEASE STOP THIS FROM HAPPENING!!!

Our town is in your hands - please don't let us down!!

Thank you for your time!

Kathy Coughlin
(Acton Resident)

Sent from my iPhone

From: Kaisa Akerlund
To: Barger, Kathryn
Subject: Agenda item #53 - opposing the Hecate Grid Humidor Storage
Date: Monday, October 7, 2024 11:56:23 PM

Reference:
AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms. Barger,

I am a constituant. My mother is too, 90 years old. This is really important to me and my neighbors. It truly is a matter of life and death.

I don't think anyone would vote for particular this location, so why can't this be built somewhere out in the desert, far away from homes and farms?

Please fight for the residents of Acton and Agua Dulce who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that have shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town.

Did you know....

.....this is a high fire area, we are having so much trouble getting fire insurance, I can only imagine how the high-fire risk of this place will affect our chances of getting any fire insurance at all in the future.
.....the aqueduct passes through here?
.....we are known for our fierce Santa Ana winds here?
.....the San Andreas fault is very near here?
.....the only freeway and route from Santa Clarita to Mohave passes though here?
.....there are houses very nearby that have wells for their drinking water and livestock? You already know how lithium fires effect ground water!!
.....there is another Edison transfer station in Mohave where this dangerous battery storage could be placed?
.....the Metrolink train station is very close by, many people rely on this transportation to and from work every day.

Please oppose and fight this for our little, rural town, we really need your help and support.

Thank you,
Kaisa Akerlund

From: Kari Owens
To: Barger, Kathryn
Subject: Strongly opposed to Humidor Bess Project
Date: Tuesday, September 17, 2024 5:49:57 PM

CAUTION: External Email. Proceed Responsibly.

I am writing to give my strong opposition to the Acton Humidor Bess proposal.

I grew up in, and currently reside in the community. With our high winds and high heat indexes, this community is not a good fit for this type of project.

My information is included to prove my residency. Please do not share my information with others.

Karina Owens
3727 Smith Ave
Sent from my iPad

From: Kathleen Hanson
To: Barger, Kathryn
Subject: Bass project
Date: Tuesday, October 8, 2024 6:56:41 AM

CAUTION: External Email. Proceed Responsibly.

I am opposed to this project being in our community. We are near the San sandra's fault line and in a high. fire danger area.
Kathleen Hanson
Sent from my iPhone

From: Kathleen Trinity
To: Barger, Kathryn
Subject: Lithium Battery Storage Facility in Acton
Date: Monday, October 7, 2024 7:51:21 PM

Dear Supervisor Barger,

I oppose the proposed lithium battery storage facility in Acton. The Acton community endured the horrible Station Fire several years ago. As you know we have dry chaparral much of the year and a steady flow of winds off and on all year long. A lithium facility in our community is another wildfire waiting to happen, regardless of brush clearance and other precautions. There have been numerous lithium explosions throughout the country.

Why is it that Acton is always chosen for utility infrastructure? We are an equestrian and semirural community, not an industrial park. We live here, adjacent to the San Gabriel National Monument, so that we can appreciate and protect our natural surroundings. A lithium facility does not belong here, but in some kind of industrial park or other utility center.

Thank you.

Kathleen Trinity
Acton Resident since 2004

From: Kathy Fairbrother
To: Barger, Kathryn
Subject: AGENDA ITEM #53 -- Hecate Grid Humidor Storage -- Opposition
Date: Monday, October 7, 2024 3:41:01 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms. Barger

Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that have shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town.

Did you know....

.....this is a high fire area, we are having so much trouble getting fire insurance, I can only imagine how the high-fire risk of this place will affect our chances of getting any fire insurance at all in the future.

.....the aqueduct passes through here?

.....we are know for our fierce Santa Ana winds here?

.....the San Andreas fault is very near here?

.....the only freeway and route from Santa Clarita to Mohave passes though here?

.....there are houses very nearby that have wells for their drinking water and livestock? You already know how lithium fires effect ground water!!

.....there is another Edison transfer station in Mohave where this dangerous battery storage could be placed?

.....the Metrolink train station is very close by, many people rely on this transportation to and from work every day.

.....as the crow flies, this facility will be only 2 miles from my house !! Horrifying !!

.....Newsom and his thrill ride to be the first in everything needs to put this in his own back yard, not ours.

Please oppose and fight this for our little, rural town, we need you help and support.

Thank you,

Kathy and Matt Fairbrother
Acton, CA

From: KATIE HALE
To: Barger, Kathryn
Subject: Agenda Item #53-Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 3:31:16 PM

CAUTION: External Email. Proceed Responsibly.

Ms Barger-
As residents of Acton, Ca, we are asking that you do not approve the lithium ion batteries and BESS projects planned by multiple developers in our area.

There have been many communications about this topic to you, your staff and your Board in the forms of meetings, letters, calls, emails, and petitions. The media coverage from around the world about serious damage, destruction, injury and death have been reported about the dangers caused by lithium ion batteries. The damage related to fires, groundwater contamination and hazards to the air we breathe are all concerns.

These batteries in their current form are used in many instruments, and the dangers related to their potential fires are the last thing an area such as Acton needs. The quantity of these batteries planned for the Acton area BESS facilities are unthinkable!! This is an area with extreme fire risk already. Potential fire suppression would be limited due to the lack of ability to extinguish these fires, our shortage of emergency responders, limited evacuation routes for residents and animals, and the
BESS developers surprising lack of admission to the potential dangers!!

It is perplexing that the BESS facilities were ever considered for Acton. Their presence violates the Acton general plan and the CEQA guidelines.

Perhaps after more research is done about safer alternatives to lithium ion batteries as a way to provide clean energy, a more suitable location could be determined…closer to the portion of Los Angeles for which you are endeavoring to provide energy.

Pls seriously consider the safety of your Acton residents, and any other areas in your district that are considering this technology.

We wish you the best in the challenges of your position/
David and Kathleen Hale

Sent from my iPhone

From: Kelly Bolan
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 1:22:48 PM

CAUTION: External Email. Proceed Responsibly.

Dear Mrs. Barger,

I am writing to express my opposition to the adoption of the franchise agreement for the Humidor Battery Energy Storage System (BESS) transmission line in Acton. My primary concern is the significant safety risks associated with large-scale battery storage facilities, particularly the heightened fire hazards that have been documented in similar projects. The potential for fire poses a severe threat to our small community, which has limited access routes and emergency response capabilities. In a town like Acton, with just one major access point, such risks could have disastrous consequences, especially for homeowners with animals who would face difficulties during evacuation.

The energy storage industry has seen numerous incidents of fires at battery storage facilities, leading to growing concerns about the sufficiency of local firefighting resources and preparedness to manage such emergencies . These facilities are known to require specialized firefighting equipment and techniques that may be beyond the capabilities of our local fire station, further increasing the risk to both people and property.

Additionally, the scale of the Humidor project—projected to store hundreds of megawatts of energy—raises questions about its suitability for a rural community. The proposed high-voltage transmission lines and the associated conversion of open space into industrial infrastructure provide no direct benefit to the local community. Instead, the electricity generated would serve larger urban areas, leaving Acton to bear the risks without any clear advantages.

I strongly urge you to reconsider this project in light of these concerns, prioritizing the safety and well-being of our community.

Sincerely,
Kelly Bolan
Concerned Acton Homeowner

From: Kevin Marten
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 1:07:58 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

I'm writing to you on behalf my myself and my family. We have lived in Acton for over 30 years and we are opposed to this BESS project being developed in our community!

As you're aware, this project poses numerous health, fire, and safety risks. We already live in a high fire severity zone and many residents struggle to insure our homes without spending an arm and a leg to do so.

Additionally, many residents are on private wells, which could easily become contaminated in the event of a fire since it is NOT possible to contain all of the water that'd be used.

We strongly oppose this project and urge you to support us, your constituents, in this fight against this project.

Thank you.

Sincerely,

The Martens

Please excuse brevity and typos. Sent from my iPhone

From: KIMBERLY DWIGHT
To: Barger, Kathryn
Subject: BESS mess
Date: Monday, October 7, 2024 12:50:08 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Have you no concern for our safety?

I'm very much opposed to the idea of a lithium battery storage facility in Acton. This is a rural community, primarily equestrian. Water is scarce and wells are insufficient as it is.

A fire from this would be devastating. There's so much brush in our desert that would spread to neighboring homes that are deliberately far apart.

We've seen the damage on the Vincent Thomas bridge last month. They had easy access to water. We don't.

Kimberly Dwight

From: Kristen James
To: Barger, Kathryn
Subject: I OPPOSE this HUMIDOR BESS project and therefore DO NOT SUPPORT the adoption of the Franchise Agreement
Date: Monday, September 16, 2024 9:23:04 AM

I OPPOSE this HUMIDOR
BESS project and therefore DO NOT
SUPPORT the adoption of the Franchise
Agreement

Acton is NO place to have a battery storage. It is an extremely high fire risk area, most home owners are getting dropped from their insurance companies because of the risk of covering them in case of a fire. HOW IS THIS STORAGE FACILITY A GOOD IDEA HERE?

NO ONE SUPPORTS THIS. Please do something about this issue, unlike the 300 homes being built by the Russians. Nothing is being done about that. There still a chance to stop this!

From: Kristine White
To: Barger, Kathryn
Subject: AGENDA ITEM #53
Date: Monday, October 7, 2024 3:22:20 PM

To Kathryn Barger:

RE: AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

I vehemently oppose the proposed Humidor or Hecate BESS being developed in Acton, as well as any other BESS being developed in Acton or Agua Dulce. Our communities are located in extreme fire danger areas; there are many fires here every year. The hot, dry, Santa Ana winds in some places here (including the proposed locations of these projects) reach hurricane force speeds. It is reckless to even consider permitting any BESS in these communities.

In addition to the insane fire hazard, there are risks of contaminating our well water and of toxic fumes. The BESS would be located next to residents and properties with many animals as well as our only safe evacuation routes: the 14 freeway and Sierra Highway.

DO NOT ALLOW ANY BESS IN OUR COMMUNITIES. YOU WILL BE RESPONSIBLE FOR DEATH AND DESTRUCTION THAT OCCUR AS A RESULT.

Sincerely,

Kristine White

From: laneycl
To: Barger, Kathryn
Subject: BESS in Acton
Date: Monday, September 16, 2024 7:02:15 PM

I Do NOT support any business involved with BESS in Acton. There are incidents almost once a week of some kind involving a Lithium ion battery fire somewhere in the US. Any kind of fire from BESS in Acton would be devastating because of fire pollution with air quality n underground water and land and building destruction.

Please consider these factors.
I do Not support Bess in Acton.

Thank you.
Laney Clevenger White

From: laneycl@ca.rr.com
To: Barger, Kathryn
Subject: Agenda #53
Date: Monday, October 7, 2024 7:01:51 PM

RE AGENDA#53
Hecate Grid Humidor Storage 1 LLC
Proprietary ElectricalTransmission Franchise

I am so opposed to the development of this project in my town of Acton.
Safety considerations should be a TOP priority.
We are in a high fire zone. If a battery goes into thermal runaway, it will pollute our air, pollute our water table, possibly destroy our beautiful town.
There's plenty of publicity about BESS, lithium-ion batteries catching fire in cars, trucks, small e-vehicles, shutting down freeways, bridges, burning down houses, firemen do not properly know how to extinguish these battery fires...they can't, they just have to let them burn.
Please please do not approve this Agenda #53.
Protect our town, Acton, from possible danger.
I AM OPPOSED TO THIS.

Laney Clevenger
2848 Calmgarden Rd
Acton CA 93510

From: Larry Sanderson
To: Barger, Kathryn
Subject: Agenda item #53 Hecate Grid Humidor storage
Date: Monday, October 7, 2024 2:43:54 PM

CAUTION: External Email. Proceed Responsibly.

Supervisor Barger,

Please oppose Agenda item 53 Hecate Grid Humidor storage1 LLC Franchise Agreement transmission line.

The recent history Lithium Battery storage issues has proven that this installation is a large risk to the community and should not continue
In the proposes site.

One battery fire could shutdown access to the Antelope Valley for days or weeks as one battery fire did to:
The 15 freeway to Las Vegas
The I80 freeway to Tahoe

A fire could also pollute the Santa Clarita River aquifer if water or fire retardant is used on the fire. The technology is not available to
effectively fight these fires

The risk to the Acton community is enormous with the risk of evacuation and removal of all animals in a emergency.

Thank You,

Connie and Larry Sanderson

From: Laura S
To: Barger, Kathryn
Subject: NO Hecate Grid Humidor Storage
Date: Tuesday, October 8, 2024 11:39:51 AM

AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Supervisor Barger,

I am strongly opposed to the BESS project being developed in our community of Acton, California!!

It would endanger too many lives and lower our property values.

Thanks for all you do!

Laura Skorich
(661) 305-3010

3651 Soledad Canyon Road
Acton, California 93510

From: leonardo murillo
To: Barger, Kathryn
Subject: Opposition to Agenda Item #53 - Hecate Grid Humidor Storage 1 LLC Franchise
Date: Monday, October 7, 2024 8:47:58 PM

Dear Supervisor Barger,

I am writing to express my strong opposition to the BESS project proposed in Acton under Agenda Item #53. My primary concern is safety, particularly the potential fire hazards and environmental risks posed by lithium-ion battery storage in our community.

This project does not align with Acton's rural character and poses unnecessary risks to our residents.

I urge you to vote against this franchise agreement.

From: Lisa Klein
To: Barger, Kathryn
Subject: BESS plant objection - Acton!
Date: Monday, October 7, 2024 12:25:26 PM

Dear Ms. Barger

Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. We personally have been affected by a battery fire at our home so this really tells me that a volatile facility like this has no place in LA County.

Please oppose and fight this!

Lisa Klein

From: Lisa Smith
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 4:03:48 PM

Honorable Supervisor Barger,

I am strongly opposed to this BESS project being developed in our community of Acton! The numerous environmental and water issues surrounding BESS will have far reaching affects for generations to come. The dangers of BESS involving fires and fire suppression problems are an immediate safety concern for all.

Sincerely,

Lisa and Tim Smith
Property Owners on Fairlane Rd in Acton

From: LM Vath
To: Barger, Kathryn
Subject: Acton BESS project
Date: Monday, October 7, 2024 12:11:12 PM

Lithium battery technology is a safety disaster and antiquated design. Please don't allow old junk shrouded in political rhetoric to play out in Acton. Science is doesn't not support the efficacy of the current design. Science proves this tech application is volatile. Lithium mining is a humanitarian disgrace. Save face and send the project back the drawing board with a higher standard in all regards.
Thank you,
LV Vath.

From: Luanne Emery
To: Barger, Kathryn
Subject: Hectate Humidor opposition
Date: Monday, October 14, 2024 7:45:09 PM

CAUTION: External Email. Proceed Responsibly.

Letter OPPOSING the Hecate Humidor LLC transmission line Franchise Agreement Ordinance
Agenda item 53

Please please please do not allow this BESS facility to go in! It will present way too many negative issues to the environment and communities of Acton as well S the entire Santa Clarita Valley. Not only are these facilities dangerous as far as Fire and runaway explosion, they also present potential contamination to our air & water supply if there is any issue that arises at the facility.
The Canyon Country BESS facility is already being installed on the banks of the Santa Clara river. It's a dangerous situation as is. No other facilities should be allowed in these fire zones or on the banks of our waterways.

Please note that there have been numerous incidents involving these lithium ion batteries on our roadways, on cargo ships, and at these facilities. We need to use safer means - which do exist. Don't listen to their sales persons who lie about the dangers , in the name of making the all mighty dollar their motive to sell their dangerous facilities. Please do your investigation, your homework and protect the people in our communities and the environment from future contamination and distraction from these potentially very hazardous facilities. These batteries are more dangerous than they are helpful.

Sincerely,
Luanne Emery
Concerned Resident

Sent from my iPhone

From: Lynn Colby-Galloway
To: Barger, Kathryn
Subject: Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Tuesday, October 8, 2024 9:42:27 AM

CAUTION: External Email. Proceed Responsibly.

Please protect your constituents & do not vote for this project! The community of Acton & the surrounding area does not deserve to be exposed to the fire hazard danger this project would inflict on the community.

From: LYNN DOYLE
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 4:11:31 PM

CAUTION: External Email. Proceed Responsibly.

Supervisor, Barger
I am writing this to oppose the lithium battery project proposed forActon California. We live in a high fire area and this would be devastating to our community if a fire were to ever break out. I urge you to please vote no on this proposal
Thank you,
Lynn Doyle
(Acton Viter
Sent from my iPhone

From: lzorell
To: Barger, Kathryn
Subject: Agenda Item #53 Hecate Grid Humidor Storage 1 LLC Proprietary Elecrical Transmission Franchise
Date: Monday, October 7, 2024 1:32:44 PM

Agenda Item #53
Hecate Grid Humidor Storage 1 LLC Proprietary Elecrical Transmission Franchise.

Dear Ms. Barger,
Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. Please oppose and fight this!

Best regards,
Leo Orellana
Acton Resident

From: macias91390
To: Barger, Kathryn
Subject: Agenda #53
Date: Monday, October 7, 2024 2:35:19 PM

I have lived in the area almost 45 years. Please help us to stay safe!

Sent from my Galaxy

From: Marcia Lewis
To: Barger, Kathryn
Subject: Electric battery storage
Date: Monday, October 7, 2024 4:52:43 PM

Please vote NO against electric battery storage in Acton, California, as it is dangerous, volatile and toxic to humans, pets, farm animals & wildlife, as well as to the water tables and land in Acton, California and surrounding areas.Thank you.
Sincerely,

Marcia Lewis
Acton Resident

From: Marian
To: Barger, Kathryn
Cc: Ruth Brock
Subject: Agenda Item #53
Date: Monday, October 7, 2024 8:20:48 PM

CAUTION: External Email. Proceed Responsibly.

Re: Agenda item number 53
Hecate grid humidor storage 1LLC.
Proprietary electrical transmission franchise

Dear Supervisor Barger,

You should be familiar with this issue by now. The Hecate Grid Humidor Storage 1 LLC is NOT safe for Acton, Agua Dulce, or adjacent areas. It should be clear to everyone that the dangers outweigh any expected benefits. I urge you to oppose and reject this project. The mountain communities of LA county are vulnerable to an array of natural hazards, fire above all. With global warming this hazard is increasing. It would be shortsighted to even consider a project like the Humidor Storage Facility for such a vulnerable, yet vital part of LA County.

With gratitude for your service and concern for the citizens of unincorporated LA county,

Marian Katz
10203 Vista Del Sol
Agua Dulce, CA 91390

Sent from my iPhone

From:	Mark Fairbrother
To:	Barger, Kathryn
Subject:	[SUSPECTED SPAM]AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission
Date:	Monday, October 7, 2024 4:34:19 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission

Supervisor Barger

I am strongly opposed to this BESS project.
I live in Acton and these facilities seem way too dangerous to have in areas that are prone to high heat, high winds and wildfires.
There have been many battery related fires just this year to consider placing this facility so close to residential areas.

Please help keep these kind of facilities away from Acton.

Thank you.

Mark Fairbrother
Acton, CA.

From: Mark Stocks
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Helcate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 4:14:01 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

My wife and I are residents of Acton and have lived in the area over 30 years, We both come from law enforcement backgrounds and have seen tragic circumstances unfold. I myself have expertise in wildland fires as I was an Arson Investigator. We are so concerned about the size and location of lithium storage that is being proposed, that we have started to look for a new home out of state. We have done extensive research and it is our opinion based on recent events around the U.S. and world that eventually this is a disaster waiting to happen. Lithium produces it's own heat and does not need fuel to ignite and therefore is quite dangerous in large capacity as this one would be. An ignition fire of a storage facility would have great impact for years on the residents of Acton and surrounding areas. Because of the proposed location it would cut off access from Antelope Valley from the I-14 freeway as well as the Metro Link. We need help and at this point we feel all alone. Please do not allow this storage facility to proceed forward.

Sincerely,

Mark Stocks
Acton resident

From: marydawson737
To: Barger, Kathryn
Subject: Battery site in Acton
Date: Monday, October 7, 2024 12:10:25 PM

CAUTION: External Email. Proceed Responsibly.

Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. Please oppose and fight this!

Sincerely,

Mary Dawson

From: Matt Fairbrother
To: Barger, Kathryn
Subject: AGENDA ITEM #53 -- Hecate Grid Humidor Storage -- Opposition
Date: Monday, October 7, 2024 4:57:53 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms. Barger

Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that have shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town.

Did you know....

.....this is a high fire area, we are having so much trouble getting fire insurance, I can only imagine how the high-fire risk of this place will affect our chances of getting any fire insurance at all in the future.

.....the aqueduct passes through here?

.....we are known for our fierce Santa Ana winds here?

.....the San Andreas fault is very near here?

.....the only freeway and route from Santa Clarita to Mohave passes though here?

.....there are houses very nearby that have wells for their drinking water and livestock? You already know how lithium fires effect ground water!!

.....there is another Edison transfer station in Mohave where this dangerous battery storage could be placed?

.....the Metrolink train station is very close by, many people rely on this transportation to and from work every day.

.....as the crow flies, this facility will be only 2 miles from my house !! Horrifying !!

.....Newsom and his thrill ride to be the first in everything needs to put this in his own back yard, not ours.

.....I've read that it takes a few hours for firemen to put out a Tesla car fire.

Please oppose and fight this for our little, rural town, we need you help and support.

Thank you,

Matt Fairbrother

From: Meghan Valenti
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 6:11:40 PM

Dear Mrs. Barger,

As an Acton resident, I am extremely concerned about the safety of the Hecate project. I am sure you have already heard of the dangers lithium ion battery storage pose in a high fire danger and watershed area. Acton is an incredibly inappropriate site for such a hazardous energy project like Hecate.

Respectfully,
Meghan Valenti
Acton, CA

From: Michael Boggs
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 2:54:12 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Supervisor Barger

I am opposed to this BESS project being developed in the community of Acton! This project is adjacent to my property, I rely on well water and feel if there is an incident the ground water will become contaminated. Fire insurance is getting harder to find and this might be the final straw for our insurance to get canceled. I also feel this will have a very negative effect on property values. We will not feel safe any longer living here. Please do not allow this to go forward

Sincerely

Michael & Susette Boggs
33830 Angeles Forest Hwy
Palmdale Ca, 93550

From: MIKE GOODNIGHT
To: Barger, Kathryn
Subject: Fwd: Agenda item #53 Hecate Humidor Storage
Date: Monday, October 7, 2024 1:28:14 PM

Sent from my iPhone

Begin forwarded message:

From: MIKE GOODNIGHT <mgoodn6044@aol.com>
Date: October 7, 2024 at 12:39:06 PM PDT
To: kathryn@bos.lacounty.gov
Cc: Mike Goodnight <d.mike.goodnight@gmail.com>
Subject: Agenda item #53 Hecate Humidor Storage

Dear Ms Barger
We r 30 year residents of Acton and are highly opposed to the Hecate Project that is proposed for our area. These BESS facilities have no place in high fire, populated areas. This area has numerous ranches with large amounts of live stock some dog kennels, animal sanctuaries etc. as well as many populated neighborhoods as well. This is Also projected to be built in a highly traveled corridor to and from the AV. If this BESS were allowed to proceed and a thermal runaway fire were to develop it would shut down the 14 fwy, pearblossom Hwy, Sierra Hwy, Angeles Forrest Hwy, Soledad cyn rd and the metro link rail as well. It would put a stop all travel both personal and commercial through this area. To add insult to injury they r also planning the high speed rail through this area. These BESS facilities r suppose to be sensitive to vibration. So it makes even less sense to place it a short distance from the San Andreas fault as well as railway tracks and a highway. We would appreciate your support in stopping this project through our area and endangering the lives of the residents of Acton, Agua Dulce and the antelope valley. This project would be located over our aquafier that supplies the water to everyone on a well and it runs all the way to the Santa Clarita valley. To pollute this valuable underground water supply is irresponsible to say the least. There are a lot of serious reasons that this project should not proceed and should be stopped. The project is of no benefit to our area. These BESS Projects belong further out in open land away from the public. Please support our objection to this project and do what's right for the people that have supported u and voted u into Office.

Thank you,
Elaine Goodnight
2133 1/2 W. Carson Mesa Rd
Acton,ca

Sent from my iPhone

From: Mike Granillo
To: Barger, Kathryn
Subject: Humidor BESS
Date: Tuesday, October 8, 2024 7:29:05 AM

Kathryn

Please Vote No On

AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

We are Just Looking For Trouble , when they fail and it will , a lot of live will be impacted.

Thank You
Mike Granillo

From: Mike Ralphs
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 12:56:50 PM

I am opposed to this BESS project being developed in our community of Acton, mainly because of the danger of thermal runaway, leading to toxic gases and the possibility of groundwater contamination.
Thank you,
Michael Ralphs resident of Acton.

From: MYTRNOW
To: Barger, Kathryn
Subject: Agenda Item #53 Hecate Grid Humidor Storage Facliity
Date: Monday, October 7, 2024 12:14:59 PM

CAUTION: External Email. Proceed Responsibly.

Ms. Barger,

I am writing to you this afternoon to ask you to deny this Hecate Grid Facility. Here in Acton , we do not want this here it has zero benefits for us and all the hazardous risks . Our biggest concern is Safety.

Safety for our lives
Safety for our homes
Safety for our children
Safety for our animals
Safety for our life time investment of our homes and property.

I live within a very short distance of this nightmare. Not if ,but when a fire occurs it will shut the town of Acton down and no through roads in or out of here to Santa Clarita, Pasadena or Antelope Valley. The 14 freeway , Angeles Forest Highway, Sierra Highway and Soledad Canyon Rd. Those are the only roads ....all will be shut down , along with Metro-link services. I'm not being dramatic , I am being realistic and practical. It will happen.
Our home owners insurance is already at an all time high, I cannot imagine what the effects of living this close to this fire storm toxic plant will do to my rates and those of others close by.
Acton needs you, we have all voted for you in the past , you are an amazing leader . Please do what's right for our small community and our residents.

Thank You
Tammie Necessary

From:	Nancy Harris
To:	Barger, Kathryn
Subject:	Bess Project in Acton - AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date:	Friday, October 11, 2024 4:12:39 PM

Kathryn,

I am opposed to this BESS project being developed in our community of Acton!

If a fire happened, and you know how many fires have already occurred due to lithium batteries, it could not be put out and millions of gallons of water could be wasted trying to control it. The fumes and gases will pollute our air and ground water, and you also know we all live on well water. It is also too close to the railway and freeway and it will disrupt the movement of commuters from the Antelope Valley to Santa Clarita and other cities south of us.

This project, if ever approved, needs to be moved out to the middle of nowhere, where it will not affect the lives and health of so many people.

The safety of the Acton residents needs to be the forefront of this decision.

Respectfully submitted,

Nany Harris
46 year resident of Acton, CA
805-341-6405

From: Norma Cobb
To: Barger, Kathryn
Subject: Proposed Site in Acton for a Lithium Battery Storage Facility
Date: Tuesday, October 8, 2024 1:30:05 PM

Dear Ms. Barger,

Please stand up ffor the residents of Acton who are opposed to the extreme dangerous battery site that is being proposed to be built here in Acton, California.

After recent incidents of battery fires that have shut down freeways and exposed residents to toxic fumes, resulting in evacuations. It is difficult to understand why the community of Acton is even being considered as a future site for this dangerous Lithium battery storage facility.

Acton is considered a high fire area and prone to strong Santa Ana winds creating dangerous conditions when a fire breaks out. There are many homes close to the proposed site which rely on wells that supply their drinking water and many have livestock. As you are aware, lithium fires affect ground water which will endanger the residents.

Please consider other areas far away from residential neighborhoods where it would be safer to build a lithium battery storage site. The proposed site is only a few miles from my home. Please stop this facility from being built here in Acton. We ask for your help and support in this matter.
Sincerely,
Norma Cobb
Sent from my iPhone

From: ones2watch
To: Barger, Kathryn
Subject: "Agenda item 53 —Hecate's Humidor LLC Transmission Line Franchise Agreement."
Date: Friday, October 11, 2024 12:09:07 PM

Please, please stand with Acton /Agua Dulce! Stop this before it becomes a runaway event. It's not a question of if, but when it will happen.

Please help save our community!

Kristi Marshall
Acton, CA

From: Patricia Akkad
To: Barger, Kathryn
Subject: acton electricity danger
Date: Monday, October 7, 2024 1:26:25 PM

CAUTION: External Email. Proceed Responsibly.

Please, please please vote against the proposed dangerous, electric battery storage facility!!!!!
Besides being a terrible eyesore, that is the least of our problems: it is an extreme fire danger and we live in a high fire danger zone, and it gives off poisonous toxic emissions to the residents!
I suggest they put it out in the remote desert next to one of the windmill farms or solar farms and not put our citizens in danger

Respectfully submitted,
Patricia Akkad
35 year Acton resident
661 733-3636
Sent from my iPhone

From: Polly Myhrvold
To: Barger, Kathryn
Subject: Agenda Item #53
Date: Monday, October 7, 2024 3:18:02 PM

AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Please please please do not let this come into our town! Fire fire fire! I would hate to see our town go up in smoke if this catches fire. We've already seen two instances on California highways where a truck has caught on fire and blocked the intersection and another blocked the 15 highway until it could be taken care of. There is no populated place that any of these storage facilities should ever be built!.

Thanks
Polly Myhrvold
661 904-3202

From: Residual Ranch
To: Barger, Kathryn
Subject: Franchise Agreement re: Humidor BESS transmission line
Date: Monday, October 7, 2024 9:51:52 PM

Supervisor Barger:

Although I am not a resident of Acton, I am totally against the BESS project. I'm concerned for the safety of those who reside in Acton and the consequences they may face.
Please do not adopt this Resolution. This is an election year, and I would like to believe that the supervisors are concerned about Acton's concerns and will not adopt this Resolution.

I appreciate your attention and vote against this project.

Georgiana Rodrigues
Agua Dulce, CA.

From: ROBERT TAYLOR
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 2:50:51 PM

CAUTION: External Email. Proceed Responsibly.

As a retired first responder, I cannot for the life of me come up with a valid reason why the Board of Supervisors would entertain, much less approve, storage of such dangerous materials in a known high risk fire area. I don't know how many news stories about out of control fires involving lithium batteries need to be broadcast before some common sense is exercised. Whose palm is getting greased here?

If you must have a BESS facility in the AV, at least move it to a more sparsely vegetated area away from homes and major transportation choke points!

Robert Taylor
LASD Retired.
Sent from my iPad

From: Ron Bird
To: Barger, Kathryn
Subject: Humidor Storage
Date: Monday, October 7, 2024 1:21:20 PM

I live in Acton and strongly support the Humidor battery storage project that is on your agenda tomorrow. Please vote yes on this item.

From: rumroum@aol.com
To: Barger, Kathryn
Subject: suggested fatal device
Date: Monday, October 7, 2024 2:05:13 PM

I understand that there will be a vote tomorrow by the board of supervisors about the proposed terrible and dangerous battery storage facility in Acton
I would like to register my request, even begging, to please vote against this terrible thing!
It is poisonous and can prove fatal for the entire community if it catches fire. All electric batteries are prone to fire.
My husband and I were on an airplane, and his cell phone became too hot to touch! I don't know how, but he was able to turn it off before it caught fire and the entire plane caught fire, and could have crashed and killed all people on board.
That is just one tiny example of all the electrical battery fires. And I am so afraid if that battery storage place goes in, I will sell my house and move away.
Please help

R. Anderson
Acton

From: Ruth Brock
To: Barger, Kathryn; Saraiya, Anish
Subject: Agenda item 53 and 107–Requesting letters to be included in official record
Date: Tuesday, October 8, 2024 7:17:15 PM

Dear Supervisor Barger,

Re: Agenda Item 53 and 107

As the Board of Supervisors address the Franchise Agreement for the Humidor Transmission line this month with the final adoption being on the Oct. 29th agenda for your consideration, I am requesting that all of the letters sent in from Acton residents opposing this BESS project and its transmission line portion of the project are entered into the official record for this project.

The Acton residents sent their email letters of opposition to:
kathryn@bos.lacounty.gov

Thank you very much.
Ruthie Brock
Acton Takes Action

From: Ruth Brock
To: Barger, Kathryn
Cc: mpestrella@pw.lacounty.gov
Subject: COMMENTS in opposition to Agenda item 53–Humidor transmission line Franchise Agreement ordinance
Date: Monday, October 7, 2024 2:29:38 PM
Attachments: How safe are lithium iron phosphate batteries – pv magazine International.pdf

Dear Supervisor Barger,

I'm writing in opposition to the resolution of intent to adopt the Franchise Agreement ordinance for the Hecate Humidor BESS project in the community of Acton.

The residents of Acton are against this project approval for many reasons:

1) The BESS will utilize thousands Lithium-Iron-Phosphate batteries which are a fire risk, difficult to impossible to extinguish, can go into Thermal Runaway and expel large amounts of highly toxic gases that include Hydrogen Fluoride, Hydrogen Chloride, Hydrogen Cyanide, Methane, Ethane, Carbon Dioxide and Carbon Dioxide.

2) A failure at this BESS facility could result in soil and groundwater contamination from water runoff used to protect adjacent exposures. The approved Humidor site plan has not provided a design to contain water runoff should there be an incident. The Acton Water Basin basin serves the private wells of many Acton residents and is literally beneath this BESS project and the head waters of the Santa Clara River are adjacent to it.

3) In the event of a fire/failure incident, the State Route 14, Metro Rail and all roads serving this corridor of East Acton will be closed. This area has very limited ingress and egress so residents

will have difficulty evacuating quickly. Many equine, livestock and other domestic animals also will need to be evacuated. Because of this area having limited escape routes, people may not be able to evacuate in time and may become trapped in close proximity to this dangerous off-gassing.

4) Acton residents will receive none of the benefit of the stored power that will be supporting the grid but must bear all of the fire and health risks and financial burdens of this project.

5) Properties may become devalued and far more difficult if not impossible to sell.

6) Fire insurance, which is already becoming very difficult to obtain may become impossible to obtain. Policy premiums have already doubled and tripled in this area under the CA "Fair Plan" as compared to what residents were previously paying under their now canceled or non-renewed policies. Without fire insurance these residents could lose their homes as all mortgage lenders REQUIRE fire insurance.

7) There is NO NEED for a BESS to be located near the substation to which it will connect. The only benefit is to the developer who will save money on a transmission line that spans a much shorter distance. As far as the function of the BESS, there is no reason to be near the substation. In the case of the Humidor, the developer insists it is necessary to put lives and property at risk in order for them to serve the grid. This is absolutely untrue. If this were true, solar and wind farms with integrated battery storage would not be out in the remote areas of the desert away from substations. This is all about PROFITS OVER PEOPLE.

8) In San Diego County there have been 3 BESS fires in the past year alone. In Sept. 2023, the Valley Center BESS burned. In May of this year the Gateway BESS in Otay Mesa burned for 11 days. And just on Sept. 5th the BESS owned by and located at San Diego Gas & Electric burned for several days. All three fires resulted in evacuations and shelter in place orders for residents as well as closures of hundreds of businesses, closure of schools and of course road closures. These failure events are extremely disruptive due to the risks of toxic off-gassing to the surrounding areas.

9) Very importantly, the location of the Humidor puts the power grid itself at risk due to being very close to critical 500kV overhead transmission lines that make up the southern terminus of the Pacific AC Intertie. A fire at the Humidor would potentially produce smoke that could cause the 500kV lines to arc and short-circuit. The short-circuiting could melt the insulators on the lines and result in the tripping of the grid system. This tripping can cause additional tripping as a safety response on other interconnected systems and could result in taking down the grid in many western states. It could take days to weeks and possibly up to $1B to restore the power following an event like this. This scenario was brought to Acton's attention by two transmission specialists (Large System Operators) with a combined 75+ years experience and we conveyed this information to Congressman Mike Garcia. He has spoken about this poorly sited BESS and the risks to the grid and the residents of Acton from the floor of the House.
Rep. Mike Garcia Floor Speech for Battery Electric Storage Systems

Rep. Mike Garcia Floor Speech for Battery Electric Storage Systems

By Congressman Mike Garcia

The people of Acton have been very vocal and have spoken very clearly on their opposition to this project and sadly the County and the Board of Supervisors have thus far completely ignored our concerns. This project could still serve the grid and provide revenue to LA County if it were sited away from residents who are being put in harms way by placing it further out in the open desert.

Alternatively, if the County were to demand that Hecate deploy a SAFE battery technology for this project such as Iron Air or Iron Flow batteries which have no fire or toxicity risk and are capable of longer duration storage, this would mitigate all risks to residents. Recently Sacramento approved a 5 MW project which will utilize long duration energy storage batteries (LDES) that are Iron Flow technology. This project which will provide up to 100 hours of power also received $30M in grant money from the CEC.
https://www.energy.ca.gov/news/2023-12/cec-awards-30-million-100-hour-long-duration-energy-storage-project

The approval for the BESS itself was based on a "similarity determination" which was totally inaccurate. This BESS should never have been declared "similar to an electric distribution

system". Why? Because this Humidor BESS will receive energy over a 230kV AC (Alternating Current) transmission line and convert/step down the energy to 34 DC (Direct Current) power for storage in the batteries.
The BESS will then, when needed, convert or step up the energy back to 230kV AC to transmit power back to the Vincent Substation via the connected transmission line. The substation then steps it down to a lower voltage and sends it out at a lower AC voltage that can be utilized by households and other consumers.

Fact #1–Any voltage over 200 kV is considered "TRANSMISSION" voltage. Humidor receives electricity at 230 kV AC.
Fact #2–The stored DC power CANNOT be utilized by households and other consumers who can only receive AC power, so therefore the BESS cannot "distribute" this power.
Fact #3–"Distribution voltage" is considered 50 kV AC or less, but never DC! The Humidor stores energy at 34 kV DC.
Fact #4–The BESS cannot "distribute" energy that is "transmission" level based on the 230 kV voltage at which it returns power back to the Vincent Substation.

Please consider the significant risks associated with siting this project which will utilize millions of watts of risky Lithium-Iron-Phosphate batteries in a designated Very High Fire Hazard Severity Zone in proximity to residences, animal rescues, equine facilities and kennels.
Lithium-Iron-Phosphate are touted as "safe" by developers as compared to Lithium-ion batteries, but there is information and studies that contradict this. (See attachment below)

Please do not approve the Franchise Agreement ordinance that

would allow this lithium-iron-phosphate BESS to be developed in ACTON.
Thank you,
Stephen Brock
Retired 30 year LACOFD Firefighter Specialist, HazMat
32 year Acton resident

From: SALLY IVES
To: Barger, Kathryn
Subject: Agenda Item 53
Date: Monday, October 7, 2024 12:27:46 PM

Good afternoon,
I am concerned citizen of the Acton Agua Dulce rural area. And I am writing you in regard to the Bess storage Facility proposal in Acton. This is a danger to our community. This will hurt our rural environment. It will change the wild life habitat for many species.
Please find somewhere else to put these dangerous batteries that can explode. This is a high fire danger area. As you know and our fire insurance has gone up every year now for a while. Which brings me to the question. How is the facility even allowed to happen with such high Fire Danger. Please go to your roots of common sense and open your eyes to the real facts of the dangers this could cause. Stop this from proceeding. Please take MONEY out of the equation.

Sally Ives

From: Sbcglobal
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 12:35:40 PM

Supervisor Barger,

The entire Acton community and myself are absolutely opposed to the BESS project being developed in the vicinity of Acton due to the overwhelming evidence of safety concerns. The area is already considered a high fire zone, let alone the build site being in a pinch zone with high traffic congestion, making this is a recipe for disaster! Additionally, this will eliminate our ability to purchase home owners insurance which is already near impossible to find let, never mind the ridiculously high cost.

Please consider this before allowing the project to continue.

Sincerely,
Brian De Grandis
Home owner and taxpayer

From: Shannon Greenis
To: Barger, Kathryn
Subject: Dangerous Battery Site in Acton
Date: Monday, October 7, 2024 12:42:03 PM

Dear Ms. Barger
Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. Please oppose and fight this!

Thank you,
Shannon
Get Outlook for Android

From: Shannon Trudell Etheridge
To: Barger, Kathryn
Subject: Hectate Grid - Acton CA
Date: Tuesday, October 8, 2024 1:57:39 PM

CAUTION: External Email. Proceed Responsibly.

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms Barger,

I am writing to express my opposition of the BESS humidor project that is proposed to be placed in Acton California. As a resident of Acton , I have extreme concerns of the detrimental effects this project will have to our community and lifestyle. We are living in a high fire danger zone already and with many homes, depending on well water, it would be tragic to put this kind of facility in our community where one accidental fire could devastate our community and our precious supply of groundwater. Please do what's right for us and oppose this.

Shannon Trudell

Sent from my iPhone

From: Sharon Corbett
To: Barger, Kathryn
Subject: Bess Project-Acton
Date: Monday, October 7, 2024 6:02:22 PM

CAUTION: External Email. Proceed Responsibly.

Sent from my iPhone
I'm sending you this email to oppose the Bess project for Acton.
Acton is a high fire area.
It has been proven these batteries do catch fire.
Our insurance rates are already shy high.
People moved here to live a rural life and yet we keep getting dumped on.
Please listen to the people of Acton and Aqua Dulce.
Thank you,
Sharon Corbett
31660 Cedarcroft Rd
P o box 52
Acton

From: Sharon"s Tablet Runci
To: Barger, Kathryn
Subject: Agenda item #53 Hecate grid humidor storage in Acton
Date: Monday, October 7, 2024 4:40:07 PM

Ms. Barger;
Please vote against the projected Hecate grid humidor storage facility planned for Acton. Recent small lithium ion battery fires have clearly shown the danger of larger facilities in an area near homes and transportation centers.

Our home of 30 years is located in a canyon directly across from the Acton Metrolink station. Our safety could not be guaranteed as a thermal runaway fire would not allow us the time to evacuate. Sheltering in place, should a fire occur, may also be a death sentence since we are designated an "extremely high fire danger area" by Edison. Our insurance rates are astronomical and these facilities will have a major impact on future policies if they are even available.

Please do the right thing for your constituents and vote against this facility. There is a need for them, but Acton is not the right place.

Thank you.
Sharon Runci

From: smziggys@yahoo.com
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 1:17:15 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms. Barger
Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. Please oppose and fight this!
Michelle Ziegelmeyer

From: Summer Baker
To: Barger, Kathryn
Subject: Agenda item 53. Hecate Gide Humidor
Date: Monday, October 7, 2024 1:38:36 PM

Kathryn Barger
Los Angeles County Board of Supervisors

kathryn@bos.lacounty.gov

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Supervisor Barger,

I am writing to express my opposition to the Hecate Grid Humidor Storage 1 LLC project being proposed in the Acton community. As a resident of Acton, which is located in a high fire-risk zone, I am deeply concerned about the significant safety risks associated with placing a large-scale lithium battery energy storage system (BESS) in our area.

Safety is my primary concern. Lithium-ion battery storage facilities pose a serious fire hazard, particularly in fire-prone areas like Acton. These batteries are highly combustible and can cause dangerous fires, as evidenced by previous incidents. In high temperatures, a single malfunction could lead to a catastrophic fire event, which would be extremely difficult to control, especially given the rural nature of our area and the limited firefighting resources. Lithium battery fires also emit toxic fumes that could pose additional health risks to the residents and wildlife in the surrounding areas.

Moreover, the environmental impact of such a facility is also concerning. In the event of a fire, hazardous chemicals from the burning batteries could contaminate local air and water sources, leading to long-term damage to our ecosystem. Given that Acton is a rural and environmentally sensitive area, the risks are too great to ignore.

While I recognize the importance of renewable energy projects, I strongly believe that such a facility should not be located in a high fire zone like Acton. There are safer, more appropriate locations for this type of project that do not carry the same level of risk to public safety and the environment.

I urge you to reconsider the approval of this project for the safety and well-being of our community. Thank you for your attention to this important matter.

Sincerely,
Summer Baker
Acton, CA

From: Susan Burns
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 7:58:23 PM

I am STRONGLY OPPOSED to this BESS project being developed in beautiful our town of Acton. This is a HIGH FIRE AREA and WHEN NOT IF this BESS CATCHES fire (thermal runaway) in our HIGH WIND CORRIDORS I don't have to imagine the catastrophic effects it will have. All roads, highways and sr14 all rail systems will be shut down in and out a shelter in place orders for TOXIC FUMES will be in order harming many of our families elders, children along with pets and livestock in the outdoors. If water is used for a cooling down because it burns at such a intense high degree all those toxins will go into our ground water. THESE BESS FACILITIES DO NOT BELONG IN ANY COMMUNITY ANYWHERE, OTAY MESA AND MANY OTHERS ARE OBVIOUS EXAMPLES OF WAY, PLEASE DO NOT ENDANGERED OUR LIVES.

THANK YOU FOR YOUR TIME AND RESEARCH ON THIS MATTER.

SUSAN BURNS RESIDENT OF ACTON FOR 38YRS.

From: Susie Bayer
To: Barger, Kathryn
Cc: Ruth Brock
Subject: I Oppose the Hecate BESS Project in Acton, California
Date: Monday, October 7, 2024 5:08:00 PM

Dear Supervisor Barger,

This letter is to inform you that I am not a supporter of the Humidor Hecate BESS project. As you are aware, Acton's natural terrain is brush and weather is very dry. When there is a wild fire in our area it can take weeks to extinguish and it can burn for miles and be more than devastating. Our community has already struggled with home owners' insurance rates jumping to sky high premiums or cancellations due to being deemed **VERY HIGH FIRE AREA**. This project will be the death of our property values. It only increases our risk!

Acton is not full of residential planned communities. Acton is a rural town, where people live on one or more acres. Those acres house families, domestic pets, horses, goats, chickens, cows and vegetable gardens. It is also close to two highways and rail line which is our only way out when your battery storage catches fire. ***So, in my eyes, this project is not planned in a safe place.***

I am also aware, that SCE Vincent Hill substation does not provide power to the Acton community. Increasing the grid does not keep my lights on.

In closing, I would like to inform you and the Hecate Grid, I am not in support of your project in my community. My recommendation would be for you to look further out into the desert where this project will be surrounded by rocks and sand that will not burn down homes, livestock and endanger peoples lives along with spreading poisonous chemicals into the water and air! Why put over 7000 people or more at risk?

Sincerely,

Susan Bayer

Concerned Acton Resident

From: TERRY WOOD
To: Barger, Kathryn
Subject: BESS Project
Date: Monday, September 16, 2024 7:16:52 AM

Hello,
I am writing this in opposition of the BESS Project proposed for Acton, CA. I OPPOSE this HUMIDOR BESS project and therefore DO NOT SUPPORT the adoption of the Franchise Agreement.

Regards,
Terry & Michael Wood
1607 Mary Rd
Acton, CA 93510
661-435-9334

From: The Hamburgers
To: Barger, Kathryn
Subject: Agenda item #53
Date: Monday, October 7, 2024 2:35:00 PM

AGENDA ITEM #53
Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Ms. Barger,
I am writing in the hopes that you would oppose the BESS project in Acton.
Acton is a small rural town with a large heart. There are so many other places to build this BESS site- why in a small town. We already have our homeowners insurance rising because of the potential of fire. I ask why would we put a fire risk here? It does not make sense when there are so many other options away from a community. Please say NO to BESS!
Thank you for your time!

David and Christa Hamburger

From: Thomas Harvey
To: Barger, Kathryn
Subject: AGENDA ITEM #53 OPPOSITION
Date: Monday, October 7, 2024 3:20:48 PM

AGENDA ITEM #53
HECATE GRID HUMIDOR STORAGE 1 LLC PROPRIETARY ELECTRICAL FRANCHISE

To Whom this may concern

Hello ! My name is Thomas Harvey , a homeowner and resident of Acton CA.

I would like to express my opposition regarding Item #53.

Acton is a small community of family farms and quiet living.
Building a structure like this would bring a huge concern around safety of our residents.

Road infrastructure is not able to withstand it.

It brings a level of crime to our area.

It brings unwanted noise pollution to our quant village.

If you can please consider these key points it would be greatly appreciated as we aim to keep Acton a country living village.

Regards

Thomas Harvey
(631)504 8298

From: thomas mastin
To: Barger, Kathryn
Subject: Agenda Item #53 Hecate Grid Humidor Storage facility
Date: Monday, October 7, 2024 2:47:12 PM

Supervisor Barger,

I am writing to you to voice my concern regarding the Hecate Grid Storage Facility in Acton California. As you are aware Acton is a high fire danger zone and many of the residents including myself have had our homeowners insurance canceled in the past year with most insurance companies ending coverage in this area due to the high fire danger. Insurance coverage was difficult to find and was much more expensive.

The development of any battery storage facility in Acton will increase the fire danger for our families and property and will affect our ability to insure our homes. I urge you to oppose agenda item #53 Hecate Grid Humidor Facility storage 1 LLC Priority Electrical Transmission Franchise.

Respectfully
Thomas Mastin
33855 McEnnery Canyon Rd, Acton, CA 93510
(661)878-5816
thomasmastin@gmail.com

From: timclen
To: Barger, Kathryn
Subject: BESS IN ACTON
Date: Monday, October 7, 2024 5:41:10 PM

Greetings,

I along with my family and most residents are against the proposed site for this facility. As a matter of safety and the fact that it is right next to Angeles Crest forest makes this a recipe for potential disaster.

I am a 20 year resident and have been here for two major fires in where evacuation orders were mandated.

This town/zip code has already suffered from insurance company cancelations and premium increases not to be believed. (Fire Zone)

Respectfully,

Tim Clendenen

From: Toni Faragalli
To: Barger, Kathryn
Subject: BESS in Acton Ca
Date: Tuesday, October 8, 2024 8:45:59 AM

Dear Ms. Barger
Please fight for the residents of Acton who are opposed of this very dangerous battery site that could be built in Acton. Given the recent battery fires that shut down freeways and evacuated residents due to the toxic fumes, I cannot imagine how they could build such a dangerous site so close to our town. Please oppose and fight this! Besides the extreme fire danger if we contaminate out water it will never recover.

Thank you
Toni Faragalli
9342 Sierra Highway
Agua Dulce Ca 91390

Blessed is the person who sees the need, recognizes the responsibility, and actively becomes the answer. -William A. Ward

From: Traci Foster
To: Barger, Kathryn
Subject: Proposed Bess site
Date: Friday, October 11, 2024 10:18:59 AM

I am writing you to reconsider putting this Storage facility in Acton. Safety is a big issue. High fire danger in this location. If it catches on fire (which is probable) you could wipe out our community. Also toxins can enter our water table. They're are much better sites to consider than our community .

Please have some compassion.

Thankyou.
Traci Foster

From: Tracy M Smith
To: Barger, Kathryn
Subject: Agenda Item #53
Date: Monday, October 7, 2024 1:37:16 PM

Supervisor Barger,

Please do not allow the Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise to be built in Acton. There is plenty of desert land further out that can be used for this type of facility.

Residents of Acton, a rural, family oriented, animal friendly community do not need nor want this facility in our area.

Please vote NO!

Tracy M. Smith
TMS Communications
tracy.tmscom@gmail.com
818-640-1801
www.linkedin.com/in/tracymsmith

From: Tricia De Grandis
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Tuesday, October 8, 2024 8:01:39 AM

Dear Supervisor Barger,

I hope this message finds you well. I am writing to express my strong opposition to the proposed Battery Energy Storage System (BESS) project being developed in the Acton community. While I understand the importance of advancing clean energy initiatives, I have serious concerns about the safety implications of such a project, particularly in our area, which I believe must be considered.

The primary concern is the inherent risk posed by large-scale battery storage facilities. These systems, as you are likely aware, have been linked to a number of safety incidents, including fires and explosions. Given the close proximity to residential homes and the rural nature of Acton, the possibility of such an event occurring poses an unacceptable threat to public safety.

Compounding this issue is the fact that Acton has only one road in and out of the area. In the event of an emergency, such a limitation significantly hinders the ability to safely evacuate residents or provide timely access to emergency services. This bottleneck creates an unnecessary risk that could result in catastrophic consequences, not only for the people living here but also for first responders.

Furthermore, the introduction of this facility will disrupt the rural character of our community, adding industrial-scale infrastructure that is out of place in an area where residents value the natural environment and peaceful living conditions. The long-term effects of the project could extend beyond safety concerns, impacting the quality of life and property values for those of us who call Acton home.

I urge you to consider these significant concerns and the potential risks posed by the project. I respectfully ask that you oppose this development and work with the community to find safer, more appropriate locations for such projects.

Thank you for your time and attention to this matter. I look forward to your response and hope that our concerns will be given the serious consideration they deserve.

Sincerely,

Tricia De Grandis
33746 White Feather Rd.

Acton Ca, 93510
661-310-4086

From: vitanmore@aol.com
To: Barger, Kathryn
Subject: AGENDA ITEM #53 Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise
Date: Monday, October 7, 2024 12:06:58 PM

Dear Supervisor Barger,

it has come to my attention that the tomorrow the Resolution of Intent to Adopt the Franchise Agreement for the Humidor BESS transmission line will go before the Board of Supervisors!

I beg you to not allow this to pass! This will be a health risk to our families as well as fire risk to the AV area.

Thank you, Barbara Moore
34689 Desert Rd.
Acton CA 93510

From: Wayne Wilson
To: Barger, Kathryn
Subject: AGENDA ITEM #53 BESS
Date: Monday, October 7, 2024 2:02:12 PM

AGENDA ITEM #53

Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise

Dear Supervisor Barger

I will keep this short. My wife and I are strongly opposed to placing the Humidor BESS project in our Acton community. The reasons are many, and it seems every day Lithium-Ion Battery technology is proving to be much less safe than originally thought.

But for us, we live all too near the proposed BESS project to feel safe.

We live along Soledad Canyon Road on the BESS side of the road. Friends of ours live even closer o this massive storage site. They are all afraid.

- Acton is a high risk fire area. That's why our insurance rates have gone through the roof.
- BESS projects have not adequately provided for thermal runaway fires in such high risk areas. Where is the water going to come from?
- Toxic fumes pour out of BESS-style fires. We are too close to even consider allowing this in our "neighborhood."

We have looked at the science, and this is simply too unsafe for our area.

I am all for Green Energy. Safe, modern nuclear power is far preferable to the destruction of so much fertile land, global child labor in mining lithium, and the inherent dangers of this soon to be out dated lithium technology.

Please move this project away from people and their homes. Union jobs are important, but not more important than safety!

Thank you,

Wayne and Laura Wilson

1414 Soledad Canyon Road

Acton, CA 93510

From: wbmkitcko@aol.com
To: Barger, Kathryn
Subject: Acton
Date: Monday, October 7, 2024 1:54:56 PM

CAUTION: External Email. Proceed Responsibly.

Dear Supervisor Barger,

I am opposed to BESS being developed in our lovely community of Acton..
This project is inappropriate for our town.
Thank you for taking the time to read my email.

Sincerely,
Wendy Kitcko

From: Wendy Calvin
To: Barger, Kathryn
Subject: I oppose the Humidor BESS project in Acton Agenda item #53
Date: Monday, October 7, 2024 5:47:38 PM

Dear Supervisor Barger,

RE: AGENDA ITEM #53Hecate Grid Humidor Storage 1 LLC Proprietary Electrical Transmission Franchise.

As an Acton, resident I vehemently oppose the Resolution of Intent to Adopt the Franchise Agreement for the Humidor BESS transmission line. I understand that this agenda item will go before the Board of Supervisors on Tuesday, October 8, 2024, and I urge you to vote NO.

As local Acton resident and business owner, this project is dangerous and will create a severe safety and fire risk in an area designated by Cal-Fire as high risk for forest fires.

We have seen the dangers of these storage facilities with fires in San Diego and the recent incident on the 15 freeway where the tractor trailer carrying batteries caught fire causing evacuations of the surrounding area and the fire department unable to put the fire out. Why would the Board of Supervisors want to put that in the middle of our small town? What possible gain would there be to put our lives at risk? There is not enough money worth more than the lives of the residents of Acton.

This company has lied and sent propaganda mailers out to the residents with false claims of support. Please do not fall for their tactics.

I ask you to do what is right for your constituents and vote NO.

Respectfully,
-
Wendy Calvin
818-621-8834

From: wpplus@isd.lacounty.gov
To: Barger, Kathryn
Subject: New submission from Contact Us
Date: Tuesday, October 8, 2024 8:13:13 AM

Name

Bill Gerlach

Email

BillGerlach@ca.rr.com

Phone

(661) 400-9345

Address

2420 Vista Del Monte DR
Acton, California 93510
United States
Map It

Subject

Humidor BESS transmission line

Office Location

Downtown Office

Message

Please don't let this happen in our community. This is hazardous and unsafe for our residents and homes.
If it is absolutely necessary then find a place in the desert away from citizens and residences.

Cox, Castle & Nicholson LLP
50 California Street, Suite 3200
San Francisco, California 94111-4710
P: 415.262.5100 **F**: 415.262.5199

Anne E. Mudge
415.263.5509
AMudge@coxcastle.com

October 28, 2024

Board of Supervisors
County of Los Angeles
500 West Temple Street, Room 383
Los Angeles, California 90012

Re: Hecate Grid Storage 1 LLC Electrical Transmission Franchise Ordinance
Public Hearing Date: October 29, 2024; Agenda Item No. 6

Dear Members of the Board of Supervisors:

This firm represents Hecate Grid Humidor Storage 1 LLC, the applicant for an electrical transmission franchise ordinance calendared for hearing before your Board on October 29, 2024 (Agenda Item No. 6). This letter supports the findings of the Los Angeles County Department of Public Works regarding the environmental review for the electrical transmission franchise ordinance and the Humidor Battery Energy Storage Project (the "**Project**") under the California Environmental Quality Act ("**CEQA**").

The County Has Considered the Project as a Whole and Properly Determined it is CEQA Exempt

The granting of an electrical transmission franchise in this instance is statutorily exempt from CEQA under Public Resources Code 21083.3 and CEQA Guidelines Section 15183. The Project qualifies for this statutory exemption because it is consistent with the development density established by the existing Countywide General Plan, Antelope Valley Area Plan, and zoning. The County prepared a thorough analysis demonstrating that there are no project-specific effects which are peculiar to the Humidor project as a whole or its site.

The Project site is designated as Light Industrial by both the Countywide General Plan and the Antelope Valley Area Plan, and Light Manufacturing by the County Zoning Ordinance. These use regulations allow for the development and operation of the Project at the proposed location. The Project is consistent with all applicable zoning standards and the Department of Regional Planning determined that Battery Electric Storage System ("**BESS**") projects are similar to Electrical Distribution Substations and are treated the same as that defined land use under the Zoning Code.

Case Law Supports the Application of the Section 15183 Exemption Here

The Court of Appeal has upheld use of this statutory exemption for uses that are not directly listed in the General Plan and zoning, such as BESS in Los Angeles County, but which are similar to other uses allowed in the various zones. In *ucas v City of Pomona* (2023) 92 Cal.App.5th 508, the City of Pomona adopted zoning overlay districts that would allow various cannabis uses. An opponent of the ordinance challenged the City's finding that adoption of the overlay districts was statutorily exempt under CEQA Guidelines Section 15183 because the impacts of commercial cannabis activities were not and could not have been analyzed in the City's Environmental Impact Report ("**EIR**") for its General Plan because the City did not allow commercial cannabis activities at the time the prior EIR was prepared. The Court of Appeal rejected the challenge and upheld the City's reliance on the statutory exemption because substantial evidence supported the City's finding that cannabis uses are similar to or consistent with existing land uses or development density established by the City's General Plan and its EIR.

Similar to *ucas*, the County made findings that BESS facilities are similar to other industrial uses allowed by right in the M-1 zone. (See County Department of Regional Planning Subdivision and Zoning Ordinance Interpretation No. 2021-03 – Battery Electric Storage Systems, dated October 18, 2021; Letter to the Acton Town Council from the Department of Regional Planning regarding the Hecate Humidor BESS, dated August 1, 2023; Department of Regional Planning Report to the Board of Supervisors on Appeal of CEQA Determination, dated December 19, 2023; CEQA compliance memo, dated August 14, 2024, pp. 6-7; Statement of Reasons for Exemption from Additional Environmental Review and 15183 Checklist, dated August 14, 2024, especially p. 7.)

The Court of Appeal also recently found that CEQA Guidelines section 15183 limits environmental review for qualifying projects to those effects that are peculiar and project-specific, or not addressed as significant in the prior EIR, but does not state that such effects render the streamlined process wholly inapplicable. (*illtop roup, nc v County of San Diego* (2024) 99 Cal.App.5th 890, 914.) In *illtop*, the Court of Appeal evaluated the meaning of a "peculiar impact" under Guidelines Section 15183:

> Even if evidence in the record demonstrates the existence of project-specific environmental effects, an environmental impact "shall not be considered peculiar to the project or the parcel ... if uniformly applied development policies or standards have been previously adopted by the city or county with a finding that the development policies or standards will substantially mitigate that environmental effect when applied to future projects, unless substantial new information shows that the policies or standards will not substantially mitigate the environmental effect." (Guidelines, § 15183, subd. (f).) Thus, contrary to the County's assertions, the issue is not simply whether sufficient evidence in

> the record supports a finding that "the [NCER] Project may have significant environmental impacts." Rather, the issue is whether substantial evidence in the record supports the Board of Supervisors' findings that there are project-specific impacts that will not be substantially mitigated by previously adopted and uniformly applied policies and procedures.

The County's thorough analysis demonstrated that there are no Project-specific impacts that will not be substantially mitigated by previously adopted and uniformly applied policies and procedures and the Project will not result in any "peculiar" impacts.

Fire is Not a Peculiar Impact in Los Angeles County

With respect to fire, much of California and Los Angeles County are designated as very high fire hazard areas and many industrial uses are developed and conducted within a very high hazard severity zone. Thus, the potential for fire in a BESS facility is not peculiar. Electrical infrastructure is prevalent throughout California and within the Project area. Further, BESS facilities have similar impacts to other common electrical facilities, such as distribution and transformer substations, and BESS facilities are more commonplace. From 2018 to 2023, battery storage capacity in California increased from 500 megawatts to more than 6,600 megawatts with much more capacity planned to come online. With respect to claims regarding the Project's proximity to a railroad and a highway, temporary highway closure is not likely but in any event should not be considered a significant environmental impact under CEQA. Temporary highway closures to address events such as accidents or brush fires are common-place and fires at almost any business or other land use could result in such a temporary closure. Secondary impacts from temporary emergencies such as traffic delay is not itself considered a significant impact under CEQA. Finally, multiple roadways serve the area including the Antelope Valley Freeway, Carson Mesa Road, and E Soledad Pass Road. The environmental analysis prepared for the Project includes analysis of wildfire risk and its finding that the Project will not result in a peculiar wildfire impact is supported by substantial evidence. (See CEQA compliance memo, dated August 14, 2024, pp. 10-15; Statement of Reasons for Exemption from Additional Environmental Review and 15183 Checklist, dated August 14, 2024, especially pp. 7 and 161-169.)

In addition, following the recent Otay Mesa fire, San Diego County Hazmat conducted air monitoring where only normal products combustion of a structure fire were detected and at levels considered by National Institute for Occupational Safety and Health and Occupational Safety and Health Administration to be well below exposure thresholds. A third-party contractor conducted additional air quality monitoring and concluded that at no time during the incident did the levels of oxygen deviate from 20.9 percent, which is considered normal atmospheric level. Any decrease in the percentage of oxygen would indicate that there was some unknown gas in the atmosphere that was not able to be detected by monitoring equipment. No such deviation was detected. Additionally, hydrofluoric acid was not detected at any of the sampling locations. The use of fluoride reactive test strips was negative at all locations. (See reports provided at Attachment A.)

The Granting of a Franchise Agreement Does Not Reopen the Site Plan Review for the BESS facility, Nor Does it Impose Conditions of Approval on the Construction or Operation of the BESS Facility

The County Department of Regional Planning previously approved a Site Plan Review for the Humidor BESS facility. The Site Plan Review approval is final, not subject to appeal, and your Board previously rejected an appeal of the County's finding that the Site Plan Review is ministerial and, alternatively, that several other categorical exemptions apply. The current request for an electrical transmission franchise agreement authorizes the Project's gen-tie line only and does not impose conditions of approval on the BESS facility. As such, approval of the electrical transmission franchise agreement does not require the County to re-assess the environmental impacts of the BESS. The County's authority under the franchise agreement is limited to whether to allow the installation of the gen-tie in the public roadway. The County's franchise authority does not extend to making changes in, mitigating, or otherwise conditioning the BESS. CEQA does not require the County to assess the impacts of an activity it has already approved as a use allowed by right. (See Letter from Cox, Castle & Nicholson LLP to the Board of Supervisors regarding the Appeal of CEQA Review of Site Plan Determination for the Humidor BESS, dated November 16, 2023.)

The Similar Use Determination Is Final

In addition, the County's similar use determination, issued on October 18, 2021, is final and was not appealed. In *ucas v City of Pomona* (2023) 92 Cal.App.5th 508, the City made six similar use determinations for various cannabis uses, finding that such uses were similar to other uses already allowed in the City's zoning code. An opponent challenged the subsequent adoption of zoning overlay districts that would allow the cannabis uses but did not appeal the initial similar use determinations. The Court of Appeal found that the similar use determinations were final and the opponent was foreclosed from challenging those findings. (See County Department of Regional Planning Subdivision and Zoning Ordinance Interpretation No. 2021-03 – Battery Electric Storage Systems, dated October 18, 2021; Letter to the Acton Town Council from the Department of Regional Planning regarding the Hecate Humidor BESS, dated August 1, 2023; Department of Regional Planning Report to the Board of Supervisors on Appeal of CEQA Determination, dated December 19, 2023.) Further, the applicant submitted responses to the Acton Town Council' claims that the Humidor BESS facility is not an electric distribution substation during the Site Plan Review process. (See Humidor BESS – LA County Response – 03/07/2023; Letter to County Counsel from Cox, Castle & Nicholson LLP, dated October 2, 2023; Letter to the Board of Supervisors from Cox, Castle & Nicholson LLP, dated November 16, 2023; Letter from Hecate Grid to Supervisor Barger responding to Acton Town Council's Letter from March 8, 2024, dated May 3, 2024.)

In Addition to the Exemption under Section 15183, the Project Qualifies for Multiple Categorical Exemptions

Finally, the electrical transmission franchise agreement and the Project as a whole qualify for several categorical exemptions under CEQA. The electrical transmission franchise agreement would allow for the placement, operation, and maintenance of an electrical line(s) under a public roadway within an existing utility corridor, adjacent to existing utility lines. Construction and operation of the interconnection line authorized by the franchise agreement meet the criteria set forth in Sections 15301, 15303, 15304, 15305. And 15311 of the CEQA Guidelines and Classes 1, 3, 4, 5, and 11 of the County's Environmental Document Reporting Procedures and County Guidelines, Appendix G. (See CEQA compliance memo, dated August 14, 2024, pp. 2-6; Department of Regional Planning Report to the Board of Supervisors regarding Resolution of Intention and Introduction of an Ordinance to grant a proprietary electrical transmission franchise to Hecate Grid Humidor Storage 1 LLC, dated October 8, 2024.

In addition, the project consists of a series of small-scale equipment on approximately 12 acres within an industrial zone and adjacent to other existing public utilities, light industrial uses, and railroad infrastructure. The project site is currently developed, requires minimal grading, and the project avoids sensitive land areas. The ordinance granting a Franchise Agreement would allow for the placement, operation, and maintenance of an electrical line(s) under a public roadway within an existing utility corridor, adjacent to existing utility lines. Construction and operation of project meet the criteria set forth in Sections 15303, 15304, 15305, and 15411 of the CEQA Guidelines and Classes 1, 3, 4, 5, and 11 of the County's Environmental Document Reporting Procedures and County Guidelines, Appendix G. (See CEQA compliance memo, dated August 14, 2024, pp. 7-9. Department of Regional Planning Report to the Board of Supervisors regarding Resolution of Intention and Introduction of an Ordinance to grant a proprietary electrical transmission franchise to Hecate Grid Humidor Storage 1 LLC, dated October 8, 2024.)

Categorical exemptions do not apply if the Project may impact an environmental resources of hazardous or critical concern where designated, precisely mapped, and officially adopted by federal, state, or local agencies. Most of the Project area has been previously developed and is occupied by commercial developments, including an adjacent Metrolink station with a large parking lot, a paintball facility, a utility electrical subcontractor, and commercial trucking staging/parking area. There are no designated, mapped, or adopted environmental resources of hazardous or critical concern. (See CEQA compliance memo, dated August 14, 2024, p. 9.)

Categorical exemptions also do not apply if the cumulative impact of successive projects of the same type in the same place over time is significant. None of the BESS proposals cited by the Project opponents have commenced any formal discussions of filed permit applications and are thus not reasonably foreseeable and there is no showing that such potential future projects, if proposed and approved, would result in significant cumulative impacts. (See CEQA compliance memo, dated August 14, 2024, pp. 9-10.)

Further, there is nothing unusual about the Project that distinguishes it from others in the classes of categorical exemptions that apply. It is similar in size and nature to other illustrative examples of projects that qualify for categorical exemptions included in the CEQA Guidelines and the County's Environmental Document Reporting Procedures and County Guidelines, Appendix G. Many projects are located within a very high hazard severity zone and thus this is not an unusual circumstance. The project is designed in compliance with the County Fire Code and incorporates all BESS-specific Fire Code provisions and detailed conditions of approval from the Fire Department. (See CEQA compliance memo, dated August 14, 2024, pp. 10-15.)

Project opponents have claimed the gen-tie line will connect to three Hecate-proposed projects (Humidor, Flea Flicker, and Maathai), and these three projects and the gen-tie line comprise the whole of the action which must undergo a collective CEQA review. Flea Flicker and Maathai have queue positions for potential future interconnection, but no applications have been filed with any permitting entity. There is a high degree of attrition in the interconnect application process and many projects with a queue position never go forward. Therefore, neither potential project is reasonably foreseeable. In addition, Fleaflicker is a Hecate Energy project—not a Hecate Grid project. Hecate Energy and Hecate Grid are different, separate businesses. (See CEQA compliance memo, dated August 14, 2024, pp. 9-10; Statement of Reasons for Exemption from Additional Environmental Review and 15183 Checklist, dated August 14, 2024, pp. 7-9.)

The Project's Capacity Is and Has Always Been Capped at 400 Megawatts

Lastly, Project opponents have claimed the Humidor BESS is 545 megawatts, not 400 megawatts. The Project has a maximum capacity of 400 megawatts and will never discharge more than 400 megawatts to the grid. The claim that the Project is actually 545 megawtts appears to arise from a misunderstanding of Note 2 on the approved site plan about the need to augment the batteries over time to maintain the maximum capacity of 400 megawatts. Note 2 reflects the fact that over time, battery capacity is anticipated to degrade by 43 percent, requiring addition and/or replacement of battery cells to maintain the maximum capacity of 400 megwatts. As stated in Note 1 on the site plan, the "Maximum Nameplate Capacity of the BESS is 400MW."

The opposition also appears to misconstrue the description of per container capacity on the site plan, asserting that 440 containers x 1.236 megawatt per container equals 544.84 megawatts. However, the 440 containers identified on the Humidor Preliminary Site Layout represent the ultimate end-of-life buildout of the site. Initially, only 324 containers will be present. Over the Project's expected 20-year lifespan, the capacity of the cells will degrade. As they degrade, other batteries referred to as "augmentation cells" will be installed. The correct calculation is 323.625 (rounded to 324) containers x 1.236 megawatt per container, which equals 400 megawatts. Over the Project's life, there will be 116 new containers added, totaling a maximum of 440 containers. But these 440 containers will produce no more than 400 MW because the original containers will continue to operate at a derated level.

Finally, batteries are not plugged directly into the grid. Each unit is connected to an inverter that is controlled to meter out exactly how much power will be supplied to the step-up transformer,

which is then connected to circuits that connect to the new Humidor on-site substation. The on-site substation would not receive or discharge more than 400 megawatts at any given time.

Thank you for your attention to this important matter. We urge the Board of Supervisors to approve the electrical transmission franchise ordinance and assist the County and the state in providing necessary resiliency to the electrical grid to allow for the use of renewable energy to meet our climate goals.

Sincerely,

Anne E. Mudge

City News & Updates

Posted on: September 19, 2024

Air Quality Report and Water Run Off Report for the SDG&E Battery Storage Fire

On September 5 at 12:09, units from the Escondido Fire Department responded to a fire at the SDG&E battery storage facility at 571 Enterprise Street. Upon arrival, crews found an active fire in a Lithium-Ion battery bank. Due to the specific hazards of such fires, a defensive strategy was employed, focusing on protecting adjacent structures containing additional batteries by applying water to those adjacent structures. Evacuations of the surrounding area began at approximately 13:00 on September 5 and remained in effect until September 7.

San Diego County Hazmat arrived to conduct air monitoring from 14:30 to 18:30 at which time only normal products combustion of a structure fire were detected and at levels considered by NIOSH and OSHA to be well below exposure thresholds. Haley & Aldrich Inc.,

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- Fish Report

SDG&E's third-party contractor, began air quality monitoring later that evening and concluded on September 7. The fire was fully extinguished at 01:10 on September 6, with precautionary air monitoring continuing for an additional 12 hours into the afternoon of September 7. At no time during the incident did the levels of Oxygen deviate from 20.9 percent which is considered normal atmospheric level. Any decrease in the percentage of Oxygen would indicate that there was some unknown gas in the atmosphere that was not able to be detected by monitoring equipment. Fortunately, no such deviation was detected. The use of Fluoride reactive test strips was negative at all locations. Additionally, Hydrofluoric acid was not detected at any of the sampling locations.

- Air Quality Report
- Water Run Off Report

Information Requests:

San Diego County HAZMAT/ San Diego City Fire Department HAZMAT

(619) 595-4633

San Diego Gas & Electric/ Haley & Aldrich INC

(877) 866-20266

⇐ **Previous**
Escondido Fire Department Community Survey

Next ⇒
Emergency Repair Work - Grape Day Park Construction

Other News in City News & Updates

Movie in the Park at Dixon Lake

Air Quality Report

This report has been compiled utilizing data provided by San Diego County HAZMAT/ San Diego City Fire Rescue HAZMAT and Haley & Aldrich, Inc.

The information obtained from these sources has been carefully analyzed and incorporated to ensure the accuracy and reliability of the findings.

SDG&E Battery Fire
571 Enterprise Street
Start 9/5/2024 12:09
Repopulate 9/7/2024 12:00

Air quality monitored by San Diego County HAZMAT

- Three types of monitoring units
- First reading taken at 14:30 on 9/5/2024
- Final reading taken at 18:32 on 9/6/2024

Air monitoring equipment (SD HAZMAT)

1. EAGLE 2 CGI
   Last calibrated on 8/30/2024 and was “zeroed” prior to use on incident.
   Standard 4 gas monitor which measures:
   Lower Explosive Limit -**LEL**
   Oxygen -**O2**
   Hydrogen Sulfide-**H2S**
   Carbon Monoxide-**CO**

2. RedWave XplorIR
   Self-Calibrates at device startup.
   Identifies over 5,500 gases at low part per million (ppm) concentrations

3. MultiRAE Pro
   Last calibrated on 8/30/2024 and “zeroed” prior to use on the incident.
   Monitors both chemical threats and gamma radiation and is the only multi-threat monitor with parts per billion

Gases monitored

1. **PH3 (Phosphine)**
2. **Cl2 (Chlorine)**
3. **H2S (Hydrogen Sulfide)**
4. **CO2 (Carbon Dioxide)**
5. **HCN (Hydrogen Cyanide)**
6. **CO (Carbon Monoxide)**
7. **HF (Hydrofluoric Acid)**

Hazmat Exposure Terms

1. TWA (Time-Weighted Average)

- **Definition**: TWA refers to the average exposure to a hazardous substance (usually airborne) over a standard workday, typically 8 hours, and a 40-hour workweek.
- **Purpose**: It is used to assess the cumulative exposure a person may experience and is compared against permissible limits to ensure safety over long-term exposure.

2. STEL (Short-Term Exposure Limit)

- **Definition**: STEL is the maximum concentration to which a person can be exposed to a chemical substance for a short period, typically **15 minutes**, without suffering adverse effects like irritation, chronic or irreversible tissue damage, or narcosis.
- **Purpose**: It helps control exposure to hazardous substances during short bursts of high exposure within a workday.

3. PEL (Permissible Exposure Limit)

- **Definition**: PEL is the maximum amount or concentration of a substance that a person can be exposed to under OSHA (Occupational Safety and Health Administration) regulations over an 8-hour work shift (TWA) or a 40-hour workweek.
- **Purpose**: These are legally enforceable limits to protect workers from the harmful effects of hazardous chemicals and substances in the workplace.

4. REL (Recommended Exposure Limit)

- **Definition**: REL is a recommended exposure limit set by NIOSH (National Institute for Occupational Safety and Health) that suggests maximum allowable concentrations for exposure to substances over a workday or workweek.
- **Purpose**: These limits are non-enforceable but serve as guidelines for employers and regulators to ensure worker safety. They are typically more stringent than PELs.

5. IDLH (Immediately Dangerous to Life or Health)

- **Definition:** the maximum concentration of a chemical in the air to which a person can be exposed for **30 minutes** without suffering life-threatening health effects or death.
- **Purpose:** Determines when workers need to wear protective equipment, such as respirators, and **when emergency evacuation is necessary**. It is critical for ensuring worker safety in hazardous environments.

Summary:

- **TWA** refers to the average exposure over time.
- **STEL** refers to the limit for short-term exposures.
- **PEL** is a legally enforceable limit by OSHA.
- **REL** is a recommended limit by NIOSH (often more conservative than PEL).
- **IDLH** refers to the maximum level of a toxic substance in the air that a person can be exposed to for 30 minutes without experiencing life-threatening effects or being unable to escape.

OSHA and NIOSH exposure limits

1. **Phosphine (PH_3):**
    - **OSHA PEL: 0.3 ppm (TWA)**
    - **NIOSH REL: 0.3 ppm (TWA) / 1 ppm (STEL)**
    - **IDLH 50 ppm**

2. **Chlorine (Cl_2):**
    - **OSHA PEL: 1 ppm (TWA) 3 ppm (STEL)**
    - **NIOSH REL: 0.5 ppm (TWA) / 1 ppm (STEL)**
    - **IDLH 10 ppm**

3. **Hydrogen Sulfide (H_2S):**
    - **OSHA PEL: 20 ppm (TWA) / 50 ppm (STEL)**
    - **NIOSH REL: 10 ppm (TWA) / 15 ppm (STEL)**
    - **IDLH 100 PPM**

4. **Carbon Dioxide (CO_2):**
    - **OSHA PEL: 5,000 ppm**
    - **NIOSH REL: 5,000 ppm (TWA) / 30,000 ppm (STEL)**
    - **IDLH 40,000 ppm**

5. **Hydrogen Cyanide (HCN):**
    - **OSHA PEL: 10 ppm (TWA)**
    - **NIOSH REL: 4.7 ppm (not to be exceeded)**
    - **IDLH 50 ppm**

6. **Carbon Monoxide (CO):**
    - **OSHA PEL: 50 ppm (TWA)**
    - **NIOSH REL: 35 ppm (TWA) / 200 ppm (STEL)**
    - **IDLH 1,200 ppm**

7. **Hydrofluoric Acid (HF):**
    - **OSHA PEL: 3 ppm (TWA) 6 ppm (STEL)**
    - **NIOSH REL: 3 ppm (TWA) 6 ppm (STEL)**
    - **IDLH 30 ppm**

SD County Hazmat Readings in Parts Per Million (PPM)

Location	Distance from Incident (ft)	Time	PH3	CL2	H2S	CO2	HCN	CO
Main Gate	315	14:30	0	0	0	0	0	0
Venture and Simpson	784	14:35	0	0	0	0	0	0
State St (All	1447	14:36	0	0	0	0	0	0
Enterprise and Auto Park	776	18:15	0	0	0	0	0.5	0
Enterprise Gate	262	18:16	0	0	0	18	2	0
Venture and Simpson	784	18:21	0	0	0	0	0.5	0
Venture and State	1108	18:22	0	0	0	0	0.5	0
Market and Auto Park	2227	18:25	0	0	0	0	0	0
Vinewood and Industrial	2280	18:27	0	0	0	0	0.5	0
Andreasen and Simpson	2522	18:29	0	0	0	0	0.5	0
1287 Simpson	3943	18:32	0	0	0	0	0.5	0

Above readings are the peak (highest detected) readings during the entire incident*

*** CO2 sensors are calibrated to account for typical atmospheric CO2 levels, which generally range between 400-420ppm. This ensures that variations above normal levels are easily detectable****

****Negative reading on Fluoride paper at all locations. Non detect for Hydrofluoric Acid (HF) at all sites****

*** All readings taken <u>were well below acceptable exposure limits</u> and considered expected readings during a routine structure fire****

Air quality monitored by SDG&E

- Via 3rd party contractor; Haley & Aldrich, INC.
- Two types of monitoring units
- First reading taken at 20:30 on 9/5/2024
- Final reading taken at 21:36 on9/6/2024

Air monitoring equipment

1. RAE Systems MultiRAE with P2P
   Calibrated on 9/5/2024.
   Multi-threat chemical detector and gas monitor

2. TSI 7575-x Indoor air quality monitor utilizing the TSI 982 Sensor probe
   Monitor calibrated on 8/29/2024.
   Probe calibrated on 3/11/2024.
   Used to monitor indoor air quality

Gases Monitored

- **LEL (Lower Explosive Limit)**
- **HCN (Hydrogen Cyanide)**
- **CO (Carbon Monoxide)**
- **H2S (Hydrogen Sulfide)**
- **O2 (Oxygen)**

***** Only Carbon Monoxide (CO) levels were detected and had readings above 0 but remained well below acceptable exposure limits. Elevated CO readings are expected result during a structure fire*****

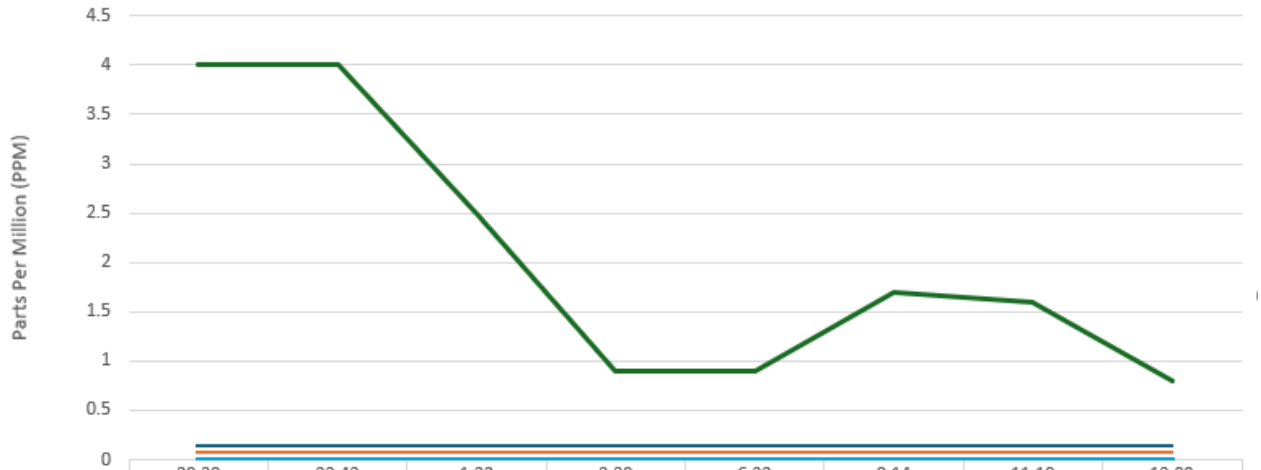
*****Carbon monoxide (CO) levels may be detected in the environment due to various sources of incomplete combustion, including vehicle emissions*****

Haley & Aldrich, INC (SDG&E) Monitoring locations denoted in blue

Monitoring Locations

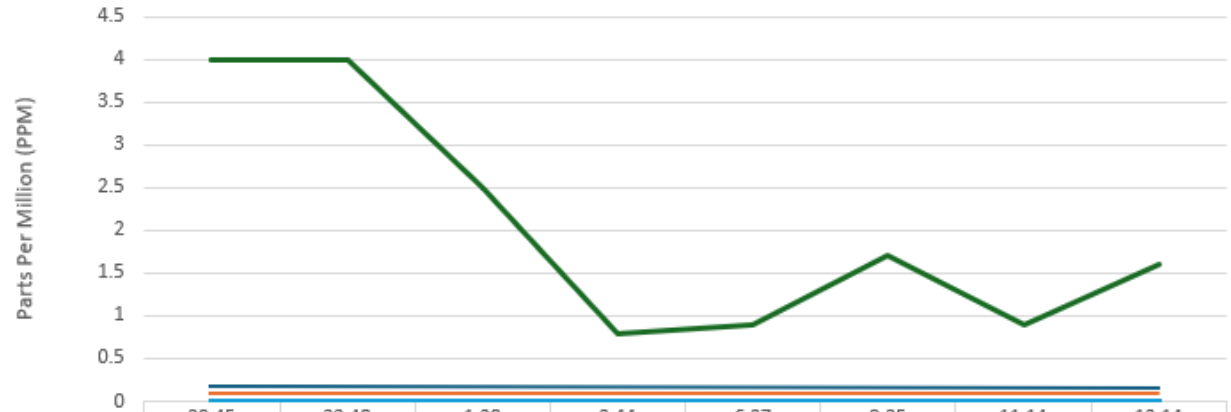
1. **Incident location**: 571 Enterprise St South side of property
2. 571 Enterprise St: Stop sign in equipment yard
3. 571 Enterprise St: Breakroom
4. 571 Enterprise St: Substation
5. 1564 Mission Rd
6. 1856 Commercial St
7. 440 Venture
8. 446 Enterprise St
9. 555 Enterprise St
10. 630 Alpine Wy
11. Alpine Wy and Don Lee
12. Auto Park and Mission Rd
13. Auto Park and Alpine Wy
14. Auto Park and Enterprise
15. Auto Park and Citracado
16. Auto Park and Country Club Dr
17. Enterprise St and Mission Rd
18. Simpson Wy and Ventrure St

1. Air monitoring at SDG&E site location



	20:30 9/5/2024	22:42 9/5/2024	1:32 9/6/2024	3:39 9/6/2024	6:32 9/6/2024	9:14 9/6/2024	11:10 9/6/2024	13:09 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	4	4	2.5	0.9	0.9	1.7	1.6	0.8
H2S	0	0	0	0	0	0	0	0

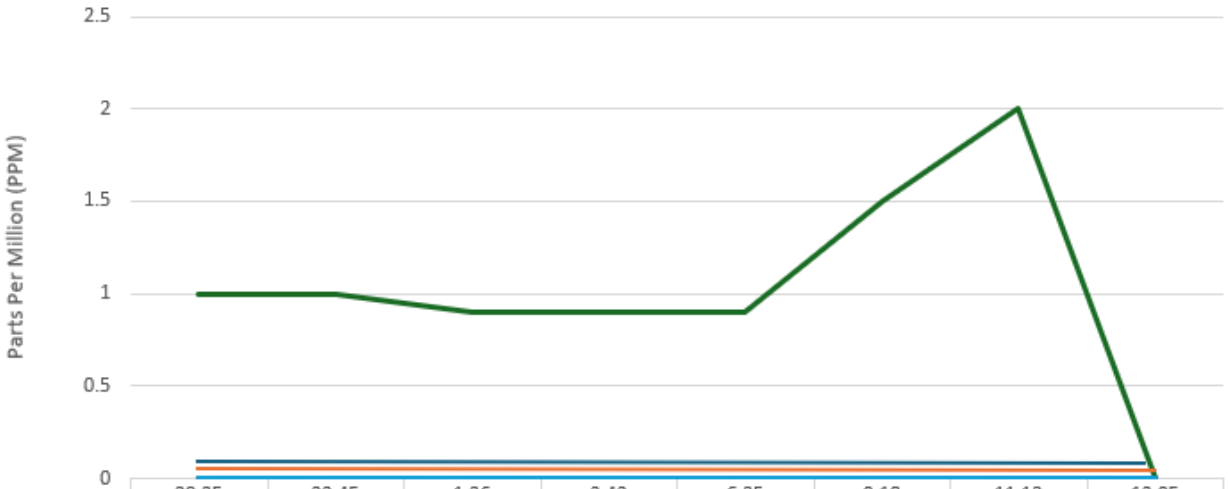
2. Air monitoring at Stop Sign NE corner of Equipment Storage yard



	20:45 9/5/2024	22:48 9/5/2024	1:38 9/6/2024	3:44 9/6/2024	6:37 9/6/2024	9:25 9/6/2024	11:14 9/6/2024	13:14 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	4	4	2.5	0.8	0.9	1.7	0.9	1.6
H2S	0	0	0	0	0	0	0	0

****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

3. Air monitoring at SDG&E Breakroom



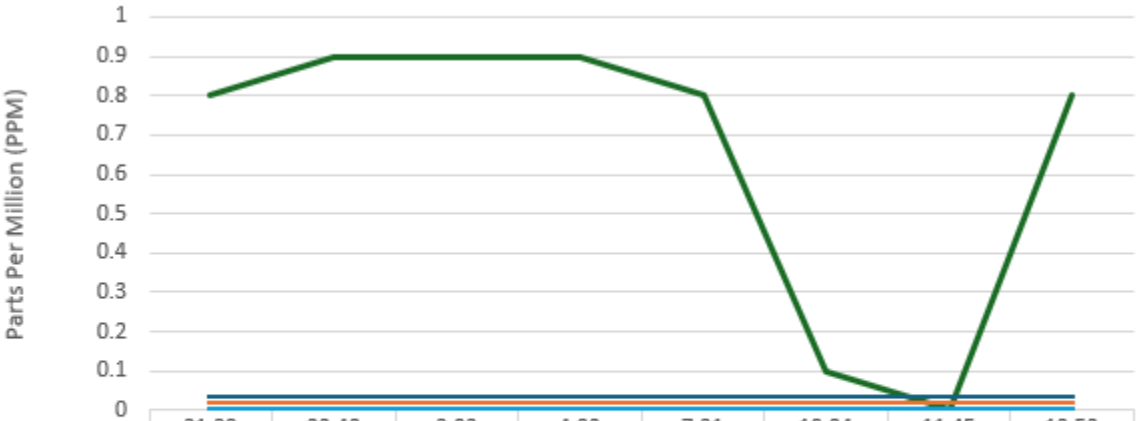
	20:35 9/5/2024	22:45 9/5/2024	1:36 9/6/2024	3:42 9/6/2024	6:35 9/6/2024	9:18 9/6/2024	11:12 9/6/2024	13:05 9/6/2024
LEL(%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	1	1	0.9	0.9	0.9	1.5	2	0
H2S	0	0	0	0	0	0	0	0

4. Air Monitoring at North SDG&E substation

	20:47 9/5/2024	22:52 9/5/2024	1:43 9/6/2024	3:49 9/6/2024	7:16 9/6/2024	9:26 9/6/2024	11:17 9/6/2024	13:22 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	1	1	2.5	0.9	0.9	0.9	0.8	3
H2S	0	0	0	0	0	0	0	0

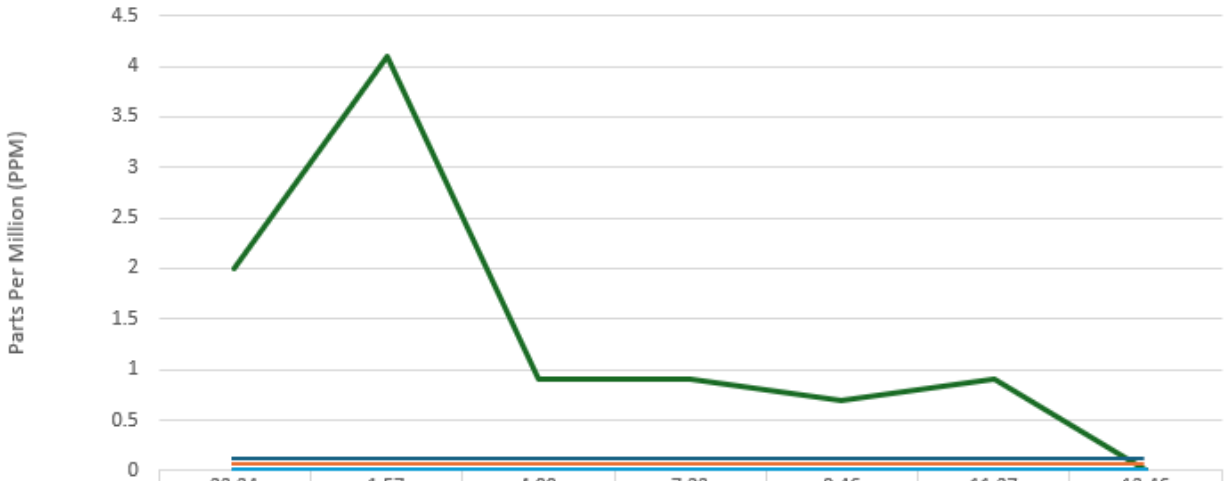
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

5. Air monitoring at 1564 Mission Rd



	21:29 9/5/2024	23:40 9/5/2024	2:03 9/6/2024	4:03 9/6/2024	7:31 9/6/2024	10:04 9/6/2024	11:45 9/6/2024	13:53 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.8	0.9	0.9	0.9	0.8	0.1	0	0.8
H2S	0	0	0	0	0	0	0	0

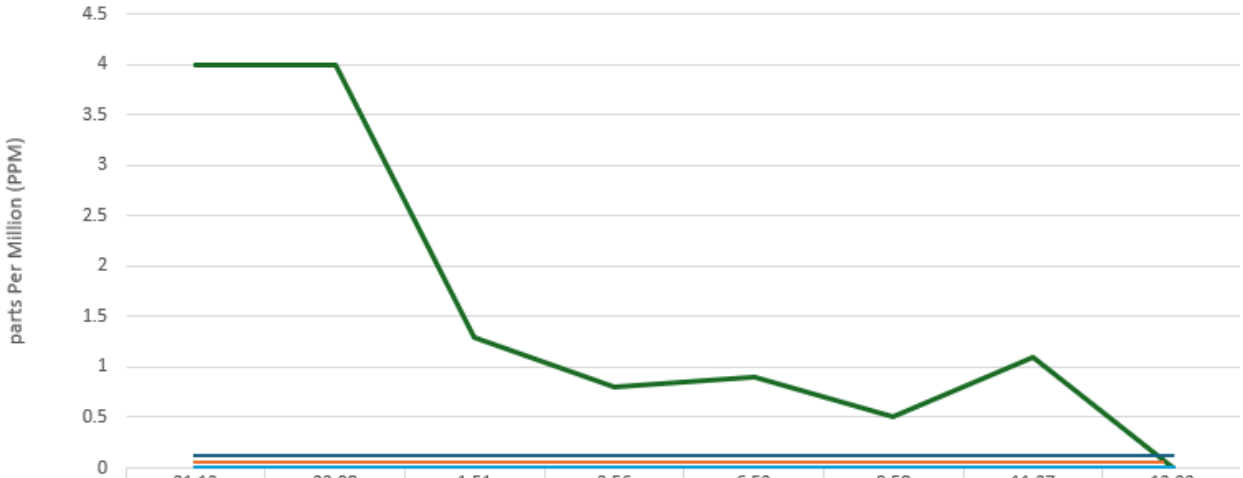
6. Air monitoring at 1856 Commercial St



	23:34 9/5/2024	1:57 9/6/2024	4:00 9/6/2024	7:23 9/6/2024	9:46 9/6/2024	11:37 9/6/2024	13:46 9/6/2024
LEL(%)	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0
CO (PPM)	2	4.1	0.9	0.9	0.7	0.9	0
H2S	0	0	0	0	0	0	0

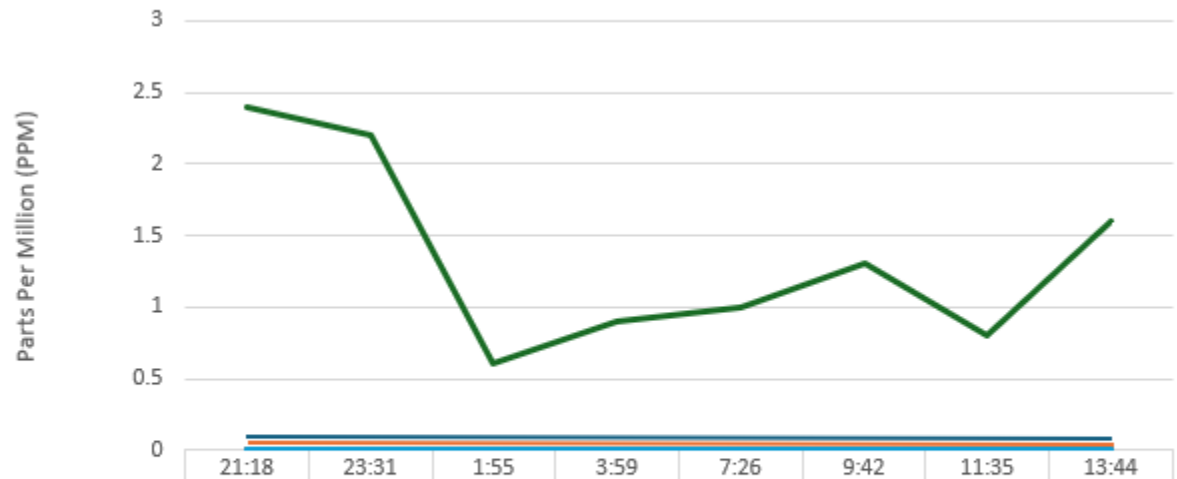
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

7. Air monitoring at 440 Venture Rd



	21:13 9/5/2024	23:08 9/5/2024	1:51 9/6/2024	3:56 9/6/2024	6:52 9/6/2024	9:58 9/6/2024	11:27 9/6/2024	13:33 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	4	4	1.3	0.8	0.9	0.5	1.1	0
H2S	0	0	0	0	0	0	0	0

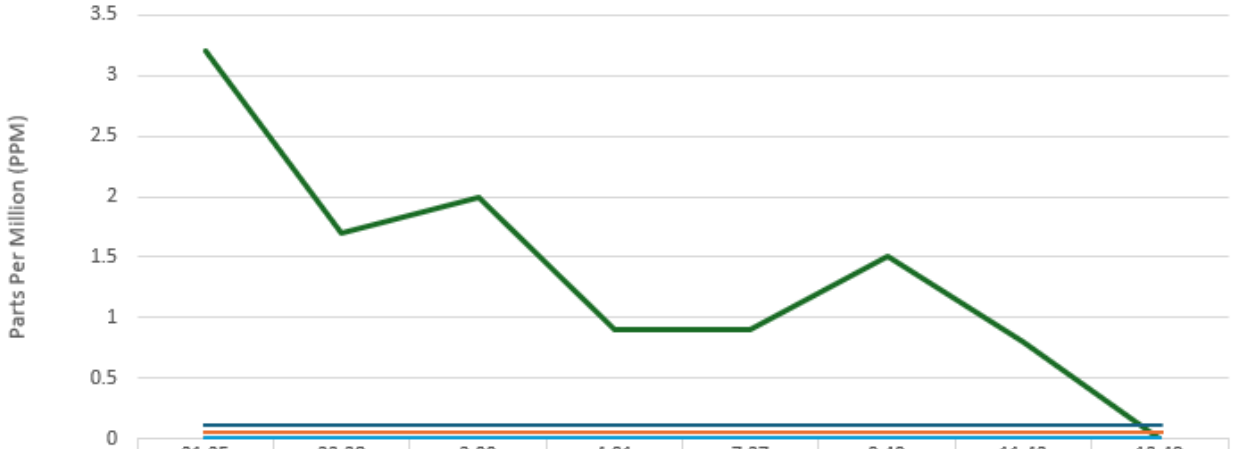
8. Air monitoring at 446 Enterprise



	21:18 9/5/2024	23:31 9/5/2024	1:55 9/6/2024	3:59 9/6/2024	7:26 9/6/2024	9:42 9/6/2024	11:35 9/6/2024	13:44 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO (PPM)	2.4	2.2	0.6	0.9	1	1.3	0.8	1.6
H2S	0	0	0	0	0	0	0	0

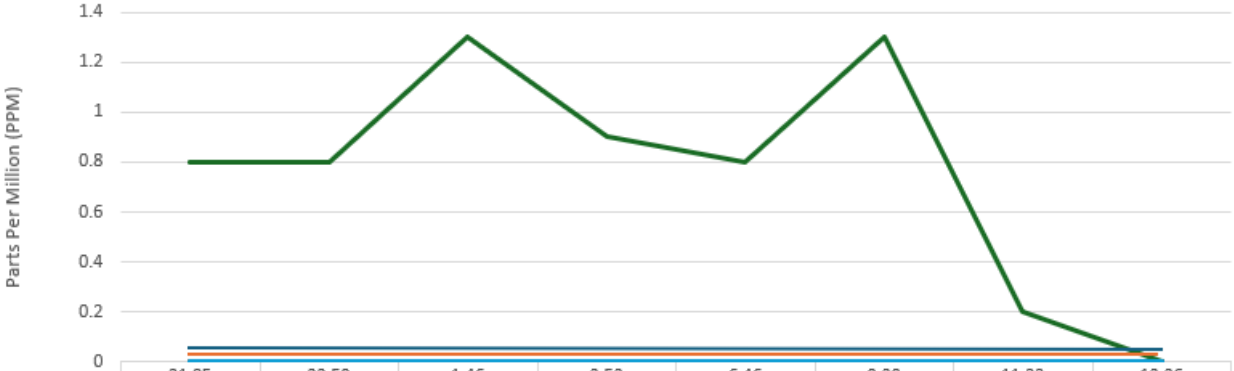
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

9. Air monitoring at 555 Enterprise St



	21:25 9/5/2024	23:38 9/5/2024	2:00 9/6/2024	4:01 9/6/2024	7:27 9/6/2024	9:49 9/6/2024	11:42 9/6/2024	13:49 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	3.2	1.7	2	0.9	0.9	1.5	0.8	0
H2S	0	0	0	0	0	0	0	0

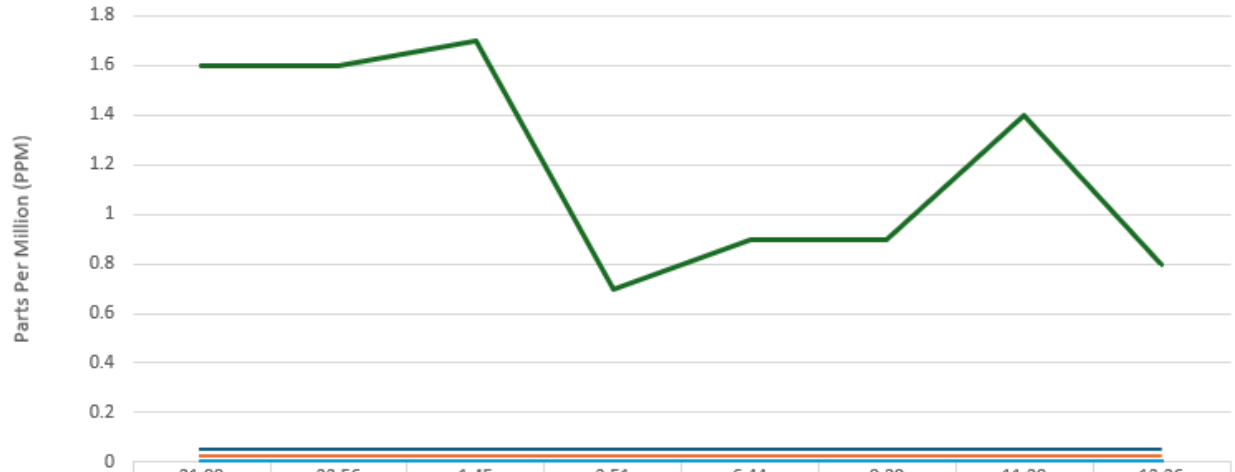
10. Air monitoring at 630 Alpine Wy



	21:05 9/5/2024	22:59 9/5/2024	1:46 9/6/2024	3:52 9/6/2024	6:46 9/6/2024	9:30 9/6/2024	11:23 9/6/2024	13:26 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.8	0.8	1.3	0.9	0.8	1.3	0.2	0
H2S	0	0	0	0	0	0	0	0

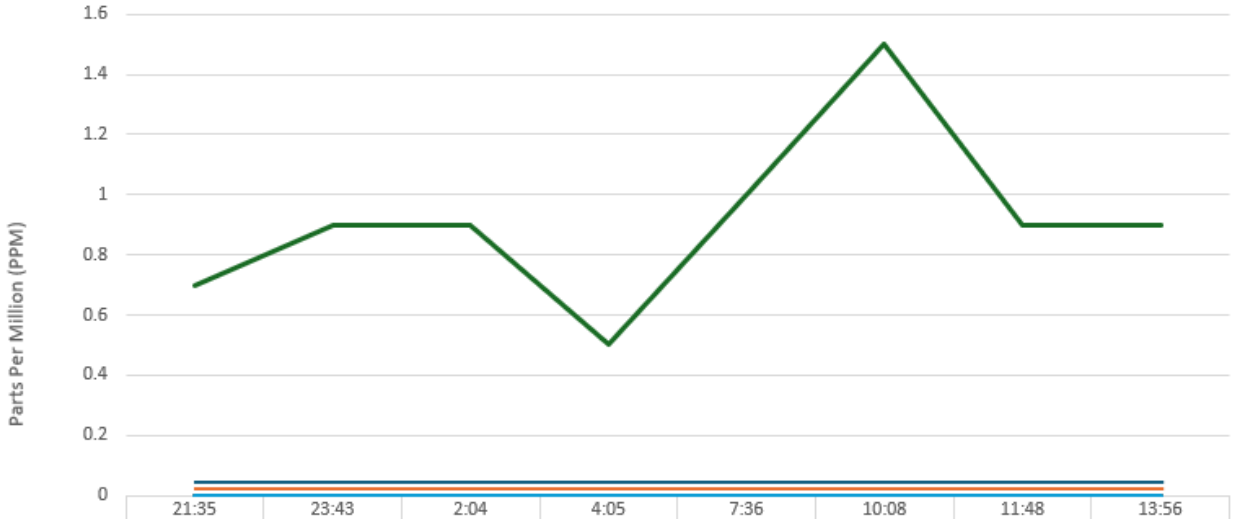
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

11. Air monitoring at Alpine Wy and Don Lee



	21:00 9/5/2024	22:56 9/5/2024	1:45 9/6/2024	3:51 9/6/2024	6:44 9/6/2024	9:29 9/6/2024	11:20 9/6/2024	13:26 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	1.6	1.6	1.7	0.7	0.9	0.9	1.4	0.8
H2S	0	0	0	0	0	0	0	0

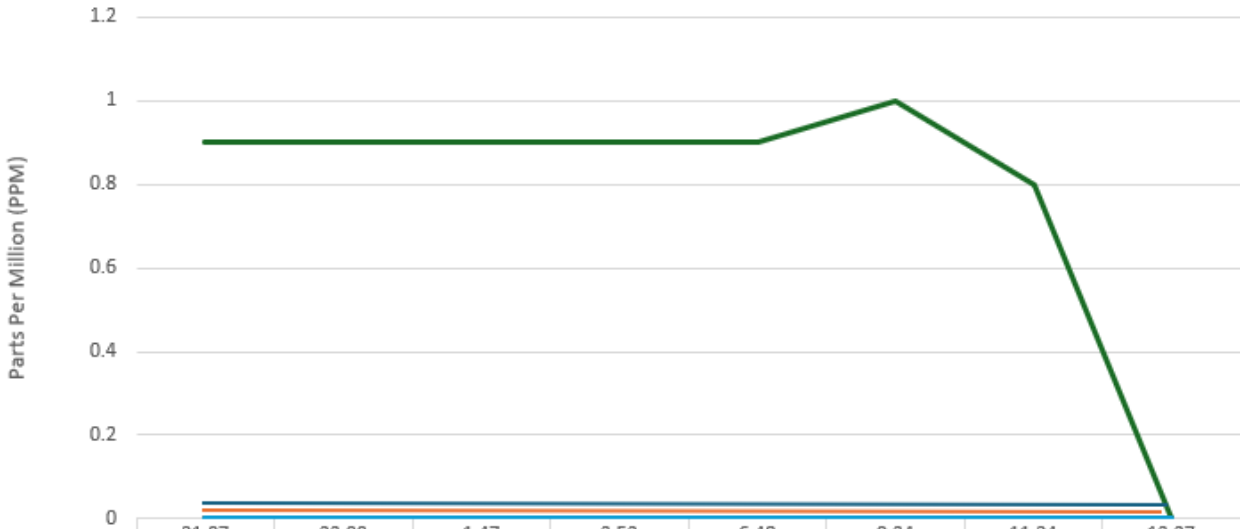
12. Air monitoring at Auto Park Way and Mission Rd



	21:35 9/5/2024	23:43 9/5/2024	2:04 9/6/2024	4:05 9/6/2024	7:36 9/6/2024	10:08 9/6/2024	11:48 9/6/2024	13:56 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.7	0.9	0.9	0.5	1	1.5	0.9	0.9
H2S	0	0	0	0	0	0	0	0

****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

13. Air monitoring at Auto Park and Alpine Wy



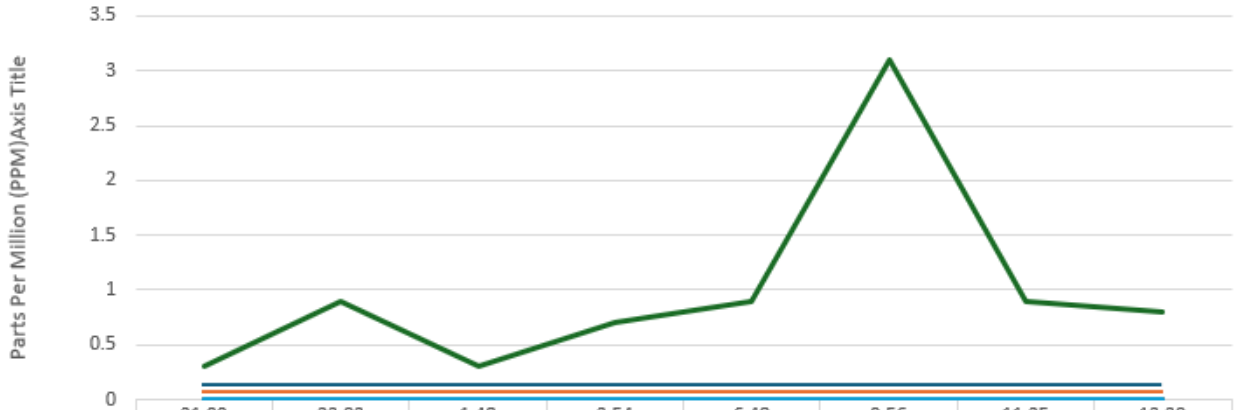
	21:07 9/5/2024	23:00 9/5/2024	1:47 9/6/2024	3:52 9/6/2024	6:48 9/6/2024	9:34 9/6/2024	11:24 9/6/2024	13:27 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.9	0.9	0.9	0.9	0.9	1	0.8	0
H2S	0	0	0	0	0	0	0	0

14. Air monitoring at Auto Park and Enterprise St

	21:10 9/5/2024	23:05 9/5/2024	1:49 9/6/2024	3:55 9/6/2024	7:21 9/6/2024	9:41 9/6/2024	11:34 9/6/2024	13:32 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	1.2	1.2	0.9	0.6	1.4	1.7	0.4	0.8
H2S	0	0	0	0	0	0	0	0

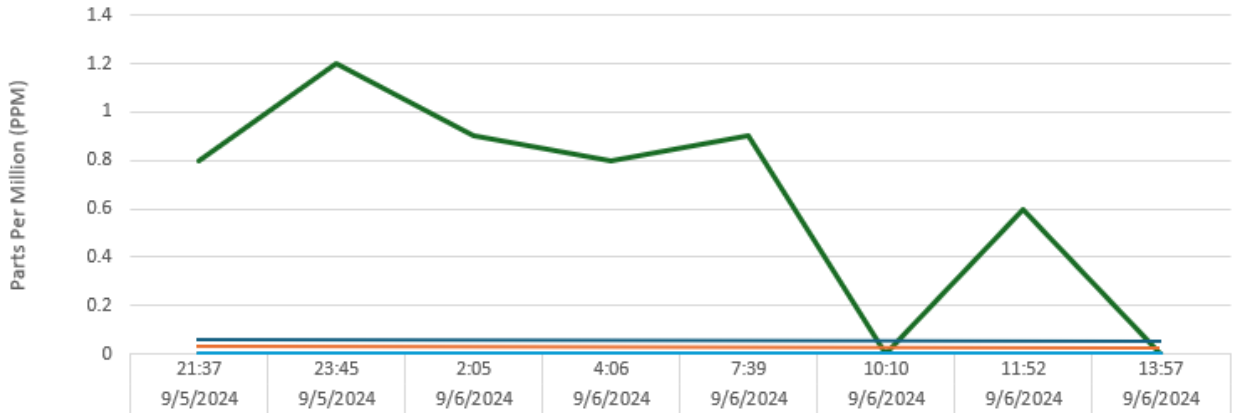
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

15. Air monitoring at Auto Park and Citracado



	21:09 9/5/2024	23:03 9/5/2024	1:48 9/6/2024	3:54 9/6/2024	6:48 9/6/2024	9:56 9/6/2024	11:25 9/6/2024	13:30 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.3	0.9	0.3	0.7	0.9	3.1	0.9	0.8
H2S	0	0	0	0	0	0	0	0

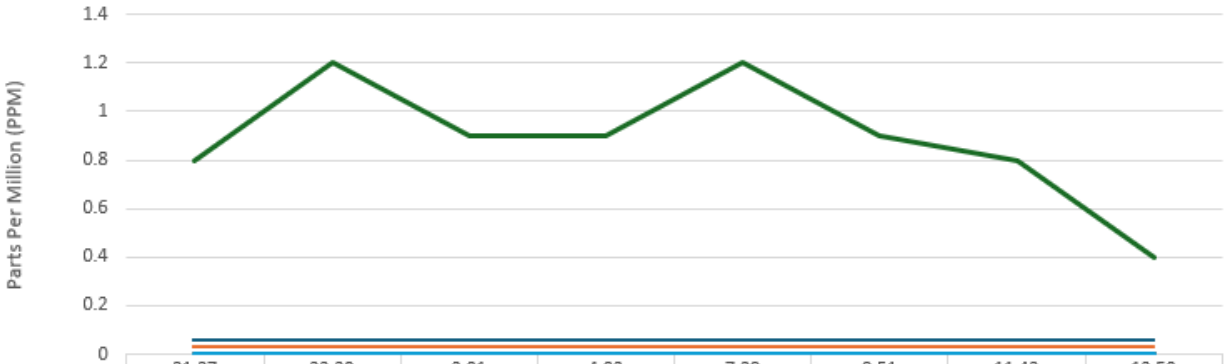
16. Air monitoring at Auto Park Way/Country Club Dr



	21:37 9/5/2024	23:45 9/5/2024	2:05 9/6/2024	4:06 9/6/2024	7:39 9/6/2024	10:10 9/6/2024	11:52 9/6/2024	13:57 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.8	1.2	0.9	0.8	0.9	0	0.6	0
H2S	0	0	0	0	0	0	0	0

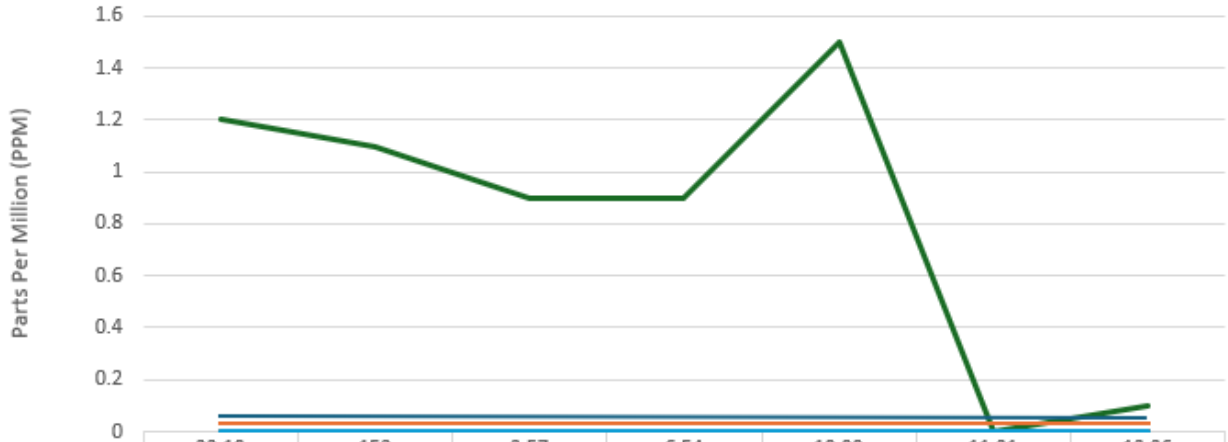
****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

17. Air monitoring at Enterprise and Mission



	21:27 9/5/2024	23:39 9/5/2024	2:01 9/6/2024	4:02 9/6/2024	7:29 9/6/2024	9:51 9/6/2024	11:43 9/6/2024	13:50 9/6/2024
LEL (%)	0	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0	0
CO	0.8	1.2	0.9	0.9	1.2	0.9	0.8	0.4
H2S	0	0	0	0	0	0	0	0

18. Air monitoring at Simpson and Venture



	23:10 9/5/2024	152 9/6/2024	3:57 9/6/2024	6:54 9/6/2024	10:00 9/6/2024	11:31 9/6/2024	13:36 9/6/2024
LEL (%)	0	0	0	0	0	0	0
HCN	0	0	0	0	0	0	0
CO	1.2	1.1	0.9	0.9	1.5	0	0.1
H2S	0	0	0	0	0	0	0

****Urban CO levels are typically higher than in rural areas due to vehicle emissions and industrial processes. Although average concentrations are low (0.5 to 5 ppm), they can increase near heavy traffic or industrial sites, especially during rush hours. The concentrations shown on the graphs remained significantly below harmful thresholds and do not pose any significant health risks ****

Findings:

On September 5 at 12:09, units from the Escondido Fire Department responded to a fire at the SDG&E battery storage facility at 571 Enterprise Street. Upon arrival, crews found an active fire in a Lithium-Ion battery bank. Due to the specific hazards of such fires, a defensive strategy was employed, focusing on protecting adjacent structures containing additional batteries by applying water to those adjacent structures. Evacuations of the surrounding area began at approximately 13:00 on September 5 and remained in effect until September 7. San Diego County Hazmat arrived to conduct air monitoring from 14:30 to 18:30 at which time only normal products combustion of a structure fire were detected and at levels considered by NIOSH and OSHA to be well below exposure thresholds. Haley & Aldrich Inc., SDG&E's third-party contractor, began air quality monitoring later that evening and concluded on September 7. The fire was fully extinguished at 01:10 on September 6, with precautionary air monitoring continuing for an additional 12 hours into the afternoon of September 7. At no time during the incident did the levels of Oxygen deviate from 20.9 percent which is considered normal atmospheric level. Any decrease in the percentage of Oxygen would indicate that there was some unknown gas in the atmosphere that was not able to be detected by monitoring equipment. Fortunately, no such deviation was detected. The use of Fluoride reactive test strips was negative at all locations. Additionally, Hydrofluoric acid was not detected at any of the sampling locations.

Information Requests:

San Diego County HAZMAT/ San Diego City Fire Department HAZMAT
(619) 595-4633

San Diego Gas & Electric/ Haley & Aldrich INC
(877) 866-20266

Water Quality Report

This report was prepared using data obtained from runoff water analysis conducted by Eurofins Calscience, a laboratory accredited for environmental testing. The analysis was reviewed by personnel at the City of Escondido Hale Avenue Resource Recovery Facility (HARRF) laboratory to ensure the accuracy and integrity of the results.

SDG&E Battery Fire

571 Enterprise Street

Start 9/5/2024 12:09

Incident summary

On September 5 at 12:09, units from the Escondido Fire Department responded to structure fire at the SDG&E battery storage facility at 571 Enterprise Street. Upon arrival, crews found an active fire in a Lithium-Ion battery bank. Due to the specific hazards of such fires, a defensive strategy was employed, focusing on protecting adjacent structures containing additional batteries by applying water to those adjacent structures.

Sampling

- The samples were collected on **September 5, 2024 at 18:30 and again at 18:35** and were sent to a 3rd party laboratory for analysis
- The pH of the water sample was recorded at **7.47**, with a temperature of **26.8°C** at the time of testing.

Laboratory Analysis

- The analyses were performed by **Eurofins Calscience**, a laboratory with accreditation for environmental testing (EPA and SW846 protocols were followed).
- Samples were tested for various metals, including **barium, molybdenum, vanadium, copper, zinc, and cobalt**.

Results

- **Barium** concentration was found at **0.115 mg/L**, while the detected levels of **molybdenum**, **vanadium**, **copper**, **zinc**, and **cobalt** were all within acceptable ranges based on the applied methodologies.
- No detectable concentrations of other potentially harmful metals such as **cadmium**, **antimony**, **beryllium**, and **lead** were observed.

Quality Control

- The report indicates thorough quality control (QC) measures were applied, including spike recovery tests to ensure the accuracy and reliability of the results.
- For all tested metals, the recovery rates were within acceptable limits, confirming that the sampling and testing processes were effective.

Analysis

- **Water Quality**: The pH and metal concentrations suggest the water quality was within normal or acceptable ranges for most of the analyzed contaminants. The absence of toxic metals like **cadmium** and **lead** is a positive outcome.
- **Environmental Impact**: The low levels of metals like **barium**, **copper**, and **zinc** indicate that the runoff water does not pose significant environmental hazards.

pH and Temperature:

- **pH Level**: The pH of the water sample was recorded at **7.47**, which is neutral and within the acceptable range for general water quality standards (6.5 to 8.5 for drinking water). This suggests that the water was neither too acidic nor too alkaline.
- **Temperature**: The sample temperature was **26.8°C**, which is within a typical range for water at ambient temperatures. However, temperature could affect the solubility and mobility of metals, especially if the water is in a warmer environment.

Concentration of Detected Metals

- **Barium**:
    - Detected concentration: **0.115 mg/L**.
    - **Barium** is naturally occurring but can enter water through industrial discharge or from drilling operations. According to the **EPA's maximum contaminant level (MCL)** for barium in drinking water, the limit is **2 mg/L**. The detected level of **0.115 mg/L** is well below this threshold, indicating no significant risk from barium in this water sample.
- **Molybdenum**:
    - Detected concentration: **0.0075 mg/L**.
    - **Molybdenum** is an essential trace element, but elevated levels can be harmful to aquatic life. The detected concentration is relatively low and does not raise any immediate concerns. The **WHO** suggests a guideline of **0.07 mg/L** in drinking water, which makes this result favorable.
- **Vanadium**:
    - Detected concentration: **0.0051 mg/L**.
    - **Vanadium** is present in some natural water sources but can also come from industrial activities. There is no widely established regulatory limit for vanadium in drinking water, but concentrations below **0.01 mg/L** are generally considered safe. The level in the sample is well within this range.

- **Copper**:
    - Detected concentration: **0.0216 mg/L**.
    - The **EPA** action level for copper in drinking water is **1.3 mg/L**. The detected concentration of copper in the sample is far below this limit, indicating that the water is safe from copper-related toxicity.
- **Zinc**:
    - Detected concentration: **0.0767 mg/L**.
    - **Zinc** is essential for human health, but at higher concentrations, it can impart a metallic taste to water and cause health issues. The **EPA** has set a secondary maximum contaminant level (SMCL) of **5 mg/L** for zinc, primarily for aesthetic concerns. The concentration in this sample is well below this level, indicating no risk from zinc contamination.
- **Cobalt**:
    - Detected concentration: **0.0014 mg/L**.
    - **Cobalt** is another essential element but can be toxic at higher levels. There are no specific regulatory limits for cobalt in drinking water, but the detected amount in the sample is extremely low and does not pose any immediate health concerns.

Non-Detected Metals

- **Cadmium**, **antimony**, **beryllium**, **thallium**, **nickel**, **silver**, **arsenic**, **lead**, **selenium**, and **chromium** were **not detected** in the samples. This is a positive result as these metals are known for their potential toxicity and environmental persistence. The absence of these contaminants suggests that the water is not exposed to significant industrial pollution or corrosion from pipes that could introduce these metals.

Mercury Analysis

- **Mercury** was **not** detected in the samples, which is significant because mercury is highly toxic, especially in its methylated form. Even small amounts of mercury can have serious health and ecological impacts. The non-detect result (ND) indicates that the water is free from mercury contamination.

Comparative Toxicity and Environmental Impact

- The presence of trace amounts of metals like **zinc**, **copper**, and **barium** is typical in urban environments where water can come into contact with various materials and sediments. However, the levels detected in this sample do not indicate a significant environmental or health hazard.
- The absence of **toxic metals** such as **lead**, **cadmium**, and **mercury** further support that this water is unlikely to contribute to significant contamination of the environment.
- Laboratory personnel at the Hale Avenue Resource Recovery Facility (HARRF) laboratory were consulted regarding the results of the runoff water analysis and confirmed that there were no concerns with this water entering the environment.

Conclusion:

The analysis of the samples collected from the runoff water suggests that the water quality is within acceptable limits for most contaminants, especially when considering public health standards for drinking water. The low levels of metals detected, combined with the absence of more toxic elements like **lead** and **cadmium**, suggest that the water poses minimal risk both to human health and the environment.

Information Requests:

San Diego Gas & Electric/ Eurofins Calscience

(877) 866-20266

From: ExecutiveOffice
To: PublicComments
Subject: FW: Hecate battery storage support
Date: Wednesday, October 30, 2024 9:30:39 PM

The following correspondence is being forwarded to you for your handling.

From: Dale Herbert <daletranspo@gmail.com>
Sent: Monday, September 16, 2024 4:01 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Hecate battery storage support

To the Los Angeles Board of Supervisors,

I am writing as a resident of LA County in favor of Hecate Grid's battery storage project in Acton. Im a resident of 7 years in this community. Hecate has shown that they will be a good partner to our county, not only through careful siting practices but with the economic benefits that go along with the project.

During construction, there will be union construction jobs available. These are good paying jobs that help support working families. There will also be long term positions available during the operation of the project.

Additionally, millions will be provided through the tax revenue over the life of the project. This can help support essential services such as first responders and infrastructure.

Please consider the benefits this project would have not only for Acton but for LA County as a whole. I hope that you will grant Hecate the franchise agreement they need to move forward.

Thank you.

Dale Herbert III

From:	ExecutiveOffice
To:	PublicComments
Subject:	FW: The website wasn"t working
Date:	Wednesday, October 30, 2024 8:27:28 PM
Attachments:	Please Listen to the Residents, we"re not wrong..pdf

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The following correspondence is being forwarded to you for your review/information .

From: Beth Placek <bethplacek@gmail.com>
Sent: Tuesday, October 22, 2024 10:18 AM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: The website wasn't working

I attempted to submit a comment for the board meeting today but the site wasn't working properly and my document would not upload.

Please read my letter. We are part of an amazing community and we deserve to be heard and listened to.

Sincerely,
Beth Blumin

bethplacek@gmail.com
402-630-4123

15526 Lemoli Ave.
Gardena, CA 90249

I am not opposed to housing developments. I fully appreciate the dire need for affordable housing here in un LA and that if there is more supply it should drive the cost down. I have known friends with adult children that have left the state because they can't afford to start their lives here. However, I am opposed to working toward housing in a hastily ill-conceived way.

The two housing developments plan to have a total of 225 units on what were small corner lot gas stations. They will have units of only 200-250 square feet which isn't much bigger than a bedroom. In order to fit this many units into such a small lot the buildings are going to be 7 stories tall, which in no way aligns with the neighborhood and that is one of the stipulations within the law. On paper it would seem that these are going to be single person units as they are so small, but please don't be naive to the reality of living in Los Angeles. Many if not all of the units will have 2 or more people living in them.

There is no planned parking and these units will fall within the unincorporated neighborhood of El Camino Village where the residents already need to have parking permits as parking is an issue. There is street sweeping 2 days a week between the hours of 0600-0800 when residents are still home causing the entire neighborhood to have to park on only one side of the street. This already has people parking over sidewalks and covering parts of driveways. This same situation happens again on trash day. So that's 3 days of the week where challenging parking becomes ever more difficult than it already was.

The plan for the development stated that there was "high quality transit" nearby. I think we all need clarity as to what constitutes high quality transit, given that there is only a bus route that comes at non-incremental times and a metro line that is 2.5 miles away which equates to a 58 minute walk. People have cars in LA. Yes, I think everyone would love to see LA be more public transportation friendly. I have wanted for years to be able to get outside of the South Bay for dining and entertainment but it's such a tremendous time constraint due to traffic. But the reality is that we don't have good public transportation. Los Angeles fell behind and has been unable to catch up. We cannot put housing in and pray, hope and cross our fingers that the infrastructure for public transportation will follow. As it stands the South Bay has been almost completely ignored when it comes to public transportation. Putting up housing like and stating there is quality transit, is basically a lie and clearly putting the cart before the horse.

There are already a lot of traffic issues for our neighborhood. I live on Lemoli Ave which has been a drag strip for people wanting to avoid Crenshaw. It is a straight shot between Manhattan Beach Blvd. and Marine with 1 stop sign. It's capped by two lights so people speed down the street to make the lights.

We already have safety issues in our community as our closest law enforcement is not the sheriff station at 15331 Prairie Ave, 90260 but instead the station 1310 W. Imperial Hwy, 90044. When we call for law enforcement if they are coming from the station it's a 4.7 mile drive which equates to a 9-15 minute drive time. Could be worse depending on good ol' LA traffic. By no means am I implying that this specific development automatically brings a need for law

enforcement but an increase in people does. There will be more people having issues and needs for law enforcement which is simple population conversations and understanding.

Again, I want to say that I am not against the development of housing. But there is a right way and a wrong way we can do it. The right steps would be to have not pushed this through so hastily. I personally believe you knew there would be push back so the approval was rushed through. I also think that site was chosen specifically because we are unincorporated and don't have a city government to help us. The right way to do this would be to talk to the community first. Let us understand the wants and needs and discuss reasonable solutions. Solutions that result in compromise and common sense solutions. I can assure you had a development plan come to us with a plan of 2 buildings, 4 -5 stories, planned small retail (restaurants, service, shopping) on the ground level and parking most of us would have been ok with it. Something like that would have brought value to our community but instead what is planned will only bring frustration and endless problems and difficulties.

I ask that you seriously look at the cons of this and listen to the residents. We are not unreasonable people. We know and understand that life has compromises. We know LA needs affordable housing, we know LA needs public transit. But we were never part of the conversation and were told, not asked about something that brings no benefit to us or our community.

Sincerely,

Elizabeth Blumin
Blumin Residence
Family of 4
15526 Lemoli Ave.
El Camino Village, CA 90249

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Support for the Humidor Battery Energy Storage System (BESS) Project
Date:	Wednesday, October 30, 2024 5:39:36 PM

The following correspondence is being forwarded to you for your review/information.

From: hweinstein@umail.ucsb.edu <hweinstein@umail.ucsb.edu>
Sent: Friday, October 25, 2024 11:41 AM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Support for the Humidor Battery Energy Storage System (BESS) Project

Dear Chair Horvath and Members of the Board of Supervisors,

I'm writing to encourage your approval of the Humidor Battery Energy Storage System (BESS) franchise agreement on October 29. This County-approved project awaits only your endorsement of the franchise agreement to move forward.

The Humidor BESS offers several immediate benefits to our community:

- Reduces dependence on fossil fuels
- Increases access to renewable energy
- Alleviates grid congestion in a critical area
- Creates local jobs during construction
- Minimizes environmental impact by utilizing existing industrial land

As an Environmental Studies student at UC Santa Barbara, I understand that battery storage projects like this are essential for building a stable and sustainable clean energy grid in California. My studies have shown me that projects like the Humidor BESS represent pivotal steps toward enhancing grid reliability while supporting our renewable energy goals.

I urge you to approve this franchise agreement and help advance our progress toward a resilient, clean energy future.

Thank you for your consideration.

Sincerely,
Haley Weinstein
Environmental Studies Student
University of California, Santa Barbara

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: Letter of Support for Hecate Grid Humidor
Date:	Wednesday, October 30, 2024 5:37:19 PM

The following correspondence is being forwarded to you for your review and information.

-----Original Message-----
From: Julie dC Lowe <juliedclowe@gmail.com>
Sent: Friday, October 25, 2024 1:06 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Subject: Letter of Support for Hecate Grid Humidor

CAUTION: External Email. Proceed Responsibly.

Dear LA County Supervisors,

I wanted to express my support for Hecate's Humidor Battery Storage System at the upcoming October 29 th hearing.

Hecate Grid has shown that the project will enhance grid reliability for our community.

This project has been properly sited away from residential neighborhoods, on industrial land located adjacent to grid infrastructure. This important location will ensure that the system is able to efficiently connect to our current energy system to support the grid when we need it the most.

Hecate has done its due diligence to ensure that this project will not only have respect for the environmental and cultural resources in the area, but it has been tested to ensure compatibility in climates and conditions similar to that of Acton.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project. Thank you.

Sincerely,

Julie Lowe

From:	ExecutiveOffice
To:	First District; Holly J. Mitchell; Third District; Supervisor Janice Hahn (Fourth District); Barger, Kathryn
Cc:	PublicComments
Subject:	FW: The Adept Group, Inc."s Support for Humidor BESS Project
Date:	Wednesday, October 30, 2024 5:28:14 PM
Attachments:	Humidor_Letter of Support_ADEPT_Oct_25_2024.pdf

The following correspondence is being forwarded to you for your information.

From: Alex Moutoux <amoutoux@adeptgroup.net>
Sent: Friday, October 25, 2024 3:56 PM
To: ExecutiveOffice <ExecutiveOffice@bos.lacounty.gov>
Cc: Liam Hurley <lhurley@adeptgroup.net>; Alex Spataru <aspataru@adeptgroup.net>
Subject: The Adept Group, Inc.'s Support for Humidor BESS Project

Dear Chair Horvath & LA County Board of Supervisors,

In preparation for the upcoming Board of Supervisors meeting on 29 October, The Adept Group, Inc. (ADEPT) would like to emphasize our support for the Humidor Battery Energy Storage System (BESS). Attached please kindly find a Letter of Support stating as much.

ADEPT is a small, LA based, veteran owned, engineering and project development firm. ADEPT is well versed in green energy engagements (e.g., geothermal, small hydro, solar, wind, landfill gas). Its work portfolio includes microgrids, the hydrogen ecosystem, and the decarbonization of the maritime industries.

ADEPT thanks the LA County Board of Supervisors for its ongoing commitment to modernizing the electrical grid and to lower harmful greenhouse gases and air pollution.

Thank you.
Best,

Alex Moutoux (he/him)
Vice-President
amoutoux@adeptgroup.net | +1 (650) 339-3168
THE ADEPT **GROUP**, INC.

THE ADEPT GROUP, INC.

October 25, 2024

Dear Chair Horvath and LA County Board of Supervisors,

The Adept Group, Inc. (ADEPT) is pleased to support the Humidor Storage Project. This 400-megawatt (MW) & 1,200-megawatt-hour (MWh) battery electric storage system (BESS) intends to connect to the grid - at the existing Vincent Substation – via an approx. one-mile, underground electric line. Humidor will lower congestion at this vital grid site, while maximizing the ability for renewable energy to be delivered to loads – and thus minimizing renewable energy curtailment.

Humidor BESS will have a massive impact in reducing greenhouse gas emissions and criteria pollutants in the LA basin. With the Los Angeles County Board of Supervisors' approval, this project can significantly move the needle toward decarbonization of LA county. Grid-scale battery storage, like the Humidor Storage Project, is key to helping renewables replace gas plants during peak demand hours.

ADEPT is a small, LA based, veteran owned, engineering and project development firm. ADEPT is well versed in green energy engagements (e.g., geothermal, small hydro, solar, wind, landfill gas). Its work portfolio includes microgrids, the hydrogen ecosystem, and the decarbonization of the maritime industries.

ADEPT thanks the LA County Board of Supervisors for its ongoing commitment to modernizing the electrical grid and to lower harmful greenhouse gases and air pollution.

Sincerely,

Alex Spataru
CEO

From: Matthew Correia
To: ExecutiveOffice
Subject: Grid
Date: Friday, October 25, 2024 8:32:56 AM

Grid Reliability/Enable Renewables (Subject Line) Dear Los Angeles County Board of Supervisors, I am writing to you today in support of ensuring grid reliability in LA County. Hecate Grid's battery storage project, Project Humidor, is a step in the right direction. Projects like these can help provide us with the power we need during critical times. As LA County residents, we are all too familiar with heat waves and subsequent power outages from the overuse of our power grid. Battery storage projects, like Project Humidor, help to supplement our grid and keep our lights on and our AC working when we need it most. Battery storage projects also help enable the use of renewable energy and eliminate the need to rely on gas-fired power plants during times of high energy use. This supports our residents here in LA County and our environment. I hope you will join me in voicing your support for Hecate Grid's Project Humidor at the October 29 th meeting. Thank you.

From: Samantha Dorenfeld
To: ExecutiveOffice
Subject: Grid Reliability/Enable Renewables
Date: Friday, October 25, 2024 8:51:44 AM

CAUTION: External Email. Proceed Responsibly.

Dear Los Angeles County Board of Supervisors,

I am writing to you today in support of ensuring grid reliability in LA County. Hecate Grid's battery storage project, Project Humidor, is a step in the right direction. Projects like these can help provide us with the power we need during critical times.

As LA County residents, we are all too familiar with heat waves and subsequent power outages from the overuse of our power grid. Battery storage projects, like Project Humidor, help to supplement our grid and keep our lights on and our AC working when we need it most.

Battery storage projects also help enable the use of renewable energy and eliminate the need to rely on gas-fired power plants during times of high energy use. This supports our residents here in LA County and our environment.

I hope you will join me in voicing your support for Hecate Grid's Project Humidor at the October 29th meeting.

Thank you.

Samantha Dorenfeld

From: Kaylie Gomez
To: ExecutiveOffice
Subject: Grid Reliability/Enable Renewables
Date: Friday, October 25, 2024 8:51:52 AM

CAUTION: External Email. Proceed Responsibly.

Dear Los Angeles County Board of Supervisors,

I am writing to you today in support of ensuring grid reliability in LA County. Hecate Grid's battery storage project, Project Humidor, is a step in the right direction. Projects like these can help provide us with the power we need during critical times.

As LA County residents, we are all too familiar with heat waves and subsequent power outages from the overuse of our power grid. Battery storage projects, like Project Humidor, help to supplement our grid and keep our lights on and our AC working when we need it most.

Battery storage projects also help enable the use of renewable energy and eliminate the need to rely on gas-fired power plants during times of high energy use. This supports our residents here in LA County and our environment.

I hope you will join me in voicing your support for Hecate Grid's Project Humidor at the October 29th meeting.

Thank you.

Sent from my iPhone

From:	BENJAMIN OAKES
To:	ExecutiveOffice
Subject:	Support for the Humidor BESS Project from a UCLA Policy Student
Date:	Friday, October 25, 2024 11:12:15 AM

Dear Chair Horvath and Board of Supervisors,

I write to you as a UCLA Public Affairs student to express my support for the Humidor Battery Energy Storage System (BESS). I have been closely following the progress of this project and urge the Board of Supervisors to vote in favor of its development at the October 29th meeting.

In California's clean energy transition, significant deployments of battery storage will be necessary to meet the need for peak electricity demand. As a UCLA student studying policy, I view the Humidor BESS as a significant step forward in preparing the grid for this decarbonized future, while providing immediate benefits to the grid and local community. Notably, the Humidor BESS has already received County approval, and the Board of Supervisors now only needs to approve the project's franchise agreement.

The Humidor BESS will deliver numerous benefits, including reduced reliance on fossil-fuel generators and increased renewable energy delivery. Its location at a key grid intersection will significantly ease congestion and enhance resilience for the local community. These communities will also experience immediate economic benefits from the jobs created during the project’s deployment. Moreover, the project’s location on developed industrial land, isolated from residential areas and other facilities, helps preserve pristine lands and reduces the need for future BESS deployments on these lands.

I strongly urge you to approve the franchise agreement for the Humidor BESS and help guide Los Angeles County toward a clean energy future.

Sincerely,

Benjamin Oakes

From: Eric Velazquez
To: ExecutiveOffice
Subject: Grid Reliability/Enable Renewables
Date: Thursday, October 24, 2024 2:36:10 PM

To the Los Angeles Board of Supervisors,

I am writing to you today to express my support for Hecate Grid's Humidor Storage project at the upcoming hearing. As you consider granting their franchise agreement, I urge you to think about the grid reliability that this project will have for the local community.

Here in Palmdale, we are familiar with brownouts and blackouts. During these peak times in California's electricity demand, especially during the summer months or in a heat like we experienced at the beginning of September, battery storage can be used to help meet energy needs.

By storing renewable energy when it's not needed, battery storage facilities, like this one, will help power thousands of homes in the area when it's needed most.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you..

From: Ashleigh Gallant
To: ExecutiveOffice
Subject: Letter of Support for Hecate Grid Humidor
Date: Thursday, October 24, 2024 12:51:42 PM

CAUTION: External Email. Proceed Responsibly.

Dear LA County Supervisors,

I wanted to express my support for Hecate's Humidor Battery Storage System at the upcoming October 29 th hearing.

Hecate Grid has shown that the project will enhance grid reliability for our community.

This project has been properly sited away from residential neighborhoods, on industrial land located adjacent to grid infrastructure. This important location will ensure that the system is able to efficiently connect to our current energy system to support the grid when we need it the most.

Hecate has done its due diligence to ensure that this project will not only have respect for the environmental and cultural resources in the area, but it has been tested to ensure compatibility in climates and conditions similar to that of Acton.

I hope that you will join me in supporting battery storage projects here in the County, starting with the Humidor Storage Project.

Thank you.

Ashleigh Gallant

From: Mallory Mead
To: ExecutiveOffice
Subject: LA County Energy Storage Project
Date: Thursday, October 24, 2024 12:24:16 PM

To the Los Angeles County Board of Supervisors,

Please join me in expressing support for Hecate Grid's battery storage project and all of its associated economic benefits.

Throughout the permitting process, Hecate Grid has shown the immense economic benefits that this project would have for LA County. Not only would it bring hundreds of union jobs and a few, good paying long-term jobs, but the project would also generate millions in tax revenue each year.

Over the life of the project, it is expected to generate between $40-70 million in tax revenue. This can be used to help fund essential community services like police, fire and schools as well as infrastructure improvements.

I hope you will take this into consideration, as the project is up for deliberation for its Franchise Agreement.

Thank you.

Mallory Mead

From:	Craig Lewis
To:	ExecutiveOffice
Subject:	Please support the Humidor Battery Energy Storage System (BESS)
Date:	Thursday, October 24, 2024 9:25:25 AM
Attachments:	Humidor BESS benefits information letter (09_jh, 26 Aug 2024).pdf Humidor BESS - enhancing renewables & resilience for LA (10a_cl, 19 Jun 2024).pptx

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Dear Chair Horvath and Board Supervisors:

In preparation for the upcoming Board of Supervisors meeting on 29 October, I want to reemphasize the Clean Coalition's support for the Humidor Battery Energy Storage System (BESS). I will be in attendance to provide verbal comments on the 29th and will be happy to answer any questions you might have for me in person.

As noted in my email dated 27 September (shown under this email), the Clean Coalition is a very technical nonprofit with a mission to accelerate the transition to renewable energy and a modern grid. The Clean Coalition has performed substantial analysis on many of the benefits that Humidor will deliver. The findings, as conveyed in the attached presentation, show that the Humidor BESS is being sited at an ideal location, near the massive Vincent Substation where the BESS is poised to deliver numerous location-specific benefits that include the following:

- Enhancing a key intersection of the grid by reducing grid congestion and improving grid reliability.
- Maximizing the delivery of renewable energy and minimizing the use of gas-fired generators.
- Utilizing disturbed land in an industrial zone and ensuring that fewer deployments of future BESS will be needed on pristine lands.

The Humidor BESS will deliver many additional benefits, as highlighted in the attached presentation and in the attached group support letter from the Clean Coalition, NRDC, Climate Resolve, Permacity Foundation, and Elders Climate Action.

I am happy to answer any questions you might have for me, including via email any time and/or in person on 29 October.

In summary, the Clean Coalition strongly encourages the County to fully support the Humidor BESS, including by approving its necessary franchise agreement.

Sincerely,

Craig Lewis
Executive Director
Clean Coalition
Santa Barbara | Menlo Park | Colorado Springs
650-796-2353 mobile
craig@clean-coalition.org

---------- Forwarded message ---------
From: **Craig Lewis** <craig@clean-coalition.org>
Date: Fri, Sep 27, 2024 at 3:44 PM
Subject: Please support the Humidor Battery Energy Storage System (BESS)
To: <executiveoffice@bos.lacounty.gov>

Dear Chair Horvath and Board Supervisors:

The Clean Coalition is a very technical nonprofit with a mission to accelerate the transition to renewable energy and a modern grid. As the Executive Director of the Clean Coalition, I am writing to express the Clean Coalition's support for the Humidor Battery Energy Storage System (BESS). I also plan to express support verbally at the Board of Supervisors meeting on 8 October, at which the necessary franchise agreement for the Humidor BESS is expected to be on the agenda.

Importantly, the Humidor BESS is being sited at an ideal location, near the massive Vincent Substation in north Los Angeles County where the BESS is poised to deliver numerous location-specific benefits that include the following:

- Enhancing a key intersection of the grid by reducing grid congestion and improving grid reliability.
- Maximizing the delivery of renewable energy and minimizing the use of gas-fired generators.
- Utilizing disturbed land in an industrial zone and ensuring that fewer deployments of future BESS will be needed on pristine lands.

The Humidor BESS will deliver many additional benefits, and the attached group support letter from the Clean Coalition, NRDC, Climate Resolve, Permacity Foundation, and Elders Climate Action highlights the details.

I am happy to answer any questions you might have for me, including via email and/or during the 8 October Board of Supervisors meeting at which I plan to participate by making verbal comments that reinforce the Clean Coalition's support for the very important Humidor BESS.

Overall, the Clean Coalition strongly encourages the County to fully support the Humidor BESS, including by approving its necessary franchise agreement.

Sincerely,

Craig Lewis
Executive Director
Clean Coalition
Santa Barbara | Menlo Park | Colorado Springs
650-796-2353 mobile
craig@clean-coalition.org

Humidor Storage Project – SUPPORT

To whom it may concern,

The Clean Coalition (clean-coalition.org), a technical nonprofit organization with a mission to accelerate the transition to renewable energy and a modern grid, is supporting the Los Angeles County Board of Supervisors approval of a franchise agreement that will allow for the approved Humidor Battery Energy Storage System (BESS) to connect to the grid at the existing Vincent Substation with an approximately one-mile, undergrounded electrical line. This 400-megawatt (MW) & 1,200-megawatt-hour (MWh) BESS has an approved site plan review and will be located on disturbed land near the existing Vincent Substation in Acton, California. The connection of Humidor to the grid is key to maximizing renewable energy generation, reducing grid congestion, and improving grid reliability throughout Los Angeles County – and even across the entire State of California. The Vincent Substation serves as a vital intersection of transmission & distribution lines that tie renewable energy from the Central Valley to loads throughout Los Angeles County. As noted, the County has already approved the BESS itself. All that remains is for the Board of Supervisors to allow the gen-tie line to be installed in an existing utility corridor in a public street.

Humidor will be an essential enhancement to the Vincent Substation by reducing congestion at this vital location on the grid, while maximizing the ability for renewable energy to be delivered to loads – and thereby minimizing the curtailment (i.e., waste) of renewable energy. Humidor will also minimize the need for dirty gas-fired plants to operate, including during periods of peak electricity demand, which will prevent pollution that would otherwise spew into impacted communities across the Los Angeles region.

Proven BESS technology will be incorporated in Humidor, and large buffer zones and comprehensive safety plans will ensure community-friendly operations. Furthermore, the substantial investment in Humidor will drive significant economic stimulation in the form of local job creation, tax revenue generation, and indirect spending. Additionally, $100,000 per year has been committed to community initiatives. In short, Humidor aligns with California's commitment to resilience, sustainability, and prosperity.

There are five key reasons to support the franchise agreement for Humidor:

1. Critical location near the existing Vincent Substation to enhance renewable energy delivery, grid reliability, and resilience.

2. Community-friendly deployment, sited on disturbed land in an industrial zone and already approved by the County, with significant distances to the Acton town center.

3. Safe BESS technology that is already proven throughout the United States and beyond.

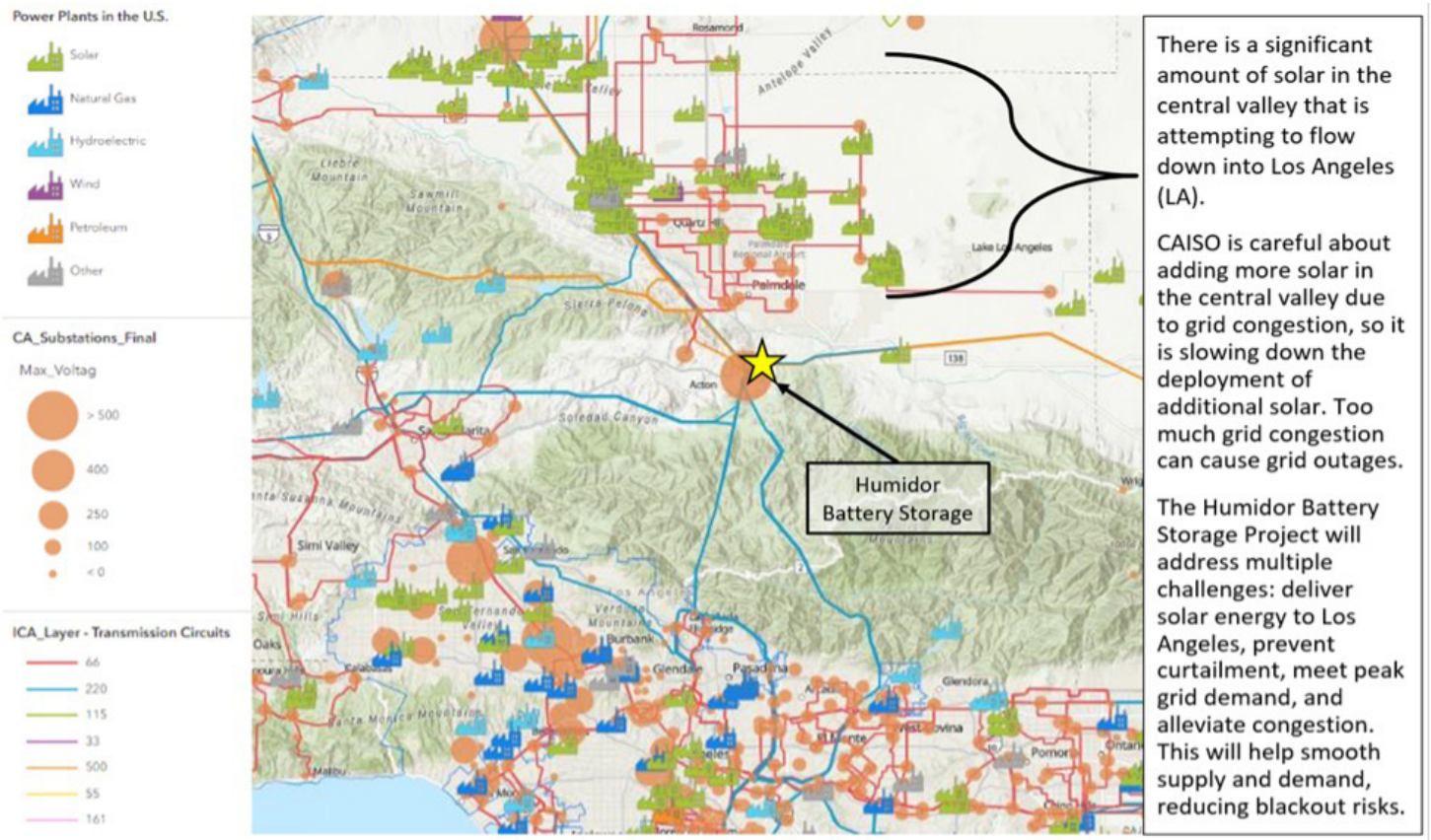
4. Significant economic stimulation to the region.

5. Targeted benefits for the Acton community.

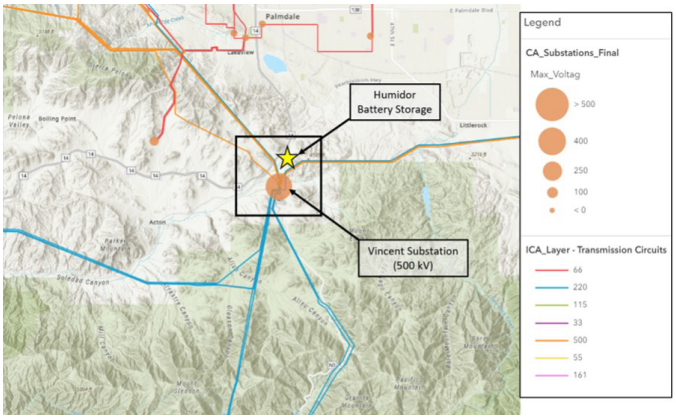
Important location to provide reliability and meet energy demand

■ Reduce grid congestion by storing solar energy and other renewables from the Central Valley that would otherwise be curtailed during times of grid congestion and delivering it to loads in the Los Angeles region, thereby preventing gas-fired generation that otherwise pollutes impacted communities.

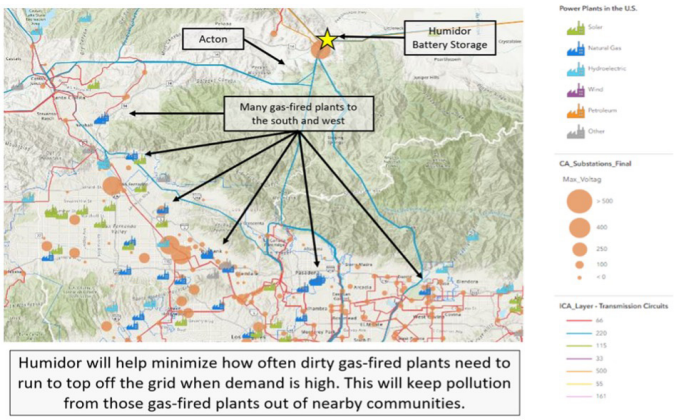
■ Improve reliability system-wide during the hottest hours of the year and decrease the runtime of dirty gas-fired plants.



Humidor is in the perfect location to reduce grid congestion and improve reliability



Humidor is located at a major grid intersection



Humidor will keep pollution from nearby gas-fired plants out of nearby communities

Significant distances from other facilities, including housing

In its approved location, Humidor will:

■ Use already disturbed industrial land recently used for commercial trucking and as an electrical subcontractor yard.

■ Be buffered by roadways, rail lines, and industrial facilities.

■ Be visually screened by local, native vegetation and well-secured by a 8-foot-high perimeter wall and internal security fence.

FAR AWAY FROM RESIDENTIAL NEIGHBORHOODS

ADJACENT TO GRID INFRASTRUCTURE

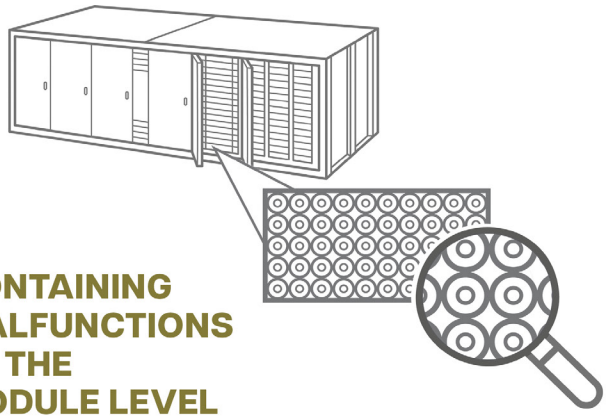
AN INDUSTRIAL AREA BETWEEN A FREEWAY AND RAIL LINE

FAR AWAY FROM RESIDENTIAL NEIGHBORHOODS

Humidor's approved location is on already disturbed industrial land buffered by industrial infrastructure

A rendering of the approved Humidor BESS with attractive natural screening

Same safe BESS technology that is already deployed across the United States



24/7
MONITORING

EXTERNAL FIRE
ALARM CONTROL
PANELS

CONTAINING MALFUNCTIONS AT THE MODULE LEVEL

TECHNOLOGY CAN COMPARTMENTALIZE, DETECT AND SUPPRESS, MITIGATING ANY SPREAD OF CELL FAILURES. BMS CAN DISCONNECT INDIVIDUAL MODULES AS NEEDED TO ISOLATE AN ISSUE.

SMOKE AND GAS
DETECTION
SYSTEMS

VENTILATION +
TEMPERATURE
CONTROL
SYSTEMS

MEET OR EXCEED ALL LOCAL
AND STATE FIRE CODES

SITE-SPECIFIC
ANNUAL TRAINING

BATTERY STORAGE TECHNOLOGY HAS RAPIDLY ADVANCED

A MODERN, TESTED AND PROVEN APPROACH TO FIRE SAFETY

EMERGENCY PLANNING + LOCAL COORDINATION

COLLABORATE WITH LOCAL EMERGENCY RESPONDERS THROUGH TRAINING AND EDUCATION TO DEVELOP A COMPREHENSIVE EMERGENCY RESPONSE PLAN.

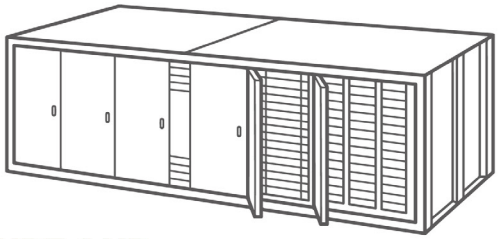
■ Hecate Grid is working with the LA County Fire Department to exceed code requirements at Humidor and develop a site-specific emergency response plan to train on the project equipment.

■ A joint study* by the Electric Power Research Institute, the Pacific Northwest National Laboratory, and TWAICE, determined that problems with system components other than battery cells and modules were responsible for most BESS failures. That the "common storyline… that failures are almost all attributable to battery modules'' is inaccurate.
*https://www.epri.com/research/products/000000003002030360

■ Hazard studies* from similar battery projects concluded that the probability is very low that a battery failure would ever require a Fire Department response. It was also determined that any conceivable fire-related event would be of similar concern as a Class A Fire, which is a fire involving ordinary combustibles such as wood, paper, fabric, and plastic.
*https://drive.google.com/file/d/1iDpar4MLq6ecinXIURFKM-KdSeaP-Zog/view?usp=sharing

■ Other hazard studies* revealed that risks from any potential exhaust from a battery issue would be of little concern beyond 15 feet from the source battery cabinet, in part due to the simple fact that warm exhaust quickly rises and scatters.
*https://drive.google.com/file/d/1i4WxNY0DVxXDd6b2yl1C42w8pEKR8PAE/view?usp=sharing

Same safe BESS technology that is already deployed across the United States

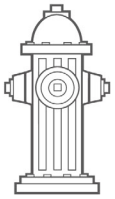


SECURE AND CONTAINTED ENCLOSURES

PROPERLY MAINTAINED AND UTILIZED BATTERY STORAGE SYSTEMS ARE NOT A THREAT TO THE ENVIRONMENT, OR GROUNDWATER.

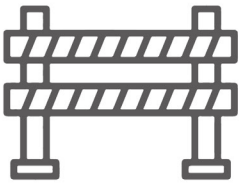
DECOMMISSIONING

WHEN THE PROJECT REACHES THE END OF ITS USEFUL LIFE, IT WILL BE DECOMMISSIONED, AND ALL THE COMPONENTS WILL BE CLEARED AND PROPERLY RECYCLED OR DISPOSED OF WITHOUT COST TO LOCAL.

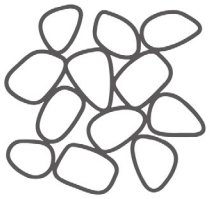


READILY AVAILABLE WATER SUPPRESSION TOOLS

DESIGN AND INSTALL FIRE HYDRANT NETWORK TO BE USED TO CONTAIN AND COOL BATTERY ENCLOSURES TO AVOID AND OR MITIGATE AGAINST ANY ISSUES.

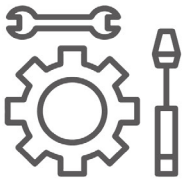


SAFETY ZONE AROUND THE PERIMETER OF THE FACILITY



GRAVEL BREAKS AND MASONRY WALL

SUBSTANTIAL SETBACKS FROM PARCEL BOUNDARIES



REGULAR MAINTENANCE

SEISMICALLY BRACED AND PROTECTED

THE PROJECT WILL NOT USE GROUNDWATER AND WILL SOLELY USE LA COUNTY PUBLIC WORKS WATER

ADDITIONAL PHYSICAL SAFETY DESIGN FEATURES

ENHANCEMENTS TO ADDRESS FIRE RISKS

Respect for environmental & cultural resources

The site will use LA County public water from District 37; water connections already exist.

Humidor has no impact on sensitive biological areas or species.

Humidor has no impact on cultural resources or artifacts.

Significant economic benefits to the local community

Will create approximately 100 union construction jobs.

Will employ 2 to 4 maintenance staff in addition to a 24/7 remote operations team.

Approximately $2,000,000/year in annual tax benefits to LA County.

$100,000 per year for community initiatives.

Humidor aligns perfectly with California's commitment to resilience, sustainability, and prosperity – and I hope you will join the Clean Coalition in allowing this approved project to connect to the Grid by the approval of a franchise agreement.

Thank you for your consideration.

Sincerely,

Craig Lewis Founder & Executive Director Clean Coalition	**Jonathan Port** Founder Permacity Foundation	**Merrian Borgeson** Policy Director, California, Climate & Energy Natural Resources Defense Council (NRDC)	**Jonathan Parfrey** Executive Director Climate Resolve	**Richard Burke** Leader Elders Climate Action SoCal and NorCal

Clean Coalition

Making Clean Local Energy Accessible Now

Humidor Battery Energy Storage System

Enhancing renewables & resilience for Los Angeles region

Bryan Murray
Senior Engineer
Clean Coalition
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bryan@clean-coalition.org

Craig Lewis
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Mission

To accelerate the transition to renewable energy and a modern grid through technical, policy, and project development expertise.

Renewable Energy End-Game

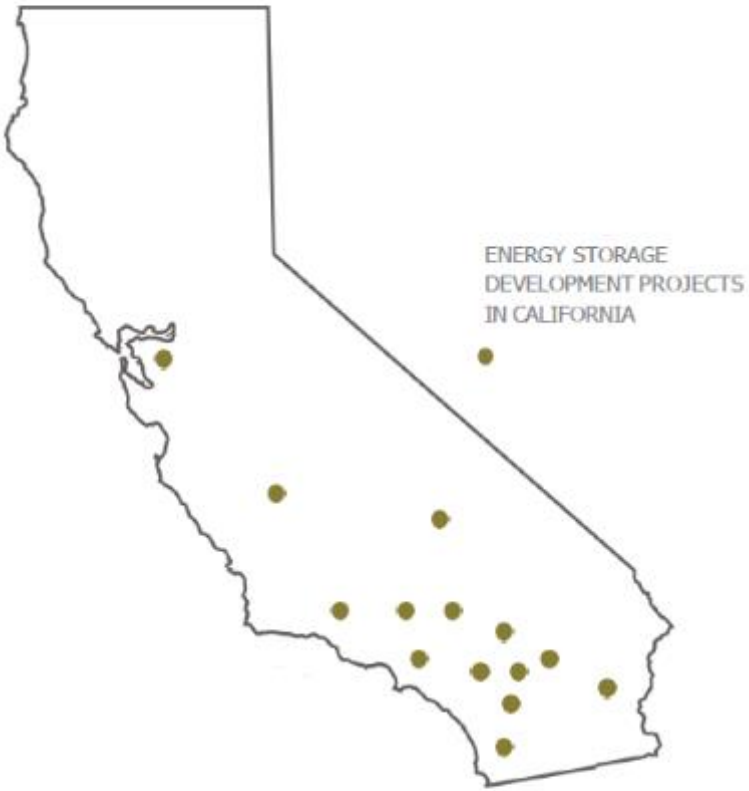
100% renewable energy; 25% local, interconnected within the distribution grid and ensuring resilience without dependence on the transmission grid; and 75% remote, fully dependent on the transmission grid for serving loads.

Humidor BESS summary

- 400 MW / 1,200 MWh Battery Energy Storage System (BESS)
- Installed by Hecate Grid, a leading independent power producer focused on developing, building, owning, and operating stand-alone energy storage projects in the US.
    - Hecate Grid has a pipeline of over 6 GW of BESS throughout the US with 3 GW in California.
- Located in Acton, CA, about midway between Glendale and Lancaster.
- Closest neighborhood will be 4,000 feet from the Humidor project site.
- Will enhance grid reliability, including during times of AC-driven stress and during extreme weather events and other disasters that threaten the broader grid.
- Utilizes disturbed and industrial zoned land buffered by roadways, rail lines, and industrial facilities.
- Will not use any groundwater and will only use LA County Public Works water.
- Will create approximately 100 high paying union jobs during construction and employ several workers for ongoing operations.
- For every 1 MW of capacity in operation, Hecate Grid will invest $250 annually in local community initiatives, totaling $100,000 annually at full capacity.

About Hecate Grid

ABOUT HECATE GRID



- Hecate Grid is a leading energy storage Independent Power Producer (IPP) safely developing and operating standalone storage projects in California and across the US.
- Current development pipeline exceeds six gigawatts (GW) of battery energy storage (BESS) throughout the US with three GW in California.
- In California, Hecate Grid has 15 BESS projects in development, four undergoing construction and one in operation.
- Since 2019, Hecate Grid has successfully operated battery storage systems with no safety or fire incidents.

Hecate Grid

Five key reasons to support Humidor Energy Storage Pro ect

Clean Coalition

1. Important location to provide reliability and meet energy demand
2. Significant distances from other facilities, including housing
3. Same safe BESS technology that is already deployed across the United States
4. Respect for environmental & cultural resources, and supportive to private property owners
5. Significant economic benefits to the local community

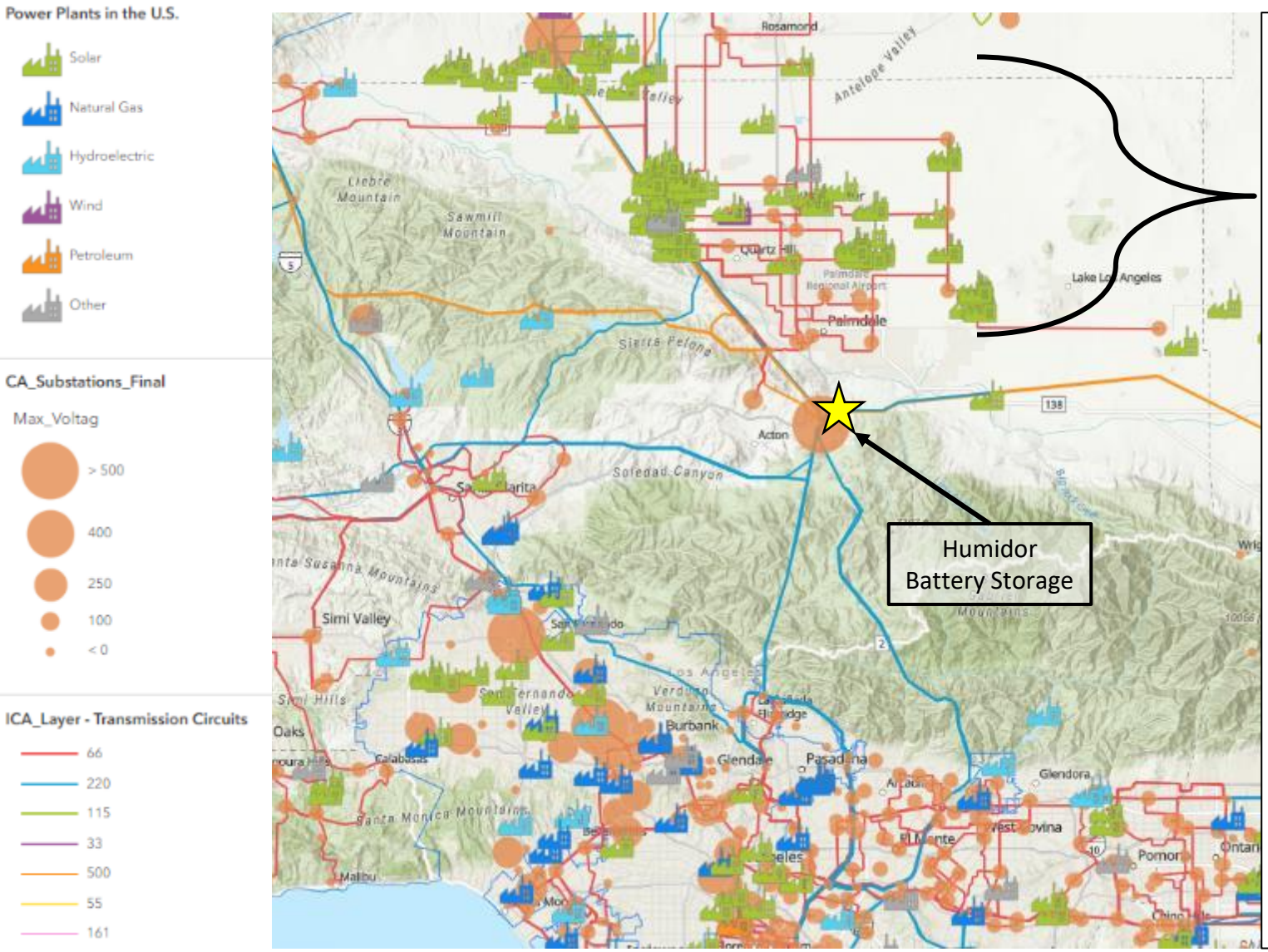
Important location to provide reliability and meet energy demand

Three primary benefits

1. **Reduce grid congestion** by storing excess solar energy from the Antelope Valley (and beyond) in the Humidor BESS and discharging it during peak demand hours to alleviate grid congestion.
2. **Maximize solar and other renewable energy** that can reach the Los Angeles region, while minimizing the use of gas peaker plants, which are mostly located in highly impacted Los Angeles communities.
3. **Improve reliability system-wide** including during the hottest hours of the year when AC is exacerbating the grid.

Humidor will ma imize solar while enhancing grid reliability

Clean Coalition



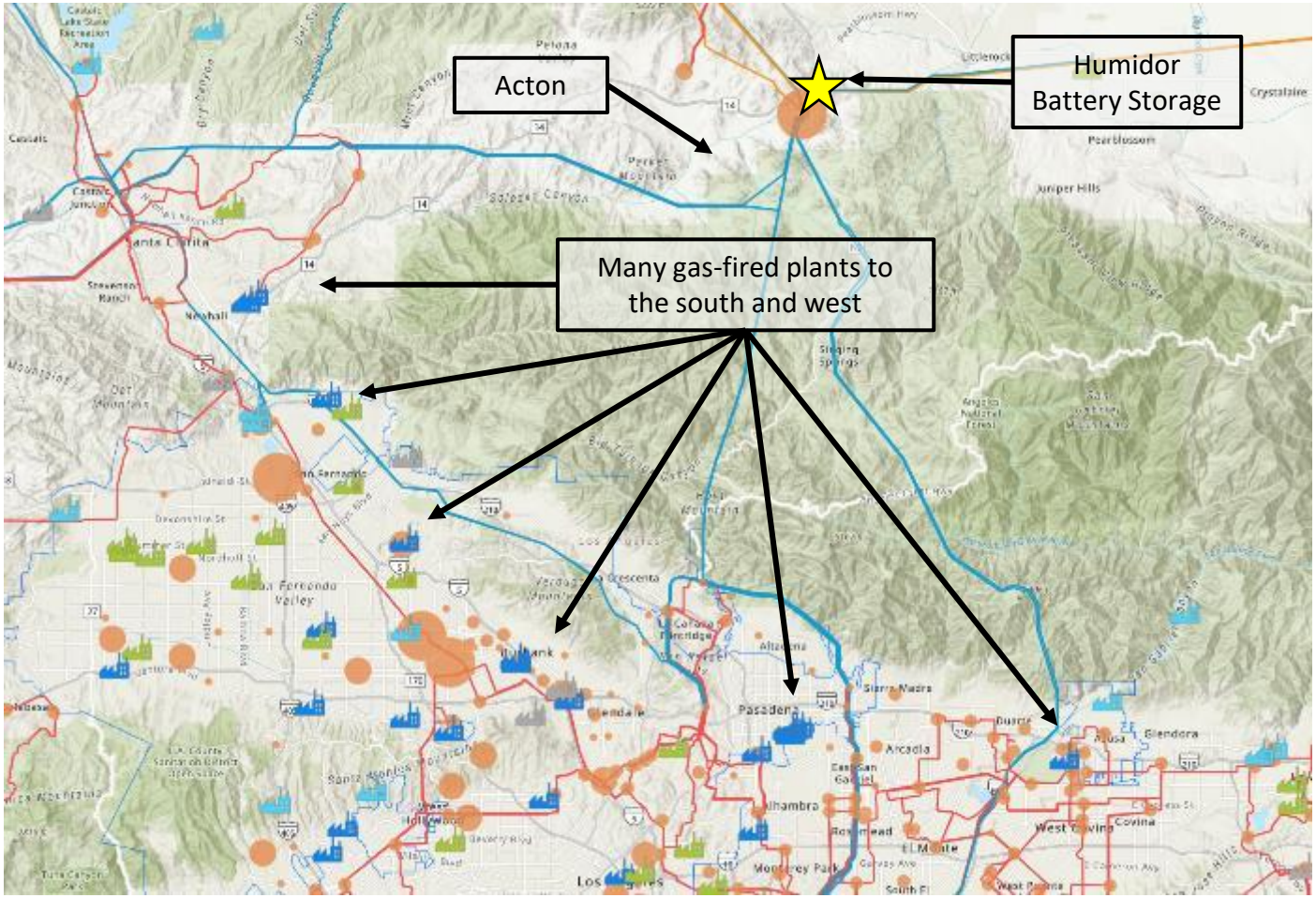
There is a significant amount of solar in the central valley that is attempting to flow down into Los Angeles (LA).

CAISO is careful about adding more solar in the central valley due to grid congestion, so it is slowing down the deployment of additional solar. Too much grid congestion can cause grid outages.

The Humidor Battery Storage Project will address multiple challenges: deliver solar energy to Los Angeles, prevent curtailment, meet peak grid demand, and alleviate congestion. This will help smooth supply and demand, reducing blackout risks.

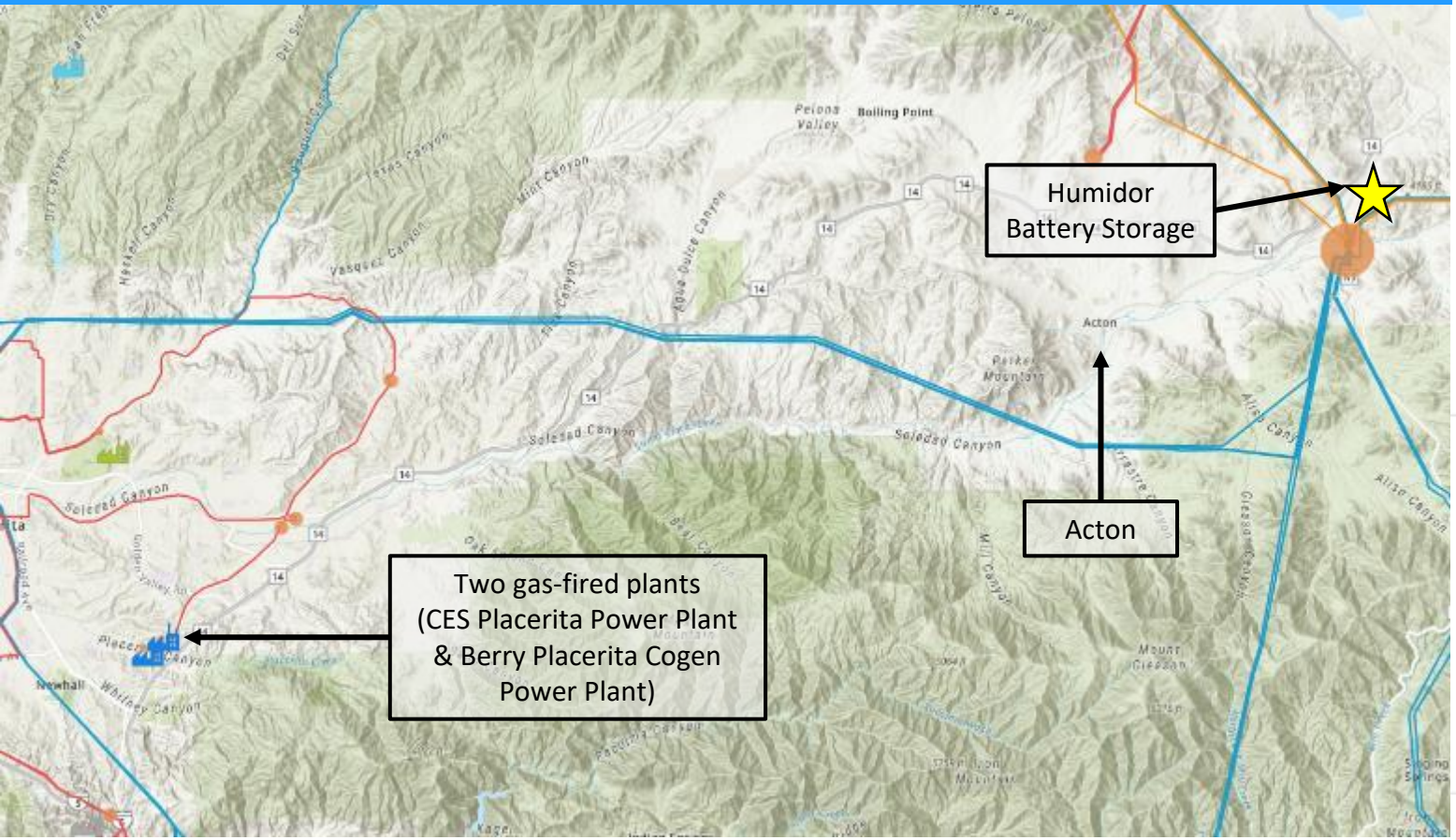
Humidor will reduce pollution from especially dirty gas-fired peaker plants

Clean Coalition



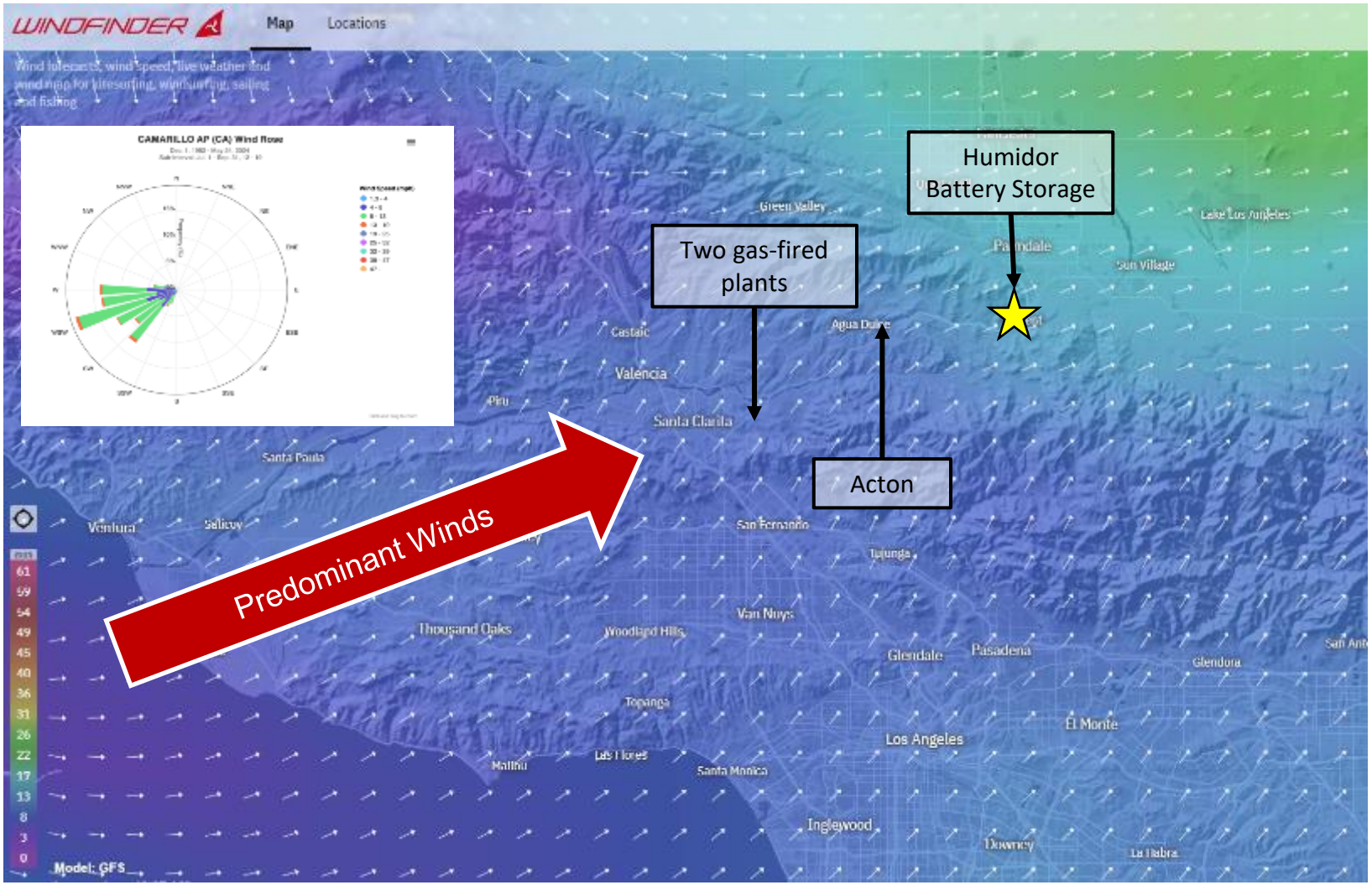
Humidor will help minimize how often dirty gas-fired plants need to run to top off the grid when demand is high. This will keep pollution from those gas-fired plants out of nearby communities.

Humidor will reduce pollution from especially dirty gas-fired peaker plants continued



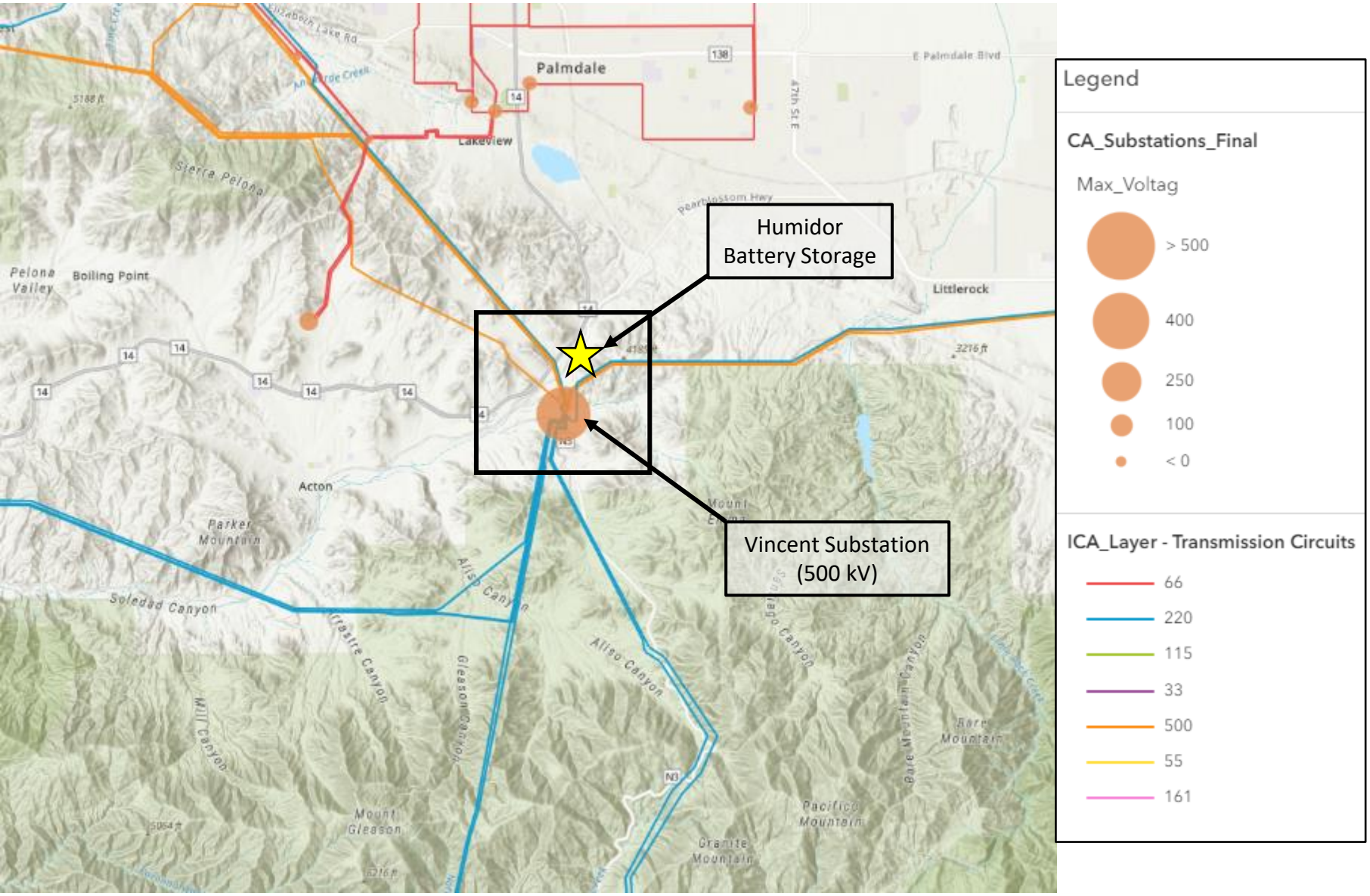
Humidor will help minimize how often dirty gas-fired plants need to run to top off the grid when demand is high. This will keep pollution from those gas-fired plants out of nearby communities.

Coastal winds push pollution from gas-fired plants through Acton



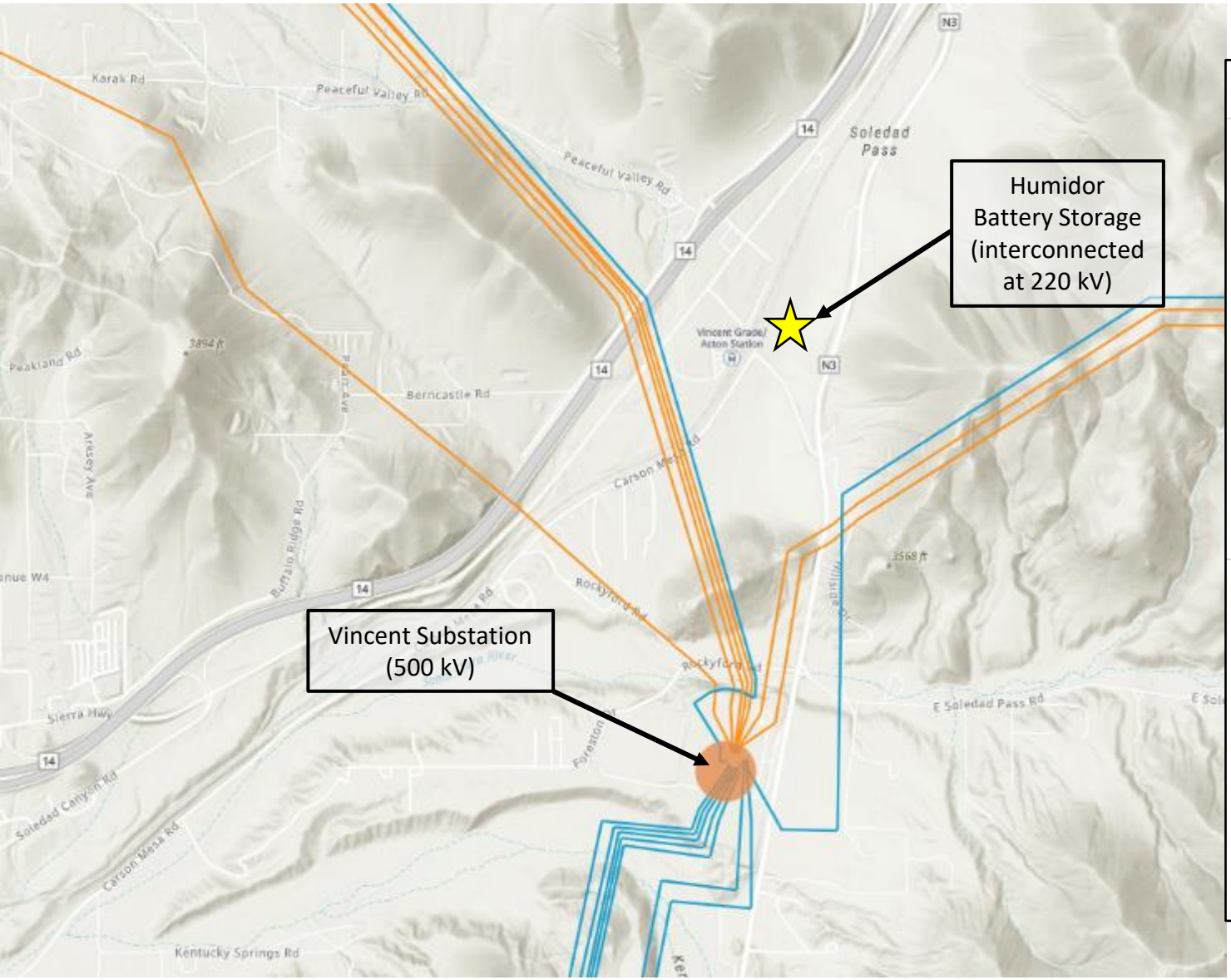
Acton is downwind of gas-fired plants, while Humidor is downwind of Acton

Humidor energy storage is located at a ma or grid intersection

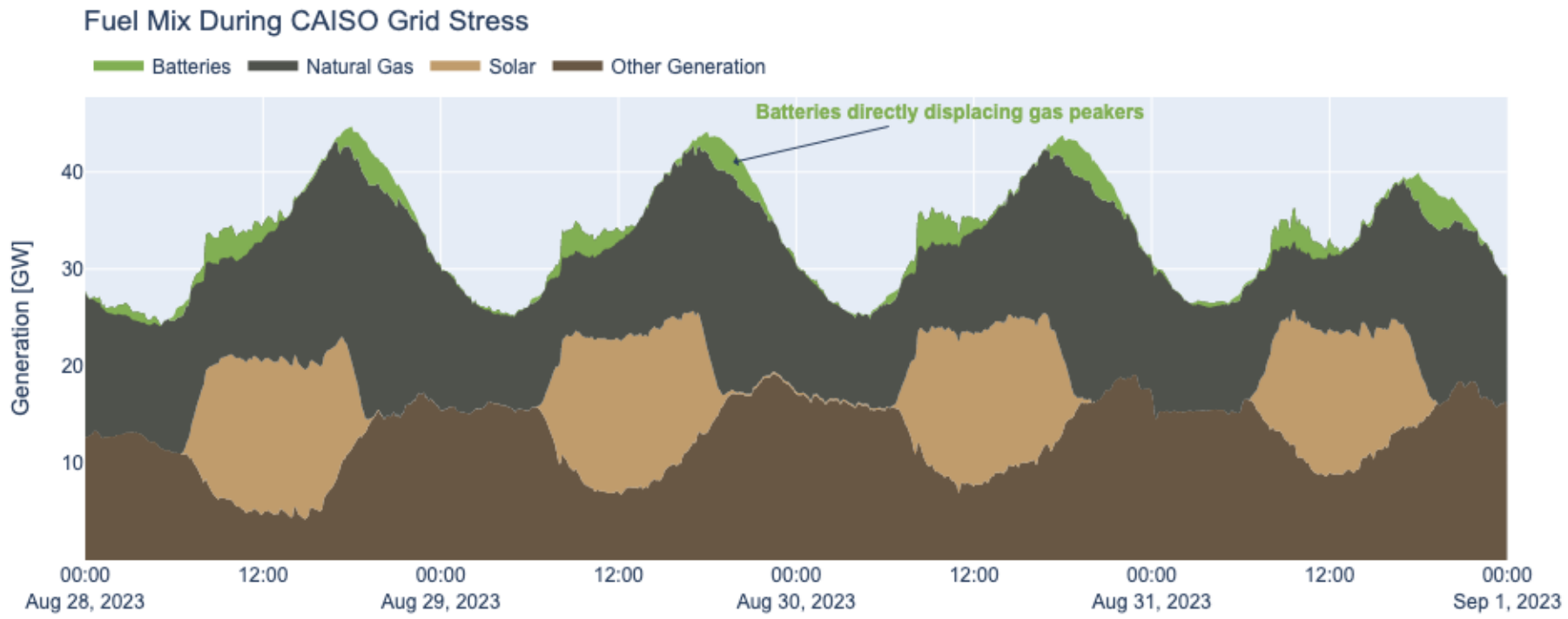


Humidor is located at a ma or grid intersection, less than one mile from the massive Vincent Substation

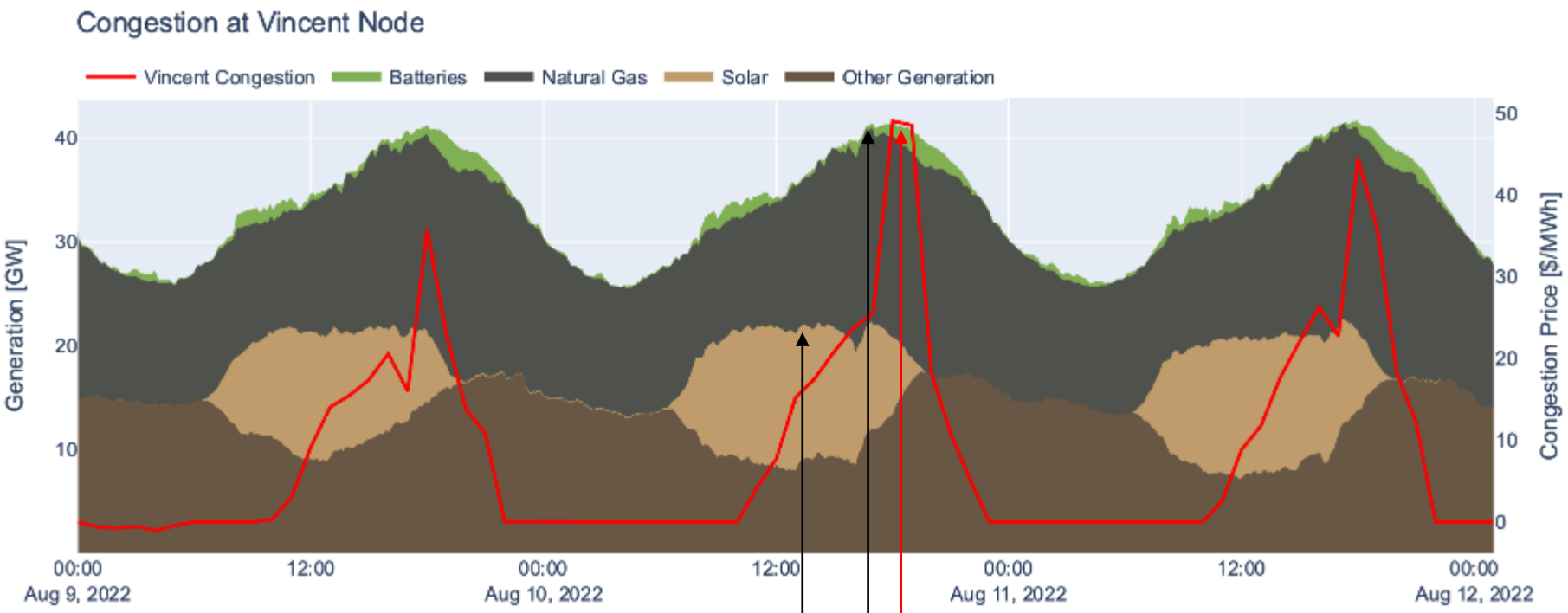
Clean Coalition



Time-shifting solar generation helps prevent blackouts



Congestion follows a daily pattern…



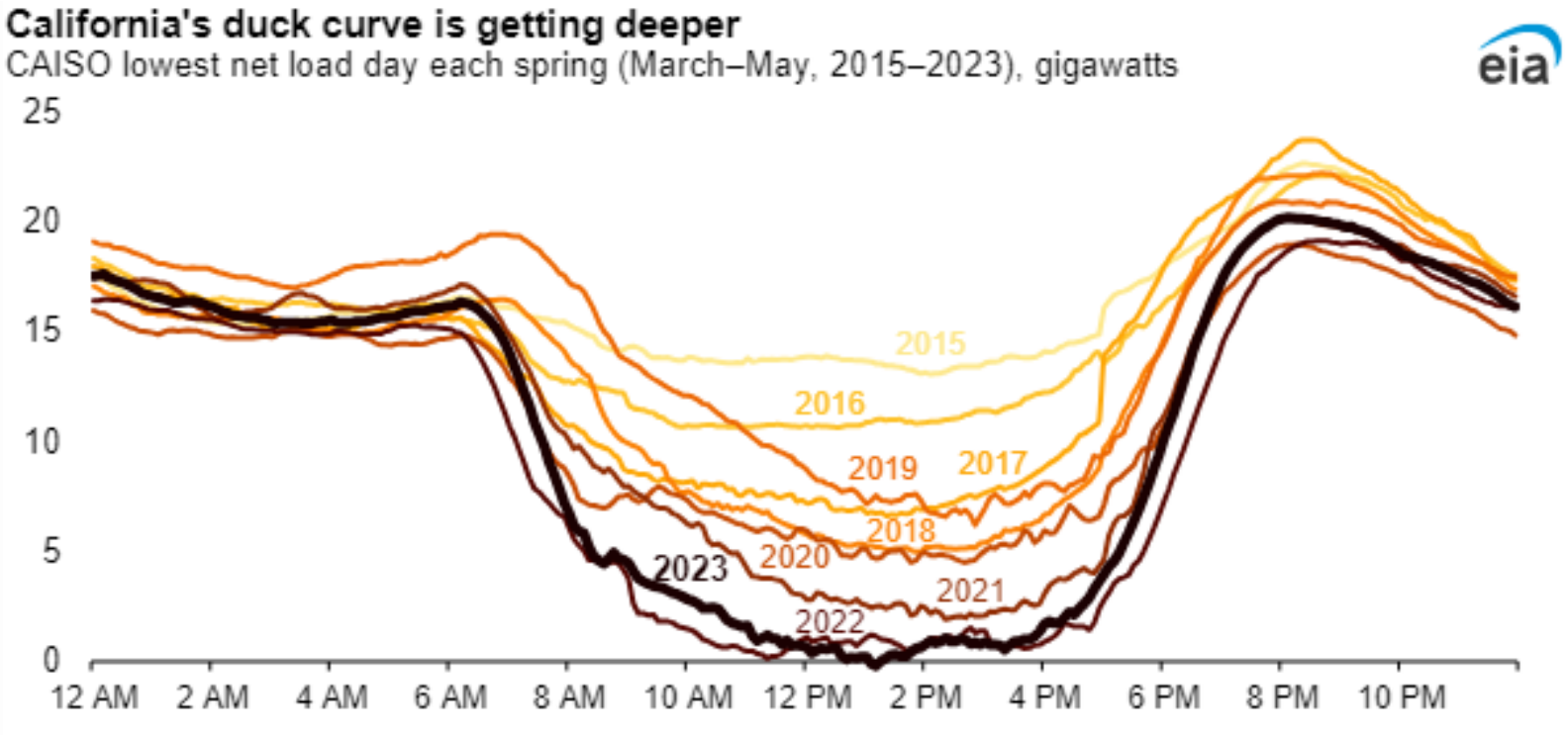
1. Solar generation peaks in the early afternoon

2. Load peaks in the late afternoon

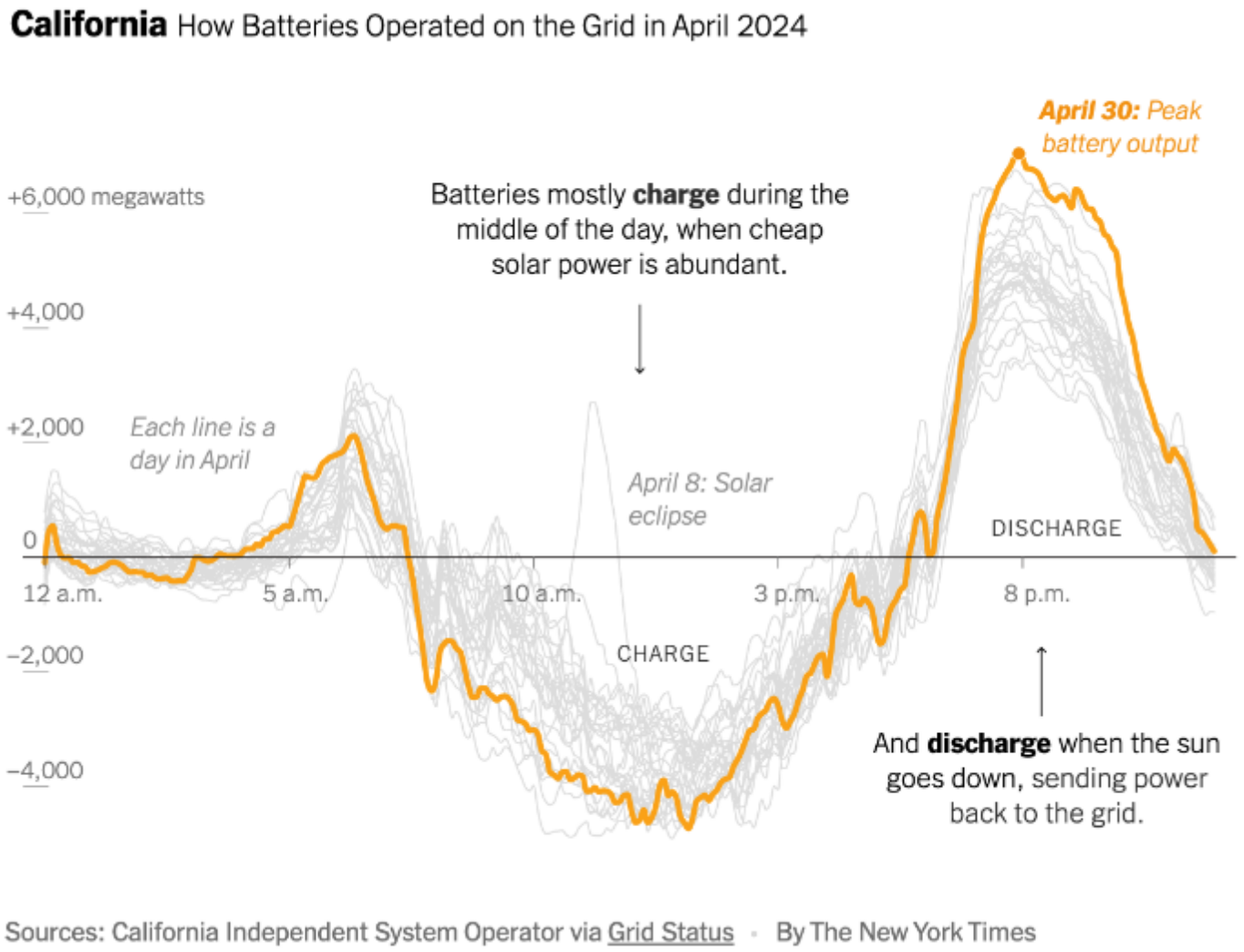
3. Congestion price spikes as load persists and solar production falls

As electricity demand grows and congestion keeps new generation off the grid, reliability degrades and **state-wide blackouts** become more likely!

California duck curve is getting deeper



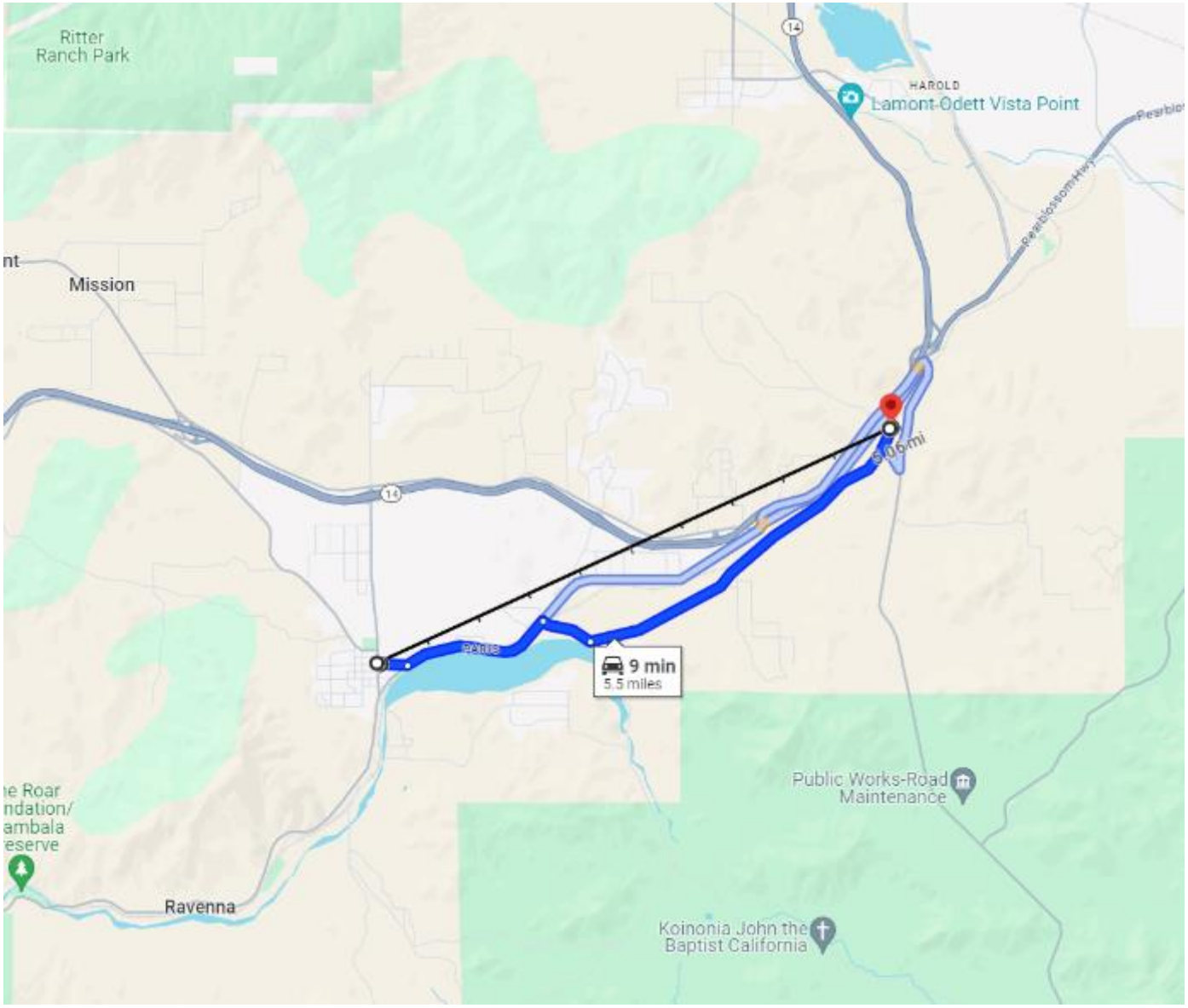
Batteries help midday solar serve evening load



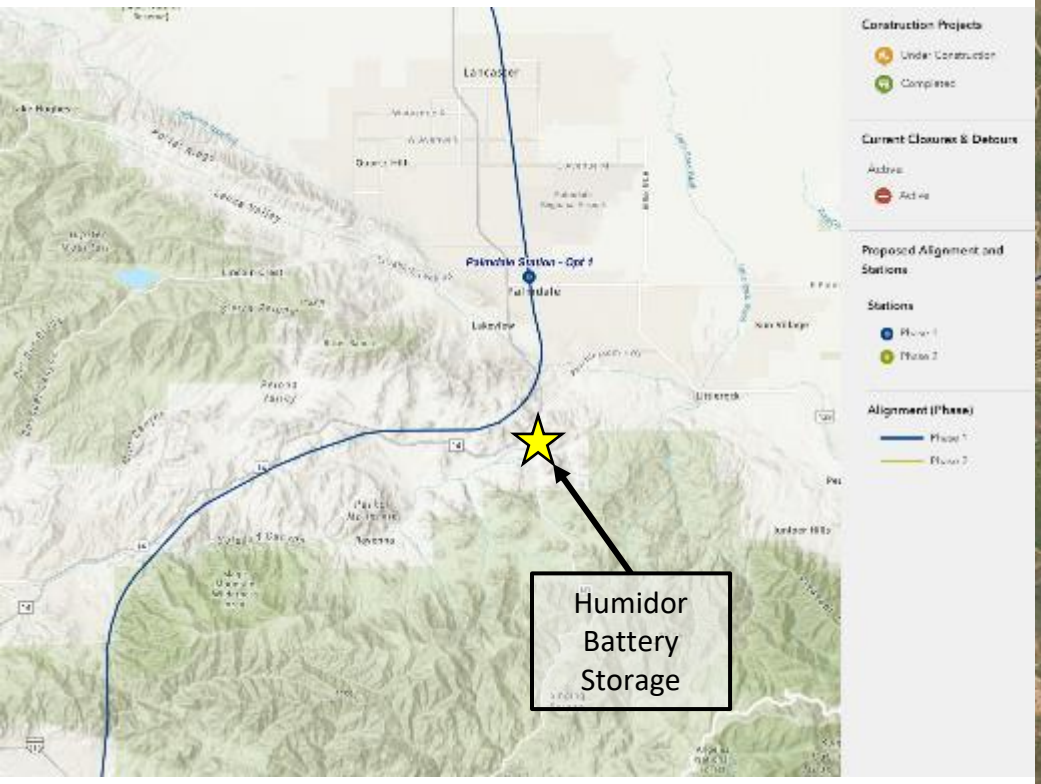
Significant distances from other facilities, including housing

Significant distances from other facilities, including housing

Humidor will be located over miles northeast of Acton, CA



tilize already disturbed industrial land



Planned California High Speed Rail route
Source: https://buildhsr.com/map/

- Humidor will utilize already disturbed industrial land recently used for a commercial trucking and an electrical subcontractor yard.
- Humidor will also be located near the planned California High Speed Rail.

Humidor is in an industrially-zoned area

HUMIDOR STORAGE LOCATION | AN IMPORTANT LOCATION FOR BATTERY STORAGE

The proposed project site is far away from residential areas in Antelope Valley. It is located in an industrially-zoned area between a highway and rail line with nearby grid infrastructure to efficiently hook-up to the energy grid.

A Fair Distance from Town Centers In Antelope Valley

Adjacent to Grid Infrastructure

An Industrial Area Between a Freeway and Rail Line

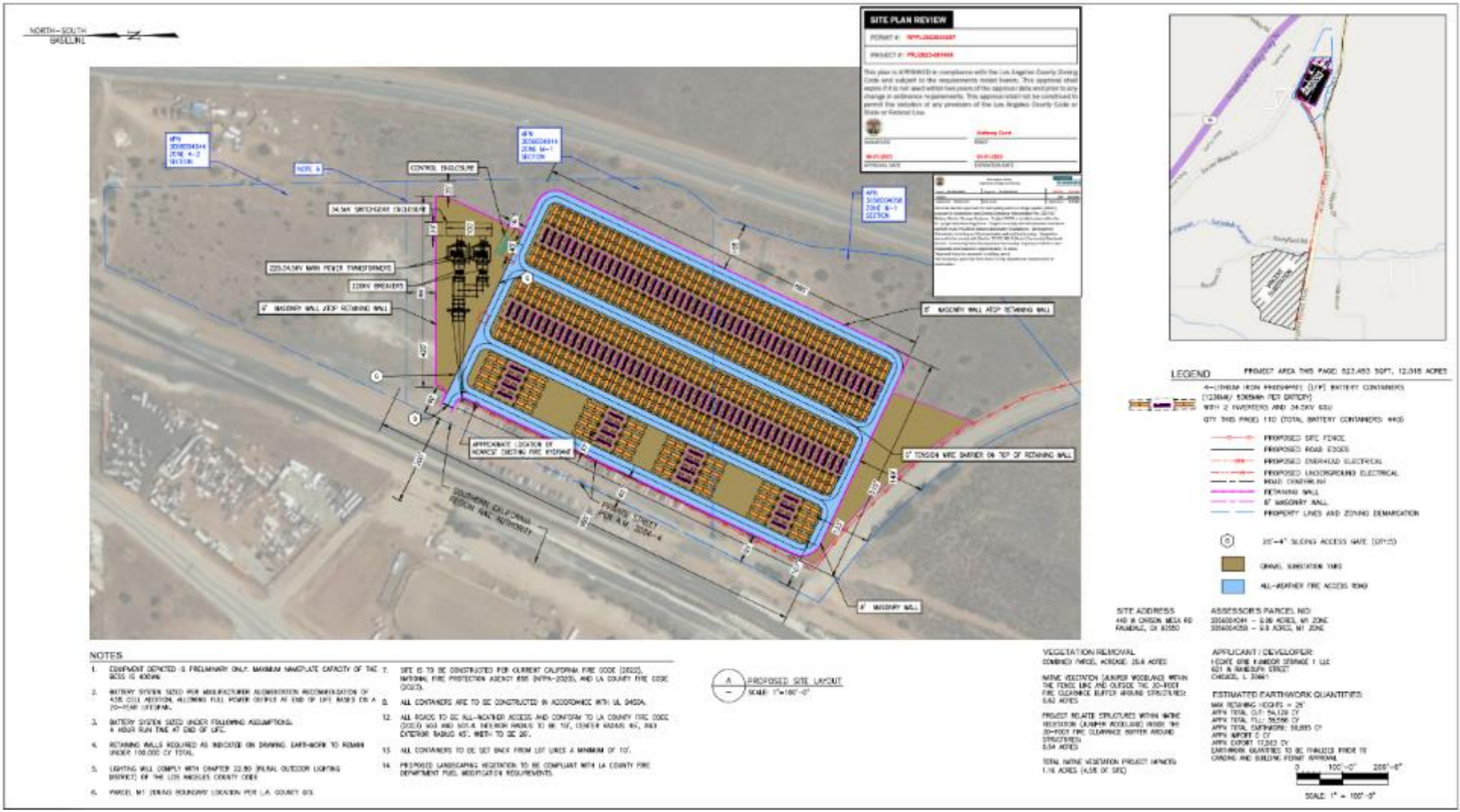
Far Away From Residential Neighborhoods

Visually screened and secured

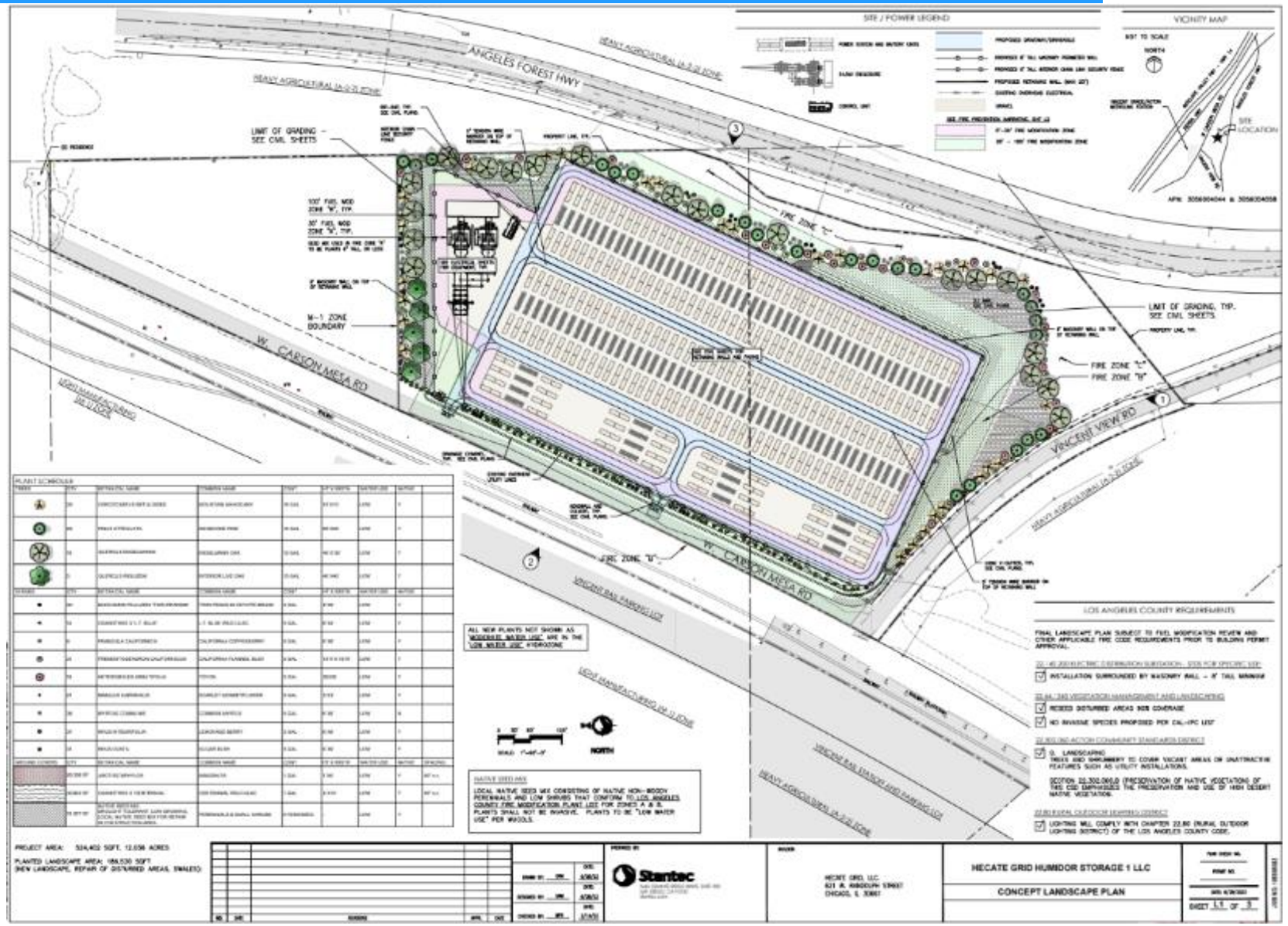
VISUALLY SCREENED & WELL-SECURED

THE PROJECT SITE WOULD INCLUDE AN 8-FOOT-HIGH PERIMETER WALL AND AN 8-FOOT HIGH INTERNAL CHAIN LINK SECURITY FENCE TO INCREASE THE PHYSICAL SAFETY OF THE FACILITY AND REDUCE VISUAL IMPACTS. THERE WILL ALSO BE LOCAL, NATIVE VEGETATION PLANTED AND MAINTAINED TO PROVIDE ADDITIONAL VISUAL BUFFERS AND MATCH THE AESTHETIC OF THE AREA.

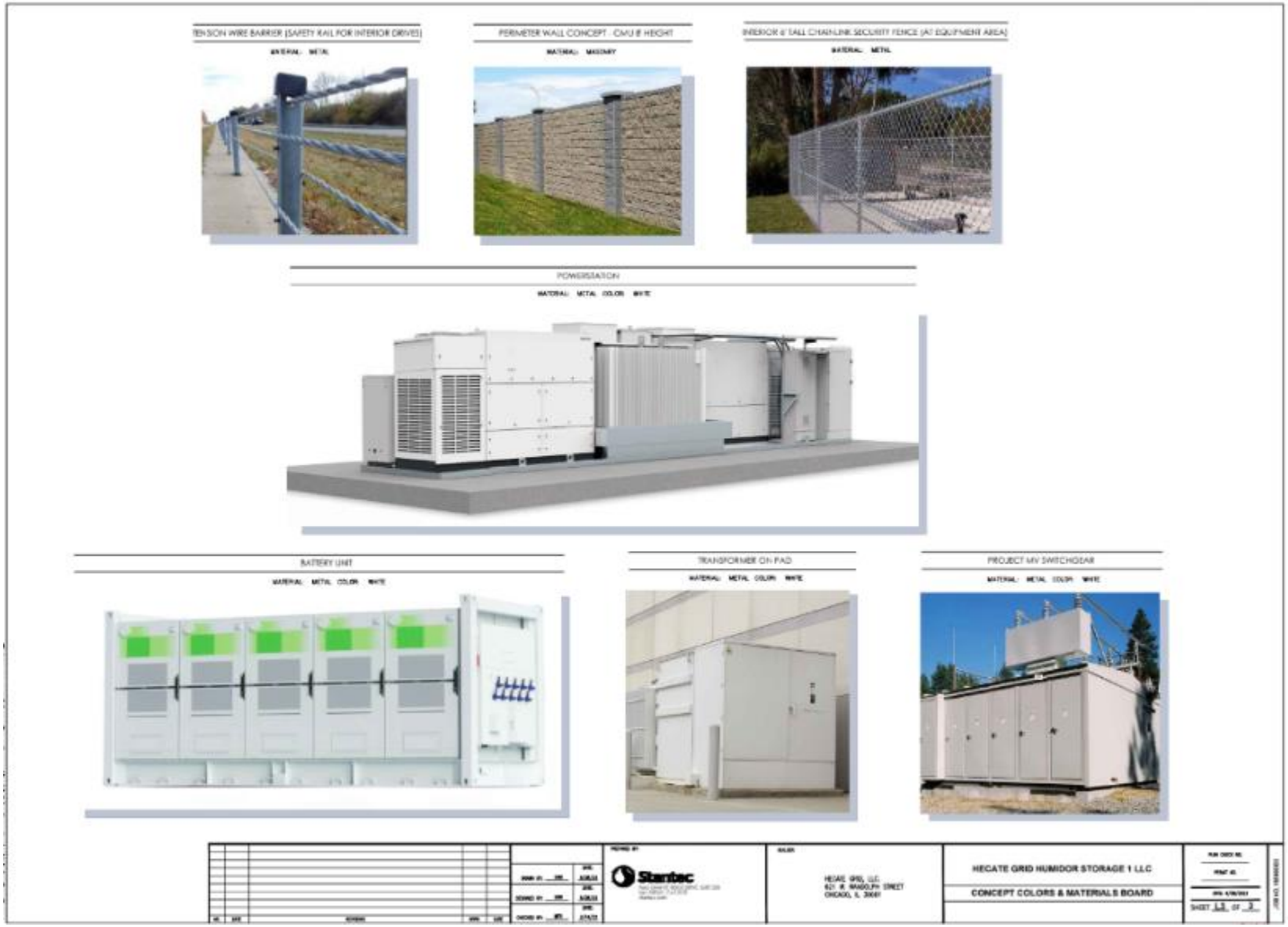
Humidor site plan



Humidor site plan continued



Humidor concept materials and colors

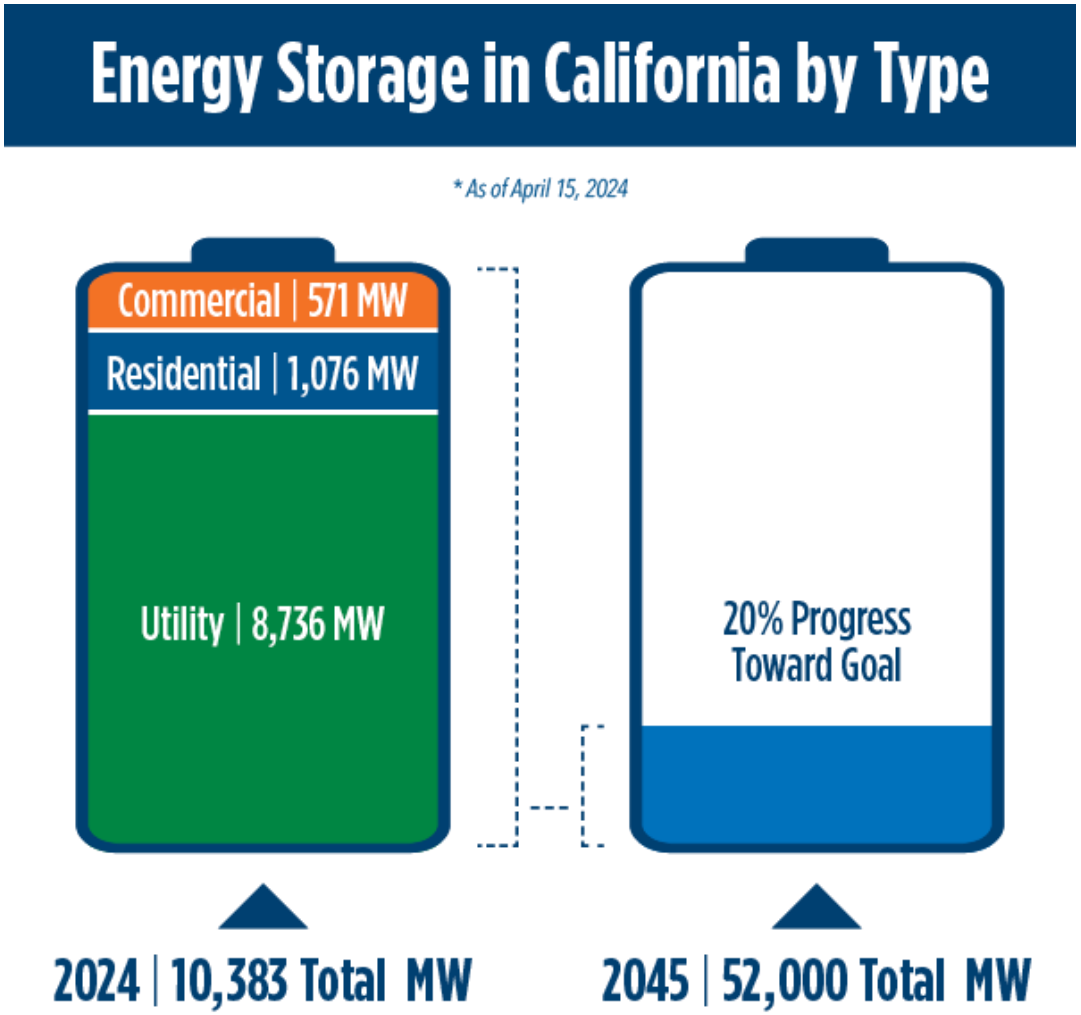


Same safe BESS technology that is already deployed across the nited States

Same safe BESS technology that is already deployed across the United States

California energy storage system survey

- From 2018 to 2024, battery storage capacity in California increased from 500 megawatts (MW) to more than 10,300 MW, with an additional 3,800 MW planned to come online by the end of 2024.
- The state projects 52,000 MW of battery storage will be needed by 2045.



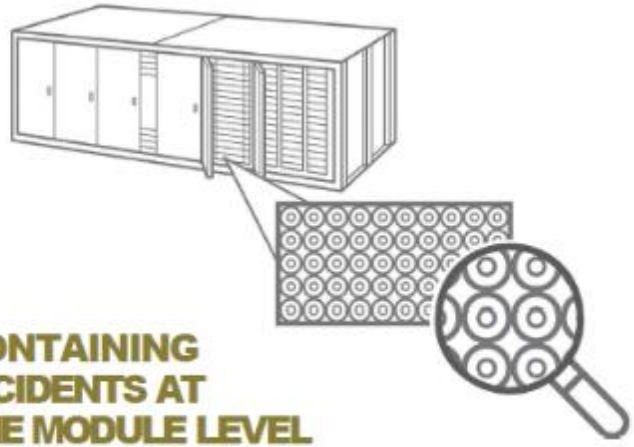
Source: CEC, California Energy Storage System Survey

Proactive safety measures

- Hecate Grid is working with the LA County Fire Department to meet or exceed code requirements at Humidor and develop a site-specific emergency response plan to train on the project equipment.
- A joint study by the Electric Power Research Institute, Pacific Northwest National Laboratory, and TWAICE, determined that problems with system components other than battery cells and modules were responsible for most BESS failures. That the "common storyline…that failures are almost all attributable to battery modules", is inaccurate.
- Hazard studies from similar battery projects concluded that the probability is very low that a battery failure would ever require a Fire Department response. The specific probability is that such an event would occur once every 10,989 years. It was also determined that any conceivable fire-related event would be of less cocern than a Class A Fire, which is a fire involving ordinary combustibles such as wood, paper, fabric, and plastic.
- Other hazard studies revealed that risks from any potential exhaust from a battery issue would be of little concern beyond 15 feet from the source battery cabinet. In part, this is due to the simple fact that warm exhaust rises and quickly scatters.

Same safe battery storage technology that is being deployed across the nited States

Clean Coalition



CONTAINING INCIDENTS AT THE MODULE LEVEL

TECHNOLOGY CAN COMPARTMENTALIZE, DETECT AND SUPPRESS, MITIGATING ANY SPREAD OF CELL FAILURES. BMS CAN DISCONNECT INDIVIDUAL MODULES AS NEEDED TO ISOLATE AN ISSUE.

24/7 MONITORING

EXTERNAL FIRE ALARM CONTROL PANELS

SMOKE AND GAS DETECTION SYSTEMS

VENTILATION + TEMPERATURE CONTROL SYSTEMS

MEETS OR EXCEEDS ALL LOCAL AND STATE FIRE CODES

SITE-SPECIFIC ANNUAL TRAINING

BATTERY STORAGE TECHNOLOGY HAS RAPIDLY ADVANCED – UL9540A

A MODERN, TESTED AND PROVEN APPROACH TO FIRE SAFETY

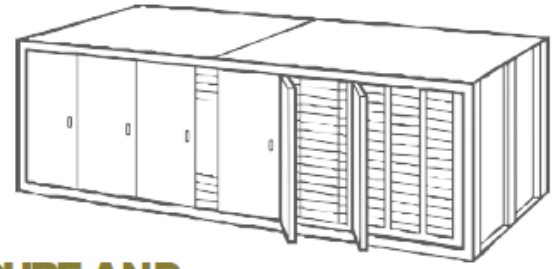
EMERGENCY PLANNING + LOCAL COORDINATION

COLLABORATE WITH LOCAL EMERGENCY RESPONDERS THROUGH TRAINING AND EDUCATION TO DEVELOP A COMPREHENSIVE EMERGENCY RESPONSE PLAN.

NFPA

Same safe battery storage technology that is being deployed across the nited States

Clean Coalition



SECURE AND CONTAINED ENCLOSURES

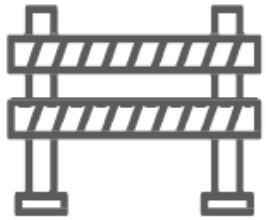
PROPERLY MAINTAINED AND UTILIZED BATTERY STORAGE SYSTEMS ARE NOT A THREAT TO THE ENVIRONMENT OR GROUNDWATER.

DECOMMISSIONING

WHEN THE PROJECT REACHES THE END OF ITS USEFUL LIFE, IT WILL BE DECOMMISSIONED. ALL THE COMPONENTS WILL BE CLEARED AND PROPERLY RECYCLED OR DISPOSED OF WITHOUT COST TO LOCALS.

READILY AVAILABLE WATER SUPPRESSION TOOLS

DESIGN AND INSTALL FIRE HYDRANT NETWORK TO BE USED TO CONTAIN AND COOL BATTERY ENCLOSURES TO AVOID AND OR MITIGATE AGAINST ANY ISSUES.



SAFETY ZONE AROUND THE PERIMETER OF THE FACILITY

GRAVEL BREAKS AND MASONRY WALL

SUBSTANTIAL SETBACKS FROM PARCEL BOUNDARIES

REGULAR MAINTENANCE

SEISMICALLY BRACED AND PROTECTED

THE PROJECT WILL NOT USE GROUNDWATER AND WILL SOLELY USE LA COUNTY PUBLIC WORKS WATER

ADDITIONAL PHYSICAL SAFETY DESIGN FEATURES

ENHANCEMENTS TO ADDRESS FIRE RISKS

Recent Otay Mesa battery fire is not as bad as headlines would indicate

- Is being controlled
- Includes 4-year old battery technology
- Batteries are located in an enclosed building, providing more flammable material, while Humidor would not be
- The cause of the fire has not yet been determined

Source: The San Diego Union-Tribune

Respect for environmental cultural resources, and supportive to private property owners

Respect for environmental & cultural resources, and supportive to private property owners

Respect for environmental cultural resources, and supportive to private property owners

- No groundwater will be used, and the site will utilize LA County public water
- Humidor site avoids protected areas, cultural resources or artifacts, and species
- Landowners will leverage their land to earn income from other sources that increase grid reliability

Significant economic benefits to the local community

Significant economic benefits to the local community

Significant economic benefits to the local community

- Will create approximately 100 union construction jobs
- Will employ 2 to 3 full time staff in addition to a 24/7 remote operations team
- Up to $100,000/year to local area initiatives throughout the operating life of the project and approximately $2,000,000/year in annual tax benefits to LA County

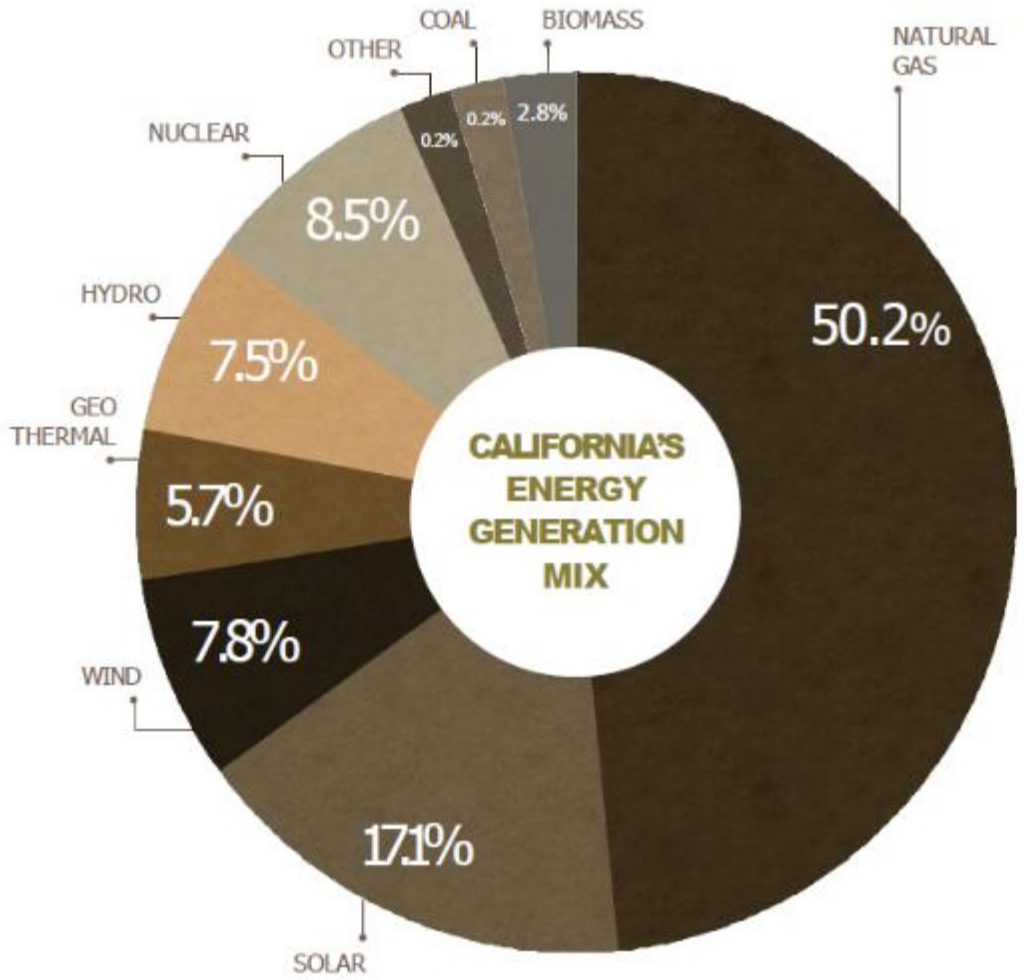
Backup

Humidor is connecting at one of these two nodes “Vincent_2_N100” or “Vincent_2_N101”

- Vincent_2_N101 node has a Local Marginal Price for energy of $38.15/MWh (17 May 2024)

Source: CAISO’s Locational Marginal Price (LMP) map page

California relies on renewables



CALIFORNIA RELIES ON RENEWABLES

CA GETS 1/3 OF ENERGY FROM RENEWABLES

Source: California Energy Commission, 2021 Total System Electric Generation

THE STATE IS VULNERABLE TO POWER OUTAGES & BLACKOUTS

Effects of energy storage on peak demand

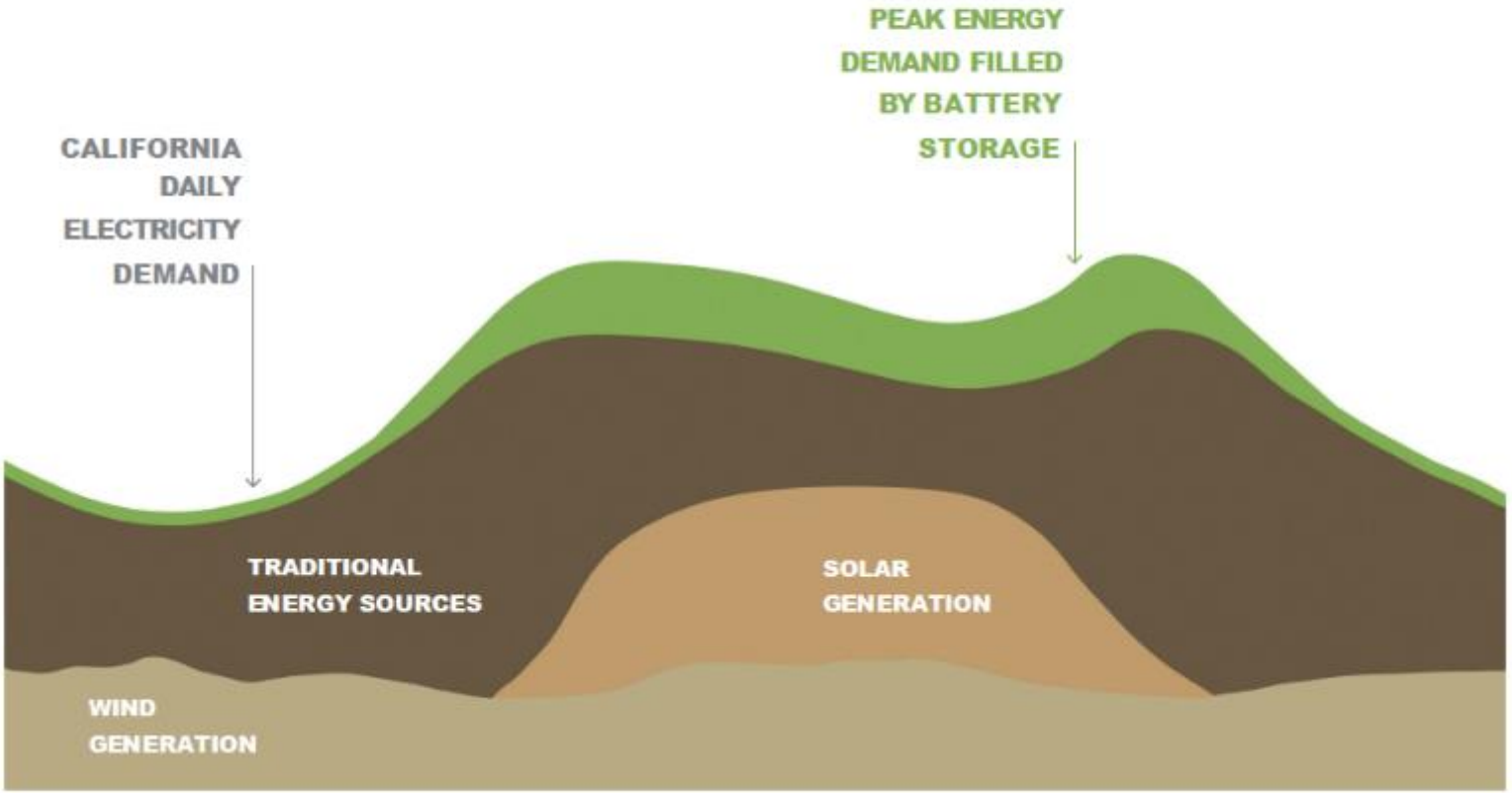
Clean Coalition

MEETING PEAK ENERGY DEMAND WITH BATTERY STORAGE

Every day, California enjoys energy production from wind 24/7 and solar during the day, with traditional sources such as natural gas power plants filling the gap. As California energy demand peaks with a growth in daily use, battery storage is being called upon to fulfill the additional demand to avoid brownouts or blackouts.

"ELECTRICITY STORAGE COULD HELP THE UTILITY GRID OPERATE MORE EFFICIENTLY, REDUCE THE LIKELIHOOD OF BROWNOUTS DURING PEAK DEMAND, AND ALLOW FOR MORE RENEWABLE RESOURCES TO BE BUILT AND USED."

- U.S. ENVIRONMENTAL PROTECTION AGENCY, ELECTRICITY STORAGE, ENERGY & ENVIRONMENT WEBPAGE



U.S. Energy Information Administration, Today in Energy Webpage