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TO RETURN TO THIS PAGE

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED OCTOBER 17, 2016

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED NOVEMBER 16, 2016

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED MARCH 16, 2017

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED APRIL 13, 2017

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED SEPTEMBER 28, 2017

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED OCTOBER 26, 2017

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED MARCH 15, 2018

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED SEPTEMBER 5, 2018

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED MARCH 28, 2019

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED APRIL 25, 2019

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED SEPTEMBER 2 , 2019

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CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED APRIL 22, 2021

CLICK HERE FOR THE DIRECTOR OF REGIONAL PLANNING'S REPORT DATED SEPTEMBER 29, 2021

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

October 17, 2016

TO: Supervisor Hilda L. Solis, Chair
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Don Knabe
Supervisor Michael D. Antonovich

FROM: Richard J. Bruckner
Director

REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

The Strike Team held a public meeting on October 13, 2016 to discuss the report and to hear public comment. The Strike Team passed a motion to direct staff to file this report with the Board and to present it to the Advisory Panel. This report is the first of three biannual Strike Team reports that will be provided to the Board during the 18-month long Strike Team effort.

The purpose of the Strike Team effort is to access risk to the public and prioritize sites for further action through onsite visits using criteria including proximity to nearby communities, age and history of the facility, and use of regulated well stimulation techniques. This report includes an overview of Strike Team efforts over the last 3 month period, which focused on 1) updating the inventory of oil and gas facilities, 2) developing protocols to identify permit and compliance issues, and 3) facility visits. For each facility inspected, the report includes a description of the existing facility, a description of existing conditions based on site visits, an analysis of permit compliance, recommendations for further action as appropriate, and a summary of next

steps. This report also includes recommendations of other oil and gas facilities to be evaluated. Subsequent progress reports will include evaluation of potential public health and safety risks associated with existing oil and gas facilities, as well as legislative recommendations. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

The next biannual report will be provided to you no later than March 29, 2017. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

RJB:JS:SFR:TS

Attachment: planning.lacounty.gov/oil-gas/strike

c: Executive Office, Board of Supervisors
County Counsel
Fire Department
Department of Public Health
Department of Public Works

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Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

November 16, 2016

TO: Supervisor Hilda L. Solis, Chair
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Don Knabe
Supervisor Michael D. Antonovich

FROM: Susana Franco-Rogan
Supervisor, Zoning Enforcement West

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Strike Team's first biannual report was submitted to the Board on October 17, 2016.

The Board also requested that a five member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production to work in conjunction with the Strike Team in order to assess the team's findings and recommendations, and provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. This report addresses the Advisory Panel's assessment of the Strike Team's first biannual report.

The Advisory Panel held a public meeting on November 9, 2016, to discuss their draft comments on the first Strike Team biannual report and provided final written comments following the meeting. This report includes the written comments from the Advisory Panel member from the First, Second, Third, and Fourth Supervisorial Districts. Written comments have not been received from the Advisory Panel member from the Fifth Supervisorial District. The Advisory Panel report can also be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

This is the first of three Advisory Panel reports that will be provided to the Board during the 18-month long Strike Team effort. The next Oil and Gas Strike Team report is due on March 29, 2017, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

RJB:JS:SFR:TS

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20161116-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Fire Department
Department of Public Health
Department of Public Works

LUR_11-16-2016-MBS_GAS_OIL_STRIKE_ADVISORY_REPORT_1

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

Initial Recommendations of Julia May, First District representative, Advisory Panel of LA County Oil & Gas taskforce, regarding Draft First Report, 11/7/2016

- *Subject to additional discussion and comments during Advisory Panel on 11/8/2016*

1. **I appreciate the important work of the staff and consultants, and the Board of Supervisors** in beginning this crucial process to protect health, safety, and the environment related to Oil and Gas operations in Los Angeles County, and for the first draft report.

2. **I agree with the comments submitted by Tim O'Connor, Third District, yesterday, regarding the need to take additional steps,** evaluate air and odor impacts, community history, views, and complaints, well stimulation and chemical use, and to expand inspection and maintenance requirements, breakdown prevention, and air monitoring.

3. **I submitted a letter to staff in September (before the County draft staff report was produced) regarding the poor environmental and health conditions surrounding oil & gas extraction facilities in the Los Angeles region,** the inadequacies of public nuisance reporting systems, and including a long list of chemicals reported by oil and gas operators pursuant to SCAQMD Regulation 1148.2, as being used locally. I recommended that there was already overwhelming evidence that oil and gas extraction is incompatible with residential areas and sensitive receptors, and should not be permitted. This letter also included information on the work and recommendations of STAND LA community organizations regarding oil and gas extraction. This letter was forwarded to the Advisory Panel on Monday by staff.

4. **Since then, the City of Los Angeles has adopted new and improved procedures for undertaking environmental review pursuant to CEQA upon receiving Oil and Gas extraction applications,** including requiring formal Health Impact Assessments. The County should review these procedures for incorporation as recommended below, but should consider these as the bare minimum baseline, and develop land use policies addressing where, to what extent, and how drilling may occur in unincorporated areas.

5. **Preliminary Recommendations: Add a <u>Next Steps</u> section to the First Draft report, for submittal to Supervisors including (but not necessarily limited to) these commitments:**
    a. Evaluate feasibility of a <u>1500 ft. setback zone requirement</u> for oil and gas extraction
    b. <u>Interview community members</u> living near oil and gas extraction facilities for comment about the community experience.
    c. Evaluate <u>removing "by right" permitting</u>, and incorporating discretionary permitting.
    d. Evaluate incorporation of recently adopted <u>City of LA procedures</u> for environmental review and health impact assessment.
    e. Evaluate <u>banning extremely hazardous substance transport through residential areas</u> for use at oil & gas facilities, including Hydrogen Fluoride, and potentially other hazardous chemicals.
    f. Evaluate a requirement for an <u>Odor Prevention Plan</u> for all oil and gas extraction (which would also generally reduce emissions), and streamlined public nuisance reporting procedures to reduce barriers to public reporting.
    g. Evaluate methods for <u>monitoring air emissions</u>.
    h. Evaluate <u>Best Available Control Technologies & improved inspection/maintenance.</u>

9/20/2016

Susana Franco-Rogan
Supervising Regional Planner
County of Los Angeles

Re: Key issues Staff should consider in developing its evaluation and recommendations on Oil & Gas facilities

Dear Ms. Franco-Rogan,

This is to follow up on the discussion during the August 31, 2016 meeting of the Advisory Panel of the Los Angeles County task force on Oil and Gas facilities. I appreciate very much the work of the staff and County Supervisors to evaluate these important health and environmental issues, and being invited to provide input as part of the Advisory Panel. The County evaluation is an unusual and important opportunity, that can also provide a model other regions could replicate. I include an initial set of information and recommendations, which I will supplement during the normal course of the Advisory Panel recommendation process.

As a Senior Scientist at Communities for a Better Environment (CBE), I have witnessed many community members' complaints about extraction facility impacts in LA County, including:

- Severe smells,
- Asthma attacks during heavy site activities,
- Drilling site flaring (found by the AQMD to be illegally burning 24 hours/day, and with gas flow well above permit limits),
- Unpermitted activities,
- Oil eruptions that sprayed oil onto nearby houses, cars, streets, and residents
- Cracking foundations after drilling operations,
- Illegal routing of diesel trucks through neighborhoods to carry oil from drilling sites,
- Extraction workers operating in full protective gear within a dozen feet of apartment windows (without warning to neighbors),
- Plants that have been confirmed by a plant pathologist to have died from chemical exposure,
- Extreme noise keeping neighbors and children awake,
- Drill-site dust blowing onto homes,
- Lack of information for neighbors about the equipment and chemicals used by extraction facilities and their activities,
- Lack of a meaningful public review process,
- Lack of advance notification regarding drilling activities,
- Descriptions by neighbors of extraction activities severely impacting quality of life.

The overall oil and gas industry is heavily concentrated in communities of color and low income communities. While the areas where I have witnessed impacts (including Wilmington) are not in unincorporated Los Angeles County, the lessons learned apply to extraction in general and should be considered in the County investigation. I would also urge the County to do everything it can to report on the entire county rather than only unincorporated areas.

As staff are preparing a report to the Supervisors on these issues, I wanted to provide documents from community organizations and community members describing extraction impacts and recommendations. This is the tip of the iceberg in terms of documentation on impacts, but provides important local information. I am equally sure the County staff and consultants have gathered substantial data and documentation that I am looking forward to seeing when the staff report is published. The attachments to this letter include the following (also described further later in this letter):

- Three letters submitted by the coalition of neighborhood organizations and Environmental Justice advocates called STAND LA (Stand Together Against Neighborhood Drilling – Los Angeles) with recommendations on AQMD regulations, and in support of Aliso Canyon neighbors,
- A letter to the California Air Resources Board regarding state Oil and Gas regulations by another set of Environmental Justice and public health advocates.
- Surveys of neighbors living near one drilling operation, who describe multiple severe impacts (carried out by CBE in 2009).
- I am also including an excerpt from a CBE report regarding public health conditions and permitting deficiencies regarding the Warren E&P site in Wilmington as of April 2009.

I understand the County already has a copy of the report - *Drilling Down: The Community Consequences of Expanded Oil Development in L.A*, documenting impacts at multiple extraction sites that was developed in concert with community organizations.[1] The County should also be aware of a report by CHC (Community Health Councils),[2] *Oil Drilling in Los Angeles, A Story of Unequal Protections,* which compared extraction on the West side to South LA, and concluded that while there is a city-wide risk, communities of color are at higher risk from extraction operations:

> Whenever oil and gas is produced near homes, schools, daycare centers, and other sensitive population centers, residents are put at risk. With 17 sites across the City of Los Angeles operating hazardously close (within 1,500 feet) to these kinds of sensitive population centers, oil and gas operations present a significant citywide risk to public health that decision-makers have failed to effectively address. Although oil and gas production occurs citywide, the relative risk is significantly higher in lower-income communities of color.

[1] 2015, Liberty Hill, https://www.libertyhill.org/sites/libertyhillfoundation/files/Drilling%20Down%20Report_1.pdf

[2] January 2015, at p. 16, available at: http://www.climateaccess.org/sites/default/files/CHC-Issue-Brief-Oil-Drilling-In-Los-Angeles.pdf

It is important for staff to be aware as well of gaps in data and regulatory structures, such as flaws in the public nuisance reporting process. These flaws cause neighbors' complaints to be inherently underestimated by agencies such as the AQMD (although in fact this is a statewide problem). While the AQMD has made efforts to improve this process, it takes time for inspectors to travel to extraction sites, and the source of smells must be confirmed. The AQMD continues to require multiple calls and confirmation before stepped up pollution prevention mechanisms are required, despite neighbors urging a more streamlined and useable process. Neighbors who take the time to call inspectors and meet them but then see no improvements give up reporting. Furthermore, when nuisances occur at night, neighbors do not want to further disturb sleep by calling or meeting an inspector. Thus having a flawed public nuisance reporting system and unduly relying on this as a main enforcement mechanism to prevent odorous air emissions has resulted in entrenched, ongoing impacts.

It is also very important for the County to talk directly with neighbors of extraction sites, to understand these conditions. Some facilities appear to operate better than others, but none are appropriately cited in residential areas.

It is most important to recognize that drilling and extraction facilities are inherently incompatible with residential neighborhoods. Since drilling operations now have options for lateral drilling, rather than requiring vertical drilling, many sites could be removed away from households, and no new siting near houses should be allowed.

A rigorous identification of Best Available Control Technology (BACT) must also be carried out. The current regulatory structure in place is primitive at best, in terms of mitigating environmental harms to neighboring communities. The AQMD is in the process of evaluating BACT. Also see discussion in the attached letters, which include strong recommendations for specific BACT analysis, including enclosures, tight leak standards, and more.

Monitoring of extraction sites is also a key solution that neighbors are urging. While monitoring chemicals is specialized, with no one technique covering all chemicals, standard methods are available for sampling and continuous monitoring of hydrocarbons and other Volatile Organic Compounds, sulfur compounds, and other chemicals. (Sulfur compounds such as Hydrogen Sulfide are difficult to monitor, since people can smell them below detection limits, but nevertheless options are available.). Particulate matter monitoring uses other readily available equipment. Plate sampling and wipe sampling can be used to identify oil droplets deposited on homes. High-tech and innovative remote sensing using infrared or ultraviolet beams can be used for many different chemicals but also requires care to enable detection of different chemicals at different wavelengths, taking into account chemical interference. Noise monitoring is another important need near some extraction facilities. Video monitoring can also be helpful in certain cases (e.g. this is in use at oil refineries to identify smoking flares and to supplement flare gas flow and chemical monitoring).

Regardless of the need for care and quality assurance, there is a wide and readily available body of knowledge on monitoring oil and gas related industry, and a major need for setting such

monitoring in place. The AQMD is in the process of evaluating best monitoring for extraction facilities, at the urging of STAND LA. The County should also request sharing this information.

Community-based monitoring efforts of neighbors near oil refineries can serve as examples for evaluating the same hydrocarbons, sulfur compounds, and other chemicals generally present at oil and gas extraction facilities. Neighbors have utilized "Bucket Brigades" using low-tech but effective canister-like devices supported by EPA approved Quality Assurance plans, with samples processed at laboratories. These require training, support, and funding for lab analysis. (CBE developed the original Bucket Brigades in Northern California and has training materials available, but many organizations have since used buckets around the country and even internationally.) Refinery neighbors have also negotiated Good Neighbor Agreements, setting in place high-tech remote infrared and ultraviolet monitoring. The wide range of monitoring options available should include not only a preference for continuous monitoring by regulators and industry, but also for institutional support of community-based monitoring.

Chemicals reported through the recent AQMD regulations identify severely hazardous chemicals used in neighborhood drilling sites that should not be permitted. I understand that the staff and consultants have contacted the AQMD regarding odor complaint data. The AQMD should also provide the County its reported data on the chemicals reported pursuant to AQMD Rules 1148.1 and 1148.2 if it has not done so already. These chemicals have potential impacts on neighbors at the sites, and during transportation to the sites from other areas**.** The long list includes many hazardous materials, most notably the extremely hazardous chemical hydrofluoric acid, which should be entirely banned.

Additionally, they include many carcinogenic and otherwise toxic chemicals such as benzene, toluene, xylenes, Polycyclic Aromatic Hydrocarbons (PAHs), naphthas, formaldehyde, and others. Chemicals like 2-butoxyethanol and nonylphenol ethoxylate are also used, with medical literature identifying reproductive and endocrine disrupting characteristics of these chemicals. Community investigations are ongoing as well, regarding the use of endocrine disrupting chemicals to mask odorous hydrogen sulfide (H2S).

The list of chemicals reported also includes silica sand, which OSHA documented in a Health Hazard Alert as a health risk of certain extraction activities.[3] This brings up two issues – one, that workers' potential health impacts should also be identified by the County, supplementing OSHA's actions. Further, with neighbors so close to extraction operations, information about worker exposure may assist the County in identifying neighborhood exposures. For example, a NIOSH fact sheet describes the study: NIOSH Field Effort to Assess Chemical Exposure Risks to Gas and Oil Workers, which may yield useful information about chemicals emitted into neighborhoods.[4]

Many chemicals are reported as "trade secret," with only family name identified. Some of these are clearly toxic (for instance PAHs), others raise questions, for example "Wood Chemicals."

[3] An OSHA Alert warned of worker exposure to silica sand during extraction activities. Silica sand can be small enough to enter deep into lungs:
https://www.osha.gov/dts/hazardalerts/hydraulic_frac_hazard_alert.html
[4] http://www.cdc.gov/niosh/docs/2010-130/pdfs/2010-130.pdf

The category of wood chemicals in other circumstances includes the toxics pentacholorophenol, creosote,[5] and arsenic,[6] but the public is not provided with the chemical names for Trade Secret chemicals.

Before the AQMD regulations were adopted, the public had little or no information about these chemicals used locally in extraction, so access to the AQMD data has provided a key step forward, although it is only a first step. The resultant list is surprising and alarming due to the list length, toxicity, lack of regulation, lack of best engineering practices, secrecy, and because there is little or no warning to neighbors. By contrast, in other industries, reporting chemical use has long been standard.

The County, on the other hand, should be able to receive the data on the specific chemicals used, and evaluate potential health impacts and accident hazards, in order to protect public health. In general, there has been a broad public outcry and widespread dissatisfaction that the extraction industry is allowed to hide toxic chemical use behind "trade secret" status, when it has long been standard for other industries to publicly report chemical usage, to protect health and safety.

The list of chemicals reported to the AQMD for Wilmington extraction facilities pursuant to AQMD regulations during well drilling, well completion, rework, gravel packing, acidizing and maintenance acidizing, include the following specific chemicals, and following family names (for those ingredients identified as trade secret):

Specific Chemicals as Reported:

- 1,2,4-Trimethylbenzene,
- 2-Butoxy Ethanol,
- 2-Hydroxy-1,2,3-Propanetricarboxylic Acid,
- 2-Propyn-1-OL,
- Acetic Acid Ethyl Ester-Polymer with Ethenol,
- Acetone,
- Acrylic Polymer,
- Alkylbenzene Mixture,
- Alumina,
- Aluminum,
- Aluminum Oxide,
- Ammonium Chloride,
- Amorophous Silica,
- Amorophous Silica Fume,
- Anionic Acylamide Copolymer,
- Aromatic Barite,
- Barium Sulfate,
- Bentonite,
- Calcium Bromide,
- Calcium Carbonate,
- Calcium Chloride,
- Calcium Oxide,
- Carbon,
- Carboxy methylcellulose Sodium Salt,
- Cellophane,
- Cellulose,
- Citric Acid,
- Citrus Terpenes,
- Crystalline Silica,
- Cumene,
- Cylohexanamine-Sulfate (1:1),
- Diisoproylnaphthalene,
- Disodium Metasilicate,
- Erythorbic Acid,
- Ethylbenzene,
- Ethylene Glycol Monobutyl Ether,
- Ethyl Octynol,
- Ferrous Sulfate,
- Formaldehyde,
- Glutaral,
- Glycolic Acid,
- Glyoxal,
- Gypsum,

[5] http://kmgchemicals.com/our-businesses/wood-treating-chemicals/
[6] http://woodtreatment.sustainablesources.com/

- Heavy Aromatic Naphtha,
- Hydrochloric Acid (Hydrogen Chloride),
- Hydroxyacetic Acid,
- **Hydrogen Fluoride,**
- Iron Oxide (FE2O3),
- Isoquinoline,
- Light Aromatic Naphtha,
- Magnesium,
- Magnesium Oxide,
- Methanol,
- Methyl Amyl Alcohol,
- Methyl Ester of Sulfonated Tannin,
- Mica,
- Mineral Fiber,
- Naphthalene,
- Nitrilotriacetic Acid,
- Oxyalkylated Amine Quat,
- Oxyalkylated Alkylphenol and Resin,
- Petroleum Naphtha,
- Petroleum Resins,
- Phosphoric Acid,
- Pine Oil,
- Polymer,
- Portland Cement,
- Potassium Chloride,
- Potassium Oxide,
- Propargyl Alcohol,
- Proprietary,
- Propyn-1-ol,
- Quartz (SIO2),
- Quinoline,
- Quinaldine,
- Saponite,
- Silica,
- Silica Crystalline Quartz,
- Sodium Bicarbonate,
- Sodium Carbonate,
- Sodium Chloride,
- Sodium Gluconate,
- Sodium Lignosulfate,
- Solvent Naphtha (Petroleum) – Heavy Aromatic,
- Stearic Acid,
- Sulfonate,
- Synthetic Red Iron Oxide,
- Terpene Hydrocarbon,
- Thiourea Polymer,
- Toluene,
- Welan Gum,
- Wood Dust-Soft Wood,
- Xanthan Gum,
- Xylene.

"Trade Secrets" Chemicals' Family Names Reported:

- Acetic Acid,
- Aldehyde,
- Aliphatic Alcohol, (1), (2), (3),
- Alkylaryl Amine Sulfonate,
- Alkylaryl Sulfonates,
- Alkyl Benzenesulfonic Acid,
- Alkyne Alcohol,
- Amide Surfactant,
- Amide Surfactant Phosphate Acid Salt,
- Amide Surfactant Phosphate Ester Salt,
- Aromatic Amine TOFA Salt,
- Aromatic Amines,
- Aromatic Compound,
- Aromatic Hydrocarbons,
- Aromatic Petroleum Distillates,
- Aromatic Amines,
- Aromatic Amine - TOFA Salt,
- Aromatic Compound (1), (2), (3), (4), (5), (6),
- Cinnamic Inhibitor,
- Copolymer,
- Crosslinked Polyol Ester,
- Detergent,
- D-Limonene,
- Diol Compound,
- Ester,
- Ester,
- Fatty Acid,
- Fatty Acid Esters,
- Halides-Inorganic Salt,
- Halides,
- Inorganic Compound,
- Inorganic Potassium Compound / Alkali Hydroxide,
- Inorganic Salt of an Acid,
- Inorganic Solvent,
- Ionic Surfactants,
- Ketone,
- Linear Alkylbenzene,
- Lubricant, Mixture,
- Modified Starch,
- Modified Sulfonate,
- Modified Thiourea Polymer,

"Trade Secrets" Family Names continued:

- Naphthalenesulfonate-Formaldehyde Condensate – Sodium Salt,
- Non-hazardous ingredients,
- Nonylphenol Ethoxylate,
- Modified Sulfonate,
- Modified Thiourea Polymer,
- Naphthalene Sulfonate-Formaldehyde Condensate,
- Non-hazardous ingredients,
- Nonylphenol Ethoxylate,
- Olefin,
- Organosulfur Compound (1), (2),
- Organophosphonic Acid Salt,
- Oxyalkylated Alkylphenol,
- Oxyalkylated Alkylphenol Resin,
- Oxyalkylated Amin Quat,
- Oxyalkylated Polyamine,
- Petroleum Resins,
- Polycyclic Compound,
- Polyglycol Ester,
- Polyoxylalkylenes,
- Polysaccharide,
- Phosphonate Salt,
- Polyacrylate,
- Polycyclic Aromatic Hydrocarbon,
- Polycyclic Compound,
- Polyester,
- Polyoxyalkylenes,
- Polysaccharide,
- Powervis,
- Proprietary Blend,
- Quaternary Ammonium Compound (1), (2), (3),
- Salt Compound,
- Salt of Inorganic Acid,
- Salt of Organic Acid,
- Sulfur Compound,
- Thrutrol,
- Unsaturated Alcohol,
- Vegetable and Polymer Fibers,
- Viscosifier,
- Wood Chemicals

➔ Considering the surprisingly long list of chemicals used, **a requirement for facilities to perform a Hazards Analyses is needed.**

➔ It would also be very important to **determine whether some facilities used less toxic chemicals, that may set standards other facilities should meet.**

Other areas of concern include but are not limited to evaluation of contamination of soil and water due to use of hazardous chemicals, evaluation of the volumes of water used and produced from wells, the risks during earthquakes including fires, spills, chemical hazards, the risks from bulk natural gas storage facilities in light of the Aliso Canyon disaster discussed in the letter below, and the risks from pipelines connected with extraction facilities.

Please see the details of three attached comments by STAND LA to the AQMD, including the February 2015 letter entitled *Comments on draft Rule 1148.1*, and the July 2015 letter entitled *Rule 1148.2- Notification for Oil & Gas Wells Urgently Needs Board Improvements*, and the January 2016 letter entitled *Case No. 137-76, Porter Ranch Gas Leak – Support neighbors, take immediate action.*

The first two letters urge implementation of Best Available Control Technology (BACT), better monitoring, removing some of the barriers present in reporting public nuisances, an Odor Mitigation plan for every extraction facility, better neighbor notification of drilling activities, a Hazards Analysis regarding chemicals used, making all chemicals and other information publicly available, removing exemptions for injection wells, and more. Note that the AQMD is in the

process of evaluating BACT for extraction facilities at the urging of STAND LA. The County should request such evaluations from the AQMD. However, it should also be noted that AQMD regulations allow extraction facilities to operate with far less than best technologies, and this industry has previously been under-regulated. While the AQMD has made important improvements in recent regulations, this process is not complete, and the AQMD has promised neighbors that more work will be done on pollution prevention.

The last STAND LA letter is in support of neighbors and public health impacts of the Aliso Canyon major gas leaks, and discusses the extreme greenhouse emissions from that leak.

Please also see the attached comments of Environmental Justice organizations on the California Air Resources Board Oil and Gas regulation. This comment discusses the specific leak rates and need for tight leak standards as in the Bay Area Air Quality Management District rules, the need for frequent inspection and rule enforcement, requiring BACT, buffer zones, annual public reporting, and more.

In addition, see attached surveys of many Wilmington neighbors showing their experience with the Warren E&P facility 2009, after Warren purchased the site from Exxon, where operations had previously been reduced over years to very low or no activity. After the Warren purchase, Warren began drilling hundreds of wells from this central neighborhood location using lateral drilling. Neighbors contacted CBE, described the conditions as "A Living Hell," and described frequent diesel truck trips through the neighborhood, loud noises at night, flaring, breathing problems, continuous odors, poor notification, and general strong dissatisfaction with having this facility so near to their houses (across a residential street from homes).

Note that this year it has been reported that Warren E&P has filed for bankruptcy,[7] which cuts two ways – many neighbors wanted this facility moved out of the neighborhood years ago. However, the bankruptcy brings up questions about the company's financial ability to clean up the site if it shuts down, or whether it will simply be sold to another operator.

One lesson is that regulators failed to provide sufficient environmental analysis when this site changed hands about a decade ago, (when Warren purchased the facility from Exxon, and greatly expanded operations). **In general, when new or modified operations are proposed or when facilities change hands, thorough environmental review is necessary including environmental impact reports, health impacts analysis, and hazards analysis**.

L.A. County should also consider requiring a company to keep minimum financial assets aside to ensure they can remediate oil fields upon completion of the wells. This type of asset minimum is required of companies operating hazardous facilities under the Resource Conservation and Recovery Act,[8] and should be required of oil field operators, to prevent Los Angeles County from having to pay for oil field remediation after a company declares bankruptcy.

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[7] Warren Resources Files for Bankruptcy, Wiping Out Stockholders, June 2016, http://marcellusdrilling.com/2016/06/warren-resources-files-for-bankruptcy-wiping-out-stockholders/

[8] U.S. Environmental Protection Agency, Financial Assurance Requirements for Hazardous Waste Treatment, Storage and Disposal Facilities, last accessed Sep. 19, 2016,

It is essential that not only a methodical accounting and understanding of these facilities be achieved, but that serious pollution prevention measures be set in place. Oil and gas extraction facilities have operated at a primitive level of pollution controls compared to other heavy industry, and need to catch up with use of best technologies. These facilities also need much better pre-permitting scrutiny and environmental review, and should not be sited near neighbors, as they routinely are now.

Finally, there is a need in general to for a recognition that in light of the State's and Los Angeles' long term Clean Energy goals (including 80% GHG cuts by 2050, and 40% cuts by 2030 required by AB32, SB350, and SB32), as well as the City's 100% renewables goal, these will necessitate a phaseout of fossil fuel industries including oil and gas extraction. The County should include a recognition in its report that at the least, any expansions in oil and gas production are counter to these state goals and must cease. Moreover, a plan is needed to be phase out these facilities completely.

Sincerely,

Julia May
Advisory Panel Member of the Los Angeles County Oil & Gas Taskforce,
and Senior Scientist, Communities for a Better Environment

Attachments

https://www.epa.gov/hwpermitting/financial-assurance-requirements-hazardous-waste-treatment-storage-and-disposal.

February 6, 2015

Via Electronic Mail

Dairo Moody, Air Quality Specialist
South Coast Air Quality Management District
dmoody@aqmd.gov

Re: Comments on draft Rule 1148.1

We are writing on behalf of Stand Together Against Neighborhood Drilling (STAND LA), a coalition of community-based environmental health and justice groups impacted by oil drilling operations in the Los Angeles region and public health advocates. We appreciate your efforts to strengthen Rule 1148.1. We strongly support broadening the rule coverage beyond volatile organic compounds and inclusion of other toxic air contaminants, total organic compounds, and odors. We also appreciate the increase in the distance from the facility up to 1,500 feet for the sensitive receptor definition. However, the modifications in the current draft rule are not sufficiently protective to address many of the issues that community members have raised and significant health problems occurring in the community due to drilling operations. We propose to modify the new draft regulation to include language on the following issues:

- **Require expanded impact and mitigation plan and air monitoring for all drilling facilities, including:**
    - **An Odor Mitigation Plan for all facilities,** regardless of whether they have received confirmed odor complaints. Odor Mitigation Plans should be done on a preventive basis rather than after problems have occurred. This is an important consideration because odor complaints have proven very difficult or impossible for the District to confirm on a regular basis due to inherent limitations of the protocols used. These limitations include: travel time required for inspectors to reach facilities, the need for residents to remain in the area to meet inspectors,

lack of public familiarity on access to public complaints, difficulties in carrying out complaint processes during the night when people are asleep, the number of individuals that must call and complain, and the "burnout factor" when residents try to make complaints that often results in incomplete or no action. This is a statewide problem with odor nuisances near industrial facilities that sets the neighbors up to have the burden of proof rather than requiring facilities that are known to cause odor problems to pro-actively prevent emissions. Additionally, such an odor mitigation plan has the added benefit of reducing overall air emissions if good engineering practices are carried out.

- **AQMD staff need to provide an evaluation of onsite monitoring options** (in public workshops), for VOCs, particulate matter, air toxics, oil deposition, and for other potential emissions as well as setting requirements to put these in place.
- **Operators need to be required to have continuous air quality monitoring of criteria pollutants and toxics.** More detail should be added to the draft rule where it discusses monitoring alarms, and specific monitoring and methods should be required.
- **An Oil Deposition Monitoring and Mitigation plan for all facilities** during initial drilling and during ongoing operation. Many community members living near oil drilling operations have reported deposits of oily residue on their cars, yards, and homes. At one point the AQMD offered to carry out outdoor plate sampling to identify potential deposition of oil residue near the Warren drilling facility in Wilmington, but this was never carried out.
- **A Hazards analysis and risk assessment for any facilities using, storing, and transporting Hydrogen Fluoride and other acutely hazardous materials** during both initial and ongoing drilling operations. This should include not only ongoing risks but also risks of releases during earthquakes, fire, and breakdowns. We are very concerned about the potential for major accidents due to use of acutely hazardous materials such as Hydrogen Fluoride that has been ramped up in recent years.
- **Analysis of diesel truck emissions and other diesel engine emissions** and impacts within 1,500 feet of residences and other sensitive receptors.
- **Analysis of BTEX (Benzene, Toluene, Ethylbenzene, and Xylene) and other carcinogenic emissions** and impacts within 1,500 feet of residences and other sensitive receptors.
- **Make all information publicly available and provide an opportunity for public comments and be responsive to these comments before approval.**

- **The Specific Cause Analysis process needs to be speeded up and made less burdensome to the community when odors do occur.** The Odor Mitigation Plan to prevent odors should be updated to address any reported odors that occur (whether confirmed or unconfirmed).

- **Require operators to update standard operating procedures,** emergency or leak prevention plans, or preventative maintenance scheduling and procedures when odors occur. The current draft rule only requires that operators *consider* such changes. AQMD should require operators to adopt changes that are effective in preventing future occurrences of odors.
- **Thresholds should be lowered for confirming odor complaints when they do occur,** including the number of complaints required for a Notice of Violation. This should be done in addition to requiring pro-active Odor Mitigation Plans.
- **Records should be kept for longer – extended to 10 years –** especially since facility operation can wax and wane over time. Some of our community members have been impacted by facilities that were previously shut down and then reopened. Sometimes previously existing permit conditions were disregarded after a number of years. For many reasons, recordkeeping over the long-term is important.
- **Require a phase-in of Best Available Retrofit Control Technology (BARCT) for all oil drilling and Best Available Control Technology (BACT) for new and expanded operations,** by 2017. The District should perform a BACT/BARCT review of best operations and equipment for the purpose of minimizing and eliminating fugitive and point source emissions and best practices for eliminating use of hazardous materials. AQMD should provide this information/evaluation in their staff report during this rulemaking process.
- **Require, at a minimum, the same level of leak detection and repair that is mandated for oil refineries including frequent inspections.** For example, if AQMD identifies a leak, then it is automatically a violation, and it has to be fixed quickly. The way the drilling rule stands now, facilities don't have to fix a leak unless they find it, and that is a disincentive for finding the leak in the first place.
- **Do not allow "standing oil" in well cellars.**
- **Improve fugitive emissions controls beyond simple tarps.** The District should provide an evaluation of more protective fugitive emissions controls to protect against evaporation, including enclosures and engineered fittings.
- **Minimize on-site combustion** as much as possible in concert with eliminating fugitive leaks and venting of gases.
- **Require more transparency in all new and existing drilling operations** – Provide all of the above plans and reports, including all the Impact and Mitigation Plan and air monitoring plans and data, the Specific Cause Analysis reports, and complaint information to the public. Make this information available on your website to avoid lengthy public records requests processes.

In addition to strengthening Rule 1148.1, we strongly urge the District to initiate creating a draft for a new Rule 1148.2 for public comments by March to replace the existing rule 1148.2, which is about to sunset. We appreciate your work on this important rule, and please let us know if you have any questions. We welcome the opportunity to discuss these important community concerns and issues with you in person.

Sincerely,

Julia May
Senior Scientist
Communities for a Better Environment

Angela Johnson Meszaros
General Counsel
Physicians for Social Responsibility – Los Angeles (PSR-LA)

Rev. Kelvin Sauls
Senior Pastor
Holman United Methodist Church

Nancy Halpern Ibrahim, MPH
Executive Director
Esperanza Community Housing Corporation

Sandy Navarro
People Not Pozos
Esperanza Community Housing

D. Malcolm Carson
Policy Director & General Counsel
Community Health Councils

Richard Parks
President
Redeemer Community Partnership

Bhavna Shamasunder
Assistant Professor
Urban and Environmental Policy Department
Occidental College

cc. Susan Nakamura, Director of Strategic Initiatives, SNakamura@aqmd.gov

July 18, 2016

California Air Resources Board
1001 I Street
Sacramento, CA 95814
Via Electronic Submittal:
http://www.arb.ca.gov/lispub/comm/bcsubform.php?listname=oilandgas2016&comm_period=A

Re: Comments urging strengthening of CARB's Proposed Regulation on Oil & Natural Gas Production, Processing, and Storage

The undersigned environmental health and justice organizations offer comments on the proposed Oil and Natural Gas Production Processing, and Storage (the "Oil & Gas rule") regulation. We appreciate efforts of the California Air Resources Board (CARB) in developing the regulation, and urge the strengthening measures below, to prevent practices leaving communities unprotected.

Our organizations work for Environmental Justice in low-income communities and communities of color heavily impacted by air quality and related public health issues throughout California. We actively participate in local and statewide efforts to prevent and minimize the widespread harms of oil and gas extraction, processing, and storage. Our communities are hard hit by local health impacts of these sources, and are also among the most vulnerable to climate impacts such as heat waves, drought, and increasing smog due to temperature increases. The proposed rule focuses on reduction of the greenhouse gas (GHG) methane, but also identifies sorely needed benefits due to cuts in smog precursor and toxic co-pollutants, since multiple pollutants are emitted simultaneously by these industries. Co-pollutants include toxic BTEX compounds (Benzene, Toluene, Ethylbenzene, and Xylene), other VOCs, hydrogen sulfide, and other pollutants that burden our communities.

The extraction industry has long enjoyed lax or non-existent regulation and primitive control systems as compared to industries such as refining. In many cases, facilities are inherently badly sited, should never have been permitted for operation in residential neighborhoods, and receive many public complaints of severe odors and oil eruptions. Methane can also be emitted during these odor "episodes" reported by communities, so cleaning up odors can also clean up GHGs.

Both ongoing and episodic emissions have been poorly quantified and rarely monitored. With "enhanced" drilling to stimulate wells, many of our communities have seen a boom in extraction operations, sometimes within a few feet of their houses. Facilities all but shut down have drastically expanded operation in recent years, and new operations are springing up regularly all over the state. The volume of oil and gas produced is not necessarily a good indicator of emissions and impacts to local communities, which can be heavily impacted even by a small

nearby facility. For all these reasons and to maximize GHGs and co-pollutant cuts, it is essential that at a minimum, CARB require this industry catch up with best practices and technologies for emission prevention required in other heavy industries such as oil refining. While oil refining pollution prevention is far from ideal, extraction-related industries should at least meet the best standards that have been established by air districts for oil refining, which processes the same chemicals.

I. We urge tighter leak standards, consistent with best oil refinery standards, and speeding up implementation

We urge that leak standards in the regulation be tightened to 100 ppm for valves and connectors, 500 ppm for pumps, compressors, and pressure relief devices, and 100 ppm for any other leaking components (including pneumatic devices), to be minimized in 24 hours and repaired within 7 days. This standard has been required by the Bay Area Air Quality Management District (BAAQMD) for oil refineries for decades. Leaks above these levels should be considered a violation, and inspection and enforcement mechanisms should set in place.

We see no reason for treating oil and gas extraction and handling these leak standards differently from oil refining operations, since they process exactly the same chemicals, and since oil and gas handling operations are much less complex than oil refineries, and in many cases can more easily meet the standards. It is well-established that equipment is available for meeting these leak standards for the pollutants involved. Oil refineries within the BAAQMD District must meet these leak standards for many thousands of valves, connectors, and seals. Thus the Oil & Gas extraction and handling industry, which uses far fewer fugitive leak components, should readily be able to meet the standards. By adopting tighter standards for both methane and co-pollutants, CARB will set strong, consistent statewide requirements for GHGs, criteria pollutants, and toxics.

The final leak standards proposed by CARB are as follows (interim standards are even weaker):

Table 10: Repair Time Periods on or after January 1, 2020

Leak Threshold	Repair Time Period
1,000-9,999 ppmv	14 calendar days
10,000-49,999 ppmv	5 calendar days
50,000 ppmv or greater	2 calendar days
Critical Components	Next shutdown or within 12 months

In the Staff Report for the Oil & Gas rule, staff explains the justification for the standards proposed to be based on the most common standards in the state:[1]

> In the proposed regulation, 1,000 ppmv is the lowest leak threshold defined. Staff chose this threshold to be consistent with the majority of districts with oil and gas LDAR regulations. District regulations vary on the threshold but 1,000 ppmv is the most common across the districts. In addition, staff chose to lower the threshold from 10,000 ppmv after two years to 1,000 ppmv simply to ensure that more leaks are being detected. The thresholds and repair times assure that leaks are repaired once found and that the largest emitting sources are prioritized. The quickest leak repair time period is 2 calendar days for leaks measuring 50,000 ppmv or greater.

While we appreciate tightening from the earlier-proposed 10,000 ppm standard, we do not believe that choosing the standard based on the largest number of Districts is a valid justification. Many of these standards were adopted long ago, and should have been upgraded to meet the best standards in the state. Many of these Districts are smaller, so simply counting them doesn't provide an indicator of their relevance to impacts. **Setting a state-wide standard that meets best practices will ensure that the new rule doesn't follow an arbitrary average, but instead leads the state as a whole forward toward consistent best practices, proven to be readily-available.**

We propose that the leak standard in the proposed Oil & Gas rule be replaced with the following sections from BAAQMD Regulation 8, Rule 18, requiring a leak standard of 100 ppm for valves, and connectors, a 500 ppm standard for pumps, compressors, and pressure relief devices, and 100 ppm for all other devices (including pneumatic devices):[2]

> **8-18-301 General:** Except for valves, pumps and compressors, connections and pressure relief devices subject to the requirements of Sections 8-18-302, 303, 304, 305 and Bay Area Air Quality Management District December 16, 2015 8-18-6 306, **a person shall not use any equipment that leaks total organic compounds in excess of 100 ppm unless the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days.**
>
> **8-18-302 Valves: Except as provided in Section 8-18-306, a person shall not use any valve that leaks total organic compounds in excess of 100 ppm** unless one of the following conditions is met: 302.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 302.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.
>
> **8-18-303 Pumps and Compressors: Except as provided in Section 8-18-306, a person shall not use any pump or compressor that leaks total organic compounds in excess**

[1] *Staff Report: Initial Statement of Reasons*, (Public Hearing to Consider the Proposed Regulation for Greenhouse Gas Emission Standards for Crude oil and Natural Gas Facilities), Released: May 31, 2016, Scheduled for Consideration: July 21, 2016, at p. 119, available at: http://www.arb.ca.gov/cc/oil-gas/isor.htm

[2] Available at: http://www.baaqmd.gov/~/media/files/planning-and-research/rules-and-regs/reg-08/rg0818.pdf?la=en

of 500 ppm unless one of the following conditions is met: 303.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 303.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.

8-18-304 Connections: Except as provided in Section 8-18-306, a person shall not use any connection that leaks total organic compounds in excess of 100 ppm unless one of the following conditions is met: 304.1 If the leak has been discovered by the operator, minimized within 24 hours and repaired within 7 days; or 304.2 If the leak has been discovered by the APCO, the leak must be repaired within 24 hours.

8-18-305 Pressure Relief Devices: Except as provided in Section 8-18-306, a person shall not use any pressure relief device that leaks total organic compounds in excess of 500 ppm unless the leak has been discovered by the operator, minimized within 24 hours and repaired within 15 days; or if the leak has been discovered by the APCO, minimized within 24 hours and repaired within 7 days.

II. Deadlines, exemption allowances, monitoring, and enforcement requirements should be tightened

Again, in an effort to ensure that long-overdue available best practice methods be expeditiously set for all oil & gas extraction, processing, and storage operations, we urge the additional improvements to the regulation:

- **All standards should be met within at longest two years of adoption, rather than post-2020 for final regulation requirements.** Waiting until 2020 to implement the final standards is excessive – facilities which have been leaking and emitting for far too long need to clean up expeditiously to protect public health and the environment, and should be able to meet standards within two years of adoption. If facilities are not leaking or significantly emitting, it should be no problem to meet standards expeditiously.
- **Monitoring step-down to annual inspections should not be allowed, but should continue at least quarterly.** Monitoring practices are an essential part of pollution prevention. Monthly inspections could further increase reductions achieved, but at least quarterly inspections should be required for all components. Continuous monitoring options should be considered. No option to move to annual inspections should be allowed, even if no leaks are detected. This is especially important for the oil & gas production, processing, and storage industry which has previously lacked inspection. Regular inspection should be a basic part of normal business practices.
- **An exemption allowing 12-month leakage for "critical" components is extremely excessive and should be removed, as oil and gas extraction and processing operations can shut down operations much more easily than oil refineries.** The concept of allowing longer leakage for critical or inaccessible components came out of

oil refining regulation. Oil refineries are vastly more complex, and require complicated shutdown procedures. Oil extraction and processing operations are far smaller and less complex, and handle much lower volumes of materials. They can shut down and start up quickly, without the major impacts caused by oil refinery shutdowns. A year-long allowance for so-called "critical" component leakage is extreme, and encourages unnecessary poor practices and chronic health-threatening emissions exposures.

- **The strongest independent Monitoring, Inspection and Enforcement mechanisms should be in place through regulators**. Any leaks or emissions above standards should be defined as a violation of rules, with associated penalties sufficiently harsh to discourage lax operations.
- **Control efficiency at 95% is lower than achievable standards above 99% for vapor recovery.** CARB is well aware of much higher control efficiencies for handling hydrocarbon and sulfur gases. We strongly encourage adoption of best available vapor capture and control, and discourage combustion devices such as flares, especially near communities.
- **Exemptions should generally be removed for lower volume operations, or where lower pollutant concentration are assumed, at least while California gains more site-specific long-term data on this poorly-monitored industry.** Individual operations assumed to have lower emissions as indicated by industry-wide average factors (especially since these factors have been widely questioned in the scientific literature), and that are not monitored onsite, may never be accurately assessed. Smaller operations are not necessarily lower-emitters, and can be especially harmful in close proximity to neighbors. CARB has acknowledged in its staff report that atmospheric monitoring of oil and gas operations have found higher emissions than EPA bottom-up emissions factor assumptions. Given ongoing community complaints about this industry, the proposed Oil & Gas rule could provide a major opportunity to evaluate actual local monitored impacts of <u>all</u> equipment used in <u>all</u> such operations. These operations are not benign, are inherently polluting, and should at minimum meet best practice leak and vapor recovery standards for all equipment.
- **At a minimum, any facility within 1500 feet of a residence should be required to meet tight leak and vapor capture standards, regardless of minimum volume or pollutant concentration thresholds.** It would further be prudent to prohibit such operations near residents, especially since horizontal drilling techniques allow remote access to wells.
- **We request that CARB release an annual report to the legislature with aggregate emissions data from owners and operators collected under this rule and data from CalEnviroScreen,** for the purposes of prioritizing inspection and enforcement of this rule in areas most overburdened by pollution. We request that CARB make this document available to the public in electronic format. *See e.g.* Cal. Health and Safety Code Sec. § 25180.2.

Thank you for your consideration, and for your work developing these regulations.

Sincerely,

Julia May, Senior Scientist, **CBE** (Communities for a Better Environment)

Amy Vanderwarker, Co-Director, **CEJA** (California Environmental Justice Alliance)

Taylor Thomas, Research and Policy Analyst,
East Yard Communities for Environmental Justice

Madeline Stano, Staff Attorney, **CRPE** (Center on Race Poverty, & the Environment)

Michele Hasson, MPP, Policy Advocate/Specialist. **CCAEJ** (Center for Community Action & Environmental Justice)

Jack Eidt, Steering Committee, **SoCal 350 Climate Action**

Joe Galliani, Founder and Co-Organizer, and
Sherry Lear, Co-Organizer **South Bay Los Angeles 350 Climate Action Group**

Anabell Chavez, Advisory Board Member, **Wilmington Improvement Network**

Jesse N. Marquez, Executive Director, **CFASE** (Coalition for a Safe Environment)

Drew Wood, Executive Director, **California Kids IAQ,** Wilmington

Ricardo Pulido, Executive Director, **Community Dreams,** Wilmington

Pastor Alfred Carrillo, **Apostolic Faith Center,** Wilmington

Chaplin Anthony Quezada, **American Veterans (AMVETS),** Long Beach

Magali Sanchez-Hall, MPH, Executive Director, **EMERGE,** Wilmington

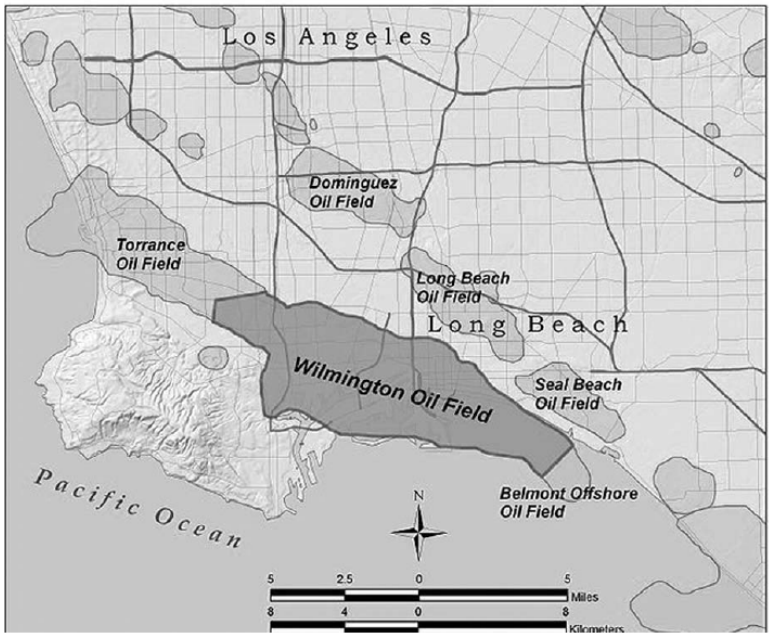
Veronica Padilla, Executive Director, **Pacoima Beautiful**

Nancy Halpern Ibrahim, MPH, Executive Director, **Esperanza Community Housing Corporation**

Martha Dina Argüello, Executive Director, **PSR-LA** (Physicians for Social Responsibility - Los Angeles)

Excerpt from CBE Report: The Increasing Burden of Oil Refineries and Fossil Fuels in Wilmington, California and How to Clean them Up!, April 2009, available at: http://www.cbecal.org/wp-content/uploads/2012/05/wilmington_refineries_report.pdf

In addition to oil refining, oil drilling is causing more fossil fuel cumulative impacts right in Wilmington



As if ports, freeways, and refineries weren't enough, **Wilmington contains the third largest oil field in the U.S.**

The oil field was previously considered depleted, but in recent years with new methods and the incentive of high oil prices, drilling has ramped up. CBE's Wilmington oil drilling campaign began in 2006. **People living around the Warren E&P drilling operations contacted CBE to report severe noise, sickening smells, air and water pollution, and breathing problems after the company purchased the site.** Neighbors reported constant diesel truck traffic through the residential streets, dust and oily residue covering and invading homes, constant flaring (from a stack burning oil field gas), and heavy vibrations at all hours of the day and night, seven days a week.

Although drilling operations occurred at this site in the past (at a much reduced level), when Warren E&P purchased the facility, production drastically increased, as did impacts on the community where it sits. Recent technological advances now allow oil companies to drill laterally, reaching out underground to large areas, that previously would have been drilled from other locations. That means much larger volumes of oil and gas can come out of one drilling site, in a very intensive operation. Warren E&P has concentrated its drilling operations in this way at the "Wilmington Town Lot," in a residential neighborhood. Even though it borders an industrial area, it is hard to understand why such a neighborhood site would be chosen.

After neighbors called us, CBE worked together with the community to devise strategies to stop the impacts of the drilling. These included evaluating Warren's compliance with air, water, toxics and land use regulations, identifying methods and equipment to reduce flaring and air pollution, pushing for enforcement of existing bans for large diesel truck traffic through the neighborhood, getting paving and street-sweeping requirements implemented to stop the heavy construction dust blowing offsite, and pushing for better government agency monitoring.

CBE contacted the South Coast Air Quality Management District and the City of Los Angeles, and together with community members met with government officials and the company. CBE community organizers and Warren neighbors developed logs of impacts, took photos, videotaped flaring, and evaluated noise levels. Meanwhile CBE lawyers and scientists researched and documented health and environmental impacts, legal requirements, and Warren's permit limits.

It became clear that Warren was not in compliance with permit conditions and limits. After we contacted the Air Quality Management District, the regional agency issued a Notice of Violation to Warren for burning gases in the flare, far above its permit limits. Unfortunately the Air District then began rushing through a permit that would have allowed even more flaring. CBE challenged it and the Air District withdrew it. CBE and neighbors met with the Air District staff and chief to describe the severe conditions. The Air District began to develop a new compliance plan to reduce Warren's air pollution.

(continued next page)

Photo from video by Rember Sosa, neighbor to Warren oil drilling

In a CBE survey, Wilmington neighbors described oil drilling operations as "a living hell."

CBE organizers carried out a survey of neighbors after bitter complaints about Warren drilling, with the following different responses from neighbors:

- It's been different since the Warren site came to the neighborhood
- A lot of allergies, breathing problem, headaches, chronic problems, lack of sleep
- Get a weird taste in my mouth, difficulty in bad traffic, breathing, there's a breeze of dust, the house is full of dust, must close the windows in the house 24/7
- Mainly health problems—sleeping. House always has dust and oily residue, vibrations. I know my blood pressure is just on edge, I just have to leave. This can't go on much longer.
- Smell, noise, illness. Extreme breathing difficulties, Dr. visits
- Evening noise—more dust, smells, extensive lung illness, constant coughing—less sleep
- Lots of dust. Every morning lots of black film all over the cars
- Problems breathing. More dust in my home, headache
- Affected my health by asthma, community is dirt
- Headache, nausea, and difficulty breathing

Neighbors attend public meeting on Warren Oil Drilling Operations at Los Angeles Councilwoman Hahn's office

After the Notice of Violation, CBE and members intensified work on the land use front. As a result of communications with the City and Wilmington's representative Janice Hahn, the Zoning Administrator instituted a review of Warren's Land Use requirements. CBE and members documented the suite of impacts, and submitted legal and technical briefs.

The morning of the hearing, Warren packed the auditorium by providing free breakfast to busloads of Warren E&P shareholders and royalty recipients from outside the community who didn't have knowledge of local impacts. CBE members from the neighborhood were dismayed and offended by this show, but many still overcame their disillusionment and spoke out eloquently at the hearing. It took months before the Zoning Administrator issued a decision, adding few requirements including restrictions on hours of operation and trucking, but not sufficient to meet neighbors' concerns.

CBE and members continued documenting ongoing impacts from Warren, and pursued the Air District process, where the agency and polluter were collaborating on a long-term plan to relieve Warren of liability for its air violations. CBE testified and offered evidence at the quasi-trial conducted by the Air District Hearing Board on Warren's permit violations.

Neighbors urged the Board to reject the plan and require compliance with the law. Although the Hearing Board denied our challenge, the community efforts resulted in the Air District issuing a more protective compliance plan to decrease Warren's flaring, improve equipment, ultimately send gases offsite for sale instead of burning onsite, and more. Warren is now required to comply with more enforceable air protections.

Although CBE and neighbors were very dissatisfied with the formal decisions at the hearings, the community pressure meant that much was accomplished behind the scenes to get the City and the Air District to force Warren to clean up operations, while they awaited permit decisions. While neighbors are very happy that conditions have greatly improved, many are concerned that this may be only a temporary improvement.

HEALTH IMPACTS OF OIL DRILLING

- H2S and other hazardous sulfur compounds such as SOx (Sulfur Oxides) can hurt breathing, and can be released by oil drilling operations including well heads, pumps, piping, separation devices, storage tanks, and flaring.
- The US Agency for Toxic Substances and Disease Registry found: People can smell H2S at low levels. Lower level, long-term exposure can cause eye irritation, headache, fatigue, respiratory irritation, and at high levels, death.[29]
- Studies found people living near oil and gas wells had higher levels of many diseases.[30]
- Oil drilling operations also cause emissions of VOCs (Volatile Organic Compounds), which include smog-producing and cancer-causing chemicals.

People are concerned that Warren may only be temporarily on its best behavior, prior to the next permit approval needed, and may relapse in the future. The facility is slated to further increase production for years. There is also a major concern that reduced noise and pollution is due to reduced production because crude oil prices are currently down again. Warren may have ramped down production until prices go up again. If production increases greatly, there is concern impacts could increase greatly.

Neighbors are also very frustrated about foundation damage to their homes that was never compensated. Continued watchdogging is needed to protect neighbors from this terribly inappropriate siting. **A serious Cumulative Impact policy could have prevented this bad siting.**

A FEW CAMPAIGN RESULTS

	Positive Result for Now?	Permanent Solution?
Diesel trucking through neighborhood	✔	?
Construction dust from dirt	✔	✔
Continuous flaring	✔	?
Noise	✔	?
Smells	✔	?
Foundation damage	☹	☹

- The frequent, illegal diesel trucking through the neighborhood has stopped; the crude oil is now piped offsite instead of trucked.
- Extreme construction dust is apparently permanently stopped on the main site. Warren has now complied with its original requirement to pave the site (though a nearby area is still in question)
- Constant flaring has stopped for now
- Noise has improve greatly, possibly temporary
- Smells have improved

July 7, 2015
Via Electronic Mail
South Coast Air Quality Management District

Re: Rule 1148.2- Notification for Oil & Gas Wells Urgently Needs Board Improvements

Dear Members of the AQMD Governing Board,

We write on behalf of Stand Together Against Neighborhood Drilling Los Angeles (STAND LA), a coalition of community-based environmental health and justice groups heavily impacted by oil drilling / extraction operations in the Los Angeles region, and public health advocates. Our coalition and other community members actively participated in the development and recent amendments of Rule 1148.2. In the current June 2015 rule revision process, our members have expressed many concerns during meeting, workgroups, and telephone calls. We very much appreciate your staff meeting with us and holding public meetings to improve Rule 1148.2 (June 2015 rule version[1]). However, there are remaining deficiencies in the rule that must be addressed in order to make the rule's measures meaningful to impacted communities. Without these additional strengthening measures, the rule will continue to leave communities unprotected.

The District has legal and policy mandates to protect public health, and the public has the right to know about the use and emissions of dangerous chemicals and activities in communities. This is especially true where many of these facilities should never have been permitted to operate in such close proximity to people's residences.

Accordingly, we respectfully request that Rule 1148.2 be further amended to incorporate the measures outlined below. Please also see the photos directly below and further in our letter, which dramatically document the extreme proximity of heavy extraction activities to neighbors (right outside apartment windows).

Please also see the brief summary below of rule deficiencies and actions that we urge that the Board to take.

[1] Available at http://www.aqmd.gov/docs/default-source/rule-book/Proposed-Rules/1148_2/7---att-f-par1148-2d-30-day-package.pdf?sfvrsn=2

The following comments most urgently need Board action at the July 10th hearing:

- **Rule 1148.2 should include injection well activities used for oil or gas operations (pictured above).** We have continually expressed our position that there exists no practical or principled reason for excluding injection wells from the rule. At the May 19, 2015 workshop, industry representatives agreed that there is no practical distinction between injection and production wells. Well injection activities can cause toxic air emissions and greenhouse gases the same way that production wells do, and there is no basis for exempting them. We urge the Board to further amend Rule 1148.2to include reporting, notification, recordkeeping, and any other requirements of the rule for injection wells. We also urge that the District to perform source testing (direct measurement of emissions) of well injection activities, with a commitment to do so in a Board Resolution.
- **Families need 72-hour notice of well work with same-day certainty of when the activities are going to take place.** While providing 72-hour notice is a step in the right direction, families are left with no certainty about the day when well work will take place, so they can move their children from harm's way. **The current allowance for up to 5 extensions makes the 72-hour notice somewhat meaningless, unworkable, and must be struck.** These repeated extension allowances should be eliminated from the rule, or reduced to no more than one. At the May 19, 2015 workgroup meeting, industry representatives voiced that a maximum of three extensions would be agreeable to them, so it is troubling that impacted residents are asked to tolerate up to a week of uncertainty as to when hazardous well activity may take place. We strongly urge the Board to provide greater certainty and protections to residents by further reducing the number of extensions that an operator may have prior to issuing a new notification.

- **Local Notification is missing, and is a basic necessity** – Currently there is no local notification required. The AQMD should require signs posted 72-hours in advance on every gate warning the local community of well work. District staff have repeatedly expressed that this is reasonable, but that it could not be done in time for this approval. The AQMD likely has existing local notice requirements covering other facilities which may be readily adapted.
- **Meaningful public notice requires that notice also be provided in Spanish and other languages, as appropriate.** As we have discussed with District Staff, providing notice in Spanish is not cumbersome, and would impose no additional requirements on operators. The email notices that are issued to subscribers of 1148.2 notices could be issued in English, followed by a Spanish translation. The 1148.2 notices could be modified to have field headers in both languages, such as, "Operator/Operador." The District has promised these modifications, and we would appreciate a commitment in a Board resolution.

We also urge that the following key issues be addressed through a Board Resolution:

- **Public data access and website disclosure improvements are needed, whether within or outside the rule.** At this juncture, we urge a Board Resolution to be adopted the July 10th hearing committing to these improvements, as frequently proposed by community members;
- **Increased enforcement mechanisms are necessary to turn around poor compliance records**, and we urge this to be included in a Board Resolution at the July 10th hearing. For example, STAND LA members spent considerable time reviewing District 1148.2 reports and found numerous errors, including complete failure to give notice, or late notice, failure to label air toxins, incorrect CAS Numbers, empty entry for facility ID, and incorrect zip codes. Such errors have greatly undermined the reporting and public notice value of the regulation.
- **A plan for increased monitoring and modeling are needed.** Such a plan should be committed to development in a Board Resolution for the July 10th hearing;
- **Importantly, the rule is still completely missing requirements for *eliminating or preventing* air emissions,** which was identified as a need more than two years ago, and are not covered by the other extraction rule (1148.1). Again, we urge development of a Board Resolution to begin this process, as the District has already stated it plans to, after adoption of the proposed changes.

Please see the additional photos below:

July 15, 2014: A worker in head to toe protective gear beside red DANGER tape stands behind tanker trucks parked right next to homes.

July 15, 2014: Heavy diesel equipment including two tanker trucks behind red DANGER tape sit idling outside bedroom windows at FMOG's Jefferson Drill Site.

More on the urgent need to include injection wells

The District currently does not consider injection well operations as included in Rule1148.2's requirements. Since injection wells may: (1) process the same chemicals as extraction wells, (2) involve waste materials that can be contaminated with hydrocarbons, and (3) cause upwelling of gases from injection wells, we believe reporting and monitoring of these wells is essential to enable the District to evaluate emissions.

The District acknowledged that injection wells have the potential to cause air emissions and was considering that these may be covered without a rule change, but we have not yet been provided any assurance that this enforcement will happen.[2] There is no justification showing why injection well activities should not carry the same reporting requirements.

[2]*Proposed Amended Rule 1148.2 Working Group Meeting May 19, 2015, provides:* "Comment: Injection wells should be included in rule, particularly injection wells where similar well stimulation techniques are used such as

(16) WELL means an oil or gas well, a hole drilled for the purpose of producing oil or gas, or a well into which fluids are injected.

The plain language of the rule can be read to include injection wells, and there is no exemption in the rule for injection wells in the regulation, so accordingly, any well used in relation to oil or gas operations into which fluids are injected should be subjected to all R. 1148.2 requirements. Again, there is no principled or practical reason to exempt injection wells or treat them differently. We urge that the Board enforce the regulation, and in addition carry out monitoring and reporting activities for well injection activities.

The photos below document major equipment in close proximity to neighbors for injection well activities using hazardous chemicals. The photos illustrate dangers to residents by such events, and underscore the need to collect data on all injection wells and inform residents.

October 3, 2014: Heavy diesel equipment, including four idling diesel tanker trucks at the Jefferson Drill Site each with a carrying capacity of 5,000 gallons, bearing labels 3264 for Corrosive Liquid and 1789 for Hydrochloric Acid, parked next to homes. FMOG told an AQMD inspector that the work was on an injection well and therefore not subject to 1148.2 reporting. Also see photos below.

acidizing; –Currently evaluating –Staff understands concern that injection wells can undergo similar treatments (e.g., acidizing) to production wells and are subject to the same emission impacts from on-site engines and treatment fluids –Issue will be addressed in Rule 1148.2 recommendations to Stationary Source Committee in June," at Slide 6

October 3, 2014: Following the unreported acid maintenance work on an injection well, plant material on the downwind corner of the facility showed signs of fatal chemical exposure.

In conclusion, we the undersigned *urge* the Board to take the actions listed at the beginning of this letter, as a basic matter of protecting public health from hazardous materials and operations of oil extraction occurring in extremely close proximity to neighbors. Thanks for your attention!

Sincerely,

Richard Parks, President, Redeemer Community Partnership

Ashley Hernandez, Community Organizer, and Julia May, Senior Scientist,
Communities for a Better Environment

Rabeya Sen, Director of Policy, Esperanza Community Housing Corporation

Sandy Navarro, Project Coordinator, People Not Pozos, Esperanza Community Housing

Monic Uriarte and Nalleli Cobo, People Not Pozos members and former Allenco Neighbor'

Bhavna Shamasunder, Urban and Environmental Policy, Occidental College

D. Malcolm Carson, Esq. General Counsel and Policy Director for Environmental Health,
Community Health Councils

Rev. Kelvin Sauls, Senior Pastor, Holman United Methodist Church, Los Angeles, CA

Martha Dina Arguello, Executive Director, and Jennifer Kim, Air Quality & Health Associate,
Physicians for Social Responsibility - Los Angeles

cc. Dr. Barry Wallerstein, Susan Nakamura, Ed Eckerle, SCAQMD

Attachment

Attachment to 1148.2 Comments by STAND LA to AQMD Board —Additional Issues brought to the District, for follow-up—

After proposing these to the District, staff indicated these will be addressed through follow-up actions after adoption of the current rule changes. This is to memorialize STAND LA's comments regarding public information access and rule enforcement.

A. Additional public access improvements needed to enhance transparency

SCAQMD's website was an important step toward providing residents with vital public health information. AQMD should increase public accountability and health by enhancing data transparency. The District has committed to improvements in the future.

1. Disclose chemical supplier information. AQMD collects chemical supplier information, but does not currently disclose the information. The public needs this information to acquire Material Safety Data Sheets (MSDS) (link) for specific trade name chemicals. MSDS sheets provide a fuller picture of the contents and scientifically established health risks of the products. The District has offered to provide an online library of chemicals health impacts.
2. Allow Search by facility ID. AQMD should allow searches of well events by Facility ID. For example, FMOG sometimes hyphenates its name, and as a result, searching for "Freeport-McMoRan Oil and Gas" provides different results than when using "Freeport McMoRan Oil & Gas" without the hyphen. Inconsistent use of operator names skews data and makes accessing accurate data unnecessarily difficult and confusing. Allowing a search by Facility ID is a common sense, no-cost solution that can consolidate minor differences in search entries and prevent errors. Other data entry errors by reporting facilities underscore the need for accountability and enforcement. We appreciate the District's commitment to provide this.
3. Require website disclosure on combustion equipment, dry materials, and fluids, not just reporting to the District.
4. Require reporting of Diesel Engine Emissions (including for extraction and injection wells), in both reports to the District and website reporting.
5. Ensure that data reported are complete, and clean.
6. Allow for more refined electronic notification to interested parties. Presently, residents must proactively sign up to receive all notifications for the SCAQMD region, although most of the region-wide notification is not directly relevant to their families. Residents should be able to screen the notifications they receive by Facility ID and zip code.

B. Strengthen Enforcement Mechanisms.

While the District has many existing enforcement mechanisms, they have not been fully utilized to address non-compliance with Rule 1148.2's requirements. We urge the District to step-up enforcement for non-compliance with the regulation, including significantly increasing fines, increasing inspections, and revoking permits. We understand the District has limited personnel, but the District has the option to increase fees for this sector to enable increased policing of non-compliance. The District has stated that it identifies missing information, spot checks all the data, and has offered to provide a mechanism for the public to report incorrect information, which would be useful. However, we still urge increased District enforcement, as compliance with accurate reporting is necessary to ensure public safety and should be a minimal requirement to operate businesses with high risks to public and environmental health.

Examples of non-compliance:

STAND LA members have spent considerable time reviewing reports, such as FMOG's, and found numerous errors in reporting. These include failure to label air toxins, incorrect CAS Numbers, empty entry for facility ID, and incorrect zip codes. Such errors greatly undermine the reporting and public notice value of the regulation. (*Note: these errors are based on event reports at facility ID 144664, Events 397, 417, 564, 628, 1934, 1952.)* Many of these problems are ongoing and incorrect on the website data to this day:

- Incorrect Zip code: Event 397 and 417 was submitted with the incorrect zip code (90044 instead of 90007). In our initial search for all events at a facility of concern by zip code, these events did not show up because the zip code was incorrect. Additionally, these two events did not even submit a facility ID.
- Unlabeled reportable air toxins: Several entries throughout the event reports for facility ID # 144644 did not properly label chemicals that are known air toxins. There are a total of 18 entries that should have been labeled air toxins, but were not.
- Incorrect CAS Numbers: This is important because chemicals have several synonyms. One of the only ways to understand the total quantity of a particular substance is by CAS numbers. On Event 564, 3 entries were submitted with incorrect CAS Numbers.
- Late event and late chemical reporting, or no notice:
    - Of the 6 reported events at facility ID #144664, only 1 has fulfilled the 24-hour notice. Four events (397, 417, 564, 628) submitted the event report an average of 350 days after the drilling date. This failure to report prevents AQMD inspectors from being on hand, and residents from taking precautions to protect their families. The regulation requires that notifications be posted well within 24-hours. (Section (d))
    - Chemical Report submission for Events 397 and 1934 exceeded the 60-day requirement. Event 397 was submitted 471 days, 1.3 years, after the date of drilling. It involved gravel packing, which requires use of known carcinogenic material.

When STAND LA coalition members raised these violations with some of the AQMD staff, they were told that the function of Rule1148.2 is for reporting only, not enforcement. This cannot be correct – the District's regulations are mandatory, not voluntary, and we believe that other

District staff have confirmed that there are enforcement mechanisms available. Without the real threat of public enforcement and accountability, FMOG and other oil companies will have little incentive to comply. A regulation without an enforcement mechanism leaves too great of a possibility of non-compliance, which drains the Rule of meaning.

Given the critical importance of accurate reporting, inaccurate or incomplete notifications should (1) immediately trigger a "kill switch" stopping the well event, (2) generate a Notice of Violation, and (3) require new notification no less than 7-days before the scheduled activity.

Inaccuracies or incomplete Chemical Reports or failure to comply with the 60-day Chemical Report requirement should (1) trigger a Notice of Violation and (2) impose an immediate moratorium on new well events until the deficiency is corrected, plus a90-day penalty.

Either way, current enforcement has not been sufficient to ensure that facilities are complying with the Rule, and we therefore urge that more resources, and strong disincentives for non-compliance, be provided, in addition to provisions for the public to report errors.

January 8, 2016

Via electronic mail

South Coast Air Quality Management District

Re: Case No. 137-76, Porter Ranch Gas Leak – Support neighbors, take immediate action

Dear Members of the AQMD Governing Board,

We write as members of Stand Together Against Neighborhood Drilling Los Angeles (STAND LA), a coalition of community-based environmental health and justice groups heavily impacted by oil extraction operations in Los Angeles, as well as public health advocates, to express our grave concern for the health and safety people living near the severely leaking Porter Ranch natural gas storage facility of Southern California Gas (SoCal Gas).

Aerial infra-red Video of the Porter Ranch gas leak:

https://www.edf.org/media/new-footage-reveals-first-aerial-view-methane-leak-polluting-los-angeles-county

The District website states that it has received over 1,800 complaints about odors, headaches, nausea, vomiting, and bloody noses due to the leak,[1] and thousands of families have been evacuated. As communities on the frontlines of oil and gas extraction operations, we unfortunately live with similar health hazards and know too well the suffering and fear that Porter Ranch residents are experiencing. No family should be subjected to these hazards, and we ask that you act swiftly, and to the full extent of your authority, to put a final end to the threats posed by the gas storage facility.

We are also alarmed at the enormity of the greenhouse gas emissions, reportedly reaching 60,000 kilograms of methane per hour (over 100,000 pounds/hour), or one quarter of the entire state's methane emission![2]

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[1] http://www.aqmd.gov/home/regulations/compliance/aliso-canyon-update/compliance-enforcement-actions/odor-complaints

[2] http://www.latimes.com/local/california/la-me-0104-gas-leak-20160104-story.html; *see also* http://www.dailynews.com/environment-and-nature/20151211/heres-what-you-need-to-know-about-the-porter-ranch-gas-leak

We appreciate the District's efforts and strongly urge it to issue an order of abatement. Given the extreme health and safety risks posed to residents, however, we ask that the District's order direct SoCal Gas to shut down its gas storage facility. We understand that the repairs of the underground leak are technically complex and that the long-term feasibility of the facility is in serious question. Most importantly, however, oil and gas operations are inherently incompatible with neighborhoods. It is unconscionable that the government's response to such industrial dangers would be to force human beings out of their homes or risk extreme injury, rather than force the facility to abandon the neighborhood. Human rights to live in a safe environment, including breathing clean air, should unquestionably trump industrial and economic concerns. Accordingly, we support neighbors' call for closure of the gas storage facility. This may include drawing down the current storage of gas and ensuring that no additional gas is piped into the reservoir, immediate and maximum efforts to stop the leaks, and transparent evaluation of alternative storage sites away from neighborhoods. The district should also evaluate how we are going to phase out our use of natural gas in the region through clean, alternative energy as soon as possible.

While we maintain that closure of the gas storage facility is the necessary and required response, at minimum, we urge the SCAQMD to:

1) Order SoCal Gas to continue to meet the neighbors demands and protect public health;
2) Ensure that ongoing AQMD monitoring at the site and in neighborhoods includes not only methane and VOCs, but also mercaptans, benzene, and any other emissions that have the potential to impact health and the environment;
3) Order SoCal to stop the gas leaks as expeditiously as possible;
4) Levy the maximum possible penalties/fines for every day the leaks continue;
5) Require SoCal Gas to make all details of their plans and timelines to stop the leaks public;
6) Require SoCal Gas to immediately pay for independent experts to evaluate whether these plans are as expeditious as possible;
7) Require SoCal Gas to fund zero carbon renewable energy sources that would offset an equivalent amount of greenhouse gases emitted by the leaks; and
8) Require SoCal Gas to pay for an independent public study of methane leaks of all its facilities, including storage, pipelines, processing, distribution and other facilities in the District, and recommendations for preventing further leaks.

We understand that Governor Brown has declared a state of emergency over this extreme methane leak, which is now the subject of international concern. While we appreciate the Governor's action, it should not deter the District from taking every possible action in its own powers.

Oil and gas production, storage, processing, and distribution are causing health, human rights and land-use problems all over the South Coast District. Neighbors are being severely impacted by emissions, flaring, odors, loud noises, and those in close proximity to the most extreme of hazardous compounds are threatened by hydrogen fluoride, and many other hazards. The AQMD is well aware that neighbors near such facilities throughout the District are extremely concerned about their health and welfare.

The disastrous situation at Porter Ranch not only requires the most extraordinary efforts to protect neighbors' health and the atmosphere we all depend on immediately, but this emergency

is yet another indicator that the oil and gas industry poses unacceptable risks to the region and the planet. We urge you to begin a comprehensive study of health impacts of oil and gas operations, in furtherance of developing new and comprehensive policies to prevent these land use, public health, and environmental conflicts in the South Coast District.

Sincerely,

Julia May, Senior Scientist, & Gladys Limón, Staff Attorney, Communities for a Better Environment

Nancy Halpern Ibrahim, MPH, Executive Director, Esperanza Community Housing

Rev. Kelvin Sauls, Senior Pastor, Holman United Methodist Church, Los Angeles, CA

Richard Parks, President, Redeemer Community Partnership

Martha Dina Arguello, Executive Director, and Jennifer Kim, Air Quality & Health Associate, Physicians for Social Responsibility - Los Angeles

Bhavna Shamasunder, Urban and Environmental Policy Department, Occidental College

Cc: Dr. Barry Wallerstein, Executive Officer SCAQMD
Los Angeles City Councilmember Mitch Englander

Address: 833 N Banning Bl #B

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	Yes (No) I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) (Sometimes (once/wk) A lot (once/day) All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little (A lot) So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	(Yes) No
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little (A lot (at least once/wk) Most nights
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) (A little (one extra truck / wk) A lot (one extra truck/day)

Address: 833 "N" Banning BL #B

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes No I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes No I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes No I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes No I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experiences since operation began?	Yes No
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes No I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	

Interested in more information and/or getting involved:

Name: Agustin Mendez

Address: 833 "N" Banning BL #B Wilmington CA 90744

Tel: NO E-mail

Domicilio: 803 N. Banning #B

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES 1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	Si No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) Mucho (once/día) Todo el tiempo
RUIDO 3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Casi no Poquito Mucho Insoportablemente
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	Si No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si No
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco Mucho (al menos 1x semana) las noches
OLORES 7. ¿Ha sentido algún olor raro?	Raramente (menos 1 ves por mes) Abecés Mucho (1 ves x semana) Todo el tiempo
TRAFICO 8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	No mucho (1 camión extra x mes) Poco (1 camión extra x semana) Mucho (1 camión extra x día)

Domicilio: _____

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
16. ¿Se le informo que habría un aumento de tráfico al empezar el trabajo en sitio?	Si No No recuerdo
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si No No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si No No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS	
19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	Si No
a. Si es así, ¿de que forma?	En forma positiva En forma negativa
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si No No le interesa
21. Junto con lo que me acabe de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren?	RUIDO POLVO NO DEJAN DORMIR

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: LEONARDO CARDENAS

Domicilio: ~~#~~ 833 N. BENNY BULEVARD

Tel: (310) 413-82-65 Correo Electronico _____

Address: 945 N BANNING

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) ~~A lot (once/day)~~ (All the time)
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little A lot (So much that I can't stand it!)
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes ~~A lot (at least once/wk)~~ (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) ~~A little (one extra truck / wk)~~ ~~A lot (one extra truck/day)~~

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes No I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes No I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes No I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes No I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes No
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes No I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began? Living HELL!!	

Interested in more information and/or getting involved:

Name: Gloria Robledo

Address: 945 N. BANNING BLVD Wilm. CA 90744

Tel: (310) 830-2535 E-mail _____

Domicilio: 837 N Banning Blv

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
<u>QUEMADORES</u> 1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	Si No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) Mucho (once/día) Todo el tiempo
<u>RUIDO</u> 3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Casi no Poquito Mucho Insoportablemente
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	Si No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si No Un Poco
6. ¿Que tan seguido se ha mantenido despierto a causa del ruido por las noches?	No mucho (menos de una/mes) Poco Mucho (al menos 1x semana) las noches
<u>OLORES</u> 7. ¿Ha sentido algún olor raro?	Raramente (menos 1 ves por mes) Abecés Mucho (1 ves x semana) Todo el tiempo
<u>TRAFICO</u> 8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	No mucho (1 camión extra x mes) Poco (1 camión extra x semana) Mucho (1 camión extra x día)

Domicilio: _____

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
16. ¿Se le informo que habría un aumento de tráfico al empezar el trabajo en sitio?	Si X No No recuerdo
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si X No No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si X No No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	X Si No
a. Si es así, ¿de qué forma?	En forma positiva X En forma negativa
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si X No No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren?	Nuestra Salud Ha Empeorado Las Alergias Son Muy fuertes la tierra que nos echo aperder Nuestros Muebles, La gargarta de Mis hijos todo ha hido mal.

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Laura Callejas

Domicilio: 837 N "B" Banning Blv Wilmington CA

Tel: 310) 835-6824 Correo Electronico _____

Address: 937 BANNING

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) A lot (once/day) (All the time)
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little (A lot) So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	[redacted] (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) (A lot (one extra truck/day))

Address: 937 BANNING

QUESTIONS	ANSWERS (PLEASE CIRCLE)
16. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	(Yes) No
a. If yes, in what way?	In a good way (In a bad way)
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	A MESS.

Interested in more information and/or getting involved:

Name: TONY JIMENEZ

Address: 937 BANNING Blvd. Wilmington CA.

Tel: 310-830-8394 E-mail Coyola-78@SBCGlobal.NET.

Jose Rodriguez

Domicilio: 1046 CARY ST. WR

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES 1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	(Si) No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) (Mucho (once/día)) Todo el tiempo
RUIDO 3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Casi no Poquito (Mucho) Insoportablemente
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	(Si) No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si (No)
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco (Mucho) (al menos 1x semana) las noches
OLORES 7. ¿Ha sentido algún olor raro?	Raramente (menos 1 ves por mes) Abecés Mucho (1 ves x semana) (Todo el tiempo)
TRAFICO 8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	No mucho (1 camión extra x mes) Poco (1 camión extra x semana) (Mucho (1 camión extra x día))

Jose Rodriguez
Domicilio: 1046 CARY St

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
16. ¿Se le informo que habría un aumento de tráfico al empezar el trabajo en sitio?	Si (No) No recuerdo
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si (No) No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si (No) No recuerdo
<u>OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS</u> 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	(Si) No
a. Si es así, ¿de que forma? NEGATIVO	En forma positiva (En forma negativa)
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si (No) No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren? Molestias por los olores el Ruido y el trafico	

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Jose Rodriguez

Domicilio: 1046 CARY St WILMINGTON

Tel: 310-518-5096 Correo Electronico

Domicilio: 937 Banning Blvd.

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES	(Si)
1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) Mucho (once/día) (Todo el tiempo)
RUIDO	Casi no
3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Poquito Mucho (Insoportablemente)
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	(Si) No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si (No)
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco (Mucho (al menos 1x semana) las noches)
OLORES	Raramente (menos 1 ves por mes)
7. ¿Ha sentido algún olor raro?	Abecés Mucho (1 ves x semana) (Todo el tiempo)
TRAFICO	No mucho (1 camión extra x mes)
8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	Poco (1 camión extra x semana) (Mucho (1 camión extra x día))
9. ¿Como ha afectado el vecindario?	No mucho Poco (Mucho)

Domicilio: 937 BANNING BLVD

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si NUNCA (No) JAMAS No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si NUNCA (No) JAMAS No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	(Si) No
a. Si es así, ¿de que forma?	En forma positiva (En forma negativa)
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si NUNCA (No) JAMAS No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren?	

MUCHO RELAJO POR EL RUIDO TRAFICO
OLORES SABOR EN LA BOCA DEFICULTAD
EN RESPIRAR ~~RARRER~~ SIEMPRE
BRISA DE POLVO CASA LLENA DE POLVO
~~COSTARA~~ ~~DE~~ TENER CASA SERADA 24/7

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Jose Vasquez

Domicilio: 937 BANNING BLVD. WILMINGTON CA. 90744

Tel: 310 830-8394 Correo Electronico
310 930-4562

Domicilio: 1128 Fries Ave
Wilmington, CA

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES	(Si)
1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) (Abecés (once/wk)) Mucho (once/día) Todo el tiempo
RUIDO	Casi no
3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Poquito Mucho (Insoportablemente)
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	(Si) No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si (No)
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco (Mucho (al menos 1x semana)) las noches
OLORES	Raramente (menos 1 ves por mes)
7. ¿Ha sentido algún olor raro?	Abecés (Mucho (1 ves x semana)) Todo el tiempo
TRAFICO	No mucho (1 camión extra x mes)
8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	Poco (1 camión extra x semana) (Mucho (1 camión extra x día))
9. ¿Como ha afectado el vecindario?	No mucho Poco (Mucho)

Domicilio: _____

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si No No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si No No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	Si No
a. Si es así, ¿de que forma?	En forma positiva En forma negativa
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si No No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren?	mas trafico. mas polutus salud no muy bien

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Yolanda Sierra

Domicilio: 1120 Fries Ave Wilmington

Tel: (310) 241-3074 Correo Electronico ysierradp@yahoo.com

Domicilio: 836 Lakme Ave

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES	(Si)
1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) Mucho (once/día) (Todo el tiempo)
RUIDO	Casi no
3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Poquito Mucho (Insoportablemente)
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	(Si) No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si (No)
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco Mucho (al menos 1x semana) (las noches)
OLORES	Raramente (menos 1 ves por mes)
7. ¿Ha sentido algún olor raro?	Abecés Mucho (1 ves x semana) (Todo el tiempo)
TRAFICO	No mucho (1 camión extra x mes)
8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	Poco (1 camión extra x semana) (Mucho (1 camión extra x día))
9. ¿Como ha afectado el vecindario?	No mucho Poco (Mucho)

Domicilio: 836 Lakme

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si (No) No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si (No) No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	(Si) ~~No~~
a. Si es así, ¿de que forma?	En forma positiva (En forma negativa)
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si (No) No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren? Negativa	

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Rosa T Cuevas

Domicilio: 836 Lakme Ave

Tel: (310) 991 3380 Correo Electronico

Mitchell St. Jones (

Address: 1056 Carylake Wilm, CA

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	Yes No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) A lot (once/day) All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little A lot So much that I can't stand it!
4. Have you heard loud noises coming from the site?	Yes No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes No
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) Most nights
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) All the time
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) A lot (one extra truck/day)

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes No I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes No I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes No I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes No I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES 19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes No
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes No I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	

Smell, Noise, illness. extreme Breathing difficulties Dr Visits

Interested in more information and/or getting involved:

Name: _____

Address: _____

Tel: _____ E-mail _____

Estella Jones

Address: 1056 N Carry ave
Wilm CA
90744

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)? Yes	(Yes) No I don't know
2. In the last month, how often has the flare been burning? at least 10 X	Rarely (once/twice) Sometimes (once/wk) A lot (once/day) All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little (A lot) So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) (A lot (one extra truck/day))

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes No I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes No I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes No I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes No I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes No
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes No I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	

Hearing noise – more dust, smells, extensive lung illness constant coughing – less sleep.

Interested in more information and/or getting involved:

Name: _____

Address: _____

Tel: _____ E-mail _____

Address: 836 Lakme Ave Wilmington CA 90744

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) (A lot (once/day) All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little A lot (So much that I can't stand it!)
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	~~Yes~~ (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) (A lot (one extra truck/day))

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES 19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes (No)
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	

The job site across the Street, where TIMEC Does their Pipe-welding is a very **bad** eyesore We live right on the other side on Lakme Ave

Interested in more information and/or getting involved:

Name: Benjamin Cuevas

Address: 836 Lakme Ave Wilmington CA 90744

Tel: (310) 415-1970 E-mail _____

Address: 1042 Cary Ave
Wilm. CA 90744

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) (A lot (once/day)) All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little (A lot) So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes (A lot (at least once/wk)) All the time
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) (A little (one extra truck / wk) A lot (one extra truck/day))

Address: 1042 Cary Ave. Wilm. CA 90744

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) Never! I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES 19. Has your opinion regarding the Warren site changed based on your experience since operation began?	(Yes) No
a. If yes, in what way?	In a good way (In a bad way)
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began? I'm very concerned about health issues. Explosions? Dust. Allergies	

Interested in more information and/or getting involved:

Name: Norma Torres

Address: 1042 Cary Ave.

Tel: (310) 834-7603 E-mail

Address: 8010 Lakme Ave.

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) A lot (once/day) (All the time)
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little A lot So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little A lot (at least once/wk) (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) (A lot (one extra truck/day))

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes No I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes No I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes No I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes No I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES 19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes No
a. If yes, in what way?	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes No I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	

air Pollution, contamination, odor, and noise.

Interested in more information and/or getting involved:

Name: Manuel Torres Jr.

Address: 830 Lakme ave.

Tel: 310 987-0549 E-mail jmp123abc@yahoo.com

Address: 937 BANNING

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) / No / I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) / Sometimes (once/wk) / A lot (once/day) / (All the time)
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much / A little / (A lot) / So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) / [redacted]
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes / (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) / A little / A lot (at least once/wk) / (Most nights)
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) / Sometimes / A lot (at least once/wk) / (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) / A little ~~(one extra truck / wk)~~ / (A lot (one extra truck/day))

Address: 937 BANNING

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	(Yes) No
a. If yes, in what way?	In a good way (In a bad way)
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began?	A VERY DIFFERENT NEIGHBORHOOD SINCE WARREN START CONSTRUCTION THERE

Interested in more information and/or getting involved:

Name: BEATRIZ JIMENEZ

Address: 937 BANNING BLVD. WILMINGTON CA-90744

Tel: 310-830-8394 E-mail

Domicilio: _____

ENCUESTA COMUNITARIA DE WILMINGTON

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
QUEMADORES 1. ¿Han habido quemadores ardiendo en el sitio de Warren (mas que solo una luz)?	(Si) No No Se
2. En el ultimo mes, ¿Que tan seguido ha estado ardiendo el quemador?	Raramente (una/dos) Abecés (once/wk) Mucho (once/día) (Todo el tiempo)
RUIDO 3. ¿Cuanto ruido se ha aumentado en el vecindario debido al sitio Warren?	Casi no Poquito Mucho (Insoportablemente)
4. ¿Ha escuchado ruidos fuertes que vengan del sitio Warren?	(Si) No
5. Entre los horarios de 10 PM y 7 AM, Warren ha sido ordenado a mantener silencio. ¿Siente que han hecho esto?	Si (No)
6. ¿Que tan seguido se ha mantenido despierto/a a causa del ruido por las noches?	No mucho (menos de una/mes) Poco (Mucho (al menos 1x semana) las noches)
OLORES 7. ¿Ha sentido algún olor raro?	Raramente (menos 1 ves por mes) Abecés (Mucho (1 ves x semana) Todo el tiempo
TRAFICO 8. ¿Desde que empezó Warren en 2006, Ha visto un aumento en el tráfico de camiones de carga?	No mucho (1 camión extra x mes) Poco (1 camión extra x semana) (Mucho (1 camión extra x día))
9. ¿Como ha afectado el vecindario?	No mucho Poco (Mucho)

Domicilio: _____

PREGUNTAS	RESPUESTAS (FAVOR DE CIRCULAR)
17. ¿Se le aviso que las operaciones en el sitio de Warren aumentarían el ruido en el vecindario?	Si (No) No recuerdo
18. ¿Algún representante de Warren le aviso de posibles impactos de salud a resultado de las actividades en el sitio?	Si (No) No recuerdo
OPINION / SENTIMIENTOS / OTRAS EXPERIENCIAS 19. ¿Ha cambiado su opinión sobre el sitio de Warren, basado en su experiencia desde que empezó a operar?	(Si) (No)
a. Si es así, ¿de que forma?	En forma positiva (En forma negativa)
20. Basado en su experiencia, ¿hubiera aprobado el proyecto en su comunidad?	Si (No) No le interesa
21. Junto con lo que me acaba de platicar, ¿Cuál ha sido su experiencia viviendo en esta comunidad desde que se empezó la actividad en el sitio Warren?	

Muchas alergias, problemas de respiracion, dolores de cabeza, tos ckonica, falta de sueño

Si le interesa envolucrarse o para recibir mas informacion:

Nombre: Veronica Vasquez

Domicilio: 937 Banning Blvd. Wilmington CA 90744

Tel: (310) 218-6362 Correo Electronico _____

Address: _____

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) No I don't know
2. In the last month, how often has the flare been burning?	Rarely (once/twice) Sometimes (once/wk) A lot (once/day) (All the time)
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much A little (A lot) So much that I can't stand it!
4. Have you heard loud noises coming from the site?	(Yes) No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	Yes (No)
6. How often has the noise kept you awake at night?	Not much (less than once/month) A little (A lot (at least once/wk)) Most nights
ODOR	
7. Have you smelled any strange odors?	Rarely (less than once/month) Sometimes A lot (at least once/wk) (All the time)
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) A little (one extra truck / wk) (A lot (one extra truck/day))

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	Yes (No)
a. If yes, in what way?	In a good way (In a bad way)
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began? Lots of Dust every Morning Lots of Black Film all over the cars	

Interested in more information and/or getting involved:

Name: Antonio Cuevas

Address: 836 Lakme Wilmington

Tel: 310-427-9393 E-mail _____

CA

Address: 923 N BANNING BL
WILM 90744

WILMINGTON COMMUNITY SURVEY

QUESTIONS	ANSWERS (PLEASE CIRCLE)
FLARES	
1. Has there been a burning flare on the Warren site (more than just a light at the top)?	(Yes) / No / I don't know
2. In the last month, how often has the flare been burning?	(Rarely (once/twice)) / Sometimes (once/wk) / A lot (once/day) / All the time
NOISE	
3. How much has the noise increased in your neighborhood due to the Warren site?	Not much / A little / A lot / (So much that I can't stand it!)
4. Have you heard loud noises coming from the site?	(Yes) / No
5. Between 10 pm and 7 am, Warren is required to maintain quiet time. Do you feel they are doing this?	(Yes) Some Time / No Depends on what there doing
6. How often has the noise kept you awake at night?	Not much (less than once/month) / A little ✓ / A lot (at least once/wk) / Most nights
ODOR	
7. Have you smelled any strange odors? From LG TRUCKS TO THE CARS IN PARKING LOT NEXT APT THAT STARTS AT 5:30 AM	Rarely (less than once/month) / Sometimes / A lot (at least once/wk) / (All the time) *
TRAFFIC	
8. Has truck traffic increased since Warren started operating in 2006?	Not much (one extra truck/month) / A little (one extra truck / wk) / (A lot (one extra truck/day))

SINGLE SIDE

Address: _____

QUESTIONS	ANSWERS (PLEASE CIRCLE)
15. Were you told that Warren obtained a permit to operate over the next 12 years at that site?	Yes (No) I don't remember
16. Were you told that truck traffic would increase after operation began?	Yes (No) I don't remember
17. Were you told that the Warren operations could increase noise in the neighborhood?	Yes (No) I don't remember
18. Did any one representing Warren tell you about any possible health impacts from operations?	Yes (No) I don't remember
OPINION / FEELINGS / OTHER EXPERIENCES	
19. Has your opinion regarding the Warren site changed based on your experience since operation began?	(Yes) No
a. If yes, in what way? IT TURN IT TO A FACTORY ALLEY	In a good way In a bad way
20. Based on your experience with the Warren facility, would you have approved this facility in your community?	Yes (No) I don't care
21. In addition to what you've already talked about, what has your experience been living in the neighborhood since activity at the Warren site began? IT NOT A NORMAL PLACE TO LIVE ? ANY MORE	

Interested in more information and/or getting involved:

Name: CALVIN Coleman #3

Address: 923 N BANNING BL Wilm Ca 90744

Tel: 424 477-5239 E-mail _____

SECOND DISTRICT
ADVISORY PANEL MEMBER
ANDREW WEISSMAN
COMMENTS

Law Offices
ANDREW N. WEISSMAN
ARKIN and WEISSMAN
STUART N. ARKIN
(1915-1975)
MERALTA OFFICE BUILDING
9696 CULVER BOULEVARD, SUITE 106
ALVIN H. WEISSMAN
(1919-1991)
CULVER CITY, CALIFORNIA 90232-0967
(310) 839-5217 • FAX (310) 559-0518

November 11, 2016

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street Los Angeles, CA 90012

Re: Comments to LA County Oil Well Strike Team Biannual Report #1

Dear Mr. Stapleton:

I am sorry I was unable to attend the advisory committee meeting on 11/9.

The advisory committee's charge is to assess the bi-annual reports of the Strike Team and to review, comment, and provide input to the Board of Supervisors on the Project results and reports. As pointed out by Member O'Connor, Report No. 1 is merely the start of a much longer process.

In that regard, the report, while adequate in terms of its content, lacks certain elements that I would consider relevant to any assessment of the County's oil and gas facilities, particularly in the area of abandoned/plugged wells and site inspection and maintenance plans for leaking and / or broken equipment. As the former Mayor of a City with active oil field operations located in our jurisdictional boundaries, I know these types of issues are in fact the type that matter the most in terms of ensuring the safety of active operations. I believe added focus on these discrete areas would benefit the county's ongoing review.

While I would support and encourage more review be done in the areas I've referenced above, I confess to some hesitancy about taking on too many new policy proposals in the context of this effort. I would counsel caution about expanding the scope of new issues to review to the point that we water down the overall effort. I am concerned that in expanding the scope, we risk not providing useful information or factual based recommendations. Respectfully, it strikes me that for the outcome of this effort to be effective, any expansion of the scope of the review mandated by the Board should be narrowly tailored to ensure an adequate review can be done in a timely fashion. I think this focused effort is best established after specific consultation and further explicit direction by the Board of Supervisors.

Thank you for the opportunity to provide these comments. I look forward to reviewing the Strike Team's continuing efforts on this important matter.

Very truly yours,

Andrew N. Weissman

bwa

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

November 10, 2016

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Re: Comments to the LA County Oil Well Strike Team Biannual Report #1

Dear Mr. Stapleton,

As a member of the LA County Oil Well Strike Team Advisory Panel, please accept these comments on the first draft of the biannual report.

Firstly, I commend the LA County Oil Well Strike Team and the Board of Supervisors for taking on the challenging but necessary task of reviewing the zoning codes and permitting processes and taking a close look at oil and gas wells in the area. However, I believe that more can be done to ensure that proper review has been made and to ensure that the County is effectively protecting the health, safety and wellbeing of our communities.

1. **Written Adaptive Management Process is Needed**

The report is just a start of a longer process, and should be viewed as such. The lessons learned by visiting a certain number of sites should be incorporated into site visits and inspection plans going forward. Unfortunately, while there is a verbal commitment to this, there is nothing in writing that captures this thought process and commitment to adaptive management going forward.

2. **Air Emissions and Odors Should be Evaluated During Site Visits**

While there is a focus on observing certain types of site characteristics, the lack of any substantive information on air emissions or odors observed by the strike team participants is troubling. This most likely because such information is not included in the well inspection protocol, a notable shortcoming. Without air monitoring or site observational data for air emissions, the report risks being immediately incomplete as to likely community impacts.

The failure of South Coast AQMD to participate in this effort is also discouraging and should be investigated – this may be due to the sporadic issuance of permits to these sites, a fact which should be included in the compliance checklist.

3. **Leak Detection and Repair Plans Should Be Reviewed and Disclosed**

One of the area's conspicuously absent from the report is information on the site level inspection and maintenance plans for leaking and / or broken equipment. Individual facilities should have site specific leak detection and repair plans – and such plans should be reviewed in the site inspection protocol. We understand from the most recent meeting of the advisory panel that SCAQMD has started to conduct its own site visits. That information was not captured in the last draft of the report. We ask that the date and findings of SCAQMD for each site visit be encapsulated in the report, and we request that SCAQMD continue to be involved in this important process.

4. **More Information is Needed on Plugged, Abandoned, and Idle Wells**

Another area missing from the report is a discussion of abandoned or plugged wells located on site, and whether the operator has any information on such operations. While there is a focus on idle infrastructure, the information on abandoned wells is lacking.

As it relates to idle wells, the inspection reports do not do a uniform job of reporting whether idle wells have been tested pursuant to the DOGGR well testing requirements, or what the findings of those tests were. While the question of whether there was an idle well test is present on the well inspection checklist, the appendices reports do not actually include this information for idle wells.

5. **Resident Complaints Should Be Accounted For and Documented**

As to the compliance checklist proposed by the strike team, to actually satisfy the important checkpoint of "neighbor issues and complaint history", there appears to be much more work needed by the strike team. For example, as it relates to the Termo facility, the community has been complaining of oil and gas operations for years. Not only has the facility been the subject of a multi-year protest by the Porter Ranch community, the facility has resulted in significant amounts of truck traffic and noise. None of this is captured in the summary report, and meetings with impacted neighbors is necessary to acquire necessary information on complaints made by residents.

6. **Well Stimulation Operations and Practices Are Missing in the Report**

One of the issues that many people have been concerned about is whether well stimulation operations have been occurring at the sites, and whether this creates unsafe conditions. While the well inspection protocol looks at several site characteristics in an individual manner, there doesn't appear to be any holistic assessment of whether well stimulation has, or is planned to occur at the sites. The protocol similarly doesn't evaluate whether high pressure equipment is brought on site to accomplish this, what chemicals / constituent compounds are used to perform such operations, and the origination / volume of water used to conduct it.

Thank you for considering these comments moving forward.

Sincerely,

Timothy O’Connor
Director and Senior Attorney
California Oil and Gas Program
Environmental Defense Fund

FOURTH DISTRICT
ADVISORY PANEL MEMBER
MATT REZVANI
COMMENTS

LA County Oil Well Strike Team Biannual Report #1

Discussion Comments

- Considering this is the very first report and limited in scope in terms of the number of facilities inspected, it is a bit difficult to completely comment on the report. Particularly considering that the task ahead is much greater than what is in this first report. Having said that, in my opinion, the protocols appear to be very comprehensive, and with the exception of a few indicators it is complete.

- The areas that may need to be added or expanded for inspection protocols and discussion are well area flow lines, and abandoned wells:

    1. There needs to be a more comprehensive understanding of abandoned wells at each production field, and their abandonment history (i.e. are the wells abandoned according to DOOGR latest requirement). There should also be a discussion on any orphan wells that may exist at the site or proximity of these sites.

    2. Historically, the interconnecting flow lines in many of older production fields have been problematic and a source of oil leaks, sometimes going undetected for a period of time, due to low pressure and presence of water and oil sometimes sitting stagnant in the line, causing corrosion. While hydrotesting or smart pigging of the lines may not be feasible, it would be helpful to gain a better understanding of the condition of those pipelines, their leak history and other criteria. A general discussion of these issues for each field will be helpful.

Matt Rezvani

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

March 16, 2017

TO: Supervisor Mark Ridley-Thomas, Chairman
Supervisor Hilda L. Solis
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: Richard J. Bruckner
Director

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

In accordance with the Board's motion, the Strike Team is submitting the second update report to the Board. This report includes an update of Strike Team efforts on 1) updating the inventory of oil and gas facilities, 2) developing a public health screening assessment tool, and 3) facility findings. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

The Strike Team held a public meeting on March 13, 2017, to discuss the second update report and to hear public comment. The Strike Team passed a motion to direct staff to file this report with the Board and to present to the Advisory Panel. This report is the second of three biannual Strike Team reports with the final report to be provided to the Board by September 29, 2017.

Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

RJB:JS:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_20170313-report.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Richard J. Bruckner
Director

April 13, 2017

TO: Supervisor Mark Ridley-Thomas, Chairman
Supervisor Hilda L. Solis
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: David Muñoz
Acting Supervising Regional Planner, Zoning Enforcement West

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Strike Team's second biannual report was submitted to the Board on March 16, 2017.

The Board also requested that a five member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production to work in conjunction with the Strike Team in order to assess the team's findings and recommendations, and provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board.

This report addresses the Advisory Panel's assessment of the Strike Team's second biannual report. This report includes the written comments from the Advisory Panel member from the First, Second, Third, and Fourth Supervisorial Districts. Written comments have not been received from the Advisory Panel member from the Fifth Supervisorial District. The Advisory Panel report can also be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

This is the second of three Advisory Panel reports that will be provided to the Board during the 18-month long Strike Team effort. The next Oil and Gas Strike Team report is due on September 29, 2017, and the Advisory Panel report will follow no later than 30 days after

that date. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

DM:TS

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20170413-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Fire Department
Department of Public Health
Department of Public Works

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

Second Report - Recommendations of Julia May, First District representative, Advisory Panel of LA County Oil & Gas taskforce, 4/11/2017 *(Likely to be supplemented if we receive additional comment period)*

1. **I wish to express great appreciation** for the important and extensive work of all the Departments of the County, staff and consultants, and the Board of Supervisors' leadership on these key issues.

2. **Many issues remain to be addressed – see my comments below & please refer again to my earlier letters** regarding extraction health, safety, and environmental impacts, nuisances, incompatibility with residences, monitoring, community surveys, and need for policy and enforcement improvements, still relevant to the Second Report.

3. A new recommendation for a **2500 foot setback** between oil & gas extraction and residences has been identified as necessary for public health and should be evaluated by the County.

4. I re-iterate my earlier comment letters and statements urging the County to:
   a. Evaluate incorporating the **City of Los Angeles' improved environmental review procedures**
   b. **Interview community members** near extraction facilities for comment on impacts
   c. Evaluate a requirement for an **Odor Prevention Plan** for all oil and gas extraction.
   d. Evaluate **banning extremely hazardous substance use & transport,** especially Hydrogen Fluoride.
   e. Evaluate **Best Available Control Technologies & improved inspection/maintenance**.

5. I am looking forward to the County developing specific policy for **removal of "by right" permitting**, and incorporating discretionary permitting, which is listed as goal in the Second Report (p. 2)

6. **Regarding Key Monitoring Needs**– I re-emphasize my earlier concerns regarding the need for assessment of monitoring improvements, both existing and added – reviewing standard and advanced methods. The Second Report includes a Scoping limitation excluding monitoring beyond the AQMD's Rule 1173 in the Scope (p. 3), which did not appear in the first report (p. 3). I request staff an explanation about the new exclusion. This appears to contradict other goals & scope, since different County departments are responsible for inspection, evaluation of odors, nuisance, and public health hazards. I do not believe it is possible to carry out these tasks without full evaluation of monitoring.

7. **Oil & Gas pipelines** – The extensive network throughout the County (in incorporated and unincorporated areas) presents hazards, has had spills, moves between jurisdictions, and appears to be expanding (at least, I know Oil Refineries are extensively expanding pipelines). This needs additional County evaluation.

8. I appreciate that the Second Report states a need for additional evaluation of **Orphaned & Abandoned wells**, and I support other Advisory Counsel members request for additional evaluation.

9. Regarding **Hydraulic Fracturing (Fracking)** – I request that staff and consultants evaluate AQMD staff reports, which found that many extraction methods not formally designated as fracking nevertheless use the same methods (acidizing, maintenance acidizing, more). I have found this to be the case in my own review of AQMD reporting – widespread use of a large number of toxic and extremely hazardous chemicals in wells that are not considered to use fracking, but use similar methods and chemicals.

10. I request additional review by the County of **Earthquake Hazards** of extraction, and related transportation & pipelines.

11. I request staff to review and consider for incorporation the recommendations of **comments submitted by Communities for a Better Environment (CBE) on March 13, 2017,** to the Taskforce.

12. I support comments made by Advisory Panel members regarding the need for **additional input by the Advisory Panel.**

COMMUNITIES FOR A BETTER ENVIRONMENT

March 13, 2017

VIA Hardcopy Submission

Los Angeles County Oil and Gas Facilities Strike Team
Department of Public Works
900 S. Freemont Avenue, Room B
Alhambra, CA 91803

Re: Recommendations Regarding Updating the Los Angeles County Municipal Code to Protect Public Health, and Comments Regarding *Draft Public Report No. 2*.

Dear Los Angeles County Oil and Gas Facilities Strike Team:

We write on behalf of the Stand Together Against Neighborhood Drilling – Los Angeles ("STAND-L.A.") coalition. STAND-L.A. is an environmental justice coalition of community groups that seeks to end neighborhood drilling to protect the health and safety of Angelenos on the front lines of urban oil extraction. It is composed of concerned residents, communities of faith, environmental justice champions, researchers, students, and parents located in neighborhoods where oil and gas drilling and operations occur in close proximity to homes, schools, and other sensitive receptors. We respectfully submit the following comments and recommendations for your consideration in your report to the County Board of Supervisors regarding proposed amendments to the County zoning code regulating gas and oil operations.

First, we commend the Board of Supervisors, particularly Supervisors Hilda Solis and Mark Ridley-Thomas, for presenting the motion to advance this necessary process of ensuring regulation of oil and gas operations adequately protects the health, safety and welfare of County residents, as well as the public's right to clean water and a healthy environment. We look forward to sharing our expertise and engaging in the County's review of its regulation of oil and gas production facilities.

The motion, passed by the Board of Supervisors on March 29, 2016, tasked this Strike Team to work in conjunction with the Advisory Panel to gather information to "complete an update to the Zoning Code and associated regulations and enforcement protocols" that will ensure that (1) proposed regulations "reflect best practices and current mitigation methods and technologies" to "minimize environmental impacts and protect sensitive uses and populations," and that (2) "oil and

COMMUNITIES FOR A BETTER ENVIRONMENT
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gas facilities may no longer operate by right in the unincorporated portions of the County[.]"[1]

This review of County oil and gas drilling and production facilities is long overdue. The County's current regulatory framework is outdated and severely deficient, allowing oil and gas production activities to occur dangerously close to homes, schools, and community gathering spaces. As explained in detail below, we respectfully recommend that the Strike Team propose the following to the Board of Supervisors pursuant to the motion:

1. A proposed ordinance with the best practice mitigation measure of a setback between oil and gas operations and homes, schools and hospitals by at least 2,500 feet to protect the health and safety of residents.

2. A proposed ordinance that eliminates drilling by-right, and requires that operators submit an application for a conditional use permit subject to the discretionary approval by the County.

3. That facilities that produce offensive odors, noise, or otherwise operate in violation of permit conditions should be closed pursuant public nuisance administrative proceedings.

4. That the County place a moratorium on approving new facilities or permitting expansion of existing facilities until the new proposed regulations are adopted.

I. The County has broad authority pursuant to its police power to regulate land uses, including oil and gas extraction in unincorporated areas.

California courts and the U.S. Supreme Court have long recognized the authority of a local government to use its police and zoning powers to enact local prohibitions and restrictions on oil and gas operations and development.[2] A municipality has an "unquestioned right to regulate the business of operating oil wells within its [] limits, and to prohibit their operation within delineated areas and districts if reason appears for so doing."[3] A policy prohibiting future expansion is also within the powers of the County, since operators do not have the right to intensify or expand a nonconforming use, or move the use to another location of the property.[4]

The California Public Resources Code affirms that local authorities retain the power to "enact and enforce laws and regulations regulating the conduct and location of oil production activities, including . . . zoning, . . . public safety, nuisance . . . [and] noise[.]"[5] Thus, a county may

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[1] L.A. County Bd. Of Supervisors (Mar. 29, 2016) Meeting Minutes, Item No. 12. at p. 12 ("*Bd. Of Supervisors' Motion*").
[2] Cal. Const. Article XI, sec. 5; Cal. Pub. Res. Code § 3690.
[3] *Beverly Oil Co. v. City of Los Angeles* (1953) 40 Cal.2d 552, 558; *see also* California Attorney General's Opinion (1976) 59 Ops. Cal. Atty. Gen. 461, 465 ("[I]t is our opinion that cities and counties have the power to prohibit [oil and gas] operations.").
[4] *See Beverly Oil Co.*, 40 Cal.2d at 557 (upholding City's ban against drilling new wells or deepening existing wells and rejecting plaintiff's claim of a vested right "to reach any and all oil underlying his property").
[5] Cal. Pub. Res. Code § 3690.

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prohibit and restrict the location where oil and gas operations and development occur pursuant to its zoning authority, including based on their incompatibility with healthy residential communities. Courts have upheld ordinances banning or restricting oil development where "reasonably related to promoting the public health, safety, comfort, and welfare, and if the means adopted to accomplish that promotion are reasonably appropriate to the purpose."[6]

The County has authority to regulate land use in accordance with its planning and zoning ordinances within the unincorporated area of the County.[7]

II. Existing regulation of oil and gas extraction activities under the Los Angeles Code is outdated, convoluted, and fails to protect the health and safety of County residents.

Oil and gas extraction operations are regulated under Title 22 of the Los Angeles County Code ("Code"). The County's regulation of such operations varies and is entirely dependent on land use designation, and not on proximity to homes and other sensitive receptors.

The County prohibits oil drilling in Mixed Use Development zones,[8] Mixed Use Rural Development zones,[9] Major Commercial zones,[10] and High Density Residential[11] zones. But the County allows oil and gas operations to occur in close proximity to homes, schools, and hospitals in some land use designations, including residential zones, as long as operators obtain a conditional-use permit. Moreover, oil and gas extractions operations may occur by right in other land use zones, without oversight by the County.

Regulation of where oil and gas extraction activities may occur under the County Code is seemingly arbitrary, and no uniform protections apply to protect sensitive receptors from air pollution, groundwater contamination, or noise and vibration impacts associated with oil and gas drilling operations.

A. The Code allows the majority of current oil and gas extraction to occur by-right, without regulatory oversight by the County.

A report on an inventory of County oil and gas wells, prepared at the request of the Board

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[6] *Higgins v. City of Santa Monica* (1964) 62 Cal.2d 24, 30.

[7] *Stirling v. Bd. of Supervisors* (1975) 48 Cal.App.3d 184, 187 ("Ordinances enacted by the [county] in the zoning and other regulatory fields are effective only in the unincorporated territory.") (*citing* Cal. Const., Art. XI, § 7); *City of Dublin v. County of Alameda* (1993) 14 Cal.App.4th 264, 274–75 ("[T]he California Constitution specifies that the police power bestowed upon a county may be exercised 'within its limits,' i.e., only in the unincorporated area of the county.").

[8] Oil wells are not a permitted use in the Mixed Use Development zone, L.A. County Code §22.40.805, and a conditional-use permit may not be granted for oil wells in this zone, *id.* at §22.40.820.

[9] Oil wells are not a permitted use in the Rural Mixed Use Development zone, L.A. County Code §22.40.460, and a conditional-use permit may not be granted for oil wells in this zone, *id.* at §22.40.475.

[10] Oil wells are not a permitted use in the Major Commercial zone, L.A. County Code §22.28.420, and a conditional-use permit may not be granted for oil wells in this zone, *id.* at §22.28.450.

[11] Oil wells are not a permitted use in High Density Residential zones, L.A. County Code §22.20.480, and a conditional-use permit may not be granted for oil wells therein, *id.* at § 22.20.520.

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of Supervisors in 2015, concluded that of the 1,687 oil and gas wells in County unincorporated areas, 85% of them do not require discretionary or permit-based approvals, and operators may drill "by-right," without oversight by the County.[12]

The Code permits oil and gas operations in Heavy Agriculture (A-2) zones, and drilling may be conducted without discretionary approval by, or even notification to, the County or any existing adjacent neighbors.[13] The only restriction imposed on drilling operations in Heavy Agriculture zones consists of a setback between oil wells and residences. That restriction provides that "[d]rilling shall not be within 300 feet of any residence," and if drilling occurs within 500 feet of a residence, then "[a]ll derricks used in connection with the drilling of the well shall be enclosed with fire-resistant and soundproofing material."[14] Similarly, oil wells are a permitted use in M-1 and M-1.5 industrial zones, but cannot be located within 300 feet of residences.[15]

Enabling drilling to occur by right without discretionary review by the County places the health and safety of nearby residents especially at risk from toxic chemicals, polluting emissions, disturbing noises, and noxious odors of drilling operations. Oil and gas extraction operations creates the risk of soil and ground water contamination, and contributes to increased emissions of greenhouse gases and smog forming pollutants. Also, while a 300-foot setback is better than no setback between sensitive receptors and oil drilling, it falls woefully short of a distance adequate to protect the health and safety of neighboring residents.

Furthermore, an oil drilling operator may seek an exemption from the minimally protective 300-foot setback, by applying for a conditional use permit. As an example, an operator located in the M-1 zone may apply for a conditional use permit to engage in extraction activities for oil wells located within the 300-foot setback distance.[16]

B. Even where the County requires conditional use permits for drilling operations, those permits provide blanket approvals that do not require additional review for expansions or other activities.

The Code does require that an operator seeking to conduct drilling operations in particular land use designations first obtain a conditional use permit. For instance, while oil wells are generally not permitted in the R-1, Single-Family Residence zone,[17] the County allows oil wells in Single-Family Residence zone as long as the operator obtains a conditional-use permit.[18]

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[12] Marine Research Specialists (Dec. 2015) *L.A. County Oil and Gas Well Inventory Report*, at ES-1 ("*LA County Inventory Report*").

[13] L.A. County Code § 22.24.120(D). All section references herein after shall refer to the Los Angeles County Code unless otherwise indicated.

[14] *Id.*

[15] Section 22.32.040 (permitting "Oil wells and accessory facilities," in Light Manufacturing (M-1) zoned land, "subject to the conditions and limitations of Section 22.24.120 (Zone A-2)[.]"); Section 22.32.110 (same with regard to M-1.5 zones).

[16] Section22.32.070 (allowing a conditional use permit to issue for "oil wells, not in conformance with the limitations of Section 22.24.120[.]")

[17] Section 22.20.070.

[18] Section 22.20.100(A) ("Property in Zone R-1 may be used for ... [t]he following use[], provided a conditional use

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Conditional use permits to engage in oil and gas extraction activities are also authorized for R-2, R-3, R-4, and R-A residential land use zones.[19] However, an operator need apply for and obtain such a permit only once, and is not required to inform or obtain additional permission from the County if it seeks to redrill, deepen, convert, maintain, or engage in any other additional drilling activity. Thus, once an operator obtains the initial conditional-use permit, the operations may continue by-right.

Furthermore, in land use designations where a conditional use permit is required, the County allows operators to drill in close proximity to homes. Inexplicably, while a 300-foot setback from residences is required in Heavy Agricultural zones,[20] and an operator may not obtain an exemption from this setback,[21] no setbacks apply to protect residents from drilling operations in residential zones.[22] At the Brea Canon lease, described in *Draft Public Report Two* ("*Report No. 2*") prepared by Marine Research Specialists ("MRS"), many wells are located on land zoned for residential uses, either R-1 or R-3. Under this lease "[t]here are 47 wells on properties **adjacent to** single family detached residences or mobile homes."[23] Thus, under the existing Code, oil and gas drilling may occur within feet of homes in areas designated for residential use, and setback distances are non-existent in these most sensitive land uses.

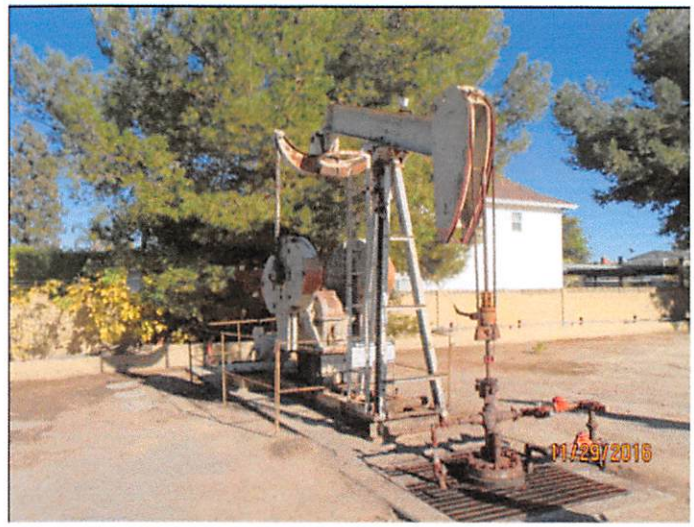

Image: Pump jack located within feet of homes at Brea Canon Lease.

Similarly, at the Matrix Sansinena lease, one of the facilities inspected by the Strike Team and MRS, oil wells are located *within* 300-feet of homes.[24] While the wells at this lease are

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permit has first been obtained . . . oil wells.").

[19] For R-2, residential zones, *see* §§ 22.20.170, 22.20.200(A). For R-3 residential zones, *see* §§22.20.260(A), 22.20.290(A). For R-4 residential zones, *see* §§ 22.20.340, 22.20.370(A). For R-A residential zones, *see* §§ 22.20.410, 22.20.440(A).

[20] Section 22.24.120.

[21] *See* Section 22.24.150 (excluding "oil wells" from the list of uses allowable within an A-2 zone with a conditional-use permit).

[22] *See e.g.*, Section 22.20.100 (providing that oil wells may be permitted by conditional use permit, but not requiring any minimum setback distance between homes and oil wells).

[23] Marine Research Specialists (Mar. 1, 2017) *Bi-Annual Report Number Two* at 64-65, ("*Report No. 2*") (emphasis added).

[24] According to *Report No. 1*, the facility is located within 60 feet of residences when measured from property line to property line, or 181 feet if measured from residence to the well. Marine Research Specialists (Oct. 6, 2016) *Oil & Gas Facility Compliance Review Project, Report No. 1* at 12 ("*Report No. 1*"). But, *Report No. 2* reports that the closest residence to the wells located at the Matrix Sansinena facility is located further away, at 224 feet, *Report No. 2* at 15, and yet later states that "wells are located less than . . . 160 feet from homes[,]" *Report No. 2* at 18. These discrepancies between *Report No. 1* and *Report No. 2* are concerning, and should be investigated and addressed by the

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currently idle, the company which recently purchased the facility is preparing to bring it back into production,[25] and thus will likely engage in drilling activities within 300-feet of homes in the near future. The conditional-use permit for this lease requires that "all setback and other requirements of the A-1-5 zone, in which this property is located must be complied with[.]"[26] However, because this lease is located on land zoned for Light Agricultural land uses,[27] no setback from residences or other sensitive receptors applies.[28] Similarly, the Linn Energy Brea Olinda Lease is located within 236 feet of residences, with 75 wells located on site.[29] According to *Report No. 2,* the land is zoned for A-1.5, agricultural land use.[30] Oil drilling should not occur in such close proximity to homes, and these sites exemplify the need for a uniform required setback distance to adequately protect public health.

Although the conditional-use permit application purports to require consideration of the impact on public health, allowing oil drilling to occur adjacent to homes creates major risks of public health and safety impacts because of the toxic air pollution and other hazards associated with oil and gas extraction facilities. Before granting a conditional-use permit, the hearing officer must find that the requested use will not:

> (1) Adversely affect the health, peace, comfort or welfare of persons residing or working in the surrounding area, or (2) [b]e materially detrimental to the use, enjoyment or valuation of property of other persons located in the vicinity of the site, or (3) [j]eopardize, endanger or otherwise constitute a menace to the public health, safety or general welfare[.][31]

As discussed below, individuals living within ½ a mile of oil and gas extraction activities face an increased risk of serious health problems including cancer, and thus oil wells will necessarily adversely impact public health.[32] Furthermore, a County planning official overseeing the conditional-use permit application is unlikely to have specialized knowledge concerning health impacts associated with oil drilling. Oil and gas drilling near homes has also been shown to lower property values.[33]

III. The County should amend the Code to impose the best practice and mitigation method of setting back oil and gas extraction activities 2,500 feet from homes, schools and hospitals to protect public health.

Strike Team.

[25] *Report No. 1* at 12.

[26] *LA County Inventory Report* at 50-51.

[27] *Report No. 2* at 15; *Report No. 1* at 12.

[28] Section 22.24.070 (excluding "oil wells" from permitted uses); *id.* § 22.20.370 (A) (allowing "oil wells" if the operator obtains a conditional-use permit, but not imposing any setback requirements).

[29] *Report No. 2* at 36, 39.

[30] *Report No. 2* at 35.

[31] Section 22.56.040.

[32] Cal. Council on Science & Tech. & Lawrence Berkeley Nat'l Lab. (Jul. 2015) *An Independent Scientific Assessment of Well Stimulation in California*, Vol. 3, at 216, *available at* http://ccst.us/publications/2015/2015SB4-v3.pdf.

[33] *See infra*, Part III(B).

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A. Local governments across the nation have enacted setbacks and prohibitions on oil and gas extraction operations to protect the health and safety of residents from toxic air pollution, noise, vibrations, and groundwater contamination.

Oil drilling in close proximity to homes and schools is incompatible with healthy communities. The County should look to best practice mitigation measures adopted in other jurisdictions, including requiring that oil and gas extraction operations be setback a minimum distance from sensitive land uses. As knowledge of the hazards of oil and gas operations expands, cities and counties in California, as well as throughout the country, are increasingly enacting setbacks and moratoriums on oil and gas development and unconventional well stimulation techniques.

There is a growing consensus that traditional regulation of oil and gas production facilities fails to protect the health and safety of nearby residents, the public's right to clean water, and fall far short of mitigating greenhouse gas emissions. Numerous cities and counties both in and out of California have imposed prohibitions on future oil and gas production activities due to concerns over environmental and health impacts. In 2014, voters in San Benito County approved Measure J, prohibiting all future petroleum operations in residential areas, both urban and rural, and prohibiting the use of hydraulic fracturing or other high-intensity petroleum operations at existing wells.[34] In March 2014, the Santa Cruz County Board of Supervisors amended its county general plan to prohibit infrastructure that would permit offshore oil and gas drilling.[35] In November 2016, residents in Monterey County voted to ban hydraulic fracturing and underground injection of oil and gas wastewater in unincorporated areas of Monterey County.[36] Numerous towns in the State of New York, where exploration of the Marcellus shale could occur, have banned all oil and gas drilling activities,[37] and in 2015 the State of New York imposed a prohibition on the use of hydraulic fracturing in gas extraction and production[38].

Additionally, cities have imposed setback requirements on oil and gas drilling activities to protect the health and safety of residents from toxic air emissions and other detrimental impacts associated with drilling, including to prevent contamination of the public water supply caused by injection of oil and gas wastes or other contaminants into underground aquifers. A few examples include the following: The City of Dallas, Texas imposed a setback on discretionary permitted drilling operations, requiring that drilling occur at least 1,500 feet from protected uses, including

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[34] *See* San Benito County (2014) *Measure J*, at 6-10, http://www.protectsanbenito.org/uploads/2/5/9/2/25924404/san_benito_protect_our_water_and_health__ban_fracking_initiative.pdf.

[35] *See* Santa Cruz County Bd. of Supervisors (May 20, 2014) Resolution No. 142-2014, http://sccounty01.co.santa-cruz.ca.us/BDS/Govstream2/Bdsvdata/non_legacy_2.0/ Minutes/2014/20140520-623/PDF/038.pdf.

[36] Monterey County (2017) *Ballot Measure: Full Text of Measure Z*, http://www.montereycountyelections.us/a_measures_NOVEMBER_2016_EN_MZ.html.

[37] For example, in the town of Bethel, New York, the municipal code was amended to remove oil and gas exploration activities from the definition of mining. Bethel, NY Mun. Code § 345-5. Additionally, the municipal code section regulating "uses and activities" "expressly and explicitly prohibited in each and every zoning district within the Town," was amended to include natural gas and oil exploration, extraction and production activities. Bethel, NY Mun. Code § 345-38(A)(1).

[38] Freeman Klopott (Jun. 29, 2015) *N.Y. Officially Bans Fracking with Release of Seven Year Study*, Bloomberg, http://www.bloomberg.com/news/articles/2015-06-29/n-y-officially-bans-fracking-with-release-of-seven-year-study.

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office, recreation, residential, and retail and personal service uses.[39] The city of Flower Mound, Texas made it "unlawful to drill, re-drill, deepen, re-enter, activate or convert any oil or natural gas well," within 1,500 feet of any public park, residence, habitable structure, place of worship, hospital building, or school.[40] The city also requires submission of a permit application prior to "engag[ing] and/or operat[ing] in oil and/or gas production activities."[41] Further, the state of Maryland prohibits oil wells from operating within 1,000 feet of the boundary of any property except by express agreement with the owners of the property.[42]

B. Oil drilling occurring within 2,500 of residences, schools, and hospitals endangers public health and safety.

Oil and gas extraction operations emit pollution at all stages, including well site construction, drilling, production, transportation, and waste disposal. Most emissions of toxic air pollutants from oil and gas development in the Los Angeles Region, including emissions of benzene—a known carcinogen—occur both in conventional and extreme extraction.[43] Furthermore, when engaging in extreme oil extraction techniques, such as hydraulic fracturing and acidizing, oil and gas extraction operations use large amounts of reproductive, immunological, and neurological toxins, carcinogens, and endocrine disrupting chemicals, including methanol, hydrochloric and hydrofluoric acid, formaldehyde, and naphthalene—all of which are hazardous air pollutants under federal law.[44]

Oil and gas extraction operations emit criteria pollutants, including volatile organic compounds and nitrous oxides, which combine to form ground-level ozone, a dangerous chemical that can burn tissue in the lungs, causing it to age prematurely.[45] Chronic exposure to ground level ozone can cause "asthma and chronic obstructive pulmonary diseases[], and is particularly damaging to children, active young adults who spend time outdoors, and the [elderly.]"[46] A study published in 2016 found that summertime asthma attacks will increase due to ozone formed from oil and gas drilling emissions, resulting in emergency visits, missed school days for children, and

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[39] Dallas, Tex. Mun. Code § 51A-4.203(b)(3.2).
[40] Flower Mound, Tex. Mun. Code § 34-422(d).
[41] *Id.* at § 34-420(a).
[42] Md. Code Ann., Envir. § 14-112 (West 2017) ("[A] well for the production or underground storage of gas or oil may not be drilled on any property nearer than 1,000 feet to the boundary of the property except by agreement with the owners of the gas and oil on adjacent lands."); Maryland Code of Reg's, tit. 26, § 26.19.01.09 (Unless due to site constraints a well must be cited closer, the regulating agency "may not issue a permit to drill a well closer than 1,000 feet to the boundary of any property adjoining the tract on which the well is situated except by written agreement with the landowners and royalty owners of that property.").
[43] Cal. Council on Science & Tech. & Lawrence Berkeley Nat'l Lab, *supra* note 22 at 212-215, 240, 258.
[44] Physicians for Social Responsibility, et al. (Jun. 2014) *Dirty Dozen: The 12 Most Commonly Used Air Toxics in Oil Drilling*, at 4-6, *available at* http://www.psr-la.org/wp-content/uploads/20140611-Air-Toxics-One-Year-Report-CBD-PSRLA.pdf. Note that similar chemicals are used for maintenance and other activities during traditional drilling as well. Abdullah, Khadeeja, et al. (2017) *Toxicity of Acidization Fluids Used in California Oil Exploration*, Toxicological & Environmental Chemistry, Vol. 99, Issue 1, 78-94, *available at* http://dx.doi.org/10.1080/02772248.2016.1160285.
[45] Theo Colborn, et al. (2011) *Natural Gas Operations from a Public Health Perspective*, Human & Eco. Risk Assess.: Int'l J., Vol. 17. Issue 5 at 5.
[46] *Id.*

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missed work days for adults.[47] "Small changes in ozone smog concentrations in areas with large total populations can have [] large total health impact numbers."[48] Thus, oil and gas extraction operations in densely populated County neighborhoods pose a serious health risk.

In the South Coast Air Basin, 627,546 people live within a ½ mile (2,640 feet) of an active oil and gas well.[49] Individuals living within a ½ mile from active oil and gas development have an increased risk of acute and chronic respiratory, neurological, and reproductive health effects.[50] Furthermore, at a distance of a ½ mile, individuals have an elevated excess lifetime cancer risk due exposure to benzene, a known carcinogen, and aliphatic hydrocarbons.[51] A study conducted in Pennsylvania found higher reported health symptoms in individuals living up to 1 kilometer (3,280 feet) from a gas extraction well.[52]

Furthermore, oil and gas extraction activities depress property values. In a study conducted in Shellmound, Texas, researchers found that homes located within 1,000 feet of an oil or gas well depreciated in value by 2 to 7%.[53]

C. The Code should be amended to create a uniform human health and safety setback of 2,500 feet irrespective of land-use designation.

The Code should be amended to protect residents' health, safety, and welfare by creating a protective 2,500-foot setback from oil and gas operations.

The present regulation of oil and gas extraction activities under the Code is unsound because it allows for drilling without setback protections, and where setbacks are required, they are arbitrarily based on land use designations, rather than being based on protecting sensitive receptors. And even then, the Code allows operators to obtain exemptions from setback requirements in some land use designations, altogether eliminating the minimal protection created by the 300-foot setback.

Impacts on human health from oil and gas drilling occur regardless of whether individuals live next to land zoned for heavy manufacturing or agricultural uses. The Code should uniformly protect residents from the impacts of oil and gas drilling by creating uniform setbacks of oil and gas extraction activities from sensitive human receptors.

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[47] Lesley Fleischman, et al. (Aug. 2016) *Gasping for Breath*, Clean Air Task Force at 8, *available at* http://www.catf.us/resources/publications/files/Gasping_for_Breath.pdf.
[48] *Id.* at 11.
[49] Cal. Council on Science & Tech. & Lawrence Berkeley Nat'l Lab. (Jul. 2015), *Table 4.3-12,* at 244.
[50] McKenzie, L. M., Witter, R. Z., Newman, L. S., & Adgate, J. L. (2012) *Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources*, Science of the Total Environment, Vol. 424, at 79-87.
[51] *Id.*
[52] Peter M. Rabinowitz, et al. (Jan. 2015) *Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania*, Envt'l Health Perspectives, Vol. 123, at 21–26, *available at* http://dx.doi.org/10.1289/ehp.1307732. http://dx.doi.org/10.1289/ehp.1307732
[53] Terrence S. Welch (2015) *Natural Gas Drilling and Its Effect on Property Values: A Municipal Perspective*, American Bar Association: State & Local News, Vol. 38, No. 2.

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Further, the Code's minimal setback distance of 300 feet falls far short of "best practices and current mitigation methods." As discussed above, studies show that residents living within ½ a mile of drill site have an increased risk of acute and chronic respiratory, neurological, and reproductive health effects. Exemptions from setbacks undermines their very purpose of protecting the health and welfare of residents within close proximity and therefore particularly vulnerable to impacts from drilling operations.

Thousands of oil- and gas-producing wells operate within the County of Los Angeles, many within close proximity to residences, schools, medical clinics or hospitals, exposing children, the sick, and the elderly to serious health and safety risks. **The County should adopt an ordinance requiring that oil and gas operations be uniformly setback by 2,500 feet from homes, schools, and hospitals to protect public health. Furthermore, exemptions from setback requirements through a conditional use permit should be eliminated.**

IV. The Code should be amended to eliminate "drilling by right," and operators should be required to apply for a conditional use permit to engage in oil and gas extraction activities.

Following issuance of the inventory report, the Board of Supervisors tasked this Strike Team with reviewing existing regulations and developing proposed amendments and enforcement protocols to "ensure that oil and gas facilities **may no longer operate by right** in the unincorporated portions of the County[.]"[54] We reiterate this imperative. The County must move beyond drilling-by-right, which has allowed the industry to drill without environmental and health assessments by the County, to the detriment of communities living within unincorporated areas. For example, in 2004, 600 wells were permitted to be drilled in the unincorporated area of Windsor hills without any environmental review. Local wells in that community contain "brown-tinged water," potentially contaminated by oil and gas extraction activities.[55]

The County can look to the City of Los Angeles as an example of permit-based review and approval of oil and gas extraction activities. In the City of Los Angeles, an operator must submit an application for discretionary review of conditions in order to "drill, deepen or maintain an oil well[.]" Los Angeles, Cal. Mun. Code §13.01H.

Last year, the Los Angeles Department of City Planning adopted a new set of procedures and guidelines to ensure compliance with the California Environmental Quality Act and local code in reviewing applications for oil drilling approvals. (Exh. A, L.A. Zoning Administrator Memo No. 133). The City. Planning Department created dedicated application forms, including a required environmental assessment form. Under these new procedures, applications for oil and gas drilling must be noticed for a public hearing to residents living within 1,500 feet of the drill site prior to approval. *Id.* Furthermore, applications to "drill, re-drill, deepen, or convert" a well now require preparation of an initial study to determine whether the activity will have a significant

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[54] *Bd. of Supervisors' Motion* at 12 (emphasis added).
[55] Alan Taylor (Aug. 26, 2014) *The Atlantic*, "The Urban Oil Fields of Los Angeles," https://www.theatlantic.com/photo/2014/08/the-urban-oil-fields-of-los-angeles/100799/.

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impact on the environment. *Id.* at 7. If the Initial Study shows that the project is within 1,500 feet of a sensitive receptor,[56] and one or more Health Impact Criteria is triggered, then an operator must prepare a Health Impact Assessment to determine possible short-term and permanent health impacts of the project on people living near to oil and gas production activities. (Exh. A, L.A. Zoning Administrator Memo No. 133.)

The State of Maryland similarly requires an operator to submit an application for a permit if it seeks to:

> [P]repare[] a well site for the operation; . . . Drill[] a well for oil or gas; . . . Redrill[] at a location previously permitted; . . . Deepen[] an existing well drilled for oil or gas; . . . Drill[] a core hole or stratigraphic test; or . . . Drill[] a well for the storage of natural gas or the observation of the storage of natural gas.[57]

An application to drill must accompanied by an environmental assessment, a sediment and erosion control plan, a storm water management plan, a reclamation plan for restoring the well site, a design plan that will prevent drilling liquids from coming into contact with waters of the state, a spill prevention and control plan, a map documenting all water wells, churches, schools, occupied buildings and buildings within ½ a mile of the well.[58] The operator must also demonstrate minimum financial assurances, including that it has fixed assets totaling at least $20,000,000.[59]

The County should amend the Code to regulate oil and gas extraction activities through a discretionary permit approval process, to exercise its power to limit the impact of oil and gas drilling on the local water supply, emission of toxic pollution and greenhouse gases, or otherwise cause a public nuisance to surrounding neighbors. **The County should regulate by discretionary permit approval if and where oil and gas production activities occur outside a setback, and should institute a set of procedures and policies to ensure strict compliance with environmental review mandates, including the California Environmental Quality Act.** Doing so will enable the County to meet its duty to protect the public's health safety and welfare, protect the public water supply, and uphold California's legislative commitment to reducing greenhouse gas emissions.

V. Additional Recommendations:

Because existing County regulations are deficient and have proven problematic, the County should place a moratorium on approving new facilities or permitting expansion of existing facilities until the new proposed regulations are adopted. While the County is completing its review of oil and gas extraction facilities in unincorporated areas of the County, new facilities or new expansions should not be approved.

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[56] The ZA memo incorporates by reference, the South Coast Air Quality Management District's definition of "sensitive receptor." (Exh. A, ZA Memo at 8.)
[57] Maryland Code of Reg's tit. 26, § 26.19.01.06.
[58] *Id.*
[59] *Id.*

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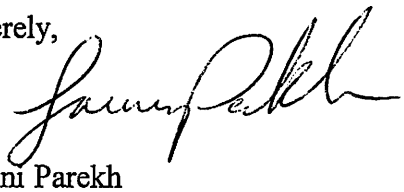
Further, facilities that produce offensive odors, substantial noise, or otherwise operate in violation of permit conditions should be closed pursuant public nuisance administrative proceedings.

Thank you for your consideration of these important matters that most directly impacts the lives of residents near drilling operations. Please contact us if you have any questions or would like additional information.

Sincerely,

/s/ 

Jaimini Parekh
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Fellow Staff Attorney

Encls.

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Exhibit A

OFFICE OF ZONING ADMINISTRATION

City Hall 200 N. Spring Street, Room 763 Los Angeles, CA 90012

OFFICE OF ZONING ADMINISTRATION

MEMORANDUM

ZA MEMORANDUM NO. 133

September 19, 2016

TO: Office of Zoning Administration
Development Services Centers
Department of Building and Safety
Department of Public Works – Bureau of Engineering
Los Angeles Fire Department
Los Angeles Department of Water and Power

FROM: Linn K. Wyatt
Chief Zoning Administrator

SUBJECT: **APPLICATION AND PROCESSING REQUIREMENTS, INCLUDING CEQA REVIEW, FOR OIL AND GAS APPROVALS PURSUANT TO LOS ANGELES MUNICIPAL CODE SECTION 13.01-H.**

This Memorandum supersedes ZA Memorandum No. 94, dated December 12, 1994, and ZA Memorandum No. 94A, dated March 24, 2000.

This Memorandum is intended to establish a comprehensive set of procedures and policies for the acceptance and processing of applications for oil drilling approvals pursuant to Los Angeles Municipal Code (LAMC) Section 13.01-H and to establish City guidelines for the California Environmental Quality Act (CEQA) review of Section 13.01-H oil drilling applications.

I. Background

The LAMC requires a formal application and a filing fee in conjunction with a request for a determination of conditions for the conduct of oil drilling pursuant to LAMC Section 13.01-H. Other than the requirement for an application and payment of a filing fee, the LAMC contains no express procedural requirements for the determination of conditions under Section 13.01-H for an original approval or for a modification or clarification to a previously approved determination of conditions.

Z.A. Memoranda Nos. 94 and 94A

Historically, as described in ZA Memoranda Nos. 94 and 94A, applicants were permitted to apply for modifications to the original conditions for oil drilling approvals through the use of a more limited review process (similar to a plan approval under LAMC Section 12.24-L and M).

The use of the process outlined in Memoranda Nos. 94 and 94A is no longer permitted for any Section 13.01-H application, including those submitted as a determination of conditions, modification of condition, request for clarification, or related approval. All applicants seeking an approval under Section 13.01-H must follow the application procedures outlined in this Memorandum. All applications seeking any approval under Section 13.01-H will be processed by the City, including the Office of the Zoning Administrator, pursuant to this Memorandum.

Existing Approvals with Modification Procedures

In addition to the above historical process, there are existing active approvals which include conditions establishing a process for subsequent modifications or condition review. An example of one condition reads substantially as follows:

> *Drilling operations for the first X wells identified in the grant clause of the instant determination shall be completed within 36 months from the effective date of this determination. The drilling for the following X wells as hereby authorized shall be subject to a review of plans by the Zoning Administrator, without a public hearing, for the purpose of updating the record with the well identification and path.*

Another condition reads substantially as follows:

> *Review of Conditions. Two years following completion of construction... the applicant shall submit a Plan Approval application for reviewing the effectiveness of these conditions. ... The applicant shall submit a 500-foot radius map with accompanying labels for owners and occupants. The Zoning Administrator may set the matter for public hearing if warranted.*

Both of these conditions include processes that are inconsistent with the processes established in this Memorandum. The first condition is inconsistent because it allows for modifications without a public hearing. The second condition is inconsistent because it allows the Zoning Administrator to not set a public hearing for a Plan Approval and implies the notice radius is 500 feet.

To the extent that any existing condition or grant in an existing approval gives the Zoning Administrator discretion in the process to be followed for a modification or condition review, the procedures in this Memorandum shall be followed, in accordance with the findings in Section II and the purpose statements in Section III.

To the extent that any existing condition or grant in an existing approval mandates a procedure that is inconsistent with this Memorandum, the Zoning Administrator shall consider whether a Plan Approval process shall be initiated by the City to revise any conditions to protect the public health, safety and welfare, including any condition establishing a process inconsistent with the purpose of this Memorandum. On the other hand, if an existing condition or provision is not modified through a Plan Approval, then the process outlined in the existing approval shall be followed.

Nothing in this Memorandum is intended to expand the authority the City has to initiate a Plan Approval.

II. Findings

In issuing this Memorandum, the Zoning Administrator makes the following findings:

A. In adopting the California Environmental Quality Act[1], the Legislature declared:

> It is the intent of the Legislature that all agencies of the state government which regulate activities of private individuals, corporations, and public agencies which are found to affect the quality of the environment, shall regulate such activities so that major consideration is given to preventing environmental damage, while providing a decent home and satisfying living environment for every Californian. (Public Resources Code Section 21000(g).

B. The CEQA Guidelines provide that CEQA's basic goal of protecting the environment has two purposes:

(1) avoiding, reducing, or preventing environmental damage where possible by requiring alternatives or mitigation measures; and

(2) providing information to decision-makers and the public concerning the environmental effects of proposed and approved actions. (CEQA guidelines 15002(a).)

C. One oft-repeated purpose of the CEQA Guidelines is to provide for public participation, including as set forth in Section 15201:

> Public participation is an essential part of the CEQA process. Each public agency should include provisions in its CEQA procedure for wide public involvement, formal and informal, consistent with its existing activities and procedures, in order to receive and evaluate public reactions to environmental issue related to the agency's activities. Such procedure should include, wherever possible,

[1] Public Resources Code, Sections 21000, *et seq*.

making environmental information available in electronic format on the Internet, on the web site maintained and utilized by the public agency.

D. Although CEQA does not require formal hearings at any state of the environmental review process, section 15202 provides that:

...

(b) If an agency provides a public hearing on its decision to carry out or approve a project, the agency should include environmental review as one of the subjects for the hearing.

(c) A public hearing on the environmental impact of a project should usually be held when the lead agency determines it would facilitate the purposes and goals of CEQA to do so. The hearing may be held in conjunction with and as part of normal planning activities.

...

(f) A public agency may include, in its implementing procedures, procedures for the conducting of public hearings pursuant to this section. The procedures may adopt existing notice and hearing requirements of the public agency for regularly conducted legislative, planning, and other activities.

E. Applications for oil and gas projects under LAMC Section 13.01-H have the potential to create unique risks and hazards to have the potential for significant and immediate impacts on the health, safety, and welfare of the residents in and around the project site through increased noise, odor, dust, traffic, and other disturbances, as well as the potential to significantly impact the City's air, water, soil, biological quality, geology, water, stormwater and wastewater infrastructure, transportation, emergency response plans and other aesthetic values and community resources.

F. People living and working within the land use and environmental impact range of oil and gas operations and activities have a substantial interest in participating in a public hearing on 13.01-H approvals.

G. Section 13.01-H provides authority for the Zoning Administrator to condition, approve or deny a Section 13.01-H application under the City's police powers to protect public health, safety and welfare and to issue and implement reasonable procedures to process Section 13.01-H applications consistent with the requirements for due process.

III. Purpose and Intent of Memorandum

This Memorandum is issued with the following intent:

- Ensure that the City complies with all legal requirements of CEQA in approving Section 13.01-H projects;
- Provide all parties that may be impacted by a project subject to a Section 13.01-H application an opportunity to participate in a public hearing;
- Meet the intent of CEQA in the review and approval of CEQA findings and determinations, to provide adequate public participation;
- Ensure that staff has time to adequately consider and respond to, if necessary, evidence submitted on a Section 13.01-H application and its related environmental findings (including the CEQA Guideline Section 15300.2 exceptions) prior to the issuance of any decision;
- Provide decision-makers and City Staff, and the public with the information and data needed for adequate decision-making under CEQA and Section 13.01-H;
- Ensure that Section 13.01-H applications are processed efficiently;
- Ensure that applicants, staff, and the public can rely on a consistent practice in reviewing Section 13.01-H applications;
- Provide for transparent disclosure and participation process; and
- Ensure that the city's processing and approvals pursuant to 13.01-H will not result in adverse effects to public health, safety, and welfare

IV. Application Requirements

The original case number shall be used for the plan approval request. Before an application may be deemed complete, the applicant must submit:

1) A completed "Land Use Application For Oil & Gas Project Conditional Approval" (CP Form CP-7834) with all required attachments, as specified in the application and the Instructions (CP Form CP-7833.)
2) A completed Environmental Assessment Form for Oil and Gas Projects (EAF-O, CP-7832), with all required attachments.
3) The filing fee pursuant to LAMC Section 19.01.

V. Processing Section 13.01-H Applications

A. CEQA Review

The following review procedures are intended to provide guidelines to implement CEQA on all Section 13.01-H applications. Nothing in this Memorandum or the guidelines provided herein are intended to conflict with CEQA. To the extent that these guidelines are silent or ambiguous, the Zoning Administrator shall fall back on the requirements and intent of CEQA. To the extent that these guidelines impermissibly conflict with CEQA, the provisions of CEQA control. Nothing in these Guidelines is intended to conflict with the Permit Streamlining Act, Gov't Code Section Government Code § 65920 et seq.

1. Preliminary Review for Exemptions

No categorical exemption forms will be processed for consideration or issued at the Planning Department Development Services. The applicant shall submit a complete EAF-O form with their application, which shall be reviewed by the Zoning Administrator. The Zoning Administrator will conduct a preliminary review to determine whether the application qualifies for an exemption from environmental review pursuant to CEQA. The Zoning Administrator may require the applicant to provide additional supporting materials from the applicant to support the use of a categorical exemption.

An application to drill, re-drill, deepen, or convert a well is not eligible for a categorical exemption and shall require an Initial Study or an EIR as described in section V.A.2. All other projects may be reviewed to determine if the project is exempt under any applicable categorical exemption in CEQA Guidelines Section 15300-15333 or any City Guidelines (adopted pursuant to CEQA). If a project is determined not to fall into any categorical exemption based on the project description, an Initial Study shall be prepared pursuant to section V.A.2. If the project falls within a categorical exemption, the Zoning Administrator shall determine if, based upon the whole of the record, any exception to any exemption under CEQA Guidelines, Section 15300.2, applies to the project, including, but not limited to the following:

> Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.
>
> Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.

If the project is determined to be categorically exempt (CE) and no exceptions apply, the Zoning Administrator shall do all of the following:

- Give the public hearing notice required in section V.B., including a notice of an intent to adopt a categorical exemption to all property owners and occupants within a 1,500-foot radius of the project site's outer boundary, and provide for a 35-day comment period on the project, prior to approval. The public hearing may be held during the comment period. The hearing notice (with the notice of intent to adopt a CE) must be provided in English and Spanish.

- If after the 35-day comment period, or any time prior to making a decision on the project, the Zoning Administrator determines that substantial evidence does not support the use of the exemption, including from the existence of an exception in Section 15300.2, the Zoning Administrator shall require an Initial Study to be prepared consistent with the procedures outlined herein.

- Alternatively, if the Zoning Administrator finds after the 35-day comment period, or any time prior to making a decision on the project, that additional information and analysis is required to determine if the categorical exemption is supported with substantial evidence, and the applicant desires the City to use a categorical exemption rather than a prepare an Initial Study, the Zoning Administrator may require the applicant to submit additional information or documents and/or technical studies or reports, including requiring the applicant to hire independent consultants to prepare any necessary technical studies or reports or peer review any prepared studies or reports. If after reviewing any additional documents, reports or studies, required by the Zoning Administrator, it is determined that a categorical exemption is not supported by substantial evidence, an Initial Study shall be prepared.

- If the use of the categorical exemption is supported by substantial evidence in the record at the time of the decision, the Zoning Administrator shall ensure the record contains a memorandum or narrative substantiating the use of the categorical exemption, including explaining how substantial evidence in the administrative record supports the use of the exemption, and that the Zoning Administrator considered whether any exception to an exemption under CEQA Guidelines Section 15300.2 is applicable, including providing where necessary an explanation or evidence to demonstrate that any comments submitted on the intent to adopt the Categorical Exemption do not provide substantial evidence that an exception applies or the exemption does not apply.

2. Initial Study Determination

For any project that does not qualify for a categorical exemption, including any project to drill, redrill, or convert a well, an Initial Study must be completed.

Nothing in this subsection is intended to require the preparation of an Initial Study, when a preliminary review of the project demonstrates an EIR is clearly required, pursuant to CEQA Guidelines Section 15060(d).

The Initial Study must be prepared by an environmental consultant with the qualifications and experience required in this Memorandum. The Zoning Administrator may require the applicant to provide any additional documents, information or technical studies or reports necessary to complete the environmental review of the project, including requiring the applicant to hire an independent contractor to prepare or peer review technical studies or reports. The Initial Study shall comply with Section 15063 of the CEQA Guidelines and be prepared using Appendix G to the CEQA Guidelines and any City issued procedures or guidelines.

If the Initial Study shows both of the following Health Impact Assessment Criteria apply, the Zoning Administrator shall also require a Health Impact Assessment (HIA), as defined in Subsection V.A.5., before preparing the environmental clearance for the project:

- one or more of the air or hazards impact thresholds on Appendix G identified as III(a), III(b), III(d), VIII(a),VIII(b), VIII(c),or VIII(g) are found to be "less than significant impact with mitigation"; and
- the project is within 1,500 feet of any sensitive receptors, as defined by SCAQMD.

After the Initial Study is completed (and the HIA, if necessary), the Zoning Administrator will determine whether the proposed environmental clearance for the proposed project is a Negative Declaration (ND) or a Mitigated Negative Declaration (MND) or whether an EIR is required pursuant to sections 15065 or 15064 of the CEQA Guidelines.

If the Initial Study demonstrates that all of the impact areas will have no impact or less than significant impact, the Zoning Administrator may prepare a ND. (Note: if the Health Impact Assessment Criteria apply, a ND could not be prepared because the Initial Study identified significant impact requiring mitigation.)

If the Initial Study (and the HIA, if required) demonstrates that the project will not result in a significant impact with mitigation imposed, the Zoning Administrator may prepare a MND.

If the Initial Study (and the HIA, if required) demonstrates that the project may result in a significant impact to the environment that cannot be mitigated to less than significant, the Zoning Administrator shall require the preparation of an EIR. In determining whether an EIR is required, the Zoning Administrator shall review and consider all of the following CEQA Guidelines, without limitation to any other applicable requirements of CEQA:

- 15064 (guidelines on determining significant impacts),
- 15064.4 (guidelines on determining greenhouse gas impacts),
- 15064.5 (guidelines on determining cultural and archaeological impacts), and
- 15065 (guidelines requiring consideration of Mandatory Findings of Significance, including subsection (a)(4): "The environmental effects of a project will cause substantial adverse effects on human beings, either directly or indirectly.")

If an ND or MND is issued, the Zoning Administrator shall publish a Notice of Intent to Adopt an ND or MND pursuant to CEQA Guidelines Section 15073, prepare the ND or MND findings (and the Mitigation Monitoring Program for a MND) and process the application pursuant to Section IV. The Public Hearing notice sent in section V.B. will include a statement that the City has published a Notice of Intent to Adopt an ND or MND and include a link to the City's website where the Notice of Intent is published. The Notice of Intent to Adopt an ND or MND shall be published on the City's website in English and Spanish.

If the Initial Study demonstrates the project requires an Environmental Impact Report (EIR), the Zoning Administrator shall follow the procedures in section V.A.3.

3. Environmental Impact Report

If an EIR is to be prepared on a project, in addition to any other requirements of CEQA, the City will require all of the following:

- Provide the Notice of Preparation to all property owners and occupants within a 1,500-foot radius of the project site's outer boundary; and
- Prepare a Health Impact Assessment, as defined in section V.A.5., if not already prepared, and provide a relevant summary of the Health Impact Assessment in the EIR where appropriate to inform the required analysis. The Health Impact Assessment shall be considered in any certification of the EIR and the approval, conditional approval, or denial of the Section 13.01-H application.

An environmental consultant with qualifications and experience provided in section V.A.4 must prepare the EIR. The EIR must be prepared and certified in compliance with CEQA, including but not limited, CEQA Guideline Sections 15080-15097, 15120-15155.

4. Environmental Consultant Qualifications

The City shall ensure that any environmental consultant that is preparing an Initial Study, MND, ND, or an EIR on a 13.01-H project has the following qualifications and experience:

- The Project Manager has at least seven (7) years' experience preparing CEQA documents.
- The Project Manager has prepared and/or reviewed at least five (5) EIRs for projects involving oil and gas drilling or production.
- The consultant or consultant team, including any subcontractors, have demonstrated training, knowledge, and experience in the following topic areas as they specifically relate to oil and gas projects: environmental health, public health, hazardous materials, air quality, GHG emissions, water quality, geology, noise, traffic, aesthetics, and risk and safety issues.
- In the case of EIRs or MNDs requiring Health Impact Assessments, the consultant team, including any subcontractors, has at least five (5) years' experience in preparing Health Impact Assessments. The consultant who prepares the HIA shall be familiar with accepted HIA process and content including, but not limited to, the "Minimum Elements and Practice Standards for Health Impact Assessment," Version 3.

The City shall ensure that all environmental consultants have copies of this Memorandum prior to preparation of any Initial Study, ND, MND or EIR.

5. Health Impact Assessment (HIA)

A HIA is defined as follows:

> A study of the project for the surrounding vicinity identifying pollution and population indicators, such as, but not limited to, those analyzed in the

California Communities Environmental Health Screening Tool; the number of people affected by the project; short term or permanent impacts caused by the project; likelihood that impacts will occur; and recommended mitigation measures.

Any HIA required under these procedures shall be used to inform whether an EIR is required and whether to approve, condition, or deny the application under Section 13.01-H.

B. Public Participation

The Zoning Administrator will hold a public hearing on all Section 13.01 applications prior to project approval.

Notice of this public hearing must be sent to all property owners and occupants within a 1,500-foot radius of the project site's outer boundary, in English and Spanish. For projects being approved with a CE, ND or MND, the Notice of Intent to Adopt a CE, ND or MND may be combined with the public hearing notice.

C. Final Determination

Notices of final decisions will be issued to the applicant, all residents abutting the project site, and all individuals who request such notice.

All Zoning Administrator Section 13.01-H Determinations may be appealed to the Area Planning Commission. The Area Planning Commission decision is final. All CEQA determinations by the Zoning Administrator or the Area Planning Commission are subject to appeal to the City Council pursuant to Public Resources Code Section 21151(c).

Nothing in this Memorandum is intended to limit the Zoning Administrator's express and inherent authority to administer LAMC Section 13.01-H.

LKW:lw

SECOND DISTRICT
ADVISORY PANEL MEMBER
ANDREW WEISSMAN
COMMENTS

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April 10, 2017

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple StreetLos Angeles, CA 90012

Re: Comments to LA County Oil Well Strike Team Biannual Report #2

Dear Mr. Stapleton:

As the 2nd Supervisorial District's representative on the Advisory Panel, I commend the Strike Team on its work to date.

The charge of the Advisory Panel is to assess the bi-annual reports of the Strike Team and to review, comment, and provide input to the Board of Supervisors on the Project results and reports. In that regard, I offer the following comments with respect to Strike Team Biannual Report No. 2:

1. I previously expressed my opinion that abandoned/plugged wells and site inspection and maintenance plans for leaking and / or broken equipment are what matter the most to constituents in the 2nd Supervisorial District in terms of ensuring the safety of active operations. I continue to believe that the public will be better served by greater efforts on behalf of the Strike Team in the area of leak prevention and detection programs to provide assurance that the safety of the public is adequately protected and would recommend more be done in this area.

2. I echo the concern expressed by Representative Burga that the Board of Supervisors consider review of relevant oil and gas facilities located outside County jurisdiction given the "cross jurisdictional boundaries of several of the County's facility operations, with associated processing facilities, trucking routes and pipelines often being located in adjacent counties or cities". The value of such a review cannot be overstated. As a former Mayor of one such jurisdiction (Culver City), an across the jurisdictions analysis is critical to ensure the proper review and inspection of all aspects of all facility operations, both inside and outside County jurisdiction.

Thank you for the opportunity to provide these comments.

I look forward to reviewing the Strike Team's continuing efforts on this important matter.

Very truly yours,

Andrew N. Weissman

bwa

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

April 6, 2017

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Re: Comments by Tim O'Connor (District 3 rep.) and EDF on the LA County Oil Well Strike Team's Biannual Report No. 2

Dear Mr. Stapleton,

As a member of the LA County Oil Well Strike Team Advisory Panel and on behalf of the Environmental Defense Fund (EDF), please accept these comments on the second draft of the biannual report.

We commend the LA County Oil Well Strike Team and the Board of Supervisors for taking on the challenging but necessary task of reviewing the zoning codes and permitting processes and taking a close look at oil and gas wells in the area. The Strike Team did update the initial report to the Board by integrating several comments made by the Advisory Panel in the second draft of the initial report. However, more can be done to ensure that proper review has been made and to effectively protecting the health and safety of County residents.

1. Air Monitoring of all Facilities Should be Recommended to the County Board

In common business parlance, better measurement leads to better management, and in the case of oil and gas facilities which can emit troubling amounts of climate and toxic air pollution, this couldn't be more important. In general, other than monitors required for combustible gas detection or monitors required because of lawsuits and settlements, there are no statutory or land use requirements for monitoring of air emissions from oil and gas production facilities. This is a notable policy shortcoming and missed opportunity to gather valuable emissions data that can help drive better policy and management of oil and gas facilities.

In a February 2017 report titled "Enhanced Inspection & Maintenance for GHG & VOCs at Upstream Facilities," the California Air Resources Board looked at data collected from 39 different oil and gas production facilities across the state. Of the 211 different gas leaks recorded, nearly half of them included the cancer-causing chemical benzene in addition to the climate pollutant methane. The frequency at which toxic chemicals were measured is concerning, and is something that should raise both concerns for the Strike Team staff and the Board and inspire action towards improved air emissions monitoring.

We recommend that the Strike Team staff document the type (which air pollutants and what technology) and amount (if any) of monitoring occurring at each facility that is inspected as part of the "Well Inspection Protocol" checklist. In the case that a facility is conducting monitoring, the emissions data should also be recorded, included in the report, and incorporated as part of the review process. This independent review and information gathering is integral to understanding whether operators are properly monitoring the emissions emanating from the facility operations. This data will also help the staff, the Advisory Panel, and the Board analyze and better assess a proper course of action and recommendations in the final staff report for better and more effective community health protection tools such as requiring monitoring as a pre-requisite for the safe and proper operation of facilities in the County. Additionally, without air monitoring or site observational data for air emissions, the report risks being incomplete as to likely community impacts.

2. Leak Detection and Repair (LDAR) Plans Should Be Reviewed and Disclosed

As in our previous comments for the first report drafted by the Strike Team staff, one of the areas that continues to be conspicuously absent from the report is information on the site level inspection and maintenance plans for leaking and / or broken equipment. Individual facilities should have site specific leak detection and repair plans – and such plans should be reviewed in the site inspection protocol. This information is pivotal for understanding how facility operators are handling leaks, and what the repair protocol is, since leaks are one of the biggest sources of fugitive emissions that contribute to environmental damage and health impacts.

Since the first report was completed by the Strike team, the State of California enacted new regulations that require improved leak detection and repair at oil and gas facilities, including quarterly inspections of components at production sites, monitoring well casing vents, and elimination of certain practices and pieces of equipment. The Strike Team's final report should evaluate the extent to which these facilities have LDAR programs consistent with the state's new requirements and report if deficiencies are noted.

3. Well Stimulation Operations and Practices Are Missing in the Report

One important component of the Strike Team's review process is a public health screening and safety risks assessment. Part of that assessment includes prioritizing oil and gas facilities for further action based on highest health or environmental risks" and "consideration should be given to the age and history of the facility, the proximity of nearby communities (specifically disadvantaged communities) or sensitive populations, and whether the facility is operating using controversial well stimulation techniques (such as hydraulic fracking)."

As noted in our previous comments, and as is contemplated in the motion directing the Strike Team's tasks, understanding whether well stimulation operations have been occurring at the sites, and whether this creates unsafe conditions is of utmost importance for resident concerns regarding health and safety. While the current well inspection protocol looks at several site characteristics in an individual manner, there doesn't appear to be any holistic assessment of

whether well stimulation has, or is planned to take place at the sites. While the facility and well inspection protocol checklists and the health review summary of each site incorporate elements of review for well stimulation practices, there is a great deal of data missing on what chemicals / constituent compounds are used to perform such operations, and the origination / volume of water used to conduct it. In several of the site visit reports, the staff simply recommends that the SCAQMD look into and provide much of the information on well work procedures. EDF recommends that for the upcoming report, the staff work with SCAQMD to actually acquire and report on that data, or note if well work procedure data is missing. It is insufficient to simply place the burden on another agency if this review process is to be complete. Furthermore, since SCAQMD has volunteered to work with the Strike Team staff during this review process, acquiring and disclosing this data should not be too cumbersome.

4. Interviews of Surrounding Residents Should be Conducted During Site Visits

We commend the Strike team on developing facility and well inspection protocol checklists that incorporate reviews of regulatory and site characteristics, and that incorporate efforts to address neighborhood complaint history by acquiring complaint reports from the SCAQMD. However, there is currently a lack of any substantive information on odor or noise complaints acquired through interviews of surrounding residents, business, schools, etc. This is especially troubling in facilities that are located alarmingly near sensitive receptors such as in the case of the Matrix Sansinena facility as well as several others. The public health risk for this facility is ranked high by the Strike Team staff in the latest update due to the facility being located less than 100 feet away from a nursery and less than 160 feet from homes.

Many complaints brought by residents or businesses are not formally filed with the SCAQMD due to a number of barriers including lack of awareness for how to file a complaint, concerns over interacting with law enforcement agencies, or concerns over unresponsiveness from the agencies with whom complaints are filed. Yet when speaking with local surrounding residents, valuable information can be drawn that will allow the Strike Team to document a more accurate and holistic narrative of how the facility is being run, what the experience is like day-to-day for surrounding residents, and the impacts the facility has on residents by way of nuisances (noise and odors) and health.

Accordingly, we recommend that requiring interviews or meetings with of community members located nearby sites be added to the "Well Inspection Protocol" checklist, specifically the noise and odors items, as well as the "Facility Checklist," which includes an item for "neighbor issues and complaint history." EDF acknowledges that this added checklist requirement would likely be somewhat time-intensive and may lengthen the Strike Team's review process, however, it is our belief that a proper and thorough analysis of the sites, with proper engagement and feedback from the communities at the frontlines of the facility operations, warrant such an effort. EDF also recommends that in convening community meetings and resident interviews, the Strike Team take into account environmental justice issues, including time of meeting and location, and that the staff enlist the close advisement and aid of organizations well-versed in

community organizing including our colleagues at Communities for Better Environment, who are also part of the Advisory Panel.

5. The Strike Team's Recommendation For Inspecting Associated Oil And Gas Facilities Is Important And Well Founded

The Strike Team staff astutely noted that several of the County's facility operations cross jurisdictional boundaries, with associated processing facilities, trucking routes and pipelines often being located in adjacent counties or cities. We agree with the staff recommendation that the Board "consider review of relevant oil and gas facilities located outside County jurisdiction under the parameters of the Project." However, we do not believe the review should be on a "case by case" basis – rather there should be an automatic review of any and all operations, regardless of location, associated with a core facility located within the County. To this end, EDF also agrees that the Board should work in tandem with other counties and cities to ensure the proper review and inspection of all aspects of facility operations. Additionally, this is a pivotal opportunity for the Board to share this important undertaking and the lessons learned as well as recommendations that result from this Strike Team review process.

6. Better Coordination Between The Strike Team And The Advisory Panel Is Essential

The motion, passed by the Board of Supervisors on March 29, 2016, tasked this Strike Team with "assessing the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County." The Strike Team is to work in conjunction with the Advisory Panel to gather information to "complete an update to the Zoning Code and associated regulations and enforcement protocols" that will ensure that (1) proposed regulations "reflect best practices and current mitigation methods and technologies" to "minimize environmental impacts and protect sensitive uses and populations," and that (2) "oil and gas facilities may no longer operate by right in the unincorporated portions of the County[.]" The Advisory Panel's role in the Project is to review, comment, and provide input on the Project findings and reports.

While we commend efforts by the Strike Team in coordinating a series of meetings with the Advisory Panel in order to provide Advisory Panel members and the public an opportunity to comment, we believe that more meaningful engagement on the Strike Team project review and field visits would create more robust recommendations and outcomes. EDF proposes an opportunity to comment on the Strike Team's initial observations and draft report prior to the reports being prepared for public dispersal and distributed to the Board of Supervisors. Without an opportunity for our comments to be reviewed and incorporated into the updated report by the Strike Team staff, before it becomes final, the Advisory Panel's role becomes sidelined and trivial. In order for there to be a fair and complete review process – while leveraging the expertise in the fields of oil and gas, health, safety, law, and policy – meaningful interaction and engagement with the Advisory Panel members should be prioritized. It is a missed opportunity to not properly incorporate valuable feedback from this group of experts into each updated report.

Thank you for considering these comments moving forward.

Sincerely,

Timothy O'Connor
County District 3 Representative, Oil and Gas Strike Team Advisory Panel Member
Director and Senior Attorney, California Oil and Gas Program, Environmental Defense Fund

Irene Burga
Policy Advocate, California Oil and Gas Program
Environmental Defense Fund

FOURTH DISTRICT
ADVISORY PANEL MEMBER
MATT REZVANI
COMMENTS

Mr. Timothy Stapleton,
AICP Zoning
Enforcement West
Department of Regional
Planning 320 W. Temple
Street
Los Angeles, CA 90012

April 7, 2017

Subject: Los Angeles County Oil and Gas Facilities Strike Team Report
Comments by Matt Rezvani – 4th District Advisory Panel member

Dear Mr. Stapleton,

The Strike Team should be commended for their comprehensive efforts in inspecting the oil and gas facilities within unincorporated areas of Los Angeles County. These efforts are major undertaking that are time consuming and at the same time important in ensuring the safety of LA County residents. Like any other environmental audits or inspection programs, these efforts can only improve and benefit from the input and suggestions it receives.

As the representative of the 4th District on the Advisory Panel of LA County Oil and Gas Facilities Strike Team I would like to offer the following comments on the second draft of the biannual report.

In my opinion, the Strike Team's report can be enhanced by providing more detailed information and specifics about its finding on leak prevention and detection programs of the facilities inspected

Undetected leaks from leaking tanks and pipelines can be a major source of leaks to underground waters and aquafers. Fortunately, there are several programs designed to prevent such leaks and those are administered by various federal and state agencies with oversite over these facilities. The strike team report appears to be incomplete in addressing the inspection of these programs in the following areas:

1. **Tanks leak detection and Tank Bottom inspections**

Leaks from tank bottoms can often result in underground oil and petroleum products plums. There are federal and state rules addressing tank leak prevention and detection, and tank

bottom inspections. These requirements are administered by California Division of Oil and Gas at producing facilities and by other agencies in other types of oil and gas facilities. While the Strike Team report indicates inspection of tanks in general, any discussion of tank bottom inspections or tanks leak detection systems and their effectiveness appears to be absent from the report.

2. **Secondary Containment**

   The USEPA Spill Prevention, Control and Countermeasure (SPCC) plan requirement is very specific on the volume of oil the secondary containments need to hold. The Strike Team report does address the issue of secondary containments in all the facilities inspected. However, the report included some pictures of earthen berms secondary containments that seemed to have been compromised. They appeared to have been detreated or partially washed off by rain. The angle from which the pictures where taken may have contributed to the appearance. if that is not the case, the secondary containments have been compromised and the issue needs to be addressed.

3. **Leak Detection and Repair Plans**

   Many facilities do have a leak Detection and Repair Plan (LDAR) that are either undertaken by the facility operators as part of their maintenance plans or required by an oversight agency because of past incidents. If the existence of these programs were evaluated by the Strike Team, they appear to be missing from the report. The Strike Team report should address the existence and the effectiveness of these programs at the facilities that have incorporated an LDAR plan in their maintenance programs.

I appreciate the opportunity to comment and look forward to future reports.

Regards,

Matt Rezvani
LA County 4th District member of the Advisory Panel

Oil and Gas Facility Compliance Review Project
Bi-Annual Report Number Three
County of Los Angeles Existing Oil Wells

September 26, 2017

Prepared for:
County of Los Angeles

Prepared by:
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Los Angeles Oil and Gas Strike Team
Oil and Gas Facility Compliance Review Project

Table of Contents

Executive Summary

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works, to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. This report is the third of three biannual Strike Team update reports that will be provided to the Board during the current 18-month long Strike Team effort. The purpose of the Strike Team effort is to prioritize sites for further action based on health or environmental risks through onsite visits with consideration of nearby communities, age and history of the facility, and use of regulated well stimulation techniques.

This report is an enhanced update of the initial reports dated October 13, 2016, and March 13, 2017, and includes both the facilities examined in the first two reports, as well as review of the wells and facilities of seven additional oil and gas operators visited over the last few months including a public health screening assessment for each of the facilities visited through July 2017. This report also includes an overview from the first report of the initial Strike Team efforts, which focused on 1) updating the inventory of oil and gas facilities and 2) developing protocols to identify permit and compliance issues. For each facility inspected, this report includes a description of the existing facility, a description of existing conditions based on site visits, an analysis of permit compliance, recommendations for further action as appropriate, and the public health screening assessment. This third and final report also includes a review of regulatory, legislative, and other recommendations.

1.0 Background

This is the third and final report to update the Board of the Strike Team's current focus for the March 29, 2016, motion as summarized below. Additionally, it builds upon the Los Angeles County Oil and Gas Well Inventory Report, a report issued in December 2015 identifying existing facilities within unincorporated Los Angeles County, summarized below and attached as Appendix A. This third report is cumulative in its analysis: the findings made in the first two reports have been incorporated as information in this third iteration and built upon with updated information gathered from the Strike Team's most recent efforts.

1.1 Board Motion Regarding Proactive Planning and Enforcement of Oil and Gas Facilities Operating in Unincorporated Los Angeles County

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion to:

- Convene a Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County.

- Review Los Angeles County Title 22: Zoning Code to ensure that oil and gas facilities may no longer operate by right in the unincorporated portion of the County and to ensure that regulations reflect best practices and current mitigation measures and technologies, minimize environmental impacts and protect sensitive uses and populations.
- Coordinate with cities throughout the County that are interested in collaborating on the development of regulatory requirements and protocols for monitoring and evaluating their local oil and gas facilities.
- Create an Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess the biannual reports of the Strike Team.
- Ensure that County Planning and Code Enforcement services are not negatively impacted.

1.2 Previous Reports

Los Angeles County Oil and Gas Well Inventory

On July 28, 2015, the Board directed the Department of Regional Planning (DRP), in consultation with the Department of Public Health (DPH), to develop a detailed inventory of all oil fields and the associated level of environmental monitoring of all oil wells currently operating within the unincorporated areas of the County of Los Angeles (County). MRS Environmental (MRS), a consulting firm with expertise in the oil and gas industry, along with County DRP Staff prepared the Los Angeles County Oil and Gas Well Inventory report dated December 2015 (attached as Appendix A), in response to the Board of Supervisors motion. The Oil and Gas Well Inventory report identifies facility and well locations based on information obtained from the State of California's Division of Oil, Gas, and Geothermal Resources' (DOGGR) oil and gas well online database. This database was used to provide a preliminary list of oil and gas wells located in the unincorporated Los Angeles County area. The report includes a review of local, State, and Federal regulatory requirements for the drilling and operating of oil and gas wells.

Inventory Report Recommendations

It was concluded in the Oil and Gas Well Inventory report that further research would be necessary to compare the existing County oil and gas well regulations with other agency regulatory standards to identify potential regulatory gaps. The comparison of these standards would allow for the review of County regulations, ensuring protections for the health, safety, and welfare of surrounding communities. It was recommended in the report that the standard conditions outlined in Title 22 and the suitability of "by-right" use of oil and gas wells within Title 22 be evaluated for effectiveness in protecting the health, safety and environment of the communities surrounding these operations. It was further recommended in the report that the well inventory be corroborated by on-the-ground site visits of oil and gas facilities to determine compliance and to review potential issues associated with health, safety, and environmental concerns.

Los Angeles County Oil and Gas Compliance First Report

The initial report submitted to the Board in October 2016 includes the findings from two facility visits and was primarily prepared to solicit feedback from the Advisory Panel, the Board, and the public on the field inspection checklists and the well inspection protocol developed. The comments and recommendations received were incorporated into the second and third reports. In addition, the

information obtained during the two facility visits detailed in the October 2016 report is included in this report.

Los Angeles County Oil and Gas Compliance Second Report

The second report submitted to the Board in March 2017 included the findings from six additional facility visits, utilized updated and improved field checklists and provided a screening public health assessment for all of the facilities presented in the first two reports. Members of the public and the Advisory Panel provided comments on the second report. Those comments have been addressed in this third and final report.

1.3 Project Objective

The objective of the Oil and Gas Facility Compliance Review Project (Project) is to provide a review of all existing oil and gas facilities in the unincorporated County to include:

- Identification of applicable regulations and permit requirements through a regulatory review and review of permit records;
- Verification of regulatory and permit compliance through site visits;
- Evaluation of regulatory compliance of facility plans (such as emergency response plans);
- Description and understanding of existing facility conditions and the neighboring zoning and nearby receptors; and
- Analysis of public health and safety risk.

The Project will enable the Board of Supervisors to update their understanding of the oil and gas facilities operating in the unincorporated County and the associated environmental protections and oversight provided by the various agencies tasked to monitor such facilities.

1.4 Project Scope

The Project scope includes review and assessment of all existing oil and gas production facilities in unincorporated Los Angeles County through site visits and review of permit records, description of existing facility conditions, evaluation of regulatory compliance, analysis of public health and safety risk and recommendations for further action. The scope does not include an evaluation of abandoned wells, a review of down-hole compliance issues (well testing and conditions of well bores below the surface of the ground) or ambient air monitoring beyond SCAQMD Rule 1173 monitoring (such as the installation of toxic air pollutant monitoring stations).

1.5 County Departments and Their Roles

County Departments involved in the Strike Team include the following:

- Regional Planning;
- Public Health;
- Public Works;
- Fire; and
- County Counsel.

The role of each of these is discussed below.

Department of Regional Planning (DRP)

The DRP is the lead County agency for this compliance review effort. DRP is responsible for the following components and tasks:

- the Director or his designee to attend Strike Team public meetings;
- Project management;
- hire and manage the consultant assisting the County;
- coordinate and facilitate staff meetings;
- coordinate and staff Advisory Panel and Strike Team meetings;
- research and collection of County permits, and ordinance and mapping data;
- coordinate information exchange between all involved agencies;
- develop the Well Inspection Protocol;
- develop the Facility Inspection Checklist;
- develop the Well Inspection Checklist;
- attend the field site audits;
- prepare field site audit findings; and
- prepare biannual reports.

Department of Public Health (DPH)

The DPH's role on the Strike Team includes:

- the Director or his designee to attend Strike Team public meetings;
- research and collection of DPH permits;
- research and collection of DPH issues, complaints, and enforcement actions;
- attend staff meetings;
- review and comment on Well Inspection Protocol;
- review and comment on Facility Inspection Checklist;
- review and comment on Well Inspection Checklist;
- review and comment on the Public Health and Safety Assessment Screening;
- attend the field site audits; and
- review and comment on draft reports.

Department of Public Works (DPW)

The DPW's role on the Strike Team includes:

- the Director or his designee to attend Strike Team public meetings;
- research and collection of DPW permits;
- research and collection of DPW issues, complaints, and enforcement actions;
- attend staff meetings;
- review and comment on Well Inspection Protocol;
- review and comment on Facility Inspection Checklist;
- review and comment on Well Inspection Checklist;

- attend the field site audits; and
- review and comment on draft reports.

County Fire Department (Fire)

The Fire Department's Fire Prevention Bureau/Petroleum Chemical Unit and the Health Hazardous Materials Division roles on the Strike Team includes:

- the Fire Chief or his designee to attend Strike Team public meetings;
- research and collection of fire prevention permits;
- research and collection of Certified Unified Program Agency-CUPA permits (hazardous materials, hazardous waste, above ground petroleum storage, and California Accidental Release Prevention Program-CalARP);
- research and collection of fire issues, complaints, and enforcement actions;
- attend staff meetings;
- review and comment on Well Inspection Protocol;
- review and comment on Facility Inspection Checklist;
- review and comment on Well Inspection Checklist;
- attend the field site audits; and
- review and comment on draft reports.

County Counsel

County Counsel provides the following assistance to the Strike Team:

- review of contract for consultant assisting the County;
- review and comment on Well Inspection Protocol;
- review and comment on Facility Inspection Checklist;
- review and comment on Well Inspection Checklist;
- attend staff meetings;
- attend Advisory Panel and Strike Team meetings;
- advise County on legal positions as necessary; and
- review and comment on draft reports.

Strike Team Members

The Strike Team is responsible for management of the Project and consists of the Department Heads, or their designated alternates, of the County agencies involved: DRP, DPH, DPW, and Fire.

Project Staff

The Project Staff consists of staff from MRS, the consultant assisting the County with the Project, and staff from DRP, DPH, DPW, and Fire. In addition, staff from the California Department of Conservation's Division of Oil, Gas and Geothermal Resources (DOGGR), the South Coast Air Quality Management District (SCAQMD), and Los Angeles Regional Water Quality Control Board (LARWQCB) have volunteered to assist the County in this effort.

Advisory Panel

The Advisory Panel consists of five members designated by each of the five-member Board of Supervisors. The Advisory Panel members are issue area experts in oil and gas, environmental, and/or

health issues. The Advisory Panel's role in the Project is to review, comment, and provide input on the Project findings and reports. The Advisory Panel consists of the following members:

- Julia May (1st District)
- Andrew Weissman (2nd District)
- Tim O'Connor (3rd District)
- Matt Rezvani (4th District)
- R. Rex Parris (5th District)

2.0 Progress Update

This section provides a summary of the Project activities completed through July 2017. Tasks completed include: three staff meetings, three Advisory Panel public meetings, two Strike Team public meetings, the development of an updated operator contact list, development of an inspection protocol, the development and update of inspection checklists, and the development of a public health screening checklist and screening health assessment. Site inspections have addressed, including the facility site inspections reviewed in the first two reports and additional operations reviewed through July 2017, a total of 557 of the 813 wells identified for Strike Team review. The wells not included are due to an inability to obtain access from the operator, a change in the status of a well (from active to abandoned, for example), or because of pending litigation. Section 3.16 provides a discussion on the wells not included for field inspections as part of the Project.

2.1 Chronology of Project Meetings

Project Staff Kick Off Meeting

The initial kick off meeting for the Project Staff occurred on June 30, 2016. The meeting was attended by representatives from DRP, DPH, DPW, and Fire with staff from County Counsel and the California Department of Conservation's DOGGR attending via teleconference. Staff from MRS also attended. Issues discussed at the kick off meeting are described below.

- Introduction of Project Staff – Staff from each participating County agency, DOGGR and MRS were introduced, and contact information was distributed.
- Purpose of the Project – The Board motion was discussed along with primary Project tasks.
- Timeline for first report – The first report would be issued as a draft in September 2016.
- Roles and responsibilities and regulatory authority – Project goals and agency responsibilities were discussed with each department or agency providing input on the process.
- Access to sites – The topics of site access and each department or agency's jurisdictional authority to visit the oil and gas facilities were discussed.

Second Project Staff Meeting

On August 18, 2016, the Project Staff met a second time, with the consultant MRS attending and with DOGGR staff attending via teleconference, to discuss Project progress. Items discussed are summarized below.

- Well inspection protocol – The well inspection protocol was discussed, and staff input on the document was received and incorporated.
- Facility inspection checklist – The facility inspection checklist was discussed, and staff input on the document was received and incorporated.
- Well inspection checklist – The well inspection checklist was discussed, and staff input on the document was received and incorporated.
- Completed site visits – It was stated that site visits to Matrix Sansinena and Termo Aliso Canyon/Oat Mountain had been completed.
- Summary of findings from completed site visits – Findings from the initial two site inspections were discussed, and methods for improving the site inspection process were discussed.
- First report to the Board outline – An outline for the first report was distributed and discussed.
- Potential legislative, regulatory, and legal position recommendations for the Board on overall safety of Project facilities – Subject input was discussed and noted for further discussion as the Project moves forward. It was agreed that it would be premature at the time of the meeting to make recommendations without completing additional site visits.
- Recommendations of other facilities for consideration of Strike Team evaluation – Facilities in adjacent jurisdictions were discussed, particularly those connected to facilities located in the County, pipelines, and other industrial facilities that use hazardous materials.

Advisory Panel Kick Off Public Meeting

The Advisory Panel kick-off meeting was held on August 31, 2016. Staff from the DRP facilitated the meeting with the assistance of County Counsel. Staff from MRS provided a Project overview and status update. Agenda items included:

- Project overview – Staff from DRP and MRS provided the Advisory Panel with an overview of the Project and an update on Project status.
- The role and responsibility of the Advisory Panel – Staff from DRP and County Counsel summarized the Advisory Panel tasks with the primary responsibility to review and comment on the Project reports.
- Brown Act responsibilities – County Counsel provided an overview of the Brown Act.
- Public comments – Comments were received from members of the public.
- Issues discussed from Advisory panel members and the public included:
    - abandoned and orphan wells;
    - odors and odor complaints;
    - methane emissions;
    - monitor for all toxics in air quality;
    - chemical use and transport, cradle-to-grave tracking of all chemicals;
    - noise, storm water, and truck traffic;
    - fracking;
    - fence line monitoring; and
    - water injection and water aquifer protection.

Strike Team Public Meeting

A Strike Team Public Meeting was held on October 13, 2016. The meeting was attended by the Directors, or their designee, of Regional Planning, Public Health, Public Works, the Fire Chief, and members of the public. The panel discussed and heard public comments on the first Oil and Gas Compliance Project Report. The panel made an affirmative motion to forward the report to the Board of Supervisors.

Second Advisory Panel Public Meeting

The Advisory Panel met for the second time on November 9, 2016. The Advisory Panel, consisting of appointees from the First, Second, and Fourth Supervisorial Districts, discussed and heard public comments on the first Oil and Gas Compliance Project Report. The Advisory Panel comments on the report were forwarded to the Board of Supervisors on November 16, 2016.

Third Project Staff Meeting

The Project Staff met for a third time on January 31, 2017. Staff discussed the preliminary findings prepared for the second Oil and Gas Compliance Project Report.

Second Strike Team Public Meeting

A Strike Team Public Meeting was held on March 13, 2017. The meeting was attended by the Directors, or their designee, of Regional Planning, Public Health, Public Works, the Fire Chief, and members of the public. The panel discussed and heard public comments on the second Oil and Gas Compliance Project Report. The panel made an affirmative motion to forward the report to the Board of Supervisors.

Third Advisory Panel Public Meeting

The Advisory Panel met for the third time on April 11, 2017. The Advisory Panel, consisting of appointees from the First, Third, and Fourth Supervisorial Districts, discussed and heard public comments on the first Oil and Gas Compliance Project Report. The Advisory Panel comments on the report were forwarded to the Board of Supervisors on April 13, 2017.

2.2 Operator Contact List/Operator Changes

As one of the first steps in the Project, Staff contacted some of the owners/operators of the oil and gas wells researched in the *Los Angeles County Oil and Gas Well Inventory Report*, included as Appendix A, to compile an initial contact list for this compliance review effort. Due to the dynamic nature of the oil and gas industry and the long operating life of an oil and gas well, it is common for multiple changes in ownership or operation of a well to occur over the lifetime of a production facility. In addition, regulatory agencies may take additional time to update their records and databases to reflect a change to the ownership or operation of a well. Current contact information for the owners/operators, with recent changes noted where applicable, for the Los Angeles County unincorporated portion of oil and gas well facilities in this study are listed below.

- Southern California Gas Company
  Centralized Correspondence
  P.O. Box 3150
  San Dimas, CA 91773
  Fields = Aliso Canyon, Honor Rancho, Playa Del Rey
  Total Wells = 160

- California Resources Corporation
  (Previous operator Vintage Production California LLC)
  CRC Long Beach
  111 W. Ocean Blvd., Suite 800
  Long Beach, CA, 90802
  Steve Greig, Director Government Affairs
  Fields = Del Valle, Newhall-Potrero, Honor Rancho, Wayside Canyon, Ramona, Ramona North
  Total Wells = 135

- Breitburn Operating L.P.
  707 Wilshire Boulevard, Suite 4600
  Los Angeles, California 90017
  Antonio D'Amico, Vice President
  Investor Relations & Government Affairs
  Fields = Rosecrans, Rosecrans South, Sawtelle
  Total Wells = 80

- Linn Operating, Inc.
  LINN Energy
  5201 Truxtun Avenue, Suite 100
  Bakersfield, CA 93309
  Trent R. Rosenlieb, P.E., Manager, Government & Regulatory Affairs
  Total Wells = 75
  Fields = Brea Olinda

- Brea Canon Oil Co.
  Brea Canon Oil Co., Inc.
  23903 Normandie Ave
  Harbor City, CA 90710
  Rey Javier, Vice President
  Total Wells = 66
  Fields = Torrance

- Crimson Resource Management Corp.
  5001 California Avenue, Suite 206
  Bakersfield, California 93309
  Kristine Boyer
  Total Wells = 52
  Fields = Hasley Canyon, Castaic Hills, Aliso Canyon

- The Termo Company
  3275 Cherry Avenue
  Long Beach, CA 90807
  Mailing Address:
  P.O. Box 2767
  Long Beach, CA 90801
  Ralph Combs Manager of Regulatory, Community, and Government Affairs

Total Wells = 47
Fields = Oak Mountain, Aliso Canyon, Oak Canyon

- Hawker Energy Inc
  (Previous operator TEG Oil and GAS USA Inc.)
  326 South Pacific Coast Highway, Suite 102
  Redondo Beach, CA 90277
  Total Wells = 37
  Fields = Tapia

- LBTH Inc.
  5574 Everglades St, # B
  Ventura, CA 93003
  Total Wells = 35
  Fields = Del Valle, Ramona

- Watt Mineral Holdings LLC
  2716 Ocean Park Blvd, Suite 2025
  Santa Monica, CA 90405
  Daniel Franchi, Director, Petroleum Operation
  Total Wells = 30
  Fields = Newhall, Placerita

- Matrix Oil
  (Previous operators Oxy USA Inc., California Resources Corporation)
  Matrix Oil
  104 West Anapamu Street
  Santa Barbara, CA 93101
  Cindy R. True
  Total Wells = 27
  Fields = Sansinena, Whittier

- Thompco, Inc.
  899 Mission Rock Road
  Santa Paula, CA 93060
  Dori Dawne Thompson
  Total Wells = 8
  Fields = Del Valle and Ramona

- Thompson Oil Company, Inc.
  13008 Santa Paula Ojai Road
  Santa Paula, CA 93060
  Dori Dawne Thompson
  Total Wells = 9
  Fields = Del Valle and Ramona

- Pacific Coast Energy Company
  (Breitburn Operating L.P. operates the wells)
  707 Wilshire Blvd., 46th Floor
  Los Angeles, CA 90017
  Total Wells = 4
  Field = Dominguez

- Power Run Oil
  721 N. Guadalupe Ave.
  Redondo Beach, California 90277
  Rodger S. Hunt
  Total Wells = 4
  Fields = Rosecrans South, Howard Townsite

- Asioco Inc.
  10801 National Boulevard #102
  Los Angeles, CA 90064-4140
  Steven Riva
  Total Wells = 2
  Fields = Rosecrans and Rosecrans South

- Sherwin D Yoelin
  808 Dolphin Circle
  Encinitas, CA 92024-2243
  Total Wells = 2
  Field = Rosecrans

- Anterra Services
  918 Mission Rock Rd Suite C-1
  Santa Paula, CA 93060-9134
  Mike Hale
  Total Wells = 2
  Field = Tapia

- Jean Martinez
  305 Kenneth Road
  Burbank, CA 91501
  Marla Martinez
  Total Wells = 1
  Field = Tapia

2.3 Well Inspection Protocol

As part of the compliance review Project, a guidance document was developed to streamline the process for regulatory and environmental review of County oil and gas facilities. This document, the

Well Inspection Protocol (Protocol), provides regulatory and field inspection guidance by issue area. The review issue areas are focused on existing DRP, DPH, DPW, DOGGR, and SCAQMD permit requirements and on regulatory requirements as specified in the DOGGR regulations related to surface facilities, in the EPA SPCC regulations, SCAQMD Rules, and Fire Department regulations and County Title 22 requirements. Issues detailed in the Protocol (see Appendices B through D) include:

- Adjacent land use;
- Air Quality;
- Bonding;
- Business Plans (hazardous materials);
- DOGGR critical wells designation and Idle Well Program;
- Drilling Activities;
- Emergency Response Plans;
- Fire Issues;
- Hazardous Materials;
- Noise Issues and Control;
- Odors history and potential;
- Oil field infrastructure;
- Oil field wastes;
- Permits;
- Pipeline operating and inspection characteristics;
- Roads;
- Sanitation;
- Secondary containment;
- Security;
- Setbacks;
- Signage;
- Spill Prevention, Control and Countermeasure (SPCC) Plans;
- Storm water basins;
- Sumps;
- Visual and aesthetics; and
- Zoning.

DRP Land Use Permits

The Protocol includes tools for review of the identified DRP land use permits for each facility, to be field-checked for compliance.

DRP Title 22

As acknowledged in the *Los Angeles County Oil and Gas Well Inventory Report* dated December 2015, many of the wells operating within unincorporated Los Angeles County do not have land use regulatory entitlements from the DRP. Pursuant to the County Zoning Ordinance, the primary land use regulations for oil wells are contained in Title 22, Section 22.24.120 D; the requirements for the A-2, Heavy Agriculture zone district. Therefore, to provide a baseline review for all facilities independent of the

existence or type of DRP permit, the Protocol provides that each facility be reviewed pursuant to the Title 22, Section 22.24.120 D requirements as part of the Project.

Other County Permits

County departments DPH, DPW, and Fire provided applicable permit documentation to the Project Staff; these requirements are compared with DRP permit requirements and are reviewed in the field for compliance. DPH records are reviewed for issues related to public nuisance such as noise and vibration complaints or negative health outcomes. DPW data are checked for recent building permits and are field checked against new development at the oil and gas facilities. Fire Department records are reviewed for compliance with all the requirements of the Fire Code.

Division of Oil, Gas, and Geothermal Resources (DOGGR)

DOGGR permits are typically limited to well down hole requirements. However, these permits are reviewed for consistency with County records and field verified.

South Coast Air Quality Management District (SCAQMD)

The SCAQMD has been invited to participate in the review process. In addition, staff has requested odor complaint data from the SCAQMD for each facility to identify any facilities that may have a history of odor complaints and could be considered a nuisance for the surrounding residents. SCAQMD Notices of Violation data has also been compiled for each facility. SCAQMD staff have participated in many of the site visits and conducted Rule 1173 air quality monitoring.

The Protocol is included as Appendix B.

2.4 Compliance Checklists

In order to facilitate documentation of Project findings in the field and to provide a consistent data base for the permit and compliance data collected for the Project, DRP, along with Project consultant MRS, developed checklist forms. The checklists provide a list of information and compliance items, organized by the issue areas identified in the Protocol, to be reviewed as part of the Project site visits. Two checklists were developed and implemented: one applicable to a facility or field as a whole (Facility Checklist) and one specific to a well or group of wells (Well Checklist). Each checklist is annotated with specific permit, land use, zoning, or other applicable information prior to the field verification compliance site visit.

Facility Checklist

The Facility Checklist covers the permit and compliance issues applicable to the overall facility or oil field including land use issues. Information was gathered on land use, zoning, nearby sensitive land uses, existing permits, and facility operations to determine regulatory compliance. The Facility Checklist documents 127 (where applicable) items reviewed during the facility site visit. Regulatory requirements associated with the facility are addressed, including DOGGR requirements, SCAQMD Rules, EPA SPCC requirements and Fire Department regulatory requirements. Appendix C provides details and specific regulatory references for each item under review. Regulatory issues are examined during the site visits as appropriate for each site. The adequacy of adherence to regulations and procedures that have been put in place to promote the protection of public health and safety and the environment are the focus of site visits. For example, the adequacy of a facility's spill plan and emergency response plan, in addition to issues that could increase the risk of releases or spills affecting the environment or the public, are

included in the checklist as focal items for review. Less emphasis is given to issues that would only affect employee health and safety, for example. General data collected and annotated on the Facility Checklist includes:

- Facility and surrounding area land use;
- Facility and surrounding area zoning;
- Location of closest residence;
- Location of closest school;
- Location of closest drainage or creek;
- DRP permits;
- DOGGR permits;
- SCAQMD Rules;
- County fire permits;
- Facility operational notes;
- Neighbor issues and complaint history; and
- All environmental issue area subjects identified in the Protocol.

Note that the Facility Checklist was updated from the one that was used in the first report to expand and clarify some items and to incorporate comments received. Also, as part of the site inspection, some items are included in the Facility Checklists that are not specifically addressed as part of a regulatory requirement but that constitute "good engineering practice", such as the use of berms at well sites or leak detection and alarm systems on pipelines. Note that the purpose of the checklists and the site visits is to gather information for future decision making. The Facility Checklist is included as Appendix C.

Well Checklist

The Well Checklist covers the permit and compliance issues applicable to an individual or group of wells. General data collected and annotated on the Well Checklist includes:

- Well identification;
- Well field;
- Well lease;
- DOGGR well status;
- Well status at time of field visit;
- Required signage;
- Fencing;
- Berms;
- SCAQMD Rule 1173;
- DOGGR critical wells and associated requirements; and
- Idle wells, idle well testing, and idle well history.

Note that the Well Checklist was updated from the one that was used in the first report to expand and clarify some items and to incorporate comments. The Well Checklist is included as Appendix D.

2.5 Public Health Screening Assessment

As noted in the first report for this Project, one component to be addressed as part of this effort is the assessment of the potential public health and safety risks associated with existing oil and gas facilities. Per the March 2016 Board motion, oil and gas facilities should "be prioritized for further action based on highest health or environmental risks" and "consideration should be given to the age and history of the facility, the proximity of nearby communities (specifically disadvantaged communities) or sensitive populations, and whether the facility is operating using controversial well stimulation techniques (such as hydraulic fracking)." For this report, the environmental, public health and safety issues have been included in the Facility and Well Checklists and then compiled into a separate checklist summary, which was used to screen facilities for additional assessment or review. The public health, safety and environmental risks are based primarily on a well or facility's proximity to populations; the presence of high hydrogen sulfide gas in production; the operating pressures of subject wells and equipment and the frequency of 24-hour per day drilling activities (both historical and projected). Environmental risks are based on a well or facility's proximity to creeks and waterbodies and on the presence of berms and free-flowing wells. The findings made as a result of conducting the public health screening assessment are included in Section 3.0 for each oil and gas facility visited for this Project to date. The Public Health Screening Checklists are included in Appendix E.

3.0 Facilities Inspected

Two facilities were reviewed in the first report:

- Matrix Sansinena.
- Termo Aliso Canyon and Oat Mountain.

The second report included review of the following additional facilities, owned by six operators, assessed as part of the Project through January 2017:

- Termo – Oak Canyon Field.
- Linn Energy – Brea Olinda Field.
- California Resources Company – Del Valle, Newhall-Potrero, Honor Rancho, Wayside Canyon, Ramona, and Ramona North Fields.
- Crimson Resource Management Company – Hasley Canyon, Castaic Hills, and Aliso Canyon Fields.
- Brea Canon Oil Company – Torrance Field.
- Breitburn Operating L.P. – Rosecrans, and Rosecrans South Fields.

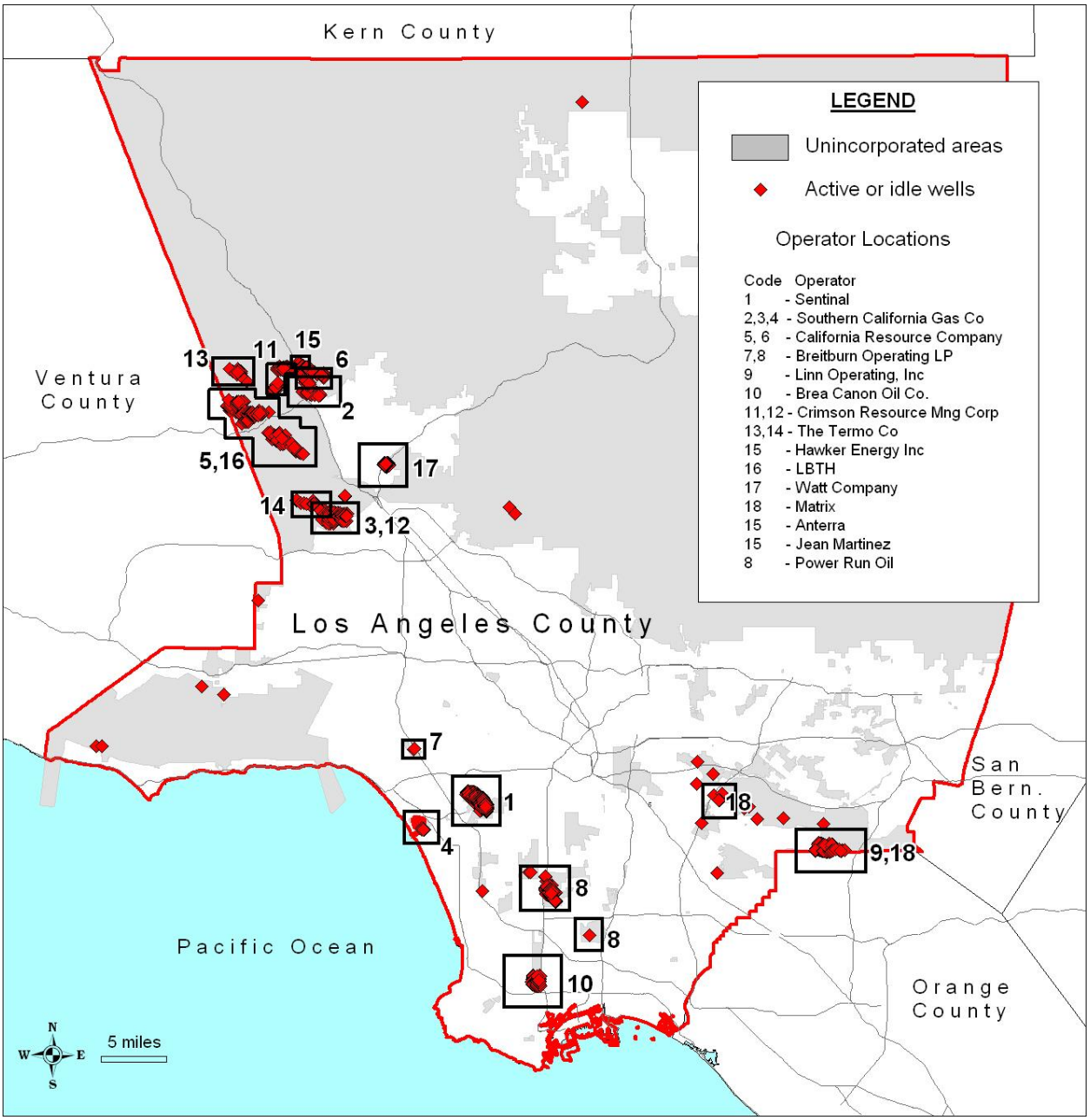
This third and final report includes seven operations as visited as part of the Project through July 2017.

- Watt Companies – Newhall and Placerita Fields.
- Matrix Whittier – Whittier Field.
- Breitburn Sawtelle and Dominguez – Sawtelle and Dominquez Fields.
- LBTH – Dell Valle and Ramona Fields.
- Anterra – Tapia Field.

- Jean Martinez – Tapia Field.
- Power Run Oil – Rosecrans South and Howard Townsite Fields.

The following sections include findings from the Strike Team field visits and facility review through July 2017. See Figure 1 for a County-wide map of the oil field locations.

Figure 1 – Oil Field Locations



3.1 Matrix Sansinena

The Matrix Sansinena facility was inspected on August 9, 2016. Staff from County DRP, DPH, DPW, and Fire along with the County consultant attended the inspection; a list of attendees is included in Appendix F. The Matrix Sansinena site was selected as one of the initial sites for review due to its proximity to residences and its operational potential for affecting the surrounding community.

Facility Description

The Matrix Sansinena facility consists of 13 electrically powered wells and a three-phase emulsion pipeline to an offsite production area known as Site 8 located at 2342 Rancho Drive in the City of La Habra Heights. The facility does not contain any storage tanks, flares, or any processing equipment. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4. The wells have been idle for approximately one year, and the facility is not currently operational. The facility recently changed ownership from CRC to Matrix, and the new company is preparing to bring the facility back into production. The tables below provide summaries of key information for the Matrix Sansinena facility. Figure 2 provides an aerial view of the facility.

Matrix Sansinena Well Overview	
Operator	Matrix Oil
Current Zoning	A-1-5 Light Agricultural
Number of Wells	13 (DOGGR)
Fields	Sansinena
Leases	Sansinena
DOGGR District (s)	1
DOGGR Operator Code	O2475
DRP Permit	ZEC 965 issued 1952

Matrix Sansinena Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-1-5	Agricultural	Commercial nursery
South	R-A-2000	Residential, SCE	SCE facility
East	A-1-5	SCE	SCE facility
West	RA	Residential	City of La Habra Heights
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Well Status**
Closest Residence	181	Well	Site is inactive
Closest School	750	Well	Site is inactive
Closest Drainage	300	Well	Site is inactive

Figure 2 – Matrix Sansinena Site 9 Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on August 9, 2016; items of note are listed in the table below:

Matrix Sansinena Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Setbacks	SB.2	Wells are within setback distance identified by DOGGR for critical wells.	DOGGR has not made a determination on critical wells status designation. All wells currently idle. Critical wells require additional safety measures and equipment, recommend DOGGR review prior to facility re-start.
Security	S.3	Outer fence does not have DOGGR required 3 barbed wires at top of fence.	There are 3 barbed wires at the top of the inner fence, but the inner fence does not completely encircle facility. Access to the facility is not limited by DOGGR compliant fencing. Recommend operator review of facility fencing prior to facility re-start.

Matrix Sansinena Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Secondary Containment	SC.3	Berms and storm water sumps may not be sufficient to contain large release.	Not all areas are protected by berms and containment. Large release unlikely because facility does not have tanks or pressure vessels, wells have individual cellars. Recommend operator review of berms prior to facility re-start.
Emergency Response Plan	ER.2	Emergency Response Plan (ERP)	This review item, incomplete from the first report, has been submitted and reviewed. No further action is required.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

Additional follow-up will be necessary once the facility becomes operational and once the required plans are updated, submitted and reviewed.

As mentioned above, this facility is a production facility that transports all products to a separate facility for separation, processing and transportation to refineries. The processing facilities, although integral to the overall production of oil and gas from the Matrix Sansinena facility, are located and regulated in the City of La Habra Heights outside of the County's unincorporated area. A complete evaluation of the overall operation, once the Sansinena facility restarts production, should include a review of the processing and transportation facilities located within the City of La Habra Heights.

Checklists, along with other data for the Matrix Sansinena facility, are included in Appendix F. The table below provides a summary of County land use permits.

Matrix Sansinena Land Use Permit(s) Summary			
County DRP Permit	**Number of Conditions**	**Number in Compliance**	**Compliance Notes**
ZEC 965	5	5	Permit condition #1 includes Title 22 requirements by reference. Permit condition #2 not required per 1/20/53 Office of County Engineer and Surveyor letter. Permit condition #5 not applicable as facility does not contain permit specific infrastructure.
Title 22	14	14	No issues noted.

*DRP land use permit conditions total for environmental or safety permit conditions, non-administrative.

Other Agency Historical Issues and Findings

Information from other regulatory agencies as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit are summarized in this section. Research on the SCAQMD web site for Matrix Sansinena, Facility ID 182930, did not result in any Notice of Violation (NOV) or Notice to Comply (NTC) documentation for the previous 10-year time period.

Matrix Sansinena Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Sansinena Facility ID 182930	None	-
DOGGR	Sansinena	None received	-

Health Screen Summary

Matrix operates 13 wells located at this site within the jurisdiction of the County. The processing facility is located within the City of La Habra Heights. Of the high priority public health risk items, the facilities rank as a high public health risk for one of the four items. This particular item is related to the facilities' proximity to sensitive receptors for the wells, where wells are located less than 100 feet from nursery employee areas and 180 feet from homes. For the remaining areas, including high pressures, hydrogen sulfide and historical drilling activities, public health risk levels are low. Spill risks are low as no pipelines or wells are located immediately adjacent to waterways, and the site area is bermed (although some berms require review as per findings table above). The Public Health Screening Checklist is included in Appendix F.

Photographs

Photographs are included on the following pages of this section.

Matrix Sansinena – Fencing and Landscape Screening

Matrix Sansinena – Well Pad Area and Adjacent Residential Use

Matrix Sansinena – Idle Wells

Matrix Sansinena – Wells

Matrix Sansinena – Well 9A 12

Matrix Sansinena – Well Pad Area

3.2 Termo Aliso Canyon and Oat Mountain

The Termo Aliso Canyon and Oat Mountain facilities were inspected on August 16, 2016. Staff from County DRP, DPW, and Fire along with MRS attended the inspection; a list of attendees is included in Appendix G. The Termo Aliso Canyon and Oat Mountain facilities were selected as part of the first report due to the proximity of the facilities to the Gas Company's Aliso Canyon Gas Storage Facility and the County's familiarity with the site.

Facility Description

The Termo Aliso Canyon and Oat Mountain facilities consist of 24 total oil wells, two tank farm/processing locations, and associated pipelines; pipelines include oil, gas and injection lines and range in diameter from two to three inches. The pipelines transport the well production to one of the two tank farm facilities where the oil and water are separated with the use of various tanks and heater treater vessels. The dehydrated oil is stored in stock tanks prior to shipping to market by tanker truck. The produced water is stored in tanks and is then either re-injected back into the producing formation via a water injection well or transported by pipeline to the adjacent Southern California Gas Company facility. The produced gas is dehydrated by gas scrubbers and transported via an existing pipeline to the Southern California Gas Company facility. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below provide summaries of key information for the Termo Aliso Canyon and Oat Mountain facilities. Figure 3 provides an aerial view of the facilities.

Termo Aliso Canyon and Oat Mountain Overview	
Operator	The Termo Company
Current Zoning	A-2 Heavy Agricultural
Number of Wells	24 (DOGGR)
Fields	Oak Mountain Aliso Canyon
Leases	Del Aliso Del Aliso 1 Gardett Oat Mountain Orcutt Roosa
DOGGR District (s)	2
DOGGR Operator Code	T1200
DRP Permit	RPP 200602106 issued 2006

Termo Aliso Canyon and Oat Mountain Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-2	Oil & Gas, Open Space	Telecommunication towers along ridge lines
South	A-2	Oil & Gas, Open Space	
East	A-2	Oil & Gas, Open	

Termo Aliso Canyon and Oat Mountain Adjacent Land Use Overview			
		Space	
West	A-2	Oil & Gas, Open Space	
Sensitive Land Uses			
	Distance (feet)	**Notes**	
Closest Residence	6,336		
Closest School	8,741	Porter Ranch Community School	
Closest Drainage	Topography along ridgeline with multiple drainages		

Figure 3 – Termo Aliso Canyon and Oat Mountain Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on August 16, 2016; items of note are listed in the table below:

Termo Aliso Canyon and Oat Mountain Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	SG.2	A vessel at well pad site should be labeled	Recommend that the gas separation vessel at Oat Mountain Del Aliso Well 1-4 pad site be appropriately labeled.
Bonding	B.1 thru B.3	Bonding information	This review item, incomplete from the first report has been submitted and reviewed, no further action is required.
Secondary Containment	SC.4	Dikes/berms	Maintenance on existing and new installation of berms for all well cellar areas was underway at the date of the site inspection. No further action is recommended.
Fire	F.5	Flow tests for fire hydrants	This review item, incomplete from the first report has been submitted and reviewed, no further action is required.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there is a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

Checklists, along with other data for the Termo facilities, are included in Appendix G. County DRP permits for the Termo wells are listed in the table below.

Termo Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
RPP	2006	200602106	2826017040	1	3

Other Agency Historical Issues and Findings

Information from other regulatory agencies as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Termo Aliso Canyon and Oat Mountain Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Aliso Canyon, Facility ID 83508	5 NOVs	Corrected, in compliance
SCAQMD	Oat Mountain, Facility ID 97081	6 NOVs and 5 NTCs	Corrected, in compliance
DOGGR	Oat Mountain	Deficiency letter, 4 items	Pending

Health Screen Summary

Termo operates 24 wells located at these sites within the jurisdiction of the County. The gas processing facility is located at the adjacent Gas Company facility. Oil is stored and shipped by truck. There are only onsite oil pipelines. Of the high priority public health risk items, the facilities rank as a low public health risk for all of the items. This is due to the remoteness of facilities to sensitive receptors for the wells and the absence of high pressures, hydrogen sulfide and the type of drilling activities at the sites. Spill risks are low as wells are not free flowing, no wells are located immediately adjacent to waterways, and the tank site areas are bermed. The Public Health Screening Checklist is included in Appendix G.

Photographs

Photographs are included on the following pages of this section.

Termo Facilities – Main Gate (Southern California Gas Company)

Termo Aliso Canyon – Well, Pump Enclosure, and Well Cellar Secondary Containment

Termo Aliso Canyon – Process Treatment Vessel

Termo Aliso Canyon – Tank Farm

Termo Aliso Canyon – Tank Farm and Loading Rack

Termo Oat Mountain – Well and Adjacent Land Use Telecommunications

Termo Oat Mountain – Process Treatment Vessels

Termo Oat Mountain – Tank Farm

3.3 Termo Oak Canyon

The Termo Oak Canyon facilities were inspected on December 6, 2016. Staff from County DRP, DPW, and DPH along with the SCAQMD and MRS attended the inspection; a list of attendees is included in Appendix H.

Facility Description

The Termo Oak Canyon facilities consist of 23 total oil wells, a gas cogeneration facility, a tank farm, a waste water facility, and associated pipelines; pipelines include oil, gas and injection lines and range in diameter from two to three inches. The gas cogeneration facility and tank farm are sited in different locations. The pipelines transport the well production to the tank farm facility where the oil and water are separated, some oil/water separation occurs at well heads. The dehydrated oil is stored in stock tanks prior to shipping to market by tanker truck. The produced water is stored in tanks, transferred to the waste water facility, and then re-injected back into the producing formation via a water injection well for water flood enhanced recovery. The produced gas is dehydrated by gas scrubbers and used to fuel the cogeneration system. The facility does not have a flare. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below provide summaries of key information for the Termo Oak Canyon facilities. Figure 4 provides an aerial view of the facilities.

Termo Oak Canyon Overview	
Operator	The Termo Company
Current Zoning	A-2 Heavy Agricultural
Number of Wells	23 (DOGGR)
Fields	Oak Canyon
Leases	L.W. Gilmour Fee Rosann USL-F USL-G USL-H W. E. Stevens B
DOGGR District (s)	2
DOGGR Operator Code	T1200
DRP Permit	None

Termo Oak Canyon Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-2-2	Vacant	
South	A-2-2	Vacant	
East	A-2-2	Vacant, single family residential	
West	A-2-2	Vacant, single family residential	
Sensitive Land Uses			

Termo Oak Canyon Adjacent Land Use Overview			
	Distance (feet)	**Well/Tank**	**Well Status**
Closest Residence	1,895	Well Roseann 1	Idle
Closest School	12,182	Well Roseann 1	Idle
Closest Drainage	Field topography is hilly with multiple drainages.		

Figure 4 – Termo Oak Canyon Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on December 6, 2016; items of note are listed in the table below.

Termo Oak Canyon Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

Checklists, along with other data for the Termo facilities, are included in Appendix H. The only DRP permit found relating to the Termo facilities is related to the Oat Mountain wells. See Section 3.2.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Termo Oat Canyon Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Oak Canyon, Facility ID 83509	1 NTC	Corrected, in compliance
DOGGR	No documents received to date		

Health Screen Summary

Termo operates 23 wells located at this site within the jurisdiction of the County. The gas processing and cogeneration area is located onsite. Oil is stored and subsequently transported by truck, no oil or gas is transported by pipeline. The facilities rank as a low public health risk for all of the high priority public health risk items. This is due to the remoteness of the facilities to sensitive receptors and the absence of high pressures, absence of hydrogen sulfide and the type of historical drilling activities. Spill risks are low as wells are not free flowing, no wells are located immediately adjacent to waterways, and the tank site and well areas are bermed. The Public Health Screening Checklist is included in Appendix H.

Photographs

Photographs are included on the following pages of this section.

Termo Oak Canyon – Gas Plant/Cogeneration Facility

Termo Oak Canyon – Tank Battery

Termo Oak Canyon – Well

Termo Oak Canyon – Well

3.4 Linn Energy

The Linn Energy facilities were inspected on September 15, 2016. Staff from County DRP, DPW, DPH, Fire along with DOGGR staff and MRS attended the inspection; a list of attendees is included in Appendix I.

Facility Description

The Linn Energy Brea Olinda Field facility consists of 7 active wells, 58 idle wells, 10 plugged and abandoned wells, one emulsion storage tank, and a 3-phase emulsion pipeline to an offsite production facility. The offsite production facility, the Brea Canon Production Facility, is located in Orange County. The field does have a tank farm with a single, 2,400 bbl emulsion tank, in use with a level controller that controls a pump. Emulsion is pumped through a single pipeline to the processing facility offsite in Orange County (Brea Canon Production Facility). Produced gas is transferred via pipeline to the Stearns Gas Plant also located in Orange County. All active wells are powered by electricity and have fencing around the pump jack and dirt berm tertiary containment around the well cellars. The Field does not have any flares or any processing equipment located within the jurisdiction of Los Angeles County. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4. Linn Energy has an active plug and abandonment program with 10 plug and abandonment well operations completed and approximately 10 idle wells scheduled for plug and abandonment per year. The tables below provide summaries of key information for the Brea Olinda Field facility.

The tables below provide summaries of key information for the Linn Energy facility. Figure 5 provides an aerial view of the facilities.

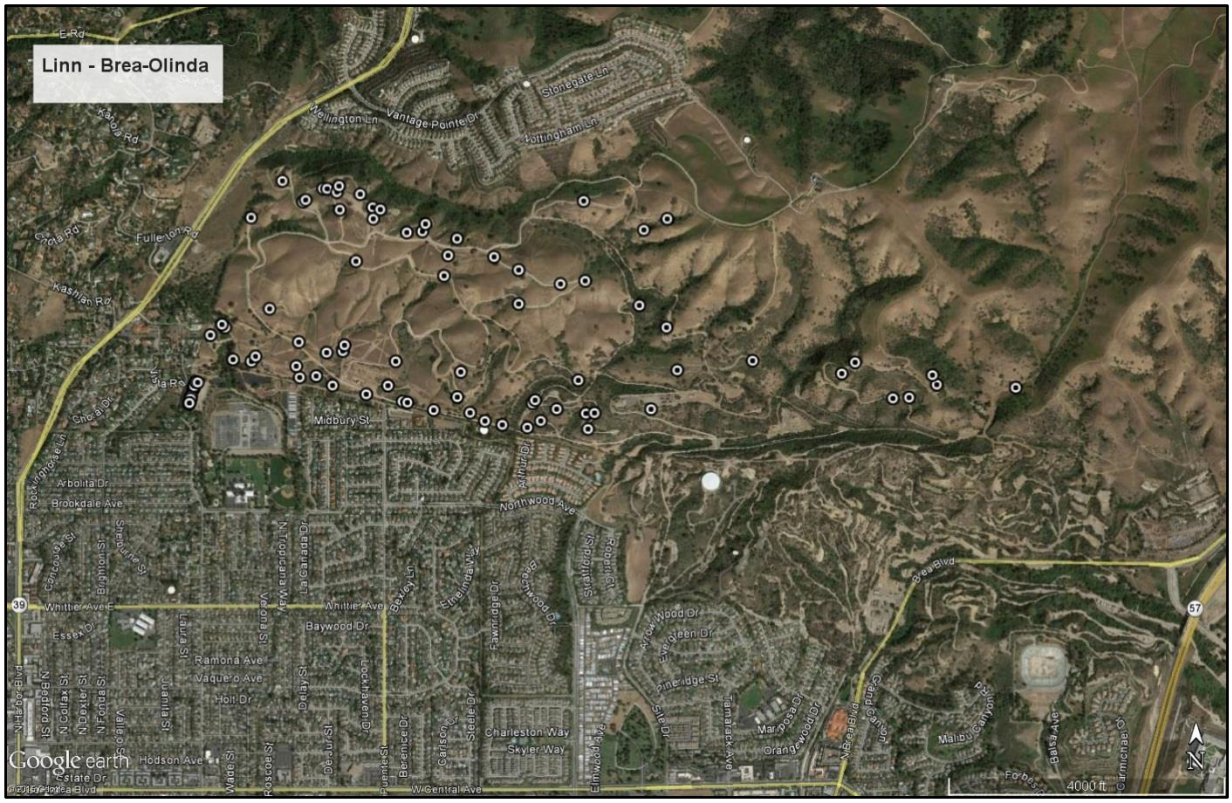
Linn Energy Overview	
Operator	Linn Energy
Current Zoning	A-1.5 Agricultural
Number of Wells	75 (DOGGR)
Fields	Brea Olinda
Leases	Grazide-Fisher Puente Puente-Orange Rowland Grazide Orange-Rowland Orange-Grazide Menchego-Fisher
DOGGR District (s)	1
DOGGR Operator Code	L2025
DRP Permit	ZEC 216 Issued 1949

Linn Energy Brea Olinda Field Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	RPD-1.5U O-S A-1.5 A-1-15000	Oil and Gas Open Space Residential	Unincorporated LA County

Linn Energy Brea Olinda Field Adjacent Land Use Overview			
	A-1-1		
South	A1 R1 A-1-5	Residential	Unincorporated Orange County (A1) City of Brea (R-1) Unincorporated LA County (A-1-5)
East	A-1-5 A-2-1	Oil and Gas Open Space	Unincorporated LA County
West	RA RA-SPO OS-C	Residential	City of La Habra Heights

Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Well Status**
Closest Residence	236	C-14	Active
	245	C-13	Active
	316	Tank	NA
Closest School	1,833	C-14	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

Figure 5 – Linn Energy Aerial



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on September 15, 2016; items of note are listed in the table below.

Linn Energy Brea Olinda Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Oil Field Waste	FW.4	Some scrap metal and concrete is located throughout the field; however, the material does not belong to operator.	Although the material does not belong to the current operator of the wells and does not produce a significant visibility or aesthetic impact, it is recommended that the operator work with the responsible party to remove the materials as feasible.
Fire Department Oversight	HM.1 F.2	The Orange County Fire Department oversees the Brea-Olinda Oil Field because the majority of the field is located in Orange County.	It is recommended that LA County Fire continue to coordinate with Orange County Fire via the existing AHJ (Authority Having Jurisdiction) Agreement on the oversight of the Brea-Olinda Oil Field.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod

Linn Energy Brea Olinda Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
			replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

As discussed above, with seven active producing wells, the oil field's production is transported to a separate facility located in Orange County for processing.

County DRP permits for the Linn Energy Brea wells are listed in the table below.

Linn Energy Brea Olinda Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
ZEC	1949	216	8269081001 8269081002	Not Noted	8

Checklists, along with other data for the Linn Energy facilities, are included in Appendix I.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Linn Brea Olinda Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Linn Brea Olinda, Facility ID 151415	1 NTC	Corrected, in compliance
DOGGR	No documents received to date		

Health Screen Summary

Linn Energy operates 75 wells from this site within the jurisdiction of the County. The processing facility is located within Orange County, with some emulsion tank storage in Los Angeles County. Of the high priority public health risk items, the facilities rank as a high public health risk for one of the four items. This particular item is related to the facilities' proximity to sensitive receptors for some well pads, where some wells are located less than 100 feet from a nursery employee area and less than 250 feet from homes. For the remaining areas, including high pressures, hydrogen sulfide and historical drilling activities, public health risk levels are low. Spill risks are considered to be medium as some wells and

pipelines are located immediately adjacent to waterways, yet none of the wells are free flowing. The Public Health Screening Checklist is included in Appendix I.

Photographs

Photographs are included on the following pages of this section.

Linn Energy Brea Olinda – Well

Linn Energy Brea Olinda – Well

Linn Energy Brea Olinda – Tank Farm

Linn Energy Brea Olinda – Nearby Homes

Linn Energy Brea Olinda – Abandoned Well Marker

Linn Energy Brea Olinda – Tank Farm

3.5 California Resources Company (CRC)

The CRC operates in six oil fields within unincorporated Los Angeles County: Del Valle, Newhall-Potrero, Honor Rancho, Wayside Canyon, Ramona, and North Ramona. These fields were divided into three groups (i.e., two fields per group), each group being inspected by the Strike Team on separate dates: October 18, 2016 (Newhall-Potrero), November 1, 2016 (Del Valle and Ramona), and December 6, 2016 (Honor Rancho and Wayside Canyon). Staff from County DRP, DPH, DPW, and Fire along with DOGGR and SCAQMD staff and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix J.

Facility Description

The CRC wells can be grouped into three main geographic areas with separate processing facilities consistent with the site inspection schedule noted above and as described below.

Newhall-Potrero Fields (Ferguson and Rancho San Francisco Wells)

These fields contain a total of 38 active and 9 idle wells, the Ferguson Tank Battery, the Ferguson Gas Plant, pipelines, and a truck loading rack. Produced oil is transported from the well heads to the Ferguson Tank Battery, where the water is removed and the oil transported off-site via tanker truck. Produced water is injected back into the reservoir with a water disposal injection well; the fields do not utilize water flood recovery methods. Produced gas is gathered at the Ferguson Gas Plant where it is processed and sold via pipeline to the Gas Company. The Ferguson Tank Battery and Gas Plant operate with a vapor recovery system that goes to a flare during upset conditions. The flare was operating on the Strike Team inspection day. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The operator informed staff that much of the property within the Newhall-Potrero Fields is used as temporary filming sets for movies, commercials, and television shows. Staff noted that structures and prepared scenes, as identified by the operator, are used for this purpose.

Del Valle and Ramona Fields (Barnes, N.L.F., Lincoln, Kern, Orduno, Langdon, and Ramona Wells)

These fields contain a total of 39 active wells and 24 inactive wells, the Kern Tank Farm, the Barnes Tank Farm, the N.L.F. Tank Farm, and truck loading racks at each tank farm. Produced oil is de-watered at each tank farm and is transported off-site via tanker truck. Produced water is re-injected back into the reservoir with a water disposal injection well; the fields do not utilize water flood recovery methods. Produced gas is transported by pipeline to the Santa Clara Gas Plant located in Ventura County; no gas treatment occurs on these CRC sites. All storage tanks and truck loading racks operate with a vapor recovery system tied to a vapor recovery compressor and the gas system. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The Los Angeles County Fire Del Valle Training Center is located on the same parcel, APN 3271003900, as some of the Del Valle wells.

Honor Rancho and Wayside Fields

The Honor Rancho and Wayside fields contain a total of 17 active and 8 idle wells, the Honor Ranch Tank Battery, the Wayside Tank Battery, a truck loading rack, and a flare. All produced oil and gas goes to the Honor Ranch tank facility, the Wayside Tank facility is not in service and contains two out-of-service tanks. Produced oil is de-watered on-site and transported via tanker truck; the loading rack has a vapor recovery system. All produced gas is flared except for some that is used as make-up gas for the vapor recovery system. Produced water is re-injected back into the reservoir with a water disposal injection well; the fields do not utilize water flood recovery methods. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

These wells and facilities are located on County-owned property that also houses the Pitchess Detention Center North, a Los Angeles County Sheriff Department medium-security jail.

The tables below provide summaries of key information for the CRC facilities. Figures 6 and 7 provide an aerial view of the facilities.

CRC Fields Well Overview	
Operator	California Resources Company
Number of Wells	135
Current Zoning	A-2 Heavy Agricultural (78) R-1 Single Family Residence (4) OS Open Space (1) SP Specific Plan (52)
Fields	Del Valle Newhall-Potrero Honor Rancho Wayside Canyon Ramona Ramona, North
Leases	Barnes Ferguson Honor Rancho 'A' (NCT-1) Honor Rancho 'A' (NCT-2) Kern Langdon Lincoln N. L. & F. North Ramona Orduno Rancho San Francisco Wayside Canyon Unit
DOGGR District (s)	2
DOGGR Operator Code	V1370
DRP Permit	RPP201000886 RPP201301090 RPP201200350

* Well number may not match well total due to multiple zoning or revised APNs.

CRC Newhall and Potrero Field Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	R-1 SP	Vacant	Some agricultural use.
South	SP O-S A-2	Vacant	
East	SP R-1	Vacant Elementary School	
West	SP	Vacant	Some agricultural use.
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	1,407	Ferguson 8	Active
	2,817	Ferguson Tank Farm	Active
	11,435	RSF Gas Plant	Active
Closest School	3,823	Ferguson 8	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

CRC Del Valle and Ramona Fields Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-2-2 SP	Vacant	
South	A-2-2 SP	Vacant	
East	M-1 SP A-2-2	Vacant	LA County Fire Del Valle Training Center on same parcel as some Del Valle wells.
West	A-2-2	Vacant and County of Ventura	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Well Status**
Closest Residence	3,472	Well Lincoln 20	Idle
	9,708	Well Kern 30	Active
Closest School	6,356	Well Lincoln 4	Active
	9,708	Well Kern 30	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

CRC Honor Rancho and Wayside Fields Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-2-5	Vacant	
South	A-2-2	Pitchess Detention Center	County Jail
East	A-2-5	Vacant	City of Santa Clarita east of Wayside Canyon

CRC Honor Rancho and Wayside Fields Adjacent Land Use Overview			
West	A-2-2	Vacant	I-5 Freeway
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Well Status**
Closest Residence	2,066	Wayside 58H	Active
	607 (Jail Dorm)	Honor Ranch 17	Active
Closest School	4,286	Wayside 58H	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

Figure 6 – California Resources Company Facilities Aerial

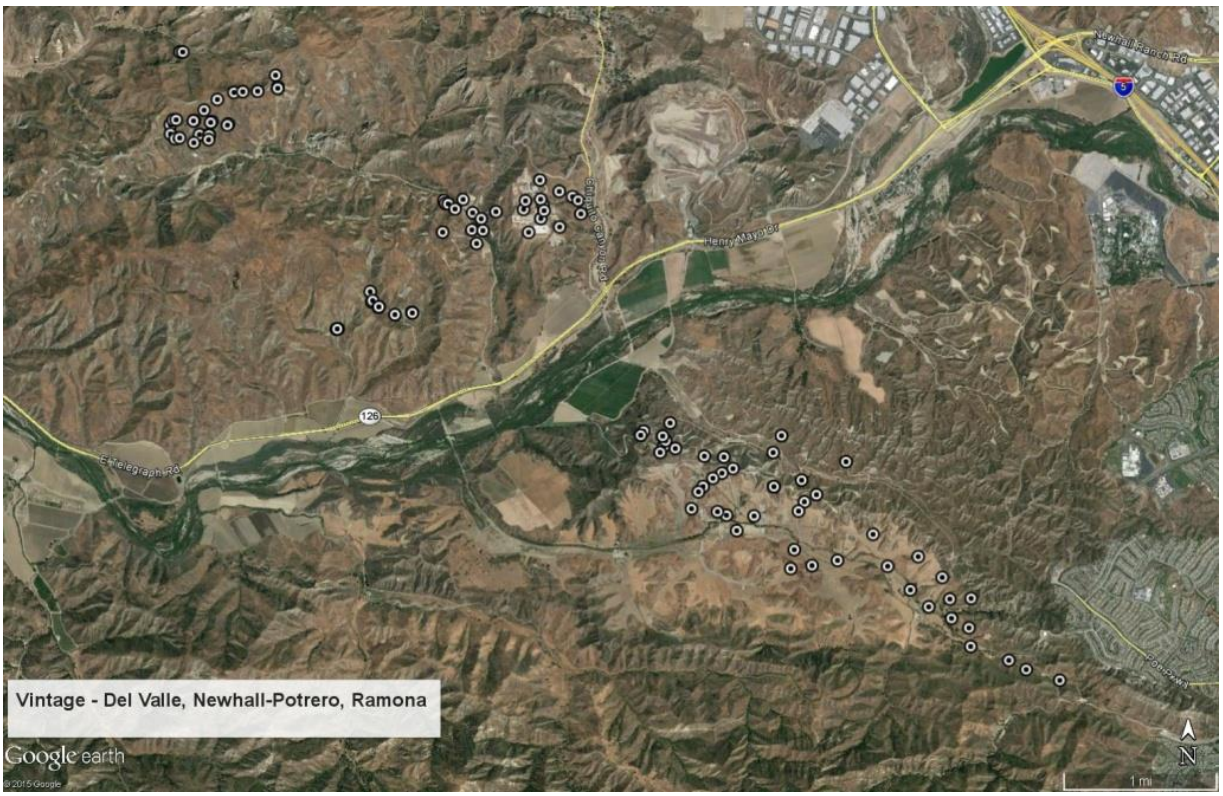


Figure 7 – California Resources Company Facilities Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on 10/18/2016, 11/01/2016, and 12/6/16; items of note are listed in the tables below.

CRC Newhall-Potrero Fields Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be

			addressed in a Community Health and Safety Plan.

CRC Del Valle and Ramona Fields Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proposer drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

CRC Honor Rancho and Wayside Fields Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proposer drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

Checklists, along with other data for the CRC fields, are included in Appendix J.

County DRP permits for the CRC wells are listed in the table below.

CRC Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
RPP	2010	201000886	2866004900 2866004905	4	13
RPP	2014	201301090	2866004900 2866004901 2866004905 2866004909	5	22
RPP	2012	201200350	2866004900 2866004905	4	14

Checklists, along with other data for the CRC facilities, are included in Appendix J.

Other Agency Historical Issues and Findings

Information from other regulatory agencies are derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, and those findings are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

CRC Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Rancho San Francisco, Facility ID 151899	3 NOVs and 4 NTCs	Corrected, in compliance
SCAQMD	Barnes, Facility ID 148895	1 NOV and 1 NTC	Corrected, in compliance
SCAQMD	NLF, Facility ID 148897	2 NOVs	Corrected, in compliance
SCAQMD	Honor Rancho/Wayside Canyon, Facility ID 148894	None	
SCAQMD	Lincoln Facility ID 148896	None	
SCAQMD	Kern Orduno Facility ID 164709	None	
SCAQMD	Langdon Facility ID 165538	None	
SCAQMD	Middle Orduno Facility ID 168998.	None	
DOGGR	Newhall/Potrero (RSF) Facilities	Full compliance letter 1/6/16	
DOGGR	Newhall/Potrero (RSF) Facilities	Inspection report 10/18/16	Pending
DOGGR	Del Valle/Romana Facilities	NOV, 2 items	Pending

Health Screen Summary

Newhall-Potrero Fields

CRC operates 47 wells located at these sites within the jurisdiction of the County. The gas processing is transported by pipeline to the Gas Company. Oil is stored and shipped by truck. The only oil pipelines are onsite, no oil is transported by pipeline. Of the high priority public health risk items, the facilities

rank as a low public health risk for all items. This is due to the remoteness of facilities and wells to residences and the temporary nature of activities associated with filming onsite. The other public health risk items present a low level of risk due to the absence of high pressures, absence of hydrogen sulfide and low level of historical drilling activities. Spill risks are low since wells are not free flowing, and, although some wells are located adjacent to waterways, those well areas and the tank site are appropriately bermed, ameliorating the spill risk. The Public Health Screening Checklist is included in Appendix J.

Del Valle and Ramona Fields

CRC has 84 wells located at these sites within the jurisdiction of the County. The gas processing is transported by pipeline to the Santa Clara Gas Plant in Ventura County. Oil is stored and shipped by truck. There are only onsite oil pipelines. Of the high priority public health risk items, the facilities rank as a moderate public health risk for one of the four items. This is due to some of the wells being located within the LACO Fire Department Del Valle Training Center in proximity (nearer than 100 feet) to buildings, although all wells are located a substantial distance from residences. The other high priority public health risk items present a low level of risk due to the absence of high pressures, absence of hydrogen sulfide and low level of historical drilling activities. Spill risks are low since wells are not free flowing, no wells are located immediately adjacent to waterways, and the tank site and well areas are bermed, which provides secondary containment in the event of a spill. The Public Health Screening Checklist is included in Appendix J.

Honor Rancho and Wayside Canyon Fields

CRC operates 25 wells located at these sites within the jurisdiction of the County. The gas is flared at the site. Oil is stored and then shipped by truck. The only oil pipelines are onsite. Of the high priority public health risk items, the facilities rank as a low public health risk for all four items. This is due to facilities and wells not being in proximity to residences, although some wells are located near the County jail buildings. The other public health risk issues present a low level of risk due to the absence of high pressures, absence of hydrogen sulfide and low level of historical drilling activities. Spill risks are low as wells are not free flowing, and, although some wells are located adjacent to waterways, well areas and the tank sites are bermed. The Public Health Screening Checklist is included in Appendix J.

Photographs

Photographs are included on the following pages of this section.

CRC Ferguson – Gas Plant

CRC Kern – Well #1

CRC Honor Rancho – Tank Battery

CRC Wayside Canyon – Out-of-Service Tank Battery

CRC Orduno – Well

CRC NLF – Tank Battery

3.6 Crimson Resource Management (CRM)

CRM operates in three oil fields in Los Angeles County, Aliso Canyon, Castaic Hills, and Hasley Canyon. These fields were inspected by the Strike Team on November 15, 2016. Staff from County DRP, DPH, DPW, and Fire along DOGGR and SCAQMD staff and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix K.

Facility Description

The CRM wells can be grouped into three main field areas with separate processing facilities as described below.

Aliso Canyon (Standard-Sesnon Wells)

This field contains a total of 4 active, 8 idle wells, and associated pipelines. All well production is transported from the well heads to facilities operated by the Gas Company. The produced oil is processed at a Gas Company Tank Farm at the Gas Company facilities, and produced water is re-injected back into the reservoir in a Gas Company injection well. Wells are powered by the produced gas in small, less than 50 horse power, pump engines that utilize propane for backup fuel. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

Castaic Hills Field (CHU and Rynne-Fisher Wells)

This field contains 12 active and 12 idle wells, two tank farms, and associated pipelines. All produced oil goes to the Turney Tank Farm, where the water is removed and the oil is transported by tanker truck. Produced water is transported from the Turney Tank Farm to the Golden Tank Farm, where the water is removed by tanker truck and appropriately disposed. All produced gas is burned on-site at the CHU 144-36 well pump engine. Production volumes are low, averaging 35 barrels of oil per day and 40 barrels of water per day. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

Hasley Canyon Field (Burns Crist, Mabel E. Strawn, Mabel Strawn, McGillevrae, and Saad Wells)

This field contains 14 active and 2 idle wells, several tank farms and associated pipelines tying most of the facilities together. The Mable E. Strawn and Mabel Strawn wells oil production is de-watered at the Mabel Strawn Tank farm and transported by tanker truck. Oil production from the McGillevrae wells is processed at the McGillevrae Tank Farm and transported by tanker truck. Burns Crist and Saad wells oil production is taken to the associated Burns Crist and Saad Tank Farms, respectively; the produced oil is then transferred by tanker truck. All Hasley Canyon field produced water is transferred from the various tank farms to the McGillevrae Tank Farm, where it is transported off-site by tanker truck. All produced gas is burned at the Mable Strawn, Burns Crist, and Saad Tank Farms in small heaters to warm and improve the viscosity of the oil for transfer and loading into tanker trucks. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below provide summaries of key information for the Crimson field facilities.

Crimson Well Overview	
Operator	Crimson Resource Management Corp.
Number of Wells	52
Current Zoning on Subject APNs and Number of Wells	A-2 Heavy Agricultural (43) M-1.5 Restricted Heavy Manufacturing (2) R-1 Single Family Residence (5) RPD Residential Planned Development (2)
Fields	Hasley Canyon Castaic Hills Aliso Canyon
Leases	Burns Crist CHU Mabel E. Strawn Mabel Strawn McGillevrae Rynne-Fisher Sadd Standard-Sesnon 1
DOGGR District (s)	2
DOGGR Operator Code	C9035

Crimson Aliso Canyon Field Adjacent Land Use Overview				
	Zoning	**Land Use**	**Notes**	
North	A-2-2	Vacant	Field in and adjacent to Gas Company wells and infrastructure.	
South	A-2-2	Vacant		
East	A-2-2	Vacant		
West	A-2-2	Vacant		
Sensitive Land Uses				
	Distance (feet)	**Well/Tank**	**Status**	
Closest Residence	6,240	Well Standard-Sesnon 1- 46	Active	
Closest School	8,903	Well Standard-Sesnon 1- 46	Active	
Closest Drainage	Field topography is hilly with multiple drainages.			

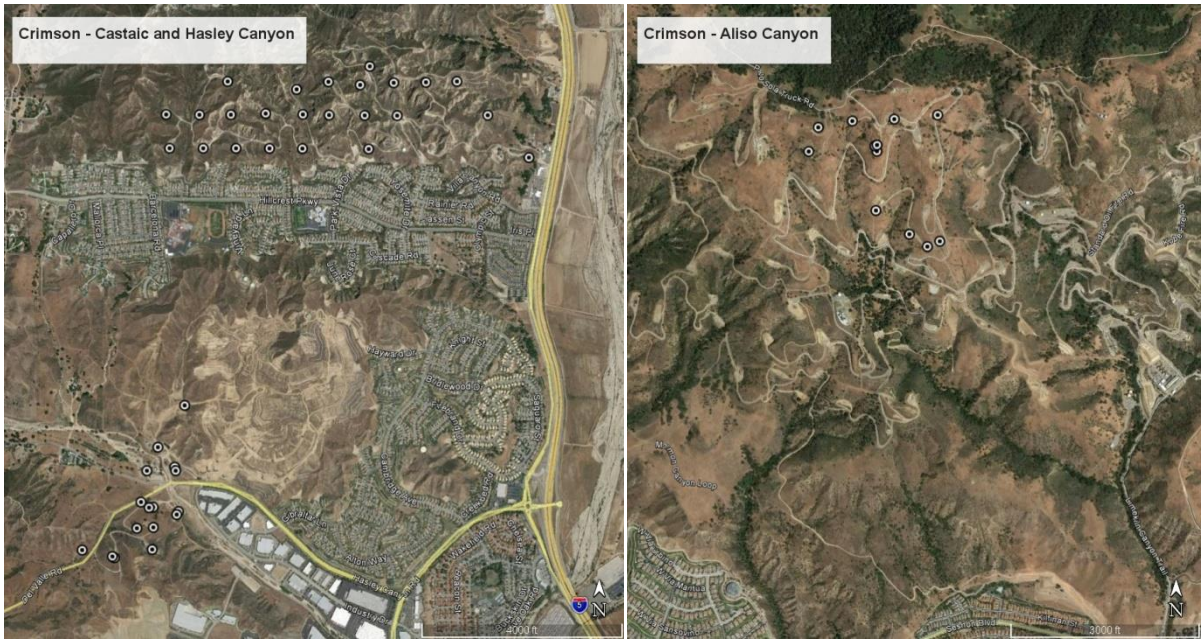
Crimson Castaic Hills Field Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	RPD-1-2U A-2-2 R-1-7500 RPD-500-1.9U	Vacant Single family residential	
South	M-1 R—1-5000	Industrial Residential	
East	M-1 R-1 RPD 180	Industrial Residential	
West	A-2-2	Vacant	
Sensitive Land Uses			

Crimson Castaic Hills Field Adjacent Land Use Overview			
	Distance	**Well/Tank**	**Well Status**
Closest Residence	315	Well CHU 144-36	Active
	778	Turney Tank Farm	Active
Closest School	1,109	Well CHU 54-35	Inactive water injection
	3,647	Turney Tank Farm	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

Crimson Hasley Canyon Field Adjacent Land Use Overview			
	Zoning	**Land Use**	**Notes**
North	A-2-2	Vacant	
South	MPD-DP R-1	Vacant	
East	A-2-2 RPD-5000-2.8U M-1.5	Single family residential and warehouses	
West	A-2-2	Single family residential	
Sensitive Land Uses			
	Distance	**Well/Tank**	**Well Status**
Closest Residence	1,321	Well Burns Crist 6	Active
Closest School	3,647	Well Burns Crist 7	Active
Closest Drainage	Field topography is hilly with multiple drainages.		

Figures 8 provides an aerial overview of the facilities.

Figure 8 – Crimson Resource Management Aerial Views



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on November 15, 2016; items of note are listed in the tables below.

Crimson Aliso Canyon Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proper drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Secondary Containment	SC	Two wells contained fluid levels requiring removal per DOGGR inspector, DOGGR 1777(c)(3).	It is recommended that the fluid be removed per DOGGR regulations. It is acknowledged that during rainy season fluid levels in cellars can

Crimson Aliso Canyon Field Findings			
			accumulate after rain events and between vacuum truck maintenance events.

Crimson Castaic Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Oil Field Waste	FW.4	Some scrap metal and concrete, material does not belong to operator.	It is recommended that metal, concrete, trash, and other debris be removed from tank farm and wells sites and disposed of properly.
Fire Fuel Management	F.3	Tank farms have significant amount of weeds/vegetation in and around the facilities.	Weed abatement recommended for safety and compliance with Fire regulations.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proposer drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Safety/Security	NA	Well 144-36 has fencing around the well cellar, however, there is no fencing or enclosure around the well pump jack/well pump motor. The well pump motor is an I.C. engine with large fly wheel and belt.	It is recommended that a fence or enclosure around the pump unit be installed due to large moving parts that may represent a safety hazard should a member of the public gain access to area. Recommend fencing be placed around entire pump area.

Crimson Hasley Canyon Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Oil Field Waste	FW.4	Some scrap metal and concrete, material does not belong to operator.	It is recommended that metal, concrete, trash, and other debris be removed from tank farm and wells sites and disposed of properly.
Security	S.2	Saad and Burns Crist Tank Farms fencing not complete or damaged, access by public is possible.	It is recommended that fencing be repaired to prevent access by the public per DOGGR requirements.
Security	S.2	Loading rack at Saad Tank Farm hose lock was not locked.	It is recommended that the loading rack system be locked when not in use and that the loading rack procedure signs should include lock instructions.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	It is recommended that well work requirements be documented in a well work procedure and should include: 1) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 2) requirements for proposer drilling mud disposal and storage; 3) limits on time-of-day deliveries to well sites; and 4) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

The County land use permit research did not identify any permits associated with the Crimson wells or oil and gas operations.

Checklists, along with other data for the Crimson facilities, are included in Appendix K.

Other Agency Historical Issues and Findings

Information from other regulatory agencies as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit are summarized in the table below. Notice of Violation (NOV), Notice to Comply (NTC), and SCAQMD data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Crimson Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Pending determination of correct Facility ID numbers	Pending	Corrected, in compliance
DOGGR	Aliso Canyon	4/19/16 NOV, 8 items	Pending
DOGGR	Castaic	4/21/16 NOV, 20 items	Pending
DOGGR	Hasley Canyon	4/21/16 NOV, 14 items	Pending

Health Screen Summary

Aliso Canyon

Crimson operates 12 wells located at this site within the jurisdiction of the County. The processing facility is located at the adjacent Gas Company facility. Of the high priority public health risk items, the facilities rank as a low public health risk for all four items. This is due to the remoteness of facilities and lack of proximity of wells to sensitive receptors and the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are low since wells are not free flowing, no wells are located immediately adjacent to waterways, and the tank site areas are bermed, providing secondary containment in the event of an oil spill.

Castaic Hills

Crimson operates 24 wells located at this site within the jurisdiction of the County. Of the high priority public health risk items, the facilities rank as a moderate public health risk for one of the four items based on the findings of the site visit. This particular item is related to the facilities' proximity to sensitive receptors for some well pads, which in some cases wells are located 315 feet from residences. For the remaining three areas, including high pressures, hydrogen sulfide and historical drilling activities, public health risk levels are low. Spill risks are low since wells are not free flowing, no wells are located immediately adjacent to waterways, and the tank site areas are bermed.

Hasley Canyon

Crimson operates 16 wells located at this site within the jurisdiction of the County. Of the high priority public health risk items, the facilities rank as a low public health risk for all of the items. This is due to the remoteness of facilities to sensitive receptors. For the remaining three areas, including high pressures, hydrogen sulfide and historical drilling activities, public health risk levels are also considered to be low. Spill risks are considered medium as some wells are located in proximity to creeks, and not all well pads are bermed, yet wells are not free flowing, and the tank site areas are bermed.

Photographs

Photographs are included on the following pages of this section.

Crimson Aliso Canyon – Well

Southern California Gas Company – Gas Plant

Crimson – Golden Tank Farm Water Loading

Crimson – McGill Tank Farm

Crimson Castaic – Well

Crimson - Burns Christ Tank Farm

3.7 Brea Canon

Brea Canon operates in the Torrance Oil Field in Los Angeles County. The field and associated leases were inspected by the Strike Team on November 29, 2016. Staff from County DRP, DPH, DPW, and Fire along with SCAQMD and DOGGR staff and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix L (DOGGR staff did not sign the sign-in sheet).

Facility Description

The Brea Canon wells are grouped into four leases and two basic units, the Joughin Unit and the South Torrance Unit. Production from these wells is processed at two main locations outside the County of Los Angeles at 23903 South Normandie Avenue in the City of Los Angeles and 630 West Lomita Boulevard in the Harbor City neighborhood in the City of Los Angeles. These Brea Canon facilities include tank farms, a gas plant, a cogeneration unit, a truck loading rack, and associated pipelines. Produced oil from the Joughin wells is transferred by pipeline to the Normandie Avenue facility, where it is de-watered and transported off-site by pipeline. The South Torrance well oil production is processed at the Lomita Boulevard location, and the oil is transported by tanker truck. All gas production is transferred by field pipelines to the Normandie Avenue facility, where it is processed and used as fuel in cogeneration turbines to power the wells in the Torrance field. The gas plant does not have a flare. Produced water is re-injected into the reservoir in a water flood well enhancement process. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below provide summaries of key information for the Brea Canon wells and facilities.

Brea Canon Well Overview	
Operator	Brea Canon Oil Company
Number of Wells	66
Current Zoning on Subject APNs and Number of Wells	M-1 Light Manufacturing (1) M-2 Heavy Manufacturing (17) C-2 Neighborhood Business (2) C-3 Unlimited Commercial (9) R-1 Single Family Residence (24) R-3 Limited multiple residence (13)
Fields	Torrance
Leases	Joughin 1 Joughin 4 Joughin Unit South Torrance Unit
DOGGR District (s)	1
DOGGR Operator Code	B6100

Brea Canon Field Adjacent Land Use Overview		
	Zoning	**Land Use**
North	Multiple APNs and Zoning	The Torrance Oil Field wells are scattered throughout the southern portion of the West Carson Zoned District. Wells are adjacent to single family detached homes, mobile homes, industrial and commercial uses, and the 110 Freeway to the west.
South		
East		
West		

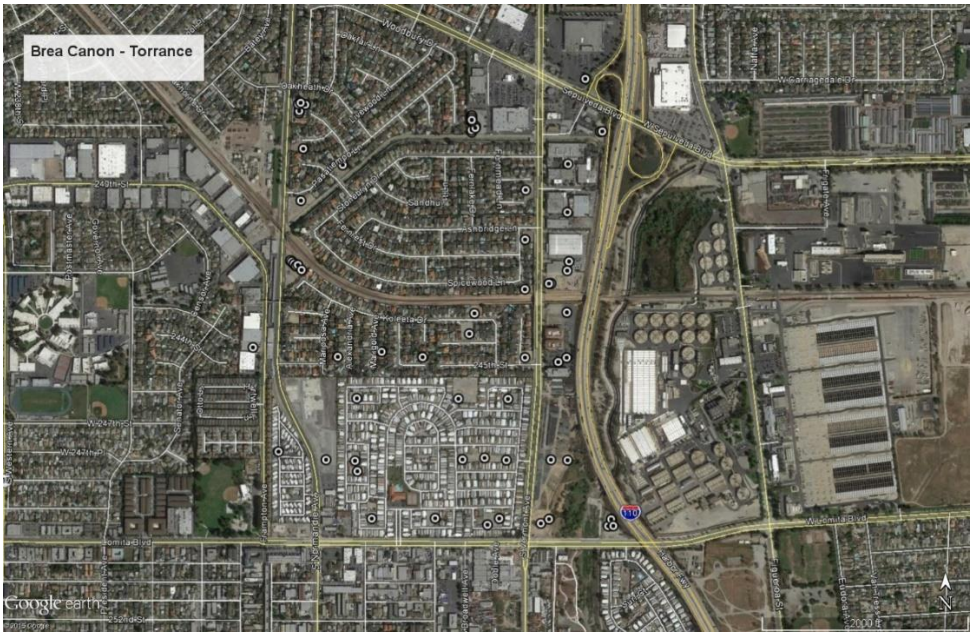
Brea Canon Field Adjacent Land Use Overview			
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	Various	There are 47 wells on properties adjacent to single family detached residences or mobile homes.	
Closest School	1,206	Well Joughin4 - 5	Active

The Brea Canon Torrance Field is located in an urban, built-out environment. The Facility Checklist provides for the review of wells located within certain distances to certain standards as identified by County DRP, the County Fire Code, and DOGGR. The table below summarizes the location criteria and number of wells that meet that critera.

Brea Canon Wells to Public Land Uses		
Checklist ID Code	**Criteria**	**Number of Wells**
SB.2	DOGGR definition of a critical well; 300' from occupied building or airport runaway (DOGGR 1720)	65
SB.3	DOGGR definition as 100' Critical well; 100 from street, highway, navigable/perennial water, public facility (DOGGR 1720)	35
SB.5	DOGGR definition as public nuisance well; Within 100 feet of outer boundary or public street (DOGGR 3600)	53
SB.6	Wells within 20' of a public highway? (Title 22.7)	1
SB.7	Wells within 100' of building? (Fire 3406.3.1.3)	50
SB.8	Wells within 300' of assembly or school? (Fire 3406.3.1.4)	1
SB.9	Wells within 75' of street or railway? (Fire 3406.3.1.2)	18

Figure 9 provides an aerial overview of the facilities.

Figure 9 Brea Canon



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on November 15, 2016; items of note are listed in the table below.

Brea Canon Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Brush Clearance	F.3	A few well sites do not have sufficient clearance from brush.	Review all well sites to ensure proper fire department clearance from brush.
Signage	WSG.3	Signs for Wells 7-F and 13-F are difficult to see based on location.	Signs are in compliance; however, it is recommended that the signs be moved for better visibility.
Security	S.3	Well W-3 block perimeter	It is recommended that the block wall be repaired

Brea Canon Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
		wall is damaged.	pursuant to DOGGR regulations.
Secondary Containment	SC.4 SC.5	Some well locations have the potential for storm-water and/or emulsion spill runoff.	It is recommended that certain well site berm design and maintenance be reviewed and modified for better containment volumes. Wells noted for review include 4-E, 5-E, 6-E, 22-F, 11-D, and 12-F.
Signage	WSG.2	Signs for Well AC-31 does not have emergency contact information.	It is recommended that emergency contact information be added to the sign for compliance with DOGGR regulations.

County DRP permits for the Brea Canon wells are listed in the table below.

Brea Canon Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
ZEC	1964	7430	7409022037	7	6
ZEC	1965	7553	7409019014	15	1
ZEC	1966	8120	7409029011	Maximum of 20	7

Checklists, along with other data for the Brea Canon facilities, are included in Appendix L.

Other Agency Historical Issues and Findings

Information from other regulatory agencies as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Brea Canon Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Brea Canon, Facility ID 082512	None	
DOGGR	No documents received to date		
Harbor City	Brea Canon pipelines	Oil Spills from pipelines in December 2011, October 2005, March 2010, and June 2010.	To be determined.

Health Screen Summary

Brea Canon operates 66 wells at this site located within the jurisdiction of the County. The processing facilities are located adjacent to the County in the City of Los Angeles. Of the high priority public health risk items, the Brea Canon facilities rank as a high public health risk for one of the four items. This particular item is related to the facilities' proximity to sensitive receptors, where in some cases wells are located nearer than 50 feet to homes. For the remaining areas, including high pressures, hydrogen

sulfide and historical drilling activities, public health risk levels are considered low. Spill risks are high as pipelines are located immediately adjacent to waterways and, although annual pressure tests are conducted on some portions of the pipeline system, there are no means of detection or alarms in the event of a leak. The Public Health Screening Checklist is included in Appendix L.

Photographs

Photographs are included on the following pages of this section.

Brea Canon – Well and Adjacent Homes

Brea Canon – Tanks

Brea Canon – Well

Brea Canon – Site 9

Brea Canon – Well in Mobile Home Park

Brea Canon – Pipeline

3.8 Breitburn Energy

Breitburn Energy operates the Rosecrans and Rosecrans South oil fields in Los Angeles County. The fields and associated leases were inspected by the Strike Team on December 13, 2016. Staff from County DRP, DPH, DPW, and Fire and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix M.

Facility Description

Breitburn Energy operates 47 active and 17 idle wells located in the Rosecrans and Rosecrans South fields. The primary processing facility for the Breitburn Rosecrans and Rosecrans South field wells is the Rosecrans LACT, located at 130 Rosecrans Avenue in the City of Gardena. The Rosecrans LACT facility processes produced oil and produced water from the Rosecrans, Rosecrans South, and seven other leases in the area. The produced water is re-injected into the reservoir in a water flood well enhancement process. Produced gas is processed at a Gas Plant located at 13601 South Broadway, Los Angeles. Other Breitburn facilities include the O'Dea Tank Farm, the Callendar Tank Farm, the Crawford Tank Farm and the Riverside Tank Farm. The produced water is pumped to the O'Dea Tank Farm prior to re-injection. The Crawford Tank Farm contains several out-of-service (OOS) tanks. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

Ten wells are within parcels directly adjacent to residential lots, and four wells are within parcels located directly across a street buffer from a residential lot.

The tables below summarize key information for the Breitburn Energy facilities. Figure 10 provides an aerial view of the facilities.

Breitburn Well Overview	
Operator	Breitburn Operating L.P.
Number of Wells	64
Current Zoning on Subject APNs and Number of Wells	R-1 Single Family Residence (3) M-1-IP Light Manufacturing (6) M-1.5-IP Restrictive Heavy Manufacturing (16) M-2-IP Heavy Manufacturing (38) B-1-IP Buffer Zone (1)
Fields	Rosecrans Rosecrans, South
Leases	Rosecrans Rosecrans A
DOGGR District (s)	1
DOGGR Operator Code	B6131

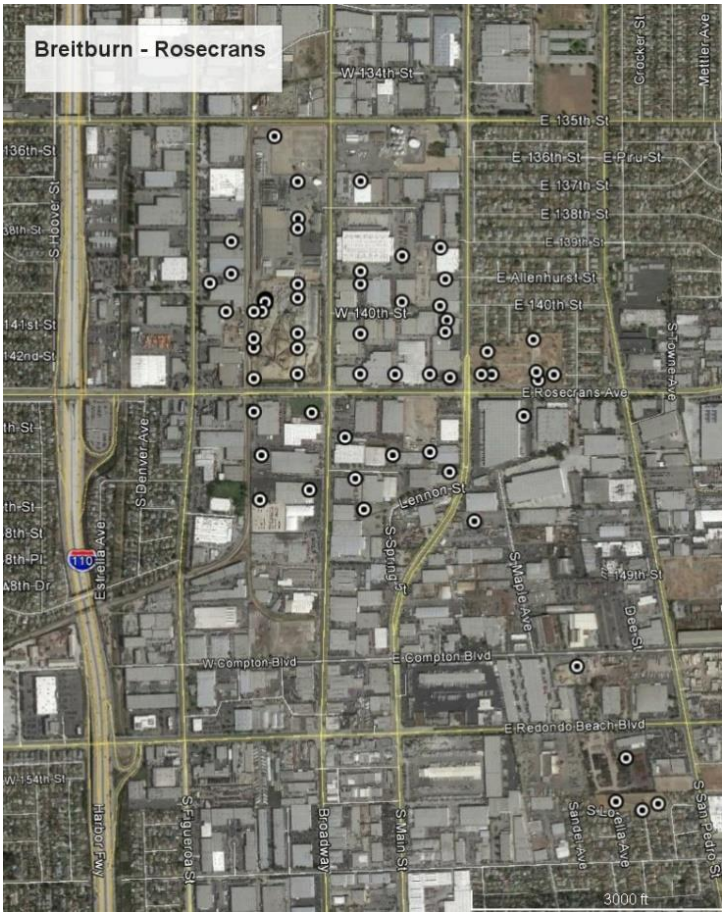
Breitburn Energy Field Adjacent Land Use Overview		
	Zoning	**Land Use**
North	Multiple APNs and Zoning	The wells are scattered throughout the southern portion of the Athens Zoned District and the northwestern portion of the Victoria Zoned District. These wells are adjacent to single family detached homes, light to heavy industrial uses, and
South		
East		
West		

Breitburn Energy Field Adjacent Land Use Overview			
		interwoven by public streets.	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	43	Well Riverside 1	Active, ICE powered well pump
	1,109	Rosecrans LACT Tank Farm	Active
Closest School	926	Well Padelford 2	Idle
	2,425	Rosecrans LACT Tank Farm	Active

The Breitburn Rosecrans and Rosecrans South fields are located in an urban, built-out environment. The Facility Checklist provides for review of wells located within certain distances to certain standards as identified by County DRP, the County Fire Code, and DOGGR. The table below summerizes the location criteria and number of wells that meet the critera.

Breitburn Energy Wells to Public Land Uses		
Checklist ID Code	**Criteria**	**Number of Wells**
SB.2	DOGGR definition of a critical well; 300' from occupied building or airport runaway (DOGGR 1720)	61
SB.3	DOGGR definition as 100' Critical well; 100 from street, highway, navigable/perennial water, public facility (DOGGR 1720)	11
SB.5	DOGGR definition as public nuisance well; Within 100 feet of outer boundary or public street (DOGGR 3600)	57
SB.6	Wells within 20' of a public highway? (Title 22.7)	0
SB.7	Wells within 100' of building? (Fire 3406.3.1.3)	42
SB.8	Wells within 300' of assembly or school? (Fire 3406.3.1.4)	0
SB.9	Wells within 75' of street or railway? (Fire 3406.3.1.2)	8

Figure 10 – Breitburn Facilities Aerials



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on December 13, 2016; items of note are listed in the table below.

Breitburn Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Signage	AQ.8	Perimeter fencing or well	Applicable perimeter or well fencing should have

Breitburn Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
		sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	the notification information as per SCAQMD requirements.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations
Noise	NA	Well Riverside 2 submersible pump motor emitted noise at 70 db adjacent to residential neighborhood.	A daytime noise level of 70 dBA may exceed the 60 dBA County Noise Ordinance threshold for nighttime and Sundays for a single-family residential land use at the adjacent homes. It is recommended that the operator assess the noise levels at the Riverside #2 well site and explore methods to mitigate the noise level. Noise impacts can lead to sleep disturbance and contribute to cardiovascular health effects, among other chronic health problems.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations

County DRP permits for the Breitburn wells are listed in the table below.

Breitburn Energy Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
PP	1989	37782	6132044033	6	1

Checklists, along with other data for the Breitburn facilities, are included in Appendix M.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website for the previous 10-year data period. DOGGR data is as supplied by DOGGR to the Strike Team as of February 2017.

Breitburn Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Callender Lease, Facility ID 150214	None	
SCAQMD	O'Dea Lease Facility/Flare, Facility ID 150209	None	
SCAQMD	Rosecrans LACT, Facility ID 150203	None	Corrected, in compliance

Breitburn Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Rosecrans Gas Plant, Facility ID 150208	None	Corrected, in compliance
SCAQMD	Crawford Lease, Facility ID 150205	1 NTC	Corrected, in compliance
SCAQMD	Riverside Lease, Facility ID 150212	1 NTC	Corrected, in compliance
SCAQMD	O'Dea GenSet, Facility ID 153236	1 NTC	Corrected, in compliance
SCAQMD	Rosecrans GenSet, Facility ID 150206	3 NTCs	Corrected, in compliance
SCAQMD	Rosecrans Wells, Facility ID 150197	None	
DOGGR	No documents received to date		

Health Screen Summary

Breitburn operates 64 wells at this site located within the Rosecrans and Rosecrans South fields. The processing facility is located within the jurisdiction of the County. Of the high priority public health risk items, the Breitburn facilities rank as a high public health risk for one of the four items. This particular item is related to the facilities' proximity to sensitive receptors; some wells are located less than 50 feet from homes. For the remaining areas, including high pressures, hydrogen sulfide and historical drilling activities, public health risk levels are considered low. Spill risks are considered low as no pipelines are located immediately adjacent to waterways, and there are minimal environmental receptors. The Public Health Screening Checklist is included in Appendix M.

Photographs

Photographs are included on the following pages of this section.

Breitburn Callender – Tank Battery

Breitburn Chandler – 4 Well-Submersible Pump

Breitburn Rosecrans – Loading Rack

Breitburn Rosecrans – Well (Industrial Land Use)

Breitburn Rosecrans – Well (Gravel Pit)

Breitburn – Well (Parking Lot)

3.9 Watt Companies

Watt Companies operates fields on the Albert and Phillips leases. The fields, the Newhall and Placerita fields, were inspected by the Strike Team on April 4, 2017. Staff from County DRP, DPW, and Fire, SCAQMD, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix N.

Facility Description

Watt Companies operates 26 active and 4 idle wells located in the Newhall and Placerita fields. All wells including the active wells are currently idle due to economic issues and electrical power to the field has been shut off; the field has been shut in since October 2015. All wells are operated by electric pumps. When the field is operating, processing occurs at the Phillip Tank Farm located near the center of the field. Oil is dewatered at the Phillips facility and loaded into trucks at a loading rack for transport offsite. All gas is burned in a SCAQMD permitted heater to heat water for water flood/steam injection well recovery. The facility does not have a flare. The tank farm contains four stock tanks, two wash tanks, a brine tank, and a fresh water tank. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

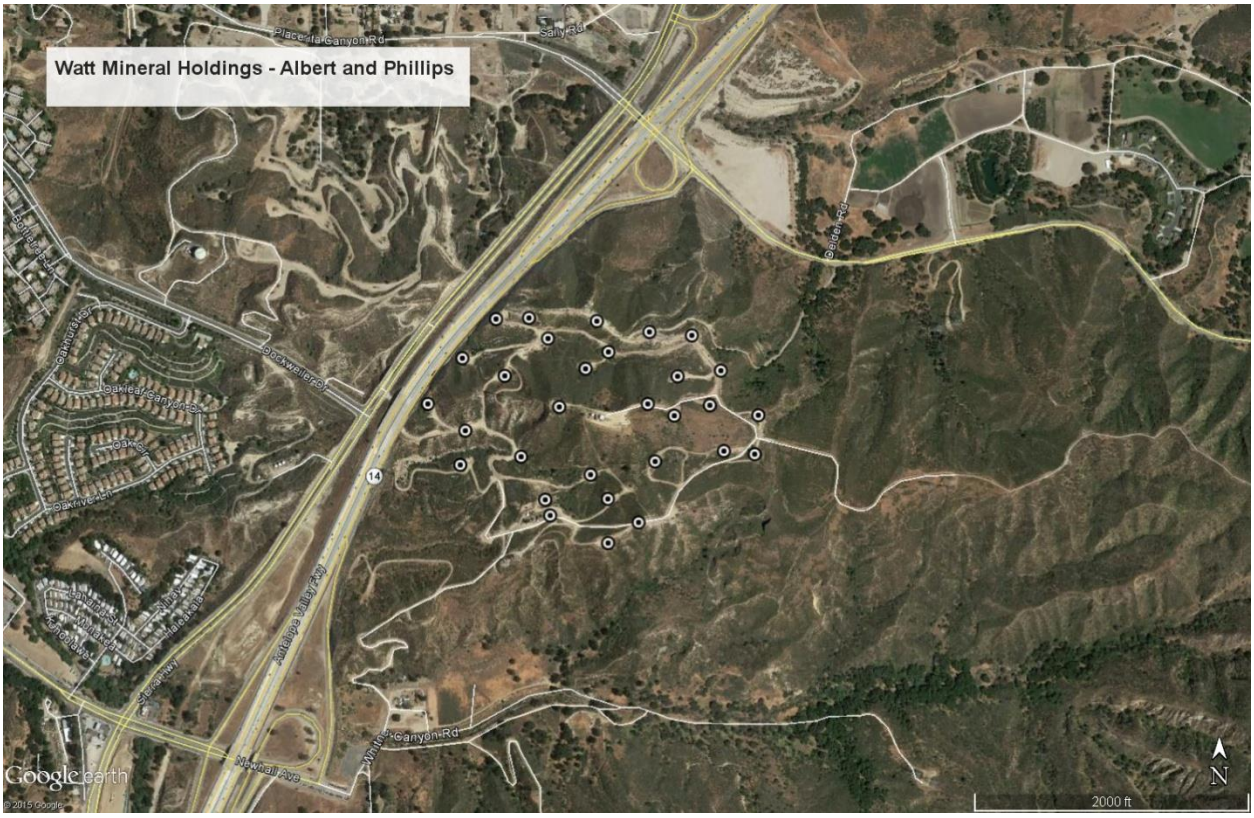
The tables below summarize key information for the Watt Companies facilities. Figure 11 provides an aerial view of the facilities.

Watt Well Overview	
Operator	Watt Mineral Holdings
Number of Wells	30
Current Zoning on Subject APNs	A-2 Heavy Agricultural O-S Open Space
Fields	Newhall Placerita
Leases	Albert Phillips
DOGGR District (s)	2
DOGGR Operator Code	W0510

Watt Companies Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	A-2-2	Vacant land, agrarian use, and single family residential	
South	---	Vacant land in Santa Clarita jurisdiction	
East	W	Vacant land, Angeles National Forest	
West	O-S	Vacant land, State Route 14, Santa Clarita, residential	
Sensitive Land Uses	**Distance (feet)**	**Well/Tank**	**Status**
Closest Residence	1,541	Well 2-A	Active
	1,478	Tank Facility South	Active
	2,357	Tank Facility North	Active
Closest School	4,466	Well 2-A	Active

Watt Companies Field Adjacent Land Use Overview			
	5,488	Tank Facility South	Active
	5,706	Tank Facility North	Active

Figure 11 – Watt Facility Aerial



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on April 4, 2017; items of note are listed in the table below.

Watt Companies Newhall and Placerita Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations
Secondary Containment	SC.3	Tank farm contains vegetation/weed growth	It is recommended that weed abatement be completed where necessary.
Security	S.2	Wells 6, 7, 11, 22, and 27 fencing in poor condition.	The oil field has adequate perimeter fencing, however, some well enclosure fencing is in poor condition and is recommended for repair.

County DRP permits for the Watt wells are listed in the table below.

Watt Companies Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
CUP	1974	572	Not Identified	2 new, 20 total	Not Referenced

Checklists, along with other data for the Watt facilities, are included in Appendix N.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, did not result in any findings. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations (NOV) and Notice to Comply (NTC) data and no NOV or NTC notifications were posted. SCAQMD staff did note some Rule 1173 fugitive emission leaks during the Strike Team inspection as noted on the Well Checklists, however, these leaks did not generate compliance documentation. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

Watt Companies Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Facility ID #152641	None	In compliance
DOGGR	No documents received to date		

Health Screen Summary

Watt has 30 wells located at this site within the County. Oil is stored and shipped by truck. There are only onsite pipelines. Of the high priority public health risk items, the facilities rank as a low public health risk for all four of the items. This is due to the facilities' remoteness from residential areas and the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are low as wells are not free flowing, minimal wells are located immediately adjacent to waterways, and the tank site and well areas are bermed. The Public Health Screening Checklist is included in Appendix N.

Photographs

Photographs are included on the following pages of this section.

Watt Albert 17 Well

Watt Tank Farm

Watt Well and Highway 14

Watt Facility Location Overview

3.10 Matrix Whittier

Matrix Whittier operates 13 active wells and one idle well in the Whittier field on the Mitchell Energy lease. Twelve of the wells are producing wells and one is a water flood injection well. The wells were inspected by the Strike Team on April 4, 2017. Staff from County DRP, DPW, and Fire, SCAQMD, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix O.

Facility Description

The Matrix Whittier facility, also known as the Matrix Rideout/Sycamore Canyon facility, is located at 5020 Workman Mill Road in Whittier. In addition to the 13 active wells, the site contains one idle well and one plugged well. All wells are operated by electric pumps. Oil is dewatered onsite and loaded into trucks at a loading rack for transport offsite. All gas is burned in a SCAQMD permitted flare; a new flare was installed in 2014 and the older flare remains as a backup. The facility contains two 750-barrel oil tanks and four process/brine tanks. Produced water is tested and discharged to sanitation sewer system under permit by the LA County Sanitation District.

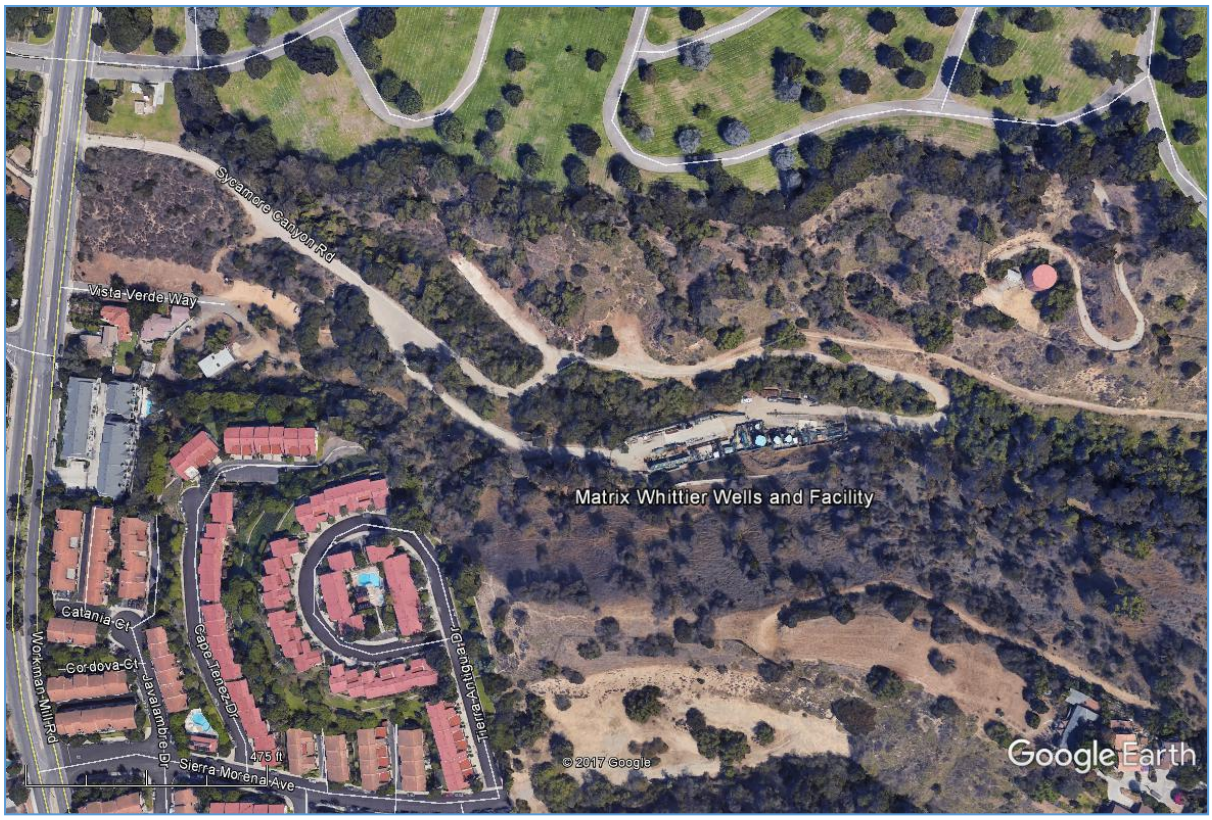
The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the Matrix Whittier facilities. Figure 12 provides an aerial view of the facilities.

Matrix Well Overview	
Operator	Matrix Oil Corporation
Number of Wells	14
Current Zoning on Subject APNs	A-1-5 Light Agricultural
Fields	Whittier
Leases	Mitchell Energy
DOGGR District (s)	1
DOGGR Operator Code	M2600

Matrix Oil Corporation Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	A-1.5	Rose Hills Memorial Cemetery	
South	A-1.5	Vacant	
East	A-1.5	Vacant	
West	A-1.5	Vacant and City of Whittier residential	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	488	Well S-32	Idle
	670	Tank Farm	Active
Closest School	3,330	Well S-32	Idle
	3,474	Tank Farm	Active

Figure 12 – Matrix Whittier Aerial



Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on April 4, 2017; items of note are listed in the table below.

Matrix Whittier Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Safety/Signage	G.7	The loading racks do not	It is recommended that the loading rack use

Matrix Whittier Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
		have signage summarizing loading procedures for safety and security.	process and security procedures signage to be placed at all loading rack locations

County DRP permits for the Watt wells are listed in the table below.

Matrix Whittier Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
PP	1977	28522	8126001903	Permit for Multi-Well Cellar	13

Checklists, along with other data for the Watt facilities, are included in Appendix O.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, is shown in the table below. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations (NOV) and Notice to Comply (NTC) data. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

Matrix Whittier Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Matrix Facility ID 131425	NOV	Case Closed
SCAQMD	Matrix Facility ID 131425	NOV	In compliance
SCAQMD	Matrix Facility ID 131425	NTC	Information requested
SCAQMD	Matrix Facility ID 131425	NTC	NOV
SCAQMD	Matrix Facility ID 131425	NTC	NOV
DOGGR	No documents received to date		

Health Screen Summary

Matrix has 14 wells located at this site within the County. Oil is stored and shipped by truck. Only onsite pipelines. Of the high priority public health risk items, the facilities rank as a low public health risk for hydrogen sulfide and pressures, and medium public health risk for proximity to residences and historical drilling activities. Spill risks are medium due to the proximity of facilities to creeks, although wells are not free flowing and all wells are located within a contained well cellar located onsite and the tank site and well areas are well bermed. The Public Health Screening Checklist is included in Appendix O.

Photographs

Photographs are included on the following pages of this section.

Matrix Whittier Well Cellar

Matrix Whittier Tank Farm

Matrix Whittier Loading Rack

Matrix Whittier Flare

3.11 Breitburn Sawtelle and Dominguez

Breitburn Energy operates the Sawtelle and Dominguez facilities; the Sawtelle facility is owned by Breitburn and the Dominguez facility is owned by Pacific Coast Energy Company and operated by Breitburn Energy. The two facilities were inspected by the Strike Team on May 17, 2017. Staff from County DRP, DPW, and Fire, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix P.

Sawtelle Facility Description

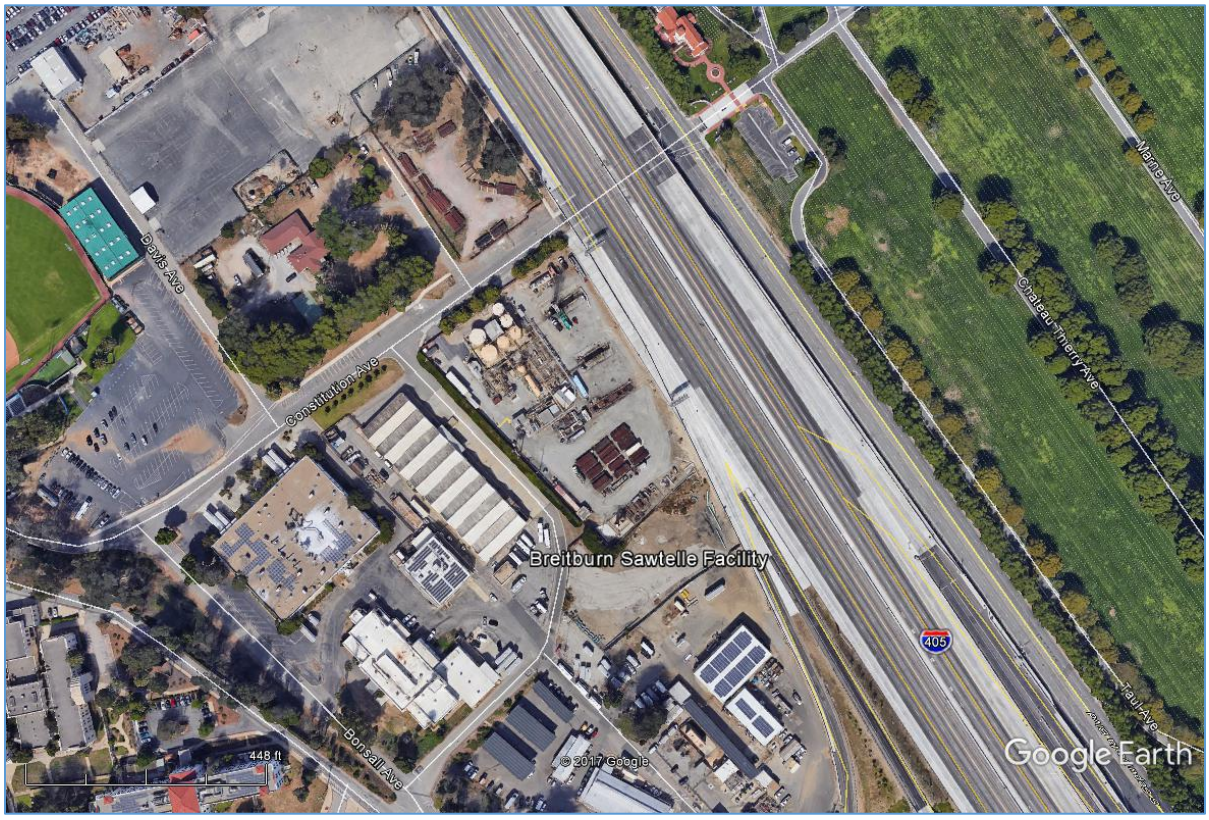
The Sawtelle facility contains 14 active and 2 idle wells located in the Sawtelle field on the Dowlen-Federal lease. The wells and associated facilities are all on the same parcel which is located immediately adjacent to the 405 freeway. All wells are powered by electric pumps, and 13 of the 14 active wells are located in group cellars. Oil is separated onsite and transported from the site in tanker trucks, approximately three tanker trucks per day. Produced gas is sold to the Gas Company and burned in a SCAQMD permitted flare. Produced water is re-used for water flood well enhancement via a water injection well. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4. The Sawtelle facility is located on Federal Lands and subject to the oil and gas regulations of the U.S. Bureau of Land Management.

The tables below summarize key information for the Breitburn Sawtelle facility. Figure 13 provides an aerial view of the facilities.

Breitburn Well Overview	
Operator	Breitburn Sawtelle
Number of Wells	16
Current Zoning on Subject APNs	O-S Open Space
Fields	Sawtelle
Leases	Dowlen-Federal
DOGGR District (s)	1
DOGGR Operator Code	B6131

Breitburn Sawtelle Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	City of LA	City of LA, storage, parking, Veterans Affairs Medical	
South	O-S	Vacant and industrial uses	
East	O-S	405 freeway and Los Angeles National Cemetery	
West	O-S	Industrial and Veterans Affairs Medical	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	1,025	Facility	Active
Closest School	4,079	Facility	Active

Figure 13 - Breitburn Sawtelle Facility



Dominguez Facility Description

The Dominguez facility contains 3 active and 1 idle well located in the Dominguez field on the Dominguez Estates and M.M. lease. Produced gas and water are separated onsite and transported offsite; oil to market by truck and water to the Breitburn Rosecrans facility. Gas is used in a heater and or flared in SCAQMD permitted devices. All wells are powered by electric pumps. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the Breitburn facilities. Figure 14 provides an aerial view of the facilities.

Operator	Breitburn Dominguez
Number of Wells	4
Current Zoning on Subject APNs	M-2-IP Heavy Manufacturing Industrial Preservation
Fields	Dominguez
Leases	Dominquez Estates and M.M.
DOGGR District (s)	1
DOGGR Operator Code	B6127

Breitburn Dominguez Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	C-M-DP	Dominguez Hills Estates mobile home park	
South	M-2-IP	Warehouses	
East	C-M-DP	Dominguez Hills Estates mobile home park	
West	C-M-DP	Dominguez Hills Estates mobile home park	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Nearest Residence	30	Tank	Active
	45	Well	Active
Closest School	4,325	Facility	Active

Figure 14 – Breitburn Dominguez Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on April 4, 2017; items of note are listed in the table below.

Breitburn Sawtelle Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.

Breitburn Dominguez Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations

Research of the County DRP records for the Breitburn Sawtelle and Dominguez wells did not result in any permit documentation.

Checklists, along with other data for the Breitburn Sawtelle and Dominguez facilities, are included in Appendix P.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, did not result in any findings. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations

(NOV) and Notice to Comply (NTC) data. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

Breitburn Sawtelle and Dominguez Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Dominguez Facility ID 120099	NTC	In compliance
SCAQMD	Dominguez Facility ID 120099	NOV	Closed
DOGGR	No documents received to date		

Health Screen Summary

Breitburn Sawtelle & Dominguez have a total of 16 and 4 wells located at these two sites within the County, respectively. Oil is stored and shipped by truck. Gas is either sold or flared or used in heaters. Of the high priority public health risk items, the Dominguez facility ranks as a high public health risk for one of the items due to its proximity to residences at the Dominguez Hills Estates Mobile Home Park, and a low priority for the remaining items. The Sawtelle facility ranks as low risk for all four items. This is due to the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are low as wells are not free flowing, and no wells are located immediately adjacent to waterways, with the site and well areas all being bermed. The Public Health Screening Checklist is included in Appendix O.

Photographs

Photographs are included on the following pages of this section.

Breitburn Sawtelle Well Cellar

Breitburn Sawtelle Tank Farm

Breitburn Sawtelle Vapor Recovery System

Breitburn Sawtelle Flare

Breitburn Dominguez Wells

Breitburn Dominguez Tanks

3.12 LBTH

LBTH Inc. operates 35 wells, 16 active and 19 idle, on the Del Valle and Ramona fields. The wells are associated with the Sepulveda, Vasquez, Vasquez W.D. and N.L.F. leases. The facilities were inspected by the Strike Team on May 23, 2017. Staff from County DRP, DPW, DPH, and Fire, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix Q.

Facility Description

The 35 wells are operated on three locations; 19 wells on the Sepulveda lease, 14 wells on the Vasquez/Vasquez WD lease, and 2 on the N.L.&F. lease. Each lease has a tank farm where the oil, water, and gas are separated. Produced oil is stored in tanks and shipped to market by truck; each tank farm area has an oil loading rack. Gas from the Vasquez/Vasquez WD and N.L.&F. leases is transported by pipeline to the Sepulveda tank farm and then by pipeline to the Santa Clara Gas Plant located in Ventura County. Produced water is disposed in the water disposal well Vasquez WD 1-17. All wells are powered by electric pumps. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the LBTH facilities. Figure 15 shows aerial view of the LBTH facility location.

LBTH Well Overview	
Operator	LBTH Inc.
Number of Wells	35
Current Zoning on Subject APNs	A-2 Heavy Agriculture SP Specific Plan
Fields	Del Valle Ramona
Leases	Sepulveda Vasquez Vasquez W.D. N.L.F.
DOGGR District (s)	2
DOGGR Operator Code	L0875

LBTH Inc. Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	A-2-2	Vacant	
South	SP	Vacant	
East	A-2-2 and SP	Vacant	
West	A-2-2 and SP	Vacant and Ventura County	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	1,520	Well Sepulveda 13	Active
	1,430	Sepulveda Tank Farm	Active
Closest School	6,960	Well Sepulveda 17	Active
	8,580	Sepulveda Tank Farm	Active

Figure 15 – LBTH Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on May 23, 2017; items of note are listed in the table below.

LBTH Inc. Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites fencing do not have AQMD contact information posted pursuant to AQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) AQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in close proximity to the public should be addressed in a Community Health and Safety Plan.

LBTH Inc. Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations.
Secondary Containment	SC.2	The loading racks utilize dirt berms and/or small plastic buckets for secondary containment.	It is recommended that improvements be made for greater capacity and control of fluids to the loading rack secondary containment systems.
Secondary Containment	SC.2	The Sepulveda Tank Farm and N.L.F. secondary containment dirt berms require maintenance.	The secondary containment berms should be repaired and maintained pursuant to DOGGR requirements and the SPCC plan.
Secondary Containment	SC	Wells adjacent to steep slopes have the potential for significant offsite impacts from a fluid release.	Recommend installation of a berm around the well sites or well pad area at Wells 12-20, 14-20, 16, 23, 12-17, and 17-17.
Secondary Containment	SC	Well 21 area contains significant amount of weeds/vegetation.	Recommend weed abatement maintenance at Well 21.

Research of the County DRP records for the LBTH Inc. wells did not result in any permit documentation.

Checklists, along with other data for the Watt facilities, are included in Appendix Q.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, did not result in any findings. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations (NOV) and Notice to Comply (NTC) data. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

LBTH Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Facility ID #s 90088, 83849, 66816, 77260, and 77259	None	In compliance
DOGGR	No documents received to date		

Health Screen Summary

LBTH has 35 wells located at this site within the County. Oil is stored and shipped by truck. Only onsite oil pipelines. Gas is sent by pipeline to Ventura for sales. Of the high priority public health risk items, the facilities rank as a low public health risk for all four of the items. This is due to the facilities' remoteness from residential areas and the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are low as wells are not free flowing, minimal wells are located immediately

adjacent to waterways, and the tank site and well areas are bermed, although some improvements are recommended. The Public Health Screening Checklist is included in Appendix Q.

Photographs

Photographs are included on the following pages of this section.

LBTH Well #17

LBTH Well and Containment Berm

LBTH Tanks

LBTH Loading Rack

3.13 Anterra

Anterra Services operates 2 active wells in the Tapia field on the Seville West Tapia (Well 2) and Tapia (Well 1-25) leases. The facilities were inspected by the Strike Team on May 23, 2017. Staff from County DRP, DPW, and Fire, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix R.

Facility Description

The Anterra facilities consists of the 2 wells and a tank farm with two tanks; one for produced oil and one for produced water. Both produced oil and produced water are removed from the site by tanker truck. Oil production is very low with an estimated annual throughput of 120 barrels. Produced gas is sent to a flare at the adjacent Jean Martinez facility. Both wells are powered by electric pumps. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the Anterra facility. Figure 16 provides an aerial view of the facility.

Anterra Well Overview	
Operator	Anterra Services
Number of Wells	2
Current Zoning on Subject APNs	O-S Open Space
Fields	Tapia
Leases	Seville West Tapia and Tapia
DOGGR District (s)	2
DOGGR Operator Code	A3229

Anterra Services Field Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	O-S	Castaic Sports Complex zoned O-S	
South	A-2-5	Vacant	
East	A-2-2	Vacant and Castaic Creek flood wash	
West	O-S	Vacant and Interstate 5 Freeway	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	2,700	Well 2	Active
	2,690	Tank Farm	Active
Closest School	6,690	Well 1-25	Active
	6,670	Tank Farm	Active

Figure 16 – Anterra Services Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on May 23, 2017; items of note are listed in the table below.

Anterra Services Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites fencing do not have AQMD contact information posted pursuant to AQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.

Anterra Services Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) AQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in close proximity to the public should be addressed in a Community Health and Safety Plan.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations.

County DRP permits for the Anterra Services wells are listed in the table below.

Anterra Services Field Land Use Permit(s)					
Permit Type	**Permit Year**	**Permit Number**	**APNs Linked to Permit**	**Number of Wells On Permit**	**Number of Wells on APNs in DOGGR Data Base**
PP	1977	33712	2865012916	Not Specified	2

Checklists, along with other data for the Anterra facilities, are included in Appendix R.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, did not result in any findings. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations (NOV) and Notice to Comply (NTC) data. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

Anterra Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Facility ID # 173379	None	In compliance
DOGGR	No documents received to date		

Health Screen Summary

Anterra has 2 wells located at this site within the County. Oil is stored and shipped by truck. Only onsite pipelines. Of the high priority public health risk items, the facilities rank as a low public health risk for all four of the items. This is due to the facilities' remoteness from residential areas and the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are medium due to the facilities'

proximity to waterways, but wells are not free flowing, and the tank site and well areas are all well bermed. The Public Health Screening Checklist is included in Appendix R.

Photographs

Photographs are included on the following pages of this section.

Anterra Services Well

Anterra Services Well Detail

Anterra Services Tank Facility

Anterra Services Tank and Loading Rack

3.14 Jean Martinez

Jean Martinez operates a single well in the Tapia field on the UFL lease. The facilities were inspected by the Strike Team on May 23, 2017. Staff from County DRP, DPW, and Fire, DOGGR and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix S.

Facility Description

The Jean Martinez facilities consist of the well, a small tank farm, and a flare. Both produced oil and produced water are removed from the site by tanker truck. Oil production is very low with an estimated 3 to 4 barrels per day throughput. Produced gas is sent to a flare. The well is powered by an electric pump. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the Jean Martinez facility. Figure 17 provides an aerial view of the facility.

Jean Martinez Well Overview	
Operator	Jean Martinez
Number of Wells	1
Current Zoning on Subject APNs	O-S Open Space
Fields	Tapia
Leases	USL
DOGGR District (s)	2
DOGGR Operator Code	M2460

Jean Martinez Facility Adjacent Land Use Overview			
	Zoning	**Land Use**	
North	O-S	Castaic Sports Complex zoned O-S	
South	A-2-5	Vacant	
East	A-2-2	Vacant and Castaic Creek flood wash	
West	O-S	Vacant and Interstate 5 Freeway	
Sensitive Land Uses			
	Distance (feet)	**Well/Tank**	**Status**
Closest Residence	2,480	Well 1	Active
	2,480	Tank Farm	Active
Closest School	6,890	Well 1	Active
	6,890	Tank Farm	Active

Figure 17 – Jean Martinez Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on May 23, 2017; items of note are listed in the table below.

Jean Martinez Facility Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Signage	AQ.8	Perimeter fencing or well sites fencing do not have AQMD contact information posted pursuant to AQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Well Work Procedures	FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) AQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in close proximity to the public should be

Jean Martinez Facility Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
			addressed in a Community Health and Safety Plan.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations.

Research of the County DRP records for the Jean Martinez well did not result in any permit documentation.

Checklists, along with other data for the Jean Martinez facilities, are included in Appendix S.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit is provided in the table below. The SCAQMD FIND website was reviewed for the previous 10-year data period data for Notice of Violations (NOV) and Notice to Comply (NTC) data. DOGGR data is as supplied by DOGGR to the Strike Team as of July 2017.

Jean Martinez Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Jean Martinez Facility ID 136623	NOV	Closed, in compliance
DOGGR	No documents received to date		

Health Screen Summary

Jean Martinez has 1 well located at this site within the County. Oil is stored and shipped by truck. Only onsite pipelines. Of the high priority public health risk items, the facilities rank as a low public health risk for all four of the items. This is due to the facilities' remoteness from residential areas and the absence of high pressures, hydrogen sulfide and historical drilling activities. The facilities are in proximity to the Castaic Sports Complex soccer fields, but the nearest field is 150 feet away. Spill risks are low as wells are not free flowing, although the well is located adjacent to waterways, with the tank site and well areas all being bermed. The Public Health Screening Checklist is included in Appendix R.

Photographs

Photographs are included on the following pages of this section.

Jean Martinez Well

Jean Martinez Tanks

Jean Martinez Tank Bottom Detail

3.15 Power Run Oil

Power Run Oil operates four wells located on the Howard Townsite and Rosecrans South fields; leases Howard, Deist, Hunter, and Brownstein. The wells were inspected by the Strike Team on July 11, 2017. Staff from County DRP, DPW, DPH, and Fire, and the County consultant attended the inspections; a list of attendees for each inspection is included in Appendix T.

Facility Description

The Power Run Oil wells are located at four separate locations on 120th Street in Los Angeles and on Redondo Beach Boulevard in Gardena as listed in the following table.

Field	Lease	Well Number	Address
Rosecrans South	Brownstein	1	249 East Redondo Beach Blvd., Gardena
Howard Townsite	Howard	1	1442 West 120th St., Los Angeles
Howard Townsite	Deist	86-1	1519 West 120th St., Los Angeles
Howard Townsite	Hunter	1	1548 West 120th St., Los Angeles

All wells utilize an electrically powered hydraulic pump; the pump motors are housed in shipping container type buildings for noise control, with the exception of Well Brownstein 1, which is located in an industrial area. The Howard 1 well is currently shut in for oil but is still producing some gas. Each well site includes a small tank farm where the oil is de-watered and loaded into trucks at a loading rack for transport offsite. The gas is burned in two SCAQMD permitted heaters located at the Brownstein and Deist well locations. The heat is used to warm the oil to facilitate oil water separation and tanker truck loading. None of the well/tank farm facilities has a flare. The facility does not use hydraulic fracturing or other enhanced well completion techniques subject to Senate Bill 4.

The tables below summarize key information for the Power Run Oil. Figures 18 and 19 provide aerial views of the facilities.

Power Run Oil Well Overview	
Operator	Power Run Oil
Number of Wells	4
Fields	Rosecrans South Howard Townsite
Leases	Brownstein Howard Deist Hunter
DOGGR District (s)	1
DOGGR Operator Code	P4153

Power Run Adjacent Land Use Overview			
	Land Use	**Zoning**	**Notes**
Facility	Well Brownstein 1	M-2-IP	Heavy Manufacturing Industrial Preservation
North	Industrial warehouse	M-2-IP	
South	Road	ROW	Redondo Beach Boulevard
East	Industrial warehouse	M-2-IP	
West	Industrial warehouse	M-2-IP	
Closest school	Nearest well 1,973 feet Nearest tank 1,968 feet		
Closest residence	Nearest well 263 feet Nearest tank 257 feet		
	Land Use	**Zoning**	**Notes**
Facility	Well Howard 1	R-1	Single Family Residence
North	West 120 Street, single family residence, Elementary School	R-1	
South	Single family residential	R-1	
East	Single family residential	R-1	
West	Single family residential	R-1	
Closest school	Nearest well 231 feet Nearest tank 131 feet		
Closest residence	Nearest well 23 feet		
	Land Use	**Zoning**	**Notes**
Facility	Well Deist 86-1	R-1	Single Family Residence
North	Single family residential	RPD-5000-10U	
South	Single family residential	R-1	
East	Single family residential	R-1	
West	Single family residential	R-1	
Closest school	Nearest well 446 feet Nearest tank 453 feet		
Closest residence	Nearest well 68 feet Nearest tank 11 feet		

Power Run Adjacent Land Use Overview			
	Land Use	**Zoning**	**Notes**
Facility	Well Hunter 1	R-1 R-1	Single FamilyResidence
North	Single family residential	RPD-5000-10U	
South	Single family residential	R-1	
East	Single family residential	R-1	
West	Single family residential	R-1	

Closest school	Nearest well 620 feet Nearest tank 532 feet
Closest residence	Nearest well 59 feet Nearest tank 36 feet

Figure 18 - Power Run Brownstein Facility Aerial

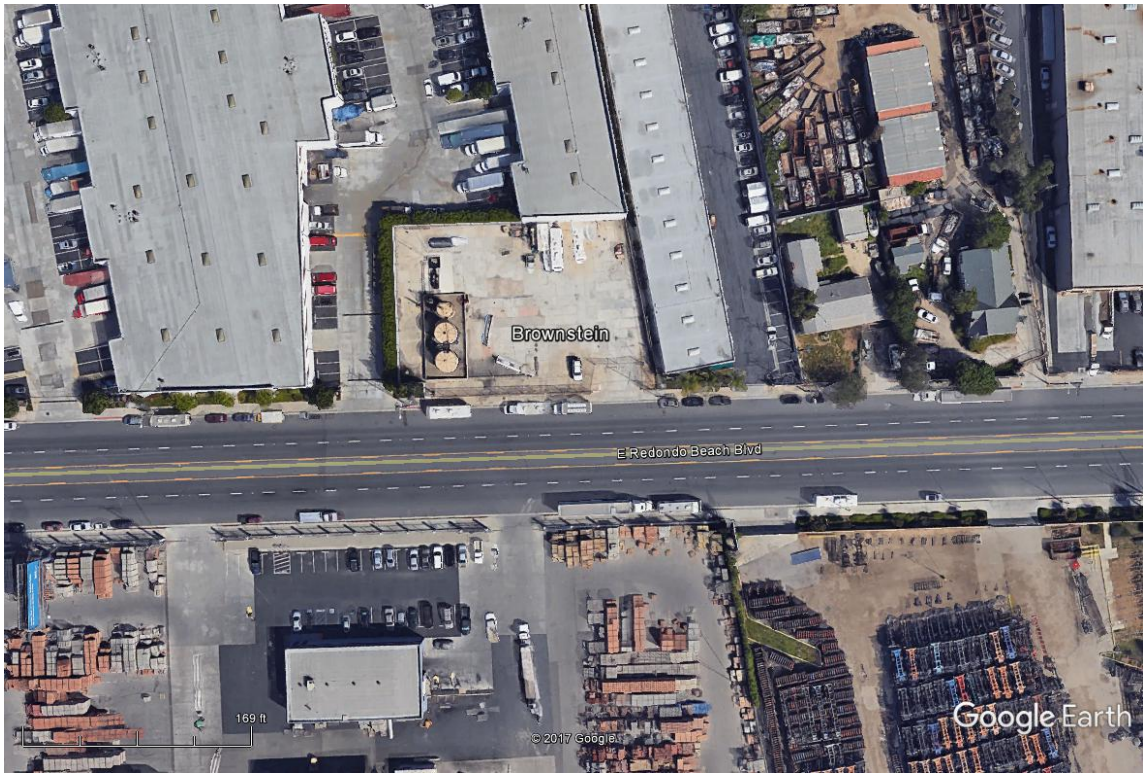


Figure 19 – Power Run Hunter, Deist, and Howard Facilities Aerial

Strike Team Findings

The review of the facility permit conditions and regulatory compliance occurred during the site inspections performed on July 11, 2017; items of note are listed in the table below.

Power Run Oil Field Findings			
Issue Area	**Checklist ID Code**	**Description**	**Recommendation**
Well Work Procedures	N.2, N.3, N.4, N.5, FI.2, FW.3, AQ.6, AQ.11	Although drilling has not occurred recently at any well sites located within the County, there are a number of requirements that should be followed if drilling were to occur due to the proximity to residences.	Well work requirements should be documented in a well work procedure and should include: 1) the use of non-combustible sound proofing material; 2) the use of mufflers/silencers on IC engines; 3) SCAQMD requirements related to notification (Rule 1148.2) and use of rubber grommets for piping/tubes/rod replacement activities; 4) requirements for proposer drilling mud disposal and storage; 5) Limits on time-of-day deliveries to well sites; 6) well work procedures that take place in proximity to the public should be addressed in a Community Health and Safety Plan.
Signage	AQ.8	Perimeter fencing or well sites do not have SCAQMD contact information posted pursuant to SCAQMD Rule 1148.1 (d) (13).	Applicable perimeter or well fencing should have the notification information as per SCAQMD requirements.
Safety/Signage	G.7	The loading racks do not have signage summarizing loading procedures for safety and security.	It is recommended that the loading rack use process and security procedures signage to be placed at all loading rack locations

Research of the County DRP records for the Power Run facilities did not result in any permit documentation.

Checklists, along with other data for the Power Run Oil facilities, are included in Appendix U.

Other Agency Historical Issues and Findings

Information from other regulatory agencies, as derived from agency input, agency web research, or agency field findings during the Strike Team Project field visit, are summarized in the table below. SCAQMD data, Notice of Violations (NOV) and Notice to Comply (NTC) data is from the SCAQMD FIND website. DOGGR data is as supplied by DOGGR to the Strike Team on July 10, 2017.

Power Run Oil Other Agency Compliance Issues			
Agency	**Location**	**Compliance Item(s)**	**Status**
SCAQMD	Facility ID 169812	None	In compliance
SCAQMD	Facility ID 169813	None	In compliance
SCAQMD	Facility ID169814	None	In compliance
SCAQMD	Facility ID 153593	None	In compliance
DOGGR	Deist	NOV	In compliance
DOGGR	Deist	NOV	In compliance

Health Screen Summary

Power Run Oil have a total of 4 wells located at these 4 sites within the County, respectively. Oil is stored and shipped by truck. Gas is transported and used in heaters. Of the high priority public health risk items, the facilities rank as a high public health risk for one of the items due to their proximity to residences at the Howard, Deist and Hunter facility, and a low priority for the remaining items. This is due to the absence of high pressures, hydrogen sulfide and historical drilling activities. Spill risks are low as wells are not free flowing, and no wells are located immediately adjacent to waterways, with the sites and well areas are all bermed. The Public Health Screening Checklist is included in Appendix T.

Photographs

Photographs are included on the following pages of this section.

Power Run Browstein Well

Power Run Browstein Tanks

Power Run Howard Well

Power Run Howard Tank Farm

Power Run Deist Well

Power Run Deist Tank

Power Run Hunter Well

Power Run Hunter Tank Farm

3.16 Other Operators

Strike Team staff was not able to inspect certain wells due to the inability to obtain access from the operator. It is important to note that access to the oil wells, the associated process facilities, and submittal of certain documentation to Strike Team staff was completed on a voluntary basis. The Strike Team acknowledges and appreciates the operators of those facilities that provided access, staff assistance, and documentation for the Project. Due to the pending litigation regarding the recent gas leak, the Southern California Gas Company wells and facilities were not inspected. In addition, research completed during the Project and recent updates to the DOGGR data base determined that some of the wells initially identified as active are actually buried, plugged, or abandoned. The table below summarizes the wells that were not visited by operator name, number of wells and well status.

Operator	Number of Wells	Status
Asioco Inc./John Guzman	2	No access provided
FE-I LLC	2	No access provided
Sherwin D. Yoelin	2	No access provided
Hawker Energy Inc	37	No access provided
Thompco Inc	8	No access provided
Thompson Oil Co., Inc.	9	No access provided
Charles C Townsend	2	No access provided
El Chico Corp.	1	No access provided
Southern California Gas Company	160	Contact with operator not available
A. D. Kneuper	1	Buried
Anchor Petroleum Co.	1	Buried
Arcadia Oil Co.	1	Buried
Asioco Inc.	2	Plugged and abandoned
C. C. Julian	1	Buried
Central Oil Co.	1	Buried
Chevron U.S.A. Inc.	1	Buried
Church Minor Syndicate	1	Orphaned/Abandoned
Cypress Petroleum	1	Buried
D.D.Dunlap&JohnF.Tracey	1	Buried
Deltron Drilling Inc.	3	Plugged and abandoned
J. T. Robertson Co.	1	Buried
Joseph B. Dabney	1	Buried
Liberty Oil Co.	2	Orphaned/Abandoned
M.L.C.R. Co.	1	Buried
Mars Oil Co.	1	Buried
Montebello Mascot	1	Buried
Montebello Oil Syn	1	Orphaned/Abandoned
Oryx Energy Company	1	Buried
Otis G. Andrews & Sons	1	Buried
Pacifica Oil Co.	1	Plugged and abandoned
Pugh-Miller Drilling Co.	1	Buried
R. W. Jackson	1	Buried
Ricano Oil Co.	4	Orphaned/Abandoned

Operator	Number of Wells	Status
Robert S. Lytle Operator	2	Buried
Rucker and Croul	1	Orphaned/Abandoned
Russian Oil Co.	1	Buried
Santa Fe Dome Oil Co. #2	1	Buried
Santa Fe Done Oil Co.	1	Buried
So. Cal Oil Co.	1	Buried
Tujunga Oil Co.	1	Buried

4.0 Recommendations to the Board

This cumulative and final report provides documentation on the methodology, health screening, and presents the findings of the field site audits of the facilities reviewed by this Project. One component of the Project is for Staff to provide recommendations to the Board on the following:

- legislative positions;
- regulatory positions;
- legal positions as necessary; and
- other facilities that may benefit the County by undergoing a similar review.

Staff have followed recent actions by other jurisdictions and agencies during the Strike Team effort and preparation of the three Project reports and advises the Board to allow for legislative updates as they relate to oil and gas operations as noted in Section 4.1. The primary regulatory recommendation derived from the implementation of the Strike Team Project is the preparation of a revised County Zoning Code for oil and gas operations to bring the regulatory framework up to date with existing oil and gas operations and new technological advances and extraction methods. This update was recognized as one of the overall goals of the Strike Team by the Board in its motion, and the need to gain thorough knowledge of the existing oil and gas operations in the unincorporated area of the County of Los Angeles is the initial first step towards a revised County Zoning Code for oil and gas operations.

Staff recommends a review and update to the County Zoning Code for oil and gas facilities and further recommends the updated Zoning Code include requirements to address issues noted during the Project site inspections and document review; these suggestions are presented in Section 4.2. Legal positions are discussed in Section 4.3. Section 4.4 discusses recommendations for other facilities to be evaluated based on Project research and the site visits completed to date. Recommendations from the public and the Strike Team Advisory Panel for future review efforts are provided in Section 4.5.

4.1 Legislative Review

Recent legislative actions of note regarding oil and gas operations include:

California Senate Bill 4 – In 2013, the California Legislature passed Senate Bill 4 (SB 4), setting the framework for regulation of hydraulic fracturing and acid stimulation technologies in California. Well stimulation enhances oil and gas production by making the reservoir rocks more permeable, thus allowing more oil or gas to flow to the well. To create a hydraulic fracture, an operator increases the

pressure of an injected fluid in an isolated section of a well until the surrounding rock breaks, or "fractures." Sand injected into these fractures props them open after the pressure is released. The second type is "acid fracturing," in which a high-pressure acidic fluid fractures the rock and etches the walls of the fractures, so they remain permeable after the pressure is released. The third type, "matrix acidizing," does not fracture the rock; instead, acid pumped into the well at relatively low-pressure dissolves some of the rock and makes it more permeable.

Public concern about the health and environmental effects of fracking resulted in the California Legislature passing of Senate Bill 4, the most comprehensive fracking law in the nation. Governor Jerry Brown signed it into law on January 1, 2014.

The law requires drillers to apply for permits for any well activity used to stimulate greater production from a well, whether by fracking or acid. The application must include the location and time of the proposed well treatment, a list of all chemicals to be used, the source of the water used and a plan to monitor groundwater in the area for possible contamination. Notices of the proposed activities are publicly disclosed on the DOGGR website. Property owners near the site must also be notified within 30 days of the activity.

Within 60 days of completing a fracking operation, drillers must disclose the source and amount of water used and the chemicals in the fracking fluid. They must also disclose how much water was recovered, test the wastewater and report all chemicals detected. This information is publicly available in the Well Stimulation Public Disclosure Report, which is posted and regularly updated on the DOGGR website.

SCAQMD Rule 1148.2 – The rule by the South Coast Air Quality Management District (amended in 2015), requires that operators electronically notify the SCAQMD prior to the start of drilling, well completion or re-work of an onshore well and specify the distance to the nearest sensitive receptor as well as information on the chemicals proposed to be used. This information is then posted on the SCAQMD website.

City of Carson Code – In 2016 the City of Carson adopted a new oil and gas code to address existing and proposed oil and gas operations in the city. The Code is organized into three Parts and covers all aspects of operations from "cradle to grave" as follows:

- Part 1 (Administrative Procedures) identifies where operations may occur, and what approvals are necessary for the types of operations. For example, new development in residential and other areas are completely banned, all other areas require conditional use permits or development agreements are required (complete with a public review process), facility closure and abandonment is regulated, insurance and bonding requirements are imposed, and monitoring and enforcement procedures (including substantial fines and penalties, etc.) are established.

- Part 2 (Development Standards for Petroleum Operations) establishes how the sites may be operated. For example, not only is new development banned in residential areas, the General Update prohibits new operations within 1,500 feet and 1,000 feet of sensitive uses unless they can comply with a variety of requirements, including an odor minimization plan, air monitoring plan, community alert system, quiet mode operations plan, photometric analysis (lighting and glare), etc. Under no circumstances can these uses be closer than 750 feet from sensitive uses. Additionally, this Part

addresses lighting, aesthetics, water quality (including groundwater), air quality, greenhouse gas, inspection and monitoring, safety standards, and other items.

- Part 3 (Development Standards for Site Abandonment and Redevelopment) addresses conditions under which a site must be assessed and remediated prior to redevelopment of a current oil or gas site. This includes leak testing, inspections, ensuring all wells are properly abandoned and recording of documents on the property to give notice to future owners and occupants of the land's prior use as an oil or gas site, results of testing, etc.

SCAQMD Rule 1180 – Fence line monitoring for refinery operations. Currently the South Coast Air Quality Management District (SCAQMD) is developing a new set of regulations to require fence line monitoring for oil and gas refineries. Following a recent federal EPA's Fenceline Monitoring Rule, all refineries are required to monitor and report levels of benzene around their fencelines. Benzene is being monitored as a surrogate for all fugitive emissions of Hazardous Air Pollutants (HAPs). The Bay Area Air Quality Management District (BAAQMD) also has a similar rule requiring petroleum refineries to conduct fenceline monitoring. The Rule 1180 would expand the federal requirements to include a range of chemicals and to allow for real-time results and online access to data by the public. Ultimately, fenceline monitoring can be used to identify leaks and unintended or accidental releases at any facility if the same technologies are applied, not just refineries, and could alert communities of potential health and safety issues. It can also be used to determine the levels of pollutants being emitted by facilities and subsequently come up with mitigation to reduce those emissions.

OSPR Inland Oil Spill Contingency Plans – In July 2014 Governor Brown and the California Legislature expanded the Office of Spill Prevention and Response (OSPR) program to address oil spill planning for all surface "waters of the state" at risk from oil spills. Thus, certain Inland Facilities such as pipelines, production facilities, refineries, and railroads must file an oil spill contingency plan with OSPR for review and approval, and must also make a demonstration of financial responsibility for a potential oil spill.

In the fall of 2016, the emergency regulations were finalized through a formal rulemaking process. In the future, OSPR intends to merge the inland components with the long-existing marine components, to form an integrated statewide oil spill preparedness and response program.

SB724, Oil and gas wells and production facilities – This bill is currently moving through the legislature. Under current law, DOGGR regulates the drilling, operation, maintenance, and abandonment of oil and gas wells in the state. State law further requires DOGGR to supervise the drilling, operation, maintenance, and abandonment of wells and the operation, maintenance, and removal or abandonment of tanks and facilities related to oil and gas production within an oil and gas field, Moreover, existing law requires the operator of a well to file a written notice of intention to commence drilling with, and prohibits any drilling until approval is given by DOGGR; the notice is deemed approved DOGGR fails to respond to the notice in writing within 10 working days from receipt and is deemed canceled if operations have not commenced within one year of receipt. This bill would extend the time period to commence operations from 12 to 24 months before the notice is required to be deemed canceled, and would prohibit the notice from being extended.

Existing law authorizes a city or county to request from DOGGR a list of those wells within its jurisdiction that have not continuously produced oil or natural gas, or have not been utilized continuously for injection purposes for a 6-month period during any consecutive 10-year period prior to or after January

1, 1991. This bill instead would authorize a city or county to request from the supervisor a list of all idle wells, as defined, within its jurisdiction.

Current law authorizes DOGGR to order the plugging and abandonment of a well that has been deserted independent of whether or not any damage is occurring or the well represents a threat to the environment. This bill would additionally authorize DOGGR to order the decommissioning of an attendant production facility of a well that has been deserted. Because a violation of an order issued under these provisions would be a crime, the bill would implement a State-imposed local program.

Existing law authorizes DOGGR to order certain operations to be carried out on any property in the vicinity of which, or on which, is located any well that DOGGR determines to be either a hazardous or idle-deserted well, as specified. Existing law prohibits the division from expending, commencing with the 2015–16 fiscal year, more than $1,000,000 in any one fiscal year for these purposes related to hazardous or idle-deserted wells. SB 724 would:

- Expand this authorization to allow DOGGR to order or undertake certain operations, as applicable, to be carried out on any property in the vicinity of which, or on which, is located any well or facility that DOGGR determines to be a hazardous well, an idle-deserted well, a hazardous facility, or a deserted facility, as defined;
- Raise the cap on spending for these purposes from $1,000,000 to $5,000,000 in any one fiscal year;
- Require the division to provide certain information regarding those wells and facilities to cities and counties upon request;
- Authorize a city or county to apply to DOGGR to enter into a contract with to either receive funds to reimburse a city or county for its costs related to plugging and abandoning a well and decommissioning production facilities, or for the division to conduct work related to plugging and abandoning a well and decommissioning production facilities, as specified;
- Prohibit DOGGR, on or after July 1, 2018, from commencing any activity to plug and abandon a well or decommission a production facility within the jurisdiction of a city or county without entering into a contractual memorandum of understanding with the city or county, except as provided;
- Require DOGGR to report on October 1, 2019, to the Legislature on the estimated number of orphan wells, hazardous wells, idle-deserted wells, deserted facilities, and hazardous facilities remaining, the estimated costs of abandoning or decommissioning those wells and facilities, and a timeline for future well abandonment and decommissioning of facilities with a specific schedule of goals; and
- Require the department to provide the Legislature with an update to this report on October 1, 2022, containing specified information.

SB 773 Oil and gas well records – Introduced February 17, 2017; awaiting referral. Existing law requires DOGGR to regulate the drilling and operation of wells used for the purpose of producing oil and gas and requires an owner or operator of a well to keep an accurate log, core record, and history of the drilling of the well. SB 773 would provide that it is the policy of the state that information sufficient to competently and completely characterize each well, including after plugging and abandonment, be maintained by the state and would require the Supervisor to ensure compliance with this policy.

California Air Resources Board (CARB) Greenhouse Gas Emission Standards – Regulation for greenhouse gas emission standards for crude oil and natural gas facilities, approved in July 2017 with effective regulation date of October 1, 2017.

Staff suggests the Board is regularly updated on State, County, City, and associated jurisdictional agency actions as they relate to the oil and gas industry.

4.2 Recommendations for Updated County Zoning Code

Staff recommends review and update of the existing County Zoning Code for oil and gas facilities to bring it in line with surrounding sensitive land uses and current technological advances and to bring it up to today's standards as stated above. In addition, Staff has identified specific recommendations for an update based on the site inspections and the document reviews completed for the Project. These recommendations are in addition to components of oil codes already adopted by existing jurisdictions, such as the City of Carson and the existing Baldwin Hills Community Standards District for the Inglewood Oil Field. The recommendations address issues or potential impacts that are not components of current codes or regulatory requirements. The recommendations along with the analysis or issue identified for the recommendation is summarized in the table below. It is expected that during the review and development of a Zoning Code update, additional requirements may be identified and reviewed for inclusion.

Oil Code Recommendation	Analysis/Issue
Removal of by right permitting	As required by the Board, the new code would include discretionary approval for oil and gas wells and removing the current allowance by right. Implementation of discretionary approval provides for the requirement of project specific mitigation measures and permit requirements.
Setback distances	The updated code should require that wells and associated facilities have a sufficient buffer zone from residential and other sensitive land uses. This would be determined based on health risk, air quality, noise, odors, aesthetics and other environmental, health and safety, and public nuisance considerations. An incentive program could be developed as part of the new code to encourage oil and gas producers to plug and abandon facilities within the new setback.
Well stimulation techniques	An updated code should address recent development in well stimulation and completion techniques. The code would reference recent SB 4 adopted regulations to be consistent with the State's DOGGR rules.
Air quality monitoring	An updated code should include requirements for monitoring to document that offsite air quality impacts are within applicable standards and to take measures to reduce impacts as appropriate.
Odor plan/monitoring	An updated code should include plans to monitor potential odors and include mitigation as applicable. Requirements would likely include the preparation of Odor Minimization Plans under specific circumstances, for all existing or proposed oil and gas facilities within a certain distance of sensitive receptors.
Down hole chemical use (Chemicals pumped down the well during drilling, maintenance or production activities)	These chemicals are not currently included in Hazardous Materials Business Plans due to the short-term use and temporary storage at oil fields. An updated code should require the tracking of the volumes and use of these chemicals and provide guidelines for

Oil Code Recommendation	Analysis/Issue
	storage, transportation and usage to prevent spills or releases into the environment.
Transportation of chemicals through residential areas	Transportation of chemicals should be routed away from neighborhoods as feasible. The updated code should contain requirements for specific transportation routes for certain chemicals as appropriate to protect the health and safety of residents and to route chemicals away from residential areas where feasible.
Pipeline systems monitoring and leak detection	Monitoring and leak detection systems should be used for pipelines near residential and other sensitive land uses. Currently, there are a variety of regulations at the state and federal level, but local oversight is limited. This addition to the code would allow for requirements for pipeline maintenance, integrity testing, and leak detection systems.
Gas gathering systems operated under a vacuum	Operation of gas gathering systems with pipelines operating under vacuum can prevent odor and other nuisance releases for facilities located near residential or other sensitive uses, and provide for rapid identification of leaks and operating irregularities. The updated code should contain provisions to address this issue.
Well site berms	Well site berms provide tertiary containment in the event of a leak but are not currently required by State regulations. Well site berms in the County range from no berm to dirt or gravel berms to concrete/cinder block walls. Regulations for non-permeable material berms could provide consistent tertiary containment for leaks and spills.
Well cellar size, volume, and depth	Well cellars with sufficient depth and volume can provide secondary containment in the event of a leak from well equipment. Well cellars in the County range from no capacity to concrete vaults with significant capacity. The updated code should provide for well cellars with sufficient volume provide consistent secondary containment for leaks and spills.
Fire water supply and monitors	Many facilities do not have a fire water supply or system and require assistance from County Fire in the event of an incident as allowed by the Fire Code. The addition of on-site fire water and or monitors would assist County Fire in incident response.
Abandonment of long idle wells	DOGGR regulations encourage abandonment of idle wells not planned for future use. Local regulations as provided in an updated code could provide local oversight of well abandonment activities in advance of State requirements.
Review of Emergency Response Plans	ERPs are reviewed by County Fire as applicable. Requiring review of ERPs in a code update should allow for other County agencies, including DRP, to become familiar with emergency incident response and allow for coordination with other area current and future projects.
Decommissioning and removal of out of service equipment	Oil fields, due to the long ongoing operations that are part of the industry, can contain and accumulate significant volumes of unused equipment and trash. Requirements for cleanup could improve aesthetics at oil and gas sites.
Storm water discharge handling with spills, drain valves control	The potential exists for storm water systems to discharge oil in the event of a spill during a precipitation event. Requirements in an updated code for drain valves and other control systems could help prevent offsite discharge of contaminated water.

Oil Code Recommendation	Analysis/Issue
Secondary containment	Secondary containment types for tank farms, vessels, and other oil and gas infrastructure in the County range from dirt berms to concrete cinder block walls. Requirements in an updated code for secondary containment systems made of non-permeable materials could provide consistent protection from leak and spills.
Community Communication	The updated code should require oil and gas facilities to prepare a community communication plan for residents within a certain radius. The plan should include conditions requiring notification, methods of notification and information on hazardous materials, conditions, or operations that may otherwise impact the health and well being of nearby residents.

4.3 Legal Positions

Staff has no recommendations with regard to legal positions as of the date of this report.

4.4 Recommendations of Other Facilities to be Evaluated

Associated Oil and Gas Facilities Outside County Jurisdiction

With 88 incorporated cities located within Los Angeles County, oil and gas fields may cross jurisdictional boundaries, wells may be associated with processing facilities located in an adjacent County or City, or oil from wells located outside the County may enter the County by pipeline or tanker truck. For example, as noted in Section 3.0, for the Matrix Sansinena, Linn Energy, CRC, Brea Canon, and Breitburn Rosecrans operations, some produced oil or gas is transported by pipeline to a processing facility located outside the unincorporated County of Los Angeles jurisdiction in adjacent jurisdictions.

Therefore, staff recommends, on a case by case basis, that the Board consider review of relevant oil and gas facilities located outside unincorporated County jurisdiction under the parameters of the Project. Specifically, as discussed above, staff recommends that the County consider contacting the following jurisdictions to discuss Strike Team review of the oil and gas processing facilities under their oversight:

- City of La Habra Heights (Matrix Sansinena wells);
- Orange County (Linn Energy wells);
- County of Ventura (CRC Del Valle and Ramona Field wells); and
- Harbor City (Brea Canon wells);
- City of Gardena (Breitburn Rosecrans).

This item is also in support of the recommendation for outreach to surrounding jurisdictions as identified by the Board. The ultimate goal would be to provide guidance to the adjacent jurisdictions on their own oil and gas regulatory frameworks to ensure that citizens in adjacent communities (and in the unincorporated areas adjacent to those communities) are protected to the same levels established in the new oil and gas code.

Oil and Gas Pipelines

The two primary methods for transportation of oil and gas are by pipeline and by truck, with pipeline transport being the preferred method for a variety of environmental reasons. Several counties in California, such as Santa Barbara County, have promulgated oil transportation policies requiring certain

new projects to use pipeline for the transportation of oil. Offsite transportation of oil by pipeline in California is regulated by the Department of Transportation (DOT), with the jurisdiction delegated to the State Fire Marshall in most areas including Los Angeles County. Staff has identified certain criteria which may trigger a recommendation for including an oil or gas pipeline for Strike Team review including:

- High-pressure pipelines;
- Pipelines containing sour gas;
- Pipelines that are routed through residential neighborhoods or other sensitive land uses; and
- Pipelines with a documented history of environmental or safety issues.

Staff has not identified any specific pipelines for further review at this stage of the Project; recommendations may be included in future reports as appropriate. However, staff is recommending adding regulations to the new oil code to address potential gaps in oversight of pipelines by the state and federal governments as stated above.

Orphan and Abandoned Wells

These types of wells are not addressed in the scope of this Project; however, during the research and review of well data for this Project, information on the ownership, status, and documentation on the abandonment details for many of these wells appeared to be incomplete. As an example, DOGGR record may not show the exact locations of some of these wells, and in other cases there may be no knowledge of the well until it leaks or it is encountered accidentally during a construction project. Therefore, staff recommends that these types of wells be considered for review in a future project.

Other Industrial Uses Related to Oil and Gas

As discussed at the initial Advisory Panel meeting, the chemicals used for drilling and well maintenance activities may not be reflected in a facility's hazardous materials business plan or inventory; this is due to the fact that the use is short term and that chemicals are typically brought on-site on a job by job basis. Chemical use associated with well drilling is addressed by SCAQMD Rule 1148.2. As noted in Section 4.2, Staff recommends that any update to the County Code for oil and gas operations include regulations that address the disclosure of the type of chemicals used and transport of those chemicals to well sites located in the County, in coordination with the SCAQMD rules.

4.5 Additional Task Recommendations

In addition to the recommendations for a future oil and gas zoning code update and the suggestions for other facilities that may benefit from a review similar to this Project, the Strike Team and members of the Strike Team Advisory Panel provide the following proposals for future projects.

Interview Community Members

Coordination with the public and residents of the neighborhoods that are located in proximity to oil and gas wells and the associated facilities was not part of the scope of the Project. It is recommended that future efforts involve obtaining input from community members to provide data on potential nuisance issues and neighborhood concerns. This can be done under the context of the preparation of the updated oil code by having stakeholder meetings in areas surrounding existing oil and gas facilities.

Environmental Review Procedures

The County DRP follows established project review and permit processing procedures as codified in the County Zoning Ordinance along with the guidelines in the County General Plan, Community Plans and other associated planning documents. Discretionary projects are also subject to review under the requirements of the California Environmental Quality Act (CEQA). Given the unique nature and potential impacts of oil and gas projects, it is recommended that any future project complete an evaluation of the environmental review procedures for oil and gas projects in the County to determine if the process can benefit from updated methodology or inter-departmental or inter-agency coordination ideas.

5.0 Conclusion

This report was completed pursuant to the Board's March 2016 motion and with the goals as discussed in this report. The *Well Inspection Protocol, Facility Checklist*, *Well Checklist, and Public Health Screening Checklist* provided staff with applicable tools to perform the site inspections and to document the infrastructure and compliance of the oil and gas facilities of interest for this review. This report is the third and final update of three biannual reports on the Project. As part of the Board of Supervisors' motion, staff was asked to create an inventory of oil and gas facilities to evaluate compliance with existing permits, to review emergency response plans, to conduct onsite visits and safety audits in order to prioritize sites for further action as described in a series of Progress Reports to be submitted to the Board. Information was gathered on land use, zoning, nearby sensitive land uses, existing permits, and facility operations. This report documents the Strike Team findings that the oil and gas wells in the unincorporated County require improvement in several areas with regard to safety and potential impacts to the environment, but that facilities are operating generally consistent with County land use permits, SCAQMD, DOGGR and other regulations. The findings are detailed in this report as recommendations for compliance or improvements to public health or safety and include the following:

- Well work requirements procedures;
- Loading rack procedures and safety signage;
- Sufficient secondary containment at loading rack stations;
- Berming of well sites adjacent to hills sides or other sensitive uses for tertiary containment;
- Repair or improvement of secondary containment at tank farms;
- Installation of signage pursuant to SCAQMD odor requirements;
- Weed abatement;
- Repair of fencing; and
- Removal of un-used equipment and out of service tanks.

The Strike Team also completed a Public Health and Safety Assessment for each of the facilities inspected. The field data, including the facility and well inspection checklists were used to screen the facilities to determine those which may produce a public health and safety impact and would therefore be recommended for more detailed public health and safety assessments. The Health and Safety Assessment concentrated on four high priority public health risk items; land use and zoning, hydrogen sulfide, well head pressures, and historical activities with the results documenting several facilities with

high risk for one of the four priority items. The following facilities ranked high in one of the 4 categories for risk due to their close proximity to residences.

- Brea Canyon - Torrance Field
- PCEC Dominguez - Dominguez Field
- Breitburn - Rosecrans and Rosecrans South Fields
- Linn - Brea Olinda Field
- Power Run - Rosecrans South and Howard Townsite Fields

The Brea Facility ranked as a high risk for spills due to the close proximity of pipelines to water receptors.

Future Efforts

The Department of Regional Planning (DRP) will also prepare a zoning code update to ensure that oil and gas facilities may no longer be permitted to operate "by-right" in the unincorporated portions of the County, and conduct outreach to local jurisdictions interested in collaborating on the development of regulatory requirements or protocols for monitoring and evaluating their local oil and gas facilities.

While the Strike Team has made substantial progress in achieving the above-mentioned goals of the motion, substantial efforts are proposed to be continued in 2018 as follows:

The effort envisioned for 2018 would include DRP's preparation of the oil and gas ordinance and would encompass the following:

- Inclusion of an update to the County Zoning Ordinance and associated regulations to reflect current mitigation methods and technologies to environmental impacts from oil and gas operations;
- Review the need for an Oil and Gas Element to the County General Plan that specifically targets those operations and their impact to the 2035 General Plan update;
- The creation of a program within the Land Use Regulation Division to continually ensure monitoring and compliance for all oil and gas facilities including a mechanism for coordination with other County and State agencies to coordinate the regulatory framework of oil and gas operations. This would also include mechanisms to ensure that public health and safety is protected in all cases; and
- A review of the DOGGR Renewal Plan on oil and gas well regulation at the State level to determine how the oversight coordinates with current and future County oversight.

In addition, as part of the ongoing effort, a number of issues were identified above as requiring further review and oversight. Those considered most salient are described below:

- Orphan/abandoned wells. There is a number of orphaned and abandoned wells throughout the County that have deficient records and mapping from the DOGGR database and are periodically found either through new construction or through potentially unsafe leaks generated by improper plugging and abandonment. A number of these wells were plugged and abandoned prior to existing regulations and by operators who may now be defunct or no longer in operation. This effort would include identifying existing orphaned and abandoned wells within

the unincorporated Los Angeles County, creating a priority list based on potential health and safety concerns and ascertaining a path forward to address these wells in the near future;

- Pipelines. Offsite transportation of oil by pipeline in California is regulated by the Department of Transportation (DOT), with the jurisdiction delegated to the State Fire Marshall in most areas including unincorporated Los Angeles County. Staff has identified certain criteria which may trigger a recommendation for including an oil or gas pipeline for Strike Team review including: high pressure pipelines; pipelines containing sour gas; pipelines that are routed through residential neighborhoods or other sensitive land uses; and pipelines with a documented history of environmental or safety issues. Pipelines are also not locally regulated, and there has been a number of leaks that could be prevented with close oversight. Additional recommendations would be developed on regulations to improve the local oversight of existing pipelines, including the appropriate mechanism to regulate them within the new oil code;
- Storage facilities. Storage facilities in the oil and gas industry have historically leaked crude products during many years of operations, and substantial damage has occurred as a result of subsequent residential uses being placed in previously contaminated areas. Such is the case with the Carousel Tract in the City of Carson, where residences were built on top of areas previously occupied by leaking storage tanks. This has generated chronic health problems among residents and created the need to remediate the site after the fact with the corresponding logistical complications. DRP will include in the new oil code a regulatory framework to address storage facilities both existing and proposed. The updated code would include a protocol for leak inspection and detection and existing areas of concern would be identified along with remediation strategies and clean up goals; and
- Other Industrial uses: DRP will work with the Strike Team in identifying other industrial facilities within the unincorporated County and surrounding communities that may merit additional oversight and review. Such facilities could include other gas storage facilities within the County (to prevent gas releases such as Aliso Canyon), industrial operations that may result in health and safety impacts to the surrounding community (such as the Exide Battery plant and any other facilities that may present an unknown risk to the residents of the County). As part of this effort, the Strike Team would conduct Risk Analysis to assess the level of risk that could exist from these facilities and the types of potential mitigation that could be used to remedy potential risks.

Appendix A: Los Angeles County Oil and Gas Well Inventory Report

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Appendix B: Well Inspection Protocol

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Appendix C: Facility Checklist

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Appendix D: Well Inspection Checklist

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Appendix E Health Screen

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Appendix F Matrix Sansinena Checklist

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Appendix G Termo Aliso Canyon & Oat Mountain Checklist

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Appendix H Termo Oak Canyon Checklist

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Appendix I Linn Energy Checklist

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Appendix J California Resources Company (CRC) Checklist

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Appendix K Crimson Resource Management (CRM) Checklist

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Appendix L Brea Canon Checklist

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Appendix M Breitburn Operating Checklist

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Appendix N Watt Companies Checklist

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Appendix O Matrix Whittier Checklist

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Appendix P Breitburn Operating Sawtelle Dominguez Checklist

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Appendix Q LBTH Inc. Checklist

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Appendix R Anterra Services Checklist

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Appendix S Jean Martinez Checklist

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Appendix T Power Run Oil Checklist

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Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Dennis Slavin
Acting Director

October 26, 2017

TO: Supervisor Mark Ridley-Thomas, Chairman
Supervisor Hilda L. Solis
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: David Muñoz, Acting Supervising Regional Planner
Zoning Enforcement West

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning (DRP), in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Strike Team's third biannual report was submitted to the Board on September 28, 2017.

The Board also requested that a five member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team in order to assess the team's findings and recommendations and to provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. The Advisory Panel public meeting was held on October 24, 2017, to discuss this assessment of the Strike Team's report.

This report addresses the Advisory Panel's assessment of the Strike Team's third biannual report. This report includes the written comments from Advisory Panel members from the First, Third, and Fourth Supervisorial Districts. The Advisory Panel report can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

The next Oil and Gas Strike Team report to the Board is due on March 29, 2018, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

DM:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20171026-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Fire Department
Department of Public Health
Department of Public Works

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

Summary Comments, Julia May, Advisory Panel, re: 3rd Report of Oil & Gas Strike Team

– This investigation accomplished important work, but major gaps remain requiring follow-up

1. Inventory work – **The overall County Strike Team investigation accomplished very important and detailed documentation of many essential extraction facility characteristics** (such as physical makeup, and various health and environmental risk factors).[1] This was a major effort, but the work is not yet finished in identifying and requiring necessary measures to protect public health.

2. Setbacks – **The 3rd report also added important recommendations for future protections, including of foremost importance, setbacks from residences and sensitive uses** for both new and existing facilities, based on health & environmental risk. However, this is based on incentives, rather than on mandatory requirements.[2]

   → Highest Priority Change: - **As fundamentally important for health and safety, setbacks should be mandatory, not incentive-based, and set at least at 2500 feet** (less than half a mile). Studies show people living within ½ mile of a drill site have increased health risks, including respiratory, neurological and reproductive harms.[3] Phase-out of oil & gas facilities near neighbors should be the goal – extraction operations are inherently incompatible with residential neighborhoods. **The 3rd Report should at minimum recommend evaluating mandatory setbacks, and evaluating 2500 feet including existing facilities, which would also harmonize County requirements with those being considered at the City of Los Angeles.**

3. Discretionary permitting – **The report recommendation to set up discretionary permitting instead of by-right permitting is important, and needs expeditious implementation.** This is also one of the original major goals of the Supervisor's Strike Team motion.

4. Evaluate harmonizing LA County & LA City environmental assessment requirements: The County should evaluate including in County requirements, the strongest City of LA measures for environmental, health and safety assessment for Oil & Gas permitting.

5. Other important issues including Air Monitoring, Odor Prevention, Neighbor Surveys, Best Available Control Technology, and Hazardous Material Use and Transport, and others, require follow-up – I appreciate that the 3rd report now includes recommendations made by myself, other Advisory Panel members, and members of the public, for follow-up to add known measures to improve Health & Safety.[4] (For example, see Advisory Panel members including Timothy O'Connor, Andrew Weissman, and Matt Rezvani on needed improvements in monitoring, leak detection, and orphaned or abandoned wells,[5] as well as my previous comments. All panel members also made useful oral comments which staff generally memorialized in the 3rd report.)

   - **Air Monitoring Requirements –** The report states *"An updated code should include requirements for monitoring to document that offsite air quality impacts are within applicable standards and to take measures to reduce impacts as appropriate."* (p. 134). This is helpful, but follow-up should identify specific monitoring regulatory activities and studies at the AQMD, identify best monitoring practices including real-time monitoring of hydrocarbons (including methane), sulfur compounds, particulate matter, as well as plate sampling for oil deposition through the air nearby. Newer methods include a variety of Optical Sensing and other techniques that are being evaluated by the Air Districts and the State; **the County should record options and set best practice standards in the next round.** (These are too many to go into in detail in this Summary.)

Community organizations have been in the forefront of carrying out both high and low-tech monitoring for decades, demonstrating that there is no longer any reason for this area to continue unaddressed, especially by regulators with greater resources.[6] The SCAQMD is now in the process of various new air monitoring studies and additional regulation, including for the oil and gas industry, and the State will be as well, in response to recent legislation. **This does not mean that all gaps will be filled by other regulators, but it means the County can take advantage of information developed by these agencies. The County should ensure that Oil & Gas operations are required to carry out best monitoring practices.**

- **Odor Prevention Plans –** AQMD's Rule 1148.1 requires Odor Mitigation Plans, but only after multiple confirmed odor events impacting neighbors.[7] **The County should evaluate and adopt such a measure as a requirement for *all* Oil & Gas facilities.** This would reduce not only odors, but also air pollution in general, including odorless toxic emissions.

- **Best Available Control Technology (BACT) – Evaluation is needed on tightest BACT standards for all equipment including but not limited to fugitive components and complete enclosure and control of operations.** Recently, the City of LA required adding a complete enclosure at the Jefferson drill site, and additional requirements.[8] The County should perform a formal top-down BACT evaluation, as defined by EPA, to identify best technologies in practice, and require for all drilling operations.[9]

- **Survey or interview of neighbors is crucial, regarding their experience of smells, health impacts, noise, shaking, and other impacts – these are not well-documented in existing Air District or other data.** Adding this step was recommended by Advisory Panel members but hasn't yet been carried out, although staff did include this as a recommendation for the future. The Air District itself identified lack of accurate emissions inventories for extraction operations.[10] At the same time, it is well-established that extraction operations can cause significant and harmful emissions of toxics, criteria pollutants, and greenhouse gases, so it will be crucial to supplement the County investigation with surveys of neighbors' experience.

- **Requirements to restrict use of hazardous chemicals, including evaluating banning deadly hydrogen fluoride, which is now being considered by the SCAQMD in oil refining operations**. Hazardous chemicals are widely used even in conventional drilling operations during in the region for well maintenance and other activities, and are trucked through the middle of neighborhoods and stored onsite, near homes and schools. Please see my previously cited September 2016 comments, which identified dozens of hazardous chemicals routinely used in oil drilling operations.

- **Oil & Gas pipelines** – The network throughout the County is extensive (in incorporated and unincorporated areas) presents hazards, has had spills, moves between jurisdictions, and appears to be expanding. This needs additional County evaluation.

- **The need for follow-up on Orphaned & Abandoned wells** is important, as previously discussed. (Also see comments of fellow Advisory Panel members.)

6. Risk factor weight – Risk factors should not have been based solely on well pressure or current H2S presence. With lateral drilling and many wells drilled from one location, current conditions may change. While current characteristics are useful to know, proximity to neighbors should be more highly weighted as a risk factor.

7. Correct legal inaccuracies and complete legal evaluations identified in the report:

   - **For example, the referenced Appendix A inaccurately states *"DOGGR retains exclusive jurisdiction*** *over all subsurface oil and gas activities in California including well stimulation techniques, such as hydraulic fracturing."* (Appendix A, p. 3) This isn't entirely accurate. For instance, the County, Cities, and Air District are evaluating or have already regulating fracking and related Enhanced Oil Recovery (EOR) techniques and chemical usage and reporting inside wells.[11] These also have above-ground impacts, including hazardous material transport risks and potential air emissions, which is the reason the SCAQMD began requiring reporting of chemical usage for these activities. **The SCAQMD also found that many so-called conventional drilling techniques carried out the same activities used in fracking (such as maintenance acidizing).[12]**

   - **Complete legal evaluations in order to carry out above recommendations, including discretionary permitting, setbacks, and other health & safety protections.** Also see submitted CBE comments regarding legal authority of the County.[13]

Thanks are in order to the County Strike Team, Staff and Consultants for the hard work, and particularly to Supervisors Solis and Ridley-Thomas for setting this taskforce in progress, as well as to all Supervisors and other Advisory Panel members. Follow-up activities will be crucial in meeting health goals.

Endnotes:

[1] http://planning.lacounty.gov/oil-gas/strike

[2] 3rd Report, *["The updated code should require that wells and associated facilities have a sufficient buffer zone from residential and other sensitive land uses. This would be determined based on health risk, air quality, noise, odors, aesthetics and other environmental, health and safety, and public nuisance considerations. An incentive program could be developed as part of the new code to encourage oil and gas producers to plug and abandon facilities within the new setback."]* P. 134, http://planning.lacounty.gov/oil-gas/strike

[3] McKenzie, L. M., Witter, R. Z., Newman, L. S., & Adgate, J. L. (2012) ***Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources,*** Science of the Total Environment, Vol. 424 at 79-87. Peter M. Rabinowitz, et al. (Jan. 2015) *["Residents living ≤ ½ mile from wells are at greater risk for health effects from NGD than are residents living >½ mile from wells."]* https://www.ncbi.nlm.nih.gov/pubmed/22444058 and ***Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania,*** Envt'l Health Perspectives, Vol. 123, at 21–26, *available at* https://ehp.niehs.nih.gov/1307732/

[4] County Memorandum with of Advisory Panel member comments attached, June 20, 2017 To: LA County Wells Strike Team Advisory Panel From: LA County DRP MRS Environmental Subject: LA County Strike Team Biannual Report #2 Advisory Panel Comments http://planning.lacounty.gov/oil-gas/strike, also, J. May Comments submitted to LA County, 9/16/2016, *Key issues Staff should consider in developing its evaluation and recommendations on Oil & Gas facilities,* available at County website, available as an attachment in the County website to the Nov. 16, 2016 County report - Advisory Panel Report on Board Motion Regarding the Oil and Gas Strike Team for Unincorporated Los Angeles County, available under Advisory Panel section as http://planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20161116-report.pdf, also other important advisory panel member comments regarding manh of the issues summarized in this comment.

[5] http://planning.lacounty.gov/assets/upl/project/oil-gas_advisory-comments-report2.pdf

[6] For example, PBS documented the **low-tech** community monitoring of Communities for a Better Environment's "Bucket Brigade, in 2002, which started in the 1990's in the Bay Area, at http://www.pbs.org/pov/fenceline/the-

bucket-brigade/ CBE also spearheaded the legal and technical requirements for the **high-tech** Optical Sensing Fenceline Monitoring at the former Unocal Rodeo Bay Area refinery Good Neighbor Agreement requirement of Contra Costa County, subsequently watchdogged for accuracy by local residents in Crocket and Rodeo. http://issues.org/32-2/citizen-engineers-at-the-fenceline/ This required substantial community work on Quality Assurance. Substantial monitoring work has also been done in recent years by community members such as Jesse Marquez of Communities for a Safe Environment (CFASE) in the South Coast, and by many other community efforts.

[7] http://www.aqmd.gov/docs/default-source/rule-book/reg-xi/rule-1148-1.pdf

[8] *City orders tougher rules for oil drilling site near South L.A. homes,* October, 2017, http://www.latimes.com/local/lanow/la-me-ln-jefferson-drilling-20171013-story.html

[9] EPA's Top Down BACT requirements are as follows: Step 1: Identify all control technologies. This list must be comprehensive and include all "Lowest Achievable Emission Rates" ("LAER"); Step 2: Eliminate technically infeasible options; Step 3: Rank remaining control technologies by control effectiveness; Step 4: Evaluate most effective controls and document results; Step 5: Select most effective option not rejected as BACT. For example, NSR Manual, Table B-1. The U.S. EPA established the top-down analysis process for BACT outlined in the 1990 Draft New Source Review Workshop Manual,[9] which provided additional required details, at: https://www3.epa.gov/ttn/naaqs/aqmguide/collection/nsr/1990wman.pdf

[10] SCAQMD, Staff Report, Proposed Rule 1148.2 – Notification and Reporting Requirements for Oil and Gas Wells and Chemical Suppliers, April 2013, *[*"*During the evaluation of hydraulic fracturing for oil and gas well operations, the SCAQMD staff concluded that there are* ***potential air emissions*** *associated with hydraulic fracturing from particulate matter during mixing hydraulic fracturing fluids, and hydrocarbons and possibly toxic emissions from flowback fluids that return to the surface.* ***Upon further analysis, the SCAQMD staff found that drilling and rework operations have similar emission sources as well completion activities such as hydraulic fracturing.*** *The SCAQMD staff evaluated these emissions sources relative to existing rules and regulations. SCAQMD staff found regulatory gaps in existing SCAQMD rules that did not cover these operations."]* at p. ES-1, and ***[*"*The SCAQMD does not have emissions data on the types of oil and gas production activities that are covered under the proposed rule****. In a report from the Office of Inspector General,*** ***"EPA Needs to Improve Air Emissions Data for the Oil and Natural Gas Production Sector"*** *released February 20, 2013, it was found there are deficiencies in emission data for well completions for oil and gas processes.* ***EPA stated that with limited data, human health risks are uncertain, states may design incorrect or ineffective emission strategies, and EPA's decisions about regulating industry may be misinformed."]*** at p. 1-3. While the AQMD report also stated that it believed its new regulations would lead to development of better data, this data is still incomplete, and ongoing reporting and monitoring measures are being evaluated. Report available at: http://www.aqmd.gov/docs/default-source/compliance/rule-1148-2-staff-report.pdf

[11] See, e.g., Measure Z in Monterey (though that was a vote) which bans fracking and limits drilling; Alameda County (vote of supervisors); Santa Cruz, San Benito, Mendocino and Butte counties.

[12] Ibid, SCAQMD staff report

[13] March 13, 2017, *Recommendations Regarding Updating the Los Angeles County Municipal Code to Protect Public Health, and Comments Regarding Draft Public Report No. 2,* by CBE attorneys Jaimini Parekh and Gladys Limon, available at County website as "CBE" under Public Comments, at: http://planning.lacounty.gov/assets/upl/project/oil-gas_strike-cbe-20170313.pdf

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

October 25, 2017

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Re: Comments from Tim O'Connor (District 3 rep.) and EDF on the LA County Oil Well Strike Team's Biannual Report No. 3

Dear Mr. Stapleton and members of the LA County Oil Well Strike Team,

Please accept these comments on the third and final draft of the biannual report of the LA County Oil Well Strike Team report.

We commend your effort to take on the lengthy but necessary task of performing facility assessments; reviewing zoning codes and permitting processes (which haven't been updated since the early 1950's); considering necessary protections for public health and safety; and taking public comment into account in the development of your report. As documented by the Strike Team, this report and its recommendations are but a step in a longer process for the county, one which should culminate in a set of protections for the citizens of Los Angeles County and which can set a positive example for nearby jurisdictions to follow. It is therefore of utmost importance that the Strike Team get their recommendations correct by fully taking into account public health science, law, and technological capabilities to move this effort forward - and pass the necessary zoning code modernizations with utmost speed and vision.

In general, many of the recommendations for zoning changes, additional inspection activities and community outreach are well founded and the County should move forward with utmost speed. At the same time, some of the recommendations (and justifications) deserve additional clarification and focus to ensure the County protects local communities from the risk of exposure while also encouraging producers to do everything they can to maximize the environmental integrity of their operations.

We offer our responses to specific recommendations to the Strike Team report as follows:

1. **Eliminating by-right drilling and implement discretionary permitting with comprehensive requirements that protect people:** At its core, the ability of local land use and permitting agencies to determine the conditions which must be implemented at production sites to protect the public health and environment makes complete and common sense. The County estimates that currently 85% of the county's oil and gas wells do not require permit-based approval and yet, as shown by the County's survey and inventory conducted by the Strike Team, and in analysis done by entities like Communities for a Better Environment (CBE) and EDF, the county has many production sites located in close

proximity to people, sensitive environmental conditions, bodies of water and much more. Though not all of the facilities located in close proximity to people were a part of the Strike Team's inventory, which was limited in scope to evaluating only 557 out of the 1,687 wells existing in the entire county, the broader county has thousands of people that do in fact live in alarmingly close proximity to active wells.

In a recent analysis, we estimate that in Los Angeles County alone, nearly 14,000 people live within 50 m of an active oil well (defined as a well that has withdrawn oil in the last 18 months).

	Number of people living within specified distances from an actively producing oil and gas well			
	Within 50 m (approx. 160 ft.)	Within 100 m (approx. 325 ft.)	Within 200 m (approx. 650 ft.)	Within ½ mile (2640 ft.)
All California	24,660	65,650	155,290	890,000
Los Angeles	13,960	36,350	88,580	584,580

With greater knowledge of the health risks associated with exposure to oil and gas pollution, it is crucial for land use and permitting agencies to impose responsible measures for public health and environmental protection at oil and gas sites, which begins with eliminating the practice of allowing operators to drill "by-right" without oversight by the County.

We are pleased and heartened to see that the Department of Regional Planning (DRP) will "prepare a zoning code update to ensure that oil and gas facilities may no longer be permitted to operate by-right in the unincorporated portions of the County." Eliminating by-right drilling is a critical and long overdue step in ensuring proper oversight of facilities and in providing a preliminary and basic layer of protection for people living nearby. We suggest that discretionary, permit-based review and approval of drilling include a comprehensive and thorough checklist of items that operators must meet prior to approval that will ensure better protections including monitoring requirements for noise and air, enclosures, and appropriate setback distances.[1],[2] We urge that DRP implement this action as expeditiously as possible, and we underscore the importance of conducting "outreach to local jurisdictions interested in collaborating on the development of regulatory requirements or protocols for monitoring and evaluating their local oil and gas facilities." We think this is critical in information sharing, distribution of best practices and ensuring that other jurisdictions follow the example set by the County in eliminating by-right drilling. We suggest prioritizing communication with jurisdictions nearby with heavy oil and gas operations, and especially those that are in close proximity to population centers.

[1] The City of Los Angeles recently imposed requirements for continuous fenceline air monitoring on the Jefferson Drill Site in South Los Angeles after years of complaints about noise, bad smells and the occasional misting of oil onto cars and homes. http://www.latimes.com/local/california/la-me-oil-drilling-jefferson-20160125-story.html

[2] A 2016 court order against AllenCo in Los Angeles requires the installation a state-of-the-art environmental health and safety monitoring system which includes continuous monitoring at four sampling locations on AllenCo's grounds, though no system has been installed to date since the site has not resumed operations. https://www.lacityattorney.org/blog/tag/MIke-Feuer

2. **Setback distances:** The Strike Team report takes an important step forward by recommending the use of buffer zones, or setbacks. As a tool, setbacks have been adopted in jurisdictions around the nation and have shown to be an effective way to reduce community exposure risk. While the method and details of implementing a setback framework for new and existing oil and gas production sites in Los Angeles are important to work out (e.g. such as what the appropriate distance is, what to do with facilities that fall within that setback distance, etc.), the basic recommendation of instituting a setback buffer zone from residential and other sensitive land uses for new and existing sites is critical and should move forward. Accordingly, EDF sees this as not a question of whether setbacks should be developed (they should), but rather a process of how. EDF also agrees with comments from 1st District Strike Team Advisory Panel member Julia May that creating incentive based setback standards may be inappropriate for this task, though evidence on this issue is important to evaluate further.

   On the issue of the size of the setback to be adopted by the county, the report says that distances would be determined based on health risk, air quality, noise, odors, aesthetics and other environmental, health and safety, and public nuisance considerations. However, this framework does not appear to take into account that health literature[3] suggests that that a single minimum distance may be appropriate – as opposed to a site-by-site assessment. EDF therefore recommends the Strike team and County evaluate a setback standard based upon a single distance framework, such as that proposed by comments received by 1st District Advisory Panel member Julia May on the report. We agree that by evaluating a mandatory, single-distance setback framework, the County would be harmonizing with current LA City efforts.

3. **Air monitoring and leak detection:** With the advent of new technology to conduct air monitoring and leak detection at oil and gas production sites, it is more crucial than ever that the County move forward with its recommendation on air monitoring.

   While we agree that it is important for the Department of Regional Planning (DRP) to conduct outreach to local jurisdictions to help develop regulatory requirements and protocols for monitoring, we recommend the County first adopt a standard that mandates that monitoring be performed, and then move expeditiously into standards development. In the development of such standards, we support the recommendation for "the creation of a program within the Land Use Regulation Division to continually ensure monitoring and compliance for all oil and gas facilities." We also support the County prioritizing both monitoring deployment and compliance assurance activities at sites in closest proximity to people.

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[3] McKenzie, L. M., Witter, R. Z., Newman, L. S., & Adgate, J. L. (2012) ***Human Health Risk Assessment of Air Emissions from Development of Unconventional Natural Gas Resources,*** Science of the Total Environment, Vol. 424 at 79-87. Peter M. Rabinowitz, et al. (Jan. 2015) *["Residents living ≤ ½ mile from wells are at greater risk for health effects from NGD than are residents living >½ mile from wells."]* and https://www.ncbi.nlm.nih.gov/pubmed/22444058 and ***Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania,*** Envt'l Health Perspectives, Vol. 123, at 21–26, *available at* https://ehp.niehs.nih.gov/1307732/

With regard to the types of monitors to be deployed, the Strike Team report advises that "fenceline monitoring can be used to identify leaks and unintended or accidental releases at any facility if the same technologies are applied, not just refineries, and could alert communities of potential health and safety issues." We agree with this observation and call for local air pollution districts, such as the SCAQMD, which is currently considering real-time air monitoring requirements at refineries under Rule 1180, to launch a similar rule for monitoring requirements at production sites. Where real-time monitoring is either infeasible or unsuitable for capturing all pollutants of concern, layered mobile monitoring should be considered as well, and consideration should be given to technologies capable of capturing data with high spatial resolution, low detection limits, and with maximized cost effectiveness.

If efforts by SCAQMD come to fruition on monitoring, we recommend that the County harmonize its efforts on monitoring with requirements for oil and gas pollution monitoring in an SCAQMD rules. However, the fact that SCAQMD may act on monitoring should not stand in the way of the County imposing its own requirements, especially given the slow-moving timeline from the agency.

4. **Storage facilities:** The Strike Team correctly identified that "storage facilities in the oil and gas industry have historically leaked crude products during many years of operations, and substantial damage has occurred as a result of subsequent residential uses being placed in previously contaminated areas," citing the Carousel Tract in the City of Carson, where residences were built on top of areas previously occupied by leaking storage tanks, as an example for a neighborhood that has acquired significant health burdens due to contaminant exposure. EDF agrees that DRP must include in the new oil code a regulatory framework new and existing storage facilities. While we are pleased to see the proposed action step of including a protocol for leak inspection and detection of existing areas of concern in the updated code, along with remediation strategies and clean up goals, we would like for the Strike Team to propose an enforcement mechanism in order to ensure these companies properly comply.
5. **Other Industrial uses:** We agree with the recommendation to have the Strike Team identify other industrial facilities within the unincorporated County and surrounding communities that may merit additional oversight and review including storage facilities, battery plants, refineries, and other facilities that contain a high risk of harming people living and working nearby. We agree that the Strike Team should conduct Risk Analysis to assess the level of risk that could exist from these facilities and the types of potential mitigation that could be used to remedy potential risks.

6. **Associated Oil and Gas Facilities Outside County Jurisdiction:** The Strike Team staff astutely noted that several of the County's facility operations cross jurisdictional boundaries, with associated processing facilities, trucking routes and pipelines often being located in adjacent counties or cities. Such was the case in the Strike Team's own inventory of the Matrix Sansinena, Linn Energy, CRC, Brea Canon, and Breitburn Rosecrans operations, where "some produced oil or gas is transported by pipeline to a processing facility located outside the unincorporated County of Los Angeles jurisdiction in adjacent jurisdictions."

We agree with the staff recommendation that the Board "consider review of relevant oil and gas facilities located outside County jurisdiction under the parameters of the Project." However, we do not believe the review should be on a "case by case" basis – rather there should be an automatic review of any and all operations, regardless of location, associated with a core facility located within the County. To this end, EDF also agrees that the Board should work in tandem with other counties and cities to ensure the proper review and inspection of all aspects of facility operations. Additionally, this is a pivotal opportunity for the Board to share this important undertaking and the lessons learned as well as recommendations that result from this Strike Team review process.

7. **Sharing best practices and lessons learned from the Strike Team effort with other jurisdictions:** While this recommendation is sprinkled throughout the report, it is important to explicitly recommend that the Strike Team share with other jurisdictions and agencies the important work done and valuable findings that have been captured as a result of the 18-month endeavor carried out. There will be many opportunities to share these lessons if the recommendations are carried out about sharing planned actions on removing by-right drilling and reviewing associated oil and gas facilities outside of the scope of this project. However, EDF recommends that the Strike Team create some structure around sharing this work in the form of a best practices report, along with the creation of a workgroup with key officials from agencies in jurisdictions throughout California, and the public, that meets periodically.

   As a proposed future action, the Strike Team report includes the creation of an ordinance that would include a "review of the DOGGR Renewal Plan on oil and gas well regulation at the State level to determine how the oversight coordinates with current and future County oversight." This is an important effort, and a working-group could continue to information share and create priorities for coordination among agencies. Currently, the inventory of oil and gas wells, and zoning code regulations are out of date in many jurisdictions across the state. In order for effective actions aimed at properly regulating oil and gas operations in California, it is critical for an accurate inventory of oil and gas wells, and their impacts including proximity to people (and health and safety concerns), be updated. Creating a system for sharing best practices and lessons learned will therefore be critical moving forward.

8. **In addition to the comments above, EDF also agrees with several of the comments submitted by 1st District Advisory Panel Member, Julia May on 10/19/2017, including comments on sections related to:**

   - Odor Prevention Plans
   - Best Available Control Technology (BACT)
   - Survey or interviews of neighbors
   - Requirements to restrict use of hazardous chemicals
   - Oil & Gas pipeline evaluation
   - Orphaned & Abandoned well further examination

Thank you for considering these comments moving forward.

Sincerely,

Timothy O'Connor
County District 3 Representative, Oil and Gas Strike Team Advisory Panel Member
Director and Senior Attorney, California Oil and Gas Program, Environmental Defense Fund

Irene Burga
Manager, California Climate & Energy for the Environmental Defense Fund

FOURTH DISTRICT
ADVISORY PANEL MEMBER
MATT REZVANI
COMMENTS

Mr. Timothy Stapleton,
AICP Zoning
Enforcement West
Department of Regional
Planning 320 W. Temple
Street
Los Angeles, CA 90012

October 24, 2017

Subject: Los Angeles County Oil and Gas Facility Compliance Review Project
Bi-Annual Report Number Three
Comments by Matt Rezvani – 4th District Advisory Panel member

Dear Mr. Stapleton,

The work of the strike team, staff and the consultant in inspecting and reviewing a great number of oil and gas facilities and wells in unincorporated segments of LA County, as directed by County Board of Supervisors' motion, is commendable. The fact that this 3rd and final report includes all previous reports and inspection results makes the report a valuable document. We particularly appreciate the fact that the report summarizes the comments and recommendations made by various members of the Advisory Panel at several Strike Team and Advisory Panel meetings about other issues and inspection of other facilities.

Considering that previous comments are covered in this report, these comments will be limited to recommendations on potential follow-up works. However, there are some suggestions regarding the format of the report that can improve the report in prioritizing issues for any future follow-up inspections.

- In coordination with oversight agencies such as DOGGR and SCAQMD, the county should create a program for continuous monitoring and compliance, particularly of those facilities identified with gaps in their compliance or those with repeated problems,

- The county should support California Department of Conservation in their efforts to secure even additional funding than what was approved this legislative session for corrective abandoning of orphan oil wells in the communities by DOGGR.

- Potential future county regulations regarding these and other facilities should not duplicate federal, state or local regulations. They can be included by reference. The

county can instead focus its efforts and limited resources on areas where there are regulatory gaps such as zoning and setback issues, as well as inspection of facilities with repeated violations or chronic problems.

- Prior to developing any potential pipeline inspections protocols, the Strike Team should consider consulting California State Fire Marshal regarding their planned annual inspection program that will identify high risk pipelines as required by SB 295, a bill that was introduced by Senator Jackson and enacted in 2015.

- The Executive Summary should have also contained the Recommendations and Conclusions sections (Section 4 and 5) of the report. This would have made it easy for some readers who have limited time to capture the essence of the report with its recommendations by reviewing the Executive Summary.

- A comprehensive list of facilities that either had various gaps in their compliance, repetitive odor issues or some more significant shortcomings would have been helpful to identify repeat violators and to prioritize those facilities for potential future inspections.

Matt Rezvani
Member of the Advisory Panel - 4th District

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Amy J. Bodek, AICP
Director

March 15, 2018

TO: Supervisor Sheila Kuehl, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: Amy J. Bodek, AICP
Director

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning (DRP), in coordination with the Fire Chief, Interim Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

In accordance with the Board's motion, the Strike Team submitted the third and final update report to the Board on September 28, 2017, for existing oil and gas production facilities within the unincorporated Los Angeles County. That report included facility findings, recommendations for the Board's consideration, and future efforts for the Strike Team. The report and appendices can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

DRP is currently finalizing a Request for Proposal for consulting services to assist the Strike Team's future efforts. It is anticipated that a consultant will be hired at the beginning of Fiscal Year 2018-2019, and an update report on the Strike Team's progress will be submitted to the Board by September 29, 2018.

Should you have any questions about this report, please contact Timothy Stapleton at tstapleton@planning.lacounty.gov or (213) 974-6453.

AJB:JS:ts

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

S_031518_LUR_L_BOS GAS OIL STRIKE TEAM

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Amy J. Bodek, AICP
Director

September 5, 2018

TO: Supervisor Sheila Kuehl, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: Amy J. Bodek, AICP
Director

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

In accordance with the Board's motion, the Strike Team submitted the third and final update report to the Board on September 28, 2017, for existing oil and gas production facilities within the unincorporated Los Angeles County. That report included facility findings, recommendations for the Board's consideration, and future efforts for the Strike Team. The report and appendices can be accessed on the Department of Regional Planning's (DRP) web page at planning.lacounty.gov/oil-gas/strike.

A memo to the Board dated March 15, 2018, provided an update on a Request for Proposal for consulting services to assist the Strike Team's future efforts. To date DRP finalized the Request for Proposal for consulting services and selected MRS Environmental Inc. as the winning proposal. On September 4, 2018, the Board approved the contract between Los Angeles County and MRS Environmental Inc. and the contract became effective on September 5, 2018.

The Strike Team will be researching and reviewing those items listed below and an update report on the Strike Team's progress will be submitted to the Board by March 29, 2019.

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines
- Oil and Gas Storage Facilities
- Review of Chemicals not identified in Hazardous Materials Business Plans

Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AJB:JS:ts

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

S_LUR_090518_L_OIL&GAS STRIKE TEAM

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Amy J. Bodek, AICP
Director

Dennis Slavin
Chief Deputy Director

March 28, 2019

TO: Supervisor Janice Hahn, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Kathryn Barger

FROM: Amy J. Bodek, AICP
Director

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

A memo to the Board dated September 5, 2018, provided an update on the Board's approval of the contract between Los Angeles County and MRS Environmental Inc. to initiate Phase II of the Strike Team's efforts. Phase II focuses on the following oil and gas items:

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines
- Oil and Gas Storage Facilities
- Review of Chemicals not identified in Hazardous Materials Business Plans

In accordance with the Board's motion, the Strike Team is submitting the sixth update report to the Board for these oil and gas subject areas within unincorporated Los Angeles County. This report is the first of six update reports for the Phase II effort. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

The Strike Team held a public meeting on March 21, 2019, to discuss the sixth update report and to hear public comment. The Strike Team passed a motion to direct staff to file this report with the Board. The next Strike Team report is due to the Board no later than September 29, 2019.

Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AJB:JS:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_20190321-report6.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

032819_LUR_L_OILANDGAS

Los Angeles County
Department of Regional Planning

Planning for the Challenges Ahead

Amy J. Bodek, AICP
Director

Dennis Slavin
Chief Deputy Director

April 25, 2019

TO: Supervisor Janice Hahn, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Kathryn Barger

FROM: AG Alex Garcia, Supervisor
Zoning Enforcement Special Projects

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning (DRP), in coordination with the Fire Chief, Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Strike Team's sixth biannual report was submitted to the Board on March 28, 2019.

The Board also requested that a five-member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team to assess the team's findings and recommendations and to provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. The Advisory Panel public meeting was held on April 22, 2019 to discuss this assessment of the Strike Team's report.

This report addresses the Advisory Panel's assessment of the Strike Team's sixth biannual report. This report includes the written comments from Advisory Panel members

from the First, Second, and Third, Supervisorial Districts. The Advisory Panel report can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

The appointed Advisory Panel members are:

- First District Board Office appointee – Julia May
- Second District Board Office appointee – Andrew Weissman
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani
- Fifth District Board Office appointee – R. Rex Parris

The next Oil and Gas Strike Team report to the Board is due on September 29, 2019, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement Special Projects section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AG:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20190425-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Fire Department
Department of Public Health
Department of Public Works

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

4/18/2019 **Comments & Recommendations on Report #6, LA County Oil & Gas Strike Team, Julia May, District 1 Advisory Committee representative**

Follow-up regarding setbacks:

- County Report #3 recommended requiring setbacks between wells, and residences and sensitive land uses, as follows:

  > **"The updated code should require that wells and associated facilities have a sufficient buffer zone from residential and other sensitive land uses.** This would be determined based on health risk, air quality, noise, odors, aesthetics and other environmental, health and safety, and public nuisance considerations. An incentive program could be developed as part of the new code to encourage oil and gas producers to plug and abandon facilities within the new setback." (p. 134)

- **Please provide the Strike Team and Advisory Committee with a progress report on this activity.** I again recommend a 2,500 foot setback, as previously discussed.

Environmental Justice and Equity Principles need to be elevated

- I received information regarding the need for a trained facilitator at County Oil & Gas Listening Sessions, to support and welcome community member input.
- The County has already developed equity principles related to Environmental Justice and equity through the LA County Center for Health Equity, which could be applied to the Listening Sessions: http://publichealth.lacounty.gov/CenterForHealthEquity/About.html
- These principles should be applied to the next O&G strike team public listening sessions and other meetings, to welcome and support community members participation. Community members provide valuable perspectives, and help identify gaps in communications and necessary evaluation. Impacted community members also deserve information and respectful answers to questions.
- In addition, please see recommendations below, regarding including Environmental Justice factors in prioritization of actions needed on abandoned O&G well, pipelines (as well as other sources of risk evaluated by the Strike Team).

Abandoned Wells:

- I appreciate the work of fellow advisory member Matt Rezvani in helping county staff and consultants identify abandoned O&G pipeline data, and gaps in oversight, as reported in Report #6.
- The sheer number of abandoned wells makes prioritization and actions difficult.
- Wells were prioritized based on: well status (plugged or unknown), well location and census block population density, historical well type, well location within 500 feet of an active injector well, age of well by spud date (date drilling commenced), well located in an oil and gas field by field age, and reservoir characteristics. (p. 11)
- **Please add to the list of well priority factors to include the siting of wells in EJ communities, which experience a high cumulative burden of multiple environmental and safety hazards.** For example, CalEnviroscreen (https://oehha.ca.gov/calenviroscreen) provides a ranking of zipcodes and census blocks according to individual and cumulative burdens of environmental impacts and socioeconomic stressors. I urge the County to include the Calenviroscreen rankings as one of the priority factors at the well sites, to supplement the list on p. 11. This will help to identify abandoned wells in communities that are already the most at-risk.

- **Simple emissions measurements at abandoned wells may help in prioritizing**. Many low-cost monitoring options are available which could help identify wells that are already emitting to atmosphere. The report states that monitoring is not part of the scope, but it may be a useful tool to help prioritize actions to remediate the large set of abandoned wells requiring action.
- **The County should consider also identifying the list of abandoned wells within the City of LA** (not just unincorporated areas), since the County has developed a method for pulling this data together. I do not think the City has yet pulled together this particular data set.
- **I look forward to follow-up information on accidents/events at abandoned wells,** and community impacts such as air, water, soil, public health harms.

O&G Pipelines – abandoned, idle, retired, or in-service:

- **I recommend the County include reports of pipeline spills that have occurred, and lessons learned.** For example, Wilmington, a center of oil and gas infrastructure, had at least two major pipeline ruptures that I know of in the last ten years, where oil spilled onto residential streets in large volume near houses, making people sick. For example, the photo below shows a 2014 spill. Although this is part of the City of LA rather than unincorporated LA County, there are lessons to be learned from evaluating this incident. This was an old oil pipeline no longer in use, owned by Phillips 66, which may have been a "retired" pipeline that was no longer maintained, and appears not to have been properly "abandoned". People had no idea the pipeline was present.
- This caused severe odors, and prompted a visit and comments by Janice Hahn, at the time U.S. Representative (San Pedro), who visited the site out of "concern for the safety and well-being of the residents of Wilmington." She stated: "The harsh, crude oil smell is not only horrible, but can also be potentially harmful to the neighborhood residents and environment."
- "As a member of the House Transportation and Infrastructure Subcommittee on Railroads, Pipelines and Hazardous Materials, I plan to make this oil spill incident a priority," . . . "I have already reached out to the subcommittee to find out what federal actions we can take to ensure that an incident like this will not happen again, and that there is proper oversight with our nation's pipelines." . . . "We have to protect the residents of Wilmington and the environment from the risks of hazardous materials transportation." [1]

Phillips 66 2014 Wilmington neighborhood oil spill from Press-Telegram

[1] Crack in idle Phillips 66 pipeline spews crude oil onto Wilmington streets, Press-Telegram from Sandy Mazza, Daily Breeze, 03/18/14, http://www.presstelegram.com/general-news/20140318/crack-in-idle-phillips-66-pipeline-spews-crude-oil-onto-wilmington-streets

- **I urge the County to gather relevant reports on the cause and recommended follow-up actions related to investigations of this incident,** especially as Supervisor Janice Hahn witnessed this herself, and called for follow-up actions.
- I recommend the county provide a list of known oil and gas pipelines ruptures, leaks, and other accidents, with causes, locations, impacts, and lessons learned.
- **I again recommend that CalEnviroScreen be used to identify areas with highest cumulative burdens, as a factor in determining future actions to ensure health and safety related to Oil & Gas pipelines.** For example, please note that the map in Report #6 Fig. 4-1 (p. 33) shows that pipelines become more highly concentrated in the Wilmington area. This is likely a result of pipelines concentrating from the ports area to the broader region. This illustrates that EJ communities such as the Wilmington area may have higher concentrations of such pipeline risks. This would be important to evaluate in the County reports. Nearby unincorporated areas are likely also at higher risk. Also, pipelines do not stop necessarily stop or start in unincorporated or incorporated areas, but travel across regions.
- **I request some additional definition of important terms, which can make the difference between a pipeline being covered or not by specific regulations.** For example, Report #6 used the terms "hazardous liquids" and "highly volatile liquids" at many points relating to various federal, state, and other regulations. But these broad terms are defined differently in different regulations and laws. Certain compounds can be exempt under such definitions, so clear definitions in the County reports are necessary for these descriptions to be meaningful. (For example, see Report #6, p. 24.)
- **In general, while listing the existing regulations is helpful, it would be more helpful to provide evaluation of the limitations and gaps in the regulations.**

Well Maintenance and rework:

- I appreciate the beginnings of analysis on the 1148.2 reporting regulation, including the lists of chemicals used, and that the County is planning additional follow-up including the impacts of these chemicals. **Please provide CAS (Chemical Abstracts Service) numbers for each chemical (helpful since chemicals have many synonyms).**
- Please note the limitations of Rule 1148.2, which does not report the volumes of chemicals stored at well sites. Since the County has identified the scope as mainly relating to above-ground activities, storage of these chemicals is very relevant (in addition to the use of chemicals within the wells). **Please identify available data on storage of toxic chemicals at well sites. Transportation methods, volumes, and routes are also very important to identify, to determine risks. Certain chemicals are higher risk than others (for example, hydrofluoric acid).**
- Specific comments were submitted by community organizations to the South Coast Air Quality Management District during Rule 1148.2 development and adoption regarding the limitations of the rule, and the need to improve the reporting and notification process in the future. **I recommend that the County collect the written comments submitted to SCAQMD by community members, and summarize the recommendations in future reports.**

O&G storage:

- **I look forward to the strike team follow-up to develop more information on the hazards related to oil and gas storage.**

SECOND DISTRICT
ADVISORY PANEL MEMBER
ANDREW WEISSMAN
COMMENTS

ANDREW N. WEISSMAN

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STUART N. ARKIN
(1915-1975)
ALVIN H. WEISSMAN
(1919-1991)

April 11, 2019

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street Los Angeles, CA 90012

Re: Comments to LA County Oil Well Strike Team Biannual Report #6

Dear Mr. Stapleton:

I have reviewed the report and cover memo and have no questions or comments with respect thereto.

Very truly yours,

Andrew N. Weissman

bwa

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

April 24, 2019

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Re: Comments of Tim O'Connor (District 3 rep.) and EDF on the LA County Oil Well Strike Team's Biannual Report No. 6 (Phase II, Report No. 1)

Dear Mr. Stapleton and members of the LA County Oil Well Strike Team,

Please accept these comments on the sixth report of the LA County Oil Well Strike Team (Phase II, Report No. 1).

We commend your effort to maintain and make progress on the lengthy but necessary task of conducting a comprehensive evaluation of the oil and gas industry in Los Angeles - in conformance with the direction within the LA County Board of Supervisors March 29, 2016 motion.

In support of the Strike Team's effort, and to help ensure the work both lays a transparent foundation for appropriate action, and considers the most up to date information, please accept these comments and recommendations for inclusion in the Strike Team report as follows:

Comments on process

- On the issue of high-level process, given that there are going to be six reports in this series, and this is the first of the six, I recommend a change in the process going forward. As it stands now, the Advisory Panel receives a copy of the Strike Team's final report and is asked to comment on it. In the past, the only way the Advisory Panel's input has been formally incorporated into the report has been by way of an appending of the text of each person's comment to the back of the report. As a result, the panel members are not allowed or given the opportunity to participate during the development process. I suggest a conference call with the panelists mid-way through the report development process to update them on the progress and solicit feedback and input earlier on so as to ensure authentic and robust engagement.

- The report focuses on four issue areas - Abandoned and orphaned wells; Storage facilities; Pipelines; and, Hazardous chemicals. However, given that new information may have surfaced on other issues related to oil and gas development during the development of this report, I recommend the strike team leave open the opportunity (and explicitly make room in the report) for other observations and emerging issues that are identified during the report

development process. In particular, I recommend the report include a section on issues identified during Strike Team review.

Comments on idle, abandoned and hazardous wells

- The Strike Team proposes to develop a prioritization matrix for idle, abandoned and hazardous wells based on a series of factors. However, it is uncertain what this scoring will be used for. At the Advisory Panel meeting on April 22, it was discussed that this matrix would be used to inform the Board of wells that warranted further oversight and potential sampling. Based on that additional work, this prioritization ranking could be used to prioritize actual well rework and plugging as well as continuous air monitoring – or to inform DOGGR of the need to do such work. If this is indeed the intent, it should be clearly spelled out in the report.

- The prioritization matrix should be made public as it is being developed, no later than upon the release of each report. This should include all of the factors going into the matrix as well as the results.

- Additional criteria should be considered for the matrix, such as 1) water level recordings during regular tests by operators, 2) observations in county or other well records of negative integrity indications, 3) date on which prior plugging was performed, 4) whether the well is located in a disadvantaged neighborhood, using a tool like CalEnviroScreen to elevate the issue of environmental justice, and 5) proximity to sites of past incidents (such as blowouts). Further, at the Advisory Panel meeting, it was stated that for wells at the recent Marina Del Rey blowout site, there had been past incidents of issues at nearby wells and elevated gas pressure in the well(s). Since pressure inside a well can contribute to leakage, the prioritization matrix should include whether the wells are having, or have experienced past incidents and whether they have downhole pressure above atmospheric. Additionally, in coastal locations such as Marina del Rey, nearby offshore wells should also be examined for past or present leaks. Any information obtained regarding well pressure information should also be made public, so as to empower residents and other community members of higher-risk wells in the area.

- It is my understanding that several years ago DOGGR conducted a review of water level testing records for idle wells and found several idle wells that showed year over year changes to water level recordings, indicating potential negative well integrity. The Strike Team should seek out such records for all wells in the unincorporated area of Los Angeles (possibly though access at DOGGR or through the DOGGR well finder program), and add to the matrix a score for whether well records indicate any communication between well liquids and the surrounding geologic formation. To the extent that the Strike team received information from DOGGR in the January 15, 2019 correspondence from the agency, identified on page 8 of the report, the content of that correspondence should be disclosed. If however, as was disclosed at the April 22, 2019 meeting, the county is unable to acquire records from DOGGR in an expeditious manner through the strategies it currently employs, the strike team should pursue additional efforts to secure this information, such as through direct phone calls to the head office.

- Given DOGGR's focus on idle, abandoned and hazardous wells, close coordination should be sought with the agency – there is a lot of activity happening across the state, and likely in the unincorporated area of LA – to plug and abandon idle wells right now. The report and Strike Team should seize on this activity and the opportunity it creates to collect information / sample during the well plugging processes. This would serve two purposes. First, this information can be used to identify trends in well integrity and also shed light on whether these old wells are leaking in advance of being plugged and abandoned. Second, the report can identify whether well plugging operations are a source of community exposure. By looking at data associated with these operations, the Strike Team can extrapolate information to learn whether other wells are leaking and what types of circumstances are most likely to cause leakage.

- As to the matrix's inclusion of prior plugging date, we observe that such information is important in knowing whether and to what extent, modern well plugging standards were used in this process.

- Seeping methane buildup from natural accumulation in the soil caused an explosion at a Ross Dress-for-Less store in the Fairfax area of LA in 1985. Following this incident, Senator David Roberti authored and passed SB 1458 as an urgency statute to address methane accumulation (attached). The bill required the State Oil and Gas Supervisor, in cooperation with appropriate state and local agencies, to conduct a study of all abandoned oil and gas wells located in the City of Los Angeles to determine the location and extent of methane accumulations. It also required the supervisor to develop a strategy for extracting such methane accumulations from the wells and for the management of methane from the wells so as to prevent future methane gas accumulations. The resultant study (attached), conducted by GeoScience Analytical, surveyed a number of high-risk, primarily urban areas - many of which are part of LA County. Finding numerous hazardous soil gases in certain areas, the study makes certain recommendations of next steps, such as the installation of methane detectors, warning systems, and perforated pipes, as well as sealing foundations and restricting development in places like the Brea-Olinda oil field. The Strike Team should take into consideration the results and recommendations for these areas in their evaluation.

Comments on the evaluation of pipelines

- Based on comments at the April 22, 2019 meeting of the Advisory Panel, it appears that the Strike Team plans to create a prioritization matrix for pipelines as it is doing for idle wells. This is an important task and one worthy of support. This matrix should include certain key pieces of information in addition to those listed, including:
    - Gas quality and respective corrosivity
    - Whether inspection reports have conveyed an indication of negative pipeline integrity conditions or trends
    - Whether gas pipeline has an active / valid / non-expired local franchise agreement in place
    - Potential concerns of volatile seismic activity near pipelines
    - Whether high-risk pipelines exist under areas of relatively high population density

- Whether reports filed with the local fire department indicate any pipeline maintenance and operations abnormalities or deficiencies

- In the evaluation of pipelines, it is important for the Strike team report to strive for the highest degree of accuracy in the information presented. Upon review though, it appears that some of the information presented is inaccurate, and needs revision, in particular:

    - CPUC rules for natural gas pipelines should incorporate the SB 1371 compliance plans filed by So Cal Gas for leak detection and repair on its natural gas pipeline facilities. In particular, So Cal Gas has proposed more regular inspections on some leak-prone pipes, while also proposing less rigorous inspection and repair on some others than what was listed.

    - The amount of gas pipelines listed in the report appears to be a gross underestimate of the actual miles of pipe (distribution and transmission) in the system. When Strike Team representatives were questioned about this at the April 22, 2019 meeting of the advisory panel, this appeared to be due to a decision by the County not to ask or compel So Cal Gas to give pipeline data to aid the Strike Team report. To the extent the report includes numbers of miles of pipe, it should strive for accuracy instead of false precision, aided by guesstimates.

Comments on the evaluation of oil and gas storage facilities

- As it relates to storage systems, the Strike Team should conduct a thorough assessment of the Playa Vista gas storage facility owned and operated by So Cal Gas. At that facility, nearby residents have complained for years of strong odors and releases of gas. As a result, the Strike team should seek out the information for nearby residents and open the door to enhanced participation in this area of the report. To the extent that the county decides the facility is not within the charge area of the study, the Strike Team should evaluate the lateral extent of subsurface stored gas to determine whether any below-ground gas storage extends into the county as opposed the facility fenceline.

Comments on the evaluation of hazardous chemicals

- As it relates to hazardous chemicals, the report seems to focus on the chemicals and materials that are used onsite for well stimulation, but seems to miss the chemicals and constituents that are naturally entrained in the oil itself (and brought to the surface through produced water), or contained in leaks from oil and gas sites. As a result, it appears that the Strike Team is reading its direction form the board on this issue "Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans" in an overly narrow manner – because there are many chemicals that can be found from the oil and gas itself.

- As to the chemicals entrained in oil and gas leaks, there has been a lot of research – one such research report was written by EDF and summarizes a lot of the science on the hazardous compounds found in leaks. - https://www.edf.org/sites/default/files/california-monitoring_filling-the-void.pdf You can also see a CARB report on chemicals included in

oil and gas leaks by Sage Environmental – CARB, (2015), "Air Resources Board RFP No. 13-414: Enhanced Inspection & Maintenance for GHG & VOCs at Upstream Facilities—Final (Revised)," Prepared by Sage ATC Environmental Consulting LLC, https://www.arb.ca.gov/cc/oil-gas/sage_i&m_ghg_voc_dec2016.pdf

- With regard to toxic contaminants such as hydrogen sulphide leaking from idle, abandoned and hazardous wells, the Strike Team should seek to ensure the most current and accurate information possible, given that contaminant levels may be underestimated due to the age of certain wells.

- Given that the hazardous chemicals associated with hydraulic fracturing processes can additionally be used in on-site storage facilities and transportation of oil and gas, information related to their usage in such processes.

- As to produced water, much has been written about this. In considering spills of produced water, the Strike Team should investigate further the presence of hazardous chemicals such as benzene and compare the level of chemicals present to established exposure limits.

Thank you for considering these comments moving forward.

Sincerely,

Timothy O'Connor
County District 3 Representative, Oil and Gas Strike Team Advisory Panel
Senior Director and Senior Attorney, Energy Program, Environmental Defense Fund

SENATE BILL No. 1458

Introduced by Senator Roberti

March 28, 1985

An act to add Article 4.1 (commencing with Section 3240) to Chapter 1 of Division 3 of the Public Resources Code, relating to abandoned wells, and declaring the urgency thereof, to take effect immediately.

LEGISLATIVE COUNSEL'S DIGEST

SB 1458, as introduced, Roberti. Abandoned wells: methane gas accumulations: City of Los Angeles.

(1) Existing law requires the State Oil and Gas Supervisor to carry out duties relating to hazardous oil and gas wells and other oil and gas activities.

This bill would require the supervisor, in cooperation with appropriate state and local agencies to conduct a study of all abandoned oil and gas wells located in the City of Los Angeles in order to determine the location and extent of methane gas accumulations from the wells. The bill would require the supervisor, in cooperation with appropriate state and local agencies, to develop a strategy for extracting methane gas accumulations from the wells and for management of methane gas from the wells to prevent future methane gas accumulations.

(2) The bill would take effect immediately as an urgency statute.

Vote: ⅔. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. Article 4.1 (commencing with Section 3240) is added to Chapter 1 of Division 3 of the Public Resources Code, to read:

Article 4.1. Abandoned Wells

3240. The supervisor, in cooperation with appropriate state and local agencies, shall conduct a study of all abandoned oil and gas wells located in the City of Los Angeles in order to determine the location and extent of methane gas accumulations from the abandoned wells.

3241. The supervisor, in cooperation with appropriate state and local agencies, shall develop a strategy for extracting existing accumulations of methane gas from abandoned oil and gas wells in the City of Los Angeles in order to protect the health and safety of the public. The strategy shall also provide plans for the management of methane gas from old wells in the city where no accumulations are discovered in order to prevent future accumulations of methane gas.

SEC. 2. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

Recent methane gas explosions in the City of Los Angeles have threatened the public health and safety and it is necessary that the provisions of this act take effect at the earliest possible opportunity.

O

AMENDED IN SENATE MAY 13, 1985

SENATE BILL No. 1458

Introduced by Senator Roberti

March 28, 1985

An act to add Article 4.1 (commencing with Section 3240) to Chapter 1 of Division 3 of the Public Resources Code, relating to abandoned wells, and declaring the urgency thereof, to take effect immediately.

LEGISLATIVE COUNSEL'S DIGEST

SB 1458, as amended, Roberti. Abandoned wells: methane *and other hazardous* gas accumulations ~~: City of Los Angeles~~.

~~(1)~~ Existing law requires the State Oil and Gas Supervisor to carry out duties relating to hazardous oil and gas wells and other oil and gas activities.

This bill would require the supervisor, in cooperation with appropriate state and local agencies, to conduct a study of ~~all~~ abandoned oil and gas wells located in ~~the City of Los Angeles~~ *areas with substantial potential for accumulation of methane and other hazardous gas* in order to determine the location ~~and~~, *the* extent of methane gas *and other hazardous gas* accumulations, *and potential hazards* from the wells. The bill would require the supervisor, in cooperation with appropriate state and local agencies, to develop a strategy for extracting methane gas *and other hazardous gas* accumulations from the wells *in high-risk areas identified by the supervisor* and for *the* management of ~~methane gas~~ *those gases* from the wells *in high-risk areas* to prevent future ~~methane gas~~ accumulations *of those gases*.

The bill would require the supervisor to report to the Legislature on or before July 1, 1986, on the bill.

~~(2)~~ The bill would take effect immediately as an urgency statute.

Vote: ⅔. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. Article 4.1 (commencing with Section 3240) is added to Chapter 1 of Division 3 of the Public Resources Code, to read:

Article 4.1. Abandoned Wells

3240. The supervisor, in cooperation with appropriate state and local agencies, shall conduct a study of ~~all~~ abandoned oil and gas wells located in ~~the City of Los Angeles~~ *those areas of the state with substantial potential for methane and other hazardous gas accumulations* in order to determine the location ~~and~~, *the* extent of methane gas ~~accumulations~~ *and othr hazardous gas accumulations, and potential hazards* from the abandoned wells.

3241. The supervisor, in cooperation with appropriate state and local agencies, shall develop a strategy for extracting existing accumulations of methane gas *and other hazardous gas* from abandoned oil and gas wells in ~~the City of Los Angeles~~ *high-risk areas identified by the supervisor* in order to protect the health and safety of the public. The strategy shall also provide plans for the management of methane gas ~~from old wells in the city~~ *and other hazardous gas from wells in high-risk areas* where no accumulations are discovered in order to prevent future accumulations of methane gas *and other hazardous gas.*

3242. The supervisor shall report the findings and recommendations developed pursuant to the requirements of this article to the Legislature on or before July 1, 1986.

SEC. 2. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts

constituting the necessity are:

Recent methane gas explosions in the City of Los Angeles have threatened the public health and safety and it is ~~necessary that the provisions of~~ *, therefore, necessary that* this act take effect at the earliest possible opportunity.

O

AMENDED IN SENATE JUNE 3, 1985

AMENDED IN SENATE MAY 13, 1985

SENATE BILL No. 1458

Introduced by Senator Roberti

March 28, 1985

An act to add Article 4.1 (commencing with Section 3240) to Chapter 1 of Division 3 of the Public Resources Code, relating to abandoned wells, *making an appropriation therefor,* and declaring the urgency thereof, to take effect immediately.

LEGISLATIVE COUNSEL'S DIGEST

SB 1458, as amended, Roberti. Abandoned wells: methane and other hazardous gas accumulations.

Existing law requires the State Oil and Gas Supervisor to carry out duties relating to hazardous oil and gas wells and other oil and gas activities.

This bill would require the supervisor, in cooperation with appropriate state and local agencies, to conduct a study of abandoned oil and gas wells located in areas with substantial potential for accumulation of methane and other hazardous gas in order to determine the location, the extent of methane gas and other hazardous gas accumulations, and potential hazards from the wells. The bill would require the supervisor, in cooperation with appropriate state and local agencies, to develop a strategy for extracting methane gas and other hazardous gas accumulations from the wells in high-risk areas identified by the supervisor and for the management of those gases from the wells in high-risk areas to prevent future accumulations of those gases.

The bill would require the supervisor to report to the Legislature on or before July 1, 1986, on the bill.

The bill would appropriate $350,000 from the General Fund to the supervisor for carrying out the purposes of the bill.

The bill would take effect immediately as an urgency statute.

Vote: ⅔. Appropriation: ~~no~~ *yes*. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. Article 4.1 (commencing with Section 3240) is added to Chapter 1 of Division 3 of the Public Resources Code, to read:

Article 4.1. Abandoned Wells

3240. The supervisor, in cooperation with appropriate state and local agencies, shall conduct a study of abandoned oil and gas wells located in those areas of the state with substantial potential for methane and other hazardous gas accumulations in order to determine the location, the extent of methane gas and ~~othr~~ *other* hazardous gas accumulations, and potential hazards from the abandoned wells.

3241. The supervisor, in cooperation with appropriate state and local agencies, shall develop a strategy for extracting existing accumulations of methane gas and other hazardous gas from abandoned oil and gas wells in high-risk areas identified by the supervisor in order to protect the health and safety of the public. The strategy shall also provide plans for the management of methane gas and other hazardous gas from wells in high-risk areas where no accumulations are discovered in order to prevent future accumulations of methane gas and other hazardous gas.

3242. The supervisor shall report the findings and recommendations developed pursuant to the requirements of this article to the Legislature on or before July 1, 1986.

SEC. 2. *The sum of three hundred fifty thousand dollars ($350,000) is hereby appropriated from the*

General Fund to the State Oil and Gas Supervisor for carrying out the purposes of Article 4.1 (commencing with Section 3240) of Chapter 1 of Division 3 of the Public Resources Code.

SEC. 3. This act is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

Recent methane gas explosions in the City of Los Angeles have threatened the public health and safety and it is, therefore, necessary that this act take effect at the earliest possible opportunity.

O

F I N A L R E P O R T

October 10, 1986

A STUDY OF ABANDONED OIL AND GAS WELLS AND METHANE

AND

OTHER HAZARDOUS GAS ACCUMULATIONS

Department of Conservation
Division of Oil and Gas
Roberti Bill, SB 1458, Methane Gas Study
Contract Number 2-5098

Contractor:

GeoScience Analytical, Inc.
4454 Industrial Street
Simi Valley, CA 93063
(805) 526-6532

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CONTENTS

CONTRACTOR'S DISCLAIMER

PROFESSIONAL SERVICES HAVE BEEN PERFORMED BY **GEOSCIENCE ANALYTICAL, INC.** USING THAT DEGREE OF CARE AND SKILL ORDINARILY EXERCISED, UNDER SIMILAR CIRCUMSTANCES, BY REPUTABLE GEOCHEMISTS PRACTICING IN SOUTHERN CALIFORNIA. NO OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE AS TO THE INFORMATION AND ADVICE INCLUDED IN THIS REPORT.

WE HAVE NOT INSPECTED OR PASSED JUDGMENT UPON THE WORK OF ANY OIL COMPANY, THEIR CONTRACTORS OR THEIR SUBCONTRACTORS, IN CAPPING OIL OR GAS WELLS LOCATED ON THE SUBJECT PROPERTIES WHICH ARE IDENTIFIED IN THIS REPORT. WE HAVE NOT REVIEWED ANY PUBLIC OR PRIVATE RECORDS, IN SEARCH OF THE EXISTENCE OR LOCATION OF OTHER OIL OR GAS WELLS, WHETHER LEGALLY ABANDONED, INADEQUATELY ABANDONED, HIDDEN, VISIBLE, OLD OR INADEQUATELY CAPPED, WHICH MIGHT BE LOCATED ON OR NEAR THE SUBJECT PROPERTY, WHETHER SUCH WELLS MIGHT BE KNOWN OR UNKNOWN TO THE CALIFORNIA DIVISION OF OIL AND GAS.

WITHOUT IN ANY WAY LIMITING OR QUALIFYING THE FOREGOING, BY REQUESTING OR RELYING UPON THIS REPORT, YOU WILL BE DEEMED TO ACKNOWLEDGE: (1) WE ARE NOT TO BE HELD LIABLE BY YOU, OR ANY PARTY CLAIMING THROUGH YOU, OR ANY PERSON INJURED UPON THE PROPERTY, FOR

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ACKNOWLEDGMENTS

A study of this scope is not just the result of one group's efforts. We are deeply appreciative of the assistance and guidance freely given to us by several people within the Division of Oil and Gas. First we must thank Mr. Murray Dosch of the Ventura Office who got us started with his generous assistance on the Summerland Site. Mr. Richard Manuel, the Technical Support Supervisor, in the Long Beach Office was most generous with his time and materials. He was always available whenever we needed advice or assistance in planning for a survey area. He was also invaluable as a liason between us and individual City governments. Mr. Ken Carlson was always available to help us locate an obscure site. Finally, we must thank Mr. William Guerard, Project Director, Mr. Marty Mefferd, State Oil and Gas Supervisor and Mr. Randall Ward, Director of the Conservation Department for their helpful discussion and support.

Of course, we are grateful to Senator David A. Roberti, without whose foresight and diligence this study would not have been possible.

EXECUTIVE SUMMARY

PROGRAM

In March 1985, a serious fire and explosion occurred at the Ross Dress-For-Less store in the Fairfax area of Los Angeles. The cause was seeping gas, not from a pipeline, but rather from a natural accumulation of gas from the soil. It was further found that the gas was almost certainly the result of bacterial activity (i.e., biogenic gas) and not associated with petroleum, which results from the heat-induced decomposition of organic matter. Such petroleum-related gas is called petrogenic or thermogenic gas.

In an effort to preclude further occurrences of such disasters, **California State Senator David A. Roberti** introduced legislation (SB 1458) directing the **Department of Conservation, Division of Oil and Gas,** to select areas thought to contain the greatest potential for such events and survey them for any signs of potential hazardous gas accumulations. Three criteria were used to identify such areas: 1) the areas must be urban; 2) the areas must have oil and gas wells that were abandoned prior to 1930; and 3) the areas must have a history of natural oil and/or

gas seepage.

Using the above criteria, the **State Oil and Gas Supervisor** designated the following as high-risk areas: Salt Lake oil field (City of Los Angeles - Fairfax-Wilshire District); Newport oil field (City of Newport Beach); Santa Fe Springs oil field (City of Santa Fe Springs); the Rideout Heights area of the Whittier oil field (City of Whittier); Los Angeles City oil field (City of Los Angeles); Brea-Olinda oil field (City of Brea); Summerland oil field (City of Summerland); and Huntington Beach oil field (City of Huntington Beach). The attached map (Figure 1: Page 14) outlines the study areas.

The majority of the sampling and analytical work at each area was accomplished on-site, utilizing a mobile field laboratory equipped with high-sensitivity, laboratory-grade gas chromatographs, which analyzed the gas samples for methane, ethane, ethylene, propane, propylene, iso-butane and n-butane. At each site, the soil gases were sampled at a nominal depth of three (3) feet using a stainless steel probe. The field laboratory was also equipped with a portable hydraulic auger to recover soil samples from greater depths. The auger samples provided sufficient gas

for isotopic measurements and could provide deeper samples when there were questions about the depth of a gas source.

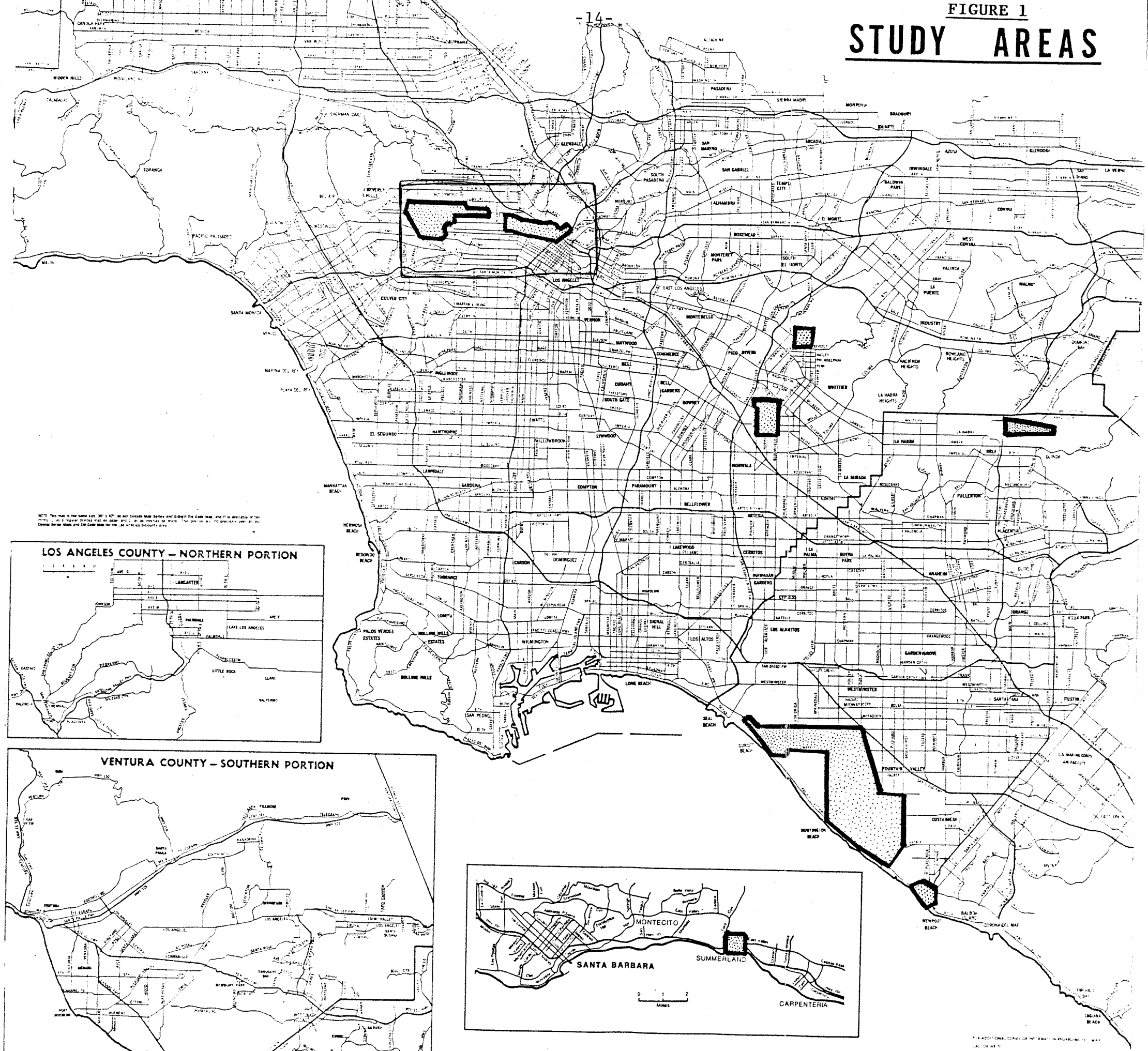
Gas samples were taken at 781 locations. In addition to analyzing the samples for hydrocarbon gas content, sufficient gas was recovered at many sites for isotopic analysis of the carbon contained in methane. The carbon isotope analyses, along with the gas compositions, were used to determine the origin of the soil gases.

The vast majority of the high-concentration gas samples taken during the study were biogenic in origin (i.e. not related to abandoned or producing oil or gas wells). The only area with significant concentrations of thermogenic gas was the Brea-Olinda oil field, which contains active, natural petroleum and gas seeps. Although the actual volumes of gas connot be determined from this study, the areas with high concentrations of methane gas (1,000 parts-per-million and above) could become hazardous if the gas is allowed to accumulate in building basements, subterranean parking areas, etc. Accumulation rates will vary from site to site, depending on the local water table and the faults, soil fractures, etc. that serve as conduits for gas migration.

All the sampling data were tabulated and mapped and comprise the main body of the final report. A brief discussion of the study areas and a short description of possible mitigation measures for each area follows.

FIGURE 1

STUDY AREAS



WESTERN ECONOMIC RESEARCH CO. INC.

SUMMERLAND OIL FIELD

BACKGROUND

Summerland is a small, unincorporated, coastal resort community between Carpinteria and Santa Barbara. Around the turn of the century, hundreds of shallow producing wells were drilled both onshore and offshore. By 1915, most of these wells were abandoned. Currently, Summerland is undergoing residential development over these old producing areas. Since there are active natural gas seeps offshore, this area was selected for study to identify any potential problems.

FINDINGS

Fifty-five (55) sites were sampled by both probe and/or coring methods and analyzed for C_1-C_4* hydrocarbons. Numerous seeps (28) were identified, some characterized as biogenic in origin and some thermogenic in origin. Low concentrations of dry biogenic gas were encountered along Lillie Avenue, west of Olive and east of Colville. Along the bluff, there were four sites that had somewhat higher concentrations of gas in the soil, although

* Methane, ethane, propane, and butane gases.

all concentrations were low.

In the area south of Ortega Hill Road and west of Pierpont, in and surrounding a local trailer park, nearly every site contained high soil gas concentrations that were relatively wet (hydrocarbons, in addition to methane, abundantly present). Active gas seeps were observed directly offshore but were not sampled.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

The soil gas concentrations in the surveyed areas are such that construction can proceed without undue concern. However, future homeowners, especially in the neighborhood of the trailer park, should be made aware that there was oil production in the vicinity and that natural gas seeps could appear in the future.

NEWPORT OIL FIELD

BACKGROUND

Newport Beach is a developed area with a history of problems due to gas seepage. The Coves, an older development along the Pacific Coast Highway, has a history of methane and hydrogen sulfide seepage. In fact, some years ago a house burned due to accumulating gas from seepage. Across Pacific Coast Highway, there is a vent well that is flaring gas, which seems to have helped the seepage problem. Homeowners in the vicinity have reported intermittent occurrences of rotten egg odor (hydrogen sulfide gas).

FINDINGS

One hundred and eleven (111) sites were sampled by both probe and coring methods and analyzed for C_1-C_4 hydrocarbons. Thirty eight (38) seeps were identified and characterized. At many locations, the soils contained gases at high concentrations.

The area north of Pacific Coast Highway and west of Newport Boulevard was extremely high in methane,

with concentrations in excess of 10,000 ppm. Another twenty (20) sites of high concentrations were found spread randomly throughout the area of the Newport field. The high-concentration soil gases are primarily biogenic, which is consistent with the marshy soils underlying most of Newport.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

Judging from the survey results and past history, Newport Beach contains several potentially hazardous areas. Since it is already developed, only after-the-fact mitigation measures can be taken. As homes are involved almost exclusively, a program involving the installation of 24-hour methane monitors appears to be the most logical choice, coupled with shallow-vent wells, as appropriate.

RIDEOUT HEIGHTS AREA OF WHITTIER OIL FIELD

BACKGROUND

The Rideout Heights area of the Whittier oil field is quite small in area. It contains 16 active wells and accompanying storage tanks. The entire area is an older residential neighborhood. There have been some instances of oil seepage reported, but it is not known whether the oil is from an old sump or from a well.

FINDINGS

Twenty-six (26) sites were sampled by probe and/or coring methods and analyzed for C_1-C_4 hydrocarbons. One site, at the eastern end of Honolulu Terrace, was found to contain soil gases in varying amounts, but not at potentially hazardous levels. Apparently, the ground has been disturbed in the past and may contain buried organic matter, oilfield waste, or perhaps abandoned and failing piping that may contribute to an elevated level of methane in the soil gases.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

Since nothing dangerous was found, no neighborhood-wide program appears to be justified. However, individual home sites experiencing oil seepage should be monitored and, if there is an increase in seepage, sumps should be considered.

BREA-OLINDA OIL FIELD

BACKGROUND

The Brea-Olinda field is a large, producing oil field. An island in the midst of constantly-encroaching development, the field is spread over hills and would require extensive grading for major development. For the last 60 or more years, natural oil and gas seepage has been observed at several locations within the field that grading might affect easily.

FINDINGS

Seventy (70) sites were probed and/or cored and the resulting gas samples analyzed for C_1-C_4 hydrocarbons. Approximately one quarter (17) of the sites contained soils with high methane concentrations that could be potentially hazardous if they were subject to development. In fact, many of the higher gas concentrations were accompanied by oil seepage, increasing the danger associated with any future development. The potentially-hazardous sites conformed to a general geographic trend, extending from the extreme western end of the field, east along the southern flank of Tonner Canyon, then arcing up and over the edge of the canyon and

down onto the western portion of an active oil lease. Other isolated high concentrations were located, but most did not contain potentially troublesome amounts of gas. The gas found on the arc was petroleum-related, while the isolated high concentrations were at least partially biogenic in origin.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

If one considers all the instances of high soil-gas concentration and oil seepage found within the Brea-Olinda field, it must be concluded that this area probably should not be developed, at least for residential or commercial usage, without taking significant mitigation measures. At present, it is not clear whether or not there are economically-feasible methods to remove or mitigate the problems associated with the gas and oil seepage.

SANTA FE SPRINGS OIL FIELD

BACKGROUND

Santa Fe Springs is the site of historically abundant oil and gas production. Currently, the field's production is declining and the City of Santa Fe Springs has a very aggressive redevelopment program underway that is bringing in much new commercial and industrial development. Buildings are being constructed near producing wells and the field is being encroached upon by new projects and natural gas seepage has been reported.

FINDINGS

One-hundred and ten (110) sites were sampled by both probe and coring methods. About 50 percent of the sampled locations contained gas-charged soils, with concentrations as high as 150,000 ppm. Compositions were suggestive of both biogenic and thermogenic origins.

The thermogenic gases were generally associated with the still-producing oil field, while the biogenic gases were found outside the producing area. The biogenic gases may be partially the result of the

heavy watering and fertilizing of lawns and other plantings that provide particularly favorable conditions for the flourishing of methane-producing organisms.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

Since high concentrations were found throughout the Santa Fe Springs survey area, it would be prudent to require continuous methane gas monitors in newly-constructed buildings. Each new building site should be surveyed for soil gases and appropriate measures taken, based on findings.

LOS ANGELES CITY OIL FIELD

BACKGROUND

The Los Angeles City oil field is spread throughout much of downtown Los Angeles. Most of the oil wells were abandoned in the 1930's, although there are still a few producing wells in operation today. Several sites of oil seepage are known and are being monitored by the City of Los Angeles.

FINDINGS

Sixty-six (66) sites were sampled by both probe and coring methods and analyzed for C_1-C_4 hydrocarbons. Numerous seeps were identified and characterized according to composition. At many locations, gas concentrations were at levels which are extremely high. Methane concentrations as high as 370,000 ppm (v/v) were observed.

In general, most of the high gas concentrations identified appear to originate from biogenic sources. Some of the gas, however, may be of thermogenic origin. The sites identified as biogenic are associated with residential or landscaped commercial neighborhoods

throughout the surveyed area. As such, they are subject to watering and the application of fertilizers, which may be encouraging growth of methane-producing organisms within the soil at various depths.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

Since most of the sites found to be potentially hazardous had biogenic gas in unknown quantities, and the occurrences followed no recognizable geographic pattern, no clearcut recommendations are possible. In areas of known natural oil seepage, continuous methane monitors in the nearest buildings may be useful. For the other areas where potentially-hazardous soil gases were found, periodic ventilation of closed spaces is suitable.

SALT LAKE OIL FIELD

BACKGROUND

The Salt Lake oil field in West Los Angeles is mostly abandoned, although at one time it was a prolific producer. Also, it is the site of the Ross-Dress-For-Less fire and the area is heavily developed with residential and commercial neighborhoods throughout. There is also new construction taking place. Eventually, the Metro Rail may be built in parts of the Salt Lake oil field.

FINDINGS

One hundred and fifty-seven (157) sites were sampled by both probe and coring methods and analyzed for C_1-C_4 hydrocarbons. Several areas, about 25 percent of the sites, were identified and characterized as having soil-gas concentrations above normal. At several locations, levels of methane gas that are potentially hazardous were identified.

The majority of the high-concentration areas contained biogenic gas and were spread throughout all of Salt Lake field in commercial and residential developments.

Most of the potentially hazardous sites also had gas that was biogenic in nature. The gas found at the Ross Dress-For-Less store (Ogden and Third) was biogenic.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

Areas containing potentially hazardous oil gases were found throughout the Salt Lake region. Most of these areas had biogenic gas and it was impossible to determine the volume of gas or even make an estimate. In a situation such as at the Ross Dress-For-Less store, a vent well is feasible (and in place). At other locations, the best approach may be periodic or passive ventilation accompanied by methane monitors, if economically feasible. (As a result of the Ross Dress-For-Less incident, the City of Los Angeles has already proposed an ordinance that requires several mitigation measures in new construction; i.e., gas detectors, impermeable foundation barriers, etc.)

HUNTINGTON BEACH

BACKGROUND

Huntington Beach is comprised of low, marshy ground, including many areas with oil production. Homeowners have reported seepage, both oil and gas, and the local gas company has reported gas seepage that is not originating from their pipelines. In summary, Huntington Beach is quite similar to Newport Beach.

FINDINGS

One hundred and eighty-six (186) sites were probed and/or cored and the samples analyzed for C_1-C_4 hydrocarbons. Several high-concentration areas (almost half of the sites) were identified and characterized according to composition. Almost all were biogenic in nature and many of the soils contained potentially hazardous concentrations of methane.

The high-concentration areas were present throughout the study area in Huntington Beach, but were concentrated in the southern portion of the City. Some hydrogen sulfide seepage was also noted in this area. According

to anecdotal comments offered by some residents, the water table is very shallow and soils tend to be very black. The area is built over old river beds and marshland, a rich source of organic matter for bacterial production of methane.

CONTRACTOR'S RECOMMENDED MITIGATION MEASURES

There is no recognizable geographic pattern to the potentially-hazardous gas concentrations and the gases are biogenic, leaving it unclear as to how much gas is actually present at any one location. Since the soils are marshy and the water table shallow, new construction should probably be sealed because the soil is the gas source. For current structures, methane gas monitors and passive or active ventilation may be economically feasible. Vent wells must be considered as a last resort, because they are expensive and the areal extent of most seepage areas are smaller than those in Newport Beach, meaning vent wells may not be effective.

SUMMARY

GeoScience Analytical, Inc. has conducted a study of abandoned oil and gas fields located in areas of Southern California. The fields, each with substantial potential for methane and other hazardous gas accumulation, have been studied to determine the location and extent of gas and potential hazards. Furthermore, strategies have been developed to drain existing accumulations of gas in high-risk areas and for the management of hazardous gas to prevent future hazardous gas accumulations.

To accomplish these objectives **GeoScience Analytical, Inc.** has conducted both a REGIONAL survey and a FOCUSSED survey to locate areas with hazardous gas accumulation. The REGIONAL and FOCUSSED surveys of the eight high risk areas have been carried out with sampling grids devised through discussion with Division of Oil and Gas Personnel, the aid of maps (both well and geological), and on-site inspection.

The REGIONAL survey emphasized sampling sites as close as practicable to the known locations of abandoned wells, since many sites were only remotely accessible due to construction. The FOCUSSED grids included suspected seeps in the high-risk areas to identify possible further

hazardous accumulations.

The majority of the sampling and analytical work was accomplished on site with a mobile field laboratory operated by a field geologist and a petroleum geochemist. The mobile field laboratory is a fully equipped recreational vehicle modified to carry high sensitivity laboratory grade gas chromatographs equipped with flame ionization and thermal conductivity detectors.

The analytical gas chromatography quantitated methane, ethane, ethylene, propane, propylene, iso-butane and n-butane. Gas accumulation can be the result of seepage from abandoned wells, natural petroleum or gas seeps or shallow biogenic gas. In the three former cases one would expect to see that the C_2^+ hydrocarbons constituted several percent up to more than 30% of the total hydrocarbons, while in the latter case the methane would constitute 98% or more of the hydrocarbon gases. (Precisely this reasoning was used to help determine that the gas which caused the Fairfax explosions was biogenic in nature rather than petrogenic.) Methane can also be the result of thermogenic (heating) processes and can resemble biogenic gas in composition. However, isotope studies, see page 47, can differentiate them.

At each site, the geologist sampled the soil gases at a depth of three feet using a hand carried narrow diameter stainless steel probe. The recovered gas sample was analyzed by the geochemist in the mobile laboratory for its hazardous gas content.

This technique was ideal for urban soil sampling because it was rapid and mobile, did not require a truck mounted drill rig, and had no environmental impact. For instance, many survey sites were obstructed by parking lots or streets. However, all that was required was a short move to a nearby lawn, parkway or flower bed. For cemented areas, the sample was taken at the nearest edge, usually a lawn or flower bed again. For built over survey sites, samples were taken at the foundation edge or as close as practicable.

At many sites a hole was augered to five (5) feet to recover a soil sample which was canned for subsequent analysis of its hydrocarbon content. The holes were backfilled.

The concentration data from the REGIONAL and FOCUSSED surveys enabled **GeoScience** to identify the areas of hazardous gas concentrations while the compositional data permitted a reliable prediction of the source.

In areas devoid of hazardous gas concentrations, the sources of the gases present were decided based upon compositional data.

In areas of no hazardous accumulation, **GeoScience** recommends passive monitoring. Homes or other buildings with basements or ground level crawl spaces can be monitored internally with electronic sensors. Structures on slabs or paved areas can be monitored with periodic checks around edges or through small holes with the soil probe.

In areas of hazardous accumulations, mitigation procedures are a direct function of the gas source and its distribution in the soil column. If the gas source was seepage from an abandoned well, economics will determine whether the well should be properly sealed or the structure modified. If the source was shallow pockets of biogenic gas, either the structure will require modification so that it is self-venting or shallow wells will be required to vent the pockets followed by permanent venting as in land fills. Periodic monitoring is required, either with electonic sensors or with actual soil gas sampling. It is likely not all pockets will be vented.

If the hazardous accumulation was the result of seepage from a diffuse source as highly disseminated organic matter which is decaying, or a geological fault, the best strategy is modification of nearby structures so that they are self-venting. Periodic monitoring with either electronic sensors or soil gas sampling, is also a prudent measure.

SAMPLING AND ANALYTICAL PROGRAM
MITIGATION STRATEGIES
GOALS

The sampling and analytical aspects of the program were focused on the identification of hazardous accumulations of methane gas. The source of the gas was ascertained in order to choose the best mitigation strategies. Emphasis was placed on direct measurement of soil gases.

SAMPLING PROGRAM

In selecting the sites for sampling, we considered two (2) objectives: a REGIONAL set of data (general survey over each high-risk area); (2) a set of sites FOCUSSED on known or suspected areas of seepage. These data collected from these sampling sites were used to determine the extent of any dangerous, or potentially dangerous, methane accumulations and their possible origins.

Soil gases in which methane or heavier hydrocarbons constituted two percent or more of the total gas (vol/vol basis) were considered dangerous. Soil gases in which methane or methane and other hydrocarbons constituted less than 2% but more than 0.1% (v/v) of the total gas were judged potentially hazardous. Soil gas measurements from safe areas were used to determine background. Anything greater than two standard deviations from background was considered anomalous.

REGIONAL

A grid of sites was sampled in each hazardous area to establish background and provide a regional view of the area. The spacing and configuration was dependent on the surface physical features such as roads, parking lots, buildings and topography of the field to be surveyed. For the larger fields (Los Angeles City, Santa Fe Springs, Salt Lake, Brea-Olinda and Huntington Beach) a grid with 25 - 100 yard spacing was employed where practicable. Modifications were incorporated to make allowance for sites that were inaccessible due to urban features or rough terrain. For the lesser fields (Rideout Heights, Summerland, and Newport), smaller grids were experimented with but not found to offer any advantages. Consequently these fields were surveyed with the same gridding as in the larger areas. The regional aspects of the information obtained in this survey was compared with the more FOCUSSED grid.

FOCUSSED

Sites were selected to provide completer coverage over known or suspected migration pathways; i.e. seeps and abandoned wells. These features were identified through consultation with California Division of Oil and Gas Personnel.

Before sampling was actually carried out over the REGIONAL AND FOCUSSED grids, sites were reviewed with the contract Supervisor from the Divison of Oil and Gas to ensure that no oversights occurred. In addition, there was consultation with local municipal authorities to obtain necessary permits and to make sure that no inadvertant damage to buried utilities occurred.

ANALYTICAL PROGRAM

COLLECTION METHODS AND ON-SITE MEASUREMENTS

Methane is present in sediments as a free gas located in the effective porosity and as interstitial gas which is occluded in pore spaces between grains. Two rapid, inexpensive, and effective techniques are currently available for sampling these gases. Which one is used depends on the depth of sampling. Each will be described herein. Both make use of a mobile field laboratory which is a fully equipped recreational vehicle containing a laboratory. The laboratory is equipped with an independent regulated power supply and gas chromatographs for the detection and quantitation of hydrocarbon gases.

PROBE METHOD: C_1-C_4 HYDROCARBONS AND NON-HYDROCARBON GASES

The soil probe is a stainless steel rod with a 1/16" hole running its length. The tip of the probe is a screw-on chisel point which conceals a side port connected to the hollow center (see Fig. 2). The small bore size minimizes the atmospheric air contamination in the soil gas sample. To recover a soil gas sample, the probe is driven to a nominal depth of three (3) feet in the soil using a slide hammer.

At depth a gas tight syringe was used to remove air from the probe's hollow center and the probe rotated twice to expose the side port to soil gases. The soil gases were removed by syringe for immediate analysis of their hydrocarbon content (see Fig. 3 for a typical chromatogram) using FID chromatographs in the mobile laboratory. As little as 10 ppb vol/vol of hydrocarbon can be detected.

The advantages of the soil probe method were its rapidity, ability to access areas not possible with a drill truck, and little or no damage to the environment. When consolidated shale or clay was encountered, we were forced to move our sampling site a few yards at

most. It was generally not practicable to auger through the consolidated layer due to time constraints (1 hr/ft of consolidated sediment with no way of knowing the thickness beforehand).

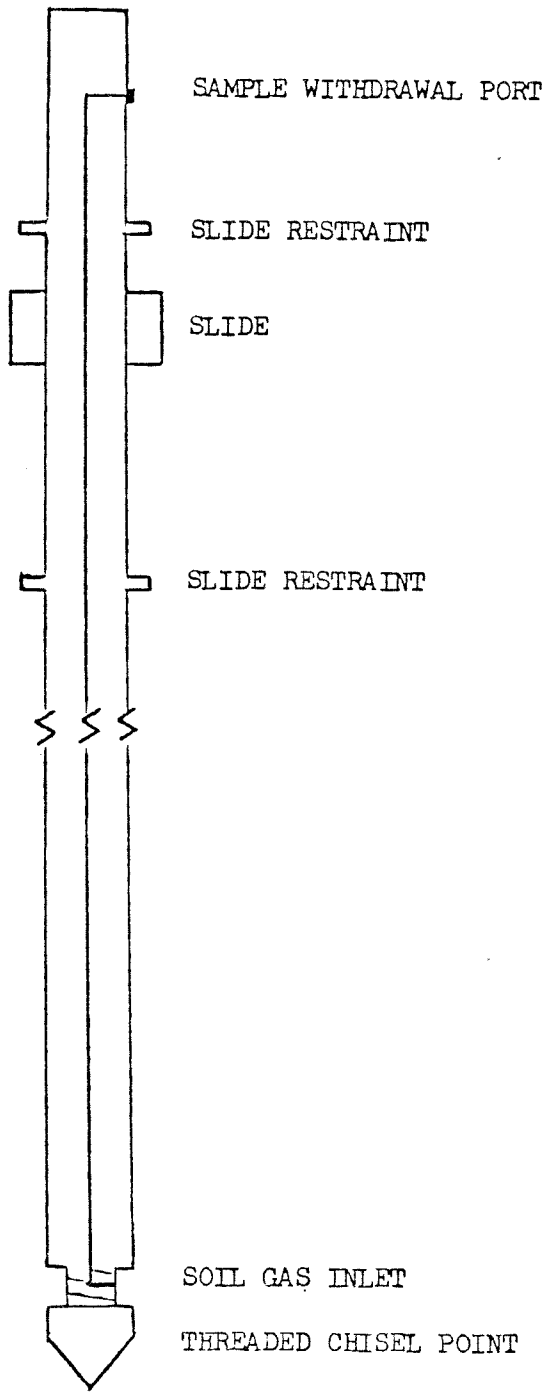


FIGURE 2: SOIL GAS PROBE

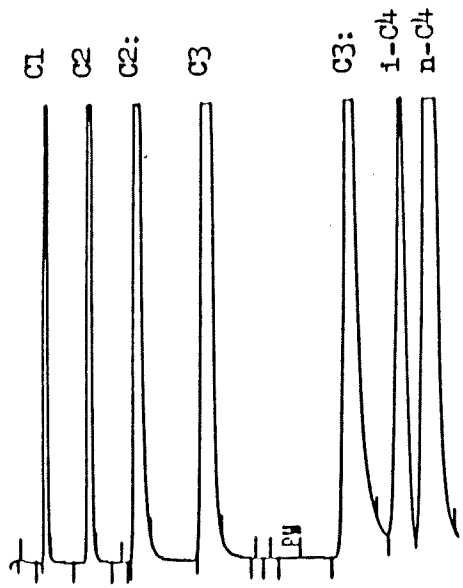


Figure 3: Hydrocarbon by Flame Ionization Detector Gas Chromatography: Methane: 250 ppb; ethane: 400 ppb; ethylene: 500 ppb; propane: 350 ppb; propylene: 300 ppb; iso-butane: 200 ppb; n-butane: 500 ppb.

CANNED HEADSPACE: C_1-C_4 HYDROCARBON GASES

In the canned headspace method, 300 - 400 cc of sediment was collected from the bottom of an augered hole by removing the auger and taking the sediment sample directly from the auger blade. The sediment was immediately canned with 200 cc of water in a No. 2½ can (860 cc volume). The lid is equipped with a silicon septum.

In the laboratory, each can was shaken for five (5) minutes on a disaggregation shaker to completely homogenize the sample and bring all hydrocarbons into equilibrium with the headspace gas (250 cc). An aliquot of the headspace gas was withdrawn for analysis by FID chromatography. This was carried out in the mobile laboratory or samples were returned to the laboratory for analyses depending on time availability. The data are reported as volume of hydrocarbon gas per volume headspace gas. The limit of detection is 10 ppb for the hydrocarbon analysis. Thus the canned samples served not only as confirmation of the probe results but also as a reservoir of gas for additional tests such as isotopic analysis in cases where it was necessary. The canned samples also provided information about the vertical extent of anomalies.

Although the methane measurements are of primary importance, quantitation of the heavier hydrocarbons is necessary with respect to determining the origin of the methane in anomalies since this information has a direct bearing on mitigation procedures. Once the hydrocarbon gas composition was known from the field analysis of a gas probe sample or confirmed with analysis of the canned sample headspace, it was possible to make a reliable decision regarding the source utilizing criteria established by the oil industry and organic geochemists. Although unusual situations may be encountered, certain guidelines are reliable. If the soil gas contains methane accompanied with unsaturates (ethylene and propylene) present in amounts comparable to the corresponding saturates (ethane and propane), the gas is bacterial in origin. In some cases, the methane can be very dry (less than 1% C_2^+) constituting more than 99% of the hydrocarbon gas. If the unsaturates are missing or present in only minor amounts and the C_2^+ gases constitute up to 20 or 30% of the hydrocarbon gases, the origin is petroleum related. If hydrocarbon gases are the result of thermal processes, the unsaturates are missing and methane constitutes 97% - 98% of the hydrocarbon fraction.

Besides the chemical composition of the hydrocarbons,

the stable carbon isotopic composition of the carbon in the methane can be measured and this information combined with the compositional information to unambiguously decide the hydrocarbon gas origin. Methane containing carbon with an isotopic ratio of less than $-55^{o}/oo$ is biogenic, while methane with an isotopic ratio greater than $-55^{o}/oo$ but less than $-40^{o}/oo$ is petroleum related. Methane with carbon measuring $-40^{o}/oo$ or greater is derived from thermal processes.

MITIGATION

The mitigation and prevention strategies are of two types. One is regional and the other is site specific both depending to some extent on the gas source (biogenic or petrogenic) as determined by the sampling and analytical program.

REGIONAL STRATEGIES

If the results of the field testing program revealed hazardous gas concentrations due to petrogenic gas, oil field pressure reduction is a possible strategy. Hydrostatic pressures generated by the ground water system control fluid pressures in the oil and gas bearing zones. As hydrocarbons are pumped out pressures drop. Once the field is abandoned, the producing zones will tend to repressurize as circulating ground water percolates back into them. Thus renewed pumping of hydrocarbons could eliminate problems at the surface by reducing pressures at depth. The cost of such a solution would be considerable since several wells would be required with continuing maintenance and upkeep into the foreseeable future.

Circulating ground water is also responsible in some degree for the transport and collection of oil and methane in shallow subterranean environments. Heavy winter rains in the last few years raised the water table level in many areas as does urban usage such as lawn watering. As the ground water level increases, it forces pockets of gas to the surface, creating serious hazards. If the water table could be lowered, many of these hazards, but probably not all, could be reduced.

If the removal of ground water is to be considered as a mitigating strategy, it is important to understand what is involved. The stratified and anisotropic character of the near surface soil types tends to inhibit the vertical flow of ground water to the surface. This inhibition of flow "confines" ground water that is under relatively high pressure and depth. Upward migration occurs slowly through "leakage" and can be a major source of shallow ground water. The exact nature and amount of hydraulic connection between shallow and deep ground water zones in the high risk areas is unknown, at least to us, at this time. It is possible that leakage between the two zones is concentrated in conduits of higher permeability caused by the arrangement of sediments or by changes in the structure of the earth's

crust. A program that would determine the feasibility of pumping to lower ground water tables that may be forcing methane "bubbles" to the surface is outlined below. The first part of the discussion describes how effective pumping rates may be estimated, while the second part of the discussion describes a simplified procedure for estimating the amount of water that will have to be pumped. Combining the two allows one to estimate the number of wells required to drain a region.

AQUIFER PUMPING

Pumping water out of wells under controlled conditions and monitoring of water levels in the pumped well and nearby observation wells can provide data on hydraulic characteristics of the underlying aquifer. Similarly, observing changes in water levels in a well in which a pump has recently been shut off can also provide important information on aquifer characteristics. Finally, any available well log data is very valuable in determining physical characteristics of the aquifer.

ANALYSIS OF AQUIFER PUMP TEST RESULTS

The observations made during the pump test can be used to evaluate the hydraulic properties of the underlying aquifer. Mathematical analysis of pump test results requires a number of simplifying assumptions. Among these assumptions is that the aquifer is effectively infinite to a real extent and is homogeneous and isotropic. These conditions are rarely, if ever, met in field applications.

Nevertheless, analysis of pump test results is helpful in predicting the aquifer response to various pumping rates. However, it must be recognized that these can only be regarded as estimates, if the assumptions are a reasonable approximation.

The water levels in the pumped well and nearby observation wells will form a more or less straight line when plotted on semi-logarithmic paper. Using a modification of the Theis non-equilibrium equation proposed by Cooper and Jacobs(1946), the transmissivity and storage coefficient of the aquifer may be estimated.

Cooper, H. H., Jr. and Jacob, D. E., 1946; A Generalized Graphical Method For Evaluating Formation Constraints and Summerizing Well-Field History: Am. Geophys. Union Trans. 27, No. 4.

This non-equilibrium method employs the relation:

$$S_2 - S_1 = \frac{2.3Q}{4\pi} \log \frac{t_2}{t_1}$$

where S_1 = water level in an observation well at time t_1

S_2 = water level in an observation well at time t_2

Q = pumping rate of well

T = transmissivity of the aquifer

Using this relation for the portions of the time-water level curves in test wells, it is possible to calculate transmissivity values for the well under recovery conditions and under pumped conditions.

A change in slopes of the time-water level curves suggests that a deep semi-confined aquifer is receiving recharge from a shallow perched layer after the cone of depression sufficiently reduces confined pressure head in the vicinity of the pumped well. As time increases after turning on the pump, the slopes of the time-water level curves will continue to decrease.

Figure 4 on page 54 depicts a hypothetical well with typical pumping conditions.

Schematic diagram of interpreted flow conditions in the vicinity of a well from well log pump test data

Outside ± 3000' radius effect of pumping of well is minimal

r = 0 ΔS=100' r = 500' ΔS=12' r = 1000' ΔS = 5' r = 2000' ΔS =<1'

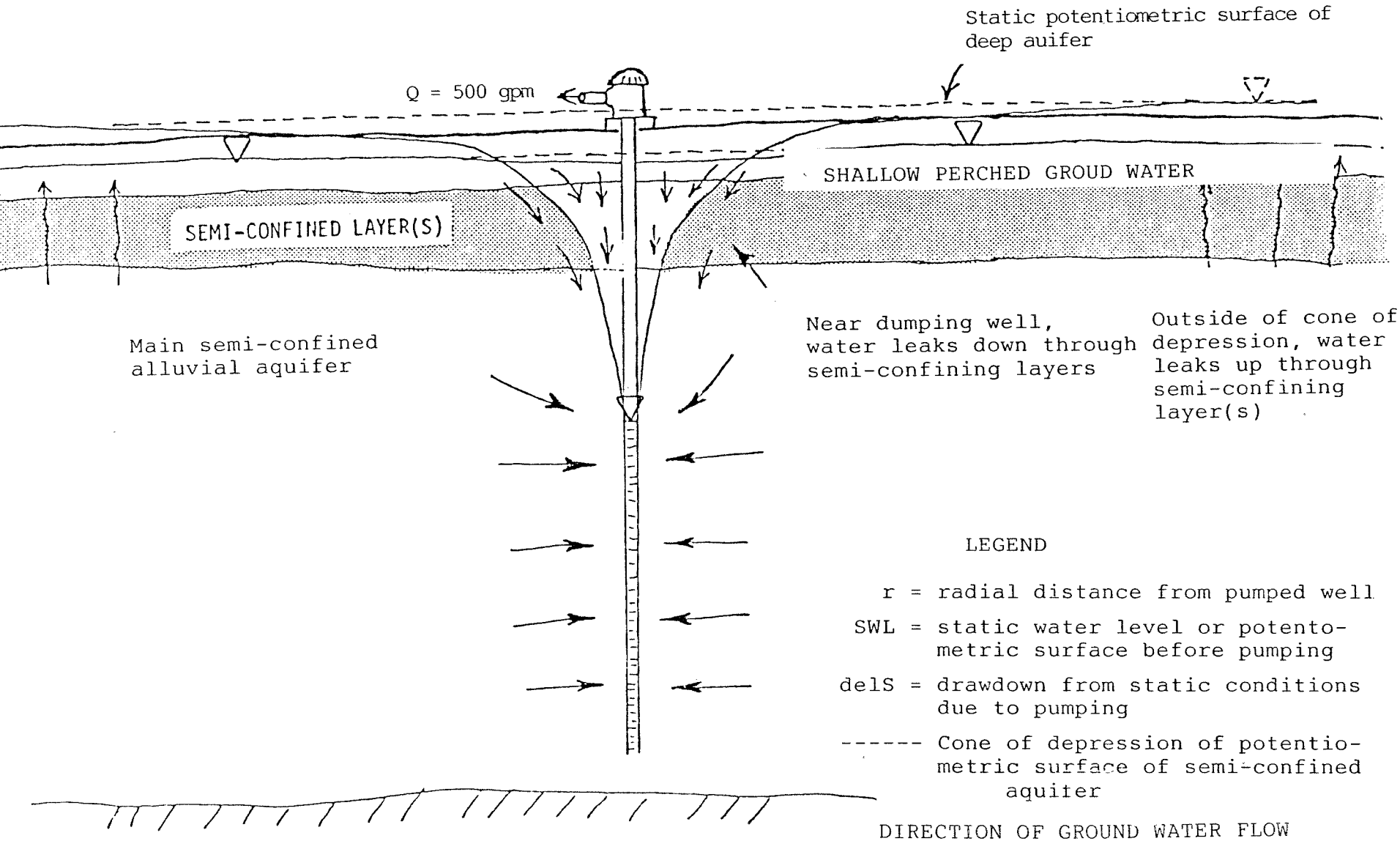


FIGURE 4

ESTIMATED WATER BUDGET

The sources of water and the rate at which ground water recharge occurs are important to an understanding of how a basin responds to changing conditions. One method of estimating the increase in ground water storage in the basin is to create a long-term water balance for the basin. This water balance is simply a budget of incoming, outgoing and stored water for the basin. It its simplest form:

$$P + I.W. = O + E + \text{del } (S), \text{ where}$$

P = precipitation
I.W. = imported water
O = outflow
E = evapotranspiration
del (S) = change in storage

The model stated above assumes that ground water divides coincide with surface-water divides and there is no ground water flow into the basin, and that water stored in the upper soil zones remains essentially unchanged over many years.

Several of the terms in the model involve more

than one contributing element.

O = Stream Runoff + Ground Water Outflow + Sewage Outflow

E = Evaporation from Surface Waters + Transpiration from Plants

del (S) = Changes in Surface Storage + Changes in Ground Water

Some of the terms are directly measurable and records are available. Other terms must be estimated based on the characteristics of the basin.

PRECIPITATION:

Government agencies such as Flood Control Districts maintain gages throughout Los Angeles, Orange and Santa Barbara Counties. These records can be used to determine input over the last ten (10) years.

IMPORTED WATER:

Water is sold by suppliers that maintain records such that it will be possible to estimate the water imported over the last ten (10) years for each of the high-risk areas.

STREAM RUNOFF:

The Los Angeles, Orange and Santa Barbara County Flood Control Districts maintain records that will allow an accurate estimate to be made for the last ten (10) years.

GROUND WATER OUTFLOW:

Ground water flow may be influenced by the presence of faults and by the differing permeabilities of various strata through which flow occurs. For example, ground water outflow can be estimated by developing a cross-section at a narrow outlet at a downstream point. The topography on either side of the narrows is extended underground as an approximation of the interface between waterbearing alluvium and non-waterbearing rock. The flow across this area is calculated using the Darcy equation, $Q = kAi$. The permeability, k, can be estimated from results from pump tests. The hydraulic gradient can be estimated as equivalent to the ground slope in the area of high ground water immediately above the narrow outlet.

SEWAGE OUTFLOW:

Records are available for the amount of waste water treated at municipal treatment plants. Its flow represents a discharge in the water balance. Individual septic systems discharge into the ground water and are accounted for as ground water storage and outflow.

EVAPOTRANSPIRATION:

The total evaporative losses involve evaporation from open water and from plants. Both types of losses are estimated by reference to measured evaporation from a standardized pan of water in an open field. Several agencies maintain Class A evaporation pans.

The pan coefficint is the proportion of evaporation from a standard pan that will occur under natural conditions. The value of the pan coefficient depends upon the type of vegetation, how densely it grows, and the atmospheric conditions at the particular site as compared to conditions at the pan.

A pan coefficient of 0.8 for grass is accepted by local users. This coefficient is applied to the area covered by landscaping. A coefficient for undeveloped areas can be developed on the basis of 0.8 in the wet season when grass and brush is flourishing, 0.1 in the dry season when grass has died back and brush is at subsistence level, and varying coefficients in transition seasons. Open water in lakes and swamps is assumed to have a pan coefficient of 0.8.

STORAGE:

The change in ground water storage is the object of this water balance. To this end, the water balance equation can be rewritten as:

$$\triangle(S) = P + I.W. - O - E.$$

SENSITIVITY AND ACCURACY OF MODEL:

The variables most accurately measured or estimated for this model are precipitation, amount of imported water and sewage discharge. The outflow due to ground water flow depends on the aquifer's permeability, a factor that can be estimated by a pumping test.

Surface flow records are available. Sheet flow is probably minor since the area is urban. Evapotranspiration losses can be major but in the current instance are not since most of the areas of interest are urban.

The water balance is a good estimate of the recharge rate of the ground water aquifer and as such will allow the calculation of the approximate number of wells needed to drain a particular region. The time and effort required for these studies will be extensive and costly and must be taken into account when considering the possible mitigation strategies.

It has been estimated that a water drainage program in the Fairfax area alone could cost $138,000.

LOCAL OR SITE SPECIFIC STRATEGIES

Hazardous accumulations whose source was probably an abandoned well were encountered. Rather than depressurize the whole field, the one or two immediate wells might be reabandoned, according to current standards. There are serious drawbacks to this approach, however. Many wells' exact location is known imprecisely and their true locations are difficult to find at best and probably impossible in built-up areas without severe disturbance of existing structures. If a well can be located there is the problem of non-continuous casing, popular during the 1930's and earlier, which would render ineffective any new surface plugs. Finally, the legal and physical problems of gaining access to a well many be practically insurmountable. A lost well encountered during new construction should be reabandoned correctly to minimize the chances of future problems.

Hazardous accumulations that are biogenic in nature may be the result of pressure driven seepage from a reservoir or pocket (bubble) of gas. The depth of the bubble will depend on local subsurface conditions but its horizontal displacement should be no greater than 75 yards. Lacking surface or other clues about its position, the best strategy for locating a test

grid for shallow vent wells would be to move upstream on the ground water gradient. Since gas pockets are discontinuous, several vent wells should be attempted, even if an early one is successful. To be cost effective, a depth of 100 feet is sufficient. A successful vent well might cost $5,500 fully equipped (well hardware, vents, guard rails, etc.). There is no guarantee that all pockets will be vented.

Some of the fields are cut by faults which can act as conduits for hazardous gas that is either petrogenic or biogenic. Near the surface, the gas is apt to collect in pockets as previously described. The siting of a relief vent grid would be over the fault rather than upstream on the ground water gradient as in the case of local biogenic gas. The well cost would probably be the same with no guarantee that all pockets would be vented.

There are several less expensive ways to mitigate the hazards of methane accumulations. Structures (buildings or homes) may be equipped with methane gas sensors either in spots of likely accumulation or within a ventilation system at regions of heavy flow. The sensors monitor continuously and sound an evacuation alarm before an explosive mixture forms (5% or greater methane

in air). They can be wired into burglar alarm systems for 24 hour monitoring. Some technical expertise is required for their installation and costs are between $400 and $2000 for a system.

Vent systems can also be retrofitted to existing structures. One of the most prominent structures in and around Los Angeles is the paved parking lot which can act as a cap to upwardly moving gases, thus forcing them into nearby buildings. A parking lot vent system is essentially a series of small trenches (20" x 20") backfilled with a 3" or 4" slotted PVC pipe and gravel. Trench spacing is a function of soil porosity since the trenches must be paved over, small stand pipe vent outlets at the ends are necessary to relieve gas accumulations. The cost could be $0.50/foot.

Venting a structure is more complicated. Trenches can be dug against the building foundation and backfilled with a slotted PVC pipe surrounded by gravel placed on the foundation footings. The gas should be vented either above the building or at least 10 feet from it. At a new construction site cost would be $20.00 - $30.00 per foot while at a standing structure costs could be double or greater depending on accessibility.

Vents can be emplaced vertically also. Slotted steel pipes driven to a depth of eight to ten feet below the foundation or small holes drilled to the same depth and filled with slotted PVC pipe are both satisfactory. Each vent pipe could cost up to $300.00.

In new construction in any of the eight identified high-risk areas, the best approach seals the foundation with layers of reinforced chlorinated polyethylene below the concrete slab-on-grade. There should be a layer of sand beneath the plastic with slotted PVC pipes to vent methane and monitor for it. Inspectors must ensure that no punctures are allowed and that all seals are correctly made. Utility conduits can be passed through the sheeting using special seals that will maintain the sheeting integrity. These seals can be retrofitted to existing structures. The cost for sealing a new building is about $2.00 per foot^2 which includes materials, labor and inspection.

With time the vent systems may be plugged by dirt and debris. To ensure that this does not occur, the soils under the structure should be checked periodically with the soil probe or another method.

RESULTS AND DISCUSSION

SUMMERLAND

SUMMERLAND FIELD

Summerland is a small unincorporated resort community on the Pacific coast between Carpinteria and Santa Barbara. Around the turn of the century, hundreds of shallow producing wells were drilled both onshore and offshore. By 1915 most were abandoned, but not to current standards. Currently, Summerland is undergoing residential development over these old producing areas. Since there are active gas seeps offshore, this area was selected for study in order to identify any potential problems.

Fifty-five (55) sites were sampled by both probe and coring methods and analyzed for C_1-C_4 hydrocarbons. A hydrocarbon gas concentration level of 3 ppm (v/v) in the soil gases was determined to constitute background. Using this criteria numerous (28) seeps and/or anomalies were identified and characterized with respect to their most likely origin. See Table "S" for a list of these sites and their classification. Following Table "S" is a set of short site descriptions, the locations for each site in Lambert cordinates and a map showing all sites.

Low concentration anomalies of dry biogenic gas

were encountered along Lillie Avenue, east of Colville and west of Olive (one site, 5, is east of Olive). Along the bluff, there were four anomalous sites with high soil gas concentrations compared to background and an additional six (6) moderate anomalies.

In the area south of Ortega Hill Road and west of Pierpont, in and surrounding a local trailer park, a majority of the sites contained high soil gas concentrations that were relatively wet (hydrocarbons in addition to methane abundantly present). Active gas seeps were observed directly offshore but were not sampled. See the Summerland map, p.370, where all sampling sites are shown with anomalous sites differentiated.

The soil gas concentrations in the surveyed areas are such that construction can proceed. However, future homeowners, especially in the neighborhood of the trailer park, should be made aware that there was oil production in the vicinity and that it would be wise to be aware that natural gas seeps could appear in the future.

FIGURE 5

TABLE "S"

Identified Anomalies and/or Seeps with Suspected Origin

5(B)	21(B)	38(T)	57(B)
9(B)	23(B)	40(B)	58(B)
10(B)	27(B)	48(B)	61(B)
12(B)	29(B)	50(B)	
14(B)	30(B)	51(B)	
17(B)	32(B)	52(B)	
19(B)	33(B)	53(B)	
21(B)	34(B)	54(B)	
23(B)	37(B)	55(B)	

B = Biogenic

T = Thermogenic

NEWPORT BEACH

NEWPORT OIL FIELD

Newport Beach is a developed area with a history of problems due to gas seepage. The Coves, an older development along the Pacific Coast Highway, has a history of methane and hydrogen sulfide seepage. In fact, some years ago a house burned due to accumulating gas from seepage. Across Pacific Coast Highway, there is a vent well that is flaring gas which seems to have helped the problem some. Along Balboa (43rd St.), an abandoned well, under pressure, was opened and sprayed a nearby home with oil. Other homeowners in the immediate vicinity have reported intermittent occurrences of rotten egg odor (H_2S). Based on this history, Newport Beach was selected to be surveyed.

One hundred and twelve (112) sites were sampled by both probe and coring methods and analyzed for C_1-C_4 hydrocarbons. A hydrocarbon gas concentration level of approximately 2 ppm (v/v) in the soil gas was established as local background. Using this criteria, thirty-five (35) seeps and/or anomalies were identified and characterized as to origin. At many locations, the soils contained gases in concentrations that are very hazardous and, in addition, a very poisonous gas, hydrogen sulfide (H_2S), was present in several instances. See Table

"N" for a list of anomalies and/or seeps with classifications of origin and danger. Following Table "N" is a list of short site descriptions, the Lambert coordinates for each site, and maps of the sites.

The area west of Newport Boulevard and to the north and south of the Pacific Coast Highway (Balboa Coves and the land to the north to the top of the bluff) was extremely high in methane with some sites containing soil gases whose methane concentration was greater than 10,000 ppm (v/v). This level is greater by a factor of over 100 than the highest anomalies found in Summerland. Hydrogen sulfide was noted at some of these sites. This is an area of historic seepage and there is a vent well on the north side of Pacific Coast Highway that is being flared. According to local residents it has substantially mitigated gas seepage problems.

Anomalous concentrations of methane in soil gas were also located at 43rd Street and nearby sites including the park at the intersection of River Avenue and Channel Place. The park has had seepage problems in the past, and 43rd Street recently had a capped well blow out after it was improperly opened. Extremely high (more than 100,000 ppm (v/v) soil gas concentrations of methane

only a trace of ethane in addition to methane. In these respects, it is very similar to the surface gases detected in the current survey. However, the composition of the gas fits the description of a biogenic souce more closely than a petroliferous source. For this reason isotopic measurements were carried out,something not previously done, to make a final determination. The results were -64^{o}/oo unambiguously biogenic. Of course, the source could be the layer of sour gas if it is biogenic. Or the source could be near surface current bacterial activity. The corresponding CO_2 delta ^{13}C value was -13^{o}/oo. In a biogenic system, the carbon isotopic difference between methane and associated carbon dioxide is usually approximately 70^{o}/oo. Here it is only 50^{o}/oo indicating that the methane has been partially oxidized or consumed by methane oxidizing bacteria. Without samples of the deeper gas, the question of source can not be answered at present.

Judging from the survey results and past history, Newport Beach contains several hazardous or dangerous areas. Since it is developed, only after-the-fact measures can be taken, such as the recent installation of shallow vent pipes by the City of Newport Beach along Marcus. As homes are involved almost exclusively, a program involving the installation of 24 hour methane

monitors tied into a central alarm system appears to be the most logical choice, coupled with shallow vent pipes, as appropriate.

FIGURE 6

TABLE "N"

Identified Anomalies and/or Seeps with Suspected Origin

1(B)D 10,151	43(B)	72(B)
3(B)H 2651	44(B)	80(B)
18(B)	47(B)	85(B) ←
19(B)	48(B)	94(B)
20(B)	53(B)	95(B)
25(T)	55(B)	98(B)
29(B)	57(B)	99(B)
30(B)	60(B)	111(B)D 124,000
33(B)	61(B)	115(B)D 590,000 PPM
36(B)	62(B)H 2516	
39(B)	65(B)	
41(B)	67(B)	
42(B)	69(B)	

B = Biogenic

T = Thermogenic

H = Hazardous

D = Dangerous

RIDEOUT HEIGHTS AREA OF WHITTIER OIL FIELD

RIDEOUT HEIGHTS AREA OF WHITTIER OIL FIELD

The Rideout Heights area of the Whittier Oil Field is quite small in area. It contains the Mitchell Energy Company Lease comprised of 16 wells. There is another well nearby with accompanying storage tanks. The entire area is an older residential neighborhood. At one time in the past, a gas injection project on some wells may have leaked and damaged some vegetation. There have also been some instances of oil seepage reported but it is not known whether the oil is from an old sump or from a well. Due to these circumstances and the proximity of the homes to existing wells, this area was chosen as a survey site.

Twenty-six (26) sites were sampled by probe and/or coring methods and analyzed for C_1-C_4 hydrocarbons. A hydrocarbon gas concentration of about 1.5 ppm (v/v) in the soil was determined to be background. Using this as a guideline six sites were found to be anomalous but not hazardous.

The site at the Mitchell Energy Corporation well platform at the eastern end of Honolulu Terrace contained the highest concentration of soil gas methane. There are sixteen (16) wells here and associated pipelines.

The implication is that the ground has been disturbed in the past and may contain buried organic matter, oil field waste, or perhaps abandoned and failing piping which may contribute to an elevated level of methane in the soil gases.

Since nothing hazardous was located, no neighborhood-wide program is justified. The anomalous sites and their classification by origin are shown in Table "W". Following Table "W" are a list of short site descriptions, the Lambert coordinates for each site and site maps.

FIGURE 7

TABLE "W"

Identified Anomalies and/or Seeps with Suspected Origin

6(B)

12(B)

17(B)

20(B)

25(B)

26(B)

B = Biogenic

BREA-OLINDA FIELD

BREA-OLINDA OIL FIELD

The Brea-Olinda Field is a large producing oil field (Unocal). An island in the midst of a sea of constantly encroaching development, the field is spread over hills and would require extensive grading for major development. For the last 60 or more years, oil and gas seepage has been observed at several locations within the field which grading might easily affect. This area was an obvious choice to be surveyed.

Seventy (70) sites were probed and/or cored and the resulting gas samples analyzed for C_1-C_4 hydrocarbons. The background concentration of hydrocarbon gases in the soil gases was about 4 ppm (v/v). Using this value as a guideline, 37 anomalies and/or seeps were identified. About one-half of these sites contained methane at hazardous or greater concentration. These sites would not be appropriate for commercial, industrial or residential development. In several instances, active oil seepage accompanied the gas, further increasing danger for any future development.

There was a general trend to the hazardous sites in terms of their location. They began at the extreme western end of Unocal's Stearns Lease area on the southern

flank of Tonner Canyon, Sites 136 and 138 (wells 71 and 67). In fact by visual inspection, since physical access was not possible, actual oil seepage was noted in the vicinity of wells 58 and 35 on the Brea Canyon Oil Company area, immediately to the west of the Stearns Lease area.

Moving to the east along the southern flank of Tonner Canyon,methane seeps and/or oil seepage were found at sites 129 (well 112), 132 (well 175), 42 (well 119), 38 (well 111), 30 (well 63A), 26 (well 64), 22 (well 65A), 19 (well 83) and 17 (well 84). These last sites are moving up the hillside (going east) on the southern flank of Tonner Canyon. From site 17 to the vicinity of site 57 (well 128) further to the east and over the top of the hill, no anomalous concentrations of methane were detected. However, the road leading east down the hillside overlooking Brea to site 57 had small amounts of oil seeping through it with gas bubbles. Indeed, the entire area defined by sites 57, 61 (well 101), and 63 (well 137) was permeated by oil and/or gas seepage. Furthermore, by visual examination, there was oil seepage on the hillside beneath wells 101 and 49 and above site 116 (well 144). At site 116 itself there was no anomalous concentration of methane. The final area of anomalous methane in

the soil and oil seepage was at site 100 (well 50 on Shell Oil's Columbia Lease). There was visual indication of seepage in the past on hillside above site 100 and a methane anomaly (not hazardous) at site 93 (Shell well 43).

There were also isolated anomalies, not on the arc described above. At site 120 (well 173) anomalously high amounts of methane were found although not enough to be hazardous. The probe showed more methane than the auger sample. Small amounts of higher hydrocarbons were also present indicating a possible biogenic origin. The soil was layered at this site with several color changes noted as augering proceeded. The methane may have been generated in one layer and diffused into others. A similar occurrence was noted at sites 12 (well 76), 13 (well 109), 109 (well 37) and 136 (well 71) with the probe showing more methane than the auger sample. Other hydrocarbons were present in much smaller amounts. The soils at these sites were layered with one acting as a source or barrier. One other possiblity is widely varying porosities which would store different amounts of gas in the different layers.

described are certainly associated with petroleum while the other isolated seeps and/or anomalies have mixed origins. The gas seeps and soil gas anomalies identified in the Brea-Olinda field are listed in Table "B" along with their classification by origin and whether they are hazardous or dangerous. Following Table "B" are a list of short site descriptions, Lambert coordinates for each site and site maps.

If one considers all the instances of high soil gas concentration and oil seepage found within the Brea-Olinda Field, it must be concluded that this area probably should not be developed, at least for residential or commercial usage, without significant mitigation. At present, it is not clear that there are economically feasible methods to remove or mitigate the problems associated with the gas and oil seepage.

FIGURE 8

TABLE "B"

Identified Anomalies and/or Seeps with Probable Origin

1(B)
11(P)H 13,000 ppm
13(P)H 2700
17(P)
19(P)
22(P)
26(P)H 3870
30(P)D 19200
34(B)
38(B)
42(P)D 26250
52(B)
54(B)
57(P)H 2000
60(B)
61(B)
63(P)H 14700
68(B)
69(B)
71(B)
73(B)H 1127
79(B)
86(B)
93(P)H 1272
95(B)
100(P)H 1104
103(B)
109(P)
120(B)
128(P)H 5940
130(B)
132(B)
136(B)
138(P)H 7020
140(B)
142(B)
144(B)

B = Biogenic

P = Petroleum

H = Hazardous

D = Dangerous

SANTA FE SPRINGS OIL FIELD

SANTA FE SPRINGS OIL FIELD

Santa Fe Springs is the site of historically abundant oil and gas production. Currently, the fields are in decline and the City has a very aggressive redevelopment program underway that is bringing in much new commercial and industrial development. Buildings are being constructed around producing wells and the fields are being encroached upon with new projects. There are reported seeps. Consequently, Santa Fe Springs was included in this study.

One hundred and ten (110) sites were sampled by both probe and/or coring methods. The background methane concentration in the soil gases was 5 ppm (v/v). With this guideline about 50% of the sampling locations were found to contain hydrocarbon charged soil gases, some as high as 150,000 ppm (v/v) in methane which is clearly dangerous. According to gas compositions some anomalies and/or seeps were clearly associated with petroleum while others were biogenic in nature. The biogenic gases were associated in many cases with lawns or other planting areas such as flower beds or trees in both commercial and residential areas. Thus the biogenic gases may be partly the result of the

heavy watering and fertilizing of lawns and other plantings which provide particularly favorable locations in which methane producing organisms can fluorish. The total amount of such gases is probably small.

The still producing oil fields between Bloomfield and Norwalk Boulevards on both sides of Telegraph contained most of the sites that were associated with petroleum by composition. The other sites that contained petroleum related gases were quite close to this area.

In many cases the high soil gas concentrations were close to the surface and beneath them, according to auger samples, concentrations were much lower. One possible explanation for this unusual behavior is that oil spills in the past have been buried. Thus there may be a foot or so of soil that is oil soaked which has trapped gases in it. Beneath this oil soaked layer, soil gas concentrations could be much lower. If this is the case, extensive removal of heavily contaminated soils will be required if it is decided to develop the remaining oil fields. This analysis also applies to the Powerine Refinery area which contained high soil gas concentrations of hydrocarbons.

Only four of the sites identified as biogenic

contained soil gases with hazardous hydrocarbon concentrations and they were not in developed areas. One (68) was in a producing field south of Telegraph and the other three (105, 106, and 109) were in one large weed grown plot of land between Norwalk Boulevard and Bell Ranch Drive just south of the trucking docks. The field shows evidence of disturbance through grading and dumping in the past. Thus these hazard sites could conceivably be the result of bacterial decay of buried organic matter as in a land fill. The old truck loading docks west of Norwalk Boulevard which might have been expected to show high soil gas concentrations of methane due to the large paved area and proximity to fields contained nothing hazardous according to the sampling. Small biogenic anomalies (74 and 77) were found.

Since mostly biogenic non-hazardous anomalies were found in the residential areas, no mitigation action is indicated for these areas. One exception is the area around site 45 (businesses and homes) which tested hazardous. Further testing in this area is recommended. As for the still undeveloped oil fields, it would be prudent to require continuous methane gas monitors in newly constructed buildings. Each new building site should be surveyed for hazardous soil gases and appropriate measures taken, such as removal

of contaminated soils, based on the findings. Other appropriate actions may include the sealing of building foundations with plastic or the installation of gas venting systems.

Table "SF" contains a listing of all anomalies found in the Santa Fe Springs area along with their probable origin. Following Table "SF" is a list of short site descriptions, Lambert coordinates for each site and site maps.

FIGURE 9

TABLE "SF"

Identified Anomalies and/or Seeps with Probable Origin

6(B) 12	54(P) 372/3.0	74(B)	113(B)
12(B) 11	56(P) 184	77(B)	117(B)
33(B) 11	57(P)D 19700/100	80(B)	121(B)
38(P)D 80700/300	*59(P)D 143,000	83(B)	125(P)H 12,2
40(P)H 1094	60(P) 911	85(B)	127(B)
41(B) 42	62(P) 524	86(B)	131(B)
42(P) 552	63(B) 12	89(B)	135(B)
43(P) 14600/3.0	65(B) 88	93(B)	137(P)D 43
45(P)H 1275	67(B) 18	105(B)H 2242	141(B)
46(B) 53	68(B)H 100?	106(B)H 11,283	142(B)
47(P)H 1151	69(P)	107(B)	146(B)
50(B) 39	70(P)H 25670	108(B)	
52(P) 556	72(B)	109(B)H 2416/2.0	

B= Biogenic

P = Petroleum associated

H = Hazardous

D = Dangerous

LOS ANGELES CITY OIL FIELD

LOS ANGELES CITY OIL FIELD

The Los Angeles City Oil field is spread through much of downtown Los Angeles. Much of it was abandoned in the 1930's, not to current standards, and there are still small producing wells in operation today. Several sites of oil seepage are known and are being monitored. Although there have been no serious problems reported, the area was chosen to be surveyed because it is densely populated.

Sixty-six (66) sites were sampled by probe and/or coring methods and analyzed for C_1-C_4 hydrocarbons. A soil gas background concentration of about 4 ppm (v/v) of hydrocarbon gases was found to exist. With this guideline about 40% of the sites were identified as anomalous. At many locations gas concentrations were at dangerous levels, as high as 370,000 ppm (v/v) methane. Gas composition was used to classify all sites with regard to probable origin.

One site (5) contained soil gases whose hydrocarbon content was clearly associated with petroleum. The site was the former location of an asphalt plant and in addition there were active wells closeby. It is not clear whether the soil gases are from a seep, leaking

well or buried asphalt wastes from the palnt. Buried wastes are the most probable source. All the other anomalies were biogenic by composition. The methane from the largest anomaly (60) was isotopically analyzed and found to contain carbon with an isotopic value of -63^{o}/oo which clearly confirms its biogenic origins.

The sites identified as biogenic are associated with residential or commercial neighborhoods throughout the surveyed area. The sites are probably being watered presently or have been in the past and it is likely that there has been fertilizer application at many of the sites. It is quite possible that this treatment has, or is, encouraging bacterial growth of methane producing organisms within the soil at various depths.

Since most of the sites found to be hazardous were biogenic in nature, of unknown size, and followed no recognizable geographic pattern, there are no clearcut recommendations possible. For the areas in which hazardous soil gases were discovered, periodic ventilation of closed spaces is suitable. If some of the older housing is removed in the future to make way for new construction, the site should be surveyed for the presence of hazardous gases and/or unknown abandoned wells. The appropriate action will be dictated by the findings.

Table "LA" is a listing of all anomalies found with most probable origin noted. Following Table "LA" is a listing of short site descriptions, Lambert coordinates for each site, and site maps.

FIGURE 10

TABLE "LA"

Identified Anomalies and/or Seeps with Probable Origin

1(B)H	19(B)	43(B)	62(B)
4(B)	20(B)	48(B)	63(B)
5(P)D	22(B)	49(B)D	68(B)
7(B)	29(B)	50(B)	70(B)
9(B)	30(B)	51(B)	75(B)
10(B)	32(B)	54(B)	
11(B)	37(B)	60(B)D	
16(B)D	39(B)H	61(B)	

B = Biogenic

P = Petroleum associated

(H) = Hazardous

(D) = Dangerous

SALT LAKE OIL FIELD

SALT LAKE FIELD

The Salt Lake Oil Field in West Los Angeles is mostly abandoned, although at one time it was a prolific producer. Currently, it is the site of the Ross Dress-For-Less fire. The area is heavily built-up with residential and commercial neighborhoods throughout. There is also new construction going on. Eventually, the Metro Rail may be built in parts of the Salt Lake Oil Field. The choice of this area for a survey is obvious.

One hundred fifty seven (157) sites were sampled by probe and/or coring methods and analyzed for C_1-C_4 hydrocarbons. A background soil gas concentration of 4 ppm (v/v) for hydrocarbons was determined. Using this guideline, several anomalies, about 30% of the sites, were identified and characterized by composition as to their most probable source. At several locations methane concentrations that were at least hazardous were identified.

The majority of the anomalies were biogenic and spread throughout all of the surveyed area of the Salt Lake Field with no easily recognizable pattern. They occurred in both residential and commercial areas and were associated with well-tended lawns or other types

of plantings. As such they are quite likely to be the result of plentiful water and fertilizer (nutrients) percolating down to bacteria in the soil. There were two non-hazardous anomalies located (139 and 141) that were not biogenic by compositon but appeared to be thermogenic in origin. The area is close to known seeps. In addition, the gas from Anthony 1, the vent well at the Ross Dress-For-Less site contained methane gas with an isotopic value of -37^{o}/oo, within the thermogenic range. This does not agree with the original conclusion that the gas which caused the original fire at Ross Dress-For-Less was biogenic in origin. However, there was no positive pressure noted at the well and it is drilled to a depth of 80 feet whereas the gas which caused the fire came from a depth of 42 feet.

If composition ratios of the gas are considered there is a definite difference between what is observed now and what was originally observed at the time of the fire and in nearby wells. The vent well was sampled on April 1 & 2, 1985, and contained gas whose ethane was 1.0% of the methane and whose propane was approximately one third this concentration. The ratio of n-butane to isobutane was about 1. Gases from producing wells nearby (Gillmore Lease, U-93 Lease, Oakwood Lease,

Metro Lease) contained ethane at levels of 4.0 - 5.0% of the methane and almost equal amounts of propane. The ratio of n-butane to isobutane was between one and two. Currently, the vent well is producing gas whose ethane is 1.2% of the methane and whose propane is 1/5 the amount of the ethane. The ratio of n-butane to isobutane is about 0.25. Thus, the current well gas is different from the gas that caused the original fire. Soil probes taken at the surface only found low levels of biogenic gas. Currently, the vent well is the source of immature thermogenic gas, but at the time of the fire, it could very well have been biogenic. Nearby sites are currently biogenic, at or near background levels.

All the hazardous or dangerous gas concentrations except one (49) were associated with, or in areas of known seeps. The anomaly at site 49 (2nd and Formosa) was in a well maintained lawn and compositionally biogenic. Two other hazardous biogenic seeps were also located. Site 125, Orange Grove and Genesee, had biogenic gas at a dangerous concentration level and there is a known seep at or near this site. At site 161 (8th and Carson) hazardous concentrations of biogenic has were also encountered. No known seep

exists here, but there are seeps nearby. The other four hazardous or dangerous soil gas concentrations located were not biogenic. One (130, Massellin and 6th, a known seep) was definitely related to petroleum. The other three sites are not associated with known seeps. Two (144 and 148) are similar in composition and are most likely associated with petroleum. One is on the corner of La Brea and Olympic at a gas station while the other is at 8th and Ridgely. The last site (142) is thermogenic in nature and located at 6th and Burnside. All three sites are close to the La Brea Tar Pits.

The area near Ross Dress-For-Less and the La Brea Tar Pits is the only part of the Salt Lake Field that might require home or commercial owners to take precautions. Probably the most effective measures would be the installation of electronic methane gas detectors coupled with periodic or passive ventilation of closed-in spaces. Throughout the rest of the Salt Lake Field area only non-hazardous biogenic anomalies were located. No precautions are necessary.

Table "SL" contains a listing of all the anomalous sites encountered as well as their probable origin. Due to a machine malfunction, the methane measurements

from sites 153 to 170 were randomly disturbed at levels below 80 ppm (v/v). For this reason only measurements above 80 ppm (v/v) were treated as reliable. Following Table "SL" is a list of short site descriptions, Lambert coordinates for each site and site maps.

FIGURE 11

TABLE "SL"

Identified Anomalies and/or Seeps with Probable Origin

5(B)	55(B)	109(B)	139(T)
6(B)	58(B)	112(B)	141(T)
8(B)	59(B)	117(B)	142(T)H
9(B)	60(B)	118(B)	144(P)D
10(B)	61(B)	120(B)	148(P)D
11(B)	62(B)	124(B)	157(B)
14(B)	64(B)	125(B)D	161(B)H
16(B)	65(B)	126(B)	162(B)
20(B)	80(B)	128(B)	163(B)
39(B)	97(B)	129(B)	165(B)
49(B)H	98(T)H	130(P)D	168(B)
50(B)	102(B)	131(B)	
52(B)	103(B)	132(B)	
53(B)	107(B)	135(B)	

158

159

B = Biogenic

T = Thermogenic

H = Hazardous

D = Dangerous

HUNTINGTON BEACH

HUNTINGTON BEACH

Huntington Beach is comprised of low, marshy ground including many areas with oil production. Homeowners have reported seepage, both oil and gas, and the local gas company has reported gas seepage not from their pipelines. In sum, Huntington Beach is quite similar to Newport Beach. Once this was recognized Huntington Beach was included in the study as an eighth area.

One hundred eighty-six (186) sites were probed and/or cored for gas samples which were then analyzed for C_1-C_4 hydrocarbons. A background hydrocarbon concentration in the soil gases of 5 ppm (v/v) was determined. With this as a guide line, approximately half the sites were classified as anomalies or seeps. According to compositional analysis, almost all sites contained biogenic gas. Several hazardous or dangerous sites were noted.

The anomalies were present throughout all areas of concern in Huntington Beach but were concentrated in the southern portion of the City (south of Indianapolis). Along Christine (23) hydrogen sulfide was found at one hazardous area. According to anecdotal comments offered by some residents, the water table throughout

this area is quite shallow and black clay-like soils are abundant. The area was formerly river channels and marsh, a rich source of organic matter for production of methane. However, the Newport-Inglewood fault system also runs through this area and may be offering conduits for deeper gas to rise to the surface as in Newport Beach which is only a few miles away. Isotopic measurements on gas recovered at Christine (23), Harborbreeze (62), Tidewater (109), Hagerstown (126) and Algonquin (199) were all in the biogenic range. (See Table exact values). Only at one site (96) on Barbados was an anomaly that appeared non-biogenic discovered. Unfortunately it was not possible to recover enough gas to make an isotopic measurement.

There is no recognizable geographic pattern to the anomalies in general or the hazardous ones in particular. Since they are biogenic in origin the absolute gas amounts are not clearly calculable at present although it must be assumed the gases are being generated or renewed on a continuing basis. If it is assumed that the soils are acting as a diffuse source, then new construction should have foundations sealed with plastic and be equipped with methane monitors and ventilation systems. For current structures, methane monitors and passive or active ventilation systems are economically

feasible. If noxious hydrogen sulfide odors become a problem (on Christine perhaps), a shallow system of perforated pipe might be installed without undue economic hardship, perhaps by the City, as in Newport Beach.

Table "HB" contains a listing of all anomalies classified as to origin and potential for harm. Following Table "HB" is a list of short site descriptions, Lambert coordinates for each site and site maps.

CARBON ISOTOPIC MEASUREMENTS OF METHANE IN SELECTED SOIL GASES FOUND IN HUNTINGTON BEACH

Christine (23)	-69 °/oo
Harborbreeze (62)	-72
Tidewater (109)	-68
Hagerstown (126)	-69
Algonquin (199)	-77

CONCLUSION

The purpose of this survey was to determine if leaking gas from abandoned or active oil wells, gas seepage along fault systems such as the Third Street Fault in Salt Lake Field, and seepage from concentrations (bubbles) of biogenic gas are, or could be, serious community hazards. The Division of Oil and Gas identified eight areas that are especially prone to this problem because they are urban, have a history of seeps, and have old abandoned wells within their boundaries.

Only two instances of possible well leakage were found, one in Newport Beach on Marcus Street and one in Huntington Beach on Algonquin. In both cases it is known that the house or apartment building present is built over at least one abandoned well. Both seeps contained biogenic gas, however, indicating that if the wells were responsible, they were only acting as conduits for shallow gas generated in the near vicinity.

The Salt Lake Field has several fault systems running through it as do both Newport Beach and Huntigton Beach. In none of these three areas was there any evidence for wide-spread occurrence of petrogenic

gas. Rather, the detected gas was overwhelmingly biogenic in nature and showed no systematic pattern in its placement. Thus, if there is seepage along faults, it is because they are acting as conduits for recently generated near surface biogenic gas.

It is true that the La Brea Tar Pits are petrogenic and contain gas. However, even sampling close to the Tar Pits revealed no preponderance of petrogenic sites. Perhaps the Tar Pits act as a convenient safety valve, limiting the occurrence of other petrogenic seeps. The Ross Dress-For-Less fire occurred very near to the Tar Pits yet was probably caused by escaping biogenic gas.

The Brea-Olinda Oil Field is also faulted and there are indeed several active oil and associated gas seeps. However, this area is currently being operated solely as an oil field and poses no community hazard. Santa Fe Springs is another currently producing oil field and may be subject to development in the near future. Evidence of petrogenic gas was found at some locations but appeared to be the result of spillage rather than seepage based on gas variation with depth. There do not appear to be leaking wells.

No convincing evidence was found for the widespread occurrence of shallow high pressure gas bubbles. Biogenic gas was the result of local in situ processes and appeared to be venting itself in a diffuse manner. In three instances (two in Newport Beach and one in Huntington Beach) point sources were found. However, they are associated with known wells as previously discussed. The third instance is on Broad Street in Newport Beach. A well is suspected here and is probably behaving as in the other two instances.

Even though there are no widespread problems associated with leaking wells, fault associated seeps, or gas bubbles, problems do exist as documented by the detection of numerous instances of hazardous soil gases. Fortunately, the discovered problems are amenable to practical and economical solutions.

In Summerland, awareness of the problem of soil gases and possibly the installation of methane detectors is sufficient. For Brea-Olinda, the best solution is to restrict development. In Santa Fe Springs development is possible if conscientious efforts are made to install warning systems, to seal foundations against gas penetration, and to provide adequate ventilation. Some removal

of contaminated soils may also be required at some construction sites. In Newport Beach and Huntington Beach the installation of methane monitors and provisions for ventilating enclosed spaces in existing structures is cost effective. New construction should probably try to seal foundations in addition to installing methane detectors and providing for ventilation. The Cities might also consider financing the installation of shallow perforated pipes to drain soils if noxious gases are a problem. In the Los Angeles City Field, the sites for new construction should be surveyed for possible gas hazards and apropriate action taken based on the findings. Residents near the hazardous sites identified should be notified and made aware of the availability of methane detectors and the benefits of ventilating enclosed areas. In the area of the Salt Lake Field near Ross Dress-For-Less and the La Brea Tar Pits, methane detectors should be installed accompanied with ventilation procedures. New construction sites must be surveyed and foundations sealed against gas intrusion depending on the results of the soil gas survey. If the Metro Rail adds underground lines here, the construction must be sealed and equipped with methane detectors, and efficient ventilation systems. These are, or should be, standard practices

in the construction of subways. Los Angeles is proposing such measures be added to its construction ordinances. In Whittier no problems were encountered and no mitigation is necessary.

SAMPLING SITE COORDINATES

SAMPLING SITE COORDINATES

FIELD: SUMMERLAND

LOCATION NO.	X	Y
1	1517302	338639
2	1517502	338567
3	1517726	338512
4	1518040	338418
5	1519975	338378
7	1519825	338450
8	1519502	338521
9	1519269	338510
10	1518990	338693
11	1518555	338855
12	1518196	339026
13	1517782	339286
14	1517434	339405
16	1517426	339566
17	1517414	339745
18	1519530	338654
19	1519313	338723
20	1519060	338839
21	1518979	338796
22	1518231	339258
23	1519371	338185
25	1516910	339486
26	1517151	339432
27	1516791	339248
28	1516535	339311
29	1516381	339169
30	1516156	339106
31	1516316	339644
32	1516044	339586
33	1516325	339112
34	1516281	339109
35	1516766	339599
36	1516524	339720
37	1517285	339436
38	1516052	338722
39	1516379	338784

SAMPLING SITE COORDINATES

FIELD: SUMMERLAND

LOCATION NO.	X	Y
40	1516596	338802
41	1516958	338841
45	1520106	337887
46	1519747	338016
47	1519141	338193
48	1519925	338015
49	1519658	338077
50	1517434	338851
51	1518766	338335
52	1519081	338252
53	1518847	338464
54	1518420	338432
55	1518204	338572
56	1518246	338491
57	1518552	338510
58	1518065	338607
59	1517791	338706
60	1517611	338821
61	1517769	338880

SAMPLING SITE COORDINATES

FIELD: NEWPORT BEACH

LOCATION NO.	X	Y
1	1487489	533480
3	1488529	533217
5	1488821	533111
7	1487739	533453
8	1487788	533344
9	1487970	533439
10	1488283	533332
11	1487340	533381
12	1488454	533161
13	1487231	533520
14	1487087	533300
15	1486988	533528
16	1487581	533372
17	1488088	533393
18	1487625	533757
19	1487828	533749
20	1487246	533784
21	1486196	533547
22	1485991	533701
23	1486279	533367
24	1485739	533753
25	1485494	534269
26	1485118	534144
27	1485448	533932
28	1485280	534031
29	1487458	532021
30	1487181	532146
31	1487074	532289
32	1487739	531955
33	1487248	532425
34	1487925	532128
35	1486932	532473
36	1487975	531983
37	1487115	532621
38	1486801	532638

SAMPLING SITE COORDINATES

FIELD: NEWPORT BEACH

LOCATION NO.	X	Y
39	1486708	533302
40	1487007	532893
41	1486418	533142
42	1486640	533012
43	1486638	532847
44	1486862	532969
45	1488047	532764
46	1487316	532725
47	1487901	532582
48	1487515	532880
49	1487789	532796
50	1487676	532422
51	1487140	532992
52	1487485	532559
53	1487309	534047
55	1487848	534009
57	1487848	534009
59	1488573	533969
60	1488189	533980
61	1487522	534038
62	1487925	533559
65	1487761	533582
67	1487434	533637
69	1489432	528961
70	1488876	529731
71	1489154	529113
72	1488997	529563
73	1489039	529326
74	1489679	529168
75	1489306	529955
76	1489284	530417
77	1489188	530708
78	1489471	530954
79	1489170	531418
80	1489176	531174

SAMPLING SITE COORDINATES

FIELD: NEWPORT BEACH

LOCATION NO.	X	Y
81	1489177	530937
82	1489697	531545
83	1489326	531827
84	1489000	531869
85	1488696	531512
86	1488691	532828
87	1488361	532588
88	1488506	532374
89	1488506	532374
90	1488140	532381
91	1488453	531976
92	1488269	532209
93	1487998	531999
94	1487615	531606
95	1487747	531366
96	1488136	531455
97	1487847	531229
98	1428298	531832
99	1488167	531997
100	1487857	531812
101	1488271	531541
102	1487979	530994
103	1488862	529893
104	1488745	529990
105	1488745	529990
106	1488654	530229
107	1488654	530229
108	1488430	530443
109	1488339	530641
110	1488137	530823
111	1487975	531988
115	1490225	535250

SAMPLING SITE COORDINATES

FIELD: WHITTIER - RIDEOUT HEIGHTS

LOCATION NO.	X	Y
1	4272719	4110705
2	4272774	4111094
3	4273101	4110669
4	4273039	4110925
5	4273155	4111254
6	4273383	4110509
7	4273567	4110612
8	4273382	4110714
9	4273248	4110810
10	4273438	4111020
11	4273944	4111069
12	4273685	4110916
13	4274092	4110925
14	4273925	4110802
15	4274080	4110701
16	4274599	4110514
17	4274343	4110473
18	4274524	4110634
19	4273783	4110491
20	4273935	4110404
21	4274061	4110203
22	4274598	4110209
23	4274409	4110161
24	4274980	4110308
25	4275182	4110427
26	4275155	4110240
28	4275140	4110255
29	4273925	4110404

SAMPLING SITE COORDINATES

FIELD: BREA-OLINDA FIELD

LOCATION NO.	X	Y
1	2038951	156694
3	2039132	157044
6	2039465	157390
9	2040683	157258
11	2041113	157388
13	2041435	157424
17	2041993	157910
19	2041505	157945
22	2041059	158108
26	2040653	158108
28	2040439	157602
30	2040353	158196
34	2040271	158138
36	2039951	158192
38	2039181	158242
40	2038789	158400
42	2038221	158492
43	2038195	158562
46	2042273	157194
48	2041680	157110
50	2042879	156908
52	2042889	157226
54	2043234	157170
56	2043705	157090
57	2044183	156993
60	2044321	157108
61	2044813	157108
63	2044545	157038

SAMPLING SITE COORDINATES

FIELD: BREA-OLINDA

LOCATION NO.	X	Y
66	2039503	156636
68	2040303	156250
69	2039805	155753
71	2040433	156560
73	2040931	156971
77	2041597	156853
78	2040967	156244
79	2040419	155903
81	2041015	155354
82	2041849	156370
84	2042193	156338
85	2041971	155154
86	2041892	155610
89	2042339	155272
90	2042067	155838
92	2042725	154742
93	2045591	156828
95	2045771	156518
98	2045563	156422
100	2045625	155928
103	2045351	154828
105	2045274	155500
107	2045105	154868
109	2043581	156278
111	2043609	155916
114	2044133	156444
116	2045041	156720
118	2044227	155766
120	2044105	155324
122	2044593	155358

SAMPLING SITE COORDINATES

FIELD: BREA-OLINDA

LOCATION NO.	X	Y
124	2043657	155368
126	2038059	158994
128	2037727	158899
130	2037727	158899
132	2036537	159402
134	2036029	159808
136	2034999	159848
138	2034935	160078
140	2035777	159498
142	2036505	159266
144	2037369	159044
146	2038513	157558
148	2038045	158024

SAMPLING SITE COORDINATES

FIELD: SANTA FE SPRINGS

LOCATION NO.	X	Y
1	4254278	4087522
3	4263875	4087392
4	4264000	4087900
5	4264187	4088468
6	4264346	4089003
7	4262612	4087104
9	4262400	4087565
10	4262943	4087565
11	4263125	4088143
12	4262381	4088143
13	4262446	4088631
14	4263125	4088631
15	4262525	4088925
16	4261968	4088400
17	4261773	4087811
18	4261654	4088925
19	4262331	4088443
20	4261490	4087392
21	4262140	4093562
22	4262343	4094031
23	4262606	4094678
24	4262312	4095475
25	4263750	4095718
26	4263571	4095281
27	4263315	4094790
28	4263046	4094103
29	4262700	4093487
30	4263381	4093325
31	4264175	4094146
33	4264746	4095146
34	4268059	4089375
35	4268346	4089068
36	4267325	4089162
37	4267225	4089662
38	4268787	4089609
40	4268000	4087709

SAMPLING SITE COORDINATES

FIELD: SANTA FE SPRINGS

LOCATION NO.	X	Y
41	4267362	4088400
42	4267384	4087728
43	4268000	4087709
45	4265950	4087681
46	4265146	4087600
47	4265956	4088895
48	4266075	4089475
49	4265671	4088393
50	4265265	4088900
51	4265100	4089687
52	4265246	4087078
53	4265978	4087081
54	4268637	4090162
56	4267988	4090334
57	4267246	4090331
59	4266721	4090337
60	4266728	4091047
62	4267321	4090931
63	4268071	4090931
65	4268515	4090921
67	4268531	4091950
68	4267600	4092075
69	4267663	4092778
70	4268515	4092684
71	4265753	4090156
72	4265118	4090159
73	4265900	4091146
74	4265912	4090900
75	4265943	4090346
76	4265678	4091025
77	4265696	4090493
79	4266187	4091803
80	4267221	4091750
82	4266725	4092443
83	4266178	4093043
85	4265809	4092140

SAMPLING SITE COORDINATES

FIELD: SANTA FE SPRINGS

LOCATION NO.	X	Y
86	4265818	4092434
89	4265884	4092693
90	4265368	4091925
91	4265368	4092268
92	4265368	4092268
93	4265371	4093165
94	4265371	4092871
95	4265371	4093806
96	4265371	4093550
97	4265953	4093828
98	4265896	4093443
101	4266512	4094043
102	4266556	4093209
105	4266990	4093150
106	4267675	4093113
107	4268390	4093081
108	4267250	4093665
109	4268237	4093500
114	4268696	4094200
116	4268031	4095771
118	4266712	4095465
120	4270753	4089078
122	4270315	4089068
124	4270043	4089978
127	4271178	4089528
129	4271806	4090750
131	4271021	4090900
134	4271284	4091568
136	4270478	4091362
138	4270125	4091637
139	4270203	4090662
140	4265987	4094787
141	4266250	4095250
142	4266987	4095025

SAMPLING SITE COORDINATES

FIELD: SANTA FE SPRINGS

LOCATION NO.	X	Y
143	4267800	4095070
144	4268562	4095200
145	4270850	4092800
146	4270203	4090662

SAMPLING SITE COORDINATES

FIELD: LOS ANGELES CITY

LOCATION NO.	X	Y
1	4214875	4136950
4	4214975	4136325
5	4216125	4136925
7	4215850	4137450
8	4214000	4136500
9	4213625	4136175
10	4212900	4136350
11	4212250	4136725
14	4211400	4135900
15	4211000	4135350
16	4209900	4135400
17	4209225	4135925
19	4210650	4136325
20	4210275	4135725
21	4209050	4136275
22	4208650	4135850
24	4209300	4135150
25	4199250	4138825
26	4198800	4137575
27	4199175	4137600
28	4199525	4138150
29	4199750	4137525
30	4200250	4137800
31	4199975	4138450
32	4200100	4138050
33	4200275	4138775
37	4207775	4135275
38	4200700	4137600
39	4200750	4138075
40	4200800	4137025
41	4201425	4137100
42	4201425	4137450
43	4201425	4138000
44	4201775	4198925
45	4201850	4137275
46	4202125	4137350

SAMPLING SITE COORDINATES

FIELD: LOS ANGELES CITY

LOCATION NO.	X	Y
47	4201775	4135825
48	4201375	4136175
49	4201425	4136600
50	4204150	4135450
51	4202500	4136050
52	4200600	4136625
53	4200525	4136050
54	4200400	4134450
55	4199550	4135475
56	4199250	4136150
57	4203100	4135250
58	4203450	4135825
59	4203650	4136250
60	4203875	4135825
61	4203975	4135375
62	4204725	4135625
63	4204500	4135425
66	4204325	4135900
67	4204925	4135400
68	4205225	4135825
69	4205750	4135600
70	4206400	4135350
71	4206150	4135825
72	4206025	4135425
73	4206550	4135875
74	4206850	4135475
75	4207150	4135950
76	4207100	4135100
77	4207975	4135550
78	4204700	4137550

SAMPLING SITE COORDINATES

FIELD: SALT LAKE

LOCATION NO.	X	Y
1	4185775	4140175
2	4185750	4141525
4	4186750	4140175
5	4186650	4141525
6	4188100	4141100
8	4189275	4141075
9	4190300	4141050
10	4190800	4141075
11	4191625	4141075
12	4192650	4140850
13	4193625	4140450
14	4194275	4140450
15	4195075	4141050
16	4185425	4141525
17	4185425	4140900
18	4185425	4140200
19	4184325	4141525
20	4184325	4140800
21	4184325	4140200
23	4183625	4141600
24	4183625	4140950
25	4183625	4140175
26	4183100	4141550
27	4183100	4140800
28	4183100	4140300
29	4182275	4141550
30	4182275	4140325
31	4182275	4140900
34	4141600	4141600
35	4181625	4140300
36	4181625	4140800
37	4181025	4141525
38	4180025	4140300
39	4181000	4140900
42	4181025	4139125
43	4180900	4138200

SAMPLING SITE COORDINATES

FIELD: SALT LAKE

LOCATION NO.	X	Y
44	4181625	4138300
45	4181625	4139100
47	4182400	4138200
48	4182325	4139100
49	4183125	4138300
50	4183100	4138275
52	4183625	4138250
53	4183500	4139150
54	4184450	4138300
55	4184325	4139125
58	4185000	4138300
59	4185075	4139150
60	4185750	4137575
61	4185725	4139075
62	4185800	4138300
63	4186575	4138300
64	4186500	4137550
65	4186700	4139275
66	4186600	4140075
67	4188150	4139925
68	4188725	4139925
69	4189625	4140000
70	4190225	4140000
71	4190825	4139900
72	4191550	4140000
73	4187075	4139875
74	4187225	4140000
75	4187700	4140100
76	4185100	4141500
77	4174700	4138000
78	4174650	4137475
79	4175650	4137850
80	4175600	4137350
81	4175550	4136750
82	4174825	4136800
83	4176600	4137700

SAMPLING SITE COORDINATES

FIELD: SALT LAKE

LOCATION NO.	X	Y
84	4176550	4137150
85	4176500	4136550
86	4176525	4138525
87	4176675	4138125
88	4176525	4140000
89	4176525	4139375
90	4175850	4139025
91	4175850	4139475
92	4175175	4139525
93	4174600	4139525
94	4174600	4140000
95	4174600	4139075
96	4174600	4139525
97	4179300	4137150
98	4179275	4137150
99	4179300	4137100
100	4178600	4136800
101	4177900	4137400
102	4178300	4137450
103	4175725	4138250
104	4174850	4138350
105	4173675	4138850
106	4173550	4138225
107	4173300	4139475
108	4173075	4139850
109	4173000	4140350
110	4173975	4140125
111	4174225	4140825
112	4174525	4140775
113	4175575	4140275
114	4175275	4140775
115	4175675	4140775
116	4176425	4140775
117	4177400	4136900
118	4176825	4137100
119	4176000	4137750

SAMPLING SITE COORDINATES

FIELD: SALT LAKE

LOCATION NO.	X	Y
120	4176000	4137200
121	4176700	4137500
122	4177225	4137425
123	4179800	4136800
124	4179300	4136450
125	4179700	4136250
126	4179275	4135250
127	4179750	4136025
128	4178700	4136025
129	4178675	4135325
130	4181175	4136050
131	4181250	4135300
132	4180850	4135925
133	4183250	4135125
134	4183350	4135925
135	4183350	4136650
136	4183350	4137300
137	4182800	4135950
138	4182700	4135275
139	4182775	4137350
140	4182775	4136675
141	4182150	4135300
142	4182175	4136075
143	4182550	4133325
144	4183150	4133300
145	4183350	4134450
146	4182900	4134400
147	4182300	4134450
148	4181600	4134425
149	4181900	4133300
150	4181225	4133350
151	4181450	4135325
152	4181500	4135950
153	4181750	4136400
154	4180925	4136450
155	4182025	4137175

SAMPLING SITE COORDINATES

FIELD: SALT LAKE

LOCATION NO.	X	Y
156	4181500	4137675
157	4180900	4137600
158	4180350	4137750
159	4179650	4136975
160	4180200	4136125
161	4180125	4134400
162	4179750	4133300
163	4179650	4133300
164	4179675	4134425
165	4179150	4134400
166	4178575	4134400
167	4178775	4133325
168	4178225	4133575
169	4180775	4134325
170	4180450	4133300

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
1	1479400	539500
2	1479500	539950
3	1479450	540250
4	1479400	541050
5	1479700	540500
6	1479950	540250
7	1480300	540800
8	1480650	541100
9	1480000	540900
10	1479800	541150
11	1480950	541150
12	1480950	541150
13	1480550	540600
14	1480550	540600
15	1477650	541150
16	1477900	540050
17	1477900	540050
18	1477800	540400
19	1477300	540450
20	1477150	540900
21	1477350	540850
22	1477050	540600
23	1476850	540700
24	1476850	540700
25	1476650	540850
26	1476650	540850
27	1474650	544000
28	1474100	543700
29	1475050	543300
30	1476450	543750
31	1476450	543750
32	1476450	541300
33	1477300	542450
34	1477550	541950
35	1477550	541950

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
36	1477600	541450
37	1476750	541750
38	1476750	542200
39	1477550	542200
40	1476650	543450
41	1476650	542950
42	1477150	542750
43	1477150	542750
44	1477350	543300
45	1478500	542950
46	1478050	542950
47	1478050	543650
48	1479000	543650
49	1479000	543200
50	1479000	542700
51	1478900	542200
52	1478800	541600
53	1478100	541350
54	1478050	542450
55	1479350	541500
56	1479400	542100
57	1479600	542050
58	1479750	542000
59	1480000	541900
60	1480250	541750
61	1480600	542200
62	1480750	541500
63	1481300	542100
64	1481550	542450
65	1480750	542400
66	1481000	542200
67	1480250	542400
68	1480000	542450
69	1479750	543050
70	1479500	542650

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
71	1480250	543050
72	1480500	542600
73	1480500	543700
74	1480750	543350
75	1481300	543800
76	1481150	543250
77	1481100	542950
78	1479700	543300
79	1479500	543300
80	1479350	543500
81	1479700	543450
82	1480100	543350
83	1472400	546400
84	1472400	546400
85	1473800	545800
86	1473200	545650
87	1473250	545150
88	1473250	544800
89	1475850	546250
90	1476150	546050
91	1476350	545650
92	1476100	545150
93	1476050	544800
94	1476100	545750
95	1475350	545700
96	1475150	546250
97	1474900	545300
98	1474400	545300
99	1474550	546200
100	1474650	546200
101	1474250	545000
102	1474150	544300
103	1474650	544250
104	1475150	544250
105	1475150	544750

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
106	1475650	544400
107	1477100	544400
108	1478100	544050
109	1478300	544650
110	1478150	544850
111	1478700	544650
112	1478900	544850
113	1478550	544250
114	1478900	544000
115	1478300	544400
116	1478700	546350
117	1478700	546350
118	1478950	545400
119	1478950	545400
120	1476750	546350
121	1479900	545800
122	1480200	546250
123	1480500	546200
124	1480650	546250
125	1480650	546200
126	1480900	546350
127	1481150	546350
128	1481650	546250
129	1481650	545300
130	1481400	545750
131	1482000	546000
132	1482450	545750
133	1482400	545450
134	1482000	544600
135	1482000	545000
136	1479450	546250
137	1479500	545750
138	1479400	545250
139	1479400	545250
140	1479450	544050

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
141	1480200	544000
142	1480200	544600
143	1479950	544400
144	1479500	544850
145	1480400	544300
146	1480650	544450
147	1481150	544550
148	1481650	544850
149	1481000	544050
150	1480850	544900
151	1482300	546750
152	1482700	546650
153	1482100	547250
154	1482650	547450
155	1482200	547750
156	1482650	547750
157	1482650	548250
158	1482200	548450
159	1482700	548700
160	1481600	548850
161	1481400	548600
162	1480650	548850
163	1453000	569900
164	1452950	569150
165	1446400	568650
166	1446700	568950
167	1461850	569750
168	1461900	569250
169	1464250	562250
170	1464700	562200
171	1464600	562050
172	1476750	559300
173	1476750	558800
174	1476750	558900
175	1466700	556850

SAMPLING SITE COORDINATES

FIELD: HUNTINGTON BEACH

LOCATION NO.	X	Y
176	1466700	556150
177	1469350	555300
178	1469350	555600
179	1472250	555650
180	1472000	555400
181	1479450	555500
182	1479450	555250
183	1479450	554800
184	1481750	555400
185	1464200	552650
186	1463850	552900
187	1463950	552450
188	1465900	553150
189	1465950	552250
190	1465850	552050
191	1468500	551750
192	1467950	550550
193	1468400	549800
194	1468800	551900
195	1469250	551700
196	1469250	552300
197	1469250	552950
198	1470800	551700
199	1452950	569150

SAMPLING SITE CONDITIONS

FIELD: SUMMERLAND FIELD

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 2.0'	TALUS AT BASE OF CLIFF
2, PROBE, 3.0'	TALUS AT BASE OF CLIFF
3, PROBE, 3.5'	HARD PACKED SAND W/ WATER; BASE OF CLIFF
4, PROBE, 3.0'	TALUS AT BASE OF CLIFF
5, PROBE, 3.0'	6' FROM ROAD
6, AUGER, 5.0'	NEXT TO ROAD, DARK CLAY
7, PROBE, 3.0'	10' ABOVE ROAD
8, PROBE, 3.0'	4' FROM ROAD
9, PROBE, 2.5'	ON ROAD; CLAY
10, PROBE, 2.5'	HARD CLAY
11, PROBE, 2.5'	NEXT TO FENCE
12, PROBE, 2.0'	HARD CLAY; IN GARDEN
13, PROBE, 2.5'	HARD STICKY CLAY
14, PROBE, 2.0'	HARD CLAY, BY GULLEY
15, AUGER, 5.0'	DRY CLAY
16, PROBE, 2.0'	HARD CLAY
17, PROBE, 3.0'	LOOSE SOIL
18, PROBE, 2.0'	HARD CLAY
19, PROBE, 2.5'	HARD CLAY
20, PROBE, 3.0'	HARD CLAY
21, PROBE, 2.5'	HARD CLAY AT 2'
22, PROBE, 2.5'	HARD CLAY; 2.0'
23, PROBE, 2.0'	HARD CLAY
24, AUGER, 5.0'	EDGE OF CLIFF; UNCONSOLIDATED
25, PROBE, 3.0'	SOFT SOIL
26, PROBE, 3.0'	SOFT SOIL
27, PROBE, 3.0'	SOFT SOIL
28, PROBE, 3.0'	SOFT SOIL
29, PROBE, 2.0'	HARD CLAY; BETWEEN TRAILER PARK AND FRWY.
30, PROBE, 2.5'	SOFT SOIL;BELOW TRAILER PARK
31, PROBE, 3.0'	IN GARDEN 6' ABOVE ROAD
32, PROBE, 2.0'	SIDE OF ROAD
33, AUGER, 4.0'	SOFT UNCONSOLIDATED SOIL: THEN HARD CLAY
34, AUGER, 4.0'	SOFT UNCONSOLIDATED SOIL; THEN HARD CLAY
35, PROBE, 2.0'	LEFT OF DRIVEWAY
36, PROBE, 2.5'	6' UP TRIAL OFF ROAD; HARD CLAY

FIELD: SUMMERLAND FIELD

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
37, AUGER, 3.5'	CORNER LILLIE & EVANS; CLAY
38, PROBE, 3.0'	TOP EDGE OF SEA CLIFF; HARD CLAY
39, PROBE, 3.0'	TOP EDGE OF SEA CLIFF; VERY SOFT SOIL
40, PROBE, 3.0'	TOP EDGE OF SEA CLIFF; WEST END OF PARK
41, PROBE, 3.0'	ALONG RAILROAD TRACKS; SOFT SOIL
42, AUGER, 5.0'	TOP EDGE OF SEA CLIFF
43, AUGER, 8.0'	DARK SANDY SOIL AT 7'
44, PROBE, 2.5'	TOP EDGE OF SEA CLIFF; HARD LAYER
45, PROBE, 3.0'	NEAR BASE OF SEA CLIFF, SOFT SOIL
46, PROBE, 3.0'	NEAR BASE OF SEA CLIFF, SOFT SOIL
47, PROBE, 3.0'	NEAR BASE OF SEA CLIFF, SOFT SOIL
48, PROBE, 2.0'	HARD PACKED CLAY; END OF DRIVEWAY
49, PROBE, 1.5'	TOP EDGE OF SEA CLIFF
50, AUGER, 6.0'	HARD STICKY CLAY; BETWEEN PARKING LOT & TRACKS
51, AUGER, 4.0'	FLAT AREA BETWEEN CLIFF EDGE & BEND IN ROAD
52, PROBE, 3.0'	EDGE OF SEA CLIFF TOP; SOFT SOIL
53, PROBE, 2.5'	BETWEEN RAILROAD TRACKS AND ROAD; SOFT SOIL
54, PROBE, 2.5'	NEAR TOP OF SEA CLIFF
55, PROBE, 3.0'	GARDEN INSIDE FENCE; CURVE IN ROAD
56, PROBE, 3.0'	TOP OF SEA CLIFF; FRON OF NEW HOUSE; SOFT SOIL
57, PROBE, 2.5'	HARD SOIL ALONG ROAD
58, PROBE, 2.5'	GARDEN BY EDGE OF CANYON
59, PROBE, 2.5'	ON EDGE OF CANYON; DEBRIS FILL
60, PROBE, 1.5'	EAST EDGE OF PARK ON HORSE TRAIL
61, PROBE, 2.0'	ROAD AT BASE OF FREEWAY SLOPE

FIELD: NEWPORT BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, AUGER, 5.0'	SANDY SOIL
2, AUGER, 10.0'	SANDY CLAY
3, AUGER, 5.0'	SANDY SOIL
4, AUGER, 7.0'	SANDY CLAY; H2S
5, AUGER, 5.0'	SANDY SOIL
6, AUGER, 8.0'	SANDY SOIL
7, PROBE, 3.0'	ENTRANCE TO COVES
8, PROBE, 3.0'	EASY SOIL
9, PROBE, 3.0'	H2S; STRONG ODOR
10, PROBE, 2.0'	EASY SOIL
11, PROBE, 3.0'	SOFT SOIL
12, PROBE, 4.0'	SOFT SOIL
13, PROBE, 3.0'	MODERATE SAND
14, PROBE, 3.0'	MODERATE SAND
15, PROBE, 3.0	EASY SAND
16, PROBE, 3.0'	EASY SAND
17, PROBE, 3.0'	EASY SAND
18, AUGER, 5.0'	OILY SMALL TO CUTTINGS
19, PROBE, 2.5'	NEXT TO FLARE AT HOGG MEMORIAL #5
20, AUGER 5.0'	OILY SMELL; HARD CLAY
21, PROBE, 4.0'	EASY SAND
22, PROBE, 2.0'	HARD INTO SAND
23, PROBE, 3.0'	SOFT SAND
24, PROBE, 4.0'	VERY SOFT SAND
25, PROBE, 3.0'	SOFT SAND
26, PROBE, 4.0'	SAND; CRACK IN SIDEWALK
27, PROBE, 3.0'	SAND
28, PROBE, 4.0'	SAND
29, PROBE, 3.0'	SANDY CLAY
30, PROBE, 3.0'	HARD, SANDY CLAY; MIDDLE OF INTERSECTION
31, PROBE, 3.0'	SANDY CLAY
32, PROBE, 4.0'	SANDY
33, PROBE, 3.0'	SANDY
34, PROBE, 3.0'	SANDY; MARCUS & 36TH
35, PROBE, 3.5'	SANDY CLAY; HARD
36, PROBE, 3.0'	BLACK CLAY; H2S ODOR IN AREA
37, PROBE, 3.5'	40TH & RIVER; SNDY CLAY
38, PROBE, 3.5'	BALBOA & 41ST; SNDY CLAY; NEAR PALM
39, PROBE, 2.0'	BLACK CLAY; H2S
40, PROBE, 3.5'	41ST & RIVER IN FLOWERS; SAND

FIELD: NEWPORT BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
41, PROBE, 2.0'	HARD CLAY; NEAR OLD WELL 44TH & BALBOA
42, PROBE, 3.0'	SAND; 43RD ST. NEAR OLD SEEP
43, PROBE, 3.0'	HARD CLAY; 42ND & BALBOA; PALM TREE
44, PROBE, 4.0'	SAND IN FLOWER GARDEN; 42ND & RIVER
45, PROBE, 3.0	CHANNEL & 38TH; CLAY
46, PROBE, 4.0'	MARCUS & 40TH; SAND
47, PROBE, 3.0'	SAND
48, PROBE, 4.0'	SAND
49, PROBE, 3.0'	CLAY; 39TH & CHANNEL
50, PROBE, 4.0'	STIFF SILTY CLAY; 38TH & MARCUS
51, PROBE, 3.0	END OF CHANNEL AND CANNEL; SAND
52, PROBE, 4.0'	CLAY
53, AUGER, 5.0'	LIGHT SAND
54, AUGER, 7.0'	SILTY SAND
55, AUGER, 5.0'	SILTY SAND; ABOVE FLARE
56, BLANK	AIR UPWIND OF FLARE AT SITE #55
57, AUGER, 7.0'	CLAY, SITE #55
58, AUGER, 7.0'	CLAY, 2ND TRY; CLAY
59, PROBE, 2.0'	HARD SANDY CLAY
60, PROBE, 1.5'	VERY HARD; TIGHT SANDY CLAY
61, PROBE, 2.0'	HARD SANDY CLAY
62, AUGER, 5.0'	SOFT WET CLAY
63, AUGER, 7.0'	SOFT WET CLAY
64, PROBE, 2.0'	SOFT STICKY CLAY
65, AUGER, 5.0'	SANDY MUD & CLAY; UNMAPPED WELL
66, PROBE, 1.5'	HARD STICKY WET CLAY
67, AUGER, 4.0'	WET SAND WITH SOME CLAY
68, PROBE, 1.0'	HARD STIFF WET CLAY
69, PROBE, 3.0'	21ST & NEWPORT; SAND
70, PROBE, 2.5'	25TH & BALBOA; HARD SAND
71, PROBE, 3.0'	SAND
72, PROBE, 1.5'	SAND; BY PALM TREE
73, PROBE, 1.0'	TREE ROOTS
74, PROBE, 3.0'	21ST.; NEAR BOAT DOCKS
75, PROBE, 3.0'	28TH ST.; SAND
76, PROBE, 3.0'	28TH & VILLA; SAND
77, PROBE, 3.0'	29TH & VILLA; SAND
78, PROBE, 2.0'	30TH & LAFAYETTE; SAND IN FLOWER BOX
79, PROBE, 3.0'	32ND & VILLA; SAND
80, PROBE, 4.0'	31ST & VILLA; CLAY

FIELD: NEWPORT BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
81, PROBE, 3.0'	30TH & VILLA; SAND
82, PROBE, 3.0'	LAFAYETTE & 32ND; SAND
83, PROBE, 3.5'	VIA OPORTO; SAND
84, PROBE, 3.5'	CITY HALL LAWN NORTH; SAND
85, PROBE, 3.0'	CITY HALL LAWN SW CORNER; SAND BY PALM TREE
86, PROBE, 3.0'	36TH & CLUBHOUSE; WET, HARD SAND
87, PROBE, 2.5'	36TH AND SHORT; SAND
88, PROBE, 2.0	35TH & SHORT; SAND
89, BLANK	AIR BLANK; FINLEY & 35TH
90, PROBE, 2.0'	36TH & FINLEY; HARD LAYER
91, PROBE, 3.0'	34TH & FINLEY; SAND
92, PROBE, 2.0'	35TH & FINLEY; CLAY
93, PROBE, 2.0'	36TH & MARCUS; WET SAND
94, PROBE, 2.0'	BALBOA & 35TH; CLAY
95, PROBE, 3.0'	BLABOA & 34TH; CLAY
96, PROBE, 2.0'	33RD & LAKE; SAND
97, PROBE, 2.0'	BALBOA & 33RD; SAND
98, PROBE, 3.0'	34TH & CANAL; SAND
99, PROBE, 3.0'	35TH & CANAL; HARD SAND
100, PROBE, 2.0	35TH & LAKE; HARD SAND
101, PROBE, 3.0	MARCUS & 33RD; SAND
102, PROBE, 1.5	32ND & BALBOA; SAND; FLOWER BED
103, PROBE, 3.0	BALBOA & 26TH; SAND
104, PROBE, 3.0	BALBOA & 27TH; SAND
105, BLANK	32ND & BALBOA; PARKING LOT; AIR BLANK
106, BLANK	AIR BLANK; SAME AS SITE #105
107, PROBE, 3.0	28TH & BALBOA; SAND
108, PROBE, 3.0	29TH & BALBOA; SAND
109, PROBE, 2.0	30TH & BALBOA; SAND
110, PROBE, 3.0	31ST & BALBOA; SAND
111, PROBE, 0.5	CATV BOX IN ALEY BETWEEN 35TH & 36TH NEAR MARCUS
112, PROBE, 0.5	WATER METER BOX 20' W OF 111
113, PROBE, 3.0	3505 MARCUS; BLACK SAND
114, PROBE, 0.5	10TH BOX IN ALLEY AT 3505 MARCUS
115, PROBE, 3.0	3112 BROAD, W SIDE BROAD & HOLMWOOD; NEXT TO TORCH
116, PROBE, 0'	GAS FROM TIKI TORCH AT 115

FIELD: WHITTIER - RIDEOUT HEIGHTS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 3.5'	SILTY CLAY; DRY
2, PROBE, 3.5'	SILTY CLAY, DRY
3, PROBE, 3.0'	DRY SILT
4, PROBE, 3.0'	SILTY CLAY, DRY
5, PROBE, 3.0'	CLAY
6, PROBE, 3.0'	SILTY CLAY
7, PROBE, 3.0'	SILTY CLAY
8, PROBE, 3.5'	SILTY CLAY
9, PROBE, 3.0'	SILTY CLAY
10, PROBE, 3.0'	SANDY
11, PROBE, 3.0'	SILTY CLAY, DAMP
12, PROBE, 3.0'	HARD CLAY
13, PROBE, 2.5	SOFT SANDY SILT
14, PROBE, 3.0'	HARD CLAY
15, PROBE, 3.5'	SILTY CLAY
16, PROBE, 3.5'	SILTY CLAY
17, PROBE, 3.5'	CLAY
18, PROBE, 3.5'	CLAY
19, PROBE, 4.0'	SANDY SILT
20, PROBE, 4.0'	SANDY SILT
21, PROBE, 3.5'	SILTY CLAY
22, PROBE, 3.0'	SILTY CLAY
23, PROBE, 4.0'	SILTY SAND
24, PROBE, 4.0'	SANDY SILT
25, PROBE, 3.0'	SANDY SILT
26, PROBE, 4.0'	SILTY CLAY; WELL SITE
27, AUGER, 5.0'	SANDY SILT
28, SURFACE, 0'	OIL FROM SITE #26
29, AUGER, 5.0'	CLAY & SILT

FIELD: BREA-OLINDA

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 2.0'	SAND AT WELL #254
1, AUGER, 5.0'	70' SW WELL #254; HARD SAND
3, AUGER, 5.0'	35' SW WELL #45; CLAY
3, AUGER 9.0'	35' SW WELL #45; STIFF WET CLAY
3, PROBE, 3.0'	WELL #45; SILT
6, AUGER, 5.0'	25' N OF WELLS #181 & 191
6, PROBE, 2.5'	WELLS #181 & 191; HARD SILT
6, PROBE, 0'	AIR BLANK AT WELLS #181 & 191
9, AUGER, 5.0'	50' SW WELL #146; YELLOW CLAY & SILT
9, PROBE, 2.5'	WELL #146; STIFF SILT & SAND
11, AUGER, 5.0'	20' E WELL #176; SILT TO STICKY CLAY
11, PROBE, 3.0'	WELL #176; SILT TO STICKY CLAY
13, PROBE, 2.5'	30' N WELL #109
13, PROBE, 0'	AIR BLANK AT #109
13, AUGER, 5.0'	30' N WELL #109; DRY SILT
17, PROBE, 3.0'	30' E WELL #84; SAND
17, AUGER, 5.0'	30' E WELL #84; BLACK CLAY
19, PROBE 3.0'	30' W WELL #83
19, AUGER, 5.0'	30' W WELL #83; LOOSE SILT
19, AUGER, 0'	WATER BLANK
22, PROBE, 3.0'	60' W WELL #65A; SANDY SILT
22, AUGER, 5.0'	60' W OF WELL #65A; BLACK CLAY W/OIL
22, AUGER, 0'	ON HILL BETWEEN 63A & 64. SURFACE SEEP; HARD.
22, AUGER, 0'	ON HILL BETWEEN 64 & 63A. SURFACE SEEP; H2O
26, PROBE, 3.0'	50' SW OF WELL #64; SILT
26, AUGER, 5.0'	50' SW OF WELL #64; SILT
28, PROBE, 2.5'	75' SE OF WELL #167; SANDY SILT
28, AUGER, 5.0'	75' SE OF WELL #167; SANDY SILT; HARD
30, PROBE, 2.5'	40' NE OF WELL #63A; HARD SILT
30, AUGER, 5.0'	30' E OF WELL #63A; SEEP SITE
30, PROBE, 5.0'	GAS; FROM AUGER HOLE AT WELL #63A
30, PROBE, 3.0'	NEXT TO AUGER HOLE AT WELL #63A
34, AUGER, 0'	?BETWEEN WELLS #63A & 106. SEEP.
34, PROBE, 0'	AIR BLANK BETWEEN 63A & 106
36, AUGER, 5.0'	50' E OF WELL #62; SILT
36, PROBE, 2.5'	50' E OF WELL #62; SILT-CLAY
38, AUGER, 5.0'	50' W OF WELL #111; BLACK SILT; SEEP
38, PROBE, 2.5'	50' W OF WELL #111; BLACK SILT; HARD

FIELD: BREA-OLINDA

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
40, AUGER, 5.0'	20' N OF WELL #114; SANDY SILT
40, PROBE, 3.0'	20' N OF WELL #114; SANDY SILT
42, AUGER, 0'	75' S OF WELL #119; GAS FROM SEEP
43, AUGER, 5.0'	50' SW OF WELL #119; SILT
43, AUGER, 9.0'	50' SW OF WELL #119; SILT
43, PROBE, 3.0'	50' SW OF WELL #119; SILT W/SAND
46, PROBE, 2.5'	50' W OF WELL #211; SANDY SILT
46, AUGER, 5.0'	50' W OF WELL #211; SILT
48, AUGER, 5.0'	75' W OF WELL #251; SILT
48, PROBE, 3.0'	75' W OF WELL #251; SANDY SILT
50, AUGER, 5.0'	20' N OF WELL #81; BROWN SILT
50, PROBE, 3.0'	WELL #81; FINE SILT
52, PROBE, 3.0'	100' SE OF WELL #143
54, PROBE, 2.5'	75' NW OF WELL #134; DAMP SAND
54, AUGER, 4.0'	75' NW OF WELL #134; VERY ROCKY
56, PROBE, 3.0'	75' W OF WELL #131; DRY SAND
57, AUGER, 2.5'	100' W OF WELL #128; VISIBLE SEEPAGE
57, AUGER, 0'	30' N OF WELL #128; SEEP POOL
57, PROBE, 1.5'	100' W OF WELL #128; GAS FROM AUGER HOLE
60, PROBE, 3.5'	300' E OF WELL #136; SANDY SILT
60, AUGER, 5.0'	300' E OF WELL #136; BROWN SILT
61, AUGER, 3.0'	30' W OF WELL #101; SEEPAGE VISIBLE
61, PROBE, 1.0'	30' W OF WELL #101; HARD SILT
63, AUGER, 2.5'	25' N OF WELL #137; BLACK OILY SILT
63, PROBE, 3.0'	45' N OF WELL #137; SILTY CLAY

FIELD: BREA-OLINDA

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
66, AUGER, 5.0'	20' N OF 182; DAMP FINE SILT
67, PROBE, 2.5'	20' N OF 182; SILT
68, PROBE, 1.5'	50' W OF 154; VERY HARD SILT
69, AUGER, 5.0'	30' SW OF A56; FINE SILT
70, PROBE, 2.0'	30' SW OF 156; DAMP FINE SILT
71, PROBE, 2.5'	BETWEEN 180 & 178; DAMP, SILTY CLAY
72, PROBE, 2.0'	BETWEEN 178 & 180; (CHISEL POINT NOT FULLY OPEN)
73, AUGER, 5.0'	25' S OF 80; SILT; POSSIBLE OIL SPILL
75, PROBE, 2.5'	25' S OF 80; DARK SILT
77, PROBE, 3.0'	25' N OF 87; HARD DAMP SILT
76, AUGER, 5.0'	25' N OF 87; LOOSE SILT
78, PROBE, 3.0'	100' S OF 72; DAMP SILT
79, AUGER, 5.0'	20' N OF 43A; SILT
80, PROBE, 3.0'	20' N OF 43A; BLACK, SILT
81, PROBE, 3.0'	30' N OF 153; DAMP CLAY
82, AUGER, 5.0'	100' N OF 170; YELLOW SILT
83, PROBE, 3.0'	100' N OF 170; HARD SILT
84, PROBE, 3.0'	30' S OF 214; DRY SANDY SILT
85, PROBE, 3.5'	40' S OF 207; LOOSE SANDY SILT
86, PROBE, 2.0'	25' E OF 208; HARD SANDY SILT
87, AUGER, 0.0'	AIR BLANK AT 208
88, AUGER, 5.0'	25' E OF 208; DAMP SANDY SILT
89, PROBE, 3.5'	100' N OF 90; DRY SILT
90, AUGER, 5.0'	30' N OF 52A; LOOSE SAND AND SILT
91, PROBE, 1.5'	30' N OF 52A; HARD FINE SAND & SILT
92, PROBE, 3.0'	40' S OF 46; DRY SILT
93, AUGER, 5.0'	SHELL #43; ORANGE SILT
94, PROBE, 2.0'	SHELL #43; HARD SILT
95, AUGER, 5.0'	200' W OF SHELL #44
96, PROBE, 3.0'	200' W OF SHELL #44; SILT
97, AUGER, 0.0'	AIR BLANK; 200' W OF SHELL #44
98, AUGER, 5.0'	100' W OF SHELL #31; SAND & SILT
99, PROBE, 2.0'	100' W OF SHELL #31; HARD SANDY SILT
100, AUGER, 4.0	200' E OF SHELL #50; ACTIVE SEEP
101, PROBE, 2.0	SHELL #50; BLACK SILT
102, AUGER, 0.0	SEEP MATERIAL; SHELL #50
103, AUGER, 5.0	30' E OF SHELL #21; SILTY; ORANGE CLAY
104, PROBE, 3.0	30' E OF SHELL #21; SILTY CLAY

FIELD: BREA-OLINDA

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
105, AUGER, 5.0	30' E OF SHELL #27; SILT
106, PROBE, 2.0	30' E OF SHELL #27; HARD SILT
107, AUGER, 5.0	20' E OF #32; SILT
108, PROBE, 3.0	20' E OF #32; HARD SILT
109, AUGER, 5.0	100' S OF #37; DAMP SILTY CLAY
109, AUGER, 5.0	200' S OF #37; SILTY DAMP CLAY
110, PROBE, 2.5	200' S OF #37; HARD SILT
111, AUGER, 5.0	10' S OF #78; DAMP SILTY CLAY
112, PROBE, 2.5	10' S OF #78; HARD SILT
113, AUGER, 0.0	AIR BLANK; 30' S OF #78
114, AUGER, 5.0	20' N OF #174; YELLOW SILTY SAND
115, PROBE, 2.0	20' N OF #174; HARD SILT
116, AUGER, 5.0	50' N OF #144; YELLOW SILT
117, PROBE, 3.0	50' N OF #144; SILT
118, AUGER, 5.0	40' W OF #36; DAMP SILT
119, PROBE, 2.0	40' W OF #36; HARD SILT
120, AUGER, 5.0	20' W OF #173; YELLOW SILT & SAND
121, PROBE, 3.0	20' W OF #173; YELLOW SILT & SAND
122, AUGER, 5.0	50' N OF #89; DRY SILT
123, PROBE, 2.0	50' N OF #89; HARD SILT
124, AUGER, 5.0	20' N OF #77; DRY YELLOW ORANGE SILT
125, PROBE, 2.0	20' N OF #77; SILT
126, AUGER, 5.0	50' E OF #57; DRY BROWN SILT
127, PROBE, 3.0	50' E OF #57; HARD SILT
128, AUGER, 0.0	SEEP MATERIAL; 20' E OF #112
129, AUGER, 4.0	20' E OF #112; OIL SOAKED SILT
130, PROBE, 2.0	20' E OF #112; OIL SOAKED SILT
131, AUGER, 0.0	GAS BUBBLING FROM SEEP; #112
132, AUGER, 5.0	20' S OF #175; CLAY WITH GRAVEL
133, PROBE, 3.0	20' S OF #175; HARD CLAY
134, AUGER, 3.5	100' W OF #115; VERY ROCKY
135, PROBE, 1.0	100' W OF #115; VERY ROCKY
136, AUGER, 4.0	50' E OF #71; ROCKY DRY SILT
137, PROBE, 1.5	50' E OF #71; VERY ROCKY
138, AUGER, 4.0	20' SE OF #67; OIL SOAKED SILT
139, PROBE, 2.0	20' E OF #67; OIL SOAKED SILT
140, AUGER, 2.5	20' S OF #117; HARD AND ROCKY
141, PROBE, 1.0	20' S OF #117; VERY HARD AND ROCKY

FIELD: BREA-OLINDA

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
142, AUGER, 5.0	30' W OF 121; SAND AND SILTY CLAY
143, PROBE, 2.0	30' W OF #121; SILT
144, AUGER, 4.0	30' W OF #118; SILT AND ROCK
145, PROBE, 2.0	30' W OF #118; HARD SILT
146, AUGER, 5.0	30' W OF #102, ORANGE SILT
147, PROBE, 3.0	30' W OF #102; SILT
148, AUGER, 3.5	10' S OF #127; RED SILT AND ROCK
149, PROBE, 3.0	10' S OF #127; SILT

FIELD: SANTA FE SPRINGS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 3.0'	FINE SAND; PRESUMED SEEP
2, AUGER, 5.0'	DRY FINE SAND
3, PROBE, 3.0'	50' N WELL #4; DARK SILT
4, PROBE, 3.0'	RR TRACK BERM: DARK SILT
5, PROBE, 3.0'	200' N SLUSHER #29: SANDY BROWN SILT
6, PROBE, 3.0'	100' E PEDRO PET #3: BROWN SANDY SILT
7, PROBE, 3.0'	SCHOOL PARKING LOT: TREE WELL; SANDY BROWN SILT
8, AUGER, 5.0'	SCHOOL PARKING LOT; FINE SILTY SAND
9, PROBE, 3.0'	LAWN SIDE S OF STREET; SILTY CLAY
10, PROBE, 3.0'	LAWN SIDE S OF STREET; SILTY SAND
11, PROBE, 3.0'	LAWN SIDE S OF STREET; FINE DRY SILT
12, PROBE, 3.0'	SW SIDE OF STREET LAWN; FINE DRY SILT
13, PROBE, 3.0'	SW CORNER OF ALBURTIS & DUNNING; DRY SILT
14, PROBE, 3.0'	S SIDE AT CORNER OF PIONEER & DUNNING; SILTY SAND
15, PROBE, 3.0'	SE CORNER OF RINGWOOD & FLORENCE; DAMP SILTY CLAY
16, PROBE, 3.0'	SW CORNER OF JERSEY & BUELL; DAMP SILTY CLAY
17, PROBE, 3.0'	N SIDE OF STREET; SANDY SILT
18, PROBE, 3.0'	PARKWAY BETWEEN MAIDSTONE & FLORENCE; MOIST SILT
19, PROBE, 3.0'	SW CORNER OF FLALLON & RINGWOOD; DRY SILT
20, PROBE, 3.0'	N CORNER OF KINGHORN & ROSETON;DRY SAND
21, PROBE, 3.0'	S CORNER OF CLAYMORE & JERSEY; SILT
22, PROBE, 2.5'	S CORNER OF FLOSSMOOR & JERSEY; DRY SANDY SILT
23, PROBE, 3.0'	SW CORNER OF PIONEER & JERSEY; DRY SANDY SILT
24, PROBE, 3.0'	NW CORNER OF HOUGHTON & DANBY; DRY CLAY
25, PROBE, 3.0'	SE OF CHARLESWORTH & ALBURTIS; MOIST SILT
26, PROBE, 2.0'	N OF SUNGLOW & ALBURTIS;HARD DRY FINE SILT
27, PROBE, 3.0'	SE CORNER OF ROMA & ALBURTIS; HARD DRY CLAY
28, PROBE, 3.0'	ONE BLOCK S OF SMITH & ALBURTIS; DAMP SILT
29, PROBE, 3.0'	W SIDE OF ALBURTIS; FINE DAMP SILT
30, PROBE, 3.0'	END OF WILLAKE; SILTY DAMP CLAY
31, PROBE, 2.0'	NW OF SMITH & ARLEE; HARD DRY SILT
32, PROBE, 3.0'	NW OF NOVA & ARLEE; COARSE MOIST SILT
33, PROBE, 3.0'	100' E OF CORNER OF ARLEE & TERRADELL; SLIGHTLY DA
34, PROBE, 3.0'	300' N OF FLORENCE ON FOREST; SILT
35, PROBE, 2.5'	INBETWEEN FOREST & BLOOMFIELD; CLAY
36, PROBE, 2.5'	IN LAWN NEAR CORNER OF SPRINGDALE & FLORENCE; DAMP

FIELD: SANTA FE SPRINGS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
37, PROBE, 2.5'	600' FROM SPRINGDALE & FLORENCE; DAMP SILT
38, PROBE, 3.0'	70' W OF MOBIL WELL #516P; SILTY DAMP CLAY
39, AUGER, 5.0'	70' W OF MOBIL #516P
40, PROBE, 2.5'	OUTSIDE DIKE SURROUNDING TANKS; SILTY CLAY
41, PROBE, 3.0'	INSIDE DIKE AT POWERINE REFINERY; SILTY CLAY
42, PROBE, 3.0'	10' FROM CURB AT POWERINE; CLAY
43, PROBE, 3.0'	10' CURB ON FENCE LINE AT POWERINE; SILT
44, AUGER, 5.0'	SITE #42; CLAY
45, PROBE, 2.5'	NW CORNER OF NORWALK & LAKELAND; FINE SILT
46, PROBE, 3.0'	SW CORNER OF KALNOR & LAKELAND; DAMP SILT
47, PROBE, 3.0'	SW CORNER OF FLORENCE & NORWALK; DAMP SILT
48, PROBE, 1.5'	20' FROM STREET IN VACANT LOT; DRY SILT
49, PROBE, 2.0'	W END OF CULDESAC; DRY SILT
50, PROBE, 2.0'	20' S FROM FLORENCE; DRY SILT
51, PROBE, 3.0'	10' E OF JALK #117(PYRAMID OIL); DRY SILT
52, PROBE, 1.0'	S CORNER OF KALNOR & ACHILLES; DRY SILT
53, PROBE, 3.0'	S CORNER OF ACHILLES & NORWALK; DAMP SILT
54, PROBE, 3.0'	100' S MOBIL #535E, BLOOMFIELD & CLARK; DRY SAND
55, AUGER, 5.0'	100' S MOBIL #535E, BLOOMFIELD & CLARK; DAMP SILT
56, PROBE, 3.0'	20' N INTERSECTION FOREST & CLARK; DAMP SANDY SILT
57, PROBE, 2.0'	100' N INTERSECTION FOREST & CLARK; SILT
58, AUGER, 4.0'	100' N INTERSECTION FOREST & CLARK; BLACK SILT
59, PROBE, 3.0'	50' N CLARK & 10' E WILLIS; DAMP SILT
60, PROBE, 1.5'	50' N PARK & 50' E OF WILLIS; DAMP SILT
61, AUGER, 3.5'	50' N PARK & 50' E WILLIS; DAMP SILT
62, PROBE, 3.0'	SE CORNER SPRINGDALE & PARK; WET CLAYEY SILT
63, PROBE, 2.5'	SE CORNER FOREST & PARK; DRY SILT
64, AUGER, 4.5'	SE CORNER FOREST & PARK; DAMP CLAY & SILT
65, PROBE, 3.0'	100' W OF BLOOMFIELD & PARK; DAMP SILTY CLAY
66, AUGER, 0.0'	AIR SAMPLE AT SITE #65
67, PROBE, 2.0'	30' W OF #452C; DRY COARSE SILT
68, PROBE, 3.0'	20' W OF #446L; SILTY DAMP CLAY
69, PROBE, 2.0'	20' N OF #425C; DAMP SILT
70, PROBE, 1.5'	100' E OF #420C; OIL SOAKED SILT
71, PROBE, 3.0'	300' N CORNER CLARK & NORWALK; VERY WET SILT
72, PROBE, 2.0'	550' N CORNER CLARK & NORWALK; WET SILT

FIELD: SANTA FE SPRINGS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
73, PROBE, 3.0'	100' SW OF NORWALK & TELEGRAPH; DAMP SILT
74, PROBE, 2.5'	20' S OF PARK & NORWALK; FLOWER BED
75, PROBE, 3.0'	ACROSS & N OF CLARK & NORWALK; MOIST SILT
76, PROBE, 3.0'	100' W OF PARK & NORWALK; MOIST SILT
77, PROBE, 2.0'	100' W & 30' N OF CLARK & NORWALK; MOIST SILT
78, AUGER, 5.0'	SAME AS SITE #77; MOIST SILT
79, PROBE, 2.0'	30' N OF JORDAN #30; MOIST SILT
80, PROBE, 2.5'	100' S OF ALEXANDER #38
81, AUGER, 5.0'	SAME AS SITE #80; DRY FINE SILT
82, PROBE, 2.0'	50' N OF ALEXANDRA #39; DRY SILT
83, PROBE, 1.5'	100' S OF HOWARD #4; DRY SILT
84, AUGER, 5.0'	SAME AS SITE #83; ALMOST DRY FINE SILT
85, PROBE, 2.0'	50' N OF DEWINTER #7; HARD DAMP SILT
86, PROBE, 2.5'	50' E OF 50H; DRY SILT
87, AUGER, 5.0'	SAME AS SITE #86; SLIGHTLY DAMP FINE SILT
88, AUGER, 0.0'	AIR SAMPLE FROM SITE #87
89, PROBE, 3.0'	30' E OF 48C; DAMP SILT
90, PROBE, 3.0'	W OF DEWINTER #5; DRY SILT
91, PROBE, 2.0'	200' N OF SITE #90 ON GEARY; DRY SILT
92, PROBE, 3.0'	100' N OF 51B NEXT TO GEARY; DAMP SILT
93, PROBE, 3.0'	100' W OF 27C ON GEARY; WET SILT
94, PROBE, 3.0'	200' S OF SITE #93; MOIST SILT
95, PROBE, 3.0'	SE CORNER OF SMITH & GEARY; MOIST SILT
96, PROBE, 3.0'	100' S OF SITE #95; MOIST SILT
97, PROBE, 3.0'	CORNER OF SMITH & NORWALK; DAMP SILT
98, PROBE, 3.0'	20' N OF 21B; SANDY SILT
99, AUGER, 5.0'	SAME AS SITE #98; MOIST SILT
100, AUGER, 0.0	AIR SAMPLE FROM SITE #99
101, PROBE, 3.0	300' NE OF SMITH & NORWALK; DRY FINE SILT
102, PROBE, 3.0	50' N OF HOWARD #5; MOIST SILT
103, AUGER, 5.0	SAME AS SITE #102; FAIRLY DAMP SILT
104, AUGER, 0.0	AIR SAMPLE FROM SITE #103
105, PROBE, 3.0	50' N OF 217B; DAMP SILT
106, PROBE, 1.5	50' N OF 413M; SILT
107, PROBE, 3.0	30' N OF 415E; ALMOST DRY SILT
108, PROBE, 3.0	10' E OF 405C; DRY COARSE SILT

FIELD: SANTA FE SPRINGS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
109, PROBE, 1.5'	75' N OF 409C; SILT
110, AUGER, 5.0'	15' S OF SITE #106; ALMOST DRY SILT
111, AUGER, 0.0'	AIR SAMPLE AT SITE #110
112, AUGER, 2.5'	100' E OF 420C; BLACK OIL SOAKED SILT
113, PROBE, 1.5'	SAME AS SITE #112; BLACK SILT
114, AUGER, 5.0'	50' S OF CORNER OF BELL RANCH; DAMP SILT
115, PROBE, 2.0'	SAME AS SITE #114; SILT
116, AUGER, 5.0'	DAMP SILT
117, PROBE, 3.0'	SAME AS SITE #116; SILT
118, AUGER, 5.0'	DAMP SILT
119, PROBE, 2.5'	SAME AS SITE #118; HARD SILT
120, AUGER, 5.0'	30' S OF 710C; SILT, CLAY, SILT
121, PROBE, 3.0'	SAME AS SITE #120; SILT
122, AUGER, 5.0'	30' N OF FLORENCE; SILT TO SANDY SILT
123, PROBE, 2.0'	SAME AS SITE #122; SILT
124, AUGER, 5.0'	100' N OF 714CR; LOOSE DAMP SILT
125, PROBE, 2.5'	SAME AS SITE #124; SILT
126, AUGER, 0.0'	AIR SAMPLE AT SITE #124
127, AUGER, 5.0'	30' N OF 712C; FINE POWDERY SILT
128, PROBE, 3.0'	SAME AS SITE #127; DRY SILT
129, AUGER, 5.0'	50' S OF 103C; DAMP SILT
130, PROBE, 1.5'	SAME AS SITE #129; DAMP SILT
131, AUGER, 4.5'	LOOSE ALMOST DRY SILT
132, PROBE, 2.0'	SAME AS SITE #131; DRY SILT
133, AUGER, 0.0'	AIR SAMPLE AT SITE #131
134, AUGER, 5.0'	50' E OF 820C & 50' W OF 819C; SILT TO CLAY
135, PROBE, 2.5'	SAME AS SITE #134; SILT
136, AUGER, 5.0'	100' W OF 846S; DRY FINE SILT
137, PROBE, 1.5'	SAME AS SITE #136; DRY SILT
138, AUGER, 4.0'	20' N OF 763E; OIL SOAKED SILT
139, AUGER, 5.0'	30' S OF J47; VERY ROCKY SILT
140, PROBE, 3.0'	W SIDE OF ROAD BETWEEN SMITH & PACIFIC; SILT
141, PROBE, 3.0'	SE OF PACIFIC & NORWALK; DAMP SILTY CLAY
142, PROBE, 3.0'	MIDDLE OF GREEN BELT; WET SILT
143, PROBE, 1.5'	END OF PIKE STREET; WET SILTY CLAY
144, PROBE, 3.0'	200' S OF JOHN & LOS NIETOS; DAMP SILT

FIELD: SANTA FE SPRINGS

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
145, PROBE, 3.0'	300' FROM LOS NIETOS & GREENLEAF; DRY SILT
146, PROBE, 2.5'	30' S OF J47; SILT

FIELD: LOS ANGELES CITY

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 3.0'	CORNER OF STADIUM & CORONEL; STICKY BLACK CLAY
2, AUGER, 5.0'	SAME AS SITE #1; GREY CLAY
3, AUGER, 0.0'	AIR SAMPLE AT SITE #1
4, PROBE, 3.0'	12' S OF FONG #1; STICKY CLAY
5, PROBE, 3.0'	IN DIRT PARKING LOT; STICKY CLAY
6, AUGER, 5.0'	NEAR SITE #5 BY CURB; DARK STICKY CLAY
7, PROBE, 3.0'	NEXT TO CURB; DAMP SILTY CLAY
8, PROBE, 3.0'	FIGUEROA TERRACE & COLLEGE; DAMP BROWN SILTY CLAY
9, PROBE, 3.0'	NEW DEPOT & FIGUEROA TERRACE; SLIGHTLY DAMP SILT
10, PROBE, 3.0'	NEAR SIDEWALK ON BEAUDRY; DAMP CLAY
11, AUGER, 5.0'	SUNSET & WHITE KNOLL; DAMP YELLOW SILT
12, AUGER, 0.0'	AIR SAMPLE FROM SITE #11
13, PROBE, 2.0'	SAME AS SITE #11; DAMP YELLOW SILTY CLAY
14, PROBE, 3.0'	TEMPLE & BOYLESTON; DAMP SILTY CLAY
15, PROBE, 2.5'	BOYLESTON & COURT; DAMP SILT
16, PROBE, 1.5'	SW CORNER OF TOLUCA & COLTON; HARD DRY CLAY & SILT
17, PROBE, 3.0'	SE CORNER OF COURT & DOUGLAS; DRY SILT
18, AUGER, 5.0'	ACROSS STREET FROM #17; SLIGHTLY DAMP YELLOW SILT
19, PROBE, 2.5'	E CORNER OF CORTEZ & EDGEWARE; DRY SILT
20, PROBE, 2.5'	NW CORNER OF EDGEWARE & COURT; DRY HARD SILT
21, PROBE, 3.0'	W CORNER OF COURT & GLENDALE; WET SILTY CLAY
22, PROBE, 2.5'	NE CORNER OF COLTON & WELCOME; DRY SILT & SAND
23, AUGER, 4.5'	SAME AS SITE #22; SILTY CLAY
24, PROBE, 3.0'	NE CORNER OF GLENDALE & BEVERLY; WET SILTY CLAY
25, PROBE, 3.0'	SW CORNER OF 1ST & NEW HAMPSHIRE; DRY SILTY SAND
26, PROBE, 3.0'	NW CORNER OF BERENDO & 3RD; DAMP SILT TO CLAY
27, PROBE, 3.0'	NW CORNER OF NEW HAMPSHIRE & 3RD; WET SILT
28, PROBE, 3.0'	150' N ON W SIDE OF 2ND & VERMONT; DAMP CLAY
29, PROBE, 3.0'	150' FROM SE CORNER OF VERMONT & 3RD; DAMP SILT
30, PROBE, 3.0'	E SIDE OF JUANITA, 200' S OF 2ND; MOIST SILT
31, PROBE, 2.5'	350' N OF 2ND & BIMINI,ON E SIDE; DRY SILT
32, PROBE, 3.0'	130' E OF BIMINI ON N SIDE OF 2ND; DAMP COARSE SI
33, AUGER, 5.0'	30' N OF END OF WHITE HOUSE PLACE; CLAY
34, AUGER, 0.0'	AIR SAMPLE FROM SITE #33
35, PROBE, 2.0'	SAME AS SITE #33; MOIST CLAY OR FINE SILT THEN ROC
36, AUGER, 0.0'	AIR SAMPLE FROM SITE #33

FIELD: LOS ANGELES CITY

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
37, PROBE, 1.5'	100' N OF 2ND & UNION; DRY SILT
38, PROBE, 3.0'	50' NW OF 3RD & WESTMORELAND; SANDY SILT
39, PROBE, 2.0'	30' N OF 2ND & WESTMORELAND; WET CLAY
40, PROBE, 2.5'	40' E OF GENEVA & WESTMORELAND; SLIGHTLY DAMP SILT
41, PROBE, 3.0'	NE CORNER OF COMMONWEALTH & GENEVA; WET CLAY
42, PROBE, 3.0'	SE CORNER OF 3RD & COMMONWEALTH; WET SILTY CLAY
43, PROBE, 2.5'	SE CORNER OF 2ND & COMMONWEALTH; BLACK STICKY CLAY
44, PROBE, 3.0'	NW CORNER OF HOOVER & 4TH; WET STICKY SILTY CLAY
45, PROBE, 2.0'	SE CORNER OF 3RD & HOOVER; DRY ORANGE SILT
46, PROBE, 1.5'	50' N OF 3RD & RENO; HARD DRY ORANGE SILT
47, PROBE, 3.0'	200' FROM HOOVER & 6TH; STICKY SILTY CLAY
48, PROBE, 3.0'	NW CORNER OF COMMONWEALTH & 6TH; STICKY WET SILT
49, PROBE, 2.5'	SE CORNER OF 4TH & COMMONWEALTH; DAMP STICKY SILT
50, PROBE, 3.0'	NW CORNER OF LAFAYETTE & 6TH; DAMP SILTY CLAY
51, PROBE, 3.0'	600' N OF LAFAYETTE & 6TH; WET STICKY SILT
52, PROBE, 2.0'	SE OF 4TH & WESTMORELAND; STIFF STICKY SILT & CLAY
53, PROBE, 2.5'	SW CORNER OF 5TH & WESTMORELAND
54, PROBE, 3.0'	250' S OF WILSHIRE & WESTMORELAND; DAMP SANDY SILT
55, PROBE, 3.0'	40' S OF SW CORNER OF 6TH & VERMONT
56, PROBE, 3.0'	30' FROM 5TH & NEW HAMPSHIRE; SLIGHTLY DAMP SILT
57, PROBE, 2.0'	W SIDE OF OCEAN VIEW & CORONADO; DAMP SILTY CLAY
58, PROBE, 2.0'	SW CORNER OF 4TH & CORONADO; MOIST CLAY
59, PROBE, 3.0'	SW CORNER OF 3RD & CORONADO; DRY SILT
60, PROBE, 3.0'	300' W OF PARK VIEW & 4TH; WET CLAY
61, PROBE, 3.0'	SW CORNER OF PARK VIEW & 5TH
62, PROBE, 3.0'	SW CORNER OF 3RD & GRAND VIEW; DRY YELLOW SILT
63, PROBE, 3.0'	30' S OF 4TH & 40' W OF GRAND VIEW; WET SILTY CLA
64, AUGER, 5.0'	SAME AS SITE #63; STICKY DARK CLAY
65, AUGER, 0.0'	AIR SAMPLE FROM SITE #64
66, PROBE, 3.0'	S SIDE OF PARK VIEW & 3RD; DAMP SILTY CLAY
67, PROBE, 2.5'	SW CORNER OF 3RD & LAKE; DRY YELLOW CLAY
68, PROBE, 2.5'	SE CORNER OF LAKE & MIRAMAR; STICKY FINE SILT
69, PROBE, 3.0'	NE CORNER OF MOUNTAIN VIEW & MIRAMAR; DRY SILT
70, PROBE, 2.0'	SE MOUNTAIN VIEW & BONNIE BRAE; DAMP STICKY SILT
71, PROBE, 2.5'	SW CORNER OF WESTLAKE & 2ND; DRY FINE SILT
72, PROBE, 2.5'	S OF MIRAMAR AT WESTLAKE; MOIST STICKY SILT

FIELD: LOS ANGELES CITY

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
73, PROBE, 3.0'	NW CORNER OF 2ND & BONNIE BRAE; WET STICKY SILT
74, PROBE, 2.5'	130' FROM MIRAMAR & BURLINGTON; DAMP SILT & CLAY
75, PROBE, 3.0'	75' FROM BEVERLY & BURLINGTON; WET COARSE SILT
76, PROBE, 2.0'	200' N OF MIRAMAR & UNION; HARD DRY YELLOW SILT
77, PROBE, 2.5'	SW CORNER OF UNION & BEVERLY; DRY YELLOW SILT
78, PROBE, 3.0'	150' NW FROM CARONDELET & BEVERLY; DRY COARSE SILT

FIELD: SALT LAKE

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 3'	NE CORNER MCCADDEN & BEVERLY; WET STICKY CLAY
2, PROBE, 2.5'	SE CORNER MCCADDEN & ROSEWOOD; DRY COARSE SILT
3, AUGER, 5'	SAME AS SITE #2; WET COARSE SILT
4, PROBE, 1'	NE CORNER OAKWOOD & JUNE; DRY COARSE SILT
5, PROBE, 3'	SW CORNER ROSEWOOD & JUNE; WET SANDY SILT
6, AUGER, 5'	50' W ON S CAHUENGA & ROSEWOOD; SILT TO CLAY
7, PROBE, 2.5'	SAME AS SITE #6; BROWN ALMOST DRY SILT
8, PROBE, 2.5'	SE CORNER ARDEN & ROSEWOOD; STICKY WET CLAY
9, PROBE, 3'	SE CORNER GOWER & ROSEWOOD; DAMP SILTY CLAY
10, PROBE, 3'	SW CORNER PLYMOUTH & ROSEWOOD; DAMP SILTY CLAY
11, PROBE, 2.5'	SW CORNER BRONSON & ROSEWOOD; DRY SILT
12, PROBE, 2'	SW CORNER ELMWOOD & RIDGEWOOD; DRY SILT
13, PROBE, 3'	NW CORNER OAKWOOD & ST ANDREWS; POWDERY SILT
14, PROBE, 1.5'	W OF WESTERN & OAKWOOD ON N SIDE; STICKY CLAY
15, PROBE, 2.5'	50' FROM SW CORNER SERRANO & BEVERLY; DRY SILT
16, PROBE, 2.5'	SE CORNER ROSEWOOD & HIGHLAND; WET SILTY CLAY
17, PROBE, 2.5'	SE CORNER OAKWOOD & HIGHLAND; WET SILTY CLAY
18, PROBE, 3'	NW CORNER BEVERLY & HIGHLAND; DAMP BLACK CLAY
19, PROBE, 2'	SW CORNER ROSEWOOD & ORANGE; DRY SILT
20, PROBE, 3'	SW CORNER OAKWOOD & ORANGE; WET STICKY SILT
21, PROBE, 3'	NW CORNER BEVERLY & ORANGE; MOIST CLAY
22, AUGER, 5'	SAME AS SITE #20; VERY STICKY WET CLAY & SILT
23, PROBE, 3'	NW CORNER LABREA & ROSEWOOD; DAMP STICKY SILT
24, PROBE, 2'	100' N OF NW CORNER LABREA & OAKWOOD;DAMP SILT
25, PROBE, 2.5'	NW CORNER LABREA & BEVERLY; DAMP SILT
26, PROBE, 2.5'	SE CORNER ROSEWOOD & FORMOSA; WET STICKY CLAY
27, PROBE, 3'	SE CORNER OAKWOOD & FORMOSA; WET STICKY CLAY
28, PROBE, 3'	NE CORNER ALLEY & FORMOSA NEAR BEVERLY; SILT
29, PROBE, 2.5'	SW CORNER ROSEWOOD & POINSETTIA; SILT & CLAY
30, PROBE, 1.5'	NW CORNER ALLEY & POINSETTIA NEAR BEVERLY;SILT
31, PROBE, 3'	NW CORNER OAKWOOD & POINSETTIA; CLAY & SILT
32, AUGER, 5'	SAME AS SITE #31; BLACK SILT TO DAMP CLAY
33, AUGER, 0.0'	AIR SAMPLE AT SITE #31
34, PROBE, 3'	SE CORNER ROSEWOOD & MARTEL; DAMP SILT & CLAY
35, PROBE, 3'	NE CORNER ALLEY & MARTEL NEAR BEVERLY; CLAY
36, PROBE, 2.5'	NW CORNER OAKWOOD & MARTEL; SLIGHTLY DAMP SILT

FIELD: SALT LAKE

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
37, PROBE, 2.5'	SW CORNER ROSEWOOD & GARDNER; BLACK CLAY
38, PROBE, 1.5'	NW CORNER ALLEY & GARDNER NEAR BEVERLY; SILT
39, PROBE, 3'	NE CORNER OAKWOOD & GARDNER; DRY SILT
40, AUGER, 5'	SAME AS SITE #39; DRY CLAY WITH SILT
41, AUGER, 0.0'	AIR SAMPLE AT SITE #40
42, PROBE, 2.5'	SE CORNER 1ST & GARDNER; COARSE SAND & SILT
43, PROBE, 2'	NW CORNER ALLEY & GARDNER NEAR 3RD; DRY CLAY
44, PROBE, 2'	NW CORNER 2ND & MARTEL; MOIST BLACK CLAY
45, PROBE, 3'	SE CORNER MARTEL & 1ST; DAMP CLAY & SILT
46, AUGER, 5'	SAME AS SITE #45; CLAY TO DAMP COARSE SILT
47, PROBE, 2'	SE CORNER 2ND & POINSETTIA; ALMOST DRY SILT
48, PROBE, 6'	20' S OF 1ST & POINSETTIA; BLACK STICKY CLAY
49, PROBE, 3'	NE CORNER 2ND & FORMOSA; DAMP STICKY SILT
50, PROBE, 3'	SE CORNER 1ST & FORMOSA; DAMP BLACK CLAY
51, AUGER, 4.5'	SAME AS SITE #50; ALMOST DRY SILT & SILT
52, PROBE, 2'	50' W OF SW CORNER LABREA & 2ND; DRY SILT
53, PROBE, 3'	ALLEY & 1ST NEAR LABREA; STICKY CLAY & SILT
54, PROBE, 2.5'	NE CORNER 2ND & ORANGE; SANDY COARSE SILT
55, PROBE, 2.5'	SW CORNER 1ST & ORANGE; DAMP STICKY SILT
56, AUGER, 5'	SAME AS SITE #55
57, AUGER, 0.0'	AIR SAMPLE FROM SITE #56
58, PROBE, 2'	NW CORNER 2ND & CITRUS; DRY BLACK CLAY
59, PROBE, 3'	SE CORNER CITRUS & 1ST; BLACK STICKY CLAY
60, PROBE, 3'	NW CORNER 3RD & MCCADDEN; DAMP COARSE SILT
61, PROBE, 3'	50' S OF NW MCCADDEN & 1ST; WET STICKY SILT
62, PROBE, 2.5'	SW CORNER 2ND & MCCADDEN; COARSE DAMP SILT
63, PROBE, 3'	NE CORNER JUNE & 2ND; STICKY DAMP SILTY CLAY
64, PROBE, 3'	NW CORNER JUNE & 3RD; DAMP BLACK CLAY
65, PROBE, 3'	NE CORNER 1ST & JUNE; BLACK STICKY DAMP CLAY
66, PROBE, 3'	SE CORNER BEVERLY & JUNE; WET CLAY & SILT
67, PROBE, 2.5'	EDGE OF GOLF COURSE W HALF WAY IN; DRY SILT
68, PROBE, 2.5'	SE CORNER ROSEWOOD & BEVERLY; DRY SILT
69, PROBE, 3'	70' S OF SE LUCERNE & BEVERLY; WET STICKY CLAY
70, PROBE, 3'	50' S OF SW GOWER & BEVERLY; COARSE DAMP SILT
71, PROBE, 3'	70' S OF SE PLYMOUTH & BEVERLY; WET SILT
72, PROBE, 2.5'	150' S OF SW IRVING & BEVERLY; DAMP SILT

FIELD: SALT LAKE

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
73, PROBE, 3'	100' S OF SE HUDSON & BEVERLY; DAMP SILT
74, PROBE, 2.5'	70' E OF SE HUDSON & BEVERLY; WET STICKY SILT
75, PROBE, 3'	300' E OF N HUDSON & BEVERLY; WET SILT
76, PROBE, 2'	SE CITRUS & ROSEWOOD; SLIGHTLY DAMP SILT
77, PROBE, 3'	SW CORNER ORLANDO & COLGATE; WET SILT
78, PROBE, 3'	NW CORNER ORLANDO & 5TH; DRY SILT
79, PROBE, 3'	SE CORNER SWEETZER & COLGATE; DAMP COARSE SILT
80, PROBE, 2'	NW CORNER 5TH & SWEETZER; DRY CRUMBLY SILT
81, PROBE, 3'	NW CORNER LINDENHURST & SWEETZER; WET SILT
82, PROBE, 2.5'	NW LINDERHURST & ALLEY NEAR SAN VICENTE; SILT
83, PROBE, 2.5'	SW CORNER LAJOLLA & COLGATE; WET SILT
84, PROBE, 2.5'	SW LAJOLLA & 5TH; BLACK DAMP SILTY CLAY
85, PROBE, 2.5'	SW LINDENHURST & LAJOLLA; WET STICKY SILT
86, PROBE, 2'	SE CORNER ALLEY & LAJOLLA NEAR 3RD; DRY SILT
87, PROBE, 2.5'	NE CORNER LAJOLLA & 4TH; DAMP STICKY SILT
88, PROBE, 2.5'	SE LAJOLLA & BEVERLY; DRY BLACK SILT
89, PROBE, 2.5'	SE CORNER 1ST & LAJOLLA; ALMOST DRY SILT
90, PROBE, 2.5'	NE ALLEY & SWEETZER NEAR 3RD; DRY STIFF SILT
91, PROBE, 2.5'	NE CORNER 1ST & SWEETZER; ALMOST DRY SILT
92, PROBE, 2.5'	NW 1ST & KINGS; STIFF ALMOST DRY SILT
93, PROBE, 2'	NE 1ST & CROFT; BLACK VERY STIFF HARD SILT
94, PROBE, 2.5'	SE CROFT & BEVERLY; DRY HARD SILT
95, PROBE, 2.5'	NE 3RD & CROFT; DRY SILT
96, PROBE, 0.0'	AIR SAMPLE AT SITE #93
97, PROBE, 3'	SE 3RD & OGDEN, 20' W OF RELIEF WELL; DRY SILT
98, DRILL, 72'	SAMPLE FROM ANTHONY 1 WELL NEXT TO SITE #97
99, PROBE, 3'	MIDDLE TREE BOX, 50' S OF WELL; SILT
100, PROBE, 2'	E FAIRFAX & 4TH; DRY SILT
101, PROBE, 3'	80' S OF SE 3RD & EDINBURGH; SANDY DAMP SILT
102, PROBE, 3'	80' W OF SW ALLEY & 3RD NEAR FAIRFAX; CLAY
103, PROBE, 3'	NE SWEETZER & 4TH; MOIST STICKY SILT
104, PROBE, 3'	NE ORLANDO & 4TH; DAMP BLACK CLAY
105, PROBE, 1.5	E ALLEY ON SAN VICENTE NEAR BURTON; DRY SILT
106, PROBE, 2.5	NW COLGATE & LEDOUX; ALMOST DRY BLACK SILT
107, PROBE, 2.5	PARKWAY ON SAN VICENTE NEAR CHEVRON FIED; SILT
108, PROBE, 1.5	NW ALDEN & SAN VICENTE; DRY HARD SILT

FIELD: SALT LAKE

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
109, PROBE, 2'	NW SAN VICENTE & BEVERLY
110, PROBE, 2.5	NE BEVERLY & LA CIENEGA; DAMP STICKY SILT
111, PROBE, 3'	NW ALFRED & OAKWOOD; DRY SILT
112, PROBE, 3'	SW CROFT & OAKWOOD; STICKY DAMP SILT
113, PROBE, 3'	120' N OF NE BEVERLY & FLORES; DRY SILT
114, PROBE, 3'	SE KINGS & OAKWOOD; DRY SILT
115, PROBE, 2'	SW SWEETZER & OAKWOOD; DAMP BLACK CLAY
116, PROBE, 3'	SW LAJOLLA & OAKWOOD; ALMOST DRY SILT
117, PROBE, 2'	SW 4TH & CRESCENT HEIGHTS; WET SANDY SILT
118, PROBE, 3'	NE 4TH & LAJOLLA; WET STICKY SILT
119, PROBE, 1.5	100' S OF SW SWEETZER & 3RD; DRY SILT
120, PROBE, 3'	SW 4TH & SWEETZER; DAMP SILT
121, PROBE, 3'	100' S OF SE LAJOLLA & 3RD; WET FINE SILT
122, PROBE, 3'	100' S OF SW CRESCENT HEIGHTS & 3RD; DRY SILT
123, PROBE, 3'	SW BLACKBURN & GENESEE; DAMP STICKY CLAY
124, PROBE, 3'	SW COLGATE & OGDEN; DAMP STICKY CLAY
125, PROBE, 3'	NE ORANGE GROVE & GENESEE; WET SILTY CLAY
126, PROBE, 2.5	NE OGDEN & WILSHIRE; DRY TAR & CLAY
127, PROBE, 2.5	N EDGE OF LABREA TAR PITS NEAR OGDEN; DRY SILT
128, PROBE, 3'	50' E OF 6TH & FAIRFAX ON N SIDE; WET SILT
129, PROBE, 2.5	MEDIAN ON WILSHIRE, 100' E OF FAIRFAX; SILT
130, PROBE, 1.5	N MASSELIN & 6TH; ALMOST DRY SILT
131, PROBE, 2'	120' N OF NE WILSHIRE & MASSELIN; DRY CLAY
132, PROBE, 1'	S SIDE OF SIERRA BONITA & 6TH; DRY SANDY SILT
133, PROBE, 3'	100' W OF DETROIT & WILSHIRE; DAMP SILT
134, PROBE, 3'	SW 6TH & DETROIT; WET STICKY SILT
135, PROBE, 3'	100' S OF SW 3RD & DETROIT; VERY WET SILT
136, PROBE, 2'	SW 4TH & DETROIT; ALMOST DRY SILT
137, PROBE, 3'	SE COCHRAN & 6TH; WET SILT
138, PROBE, 3'	300' N OF COCHRAN & WILSHIRE; STICKY CLAY
139, PROBE, 2.5	100' S OF SE COCHRAN & 3RD; ALMOST DRY SILT
140, PROBE, 2'	NE 4TH & COCHRAN; DRY BLACK CLAY
141, PROBE, 2.5	100' N OF NE BURNSIDE & WILSHIRE;
142, PROBE, 3'	NE 6TH & BURNSIDE; WET CLAY

FIELD: SALT LAKE

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
143, PROBE, 2.5	NE CORNER CLOVERDALE & OLYMPIC; DRY SILT
144, PROBE, 3'	NW CORNER LABREA & OLYMPIC; DRY SANDY SILT
145, PROBE, 2.5	120' W OF NW 8TH & LABREA; BLACK CLAY
146, PROBE, 2.5	SE 8TH & CLOVERDALE; BLACK DAMP SILTY CLAY
147, PROBE, 3'	NW 8TH & DUNSMUIR; DAMP SOFT BLACK CLAY
148, PROBE, 3'	SE 8TH & RIDGELEY; BLACK ALMOST DRY CLAY
149, PROBE, 3'	NW DUNSMUIR & OLYMPIC; WET SILT
150, PROBE, 3'	NE OLYMPIC & RIDGELEY; WET SILT
151, PROBE, 2'	150' N OF NW HAUSER & WILSHIRE; DRY CLAY
152, PROBE, 1.5	SE HAUSER & 6TH; DRY CLAY
153, PROBE, 3'	SE BURNSIDE & HAUSER; WET BLACK CLAY
154, PROBE, 3'	NE FULLER & LINDENHURST; WET BROWN SILT
155, PROBE, 3'	SE DREXEL & HAUSER; WET SILT
156, PROBE, 1.5	NW COLGATE & MARTEL; DAMP SILTY CLAY
157, PROBE, 3'	W SIDE COLGATE & GARDNER; WET SILTY CLAY
158, PROBE, 3'	INTER. OF ORANGE, CURSON & BURNSIDE; WET CLAY
159, PROBE, 3'	E OF INTER. ORANGE, ALANDALE & METRO.; SAND
160, PROBE, 2.5	W OF ALANDALE & 6TH; GREY CLAY
161, PROBE, 2.5	SW 8TH & CURSON; ALMOST DRY SILTY CLAY
162, PROBE, 3'	NW OLYMPIC & ALANDALE; DAMP SANDY SILT
163, PROBE, 2'	NE ALANDALE & OLYMPIC; SANDY DRY SILT
164, PROBE, 2'	SW ALANDALE & 8TH; DRY SILT
165, PROBE, 3'	SE 8TH & GENESEE; WET SILTY CLAY
166, PROBE, 3'	SE 8TH & ORANGE GROVE; DRY SANDY SILT
167, PROBE, 3'	NE GENESEE & OLYMPIC; SILTY CLAY
168, PROBE, 3'	100' N OF NE ORANGE GROVE & OLYMPIC; SILT
169, PROBE, 3'	SW MASSELIN & 8TH; SILTY SAND
170, PROBE, 3'	NW OLYMPIC & MASSELIN; SILTY SAND

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
1, PROBE, 1.5'	N BUSHARD & BROOKHURST; DRY SILT
2, PROBE, 2.5'	SW CORNER CASTINE & KITTERY; DAMP SILT
3, PROBE, 3.0'	E SIDE OF WOOD ISLAND LANE AT 22172; DAMP CLAY
4, PROBE, 3.0'	W CAPE MAY & PORT CLYDE; WET COARSE SILT
5, PROBE, 3.0'	NW CAPE MAY & CAPE SPLIT; WET SAND
6, PROBE, 3.0'	W JONESPORT & CAPE MAY; WET CLAY
7, PROBE, 2.5'	SE ALISON & JONESPORT; WET SILT
8, PROBE, 3.0'	E END OF MELINDA COURT; WET SILTY CLAY
9, PROBE, 3.0'	W WOODSHOLE & ROCKPORT; ALMOST DRY FINE SILT
10, PROBE, 3.0'	SE BANNING & MARBLEHEAD; STICKY SILT
11, AUGER, 5.0'	50' N OF CHEVRON KAR 5, E OF MELINDA; FILL
12, PROBE, 2.0'	SAME AS SITE #11; DAMP SILT
13, AUGER, 5.0'	10' N OF CHEVRON KAR 2; STICKY CLAY
14, PROBE, 2.0'	SAME AS SITE #13; WET SILT
15, PROBE, 3.0'	50' S OF SW BANNING & CAPISTRANO; WET SILT
16, PROBE, 3.0'	CUL DE SAC AT END OF CHRISTINE; SOFT WET SILT
17, AUGER, 5.0'	SAME AS SITE #16
18, PROBE, 3.0'	LAGUNA CUL DE SAC; DAMP SILT
19, PROBE, 3.0'	NW ISLANDER & CHRISTINE; ALMOST DRY SILT
20, PROBE, 3.0'	100' S OF SE PLAYA & SURFRIDER; FINE DRY SILT
21, PROBE, 3.0'	75' S OF SW PLAYA & ISLANDER; WET SILTY CLAY
22, PROBE, 3.0'	NW CHRISTINE & SURFRIDER; STICKY WET CLAY
23, PROBE, 3.0'	9062 CHRISTINE, ACROSS FROM SUSAN; WET CLAY
24, PROBE, 3.0'	10' W OF SITE #23; BLACK STICKY CLAY
25, AUGER, 5.0'	40' E OF #23 AT 9072 CHRISTINE; BLACK SOIL
26, PROBE, 3.0'	100' N OF NW HULA & CHRISTINE; FINE SILT
27, PROBE, 3.0'	NE HAMILTON & SEAFORTH; ALMOST DRY SANDY SILT
28, PROBE, 2.5'	30' E OF SE HAMILTON & NEWLAND; STICKY CLAY
29, PROBE, 3.0'	END OF SURVEYOR CIRCLE; STICKY WET CLAY
30, PROBE, 2.5'	SW MAGNOLIA & HAMILTON; DAMP SILT
31, AUGER, 5.0'	SAME AS SITE #30; CLAY TO FINE WET SAND
32, PROBE, 3.0'	W BANNING & MAGNOLIA; WET SAND
33, PROBE, 3.0'	50' W OF SW BERMUDA & KANEOHE
34, PROBE, 2.5'	NW MAHALO & KANEOHE; DRY SANDY SILT
35, PROBE, 0.0'	AIR SAMPLE AT SITE #34
36, PROBE, 2.5'	NW KANEOHE & ALOHA; WET STICKY SILT

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
37, PROBE, 3.0'	NE KAPAA & KIOWA; SOFT WET CLAY
38, PROBE, 2.5'	NE KAHULUI & KIOWA; WET CLAY
39, PROBE, 3.0'	N KANEOHE & REGATTA; WET CLAY
40, PROBE, 2.0'	W END OF BOBBIE CIRCLE; FINE SILTY SAND
41, PROBE, 2.5'	W END OF ADELIA; MOIST SILTY CLAY
42, PROBE, 2.5'	NE POLYNESIAN & RHODESIA; WET SILTY CLAY
43, PROBE, 0.0'	AIR SAMPLE AT SITE #42
44, PROBE, 2.5'	75' S OF SE HAITI & BAHAMA; ALMOST DRY SILT
45, PROBE, 3.0'	NW KALAHINE & HANAKAI; WET SILTY CLAY
46, PROBE, 3.0'	NE KALAHINE & IMPALA; WET CLAY
47, PROBE, 2.5'	SE NEOLANI & IMPALA; CLAY
48, PROBE, 3.0'	END OF CUL DE SAC ON NEOLANI; DRY SILT
49, PROBE, 3.0'	CUL DE SAC AT END OF ALII CIRCLE; DRY SILT
50, PROBE, 3.0'	30' W OF NW BUSHARD & MOKIHANA; WET SILTY CLAY
51, PROBE, 2.5'	100' N OF NE ALLEY & RAMBLER; FINE DAMP SILT
52, PROBE, 3.0'	END OF CUL DE SAC ON DAYTONA; FINE DAMP SILT
53, PROBE, 3.0'	20' E OF N MALIBU & BANNING; WET SILTY CLAY
54, PROBE, 3.0'	NE IMPALA & HUDSON; SLIGHTLY MOIST SILTY CLAY
55, PROBE, 3.0'	100' N OF NE BANNING & BUSHARD; DRY SILT
56, PROBE, 2.0'	NW RAMBLER & OCEANVIEW; DAMP STICKY SILT
57, PROBE, 3.0'	50' E OF S HIGHTIDE & OCEANVIEW; MOIST CLAY
58, PROBE, 3.0'	100' S OF W BEACHSIDE & SEACREST; MOIST SILT
59, PROBE, 2.0'	10' S OF W SURFCREST & SEASIDE; DAMP SILT
60, PROBE, 3.0'	END OF CUL DE SAC ON SUMMER COURT; MOIST SILT
61, PROBE, 3.0'	?100' N & 50' E OF VACATION & SURFCREST; SAND
62, PROBE, 3.0'	N HARBORBREEZE & SUMMERWIND; DAMP CLAY
63, PROBE, 3.0'	ISLAND AT BAYBREEZE & SUMMERWIND; SILTY CLAY
64, PROBE, 3.0'	E END OF CUL DE SAC ON OCEANCREST; DAMP SILT
65, PROBE, 3.0'	W END OF CUL DE SAC ON OCEANCREST; BLACK CLAY
66, PROBE, 3.0'	SW SHOREBREEZE & OCEANBREEZE; SILTY DAMP CLAY
67, PROBE, 3.0'	CUL DE SAC ON WINSONG CIRCLE; DAMP SANDY SILT
68, PROBE, 3.0'	NW ROCKPOINT & SEASIDE; BLACK DAMP CLAY
69, PROBE, 2.5'	SE LANDFALL & SALUDA; STICKY DAMP SILT
70, PROBE, 3.0'	END OF CUL DE SAC ON HILARIA; DAMP FINE SILT
71, PROBE, 2.0'	SW DIRIGO & LANDFALL; ALMOST DRY STIFF SILT
72, PROBE, 3.0'	END OF CUL DE SAC ON BRANTA; WET SILT

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
73, PROBE, 3.0'	ARCHER CUL-DE-SAC; DAMP SILT
74, PROBE, 3.0'	S CLEARBROOK & ST.JOHN; DAMP SILT
75, PROBE, 3.0'	MIDWAY ST. JOHN TO BROOKHURST; DRY SILT
76, PROBE, 3.0'	FLOWER BED IN APT. COMPLEX; WET SAND
78, PROBE, 2.5'	BORBA CUL-DE-SAC; DRY SILT
79, PROBE, 3.0'	BORBA & DAKAR; MOIST SILT
80, PROBE, 2.5'	SE CORNER DRUMBEAT & BUSHARD;DRY SILT
81, PROBE, 2.5'	DRUMBEAT CUL-DE-SAC; FINE SILT
82, PROBE, 2.5'	N CLEARBROOK; DRY SILT
83, PROBE, 2.5'	SW CORNER SURFWOOD & ATLANTA; DRY SILT
84, AIR BLANK	LOCATION 83 AIR BLANK
85, PROBE, 3.5'	SW JENNY & NEWLAND; WET SILT
86, PROBE, 3.0'	NW CORNER LOCHLEA & CREW; DRY CLAY
87, PROBE, 3.0'	SW CORNER HILLHEAD & LOCHLEA; DAMP SILT
88, PROBE, 2.5'	SE CORNER DONCASTER & LOCHLEA; STIFF CLAY
89, PROBE, 3.0'	BOLIN CUL-DE-SAC; WET CLAY
90, PROBE, 2.0'	NE CORNER KAUCH & SATTERFIELD; SILT
91, PROBE, 2.5'	SW CORNER SATTERFIELD & SHAW; WET SILT
92, PROBE, 3.0'	NE CORNER POSTON & STILLWELL; WET SILT
93, PROBE, 2.0'	EDISON COM. PARK; WET SILT
94, PROBE, 2.5'	NW CORNER POSTON & DORSETT; WET SILT
95, PROBE, 3.0'	80' FROM NE CORNER BARBADOS & DORSETT, WET SILT
96, PROBE, 3.0'	BARBADOS CUL-DE-SAC; SILT
97, PROBE, 2.0'	S CORNER MIRAMAR & SABLE; SILT
98, PROBE, 1.5'	NE CORNER GREENBORO & SABLE, WET CLAY
99, PROBE, 3.0'	NW CORNER MARTINEQUE & SHEPHERD; WET SANDY SILT
100, PROBE, 3.0	N CORNER WHITE HORSE & MARTINIQUE; WET CLAY
101, PROBE, 3.0	?NW CORNER CHELSEA & ST. AUGUSTINE, WET SILT
102, PROBE, 3.0	W MILNE & ANTIQUA, DRY SILTY CLAY
103, PROBE, 3.0	SW CORNER HATTERAS & SEAFORTH; WET SILT
104, PROBE, 3.0	SE CORNER HATTERAS & BRETON; WET SILT
105, PROBE, 3.0	21302 BRETON; WET SILT
106, PROBE, 2.0	EDISON PARK; WET SILT
107, PROBE, 2.0	EDISON PARK; WET CLAY
108, PROBE, 3.0	NE CORNER PIER & FLEET; SOFT CLAY
109, PROBE, 2.0	9322 TIDEWATER; WET CLAY
110, PROBE, 3.0	NE CORNER SOUTHSHORE & FLEET; SOFT CLAY
111, PROBE, 3.0	21321 COMPASS; WET SILT
112, PROBE, 3.0	BULKHEAD CUL-DE-SAC; WET SILT
113, PROBE, 2.5	W BREAKWATER & BOWSPRIT; WET SILT
114, PROBE, 2.5	RIER CUL-DE-SAC; WET SILT

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
115, PROBE, 3.0	DOCKSIDE CUL-DE-SAC; WET SILT
116, PROBE, 2.5	ATLANTA STORAGE TANKS; WET SILTY SAND
117, AUGER, 5.0	SAME AS 116; WET DAMP CLAY
118, PROBE, 3.5	50' NE OF DERNVILLE OIL WELL; SANDY SILT
119, AUGER, 5.0	SAME AS 118; FINE SANDY SILT
120, PROBE, 2.5	100' E SE CORNER ATLANTA & MAGNOLIA
121, PROBE, 3.0	RED JACKET CUL-DE-SAC; WET SILT
122, PROBE, 3.5	NW SIDE INDIGO & ORIENT; WET SILT
123, PROBE, 3.5	SW CORNER COCOBANA & ORIENT; WET SILT
124, PROBE, 0'	GAS IN WATER METER BOX AT 21031 STRATHMORE
125, PROBE, 0'	HOLE IN SIDEWALK AT 21021 STRATHMOOR
126, PROBE, 2.0	HAGERSTOWN CUL-DE-SAC; WET SILT
127, PROBE, 3.0	SHACKLEFORD CUL-DE-SAC; WET SILT
128, PROBE, 3.0	GAS IN WATER METER BOX AT 21042 AMBERWICK
129, PROBE, 3.5	SW CORNER AMBERWICK & EFFINGHAM; SOFT WET SILTY CL
130, PROBE, 3.0	BINGHAMPTON CUL-DE-SAC; WET SILT
131, PROBE, 2.0	NE CORNER BROOKHURST & DANA; WET SILT
132, PROBE, 1.0	SPRIT CUL-DE-SAC; WET SILT
133, PROBE, 0'	SPAR CUL-DE-SAC; MANHOLE COVER IN STREET
134, PROBE, 2.0	?BROOKHURST S. OF EDISON SUBSTATION; WET SILT
135, PROBE, 1.5	BROOKHURST E SIDE AT EDISON SUB.; WET SILT
136, PROBE, 2.5	SW CORNER CHUBASCO & ORIENT; WET SILT
137, PROBE, 2.0	W SIDE VOLANTE & CHUBASCO; WET SILT
138, PROBE, 2.0	SW CORNER PONACEO & CHUBASCO; DAMP CLAY
139, PROBE, 0'	AIR BLANK AT SITE 138
140, PROBE, 1.5	NW CORNER PINETREE & PEPPER; DRY SILT
141, PROBE, 2.0	SE CORNER PEPPERTREE & LEMONTREE; WET CLAY
142, PROBE, 3.0	NW CORNER INDIAN WELLS & LEMONTREE; DAMP SILTY CLA
143, PROBE, 3.0	SE PINETREE & CHEVY CHASE; WET SILTY CLAY
144, PROBE, E.0	SE PINETREE & CHEVY CHASE; WET SILTY CLAY
145, PROBE, 3.0	?MEDIAN ON VIA STRAITS; WET SILTY CLAY
146, PROBE, 3.0	E MEDIAN AGEAN & VILLA PACIFIC, WET SILTY CLAY
147, PROBE, 3.0	SE CORNER VILLA PACIFIC & GREESPRAY; WET CLAY
148, PROBE, 2.5	75' FROM END OF MONACO CIRCLE, EAST; WET CLAY
149, PROBE, 3.0	100' W FROM SW CORNER CARRIBEAN & VERDE MAR; SILT
150, PROBE, 3.0	SE CORNER BLUEREEF & SEASPRITE, DAMP SILTY CLAY
151, PROBE, 3.0	10061 STARBOARD, CUL-DE-SAC; DAMP SILTY CLAY
152, PROBE, 3.0	END OF SPINDRIFT CUL-DE-SAC AT 20912; DAMP CLAY
153, PROBE, 2.5	SE CORNER AQUATIC & SIGNET; DAMP CLAY

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
154, PROBE, 3.0	10172 SUNTAN; DAMP CLAY
155, PROBE, 1.5	SE CORNER AQUATIC & CLIFF; DAMP SILTY CLAY
156, PROBE, 3.0	S OF CLIFF & OYSTER BED; DAMP SILTY CLAY
157, PROBE, 3.0	N SIDE OF THESEUS AT 10131; WET SILTY CLAY
158, PROBE, 2.0	NE CORNER BEVERLY & SUBURBIA; WET SLTY CLAY
159, PROBE, 2.0	S SIDE CYNTHIA AT 10122; WET CLAY
160, PROBE, 3.0	20511 SALT AIR; WET CLAY
161, PROBE, 3.0	SW CORNER SALINE & PEBBLE; WET CLAY
162, PROBE, 3.0	END OF CUL-DE-SAC AT 9762 LA CRESTA; DAMP SILTY CL
163, PROBE, 3.0	SW CORNER ALGONQUIN AND HEIL; SILT
164, PROBE, 0.5	16642 ALGONQUIN; HOLE IN DRIVEWAY
165, PROBE, 3.0	CORNER CANBY & BAY VIEW; SAND & WATER
166, PROBE, 1.5	E CORNER BAYVIEW & 16TH; SAND & WATER
167, PROBE, 1.5	CHRIS CARR PARK 200' S OF SE CORNER HEIL & SPRINGD
168, PROBE, 2.0	50' S ON SE CORNER HEIL & SPRINDALE; SILT
169, PROBE, 1.5	S SIDE LUCIENTO & SALAMANCA AT 6822; SILT
170, PROBE, 1.5	6722 CALPE CIRCLE; SANDY SILT
171, PROBE, 1.0	END OF SHORE VIEW; SILT
172, PROBE, 2.0	SW CORNER ELLIS & NEWLAND; SILT
173, PROBE, 2.5	CORNER NEWLAND & TRAILER PARK W; SANDY CLAY
174, PROBE, 2.5	NW CORNER ELLIS & NEWLAND; WET SAND
175, PROBE, 1.5	SW CORNER GARFIELD & STEWARD; DRY SILT
176, PROBE, 2.0	STEWART W SIDE 300' S OF CANFIELD; SILT
177, PROBE, 3.0	SE CORNER CLEVELAND & HUNTINGTON
178, PROBE, 2.0	SE CORNER CLAY & HUNTINGTON; SILT
179, PROBE, 2.5	SE CORNER W OF WEYMOUNT & FALMOUNT; WET CLAY
180, PROBE, 2.0	19271 WESCHESTER; SILT
181, PROBE, 3.0	?SW CORNER FLOUNDER & WEAKFISH; WET SILT
182, PROBE, 3.0	W CORNER WEAKFISH & POLLACK; WET SILT
183, PROBE, 3.0	W CORNER TARPON & WEAKFISH; WET SLT
184, PROBE, 2.5	OFF BROOKHURST; SILT
185, PROBE, 3.0	QUIETSURF CUL-DE-SAC; SILT
186, PROBE, 3.0	ISLAND BAY LANE; WET SANDY SILT
187, PROBE, 2.5	NE CORNER ISLAND BAY & PALM; WET SILT
188, PROBE, 2.5	W CORNER SEA GULL & LITTLE HARBOR;
189, PROBE, 2.5	W CORNER LITTLE HARBOR & COASTLINE; WET SILT
190, PROBE, 2.5	COAST LINE CUL-DE-SAC; SAND
191, PROBE, 3.0	100' N NE CORNER LAKE & ADAMS; SILT
192, PROBE, 3.0	N CORNER 12TH & PARK; SILT
193, PROBE, 3.5	SW CORNER LAKE & 10TH; SOFT SAND
194, PROBE, 3.0	NE CORNER ALABABA & ADAMS; SANDY SILT
195, PROBE, 3.0	NE CORNER HUNTINGTON & ADAMS; WET

FIELD: HUNTINGTON BEACH

SAMPLING SITE CONDITIONS

SITE NO.	SITE DESCRIPTION
196, PROBE, 2.5	SE CORNER HUNTINGTON & SPRINGFIELD, SILT
197, PROBE, 2.0	SE CORNER UTICA & HUNTINGTON; SILT
198, PROBE, 3.0	100' W OF NW CORNER ADAMS & BEACH; WET CLAY
199, PROBE, 0.5	16642 ALGONQUIN; HOLE IN CEMENT REAR UNIT GAS METE

C_1 - C_4 HYDROCARBON DATA

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (1)

SITE NO. (1) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
4.92	0.13	0.4	0.29	0.07	0	0.06

SITE NO. (2) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.25	0	0	0	0	0	0

SITE NO. (3) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.16	0	0	0	0	0	0

SITE NO. (4) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.74	0.06	0.03	0.06	0	0.06	0.1

SITE NO. (5) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.09	0	0	0	0	0	0
			AUGER (5 FT)			
6.34	0.93	0.76	0.52	0.54	0.08	0.42

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (2)

SITE NO. (7) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.37	0.06	0.04	0.04	0	0.01	0.05

SITE NO. (8) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.13	0	0	0	0	0	0

AUGER (5 FT)

2.1	0.72	0.65	0.2	0.16	0.04	0.06

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.36	0.4	0.27	0.14	0.19	0	0.1

AUGER (5 FT)

27.62	3.11	2.56	0.86	0.41	0.13	0.49

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.69	0.2	0.15	0.62	0.08	0	0.05

AUGER (5 FT)

11.22	1.43	1.17	1.02	0.36	0.08	0.62

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (3)

SITE NO. (11) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.36	0.77	0.6	0.26	0.37	0	0.14

SITE NO. (12) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
4.5	0.48	0.39	0.21	0.19	0.02	0.06
			AUGER (5 FT)			
21.93	2.95	2.31	1.02	0.71	0.18	0.72

SITE NO. (13) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.19	0.73	0.07	0.04	0.36	0	0.07

SITE NO. (14) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.62	0.03	0.03	0.04	0	0	0.04
			AUGER (5 FT)			
6.17	0.97	0.83	0.44	0.46	0.06	0.21

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (4)

SITE NO. (16) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.86	0.7	0.11	0.1	0	0	0.13

SITE NO. (17) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.63	0.67	0.7	0.31	0.51	0.03	0.15
			AUGER (5 FT)			
20.31	3.02	2.41	1.78	0.61	0.15	0

SITE NO. (18) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.91	0.64	0.03	0.03	0	0	0

SITE NO. (19) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.05	0.11	0.09	0.05	0.12	0.02	0.07
			AUGER (5 FT)			
6.32	0.85	0.72	0.46	0.32	0.03	0.19

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (5)

SITE NO. (20) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.49	0.57	0.18	0.05	0.18	0	0.13

SITE NO. (21) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.89	0.07	0.49	0.21	0.32	0.03	0.11
			AUGER (5 FT)			
10.11	1.16	1.03	0.88	0.41	0.03	0.19

SITE NO. (22) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.74	0.31	0.27	0.13	0.19	0.03	0.11

SITE NO. (23) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.26	0.5	0.05	0.02	0.09	0	0.08
			AUGER (5 FT)			
18.2	4.3	3.09	1.84	1.82	0.14	0.66

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (6)

SITE NO. (25) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.22	0.09	0.03	0.2	0.08	0.03	0.11

SITE NO. (26) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.29	0.08	0.05	0.15	0.21	0.02	0.05
			AUGER (5 FT)			
3.2	0.82	0.67	0.21	0.17	0.03	0.08

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.76	1.56	1.55	0.58	0.81	0	0

SITE NO. (28) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.11	0.06	0.01	0.01	0.02	0	0
			AUGER (5 FT)			
4.97	1.02	0.76	0.57	0.33	0.06	0.21

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (7)

SITE NO. (29) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
16.4	0.76	0.78	0.8	0.66	0.09	0.14

SITE NO. (30) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.7	0.08	0.07	0.34	0.08	0.04	0.1
			AUGER (5 FT)			
27.9	9.21	5.83	2.31	1.67	0.21	1.54

SITE NO. (31) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.31	0.88	0.1	0.87	0.03	0.1	0.22

SITE NO. (32) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
4.11	0.81	0.41	0.49	0.22	0.05	0.11
			AUGER (5 FT)			
11.02	1.23	0.93	0.31	0.24	0.04	0.18

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (8)

SITE NO. (33) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
33.9	10.8	6.42	4.52	3.54	0.24	1.33

SITE NO. (34) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
60.1	17.2	11.2	7.85	7.75	0.69	2.62

SITE NO. (35) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.07	0.19	0.06	0	0	0.02	0.09

SITE NO. (36) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
1.95	0.01	0	0.01	0	0.01	0.06

SITE NO. (37) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
10.7	0	0.04	0	0	0	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (9)

SITE NO. (38) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.31	0	0	0	0.11	0.01	0.07
			PROBE (3 FT)			
10.2	2.4	0	1.61	0.01	0.42	0.73

SITE NO. (39) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.41	0.16	0.08	0.14	0.08	0.03	0.08

SITE NO. (40) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.15	0.54	0	0.07	0.07	0	0.04
			AUGER (5 FT)			
17.6	4.41	3.12	2.19	1.76	0.24	0.61
			AUGER (8 FT)			
24.3	5.77	3.59	2.46	2.45	0.23	1.13

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (10)

SITE NO. (41) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.11	0.76	0	0.21	0.06	0.04	0.08

SITE NO. (45) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.35	0.1	0.07	0.05	0.04	0.01	0.02

SITE NO. (46) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.05	0	0	0	0	0	0
			AUGER (5 FT)			
3.42	0.32	0.25	0.13	0.15	0.01	0.03

SITE NO. (47) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.44	0.07	0.07	0.03	0	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (11)

SITE NO. (48) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.26	0.36	0.03	0.1	0.07	0	0.03
			AUGER (5 FT)			
6.31	0.85	0.61	0.21	0.09	0.02	0.05

SITE NO. (49) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.46	0.39	0.57	0.22	0.4	0.03	0.09

SITE NO. (50) AUGER (6 FT)

M	E	E:	P	P:	I-B	N-B
93.1	0.4	1.03	0.26	0.57	0.04	0.07

SITE NO. (51) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
7.06	1.33	1.01	0.53	0.56	0.1	0.25

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (12)

SITE NO. (52) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.06	1.29	0.93	0.61	0.52	0.08	0.23

SITE NO. (53) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.06	0.75	0.05	0.25	0.11	0.05	0.12
			AUGER (5 FT)			
23.6	2.89	1.73	1.93	1.18	0.24	0.59

SITE NO. (54) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11.02	0.78	1.02	0.53	0.97	0.08	0.18

SITE NO. (55) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.12	0.67	0.69	0.26	0.45	0.03	0.09
			AUGER (5 FT)			
23.61	4.63	3.29	1.98	1.12	0.24	0.71

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (13)

SITE NO. (56) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.99	0.27	0.21	0.91	0.09	0	0.03

SITE NO. (57) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.25	0.88	0.23	0.41	0.16	0.08	0.12
			AUGER (5 FT)			
12.2	2.11	1.36	0.97	0.54	0.15	0.48

SITE NO. (58) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
15.4	0.16	0.19	0.11	0.1	0	0.02

SITE NO. (59) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.58	0.29	0.04	0.07	0.15	0	0.02
			AUGER (5 FT)			
4.12	0.54	0.46	0.13	0.17	0.05	0.13

C1 - C4 HYDROCARBON DATA

FIELD: SUMMERLAND (14)

SITE NO. (60) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.04	0	0	0	0	0	0

SITE NO. (61) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.64	0.35	0.18	0.3	0.1	0.04	0.11
			AUGER (5 FT)			
9.63	1.02	0.55	0.28	0.21	0.08	0.15

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (1)

SITE NO. (1) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
2.89	0.27	0.58	0.24	0.87	0.02	0.31
			AUGER (10 FT)			
10151	1.71	1.09	1.22	0.29	0.08	0.33

SITE NO. (3) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
2.13	0.05	0.15	0.06	0.39	0.12	0.17
			AUGER (7 FT)			
2651	0.28	0.31	0.14	0.02	0.01	0.07

SITE NO. (5) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.46	0.19	0.46	0.31	0.29	0.29	0.47
			AUGER (8 FT)			
3.93	0.11	0.22	0	0	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (2)

SITE NO. (7) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.67	0.28	0.21	0.05	0.05	0	0.07

SITE NO. (8) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.08	0.06	0.09	0.01	0.03	0	0

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.04	0.06	0.06	0.03	0.04	0	0

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.69	0.17	0.14	0.04	0.09	0	0

SITE NO. (11) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.42	0.01	0.01	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (3)

SITE NO. (12) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.61	0.04	0.04	0.04	0	0	0

SITE NO. (13) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.55	0.06	0.05	0.03	0.03	0	0.01

SITE NO. (14) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.11	0.1	0.06	0.04	0.07	0	0

SITE NO. (15) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.4	0.13	0.21	0.05	0.06	0	0

SITE NO. (16) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.92	0.08	0.12	0.01	0.02	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (4)

SITE NO. (17) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.68	0.11	0.09	0.04	0.06	0	0.01

SITE NO. (18) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
529	7.91	1.61	1.92	1.32	0.26	0.33

SITE NO. (19) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
11.7	0.38	0.67	0.46	0.46	0.06	0.18

SITE NO. (20) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
6.6	1.15	0.72	0.71	0.16	0.02	0.17

SITE NO. (21) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
1.01	0.12	0.16	0.08	0.13	0.01	0.04

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (5)

SITE NO. (22) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.74	0.39	0.26	0.23	0.05	0	0

SITE NO. (23) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.05	0.17	0.18	0.05	0.06	0	0

SITE NO. (24) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.52	0.08	0.07	0	0	0	0

SITE NO. (25) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
12.4	1.03	0	5.04	0	1.04	1.4

SITE NO. (26) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
2.87	0	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (6)

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.94	0.3	0	1.04	0	0.23	0.32

SITE NO. (28) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
1.69	0.02	0.01	0	0	0	0

SITE NO. (29) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8.76	0.66	0	0.33	0.03	0.05	0.14

SITE NO. (30) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
886	43.3	2.2	8.43	1.34	1.37	1.69

SITE NO. (31) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.09	0.3	0.1	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (7)

SITE NO. (32) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.26	0.02	0	0	0	0	0

SITE NO. (33) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
15.3	0.69	0.05	0.22	0.02	0.06	0.12

SITE NO. (34) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.64	0	0	0	0	0	0

SITE NO. (35) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
2.52	0.81	0	0.16	0.01	0.02	0.02

SITE NO. (36) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
256	9.72	0	0.65	0.54	0.36	0.55

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (8)

SITE NO. (37) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.11	0.05	0.01	0	0	0	0

SITE NO. (38) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.03	0.05	0.05	0.01	0.02	0	0

SITE NO. (39) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
5.71	0.13	0.15	0.03	0.06	0	0

SITE NO. (40) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.4	0.09	0	0	0	0	0

SITE NO. (41) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
175	1.35	0.15	0.3	0.03	0.07	0.12

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (9)

SITE NO. (42) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
689	1.1	0.01	0.46	0.08	0.19	0.23

SITE NO. (43) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.7	0	0	0.03	0.08	0.01	0.03

SITE NO. (44) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
14.3	0	0	0.07	0.17	0	0.01

SITE NO. (45) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.55	0.25	0	0	0	0	0

SITE NO. (46) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
1.44	0.04	0.05	0.01	0.02	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (10)

SITE NO. (47) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
19.4	0	0.08	0.06	0.08	0	0

SITE NO. (48) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
5.34	0.38	0.01	0.02	0	0	0.01

SITE NO. (49) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.43	0	0	0	0	0	0

SITE NO. (50) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.71	0.09	0	0	0	0	0

SITE NO. (51) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.39	0.08	0.05	0.02	0.02	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (11)

SITE NO. (52) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
3.68	0.07	0.11	0.04	0.05	0	0

SITE NO. (53) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
9.01	2.13	1.64	1.38	0.59	0.09	0.42
			AUGER (7 FT)			
95.2	31.8	15.6	14.8	15.9	1.57	6.51

SITE NO. (55) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
10.6	1.53	0.94	1.5	1.6	0.13	0.65

SITE NO. (57) AUGER (7 FT)

M	E	E:	P	P:	I-B	N-B
36.2	12.6	6.65	6.55	5.8	0.63	2.8

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (12)

SITE NO. (59) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.59	0.27	0.13	0.02	0.06	0	0

SITE NO. (60) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
16.5	0	1.23	2.18	1.95	0.17	0.46

SITE NO. (61) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
4.75	0	0	0.61	0	0	0

SITE NO. (62) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
291	3.15	1.64	1.35	0.35	0.57	0.38
			AUGER (7 FT)			
2516	7.49	1.06	2.26	0.42	0.8	1.24
			PROBE (2 FT)			
7.64	0.47	0.13	0.01	0.04	0.28	0.01

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (13)

SITE NO. (65) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
16	1.36	1.37	0.92	1.18	0.23	0.47
			PROBE (1.5 FT)			
108	0	0.02	0.07	0.07	0	0.04

SITE NO. (67) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
4.39	0.47	0.46	0.23	0.66	0.02	0.12
			PROBE (1 FT)			
9.7	0.29	0.17	0.14	0.09	0.01	0.06

SITE NO. (69) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.2	0.07	0.06	0.05	0.02	0.01	0.02

SITE NO. (70) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.17	0.35	0.11	0.65	0.1	0.08	0.53

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (14)

SITE NO. (71) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.04	0.06	0.05	0	0	0	0

SITE NO. (72) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
6.62	0.06	0.06	0.05	0.02	0.01	0.02

SITE NO. (73) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
2.24	0.12	0.06	0.02	0	0	0

SITE NO. (74) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.25	0.06	0.03	0.04	0.01	0	0

SITE NO. (75) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.27	0.07	0.04	0.14	0.09	0.05	0.07

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (15)

SITE NO. (76) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.41	0.09	0.06	0.05	0.06	0	0

SITE NO. (77) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.27	0.02	0.01	0	0	0	0

SITE NO. (78) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.82	0.1	0.07	0.03	0.04	0	0

SITE NO. (79) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.72	0.03	0.01	0.04	0.03	0	0

SITE NO. (80) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
21.1	0.67	0.98	0.51	0.65	0.06	0.18

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (16)

SITE NO. (81) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.4	0.15	0.01	0.02	0.03	0	0

SITE NO. (82) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.86	0.18	0.21	0.07	0.13	0	0.01

SITE NO. (83) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.55	0.08	0.05	0.04	0.05	0	0

SITE NO. (84) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.31	0.13	0.13	0.06	0.04	0	0

SITE NO. (85) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.39	0.07	0.05	0.05	0.04	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (17)

SITE NO. (86) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.47	0.03	0.01	0.01	0.01	0	0

SITE NO. (87) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.31	0.04	0	0.01	0	0	0

SITE NO. (88) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.39	0.16	0.15	0.15	0.13	0	0

SITE NO. (89) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
0.49	0.03	0.01	0.03	0	0.03	0.09

SITE NO. (90) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.31	0.05	0.01	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (18)

SITE NO. (91) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.41	0.04	0.1	0.07	0.11	0	0.01

SITE NO. (92) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.06	0.21	0.17	0.08	0.06	0	0

SITE NO. (94) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
402	0.62	0.37	0.22	0.24	0.02	0.06

SITE NO. (95) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.51	0	0	0	0	0	0

SITE NO. (96) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.42	0	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (19)

SITE NO. (97) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.37	0	0.04	0	0	0	0

SITE NO. (98) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.84	0.09	0.07	0.03	0.02	0	0

SITE NO. (99) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
61.5	1.41	1.09	1.22	1.33	0.11	0.32

SITE NO. (100) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.07	0.1	0.03	0.07	0	0	0

SITE NO. (101) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.1	0	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (20)

SITE NO. (102) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.89	0.07	0.01	0.02	0.03	0	0

SITE NO. (103) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.08	0.01	0	0	0.03	0	0

SITE NO. (104) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.86	0	0	0	0	0	0

SITE NO. (105) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
1.21	0	0	0	0	0	0

SITE NO. (106) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
2.4	0.05	0.03	0.04	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (21)

SITE NO. (107) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.67	0.01	0.01	0	0.01	0	0

SITE NO. (108) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.05	0	0	0	0	0	0

SITE NO. (109) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.88	0.01	0.01	0.01	0	0	0

SITE NO. (110) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.75	0	0	0	0	0	0

SITE NO. (111) PROBE (0.5 FT)

M	E	E:	P	P:	I-B	N-B
124550	126	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: NEWPORT BEACH (22)

SITE NO. (112) PROBE (0.5 FT)

M	E	E:	P	P:	I-B	N-B
220000	98	0	0	0	0	0

SITE NO. (113) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
294000	98	0	0	0	0	0

SITE NO. (114) PROBE (0.5 FT)

M	E	E:	P	P:	I-B	N-B
17.9	0	0	0	0	0	0

SITE NO. (115) PROBE (5 FT)

M	E	E:	P	P:	I-B	N-B
590000	182	0	0	0	0	0

SITE NO. (116) PROBE (5 FT)

M	E	E:	P	P:	I-B	N-B
641000	190	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (1) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.57	0.05	0.07	0.01	0.01	0	0

SITE NO. (2) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.27	0.03	0.03	0	0.01	0	0

SITE NO. (3) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.66	0.05	0.05	0.01	0.01	0	0

SITE NO. (4) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.82	0.08	0.1	0.02	0.04	0	0

SITE NO. (5) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.94	0.1	0.15	0.05	0.05	0	0

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (6) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.46	0.33	0.58	0.19	0.35	0.06	0.13

SITE NO. (7) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.81	0.08	0.07	0.04	0.03	0	0

SITE NO. (8) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.42	0.04	0.03	0	0	0	0

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.61	0.04	0.06	0.03	0.05	0	0.08

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.46	0.14	0.28	0.05	0.09	0	0

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (11) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.48	0.04	0.03	0.01	0.04	0	0.07

SITE NO. (12) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.11	0.31	0.78	0.24	0.5	0.06	0.14

SITE NO. (13) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
0.49	0.05	0.05	0.01	0.03	0	0

SITE NO. (14) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.65	0.3	0.35	0.27	0.32	0.06	0.17

SITE NO. (15) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.8	0.39	0.11	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (16) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.6	0.15	0.17	0.05	0.06	0	0

SITE NO. (17) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
3.43	0.15	0.22	0.08	0.13	0.02	0.13

SITE NO. (18) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
2.96	0.19	0.18	0.06	0.08	0.02	0.04

SITE NO. (19) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.82	0.18	0.18	0.07	0.1	0	0.06

SITE NO. (20) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.69	0.09	0.07	0.03	0.03	0	0

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (21) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.34	0.02	0.03	0	0	0	0

SITE NO. (22) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.48	0.11	0.16	0.06	0.11	0	0.09

SITE NO. (23) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.68	0.13	0.28	0.12	0.15	0	0.07

SITE NO. (24) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
0.75	0.05	0.24	0.07	0.08	0	0

SITE NO. (25) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
18.6	3.11	0.88	2.24	1.05	0.54	0.96

C1 - C4 HYDROCARBON DATA

FIELD: RIDEOUT - HEIGHTS

SITE NO. (26) PROBE (4 FT)

M	E	E:	P	P:	I-B	N-B
1.41	0.33	0.09	0.19	0.27	0.05	0.11

SITE NO. (27) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
17.1	2.49	1.61	0.97	0.5	0.21	0.61

SITE NO. (29) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
7.56	1.62	1.34	0.78	0.61	0.08	0.38

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (25)

SITE NO. (148)

AUGER (3.5 FT)

M	E	E:	P	P:	I-B	N-B
5.36	0	0	0.29	0.21	0.03	0.15

PROBE (3 FT)

1.17	0.18	0	0.06	0.09	0.01	0.08

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (1)

SITE NO. (1) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.64	0.83	0.67	0.48	0.24	0	0
			AUGER (5 FT)			
9.91	2.06	1.45	0.92	0.84	0.21	0.36

SITE NO. (3) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
5.17	0.39	0.36	0.2	0.1	0.01	0.05
			AUGER (9 FT)			
2.62	0.23	0.03	0.17	0.08	0	0.29
			PROBE (3 FT)			
1.05	0.74	0.67	0.33	0.3	0	0

SITE NO. (6) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.29	0.4	0.44	0.15	0.21	0	0.1
			PROBE (2.5 FT)			
5.67	0.39	0.32	0.11	0.14	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (2)

SITE NO. (6) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
1.41	0	0	0	0	0	0

SITE NO. (9) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
0.51	0.13	0.11	0.05	0.04	0	0
			AUGER (5 FT)			
4.38	0.27	0.11	0.25	0.51	0	0.37

SITE NO. (11) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7073	3960	0	2577	0	151	90.4
			AUGER (5 FT)			
262	25.4	0	8.16	0	0.3	0.33

SITE NO. (13) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2332	313	0	77.4	16.8	0	1.01

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (3)

SITE NO. (13) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
1.28	1.02	0	0.21	0	0	0
			AUGER (5 FT)			
6.04	0.42	0.37	0.25	0.3	0	0.25

SITE NO. (17) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
911	171	0	18.3	0.31	0.32	0.38
			AUGER (5 FT)			
11.8	2.35	2.03	1.25	1.18	0.12	0.53

SITE NO. (19) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
565	31.2	0	26.2	0	0.22	0
			AUGER (5 FT)			
4.63	0.33	0.18	0.15	0.09	0	0.06

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (4)

SITE NO. (19) AUGER (0 FT)

M	E	E:	P	P:	I-B	N-B
4.14	0.15	0	0.02	0	0	0.26

SITE NO. (22) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
44.5	9.96	0	9.68	0	0	0
			AUGER (5 FT)			
10.8	0.57	0.87	0.24	0.42	0.01	0.15
			AUGER (0 FT)			
3.35	0.13	0.15	0.11	0	0.01	0.03
			AUGER (0 FT)			
6.61	0.63	1.39	0.41	0.11	0.1	0.17

SITE NO. (26) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3864	685	0	66.4	0.63	0.86	0.68
			AUGER (5 FT)			
7.66	0.82	0.72	0.33	0.24	0.03	0.16

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (5)

SITE NO. (28) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.21	0.18	0.21	0	0	0	0
			AUGER (5 FT)			
7.67	1.07	0.99	0.5	0.27	0.05	0.24

SITE NO. (30) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.45	0.14	0.29	0.07	0.14	0.03	0.06
			AUGER (5 FT)			
2330	11.9	0.87	2.21	0.41	0.57	0.63
			PROBE (5 FT)			
357	0	0	0	0	0	0
			PROBE (3 FT)			
19171	0	0	2.47	0.21	0.8	0.9

SITE NO. (34) AUGER (0 FT)

M	E	E:	P	P:	I-B	N-B
56.2	0.95	0.8	0.5	1	0.14	0.59
			PROBE (0 FT)			
1.1	0.04	0.09	0.05	0.01	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (6)

SITE NO. (36) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.18	0.01	0.02	0.03	0	0	0.03
			PROBE (2.5 FT)			
1.42	0.27	0.42	0.09	0.18	0	0.03

SITE NO. (38) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
627	2.42	2.12	2.12	1.06	0.28	0.64
			PROBE (2.5 FT)			
2.57	0.83	0.67	0.34	0.33	0.06	0.21

SITE NO. (40) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.31	0.23	0.06	0.08	0.07	0	0.05
			PROBE (3 FT)			
0.48	0.1	0.3	0.11	0.07	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (7)

SITE NO. (42) AUGER (0 FT)

M	E	E:	P	P:	I-B	N-B
26279	52.5	0	1.02	0	0.35	0.12

SITE NO. (43) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
1.51	0	0	0.01	0	0	0.03
			AUGER (9 FT)			
3.3	0.23	0.44	0.18	0.03	0.03	0.16
			PROBE (3 FT)			
0.56	0.11	0.17	0.08	0.15	0	0.1

SITE NO. (46) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
0.79	0.13	0.18	0.08	0.14	0	0.15
			AUGER (5 FT)			
5.04	0.85	0.89	0.34	0.5	0	0.16

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (8)

SITE NO. (48) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.66	0.23	0.21	0.1	0.05	0	0.1
			PROBE (3 FT)			
0.36	0.07	0.1	0.05	0.09	0	0.14

SITE NO. (50) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.92	0.31	0.01	0.37	0.03	0.1	0.24
			PROBE (3 FT)			
1.04	0.21	0.29	0.14	0.19	0	0.25

SITE NO. (52) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
13.8	2.1	0.1	0.19	0.06	0	0.12

SITE NO. (54) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.44	1.56	0.71	0.29	0.5	0.02	0.36

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (9)

SITE NO. (54) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
8.97	2.08	1.4	1.38	1.18	0.14	1.06

SITE NO. (56) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.94	0.8	0.36	0.15	0.2	0.03	0.21

SITE NO. (57) AUGER (2.5 FT)

M	E	E:	P	P:	I-B	N-B
557	29.2	0.61	16.1	0.35	6.77	1.23
			AUGER (0 FT)			
437	7.54	0.96	10.3	1.55	1.57	2.12
			PROBE (1.5 FT)			
2000	12.5	0	5.38	0	2.86	0.41

SITE NO. (60) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
11.9	2.68	1.62	0.23	0.7	0.02	0.29

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (10)

SITE NO. (60) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
7.7	1.79	2.3	0.65	1.06	0.03	0.2

SITE NO. (61) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
22.8	0	0	0	0	0	0

AUGER (3 FT)

538	1.71	2.63	1.07	1.23	0.1	0.34

SITE NO. (63) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
14663	405	0	253	0	36.6	57.5

AUGER (2.5 FT)

3972	38.9	2.01	113	1.04	179	390

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (11)

SITE NO. (66) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.45	0.44	0	0.33	0.26	0.02	0.21
			PROBE (2.5 FT)			
2.4	1.16	0	0.62	0.37	0.09	0.1

SITE NO. (68) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
14.9	0.72	0	0.33	0.42	0.02	0.04

SITE NO. (69) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.98	0.16	0	0	0	0	0.18
			PROBE (2 FT)			
22.2	1.49	0	0.64	0.69	0.31	0.44

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (12)

SITE NO. (71)			PROBE (2.5 FT)			
M	E	E:	P	P:	I-B	N-B
10.1	0.7	0	0.29	0.47	0.13	0.37
			PROBE (2 FT)			
3.66	0.57	0	0.21	0.29	0.01	0.07

SITE NO. (73)			AUGER (5 FT)			
M	E	E:	P	P:	I-B	N-B
21.1	0.34	0	0.34	0.2	0	0.4
			PROBE (2.5 FT)			
3146	0	0	0	0.52	1.85	1.23
			PROBE (2.5 FT)			
11272	0	0	0	0.08	0.3	0.43

SITE NO. (77)			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
7.47	0.56	0	0.19	0.37	0.07	0.17
			AUGER (5 FT)			
3.7	0.04	0	0	0	0	0.18

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (13)

SITE NO. (78) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.78	0.46	0	0.2	0.25	0.08	0.13

SITE NO. (79) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
15.5	5.34	0	2.99	2.87	0.26	1.27
			PROBE (3 FT)			
1.09	0.27	0	0	0	0	0
			PROBE (3 FT)			
1.34	0.35	0	0.08	0.08	0	0.13

SITE NO. (81) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.21	0.35	0	0.07	0.14	0.02	0.06

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (14)

SITE NO. (82) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.64	1.12	0	0.11	0.24	0	0.32
			AUGER (5 FT)			
5.56	1.29	0	0.17	0.2	0	0.28
			PROBE (3 FT)			
0.94	0.06	0	0	0	0	0.02

SITE NO. (84) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.38	0.23	0	0.16	0.1	0	0

SITE NO. (85) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.48	0.12	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (15)

SITE NO. (86) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.93	1.48	0	0.16	0.12	0.06	0.12
			AUGER (5 FT)			
17.7	2.68	0	1.85	0.75	0.18	0.89
			AUGER (0 FT)			
1.54	0.02	0	0	0	0	0

SITE NO. (89) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
0.23	0.1	0	0	0	0	0

SITE NO. (90) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
5.43	0.74	0	0.49	0.4	0	0.1
			PROBE (1.5 FT)			
1.02	0.14	0	0.07	0.09	0.03	0.04

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (16)

SITE NO. (92) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.52	0.14	0	0.08	0.09	0	0

SITE NO. (93) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
18.7	0.31	0	0.77	0.57	0.16	0.39
			PROBE (2 FT)			
1272	0.35	0	40.5	0.3	25.4	8.51

SITE NO. (95) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.17	0.3	0	0.15	0.17	0.01	0.12
			PROBE (3 FT)			
11.5	0.11	0	0.05	0.03	0	0
			AUGER (0 FT)			
5.25	0.02	0	0.01	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (17)

SITE NO. (98) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.31	0	0	0.04	0	0	0.11
			PROBE (2 FT)			
1.02	0	0	0.04	0	0	0

SITE NO. (100) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
241	0	0	4.49	0.21	3.08	1.09
			PROBE (2 FT)			
946	0	0	12.4	0.36	4.2	2.4
			AUGER (0 FT)			
1104	0.55	0	0.47	0.87	0.4	1.16

SITE NO. (103) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
10.4	2.09	0	1.29	0.9	0.1	0.59
			PROBE (3 FT)			
0.57	0.08	0	0.07	0.07	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (18)

SITE NO. (105) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.08	0	0	0	0	0	0.14
			PROBE (2 FT)			
3.18	0	0	0.16	0.22	0.03	0.1

SITE NO. (107) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
5.11	0	0	0.32	0.1	0.03	0.16
			PROBE (3 FT)			
3.39	0	0	0.14	0.17	0	0

SITE NO. (109) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.67	0	0	0.16	0	0.03	0.2
			AUGER (5 FT)			
3.48	0	0	0.19	0	0.04	0.22
			PROBE (2.5 FT)			
66.4	0	0	7.7	0.1	0.82	1.09

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (19)

SITE NO. (111) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.87	0.15	0	0.08	0	0	0.09
			PROBE (2.5 FT)			
0.6	0.07	0	0.04	0	0	0
			AUGER (0 FT)			
1.6	0.01	0	0	0	0	0.03

SITE NO. (114) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.9	0.44	0	0.23	0.19	0	0.19
			PROBE (2 FT)			
0.79	0.05	0	0.03	0.03	0	0.01

SITE NO. (116) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.13	0.08	0	0.14	0	0	0.2
			PROBE (3 FT)			
2.37	0.05	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (20)

SITE NO. (118) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
2.63	0.02	0	0.01	0.01	0	0.08
			PROBE (2 FT)			
1.04	0.05	0	0.04	0.04	0	0.01

SITE NO. (120) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
20.2	0	0	0.05	0	0	0.03
			PROBE (3 FT)			
623	0.09	0	0.86	0.11	0.06	0.05

SITE NO. (122) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
2.47	0.08	0	0.07	0.04	0.02	0.11
			PROBE (2 FT)			
1.04	0.02	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (21)

SITE NO. (124) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
5.52	0.38	0	0.19	0.3	0	0.2
			PROBE (2 FT)			
1.07	0.02	0	0.04	0	0	0

SITE NO. (126) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
5.33	0.32	0	0.15	0.1	0	0.05
			AUGER (5 FT)			
5.25	0.26	0	0.06	0	0	0
			PROBE (3 FT)			
4.9	0.22	0	0.13	0.12	0.01	0.06

SITE NO. (128) AUGER (0 FT)

M	E	E:	P	P:	I-B	N-B
5340	0	0	7.01	0	1.4	3.26
			AUGER (4 FT)			
3109	0	0	4.36	0.44	2.31	1.08

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (22)

SITE NO. (130) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
516	0	0	0.5	0	0	0.1

SITE NO. (132) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
18	4.59	0	2.57	2.01	0.2	0.91
			PROBE (3 FT)			
6.76	0.73	0	0.25	0.43	0.03	0.1

SITE NO. (134) AUGER (3.5 FT)

M	E	E:	P	P:	I-B	N-B
4.1	0.56	0	0.16	0.14	0	0.09
			PROBE (1 FT)			
2.56	0.06	0	0.01	0.04	0	0

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (23)

SITE NO. (136) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
11.5	0.58	0	0.28	0.24	0.06	0.42
			PROBE (1.5 FT)			
307	0.28	0	0.1	0.22	0.04	0.07

SITE NO. (138) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
7019	0	0	3.28	0.28	2.24	0.58
			PROBE (2 FT)			
2434	0	0	0.45	0	0.5	0.1

SITE NO. (140) AUGER (2.5 FT)

M	E	E:	P	P:	I-B	N-B
33.6	5.11	0	4.03	3.27	0.3	1.36
			PROBE (1 FT)			
6.95	0.85	0	0.38	0.54	0.03	0.11

C1 - C4 HYDROCARBON DATA

FIELD: BREA-OLINDA (24)

SITE NO. (142) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
7.89	1.08	0	0.76	0.38	0.13	0.31
			PROBE (2 FT)			
2.78	0.16	0	0.07	0.12	0.01	0.03

SITE NO. (144) AUGER (4 FT)

M	E	E:	P	P:	I-B	N-B
9.97	2.25	0	1.13	0.48	0.09	0.47
			PROBE (2 FT)			
1.7	0.42	0	0.17	0.2	0.03	0.08

SITE NO. (146) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
2.59	0.06	0	0.04	0.01	0	0.03
			PROBE (3 FT)			
1.55	0.01	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (1)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
5.29	0.86	0.63	0.48	0.48	0.34	0.42
			AUGER (5 FT)			
5.2	0.44	0.51	0.36	0.25	0.03	0.33

SITE NO. (3)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
8.04	1.51	1.34	0.69	0.92	0.23	0.64

SITE NO. (4)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
2.12	0.27	0.52	0.16	0.25	0.02	0.07

SITE NO. (5)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
2.18	1.05	0.52	0.08	0.06	0.02	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (6) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11.9	0.79	0.77	0.38	1	0.01	0.03

SITE NO. (7) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.53	0.11	0.11	0.03	0.04	0.01	0.09
			AUGER (5 FT)			
2.73	0.17	0.06	0.1	0.1	0.01	0.16

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.47	0.24	0.07	0.09	0.06	0	0.12

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.63	0.32	0.47	0.25	0.2	0.05	0.06

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (11) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.01	0.03	0.07	0	0	0	0

SITE NO. (12) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11.4	0.43	0.65	0.3	0.34	0.03	0.1

SITE NO. (13) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8.79	0.19	0.37	0.08	0	0	0

SITE NO. (14) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.15	0.04	0.05	0.01	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (15) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.51	0.13	0.12	0.05	0.03	0	0

SITE NO. (16) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.36	0.16	0.18	0.1	0.15	0.02	0.07

SITE NO. (17) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.89	0.1	0.08	0.03	0.03	0	0

SITE NO. (18) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.11	0.22	0.22	0.08	0.12	0.5	1.01

SITE NO. (19) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.41	0.4	0.37	0.11	0.16	0	0.03

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (20) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.1	0.2	0.29	0.13	0.17	0.1	0.16

SITE NO. (21) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.12	0.21	0.21	0.07	0.13	0.03	0.12

SITE NO. (22) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.91	0.35	0.37	0.82	0.25	0.42	0.35

SITE NO. (23) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.1	0.03	0.04	0.01	0	0	0

SITE NO. (24) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.68	0.21	0.31	0.13	0.2	0.06	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (25) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.05	0.16	0.17	0.07	0.1	0	0.03

SITE NO. (26) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.16	0.18	0.35	0.09	0.21	0.02	0.03

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.75	0.12	0.19	0.08	0.12	0.05	0.03

SITE NO. (28) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.97	0.1	0.17	0.03	0.05	0	0

SITE NO. (29) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.74	0.13	0.2	0.19	0.1	0.08	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (30) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.98	0.15	0.2	0.08	0.14	0.07	0.05

SITE NO. (31) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.37	0.14	0.17	0.07	0.1	0	0.06

SITE NO. (32) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.46	0.11	0.19	0.05	0.09	0.01	0.02

SITE NO. (33) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
10.7	0.69	0.99	0.46	0.7	0.31	0.29

SITE NO. (34) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.91	0.08	0.11	0.04	0.06	0.02	0.03

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (35) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.29	0.36	0.49	0.14	0.31	0.04	0.06

SITE NO. (36) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5.63	0.47	0.62	0.37	0.44	0.03	0.12

SITE NO. (37) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.54	0.15	0.15	0.07	0.98	0.05	0.06

SITE NO. (38) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
80700	5495	0	4706	0	1831	4345
			AUGER (5 FT)			
297	26.7	1.24	28.3	0.98	20.2	9.71

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (40) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1094	25.3	0.06	0.7	0.52	1.17	0.3

SITE NO. (41) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
41.9	3.15	1.94	2.21	1.55	1.87	1.83

SITE NO. (42) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
552	39	0	36.1	0	20.4	25.2

SITE NO. (43) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
14621	245	0	84.8	0	45.6	58.7
			AUGER (5 FT)			
3.01	0.03	0	0.15	0	0.26	0.25

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (45) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1276	113	0	115	0	52.1	49.5

SITE NO. (46) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
53	4.14	3.01	4.17	2.36	1.49	3.47

SITE NO. (47) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1151	128	0.44	144	0.65	64.3	70.1

SITE NO. (48) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
5.27	0.71	0.59	0.63	0.32	0.29	0.37

SITE NO. (49) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.44	0.24	0.05	0.34	0.06	0.31	0.29

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (50) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
38.6	2.67	0.23	1.9	0.33	1.26	2.16

SITE NO. (51) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.18	0.6	0.43	6.28	0.23	0.16	0.45

SITE NO. (52) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
556	55.2	1.4	61.2	1.42	26.4	25.6

SITE NO. (53) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.75	0.2	0.17	0.11	0.12	0.03	0.11

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (54) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
372	18.9	1.06	15.2	0	5.37	5.87
			AUGER (5 FT)			
3.09	0.21	0.05	0.17	0.12	0.09	0.19

SITE NO. (56) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
184	14.2	0.7	12.8	0.38	5.15	5.34

SITE NO. (57) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
19723	8765	0	2979	0	7980	189
			AUGER (4 FT)			
60.1	10.2	1.03	4.05	0.65	48.4	1.1

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (59) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
142900	12501	0	7452	0	3469	1215

SITE NO. (60) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
911	208	0	53.9	0	168	20.9
			AUGER (3.5 FT)			
252	23.7	4.21	72.6	1.06	94.1	258

SITE NO. (62) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
524	51.7	4.07	47.9	0	24.9	10.1

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (63) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
11.8	1.53	1.01	1.72	0	0	0
			AUGER (4.5 FT)			
6.89	0.84	1.07	0.41	0.6	0.08	0.24

SITE NO. (65) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
188	24.9	5.54	10.9	4.37	22.8	3.56

SITE NO. (66) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
2.85	0.27	0	0.15	0	0	0

SITE NO. (67) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
18.1	4.27	0.41	1.1	0.74	7.57	0.54

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (68) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1007	8.53	3.22	6.74	2.58	3.7	3.9

SITE NO. (69) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
96	13.2	0.11	3	0.03	10.9	0.79

SITE NO. (70) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
25650	355	5	102	3.1	196	9.8

SITE NO. (71) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.09	0.01	0	0.01	0	0	0

SITE NO. (72) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
13.5	0.08	0.1	0.08	0	0.18	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (73) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.22	2.37	0.41	0.83	0.26	2.84	0.27

SITE NO. (74) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
9.98	1.12	1.23	0.7	0.85	0.15	0.19

SITE NO. (75) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.88	0.25	0.25	0.12	0.19	0.07	0.11

SITE NO. (76) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.96	0.67	0.78	0.41	0.51	0.07	0.16

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (77)

			PROBE (2 FT)			
M	E	E:	P	P:	I-B	N-B
20.4	2.42	2.42	1.77	1.72	0.44	1.07
			AUGER (5 FT)			
6.82	0.99	1.11	0.46	0.35	0.03	0.05

SITE NO. (79)

			PROBE (2 FT)			
M	E	E:	P	P:	I-B	N-B
3.01	0.43	0.49	0.29	0.35	0.15	0.13

SITE NO. (80)

			PROBE (2.5 FT)			
M	E	E:	P	P:	I-B	N-B
18.2	2.98	2.36	1.8	1.79	1.59	0.66
			AUGER (5 FT)			
10.1	2.44	1.97	1.26	1.39	0.18	0.56

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (82) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.19	0.42	0.36	0.31	0.26	0.39	0.23

SITE NO. (83) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
20	3.1	2.99	1.96	2.31	0.38	0.83
			AUGER (5 FT)			
23.3	5.19	3.88	2.8	2.21	0.33	1.31

SITE NO. (85) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
13.8	2.16	1.96	1.32	1.48	0.32	0.71

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (86) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
7.94	1.12	1.05	0.61	0.74	0.16	0.24
			AUGER (5 FT)			
23.5	1.61	0.52	0.7	0.16	0.13	0.32

SITE NO. (88) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
8.77	0.95	0.08	0.64	0.06	0.31	0.45

SITE NO. (89) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
60.5	9.85	7.01	5.61	5.49	0.9	2.32

SITE NO. (90) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.78	0.39	0.44	0.15	0.23	0.13	0.11

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (91) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
6.23	1.02	0.53	0.4	0.35	0.99	0.24

SITE NO. (92) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.38	0.59	0.53	0.27	0.35	0.07	0.14

SITE NO. (93) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
42.5	7.67	5.22	4.24	4.07	0.7	1.83

SITE NO. (94) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.49	0.45	0.15	0.2	0.05	0.84	0.05

SITE NO. (95) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.71	0.29	0.4	0.2	0.21	0.1	0.1

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (96) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.05	0.26	0.32	0.11	0.14	0.05	0.05

SITE NO. (97) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.32	0.67	0.24	0.28	0.12	0.55	0.06

SITE NO. (98) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.58	0.66	0.45	0.5	0.21	0.37	0.4
			AUGER (5 FT)			
6.45	1.06	0.87	0.5	0.51	0.05	0.5

SITE NO. (100) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
2.62	0.23	0.14	0.13	0.08	0.16	0.14

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (101) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.21	0.39	0.28	0.26	0.2	0.11	0.13

SITE NO. (102) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.46	0.6	0.34	0.51	0.15	0.29	0.25
			AUGER (5 FT)			
3.49	0.53	0.44	1.3	0.58	0.1	0.2

SITE NO. (104) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
3.06	0.38	0.1	0.13	0.06	0.21	0.04

SITE NO. (105) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2242	12.6	5.37	6.45	6.25	1.25	2.16

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (106) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
11283	4.2	1.77	2.16	1.52	0.31	0.38

SITE NO. (107) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
683	0.51	0.41	0.23	0.24	0	0

SITE NO. (108) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
230	0.48	0.39	0.25	0.25	0.16	0.15

SITE NO. (109) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2416	4.14	2.39	1.93	2.06	0.23	0.67
			AUGER (5 FT)			
7.23	1.5	1.29	0.82	0.89	0.06	0.21

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (111) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
4.67	0.37	0.31	0.22	0.11	0.22	0.07
			AUGER (2.5 FT)			
41.5	1.72	1.71	1.73	0.83	17.4	0.93

SITE NO. (113) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
347	3.76	0	1.34	0	4.46	0
			AUGER (5 FT)			
6.98	1.09	1.38	0.59	0.67	0.07	0.55

SITE NO. (115) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.86	0.13	0.21	0.08	0.02	0.03	0.08
			AUGER (5 FT)			
6.92	1.07	1.19	0.54	0.69	0.2	1.22

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (117) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.26	0.18	0.27	0.38	0.07	0.04	0.11
			AUGER (5 FT)			
11.1	1.79	1.55	0.84	0.44	0.04	0.19

SITE NO. (119) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.85	0.32	0.33	0.13	0.15	0.03	0.05
			AUGER (5 FT)			
5.97	0.91	0.85	0.48	0.6	0.16	0.59

SITE NO. (121) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.27	0.3	0.34	0.13	0.15	0.04	0.12
			AUGER (5 FT)			
10.1	2.16	2.15	1.12	1.39	0.06	0.69

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (123) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.66	0.3	0.22	0.09	0.07	0.01	0.04

AUGER (5 FT)

4.4	0.3	0.15	0.14	0.06	0.11	0.18

SITE NO. (125) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
12226	1015	0	105	0	33.6	6.43

SITE NO. (126) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
10.8	1.74	0	0.3	0	0.12	0.08

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (127) PROBE (5 FT)

M	E	E:	P	P:	I-B	N-B
33.2	3.93	0.18	0.56	0.08	0.2	0.09
			AUGER (3 FT)			
21.8	7.19	5.39	3.63	2.66	0.31	1.59

SITE NO. (129) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
3.21	0.42	0.54	0.34	0.23	0.23	0.66
			PROBE (1.5 FT)			
5.67	5.5	0.18	1.15	0.09	0.41	0.22

SITE NO. (131) AUGER (4.5 FT)

M	E	E:	P	P:	I-B	N-B
8.87	2.65	0.41	2.89	1.25	0.61	2.89
			PROBE (2 FT)			
18.8	1.02	0.47	0.32	0.29	0.07	0.12

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (133) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
3.34	0.26	0.03	0.11	0	0.04	0.06
			AUGER (5 FT)			
3.65	0.2	0.19	0.29	0.24	0.19	0.04

SITE NO. (135) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.64	0.41	0.31	0.29	0.15	0.16	0.16
			AUGER (5 FT)			
24.5	0.7	0.72	0.25	0.08	0.13	0.42

SITE NO. (137) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
43177	198	8.59	3.07	0.22	0.37	0.17
			AUGER (4 FT)			
7228	118	2.58	72.1	1.8	222	585

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (139) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
4.82	0.32	0.21	0.33	0.12	0.07	0.47

SITE NO. (140) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.93	0.58	0.39	0.49	0.23	0.06	0.22

SITE NO. (141) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
30.5	0.36	0.18	0.18	0.16	0.05	0.16

SITE NO. (142) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
36.8	0.91	0.72	0.4	0.47	0.07	0.24

SITE NO. (143) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.58	0.12	0.17	0.09	0.08	0.02	0.11

C1 - C4 HYDROCARBON DATA

FIELD: SANTA FE SPRINGS

SITE NO. (144) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.32	0.52	0.53	0.19	0.26	0.05	0.17

SITE NO. (145) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.43	0.82	0.66	0.32	0.45	0.05	0.21

SITE NO. (146) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
28.3	0.51	0.05	0.05	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (1)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
12390	53.9	0.72	0.58	0.63	0.45	0.28
			AUGER (5 FT)			
32.7	0.55	0.86	0.44	0.49	0.2	0.53
			AUGER (0 FT)			
26	22	0	0	0	0	0

SITE NO. (4)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
82.7	0.88	0.4	0.15	0	0	0

SITE NO. (5)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
41435	98.6	0	10.1	0.41	3.3	0.36
			AUGER (5 FT)			
4184	14.3	1.69	2.16	0.69	0.34	0.5

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (7) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
10.7	0.39	0.27	0.14	0.15	0.1	0.28

SITE NO. (8) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.66	0.62	0.53	0.35	0.37	0.06	0.15

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
14.4	0.86	0.88	0.43	0.61	0.07	0.11

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
10.6	0.24	0.14	0.1	0.03	0.01	0.09

SITE NO. (11) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
19.8	5.6	5.21	2.68	3.26	0.3	1.42
			AUGER (0 FT)			
4.93	0.15	0.1	0.08	0	0	0
			PROBE (2 FT)			
4.24	0.13	0.46	0.09	0.06	0	0.11

SITE NO. (14) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.68	0.14	0.17	0.09	0.11	0.03	0.07

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (15) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.38	0.11	0.1	0.05	0	0	0

SITE NO. (16) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
27366	10.2	0	0.34	0.06	0.93	0.16

SITE NO. (17) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.3	0.17	0.09	0.09	0	0	0
			AUGER (5 FT)			
2.93	0	0	0.09	0	0.02	0.1

SITE NO. (19) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
9.83	0.36	0.24	0.17	0.09	0	0.05

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (20) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
33	0.21	0.16	0.08	0	0	0

SITE NO. (21) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.64	0.24	0.18	0.1	0.05	0	0.03

SITE NO. (22) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
8.97	0.14	0.15	0.04	0.06	0	0
			AUGER (4.5 FT)			
7.39	0.44	0.5	0.22	0.31	0.03	0.14

SITE NO. (24) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.31	0.24	0.21	0.07	0.13	0.03	0.09

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (25) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.43	0.09	0.12	0.08	0.1	0.04	0.12

SITE NO. (26) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.28	0.23	0.36	0.1	0.12	0.02	0.08

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.64	0.09	0.29	0.05	0.12	0.03	0.11

SITE NO. (28) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.84	0.02	0.05	0	0	0	0

SITE NO. (29) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
224	19.2	195	3.61	46	0.17	0.75

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (30) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26.7	3.57	29.4	1.16	13.4	0.1	0.39

SITE NO. (31) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.54	0.78	1.38	0.33	0.81	0.03	0.15

SITE NO. (32) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
10.9	1.03	8.2	0.3	3.16	0.03	0.12

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (33) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
6.21	1.21	1.07	0.82	0.39	0.25	0.71
			AUGER (0 FT)			
2.24	0.03	0	0	0	0	0
			PROBE (2 FT)			
6.65	1.61	4.91	0.29	1.97	0.05	0.1
			AUGER (0 FT)			
1.96	0	0	0	0	0	0

SITE NO. (37) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
23.7	3.41	5.04	1.59	3.04	0.19	0.45

SITE NO. (38) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.02	0.06	0.37	0.03	0.91	0	0

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (39) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1026	130	1156	25.9	276	1.87	5.63

SITE NO. (40) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.48	0.16	1.2	0.04	0.56	0	0.02

SITE NO. (41) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.56	0.12	0.87	0.07	0.44	0	0.05

SITE NO. (42) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.1	0.22	0.58	0.11	0.23	0	0

SITE NO. (43) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
155	21.5	182	4.37	49.8	0.22	1.97

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (44) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.74	0.1	0.12	0.05	0.05	0	0.04

SITE NO. (45) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.89	0.16	0.86	0.06	0.31	0	0.05

SITE NO. (46) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.26	0.15	0.81	0.05	0.28	0	0.02

SITE NO. (47) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.84	0.25	1.31	0.08	0.72	0.01	0.06

SITE NO. (48) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
199	23.6	191	4.12	29.1	0.18	0.81

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (49) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
33982	51.2	84.1	1.98	15.8	0.13	0.52

SITE NO. (50) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
49.1	0.52	1.23	0.16	0.77	0.14	0.43

SITE NO. (51) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
226	0.86	1.54	0.24	0.92	0.04	0.1

SITE NO. (52) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.02	0.21	0.18	0.07	0.12	0.01	0.06

SITE NO. (53) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
7.53	0.45	0.43	0.15	0.09	0.01	0.05

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (54) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
107	0.58	0.81	0.13	0.32	0.02	0.08

SITE NO. (55) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.15	0.2	1.07	0.06	0.34	0	0.12

SITE NO. (56) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.85	0.15	0.2	0.05	0.12	0	0.04

SITE NO. (57) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.61	0.26	0.77	0.09	0.26	0.06	0.25

SITE NO. (58) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.56	0.14	0.63	0.06	0.21	0	0.03

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (59) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.63	0.06	0.17	0.03	0.04	0	0.04

SITE NO. (60) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
364400	2314	0	22.4	0	7.48	0.87

SITE NO. (61) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
58.1	1.3	0.16	0.09	0.07	0.06	0.12

SITE NO. (62) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
735	6.51	0.15	0.17	0.19	0.11	0.06

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (63) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
54.2	1.32	0.48	0.22	0.19	0.07	0.57
			AUGER (5 FT)			
4.43	0.49	1.17	0.36	2.12	0.16	0.78
			AUGER (0 FT)			
285	5.43	0	0	0	0	0

SITE NO. (66) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.41	0.22	0.18	0.08	0.14	0.03	0.09

SITE NO. (67) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.4	0.17	0.17	0.07	0.05	0	0

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (68) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
65.6	6.05	7.19	2.84	4.47	0.63	3.19

SITE NO. (69) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.94	0.17	0.22	0.08	0.13	0.02	0.06

SITE NO. (70) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
22.4	0.9	0.33	0.12	0.16	0.05	0.14

SITE NO. (71) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.47	0.52	0.28	0.32	0.18	0.16	0.33

SITE NO. (72) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.69	0.82	1.14	0.32	0.66	0.08	0.29

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (73) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.67	0.15	0.21	0.06	0.1	0.02	0.09

SITE NO. (74) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.92	0.42	0.35	0.1	0.18	0.01	0.03

SITE NO. (75) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8.76	1.7	2.05	0.72	1.3	0.08	0.23

SITE NO. (76) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.65	0.1	0.15	0.03	0.07	0.01	0.03

SITE NO. (77) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.88	0.17	0.18	0.08	0.18	0	0.02

C1 - C4 HYDROCARBON DATA

FIELD: LOS ANGELES CITY

SITE NO. (78) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.62	0.2	0.29	0.08	0.13	0.03	0.05

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (1) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3	0.07	0.11	0.07	0.05	0.03	0.05

SITE NO. (2) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.22	0.2	0.16	0.11	0.08	0.02	0.07
			AUGER (5 FT)			
4.4	0.89	0.49	1.12	0.6	0.01	0.93

SITE NO. (4) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
6.77	0.73	0.87	0.28	0.58	0.1	0.13

SITE NO. (5) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.1	1.96	3.31	0.93	2.01	0.2	0.43

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (6) AUGER (5 FT)

M	E	E:	P	P:	I-B	N-B
42.4	11.9	7.55	4.29	3.84	0.25	1.33

PROBE (2.5 FT)

20.4	2.98	4.93	1.33	2.92	0.15	0.46

SITE NO. (8) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
13.7	2.13	3.1	0.93	1.96	0.13	0.46

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
12.6	2.25	2.91	0.98	1.73	0.08	0.42

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11.5	1.89	2.82	0.81	1.74	0.08	0.31

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (11) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
12.5.	2.11	2.89	0.86	1.82	0.06	0.29

SITE NO. (12) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.42	0.08	0.23	0.07	0.15	0	0.06

SITE NO. (13) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.26	0.13	0.18	0.04	0.17	0.12	0.09

SITE NO. (14) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
14	2.47	3.69	0.99	2.62	0.07	0.4

SITE NO. (15) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
7.11	1.23	1.62	0.5	1.12	0.07	0.18

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (16) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
16.7	3.18	3.95	1.21	2.55	0.11	0.44

SITE NO. (17) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5.54	1.06	1.15	0.42	0.74	4	0.21

SITE NO. (18) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.41	0.27	0.35	0.21	0.32	0.05	0.11

SITE NO. (19) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.7	0.45	0.62	0.23	0.44	0.05	0.13

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (20) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.48	0.31	0.47	0.18	0.37	0.03	0.08
			AUGER (5 FT)			
9.11	2.04	1.57	1	0.96	0.06	0.38

SITE NO. (21) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.77	0.17	0.18	0.08	0.08	0.02	0.03

SITE NO. (23) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.46	0.43	0.62	0.25	0.38	0.12	0.16

SITE NO. (24) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
4	0.34	0.53	0.18	0.38	0.02	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (25) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.91	0.21	0.23	0.1	0.07	0.04	0.1

SITE NO. (26) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.88	0.76	0.94	0.27	0.46	0.06	0.19

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.89	0.11	0.18	0.05	0.12	0.05	0.14

SITE NO. (28) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.82	0.53	0.98	0.29	0.91	0.1	0.23

SITE NO. (29) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
7.44	0.87	0.53	0.31	0.35	0.05	0.17

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (30) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.32	0.17	0.16	0.06	0.05	0	0

SITE NO. (31) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.48	0.53	0.91	0.28	0.69	0.08	0.17
			AUGER (5 FT)			
5.02	0.58	0.54	0.5	0.22	0.06	0.18
			PROBE (0 FT)			
1.97	0.15	0.1	0.06	0.06	0	0.09

SITE NO. (34) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.84	0.2	0.14	0.04	0.08	0	0.03

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (35) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.75	0.31	0.41	0.15	0.22	0.03	0.11

SITE NO. (36) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.99	0.35	0.25	0.12	0.1	0.02	0.09

SITE NO. (37) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.13	0.2	0.27	0.09	0.07	0.04	0.11

SITE NO. (38) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
3.55	0.18	0.12	0.07	0.07	0	0.03

BREA-OLINDA OIL FIELD

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (39)

PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.03	0.23	0.14	0.1	0.07	0	0.09

AUGER (5 FT)

24.8	5.77	3.5	2.72	1.38	0.22	1.23

PROBE (0 FT)

3.12	0.5	0.33	0.15	0.2	0.04	0.1

SITE NO. (42)

PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.01	0.28	0.26	0.06	0.1	0	0.06

SITE NO. (43)

PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.19	0.27	0.26	0.09	0.18	0.02	0.07

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (44) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.09	0.22	0.21	0.11	0.08	0.01	0.09

SITE NO. (45) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.3	0.34	0.52	0.19	0.33	0.04	0.09
			AUGER (5 FT)			
3.8	0.67	0.5	0.4	0.08	0.06	0.36

SITE NO. (47) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.15	0.3	0.2	0.08	0.07	0.01	0.05

SITE NO. (48) PROBE (6 FT)

M	E	E:	P	P:	I-B	N-B
5.5	0.45	0.92	0.22	0.49	0.03	0.1

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (49) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
14782	0	1.01	0.21	0.78	0.03	0.13

SITE NO. (50) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
23.6	0.04	0.09	0.02	0.03	0	0.07
			AUGER (4.5 FT)			
51.4	12.9	8.35	6.72	6.18	0.63	2.78

SITE NO. (52) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
11	0.89	0.75	0.3	0.37	0.06	0.1

SITE NO. (53) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
207	0.2	0.64	0.13	0.33	0.04	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (54) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.45	0.16	0.18	0.05	0.06	0	0

SITE NO. (55) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
46.2	0.18	0.27	0.07	0.15	0.02	0.06
			AUGER (5 FT)			
26.6	7.81	4.73	4.12	3.38	0.38	1.4
			PROBE (0 FT)			
5.51	0.58	0.43	0.18	0.24	0.01	0.09

SITE NO. (58) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
26.7	0.92	0.7	0.29	0.32	0.04	0.12

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (59) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
320	8.48	0.22	0.65	0.07	0.06	0.14

SITE NO. (60) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
35	0.29	0.58	0.12	0.3	0.03	0.08

SITE NO. (61) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
34.4	1.23	0.3	0.23	0.08	0.02	0.08

SITE NO. (62) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
22.8	0.98	0.71	0.32	0.45	0.04	0.16

SITE NO. (63) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.71	0.31	0.23	0.1	0.15	0.03	0.1

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (64) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
45.8	0.47	1.01	0.23	0.73	0.05	0.13

SITE NO. (65) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
22.1	0.37	0.71	0.15	0.4	0.02	0.13

SITE NO. (66) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.99	0.16	0.16	0.08	0.11	0	0.09

SITE NO. (67) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.44	0.28	0.33	0.1	0.15	0.02	0.1

SITE NO. (68) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.07	0.14	0.1	0.04	0.15	0.09	0.08

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (69) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3	0.12	0.27	0.06	0.05	0.04	0.2

SITE NO. (70) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.51	0.17	0.25	0.05	0.1	0.06	0.1

SITE NO. (71) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.32	0.14	0.34	0.09	0.15	0.03	0.18

SITE NO. (72) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.96	0.21	0.29	0.06	0.16	0	0.07

SITE NO. (73) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.05	0.27	0.62	0.05	0.23	0.55	0.41

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (74) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.42	0.42	0.69	0.12	0.24	0.01	0.03

SITE NO. (75) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.37	0.15	0.31	0.08	0.22	0.03	0.13

SITE NO. (76) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.53	0.13	0.2	0.05	0.1	0	0

SITE NO. (77) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.96	0.17	0.34	0.08	0.19	0	0.04

SITE NO. (78) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.29	0.33	0.28	0.09	0.17	0	0

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (79) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.62	0.1	0.17	0.04	0.05	0	0

SITE NO. (80) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
8.25	0.15	0.31	0.07	0.13	0	0.01

SITE NO. (81) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.82	0.1	0.31	0.05	0.14	0	0

SITE NO. (82) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.77	0.43	0.35	0.14	0.22	0	0.05

SITE NO. (83) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.72	0.24	0.42	0.09	0.19	0.01	0.02

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (84) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.22	0.07	0.13	0.07	0.07	0	0.09

SITE NO. (85) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.59	0.19	0.3	0.08	0.18	0.01	0.05

SITE NO. (86) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.64	0.17	0.13	0.06	0.05	0	0.05

SITE NO. (87) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.15	0.34	0.51	0.12	0.27	0.03	0.1

SITE NO. (88) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.1	0.04	0.12	0.07	0.07	0	0

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (89) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.19	0.08	0.09	0.07	0.03	0	0

SITE NO. (90) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.5	0.18	0.21	0.08	0.13	0	0.05

SITE NO. (91) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
0.99	0.04	0.19	0.01	0.05	0	0

SITE NO. (92) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.44	0.08	0.07	0.07	0.01	0	0

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (93) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.02	0.04	0.1	0.04	0.09	0	0.07

PROBE (0 FT)

2.05	0	0	0	0	0	0

SITE NO. (94) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.19	0.04	0.1	0.01	0.05	0	0

SITE NO. (95) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
0.96	0.05	0.09	0	0	0	0

SITE NO. (97) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8.72	0.22	0.14	0.1	0.07	0.05	0.17

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (98) AUGER (72 FT)

M	E	E:	P	P:	I-B	N-B
6824	81	0	17.7	0	3.56	0.97

SITE NO. (99) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8.07	0.2	0.12	0.14	0.1	0.06	0.15

SITE NO. (100) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.39	0.29	0.13	0.08	0.05	0.04	0.1

SITE NO. (101) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.34	0.11	0.13	0.06	0.07	0.02	0.06

SITE NO. (102) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.09	0.81	0.47	0.36	0.24	0.09	0.24

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (103) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.43	0.44	0.38	0.21	0.33	0.07	0.21

SITE NO. (104) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.35	0.13	0.21	0.06	0.08	0.02	0.07

SITE NO. (105) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
4.09	0.65	0.77	0.29	0.45	0.04	0.11

SITE NO. (106) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.53	0.34	0.07	0.09	0.05	0.04	0

SITE NO. (107) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
10.1	2.23	0.26	0.81	0.28	0.13	0.23

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (108) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
3.69	0.44	0.2	0.22	0.13	0.05	0.11

SITE NO. (109) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
9.66	1.58	0.92	0.65	0.59	0.1	0.19

SITE NO. (110) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.97	0.21	0.26	0.14	0.27	0.03	0.07

SITE NO. (111) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.65	0.09	0.07	0.05	0.1	0	0

SITE NO. (112) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
13	2.22	5.01	1.63	4.46	0.2	0.68

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (113) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.19	0.14	0.1	0.08	0.07	0.03	0.1

SITE NO. (114) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.31	0.07	0.11	0.04	0.04	0	0.05

SITE NO. (115) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.38	0.08	0.13	0.02	0.03	0	0

SITE NO. (116) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.11	0.13	0.1	0.05	0.08	0	0

SITE NO. (117) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
39.8	1.86	3.6	1.5	3.17	0.15	0.49

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (118) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.9	1.33	2.43	1.07	2.17	0.11	0.41

SITE NO. (119) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
4.75	0.36	0.47	0.24	0.43	0.03	0.11

SITE NO. (120) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26.2	2.82	5.02	1.94	3.88	0.29	0.67

SITE NO. (121) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.42	0.15	0.2	0.17	0.09	0	0.05

SITE NO. (122) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.59	0.13	0.17	0.06	0.26	0.03	0.09

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (123) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.79	0.18	0.25	0.11	0.31	0.08	0.27

SITE NO. (124) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11.4	1.58	2.69	1.35	2.16	0.15	0.52

SITE NO. (125) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
51558	55.8	0	3.81	0.45	13.3	2.21

SITE NO. (126) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
398	0.97	0.39	0.23	0.26	0.14	0.16

SITE NO. (127) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.52	0.09	0.22	0.06	0.05	0.03	0.11

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (128) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.8	0.35	0.34	0.15	0.38	0.06	0.17

SITE NO. (129) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3041	6.73	2.76	1.74	2.18	1.41	0.61

SITE NO. (130) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
144350	2486	0	1335	0	655	19.1

SITE NO. (131) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
191	0.83	0.15	1.21	0	0.32	0.17

SITE NO. (132) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
16.4	0.19	0.3	0.13	0.19	0.05	0.08

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (133) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.65	1.17	2.13	0.38	3.05	0.06	0.2

SITE NO. (134) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.98	0.28	0.89	0.2	1.45	0.06	0.27

SITE NO. (135) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.9	0.42	1.04	0.23	1.69	0.06	0.19

SITE NO. (136) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.06	0.37	0.35	0.14	0.17	0.03	0.05

SITE NO. (137) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.89	0.46	0.97	0.25	1.35	0.05	0.19

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (138) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.25	0.44	1.03	0.31	1.67	0.09	0.24

SITE NO. (139) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
253	5.26	0.16	3.24	0.1	1.78	0.08

SITE NO. (140) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.35	0.19	0.18	0.08	0.12	0.07	0.19

SITE NO. (141) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
218	4.03	0.01	2.35	0.1	1.23	0.09

SITE NO. (142) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
8170	181	0.27	112	0.34	61.7	0.96

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (143) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5.96	0.18	0.21	0.3	0.3	5.77	35.5

SITE NO. (144) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
31192	138	0	1626	113	7574	25014

SITE NO. (145) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.49	0.12	0.14	0.14	0.08	0.6	2.25

SITE NO. (146) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5.85	0.98	0.3	17.2	1.32	112	577

SITE NO. (147) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.31	0.08	0.2	0.09	0.17	0.28	1.28

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (148) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
108	1.21	0.38	24	1.53	146	1019

SITE NO. (149) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.87	0.37	0.17	0.25	0.08	0.17	1.26

SITE NO. (150) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.03	0.2	0.33	0.18	0.13	0.37	1.95

SITE NO. (151) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.53	0.18	0.13	0.08	0.04	0.07	0.77

SITE NO. (152) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
3.29	0.38	0.09	0.43	0.05	0.19	0.84

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (163) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
76.7	2.47	1.14	0.77	0.89	1.38	3.92

SITE NO. (164) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
72.2	2.95	1.58	1.14	1.01	1.27	4.22

SITE NO. (165) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
323	5.42	1.77	1.64	1.54	1.04	1.52

SITE NO. (166) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
61.9	1.46	0.51	0.43	0.31	0.71	1.95

SITE NO. (167) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26.6	0.96	0.26	0.18	0.15	0.14	0.42

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (153) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.39	1.16	0.53	0.41	0.58	0.46	0.69

SITE NO. (154) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
29.9	1.26	0.64	0.46	0.47	0.43	0.58

SITE NO. (155) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
78.3	2.44	1.08	0.93	0.63	1.96	10.9

SITE NO. (156) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
59.9	2.62	0.9	1.68	1.04	0.8	2.95

SITE NO. (157) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
87	3.1	1.56	1.1	1.01	1.27	1.16

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (158) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
23.7	0.76	0.34	0.37	0.29	1.2	5.73

SITE NO. (159) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
43.5	1.31	0.91	0.47	0.3	1.33	6.72

SITE NO. (160) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
35.2	1.11	0.49	0.38	0.38	0.86	4.08

SITE NO. (161) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1659	4.92	1.36	1.08	0.99	1.29	4.65

SITE NO. (162) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
85.6	2.29	1.42	1.13	1.12	2.04	9.74

C1 - C4 HYDROCARBON DATA

FIELD: SALT LAKE

SITE NO. (168) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
85	3.16	0.98	1.09	0.88	2.62	12.4

SITE NO. (169) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
39.5	1.21	0.57	0.36	0.4	0.42	0.59

SITE NO. (170) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26.9	1.21	0.05	0.34	0.38	0.2	0.22

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (1)

PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
39	1.57	1.17	0.65	1.06	0.38	0.63

SITE NO. (2)

PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
52.1	1.5	0.7	0.49	0.52	0.51	0.7

SITE NO. (3)

PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
52.7	1.5	0.79	0.42	0.64	0.55	0.65

SITE NO. (4)

PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2612	5.24	2.47	1.64	1.73	1.62	1.71

SITE NO. (5)

PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
175	0.89	0.53	0.31	0.34	0.31	0.47

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (6) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4606	2.53	1.42	0.73	1.14	0.68	1.03

SITE NO. (7) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
951	0.54	0.55	0.25	0.4	0.11	0.39

SITE NO. (8) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
112	3.34	1.78	1.31	1.32	1.04	1.37

SITE NO. (9) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
66.8	1.87	0.9	0.63	1.39	1.65	1.61

SITE NO. (10) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
53	1.73	0.91	0.74	0.8	0.58	0.72

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (11)

			AUGER (5 FT)			
M	E	E:	P	P:	I-B	N-B
8.15	1.02	0.8	0.78	0.63	0.05	0.41
			PROBE (2 FT)			
56.3	1.37	0.74	0.43	0.63	0.5	0.68

SITE NO. (13)

			AUGER (5 FT)			
M	E	E:	P	P:	I-B	N-B
35.8	6.72	3.86	3.06	2.14	0.21	1.12
			PROBE (2 FT)			
1181	3.42	2.86	1.37	1.77	0.63	1.05

SITE NO. (15)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
32.9	1	0.54	0.35	0.45	0.39	0.6

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (16)

M	E	E:	PROBE (3 FT) P	P:	I-B	N-B
593	5.98	3.29	1.8	2.47	1.85	1.82
			AUGER (5 FT)			
38.2	0.07	0.83	0.17	0.29	0.03	0.2

SITE NO. (18)

M	E	E:	PROBE (3 FT) P	P:	I-B	N-B
83.2	2.09	0.89	0.56	1.14	0.95	0.9

SITE NO. (19)

M	E	E:	PROBE (3 FT) P	P:	I-B	N-B
48.8	1.31	0.73	0.38	0.66	0.47	0.7

SITE NO. (20)

M	E	E:	PROBE (3 FT) P	P:	I-B	N-B
48.9	1.29	0.56	0.37	0.45	0.46	0.68

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (21)			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
625	2.06	1.48	0.81	1.06	0.58	1.18

SITE NO. (22)			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
535	5.88	2.82	3.82	3.58	2.56	4.58

SITE NO. (23)			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
2730	6.19	2.4	1.56	1.73	1.83	2.04
			PROBE (3 FT)			
5042	15.2	1.92	3.66	1.79	0.86	2.41
			AUGER (5 FT)			
10633	1.85	0.53	0.41	0.17	0.11	0.23

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (26) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
52.3	0.99	0.54	0.37	0.24	0.32	0.71

SITE NO. (27) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6536	3.4	1.44	1.23	1	0.72	1.05

SITE NO. (28) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
37.8	1.72	0.98	0.71	0.79	0.55	0.66

SITE NO. (29) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.4	0.97	0.86	0.53	0.78	0.31	0.53

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (30) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
24.3	0.62	0.51	0.24	0.53	0.27	0.41
			AUGER (5 FT)			
6846	0.61	0.5	0.29	0.34	0.37	0.23

SITE NO. (32) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
68.8	2.97	1.91	1.43	1.64	0.87	1.24

SITE NO. (33) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
35	1.11	0.75	0.47	0.58	0.58	0.68

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (34)

M	E	E:	PROBE (2.5 FT) P	P:	I-B	N-B
50.3	1.75	0.93	0.63	0.75	0.57	0.69
			PROBE (0 FT)			
99.8	2.81	1.25	0.75	0.94	0.96	0.91

SITE NO. (36)

M	E	E:	PROBE (2.5 FT) P	P:	I-B	N-B
30.2	1.34	0.43	0.39	0.37	0.38	0.51

SITE NO. (37)

M	E	E:	PROBE (3 FT) P	P:	I-B	N-B
36.3	1.1	0.54	0.33	0.43	0.41	0.49

SITE NO. (38)

M	E	E:	PROBE (2.5 FT) P	P:	I-B	N-B
54.7	1.75	0.84	0.62	0.62	0.59	0.7

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (39) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
64.9	0.11	0.09	0.07	0.09	0.05	0.2

SITE NO. (40) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
6.03	0.11	0.29	0.18	0.1	0.04	0.16

SITE NO. (41) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.09	0.15	0.16	0.07	0.09	0.05	0.11

SITE NO. (42) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5.17	1.83	1.92	0.43	0.58	0.08	0.19
			PROBE (0 FT)			
2.28	0	0	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (44) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.18	0.19	0.13	0.15	0.11	0.03	0.07

SITE NO. (45) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.03	0	0	0	0.05	0.03	0.2

SITE NO. (46) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.98	0.55	0.57	0.52	0.5	0.1	0.43

SITE NO. (47) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.02	0.03	0.02	0.02	0.01	0.03	0.21

SITE NO. (48) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.08	0.03	0.01	0	0	0.02	0.11

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (49) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.15	0.02	0.03	0.03	1.01	0.03	0.29

SITE NO. (50) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.3	0.01	0.03	0.02	0.21	0.03	0.21

SITE NO. (51) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.62	0.02	0.03	0.01	0	0	0.23

SITE NO. (52) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
60.3	0.05	0.04	0.02	1.43	0.05	0.26

SITE NO. (53) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5920	464	3.53	1.56	0.93	0.4	0.53

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (54) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5820	240	1	1.39	1.42	0.35	1.09

SITE NO. (55) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
14.9	0.75	0.65	0.52	0.23	0.09	0.37

SITE NO. (56) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
544	22.8	1	0.54	0.75	0.2	0.76

SITE NO. (57) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.71	0.4	0.15	0.11	0.13	0.02	0.22

SITE NO. (58) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
162	6.13	0.71	0.46	1.1	0.04	0.5

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (59) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
7617	321	0.79	2.22	0.66	1.55	0.55

SITE NO. (60) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
81.4	2.78	0.16	0.02	0.08	0.03	0.21

SITE NO. (61) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26414	1224	0.3	7.53	1.19	10	1.51

SITE NO. (62) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4719	239	0.6	2.22	0.37	1.56	0.33

SITE NO. (63) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5561	227	0.63	1.89	0.34	1.29	0.63

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (64) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5057	237	1.99	2.46	1.31	1.56	0.82

SITE NO. (65) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
591	16.4	0.62	0.6	0.36	0.31	0.61

SITE NO. (66) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
122	6.18	0.81	1.12	1.19	0.17	1.02

SITE NO. (67) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
162	6.74	0.3	0.33	0.38	0.09	0.43

SITE NO. (68) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
41043	396	0	0	0.83	0.15	0.25

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (69) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
5336	42.2	0.56	0.39	1.28	0.12	0.71

SITE NO. (70) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
52.9	1.21	0.37	0.17	0.1	0.06	0.3

SITE NO. (71) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
259	5.99	0.77	0.49	0.37	0.02	0.03

SITE NO. (72) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.71	0.28	0.04	0.02	0.04	0.03	0.24

SITE NO. (73) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
22.7	0.94	0.5	0.51	0.71	0	0.07

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (74) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
11	0.16	0.25	0.15	0.27	0.02	0.15

SITE NO. (75) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17.7	0.52	0.34	0.11	0.26	0.04	0.22

SITE NO. (76) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.53	0.08	0.14	0.07	0.2	0	0.22

SITE NO. (77) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
426	1.67	0.86	0.46	2.59	0.14	0.58

SITE NO. (78) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.21	0.16	0.08	0.06	0.15	0.03	0.13

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (79) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
269	2.14	1.31	0.75	1.09	0.06	0.3

SITE NO. (80) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.78	0.34	0.38	0.15	0.21	0.03	0.18

SITE NO. (81) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
53.8	1.98	1.07	0.57	0.55	0.17	0.27

SITE NO. (82) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
7.21	0.89	1.36	0.6	0.85	0.08	0.41

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (83) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.13	0.03	0.02	0.01	0.29	0.02	0.12

PROBE (0 FT)

1.51	0	0	0	0	0	0

SITE NO. (85) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
10.6	0.56	0.97	0.26	0.59	0.04	0.27

SITE NO. (86) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.76	0.13	0.19	0.07	0.1	0.02	0.11

SITE NO. (87) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.51	0.26	0.24	0.13	0.08	0.04	0.25

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (93) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
9.13	0.27	0.29	0.11	0.04	0.01	0.05

SITE NO. (94) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
24.1	0.34	0.4	0.24	0.28	0.07	0.19

SITE NO. (95) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
603	27.3	0.51	0.02	0.01	0	0.03

SITE NO. (96) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
40290	2089	0	5.34	0	4	0.75

SITE NO. (97) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1244	68.2	0	0.33	0.2	0.18	0.18

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (98) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
237	12.2	0	0.21	0.22	0.04	0.19

SITE NO. (99) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
31.5	1.63	0.3	0.19	0.06	0.02	0.05

SITE NO. (100) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
26.9	1.62	0.4	0.28	0.25	0	0

SITE NO. (101) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.73	0.72	0.27	0.1	0.36	0	0

SITE NO. (102) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.32	0.42	0.04	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (103) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
15.6	0.42	0.26	0.17	0.13	0	0.06

SITE NO. (104) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
61.1	0.74	0.38	0.26	0.25	0.05	0.18

SITE NO. (105) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4.44	0.06	0	0	0	0	0

SITE NO. (106) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
0.53	0.03	0	0.02	0.02	0	0.03

SITE NO. (107) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
12.2	0.83	0.69	0.32	0.5	0.05	0.18

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (108) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.86	0.09	0.1	0.08	0.16	0.05	0.12

SITE NO. (109) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
66625	12.7	0	0	0	0	0

SITE NO. (110) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
30126	5.03	0.41	0.19	0.18	0.03	0.12

SITE NO. (111) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
56.5	0.87	0.61	0.52	0.26	0	0.09

SITE NO. (112) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
808	0.15	0.12	0.04	0.22	0.02	0.09

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (113) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
475	0.16	0.05	0.03	0	0	0

SITE NO. (114) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
26.2	0.03	0.03	0.02	0.15	0.01	0.07

SITE NO. (115) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
47.3	0.07	0.07	0.02	0.17	0.12	0.14

SITE NO. (116) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
65.4	0.24	0.23	0.11	0.05	0	0
			AUGER (5 FT)			
2.18	0.06	0.17	0.05	0.11	0	0.06

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (118)

			PROBE (3.5 FT)			
M	E	E:	P	P:	I-B	N-B
214	0.39	0.22	0.08	0.17	0	0.11
			AUGER (5 FT)			
23	4.08	2.01	2.08	2.22	0.15	0.57

SITE NO. (120)

			PROBE (2.5 FT)			
M	E	E:	P	P:	I-B	N-B
4.6	0.69	0.51	0.16	0.27	0.02	0.07

SITE NO. (121)

			PROBE (3 FT)			
M	E	E:	P	P:	I-B	N-B
8.78	0.4	0.59	0.26	0.55	0.06	0.25

SITE NO. (122)

			PROBE (3.5 FT)			
M	E	E:	P	P:	I-B	N-B
4.43	0.15	0.13	0.11	0.08	0	0.06

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (123) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
32.5	0.23	0.23	0.11	0.14	0.04	0.09

SITE NO. (124) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.4	0.02	0.01	0	0.16	0	0
			PROBE (0.5 FT)			
164540	68	0	3.65	0.2	0.37	0

SITE NO. (126) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
10197	2.45	0	0.13	0.2	0.04	0.13

SITE NO. (127) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
4534	2.71	0.42	0.13	0.32	0.03	0.14

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (128) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.64	0.09	0.11	0.06	0.03	0	0.04

SITE NO. (129) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
389	0.39	0.15	0.2	0.08	0.09	0.11

SITE NO. (130) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.59	0	0	0	0	0	0

SITE NO. (131) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
7.91	0.08	0.05	0.03	0.1	0.01	0.06

SITE NO. (132) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
4.58	0.1	0.05	0.07	0.09	0.03	0.11

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (133) PROBE (5 FT)

M	E	E:	P	P:	I-B	N-B
4.92	0	0	0	0.01	0	0.03

SITE NO. (134) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
3.89	0.06	0.09	0.04	0.03	0.02	0.06

SITE NO. (135) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
98.8	1.38	1.14	0.22	0.29	0.05	0.13

SITE NO. (136) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
58.4	0.27	0.33	0.13	0.21	0.03	0.1

SITE NO. (137) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
20.6	0.01	0.01	0.02	0.03	0.01	0.03

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (138) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
158	0.15	0.11	0.1	0.12	0.02	0.07

SITE NO. (139) PROBE (0 FT)

M	E	E:	P	P:	I-B	N-B
3.48	0	0	0	0	0	0

SITE NO. (140) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
26.6	1.41	3.31	1.93	0.83	0.03	0.1

SITE NO. (141) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
8.28	0.02	0.02	0	0	0	0

SITE NO. (142) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.13	0.06	0.05	0	0	0	0

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (143) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
6.13	0.16	0.18	0.07	0.09	0.03	0.11

SITE NO. (144) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
93.9	0.59	1.72	0.51	0.65	0.1	0.35

SITE NO. (145) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
154	1.91	1.61	0.91	1.03	0.07	0.31

SITE NO. (146) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
27.7	0.8	0.83	0.41	0.47	0.1	0.39

SITE NO. (147) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
9.21	0.12	0.55	0.13	0.09	0.02	0.05

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (148) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
73.3	1.06	1.44	0.92	1.91	0.41	1.01

SITE NO. (149) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
38.5	1.35	2.51	0.66	0.84	0.05	0.13

SITE NO. (150) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
13.1	0.22	0.45	0.12	0.24	0.07	0.29

SITE NO. (151) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.5	0.05	0.07	0.02	0.06	0	0.05

SITE NO. (152) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
41.2	1.26	1.68	0.49	1.11	0.03	0.14

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (153) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
11.5	0.41	0.57	0.17	0.35	0.06	0.28

SITE NO. (154) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
17	0.42	0.59	0.18	0.41	0.01	0.07

SITE NO. (155) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
2.58	0.08	0.08	0.02	0.04	0.01	0.02

SITE NO. (156) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
0.87	0.07	0.08	0.06	0.1	0	0.05

SITE NO. (157) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
46.6	0.63	0.85	0.27	0.57	0.03	0.1

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (158) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
1.41	0.06	0.09	0.03	0.06	0.03	0.04

SITE NO. (159) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
28.5	1.15	1.47	0.46	1.05	0.04	0.13

SITE NO. (160) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.78	0.07	0.08	0.06	0.05	0.01	0.03

SITE NO. (161) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.33	0.06	0.06	0.04	0.03	0	0.03

SITE NO. (162) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
7.3	0.11	0.11	0.06	0.07	0	0.01

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (163) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.26	0.15	0.19	0.11	0.27	0.05	0.29

SITE NO. (164) PROBE (0.5 FT)

M	E	E:	P	P:	I-B	N-B
1.82	0.01	0.03	0.02	0.02	0.03	0.12

SITE NO. (165) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.64	0.01	0.02	0	0	0	0.03

SITE NO. (166) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
4.9	0.2	0.3	0.16	0.21	0.05	0.35

SITE NO. (167) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
6.22	0.29	0.45	0.19	0.24	0.13	0.19

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (168) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.86	0.2	0.25	0.07	0.16	0	0.22

SITE NO. (169) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
5.42	0.72	0.17	0.27	0.43	0.05	0.24

SITE NO. (170) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
3.75	0.22	0.3	0.1	0.21	0.02	0.15

SITE NO. (171) PROBE (1 FT)

M	E	E:	P	P:	I-B	N-B
4.42	0.22	0.09	0.12	0.02	0.05	0.23

SITE NO. (172) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.17	0.12	0.13	0.02	0.18	0.01	0.14

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (173) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.39	0.12	0.16	0.04	0.03	0.02	0.14

SITE NO. (174) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
2.01	0.11	0.13	0.03	0.07	0	0.17

SITE NO. (175) PROBE (1.5 FT)

M	E	E:	P	P:	I-B	N-B
476	0.24	0.21	0.26	0.01	0.6	0.37

SITE NO. (176) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
11.3	0.42	0.35	0.18	0.15	0.03	0.12

SITE NO. (177) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
3.65	0.12	0.16	0.19	0.12	0.02	0.14

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (178) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.86	0.15	0.15	0.07	0.28	0.01	0.07

SITE NO. (179) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
10.9	0.3	0.35	0.2	0.27	0.03	0.24

SITE NO. (180) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
2.27	0.23	0.24	0.18	0.24	0.28	0.63

SITE NO. (181) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
6.8	0.31	0.39	0.14	0.23	0.02	0.11

SITE NO. (182) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1.45	0.08	0.07	0.11	0.07	0.02	0.08

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (183) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.79	0.12	0.11	0.13	0.11	0.03	0.13

SITE NO. (184) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
1.62	0.13	0.17	0.07	0	0	0

SITE NO. (185) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.07	0.55	0.38	0.28	0.15	0.08	0.4

SITE NO. (186) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
1370	58	0.64	0.3	0.29	0.12	0.41

SITE NO. (187) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
42.2	2.26	0.55	0.27	0.31	0.06	0.27

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (188) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
26.3	1.77	0.97	0.37	0.24	0.05	0.19

SITE NO. (189) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.48	0.17	0.02	0.16	0.03	0.07	0.29

SITE NO. (190) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
3.22	0.28	0.22	0.08	0.15	0.04	0.07

SITE NO. (191) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.34	0.76	0.51	0.32	0.28	0.07	0.25

SITE NO. (192) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.15	0.3	0.24	0.13	0.08	0.04	0.21

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (193) PROBE (3.5 FT)

M	E	E:	P	P:	I-B	N-B
1.05	0.11	0.03	0.05	0.04	0.06	0.24

SITE NO. (194) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
2.42	0.28	0.22	0.08	0.19	0.03	0.07

SITE NO. (196) PROBE (2.5 FT)

M	E	E:	P	P:	I-B	N-B
4.2	0.33	0.22	0.12	0.1	0.01	0.1

SITE NO. (197) PROBE (2 FT)

M	E	E:	P	P:	I-B	N-B
6.15	0.56	0.56	0.27	0.35	0.03	0.14

SITE NO. (198) PROBE (3 FT)

M	E	E:	P	P:	I-B	N-B
5.75	0.32	0.39	0.16	0.1	0.04	0.19

C1 - C4 HYDROCARBON DATA

FIELD: HUNTINGTON BEACH

SITE NO. (199) PROBE (0.5 FT)

M	E	E:	P	P:	I-B	N-B
247680	9.9	0	4.1	0	3.5	10.9

SAMPLING SITE MAPS

SUMMERLAND FIELD

ORTEGA HILL ROAD
BANNER AVENUE
EVANS STREET
ROLLISTER
GOLDEN GATE AVE.
EMERSON AVE.
WHITNEY D AVENUE
AVENUE L
LILLIE AVENUE
HELIPORT
HARDING
TRAILER PARK
WARLEY AVE.
COLVILL STREET
BANNER AVENUE
WARLEY AVENUE
VALENCIA STREET
SHELBY AVENUE
OLIVE STREET
LILLIE AVENUE
CONCRETE LINED DITCH
CONCRETE LINED DRAIN
SOUTHERN PACIFIC R.R.
US 101
N 340 000
N 339 000
N 338 000
N 337 000
E 1,516,000
E 1,517,000
E 1,518,000
E 1,519,000
E 1,520,000
E 1,521,000
MATCH TO SHEET NO.

(X) SAMPLING LOCATIONS
(X) ANOMALOUS HIGH

PACIFIC OCEAN

5	6	
9	10	11

SHEET INDEX

TOPOGRAPHIC MAP
OF
MONTECITO & SUMMERLAND AREA

SANTA BARBARA, CALIFORNIA

MAP PREPARED BY PHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED MARCH 17, 1960
1000' GRID IS BASED ON THE CALIFORNIA STATE COORDINATE SYSTEM, ZONE 5
ALL HORIZONTAL CONTROL STATIONS SHOWN HEREON WERE ESTABLISHED BY THE CALIFORNIA DIVISION OF HIGHWAYS AS SHOWN ON MAPS V-5B-2-J
VERTICAL DATUM IS MEAN SEA LEVEL.

0 200 400 600
SCALE 1:2400
CONTOUR INTERVAL = 5 FEET

NEWPORT BEACH FIELD

534000

1486500 1487000 1487500 1488000 1488500 1489000

533500

533000

532500

WEST COAST HWY

BALBOA BLVD

CHANNEL PLACE

43RD ST

42ND ST

41ST ST

40TH ST

39TH ST

38TH ST

37TH ST

36TH ST

35TH ST

34TH ST

RIVER AVE

MARCUS AVE

FINLEY AVE

LAKE AVE

PARK AVE

SEASHORE DRIVE

OCEAN

CHANNEL

RIALTO

COVES

CLUBHOUSE

NEWPORT AVE

CENTRAL AVE

VIA OPORTO

City of Newport Beach

Orange Co. Ref

Louis F. Garey & Son

Gilbert H. Beesemyer "Orange County Test No. 1"

BEACH AREA
OF
NEWPORT OIL FIELD

X SAMPLING SITE

X ANOMALY

N

SCALE IN FEET
0 100 200 300 400

SEE SHEET

TRACT 455 LOT 1

TRACT

ACREAGE

REVERT TO

CITY BDRY.

RES. 7333

SUPERIOR AVENUE

SUPERIOR AVENUE

SUPERIOR AVE. SEE L-2084 ANNEXATION

BANNING TRACT

HIGHWAY

TRACT 7530

R.S. 27-47

W. 6 BALBOA BLVD

RIVER AVE.

CRESCENT

BRUCE & CRESCENT

BRUCE PRIVATE STREET

BRUCE COURT

BRUCE & WEST

ANNE WAY

RIVER STREET

NEPTUNE

NEPTUNE AVE

SEASHORE DRIVE

CITY PROPERTY O.R. 12074/558

LOT 102

WESTERLY LINE OF EXT. FOR ST. PURPOSES SUP. CT. COR. = 2.300 OR 20/653 (VAC. RES 5462) (O.R. 5819/931)

104

CONCRETE JETTY

OCEAN

A-44 A-45 A-46 A-47 A-48 A-49 A-50 A-51 A-52 A-53 A-54 A-55 A-56 A-57

A-52 CITY PROPERTY A-44 Q.D. DB 340/224

A-51 THROUGH A-57

CITY PROPERTY O.R. 12074/558

CITY PROPERTY DEED OR 340/224 A-36 TO A-60

1485500

533500

PACIFIC OCEAN

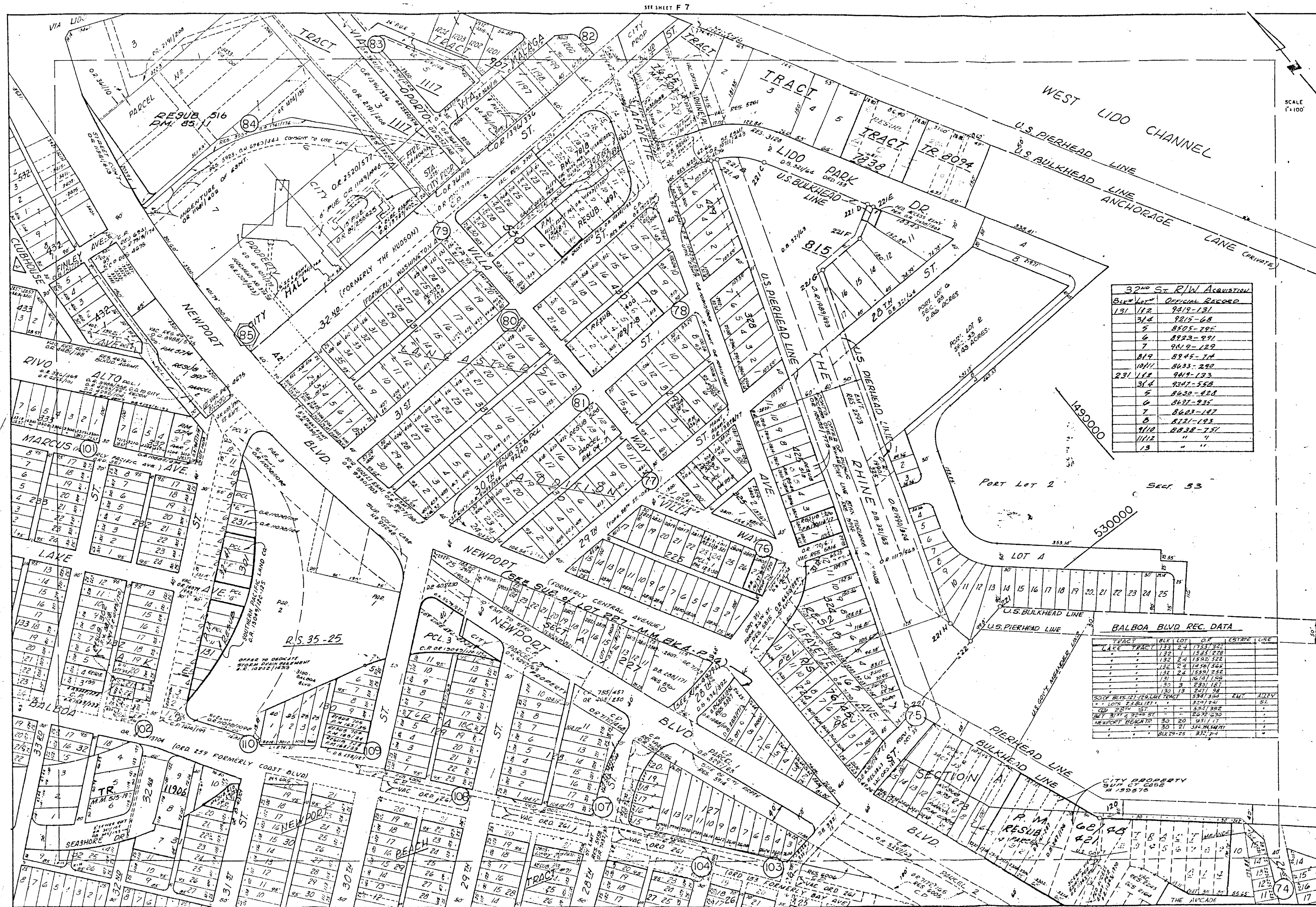
X SAMPLING SITE

X ANOMALY

SEE SHEET

CITY OF NEWPORT BEACH
PUBLIC WORKS DEPARTMENT

E 5


SEE SHEET F 7
SEE SHEET D 7
E6
WEST LIDO CHANNEL
U.S. PIERHEAD LINE
U.S. BULKHEAD LINE
ANCHORAGE LANE (PRIVATE)
SCALE 1"=100'
NEWPORT BLVD.
CITY HALL
32 ND. (FORMERLY WASHINGTON ST.)
VILLA WAY
LAFAYETTE AVE.
RHINE
LIDO PARK DR.
PORT LOT 2
SEC. 33
LOT A
BALBOA BLVD.
R.S. 35-25
SOUTHERN PACIFIC LAND CO.
SECTION A
PIERHEAD LINE
BULKHEAD LINE
32ND ST R/W ACQUISITION
BALBOA BLVD REC. DATA
THE ARCADE
1490000
530000

CITY OF NEWPORT BEACH
PUBLIC WORKS DEPARTMENT

(X) SAMPLING SITE (X) ANOMALY

E 7

SEE SHEET E 7

D6

BALBOA BLVD. REC. DATA

TRACT	BLK	LOT	O.R.	ESCHEATS	USE
NEWPORT BEACH TR	29	21	312 314		ST.
"	28	20	"		"
"	28	21	"		"
"	27	PTN 20	"		"
"	27	21	"		"
"	27	22	"		"
"	27	PTN 23	"		"
"	26	19	"		"
"	26	20	"		"
"	25	19	"		"
"	25	20	"		"
"	24	PTN 18	"		"
"	24	19	234 37 337 340		"
"	24	20	332 334		"
"	24	PTN 21	"		"
"	23	PTN 20	"		"

SEE SHEET

CITY OF NEWPORT BEACH
PUBLIC WORKS DEPARTMENT

D 7

SEE SHEET F6

IRVINE'S SUBDIVISION
BLOCK 1
LOT 172
RES. 7330

COAST HWY.

WEST (O.R.A 60-A.)

TRACT

LOT 1

WATERWAY

7330

N'WLY BDRY OF IRVINE'S SUBDIVISION

BALBOA COVES (PRIVATE STREETS)

BALBOA COVES

TRACT 1 WATERWAY

* HOUSE NUMBERING FOR BALBOA COVES IS THE SAME AS LOT NUMBERS.

LINE OF MEAN HIGH TIDE S.C.C. 23.66
C.E. HIGHWAY OR WATER WAY
O.R. 339/378

CHANNEL

ISLAND 1

WATERWAY

CHANNEL

RIVER AVE.

CITY PROPERTY CHP. 1004, STATUTES 1963

CHANNEL PARK
CITY PROPERTY
O.R. 6852/339, 184

CHANNEL

RIVO

WATERWAY RIGHT-OF-WAY
O.R. 336/385

C. MARCUS (FORMERLY PACIFIC)

ISLAND 2

CITY PARK
O.R. 948/391
O.R. 948/278
O.R. 948/280

ALTO

RIVER

BALBOA (FORMERLY BAY AVE. ORD. #138)

SEASHORE

THIRD

ADD

TO

NEWPORT BEACH

OCEAN

PACIFIC

A44 A43 A42 A41 A40 A39 A38 A37 A36 A35 A34

CITY PROPERTY A-34 THROUGH A-44

A-38 TO A-60 O.R. 840/124

FRONT

TRACT

DIALTO

WATERWAY RIGHT-OF-WAY O.R. 336/385

SHORT

CLUBHOUSE

(FORMERLY RAILROAD AVE. ORD. 357)

FINLEY

AVENUE

RIVO

ALTO

MARCH

(FORMERLY PACIFIC AVE. ORD. 357)

LAKE

PARK

38th STREET PARK
CITY PROPERTY
O.R. 350/409

LANE

DR.

BLVD.

SCALE 1" = 100'

Lot Line Adj. #A 80-1

PAR 1 P.M. 57-41
PAR 2 P.M. 57-41
PAR 3 P.M. 57-41

1485000

53150

SEE SHEET E5

SEE SHEET E7

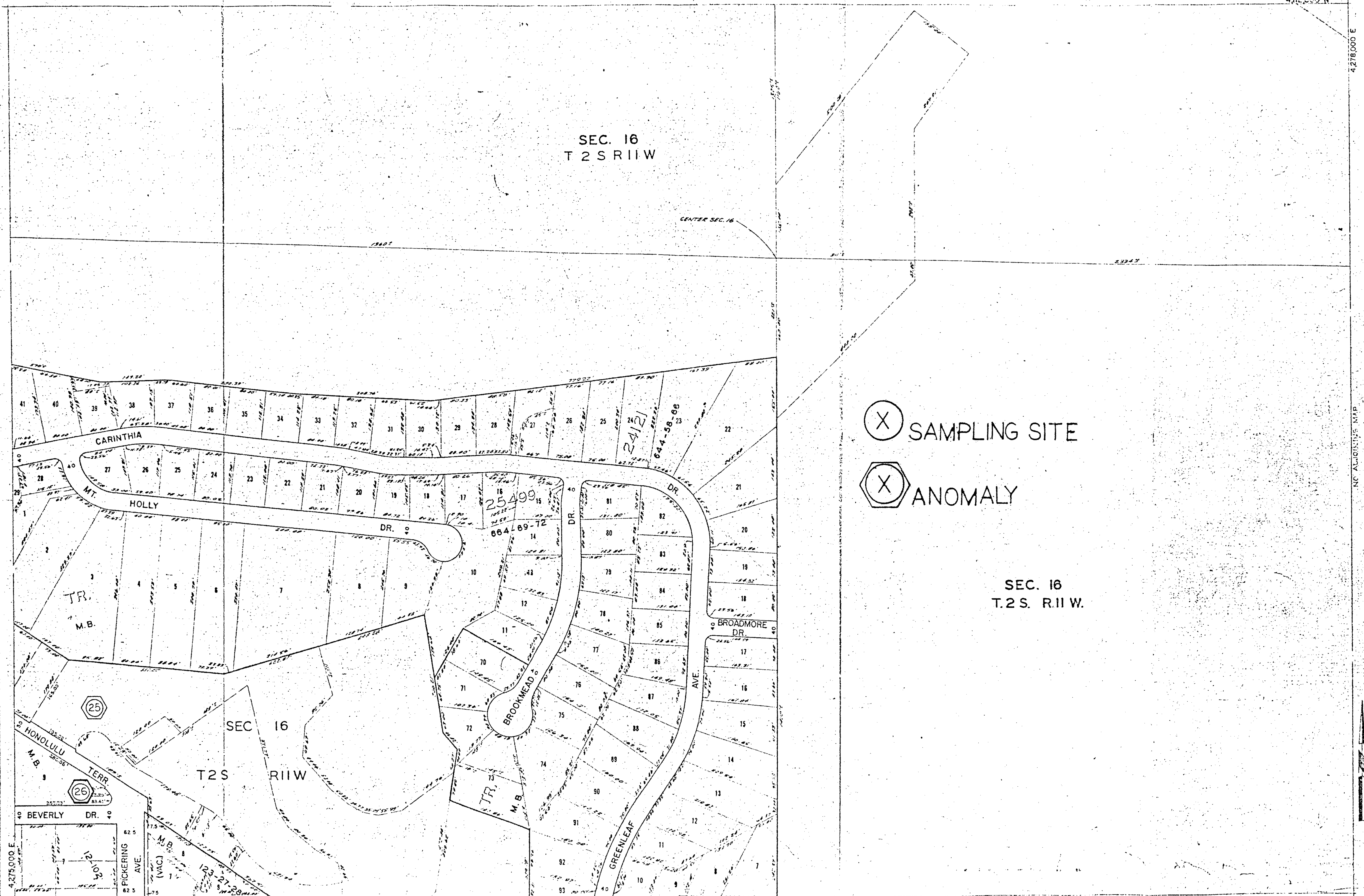
SEE SHEET D6

CITY OF NEWPORT BEACH
PUBLIC WORKS DEPARTMENT

(X) SAMPLING SITE · (X) ANOMALY

E6

RIDEOUT HEIGHTS AREA OF THE WHITTIER OIL FIELD



JULY 1964
CALIFORNIA STATE COORDINATE SYSTEM - ZONE VII
PREPARED BY CREST ENGINEERING COMPANY INC.

CITY OF WHITTIER
VERGIL C. HAIGHT - CITY ENGINEER

110-275
SCALE: 1 INCH = 100 FEET

JULY 1964

CALIFORNIA STATE COORDINATE SYSTEM - ZONE VII

CITY OF WHITTIER ⊗ SAMPLING SITE ⊗ ANOMALY

VERGIL C. HAIGHT - CITY ENGINEER

110 - 272

SCALE: 1 INCH = 100 FEET

Brea - Olinda Oil Field

SURVEY & MAP DIV. - FIELD DEPT.
UNION OIL COMPANY OF CALIFORNIA
APRIL 1942

LEGEND
SURVEYED WELL LOCATIONS
O PROPOSED
• VERIFIED
+ ABANDONED

SCALE IN FEET

AREA
STEARNS "1899" PROPERTY

STEARNS	860.277 Ac.
MET WATER DIST (RESERVOIR)	28.550 "
ROAD	1.885 "
SHELL OIL CO. (COLUMBIA)	99.483 "
TOTAL	990.195 Ac.

RANCHO RINCON DE LA CAÑON DE SANTA ANA

S 58°23' W - E 2124.16'

S 86°07'51" E 7074.43'

26300 ppm

19200 ppm

#26

#13

#11

#73

#63

#57

#93

#100

STEARNS PROPERTY

STEARNS
(FEE)

SHELL OIL CO.
(COLUMBIA)
(U. O. Company Fee)

RANCHO SAN JUAN CAÑON DE SANTA ANA

158108
157108
156108
155108

2038889
2039889
2040889
2041889
2042889
2043889
2044889
2045889

X SAMPLING SITE

X ANOMALY

LOT 1, SEC. 1, T. 3 S., R. 10 W., S.B.B.&M.

SHELL OIL CO. (FISHER)

SHELL OIL CO.

STEARNS PROPERTY

1½" IRON BAR

N.10446.216
E.957.641

S 77°00'24"E 2026.24'
1145.04'

BREA CANYON ROAD

323.38'

S.88°35'04"E
E39.94'

191.30'

N.10216.301
E. 959.086

N.10188.765
E. 2073.362

851.20'

N.9990.639
E.2331.998

S 58°14'11"E 859.06'

N.9538.414
E.3662.398

S 28°21'03"W 167.73'

N.9390.787
E.3582.747

256.72'

N.9135.26
E.3835.47

N 10,000 160108

N 9,000 159108

N 8,000 158108

E 1,000

E 2,000

E 3,000

E 4,000

1196.69'

631.91'

4673.97'

N 89°46'53"E 500.00'

N 9146.721
E.1187.766

N.9148.622
E.1687.762

S 65°46'29"E 604.10'

N.8500.724
E.2238.710

S.75°31'56"E
1553.59'

N 0°13'07"W 1250.00'

N 9387.991
E. 970.565

3 I.P.

EL.748.67
N 9019.890
E. 966.595

METROPOLITAN WATER DISTRICT
SURFACE RIGHTS

2035889

2036889

N.8730.25
E.2476.70
Cicerms

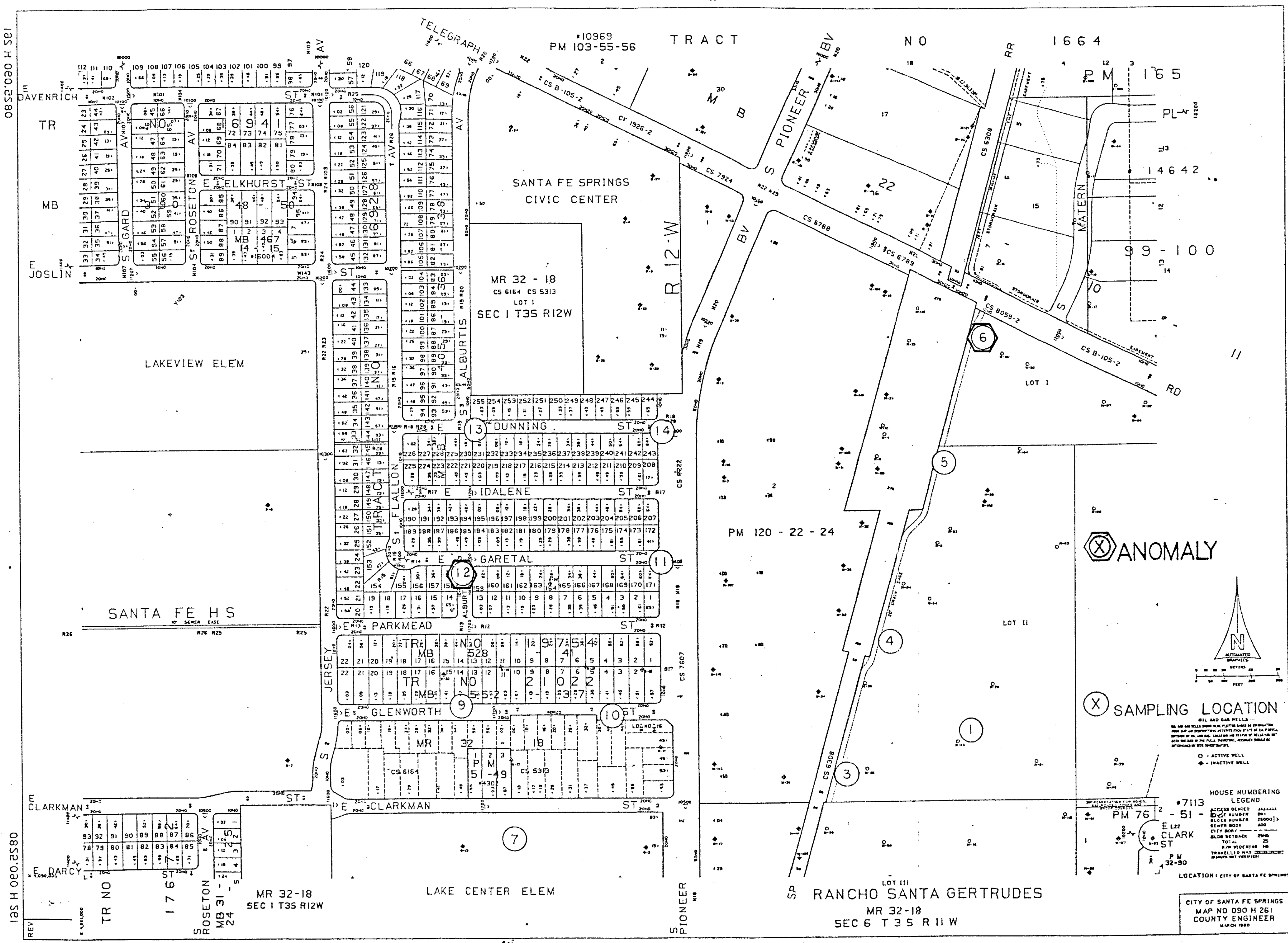
S.71°44'50"E.
1691.52'

N.8131.77'
E.3398.14

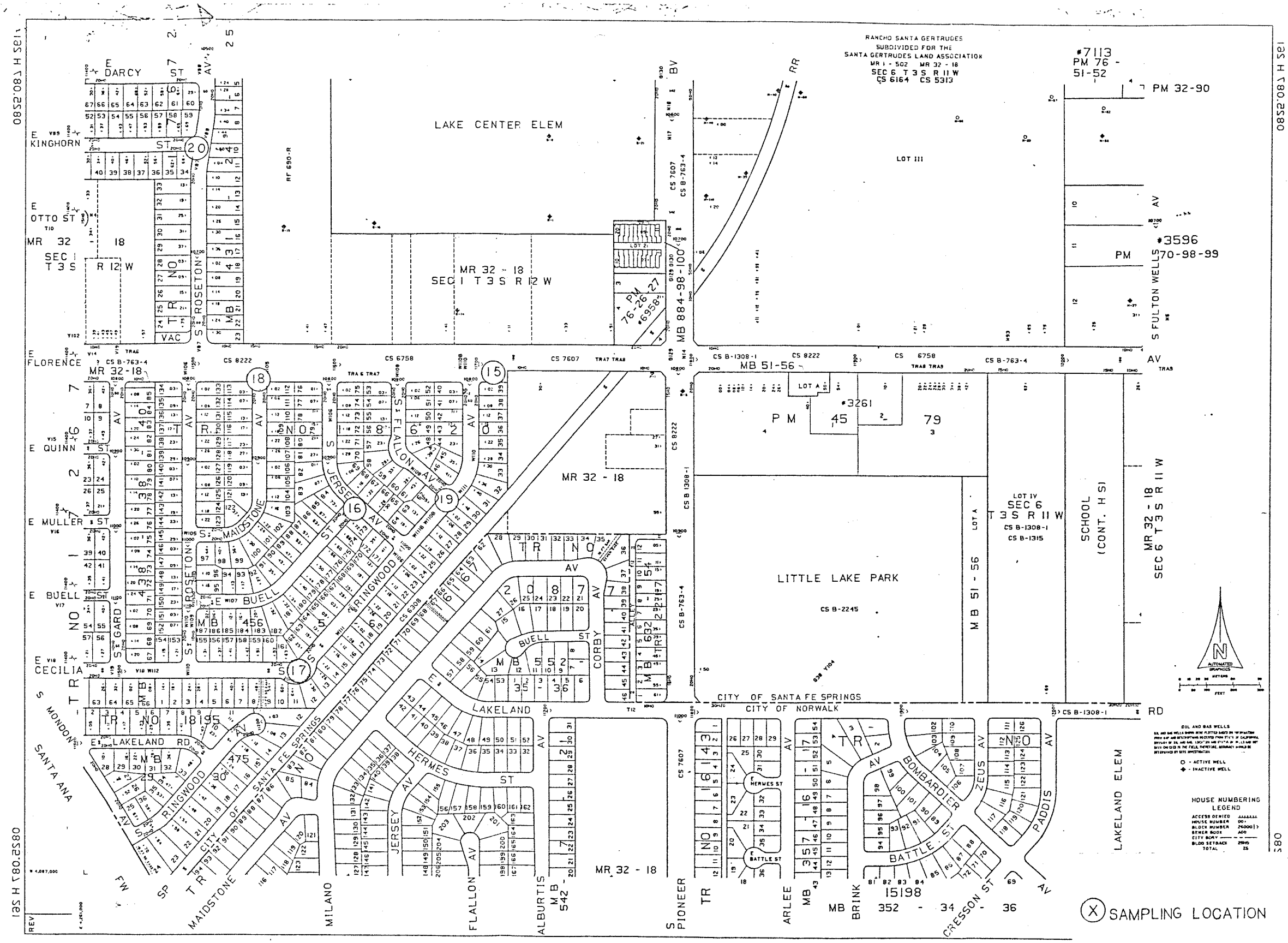
X SAMPLE SITE

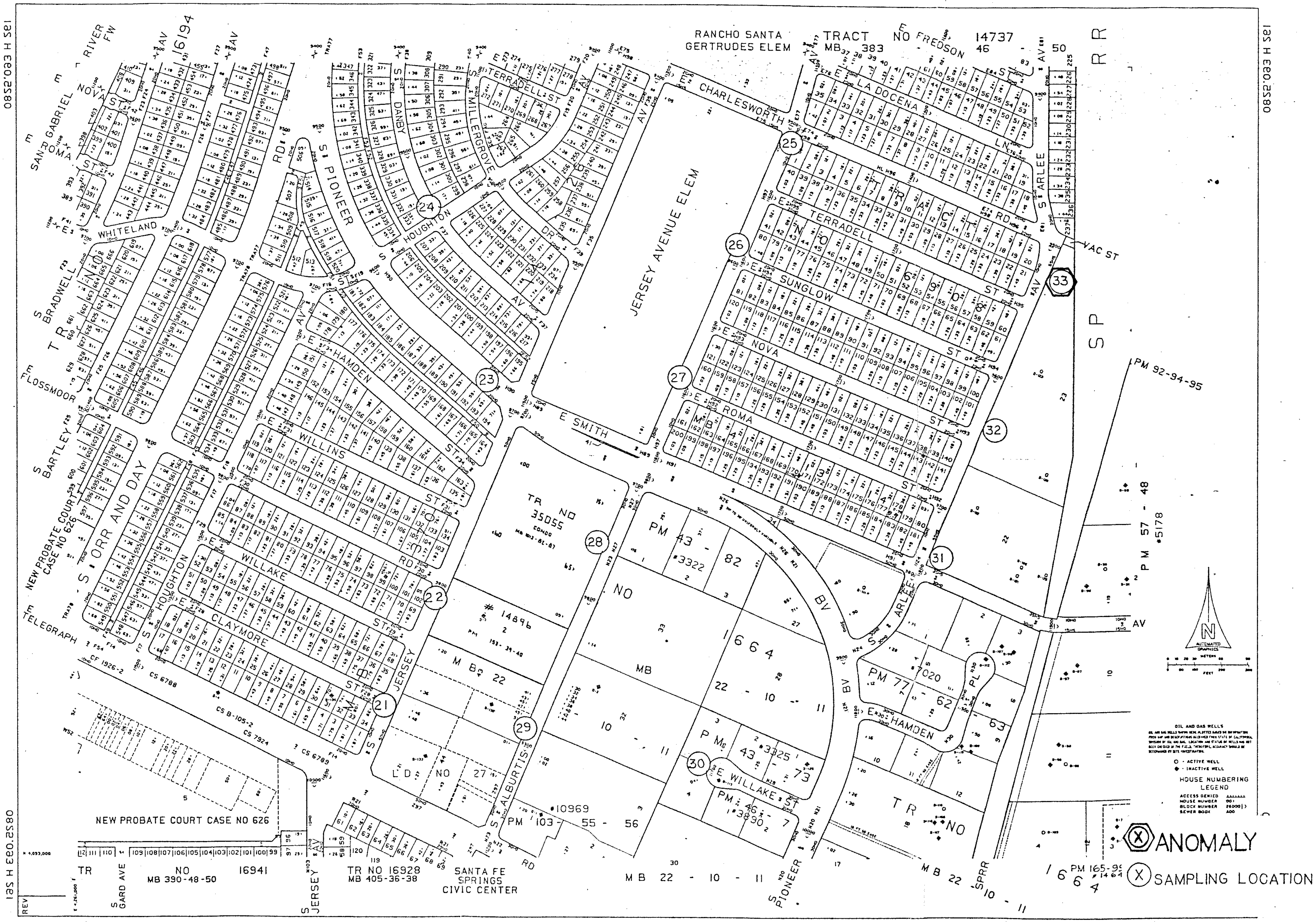
X ANOMALY

SANTA FE SPRINGS OIL FIELD

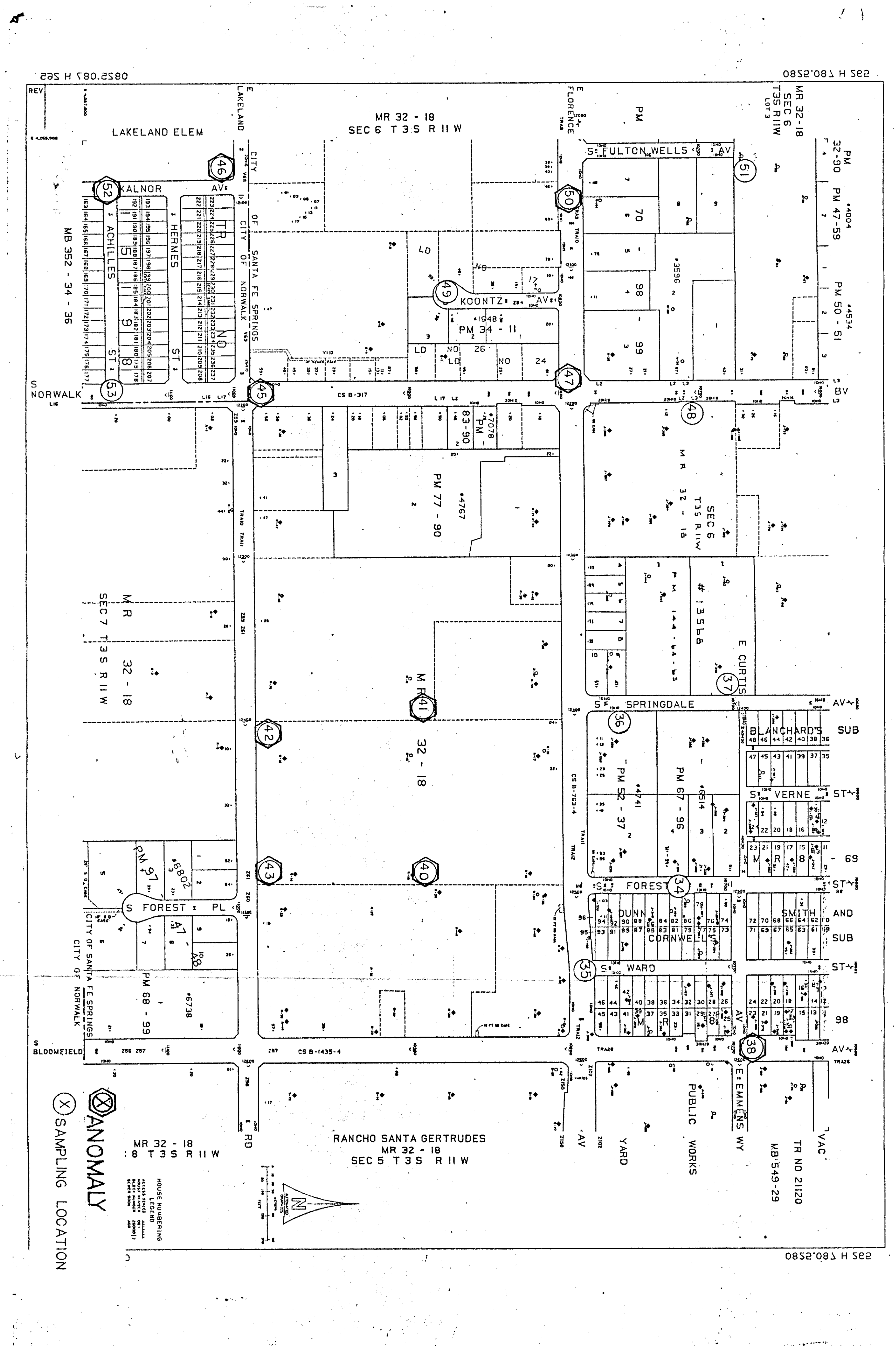


ANOMALY
SAMPLING LOCATION
SANTA FE SPRINGS CIVIC CENTER
LAKEVIEW ELEM
SANTA FE H S
LAKE CENTER ELEM
RANCHO SANTA GERTRUDES
MR 32-18
SEC 6 T3S R11W
SEC 1 T3S R12W
R 12 W
PM 120 - 22 - 24
PM 103-55-56
TRACT NO 1664
TELEGRAPH RD
S PIONEER BV
E ALBURTIS AV
E DUNNING ST
E IDALENE ST
E GARETAL ST
E PARKMEAD ST
E GLENWORTH ST
E CLARKMAN ST
S JERSEY AV
S FLALLON AV
E ROSETON AV
S GARD AV
E ELKHURST ST
E DAVENRICH ST
E JOSLIN ST
E DARCY ST
MATERN
LOT I
LOT II
LOT III
OIL AND GAS WELLS
ACTIVE WELL
INACTIVE WELL
HOUSE NUMBERING LEGEND
CITY OF SANTA FE SPRINGS
MAP NO 090 H 261
COUNTY ENGINEER
MARCH 1980
0825.090 H 261

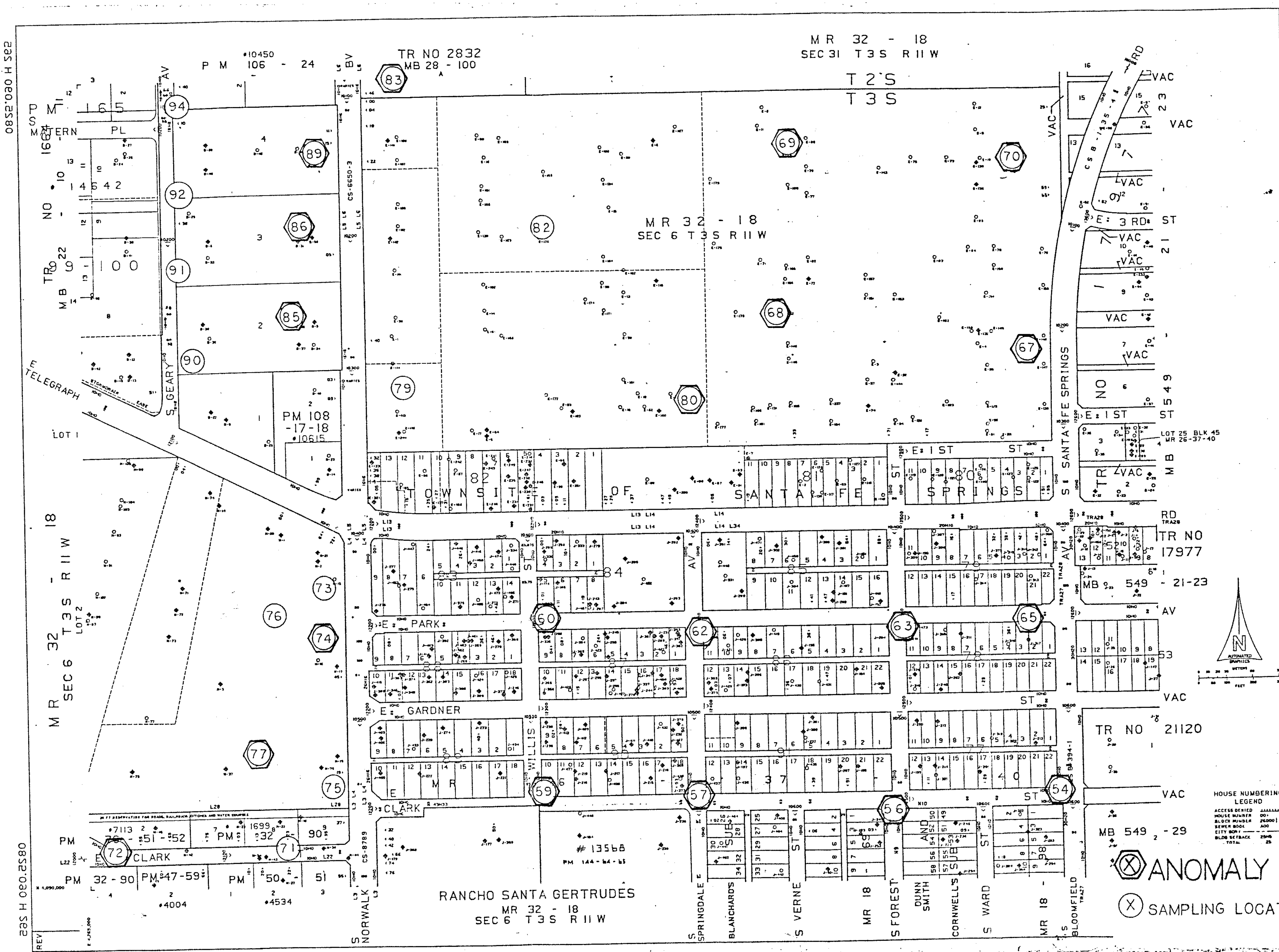

E DARCY ST
E KINGHORN ST
E OTTO ST
MR 32 18
SEC 1 T 3 S R 12 W
LAKE CENTER ELEM
MR 32 - 18
SEC 1 T 3 S R 12 W
S PROSPECT AV
RF 690-R
RANCHO SANTA GERTRUDES
SUBDIVIDED FOR THE
SANTA GERTRUDES LAND ASSOCIATION
MR 1 - 502 MR 32 - 18
SEC 6 T 3 S R 11 W
CS 6164 CS 5313
#7113
PM 76 - 51-52
PM 32-90
LOT 111
#3596
PM 70-98-99
S FULTON WELLS AV
MB 884-98-100
PM 76-26-27 #6956
LOT 21
CS 7607
CS B-763-4
CS 8222
CS 6758
CS B-1308-1
CS 8222
MB 51-56
LOT A
#3261
PM 45 2 79
E FLORENCE
E QUINN ST
E MULLER ST
E BUELL ST
E CECILIA
S MONON
SANTA ANA
S STOGARD
S MAIDSTONE
S JERSEY AV
S FLALLON AV
S RINGWOOD AV
E LAKELAND RD
CITY OF SANTA FE SPRINGS
CITY OF NORWALK
MR 32 - 18
MB 456
MB 475
MB 542 - 7
MB 552 - 35 - 36
MB 51 - 56
LITTLE LAKE PARK
CS B-2245
LOT IV
SEC 6
T 3 S R 11 W
CS B-1308-1
CS B-1315
SCHOOL
(CONT. H S)
LAKELAND ELEM
CORBY AV
HERMES ST
BUELL ST
BATTLE ST
BOMBARDIER
ZEUS AV
PADDIS AV
CRESSON ST
S PIONEER
ARLEE
BRINK
MB 352 - 34 - 36
15198
MB 884-98-100
OIL AND GAS WELLS
O - ACTIVE WELL
✦ - INACTIVE WELL
HOUSE NUMBERING
LEGEND
ACCESS DENIED
HOUSE NUMBER
BLOCK NUMBER
STREET BOOK
CITY BOAT
BLDG SETBACK
TOTAL
AUTOMATED GRAPHICS
X SAMPLING LOCATION

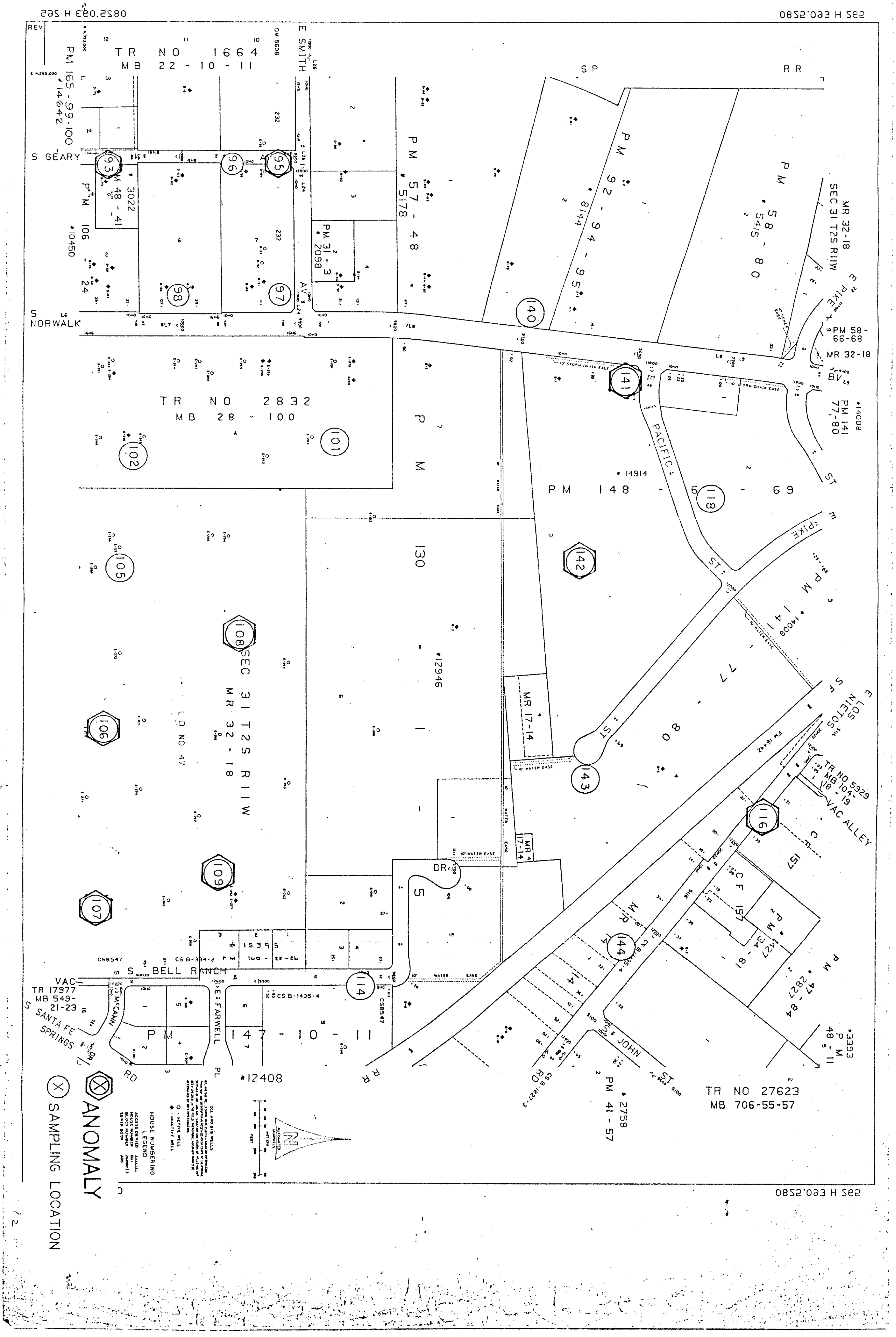


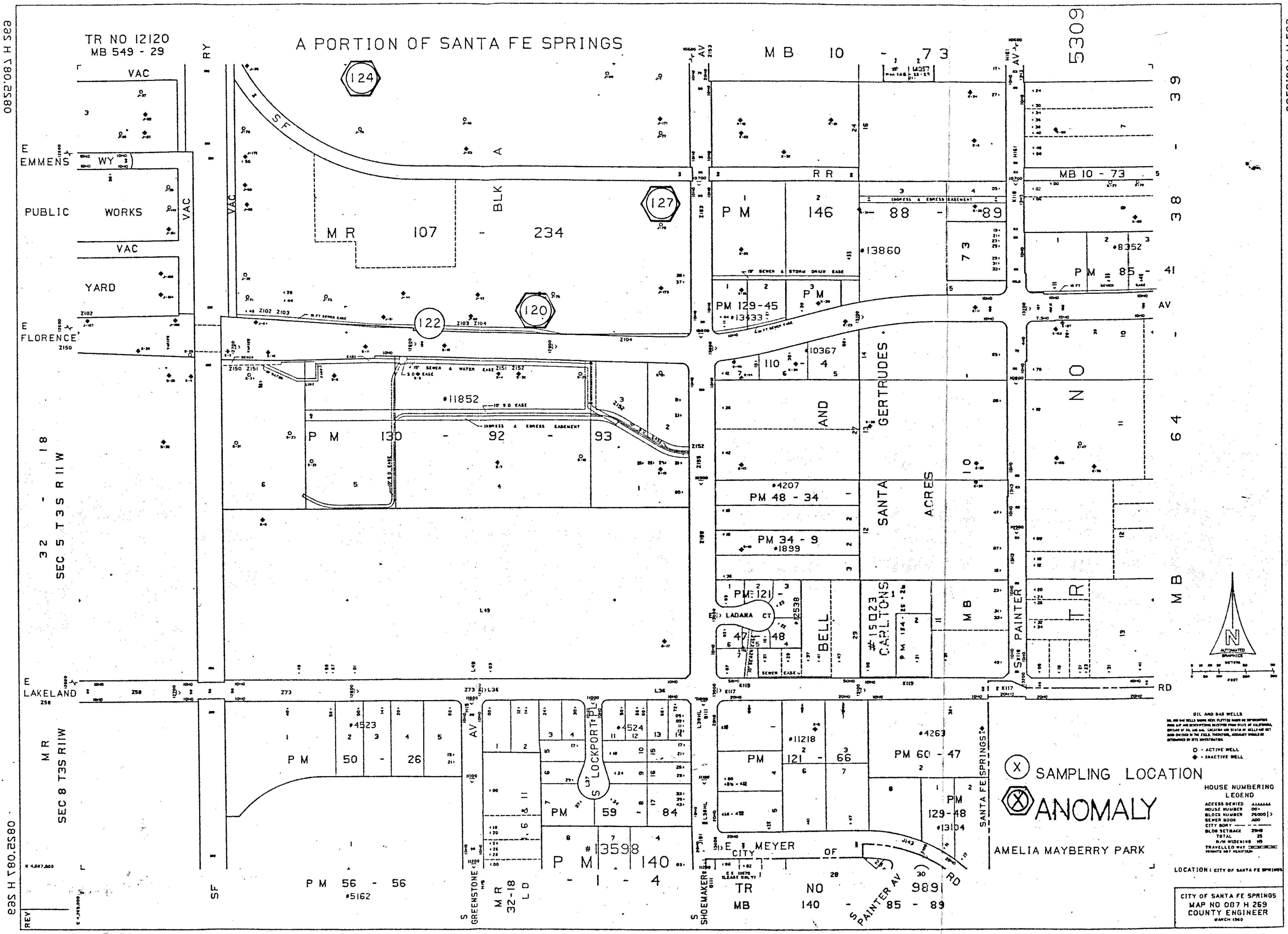
RANCHO SANTA GERTRUDES ELEM
TRACT NO 14737
MB 383 46 - 50
E FREDSON
E LA DOCENA LN
E CHARLESWORTH
JERSEY AVENUE ELEM
E TERRADELL ST
E SUNGLOW ST
E NOVA ST
E ROMA ST
E SMITH
S ARLEE AV
VAC ST
S P R R
PM 92-94-95
PM 57 - 48
#5178
TR NO 35055
PM 43 - 82
#3322
NO 1664
MB 22 - 10 - 11
PM 77 - 62
#7020
E HAMDEN PL
PM 43 - 73
#3325
E WILLAKE ST
PM 46 - 7
#3830
PM 103 - 55 - 56
#10969
S ALBURTIS AV
L D NO 27
M B 22
#14896
PM 153 - 34 - 40
S JERSEY AV
E CLAYMORE ST
E WILLAKE ST
S HOUGHTON RD
E WILLINS ST
E HAMDEN ST
S PIONEER BV
S DANBY AV
S MILLERGROVE DR
E TERRADELL ST
S ORR AND DAY RD
NEW PROBATE COURT CASE NO 626
S BARTLEY AV
FLOSSMOOR
S BRADWELL AV
TR NO 16194
WHITELAND
S ROMA ST
NOVA ST
SAN GABRIEL RIVER FW
TELEGRAPH
CS 6788
CS B-105-2
CS 7924
CS 6789
NEW PROBATE COURT CASE NO 626
TR NO 16941
MB 390-48-50
S GARD AVE
S JERSEY AV
TR NO 16928
MB 405-36-38
SANTA FE SPRINGS CIVIC CENTER
MB 22 - 10 - 11
S PIONEER
MB 22 - 10 - 11
SPRR
TR NO
1664
PM 165-95
#14164
REV
0825.093 H 5E1
AUTOMATED GRAPHICS
OIL AND GAS WELLS
O - ACTIVE WELL
◆ - INACTIVE WELL
HOUSE NUMBERING LEGEND
ANOMALY
SAMPLING LOCATION



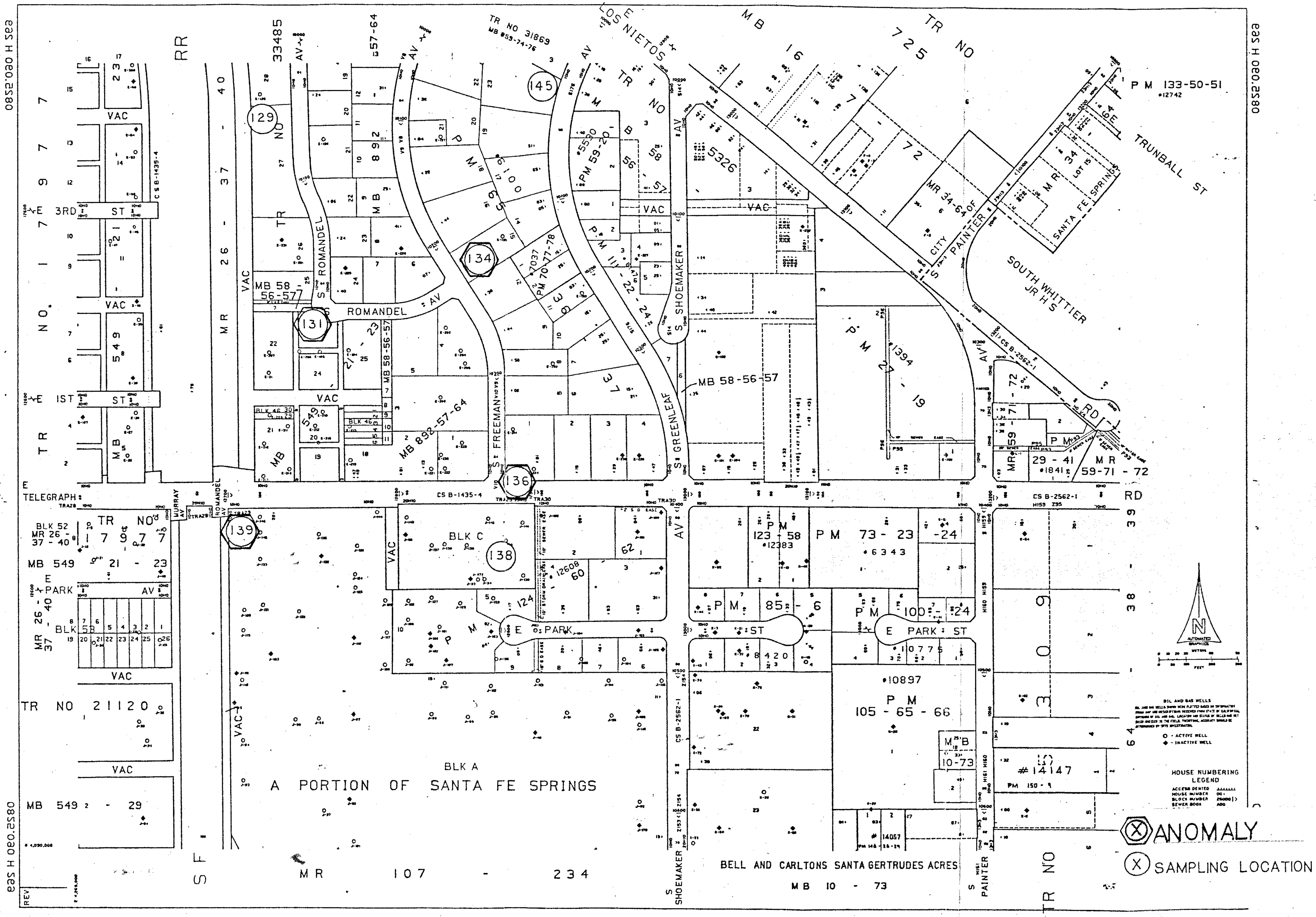
LAKELAND ELEM
MR 32 - 18
SEC 6 T3S R11W
E LAKELAND
E FLORENCE
S FULTON WELLS AV
KALNOR AV
ACHILLES ST
HERMES ST
TR 15118
CITY OF SANTA FE SPRINGS
CITY OF NORWALK
MB 352 - 34 - 36
KOONTZ AV
PM 34 - 11
PM 32-90
PM 47-59
PM 50 - 51
S NORWALK BV
CS B-317
PM 83-90
PM 77 - 90
MR 32 - 18 SEC 7 T3S R11W
PM 144 - 44 - 45
E CURTIS
S SPRINGDALE AV
BLANCHARD'S SUB
S VERNE ST
PM 52 - 37
PM 67 - 96
CS B-763-4
S FOREST PL
PM 97
S FOREST ST
DUNN CORNWELL
SMITH AND SUB
S WARD ST
PM 68 - 99
S BLOOMFIELD AV
CS B-1435-4
RANCHO SANTA GERTRUDES
MR 32 - 18
SEC 5 T3S R11W
PUBLIC WORKS YARD
E EMMENS WY
TR NO 21120
MB 549-29
ANOMALY
SAMPLING LOCATION
HOUSE NUMBERING LEGEND
592 H 087.0825


MR 32 - 18
SEC 31 T3S R II W
T 2 S
T 3 S
TR NO 2832
MB 28 - 100
PM 106 - 24
MR 32 - 18
SEC 6 T3S R II W
S GEARY AV
E TELEGRAPH
PM 108 -17-18
S NORWALK BV
TOWNSITE OF SANTA FE SPRINGS
E PARK
E GARDNER
WILLIS ST
E CLARK
RANCHO SANTA GERTRUDES
MR 32 - 18
SEC 6 T3S R II W
S SPRINGDALE
BLANCHARD'S SUB
S VERNE ST
S FOREST
DUNN AND SMITH
CORNWELL'S SUB
S WARD ST
S BLOOMFIELD
S SANTA FE SPRINGS
E 3 RD ST
TR NO 17977
MB 549 - 21-23
TR NO 21120
MB 549 - 29
VAC
LOT 25 BLK 45
HOUSE NUMBERING LEGEND
ANOMALY
SAMPLING LOCATION
0825.090 H 252


0825.093 H 265
REV
TR NO 1664
MB 22-10-11
E SMITH
PM 165-99-100
#14642
S GEARY
PM 48-41
#3022
PM 106-24
#10450
PM 57-48
#5178
PM 31-3
#2098
AV
S NORWALK
SP
RR
PM 92-94-95
#8144
PM 58-80
#5415
MR 32-18
SEC 31 T2S R11W
E PIKE
PM 58-66-68
MR 32-18
BV
PM 141 77-80
#14008
TR NO 2832
MB 28-100
PM 130
#12946
PACIFIC
PM 148-6-69
#14914
ST
PM 141-77-80
#14008
SEC 31 T2S R11W
MR 32-18
LD NO 47
MR 17-14
10' WATER EASE
10' STORM DRAIN EASE
E LOS NIETOS
SF
TR NO 5929
MB 104-18-19
VAC ALLEY
CF 157
PM 34-18
#427
PM 47-84
#2827
PM 48-11
#3393
MR
CS B-1435-4
JOHN ST
RD
PM 41-57
#2758
TR NO 27623
MB 706-55-57
DR
#15395
PM 160-92
CS8547
CS B-394-2
S BELL RANCH
VAC
TR 17977
MB 549-21-23
S SANTA FE SPRINGS
DR
M'CANN
E FARWELL
PL
RD
PM 147-10-11
#12408
RR
93
95
96
97
98
101
102
105
106
107
108
109
114
116
118
140
141
142
143
144
ANOMALY
SAMPLING LOCATION
HOUSE NUMBERING LEGEND
OIL AND GAS WELLS
○ - ACTIVE WELL
◆ - INACTIVE WELL
N
AUTOMATED GRAPHICS



A PORTION OF SANTA FE SPRINGS
TR NO 12120
MB 549 - 29
E EMMENS WY
PUBLIC WORKS
YARD
VAC
E FLORENCE
E LAKELAND
SEC 5 T3S R11W
32 - 18
M R
SEC 8 T3S R11W
SF RY
M R 107 - 234
BLK A
PM 130 - 92 - 93
#11852
PM 56 - 56
#5162
PM 50 - 26
#4523
S GREENSTONE AV
M R 32-18 L D
S LOCKPORT PL
PM 59 - 84
#13598
PM 1 - 4 140
#4524
S SHOEMAKER
TR NO 140 - 85 - 89
MB
E MEYER
CITY OF
S PAINTER AV
9891
RD
PM 121 - 66
#11218
PM 60 - 47
#4263
PM 129-48
#13104
SANTA FE SPRINGS
SAMPLING LOCATION
ANOMALY
AMELIA MAYBERRY PARK
LADANA CT
PM 121 - 3
#12538
BELL
#15023 CARLTONS
SANTA GERTRUDES AND ACRES
MB 10
PM 34 - 9
#1899
PM 48 - 34
#4207
PM 129-45
#13433
110 - 4
#10367
PM 146
88 - 89
#13860
73
RR
MB 10 - 73
PM 85 - 41
#8352
MB 64 - 38 - 39
TR NO
5309
AV
HOUSE NUMBERING LEGEND
OIL AND GAS WELLS
ACTIVE WELL
INACTIVE WELL
LOCATION: CITY OF SANTA FE SPRINGS
CITY OF SANTA FE SPRINGS
MAP NO 087 H 269
COUNTY ENGINEER
0825.087 H 269
REV


TR NO 17977
TR NO 21120
MR 26 - 37 - 40
A PORTION OF SANTA FE SPRINGS
BLK A
MR 107 - 234
S ROMANDEL AV
S FREEMAN AV
S GREENLEAF AV
S SHOEMAKER AV
S PAINTER AV
E TELEGRAPH RD
TRUNBALL ST
SOUTH WHITTIER JR H S
BELL AND CARLTONS SANTA GERTRUDES ACRES
MB 10 - 73
ANOMALY
SAMPLING LOCATION

Los Angeles City

LOS ANGELES CITY OIL FIELD

E 4,213,000 E 4,213,500 E 4,214,000 E 4,214,500 MATCH SHEET 108 E 4,215,000 E 4,215,5000 E 4,216,000 E 4,216,500

N 4,139,500 N 4,139,000 N 4,138,500 N 4,138,000 N 4,137,500 N 4,137,000

DODGER STADIUM

ELYSIAN PK AVE

LILAC WAY

STADIUM WAY

HV-47 @ 399.20

WHITEKNOLL DR

FIGUEROA TER

BEAUDRY AVE

CENTENNIAL ST

CORONEL ST

BERNARD ST

LOOKOUT DR

PASADENA FWY.

COTTAGE HOME ST.

DOYLE PL

TALE ST

N HILL ST

MATCH SHEET 118

MATCH SHEET 128

MATCH SHEET 120

E 4,213,000 E 4,213,500 E 4,214,000 E 4,214,500 MATCH SHEET 128 E 4,215,000 E 4,215,500 E 4,216,000 E 4,216,500

TOPOGRAPHIC MAP OF

NORTHEAST LOS ANGELES AREA

BOUNDED BY BROOKLYN AVENUE HOLLYWOOD FREEWAY, BEACHWOOD DRIVE, GRIFFITH PARK, AND NORTHEAST CITY BOUNDARY

THIS MAP IS AN ENLARGEMENT OF A 1" = 200' COMPILATION

CITY OF LOS ANGELES
LYALL A. PARDEE CITY ENGINEER
MAY 1969 SCALE 1" = 100'

CAPITAL IMPROVEMENT PROGRAM

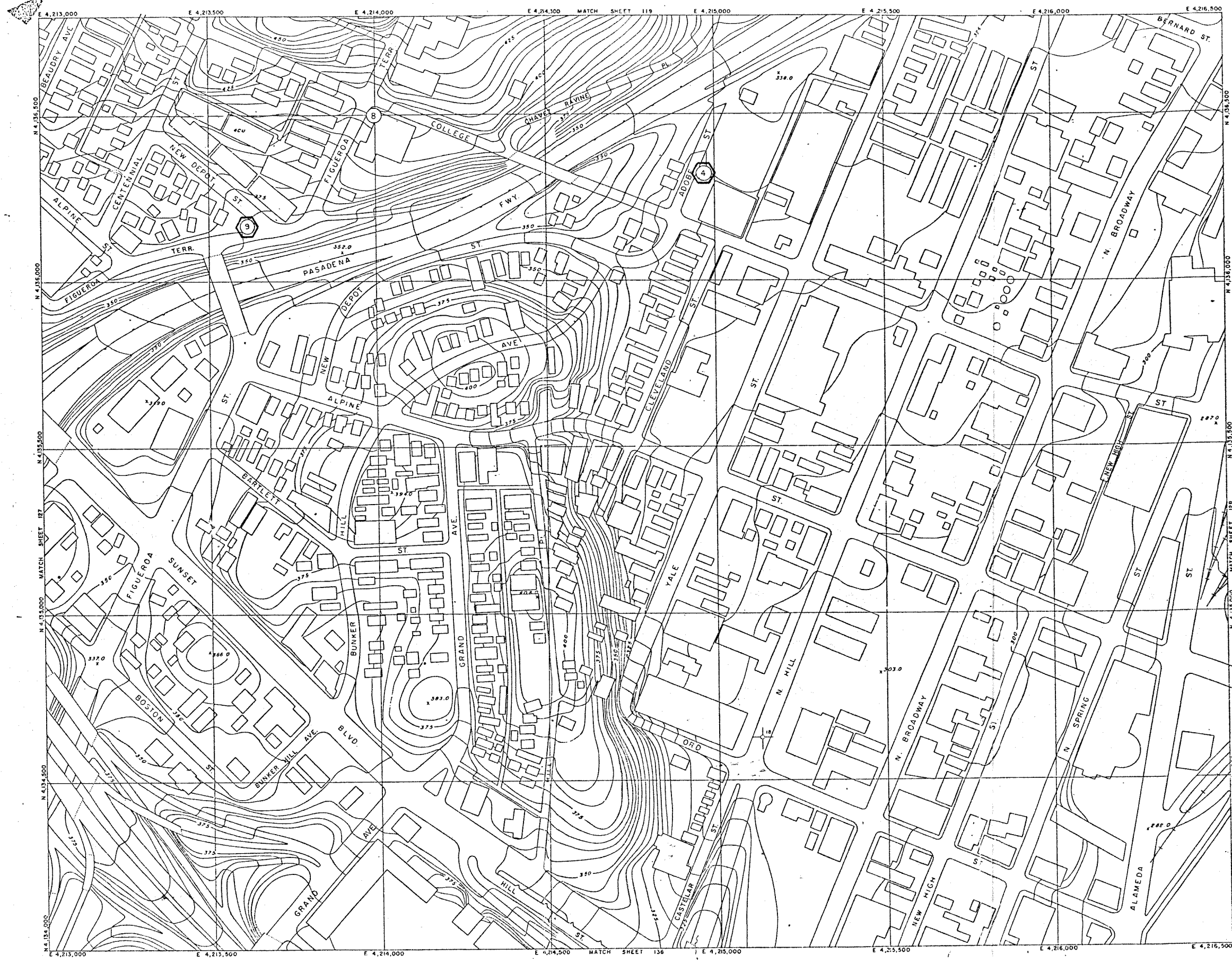
CONTOUR INTERVAL 5 FEET
U.S. COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929
500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

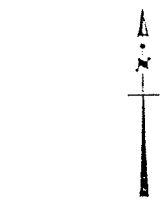
FLOWN AND COMPILED USING PHOTOGRAMMETRIC METHODS BY
AMERICAN AERIAL SURVEYS, INC.
844 SOUTH STEWART DRIVE — COVINA, CALIFORNIA
DATE OF PHOTOGRAPHY 10-12-1968
1000' PHOTOS SHEET 119

M-660

(X) SAMPLING LOCATION

(X) ANOMALOUS HIGH





100' 50' 0 100' 200'

REF: 135 B 213
132 B 213
44 NE

ANOMALY

(X) SAMPLING LOCATION

TOPOGRAPHIC MAP OF

NORTHEAST LOS ANGELES

BOUNDED BY BROOKLYN AVENUE HOLL
FREEWAY, BEACHWOOD DRIVE, GRIFFT
AND NORTHEAST CITY BOUNDA

THIS MAP IS AN REDUCTION / ENLARGEMENT OF 1"=200' CO

CITY OF LOS ANGELES
LYALL A. PARDEE CITY ENGIN
MAY 1969 SCALE 1"=

CAPITAL IMPROVEMENT PROGR

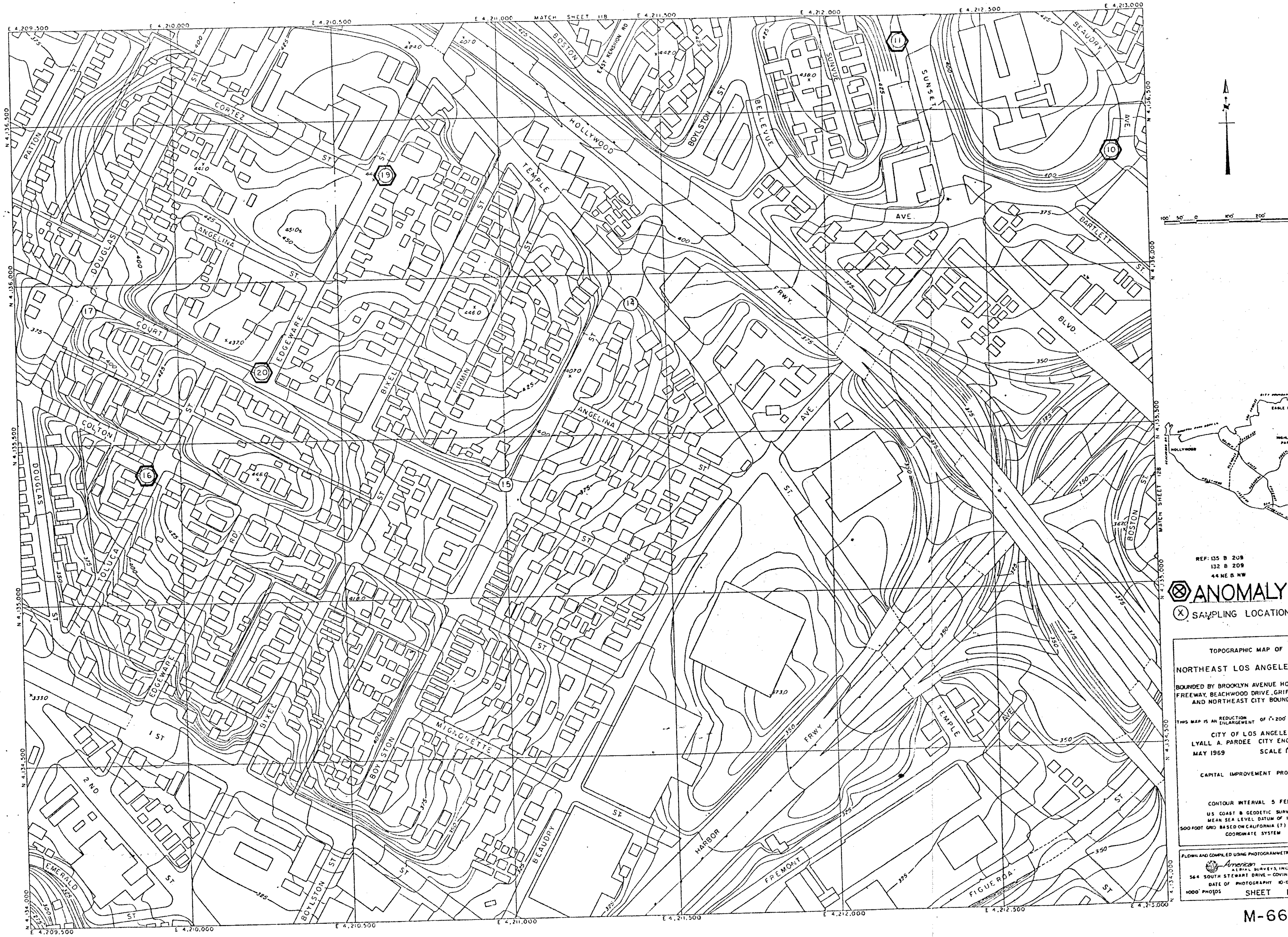
CONTOUR INTERVAL 5 FEET
U.S. COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929
500 FOOT GRID BASED ON CALIFORNIA (7) REC
COORDINATE SYSTEM

FLOWN AND COMPILED USING PHOTOGRAMMETRIC M

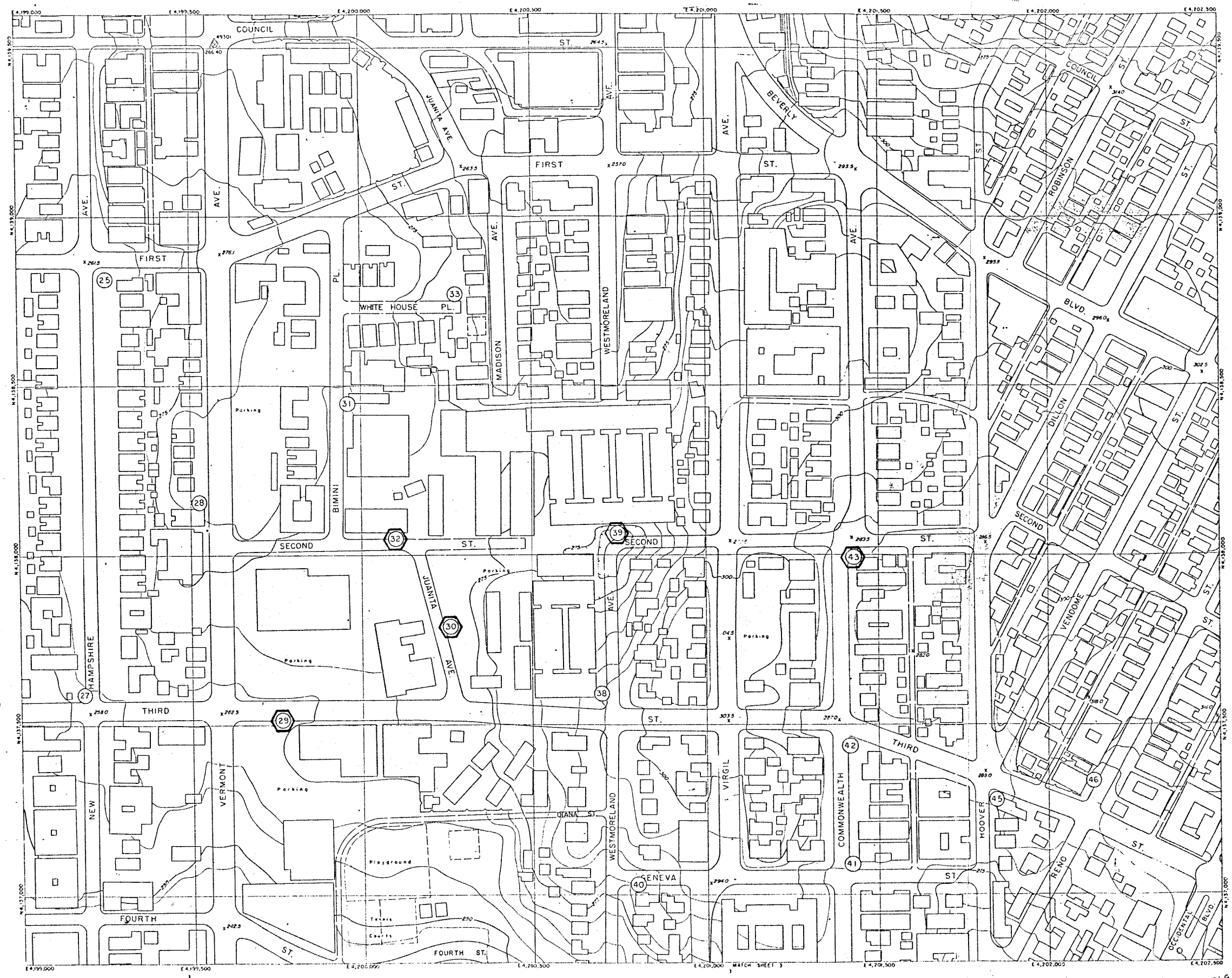
Aero-American AERIAL SURVEYS, INC.
564 SOUTH STEWART DRIVE — COVINA, C
DATE OF PHOTOGRAPHY 10-12-19
1000' PHOTOS SHEET 128

REVISED 6-82

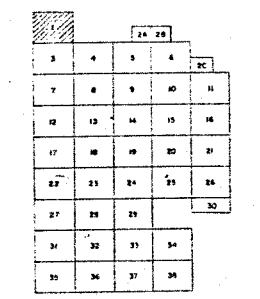
M-660



MATCH SHEET 118
MATCH SHEET 128
PATTON ST
DOUGLAS ST
CORTEZ ST
ANGELINA ST
COURT
EDGEWARE ST
BIXEL ST
FIRMIN ST
COLTON ST
TOLUCA
EDGEWARE RD
BOYLSTON ST
MIGNONETTE
I ST
2 ND
EMERALD ST
BEAUDRY
HARBOR FRWY
FREMONT
FIGUEROA
TEMPLE ST
HOLLYWOOD FRWY
BOSTON ST
EAST KENSINGTON RD
BELLEVUE AVE
SUNVUE
SUNSET BLVD
BARTLETT ST
REF: 135 B 209
132 B 209
44 NE B NW
ANOMALY
SAMPLING LOCATION
TOPOGRAPHIC MAP OF
NORTHEAST LOS ANGELES
BOUNDED BY BROOKLYN AVENUE HOLL
FREEWAY, BEACHWOOD DRIVE, GRIFFT
AND NORTHEAST CITY BOUNDAR
THIS MAP IS AN REDUCTION ENLARGEMENT OF 1"=200' CO
CITY OF LOS ANGELES
LYALL A. PARDEE CITY ENGIN
MAY 1969
SCALE 1"=
CAPITAL IMPROVEMENT PROGR
CONTOUR INTERVAL 5 FEET
US COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929
500 FOOT GRID BASED ON CALIFORNIA (7) REC
COORDINATE SYSTEM
FLOWN AND COMPILED USING PHOTOGRAMMETRIC
American Aerial Surveys, Inc.
564 SOUTH STEWART DRIVE - COVINA, C
DATE OF PHOTOGRAPHY 10-12-1
1000' PHOTOS
SHEET 12
M-660



SHEET INDEX



ANOMALY

SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES ARE

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

COMPILED BY:

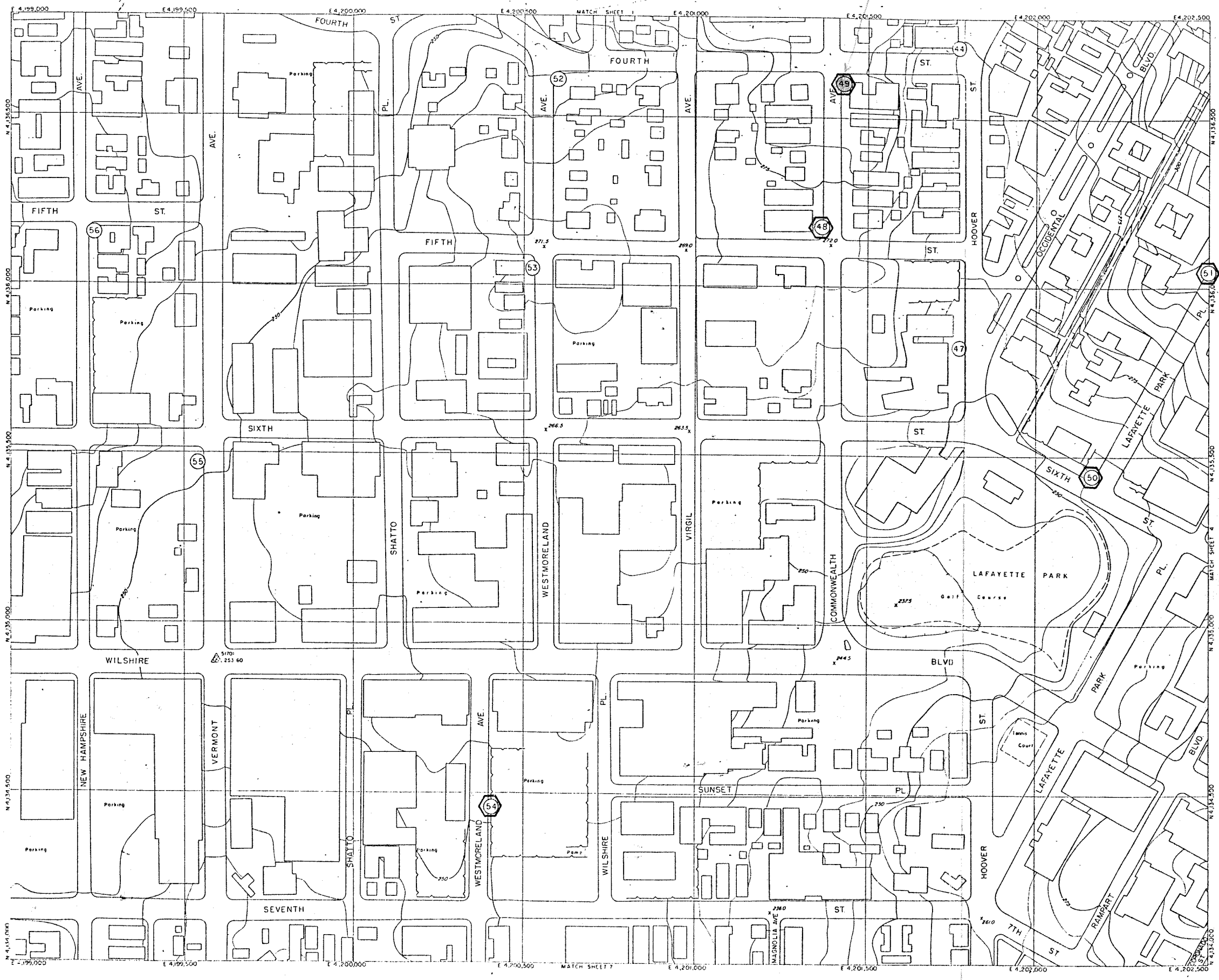
METREX

USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED SEPTEMBER 22,

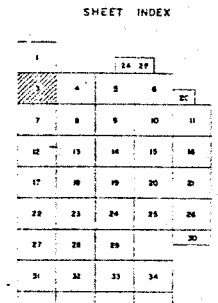
SHEET 1 OF

M-769

M-769



SHEET INDEX



ANOMALY

SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES AREA

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

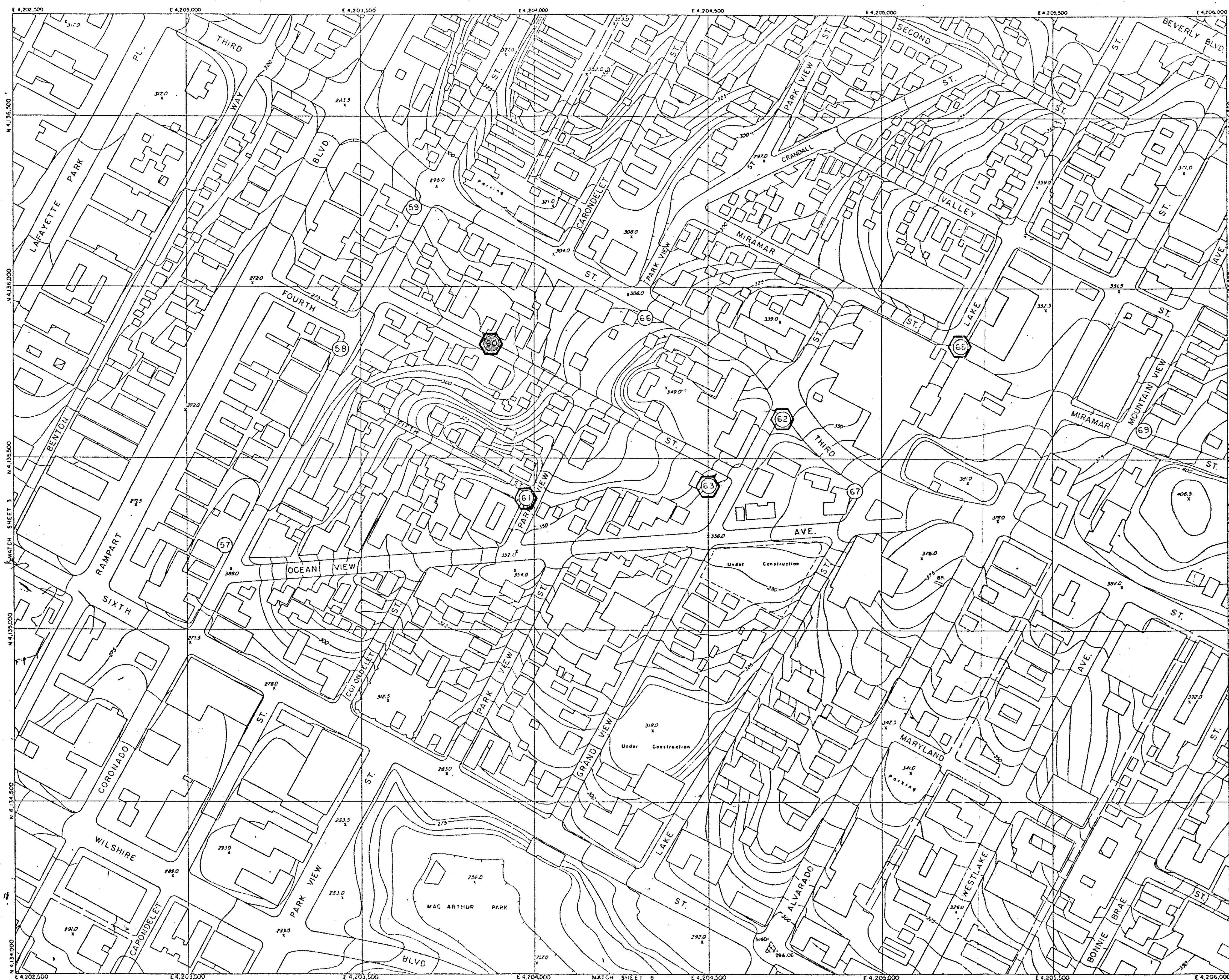
COMPILED BY METREX LOS ANGELES, CALIF.

USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHS DATED SEPTEMBER 22, 1975

SHEET 3 OF 42

M-769

#60: 730% LEL or ... Nearest Recorded well ≈150' away



ANOMALY

SAMPLING LOCATION

TOPOGRAPHIC MAP OF
CENTRAL LOS ANGELES AREA
FOR THE
LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

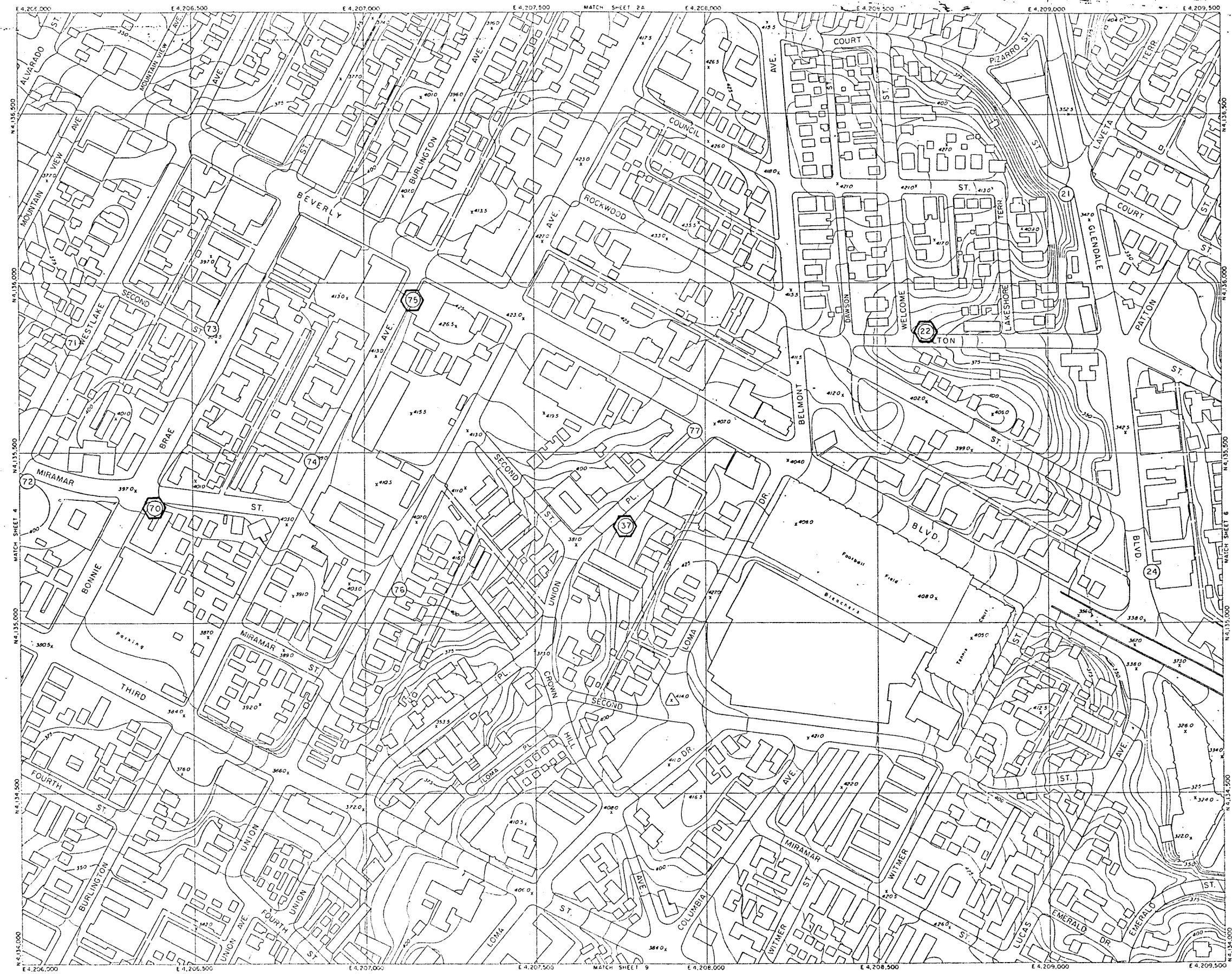
U S COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

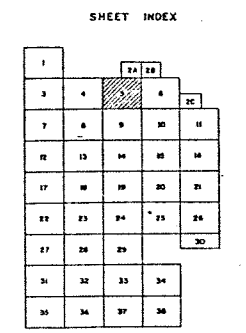
COMPILED BY: METREX USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED SEPTEMBER 22, 1975

SHEET 4 OF 42

M-769



SHEET INDEX



ANOMALY

(X) SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES AREA

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

COMPILED BY:
MEYREX
LOS ANGELES, CALIF.
USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED SEPTEMBER 22, 1975

SHEET 5 OF 42

M-769

M-660

TOPOGRAPHIC MAP OF

NORTHEAST LOS ANGELES AREA

BOUNDED BY BROOKLYN AVENUE, HOLLYWOOD FREEWAY, BEACHWOOD DRIVE, GRIFFITH PARK, AND NORTHEAST CITY BOUNDARY

THIS MAP IS AN ENLARGEMENT OF 1"=200' COMPILATION

CITY OF LOS ANGELES
LYALL A. PARKER CITY ENGINEER

MAY 1969 SCALE 1"= 100'

CAPITAL IMPROVEMENT PROGRAM

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929

5000 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

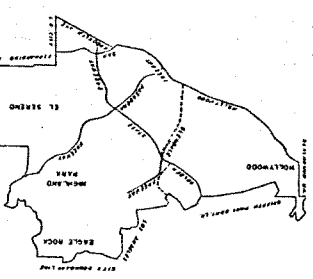
FLOWN AND COMPILED USING PHOTOGRAMMETRIC METHODS BY

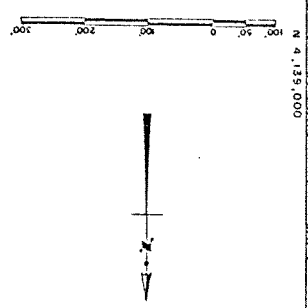
AERIAL SURVEYS, INC.
344 SOUTH STEWART DRIVE – GOWINA, CALIFORNIA

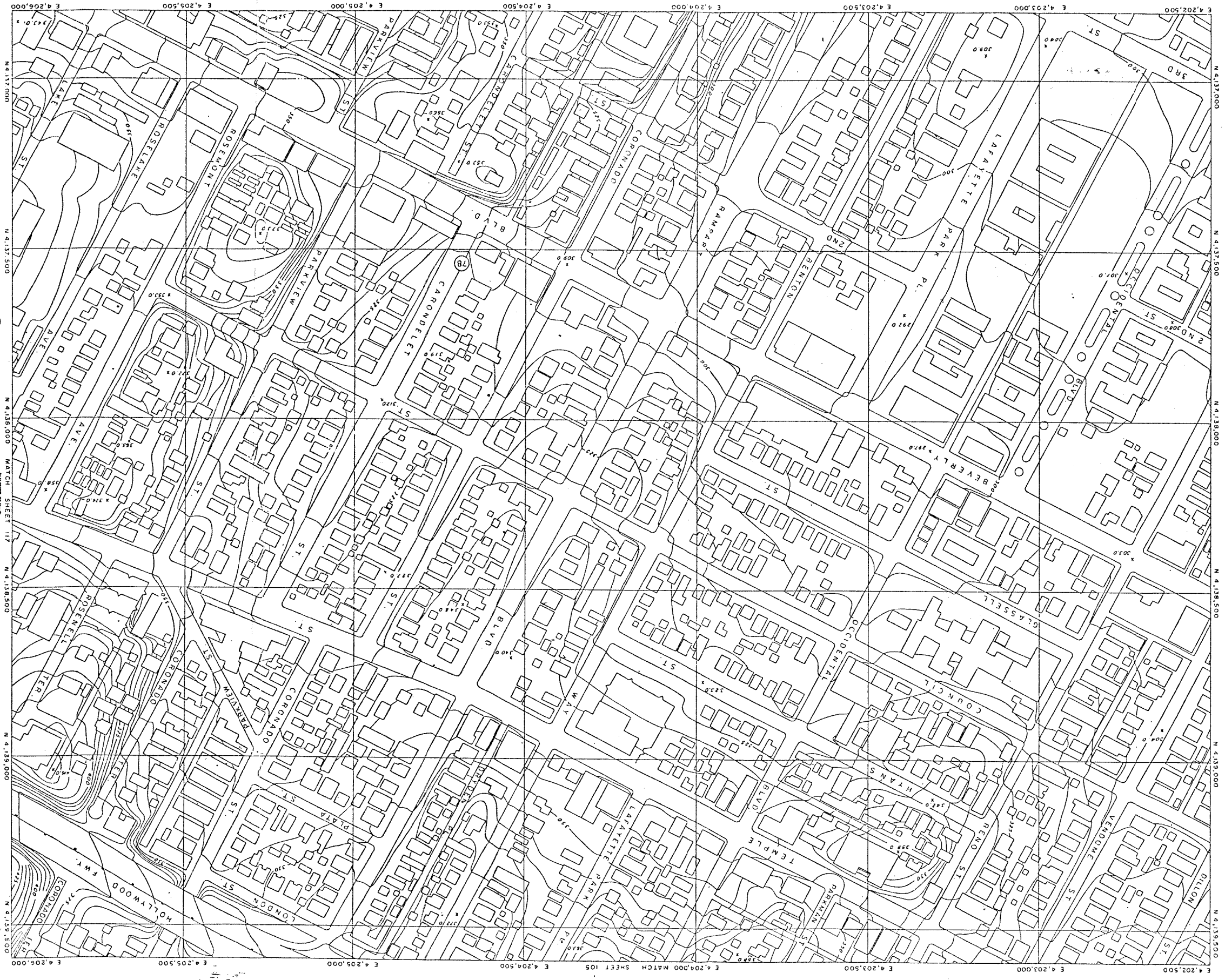
DATE OF PHOTOGRAPHY 10-12-1969

1000' PHOTOS SHEET 116

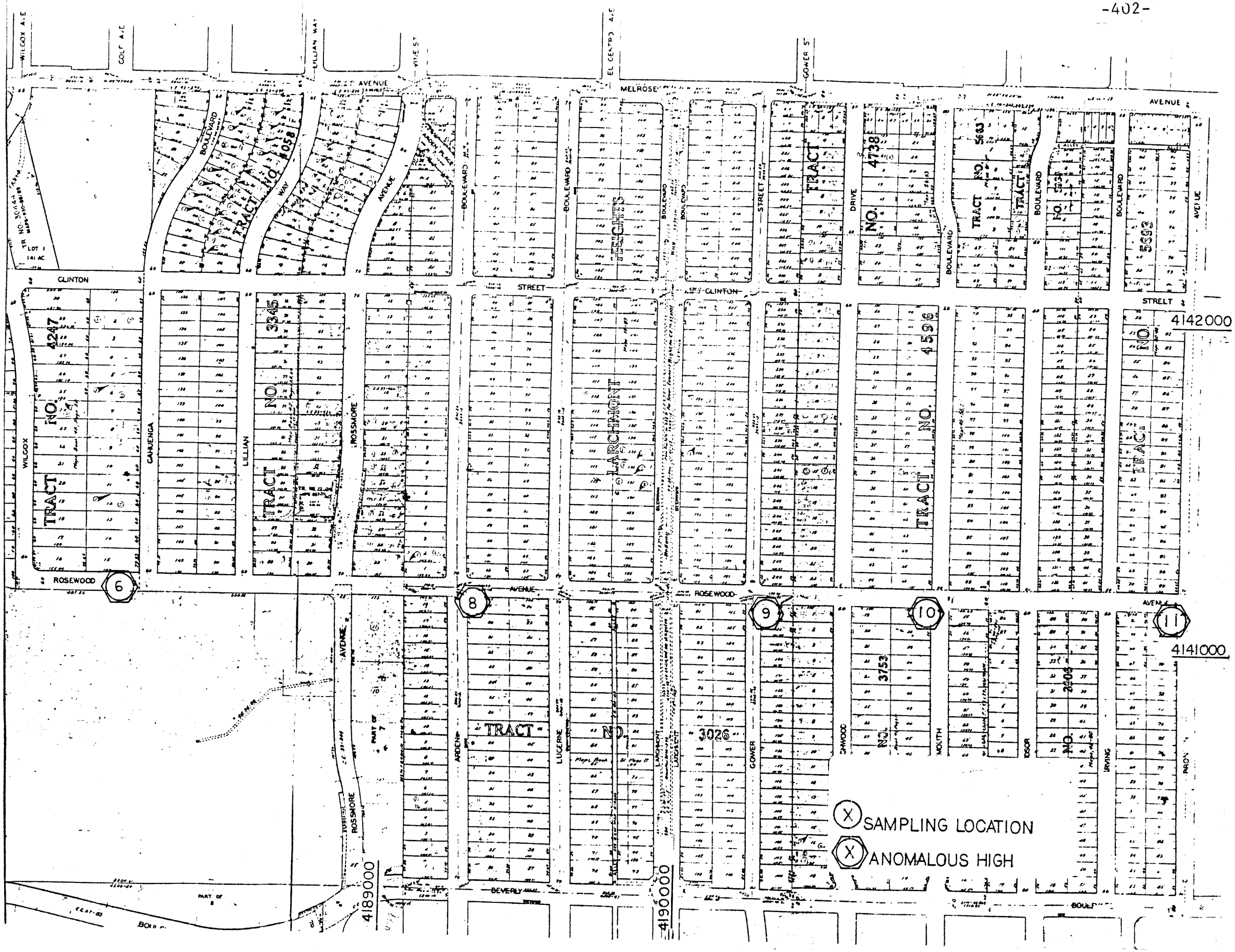
SAMPLING LOCATION





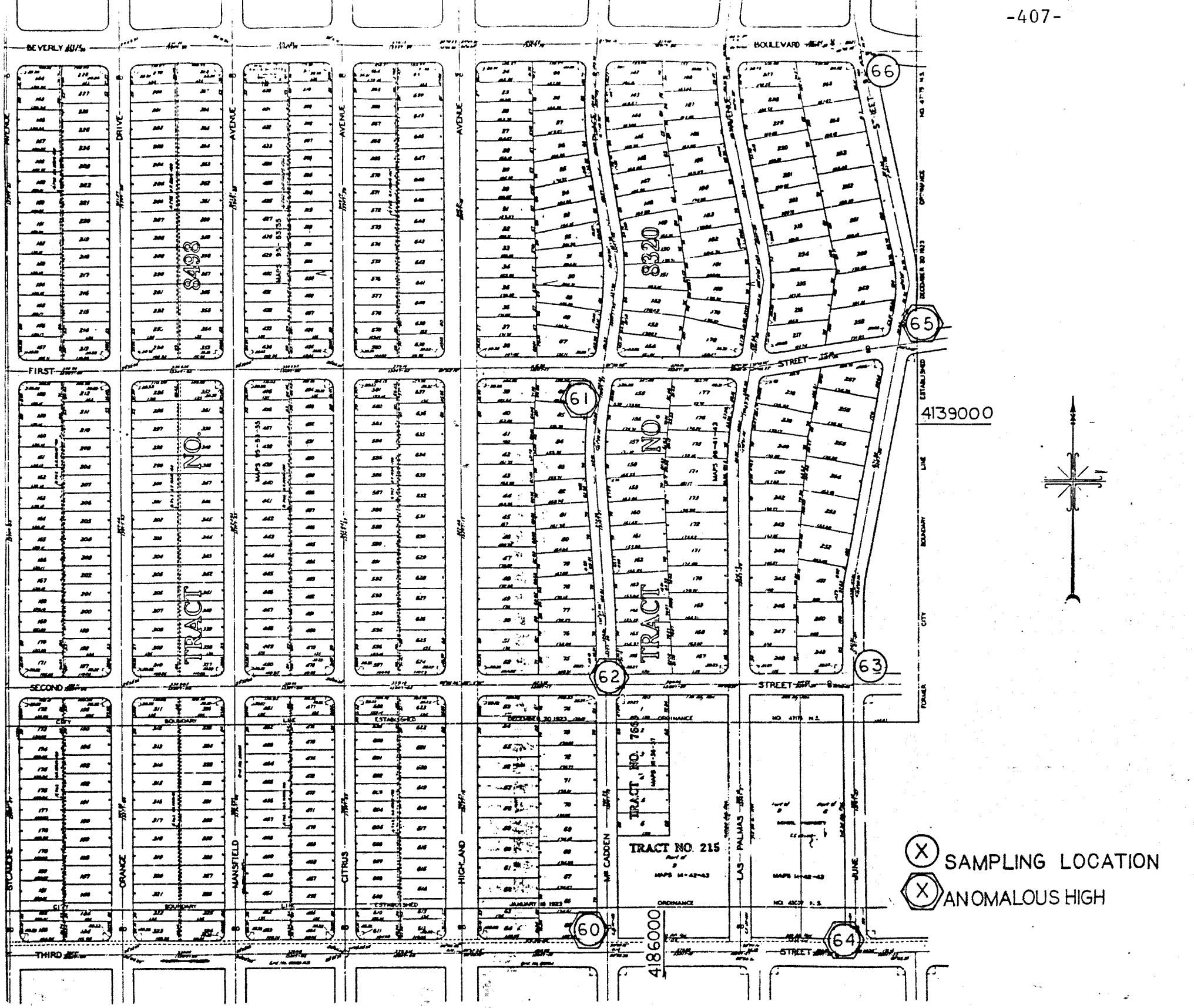


SALT LAKE OIL FIELD


WILCOX A/E
GOLF A/E
LILLIAN WAY
VINE ST
EL CENTRO A/E
GOWER ST
AVENUE
MELROSE
BOULEVARD
STREET
DRIVE
TRACT NO. 4058
TRACT NO. 4247
TRACT NO. 3345
TRACT NO. 4596
TRACT NO. 5693
TRACT NO. 4738
TRACT NO. 3026
TRACT NO. 3753
TRACT NO. 3506
LARCHMONT
TRACT NO.
TR NO. 30044
LOT 1
14.1 AC.
GLINTON
ROSEWOOD
BEVERLY
WILCOX
CAHUENGA
LILLIAN
ROSSMORE
ARDEN
LUCERNE
LARCHMONT
GOWER
SYCAMORE
MOUTH
EDSOR
IRVING
PART OF
4247
3345
4596
5693
4738
3026
3753
3506
6
8
9
10
11
4142000
4141000
4190000
4189000
X SAMPLING LOCATION
X ANOMALOUS HIGH


SAMPLING LOCATION
ANOMALOUS HIGH
BRONSON
NORTON
BEVERLY
ELMWOOD
CLINTON
AVENUE
TRACT NO. 19373
MAPS 487-13
PEACE
ROSEWOOD
ROSEWOOD AVENUE
MAPLEWOOD
MAPS 22-84
TRACT NO. 2526
TRACT NO. 4238
MAPS 29-90
4193000
OAKWOOD
ELMWOOD
SECTION
TRACT NO. 638
MAPS 16-75
GRAMERCY
MAPS 16-93
TRACT NO. 446
ST. ANDREWS
TRACT NO. 5878
WESTBORO
VENDOME
MANHATTAN
4194000
BOULEVARD
MAPS 10-100
MAPS 13-52
AVENUE
STREET
WESTERN
OAKWOOD
MAPLEWOOD
CLINTON
BEVERLY
-403-
4141000
12
13
14


BEVERLY WAY
15
AVENUE
PLACE
COUNCIL STREET
FIRST STREET
SECOND STREET
THIRD STREET
BOULEVARD
WILTON
RIDGEWOOD
GRAMERCY
ST ANDREW'S
MANHATTAN
WESTERN
OXFORD
VAN NESS
4139000
4194000
X SAMPLING LOCATION


BEVERLY BOULEVARD
FIRST STREET
SECOND STREET
THIRD STREET
BOULEVARD
STREET
AVENUE
DRIVE
ORANGE
MANSFIELD
CITRUS
HIGHLAND
LAS PALMAS
JUNE
TRACT NO. 8433
TRACT NO. 8320
TRACT NO. 215
TRACT NO. 7668
61
62
63
64
65
66
60
4139000
4186000
SAMPLING LOCATION
ANOMALOUS HIGH

S OAKWOOD

S BEVERLY

AVE S

BLVD

ST S

ST

138 B 177

138 B 185

TR 5177

TR 4924

TR 34333-C

TR 7372

TR 5207

TR 6619

TR 8498

4139000

4163000

42 43 44 45 47 48 49 50 52 53 54 55 58 59

S BAYOMAR

S VISTA

S MARTEL

S FULLER

S POINSETTIA

S ALTA VISTA

S FORMOSA

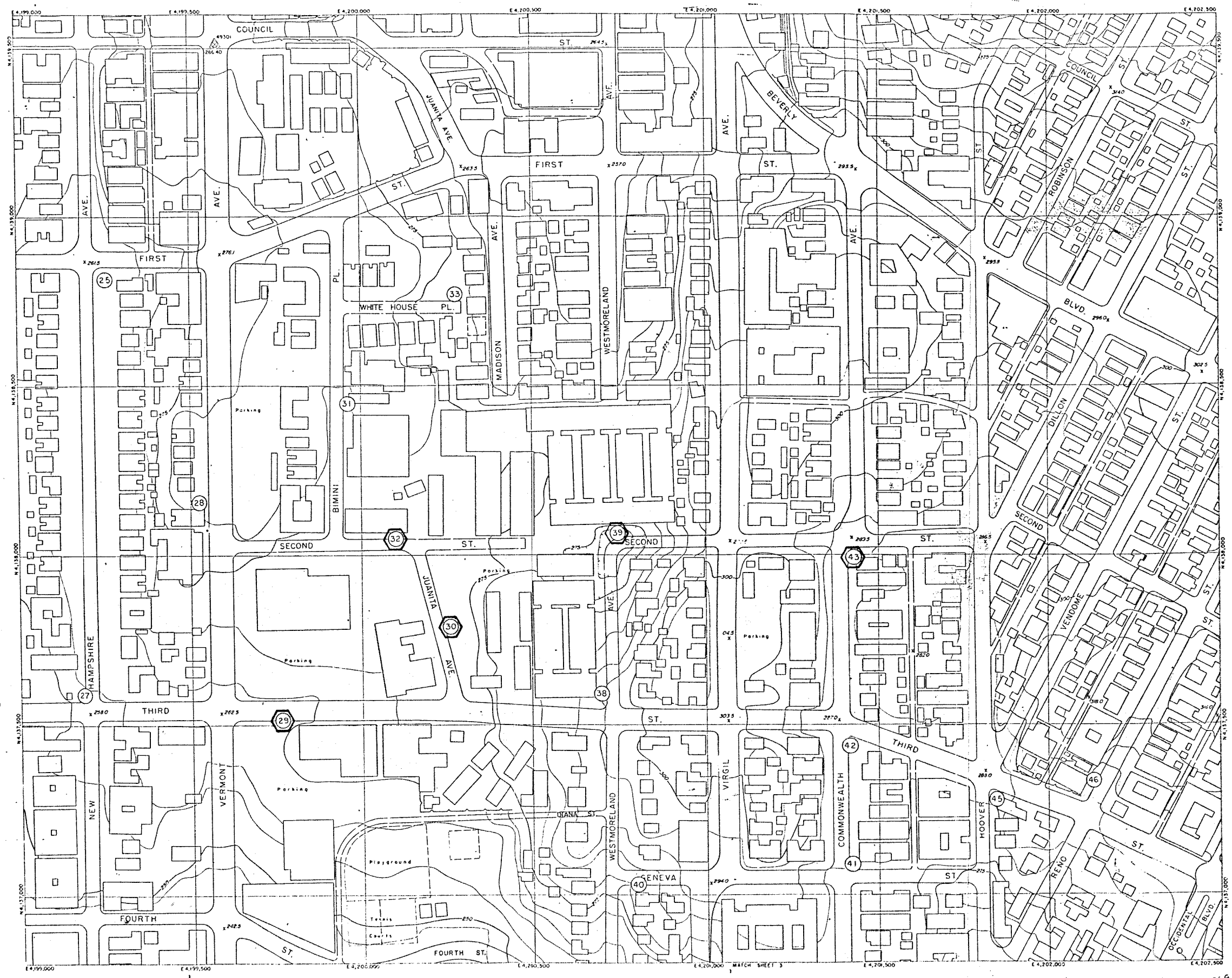
S DETROIT

S MANSFIELD

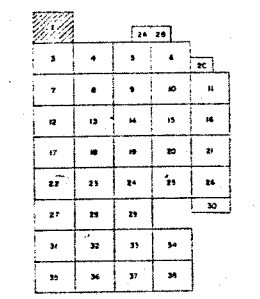
S CITRUS

(X) SAMPLING LOCATION

(X) ANOMALOUS HIGH



SHEET INDEX



ANOMALY

SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES ARE

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

COMPILED BY:

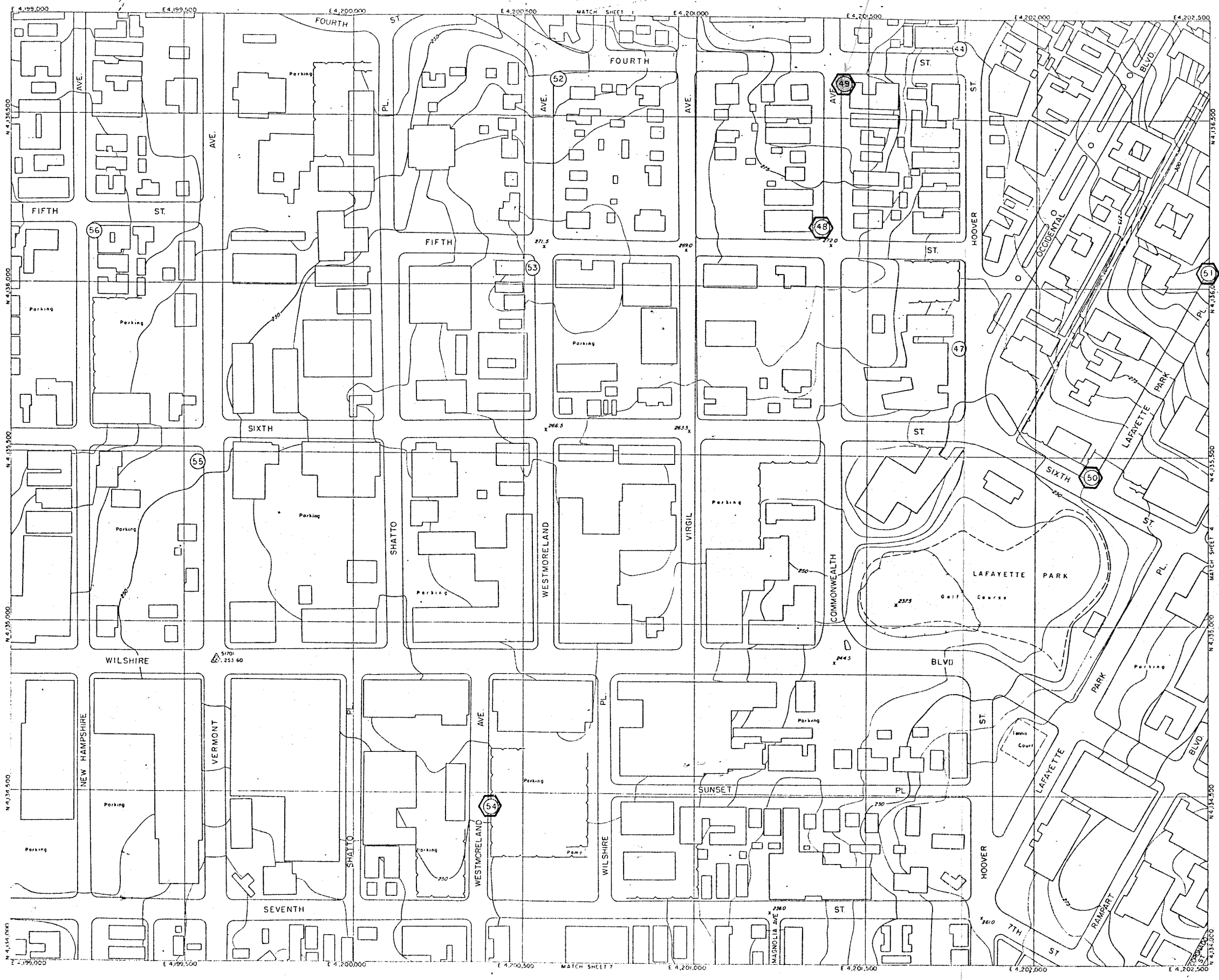
METREX

USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED SEPTEMBER 22,

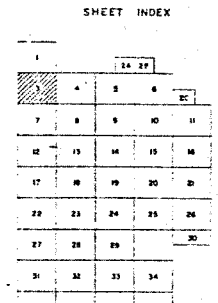
SHEET 1 OF

M-769

M-769



SHEET INDEX



ANOMALY

SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES AREA

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

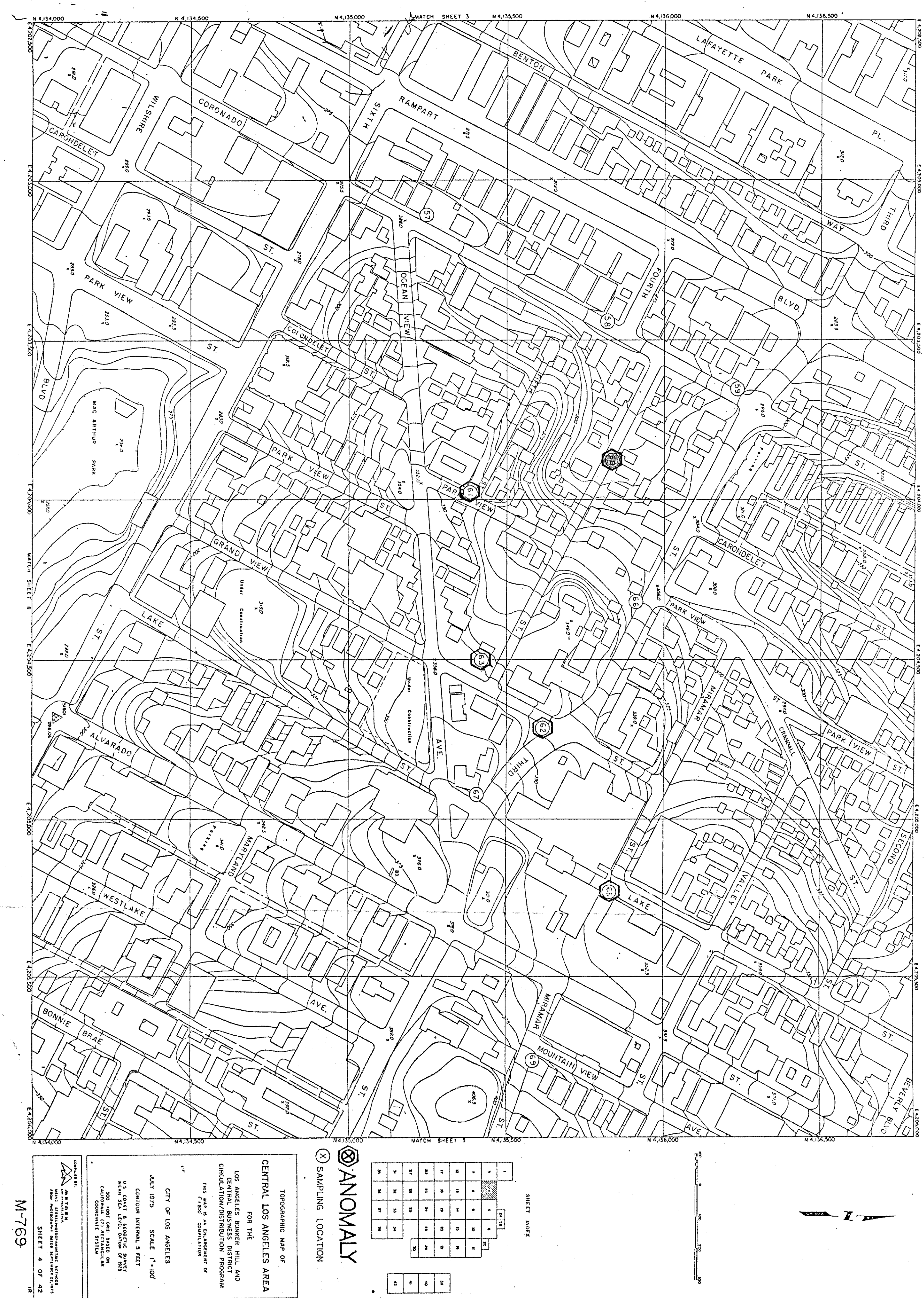
500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

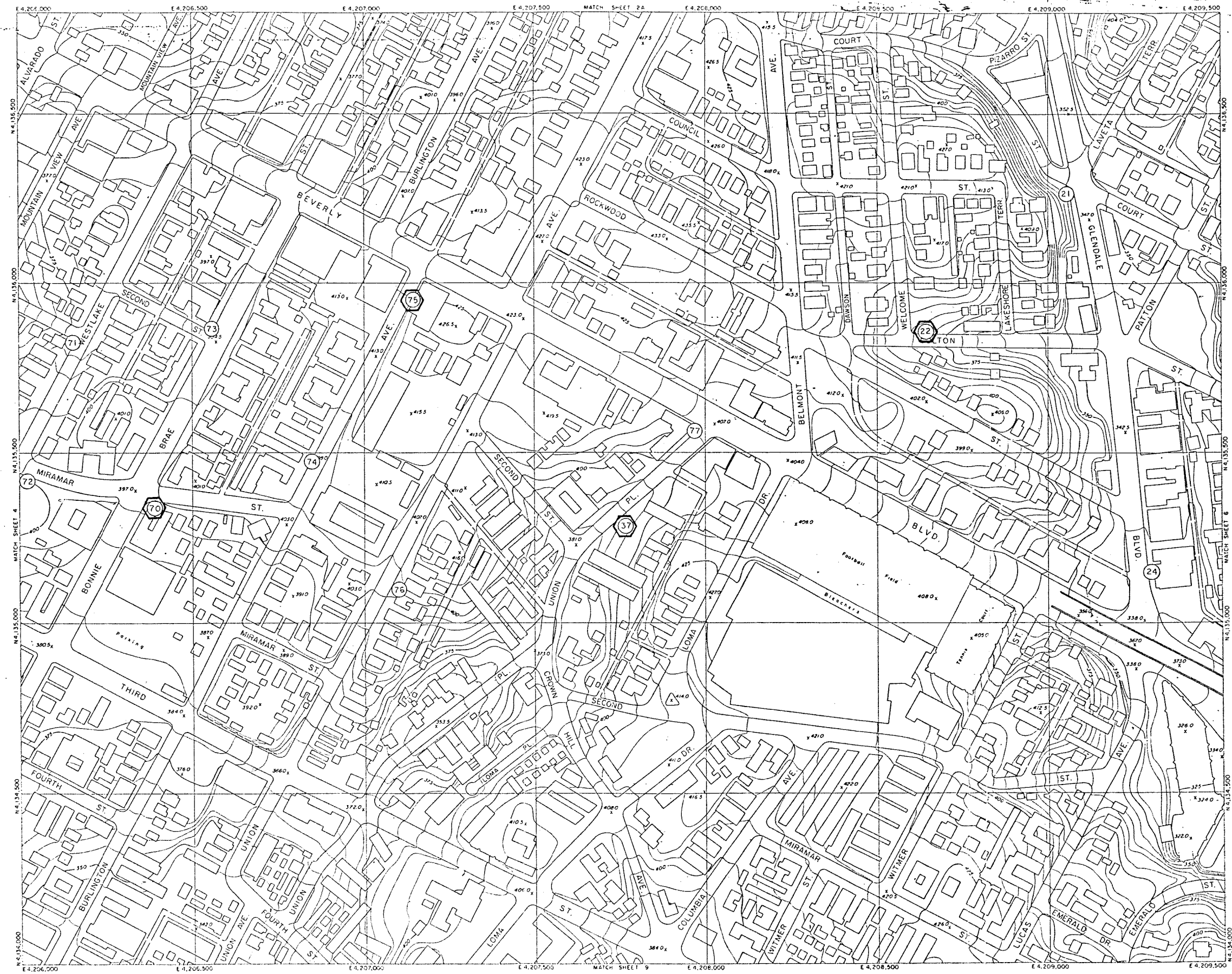
COMPILED BY METREX LOS ANGELES, CALIF.

USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHS DATED SEPTEMBER 22, 1975

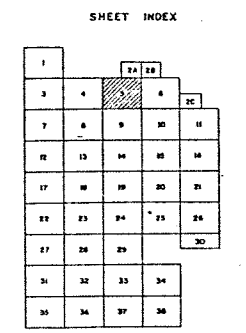
SHEET 3 OF 42

M-769


TOPOGRAPHIC MAP OF
CENTRAL LOS ANGELES AREA
FOR THE
LOS ANGELES BUNKER HILL AND
CENTRAL BUSINESS DISTRICT
CIRCULATION/DISTRIBUTION PROGRAM
THIS MAP IS AN ENLARGEMENT OF
1" = 200' COMPILATION
CITY OF LOS ANGELES
JULY 1975 SCALE 1" = 100'
CONTOUR INTERVAL 5 FEET
U S COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929
500 FOOT GRID BASED ON
CALIFORNIA (7) RECTANGULAR
COORDINATE SYSTEM
SHEET 4 OF 42
M-769
ANOMALY
SAMPLING LOCATION
SHEET INDEX
MATCH SHEET 3
MATCH SHEET 5
MATCH SHEET 8
WILSHIRE
CORONADO
CARONDELET
SIXTH
RAMPART
BENTON
LAFAYETTE PARK PL.
THIRD
FOURTH
BLVD.
PARK VIEW ST.
MAC ARTHUR PARK
OCEAN VIEW
GRAND VIEW
LAKE
ALVARADO
MARYLAND
WESTLAKE
BONNIE BRAE
AVE.
MIRAMAR
MOUNTAIN VIEW
CRANDALL
SECOND
VALLEY
BEVERLY BLVD.
57
58
59
60
61
62
63
66
67
68
69
Nearest Recorded well



SHEET INDEX



ANOMALY

(X) SAMPLING LOCATION

TOPOGRAPHIC MAP OF

CENTRAL LOS ANGELES AREA

FOR THE

LOS ANGELES BUNKER HILL AND CENTRAL BUSINESS DISTRICT CIRCULATION/DISTRIBUTION PROGRAM

THIS MAP IS AN ENLARGEMENT OF 1" = 200' COMPILATION

CITY OF LOS ANGELES

JULY 1975 SCALE 1" = 100'

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY MEAN SEA LEVEL DATUM OF 1929

500 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

COMPILED BY:
MEYREX
LOS ANGELES, CALIF.
USING STEREOPHOTOGRAMMETRIC METHODS FROM PHOTOGRAPHY DATED SEPTEMBER 22, 1975

SHEET 5 OF 42

M-769

M-660

TOPOGRAPHIC MAP OF

NORTHEAST LOS ANGELES AREA

BOUNDED BY BROOKLYN AVENUE, HOLLYWOOD FREEWAY, BEACHWOOD DRIVE, GRIFFITH PARK, AND NORTHEAST CITY BOUNDARY

THIS MAP IS AN ENLARGEMENT OF 1"=200' COMPILATION

CITY OF LOS ANGELES
LYALL A. PARKER CITY ENGINEER

MAY 1969 SCALE 1"= 100'

CAPITAL IMPROVEMENT PROGRAM

CONTOUR INTERVAL 5 FEET

U.S. COAST & GEODETIC SURVEY
MEAN SEA LEVEL DATUM OF 1929

5000 FOOT GRID BASED ON CALIFORNIA (7) RECTANGULAR COORDINATE SYSTEM

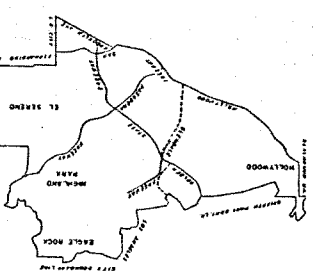
FLOWN AND COMPILED USING PHOTOGRAMMETRIC METHODS BY

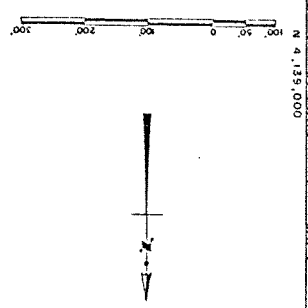
AERIAL SURVEYS, INC.
344 SOUTH STEWART DRIVE – GOWINA, CALIFORNIA

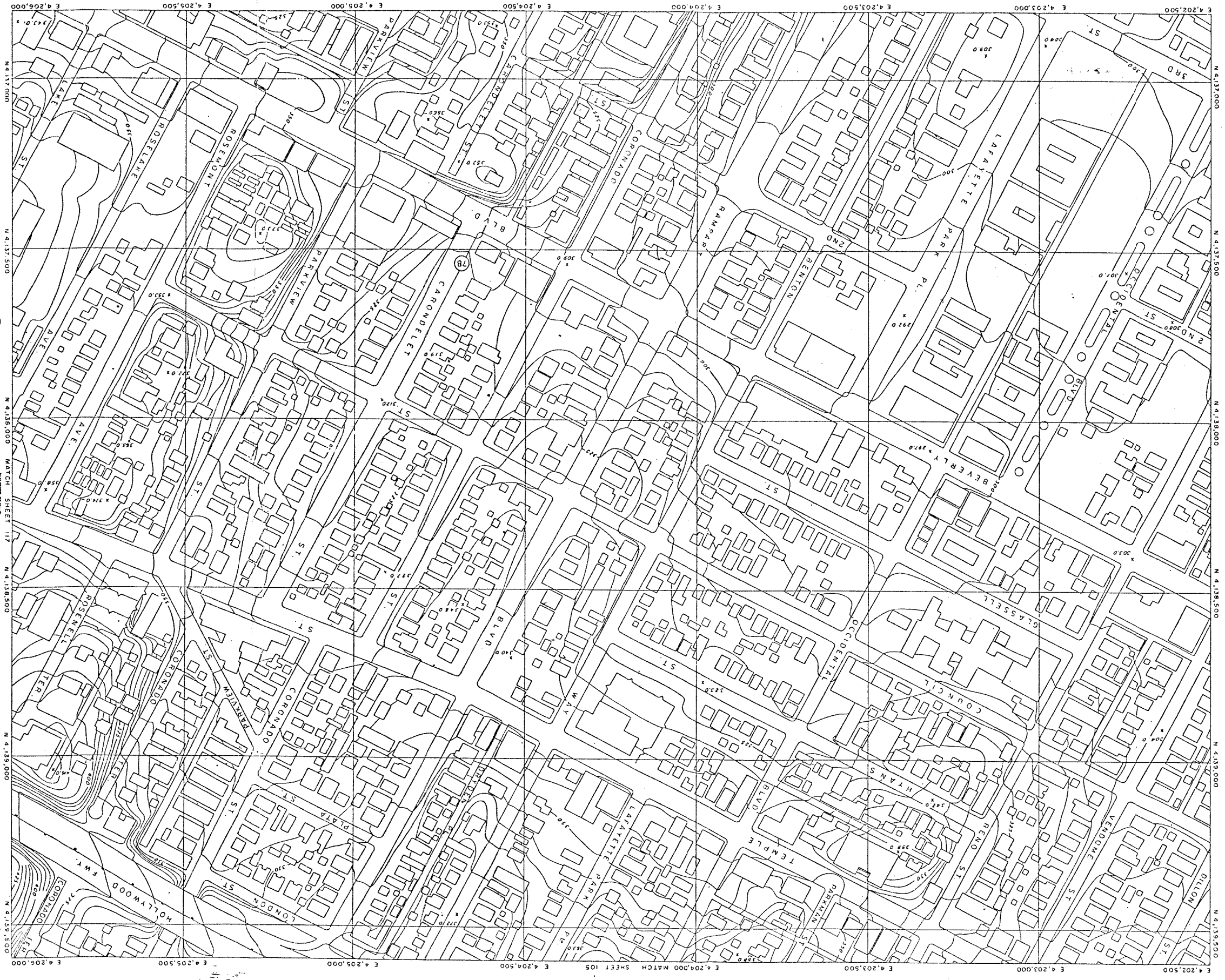
DATE OF PHOTOGRAPHY 10-12-1969

1000' PHOTOS SHEET 116

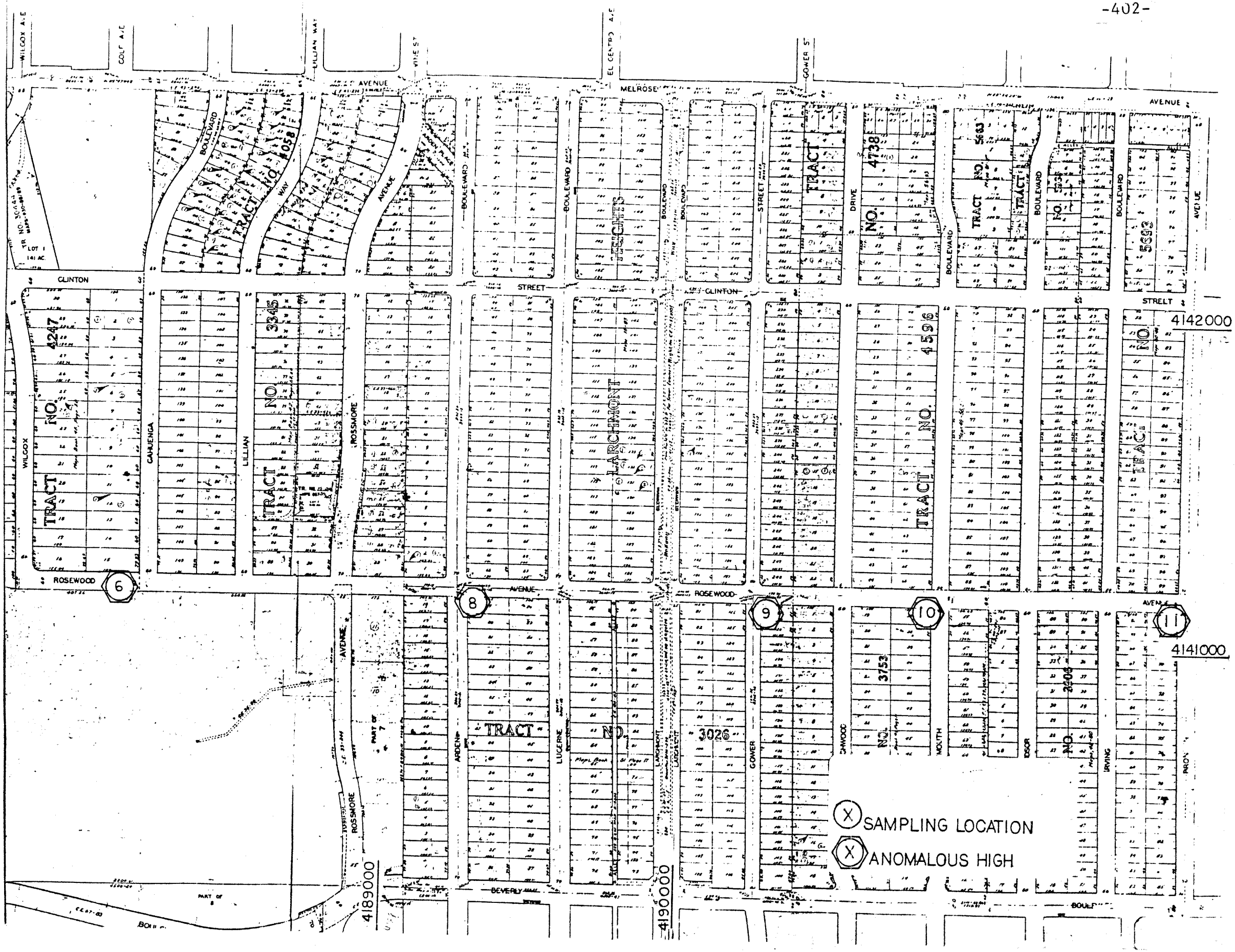
SAMPLING LOCATION





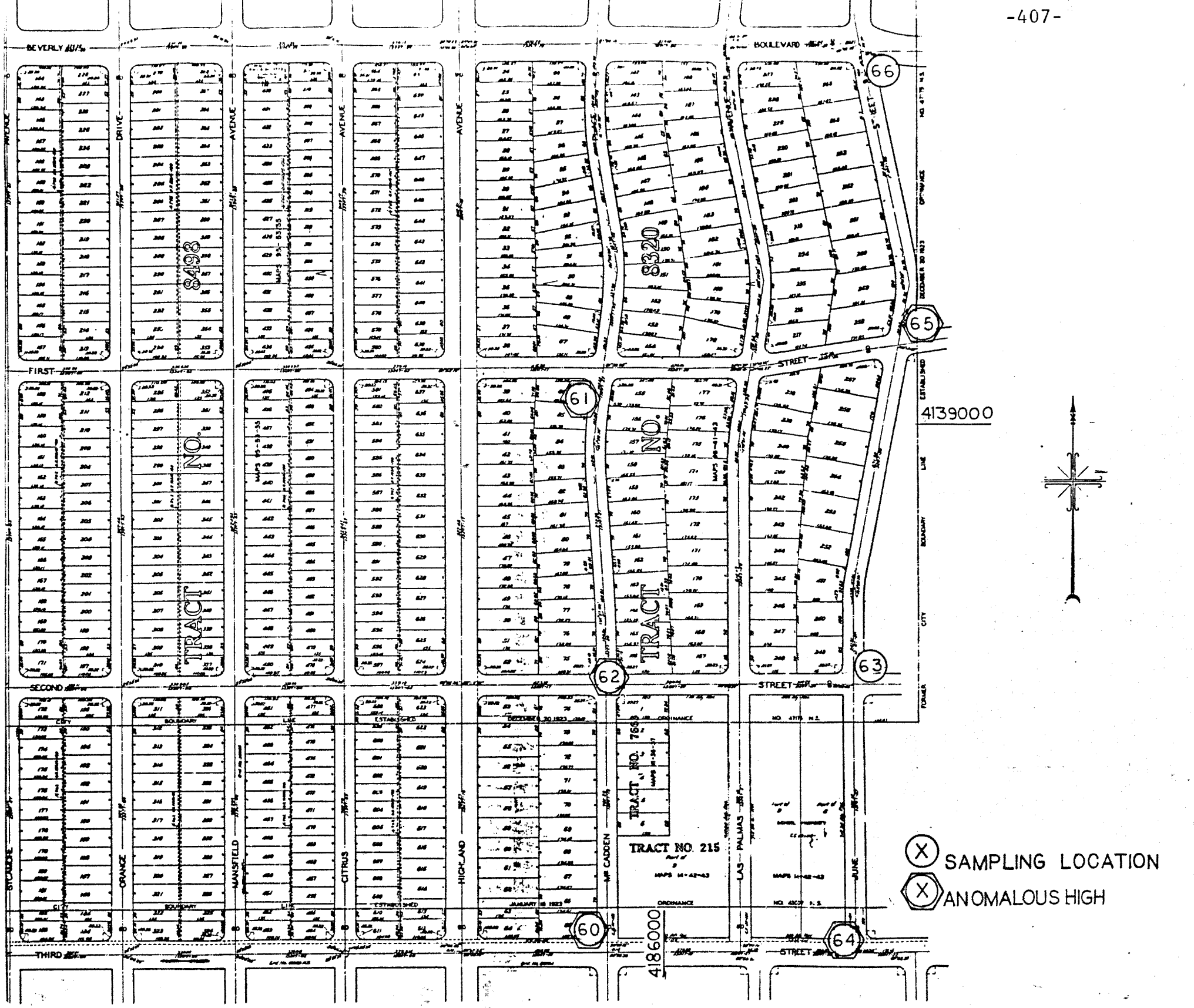


SALT LAKE OIL FIELD


WILCOX A/E
GOLF A/E
LILLIAN WAY
VINE ST
EL CENTRO A/E
GOWER ST
AVENUE
MELROSE
BOULEVARD
STREET
DRIVE
TRACT NO. 4058
TRACT NO. 4247
TRACT NO. 3345
TRACT NO. 4596
TRACT NO. 5693
TRACT NO. 4738
TRACT NO. 3026
TRACT NO. 3753
TRACT NO. 3506
LARCHMONT
TRACT NO.
TR NO. 30044
LOT 1
14.1 AC.
GLINTON
ROSEWOOD
BEVERLY
WILCOX
CAHUENGA
LILLIAN
ROSSMORE
ARDEN
LUCERNE
LARCHMONT
GOWER
SYCAMORE
MOUTH
EDSOR
IRVING
PART OF
4247
3345
4596
5693
4738
3026
3753
3506
6
8
9
10
11
4142000
4141000
4190000
4189000
X SAMPLING LOCATION
X ANOMALOUS HIGH


SAMPLING LOCATION
ANOMALOUS HIGH
BRONSON
NORTON
AVENUE
BEVERLY
ELMWOOD
CLINTON
PEACE
AVENUE
ROSEWOOD
ROSEWOOD AVENUE
MAPLEWOOD
TRACT NO. 19373
MAPS 22-84
TRACT NO. 4238
MAPS 29-90
4193000
12
OAKWOOD
ELMWOOD
SECTION
TRACT NO. 638
MAPS 16-75
GRAMERCY
MAPS 16-93
ST. ANDREWS
13
TRACT NO. 445
4194000
MAPS 10-100
MAPS 13-52
WESTBORO
VENDOME
MANHATTAN
STREET
BOULEVARD
AVENUE
14
WESTERN
OAKWOOD
MARLEWOOD
BEVERLY
CLINTON
-403-
4141000


BEVERLY WAY
15
AVENUE
PLACE
COUNCIL STREET
FIRST STREET
SECOND STREET
THIRD STREET
BOULEVARD
WILTON
RIDGEWOOD
GRAMERCY
ST ANDREW'S
MANHATTAN
WESTERN
OXFORD
VAN NESS
4139000
4194000
X SAMPLING LOCATION


BEVERLY BOULEVARD
FIRST STREET
SECOND STREET
THIRD STREET
BOULEVARD
STREET
AVENUE
DRIVE
ORANGE
MANSFIELD
CITRUS
HIGHLAND
LAS PALMAS
JUNE
TRACT NO. 8433
TRACT NO. 8320
TRACT NO. 215
TRACT NO. 7668
61
62
63
64
65
66
60
4139000
4186000
SAMPLING LOCATION
ANOMALOUS HIGH

S OAKWOOD

S BEVERLY

AVE S

BLVD

ST S

ST

138 B 177

138 B 185

TR 5177

TR 4924

TR 34333-C

TR 7372

TR 5207

TR 6619

TR 8498

4139000

4163000

42 43 44 45 47 48 49 50 52 53 54 55 58 59

S BAYOMAR

S VISTA

S MARTEL

S FULLER

S POINSETTIA

S ALTA VISTA

S FORMOSA

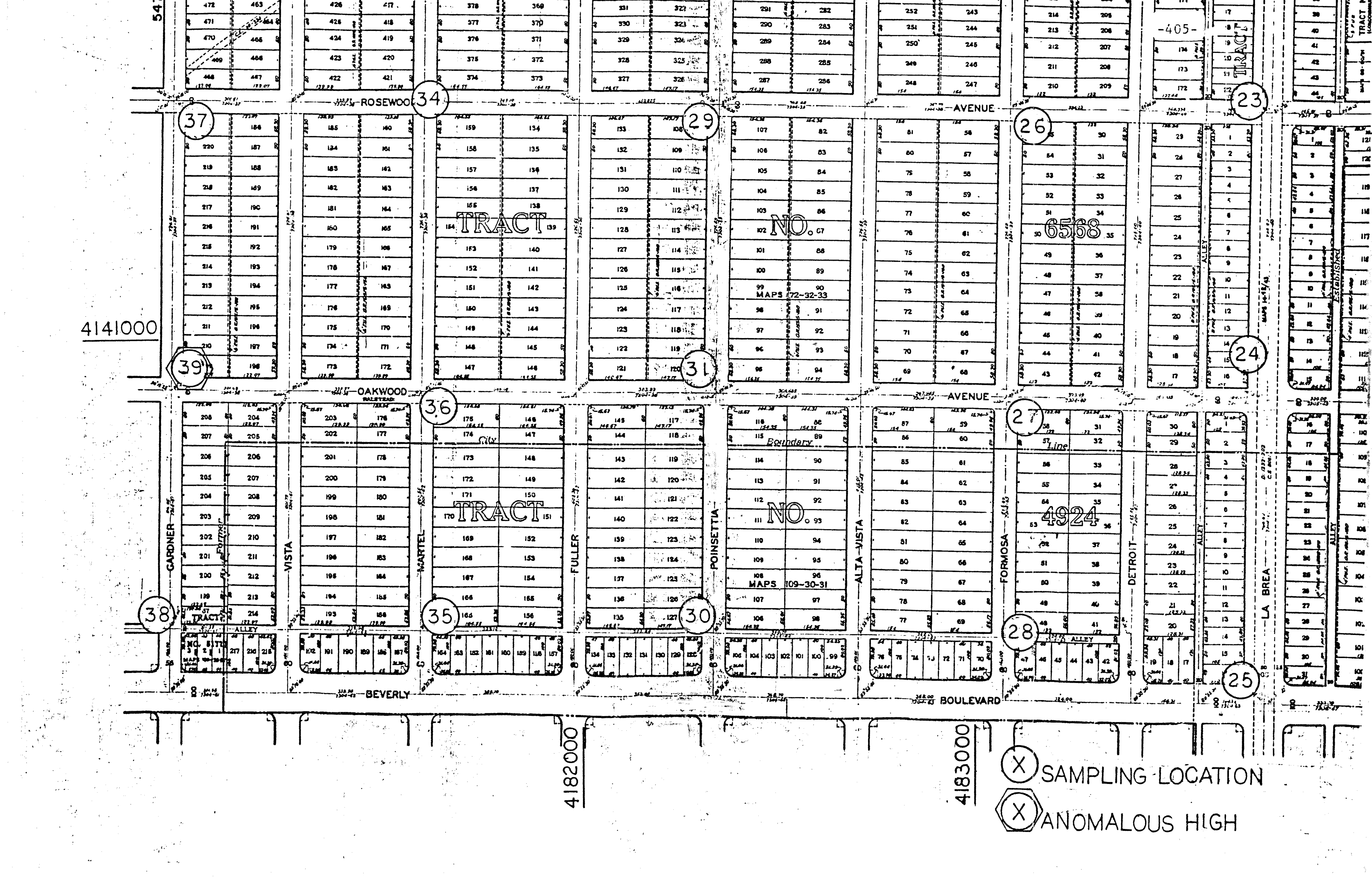
S DETROIT

S MANSFIELD

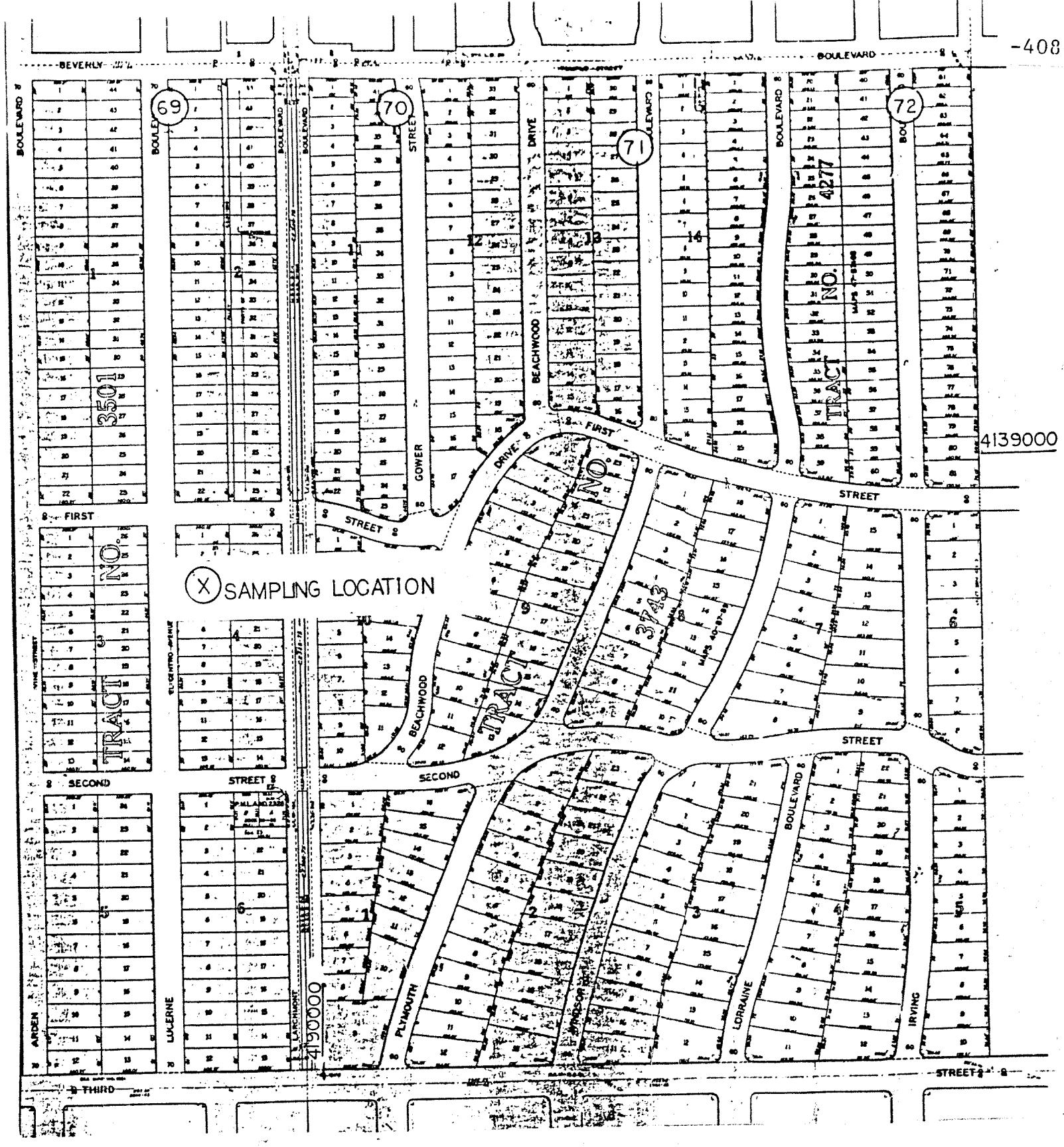
S CITRUS

(X) SAMPLING LOCATION

(X) ANOMALOUS HIGH



4141000
4182000
4183000
ROSEWOOD AVENUE
OAKWOOD AVENUE
BEVERLY BOULEVARD
GARDNER
VISTA
MARTEL
FULLER
POINSETTIA
ALTA VISTA
FORMOSA
DETROIT
LA BREA
ALLEY
TRACT NO. 6568
MAPS 72-32-33
TRACT NO. 4924
MAPS 109-30-31
City Boundary Line
-405-
23
24
25
26
27
28
29
30
31
34
35
36
37
38
39
SAMPLING LOCATION
ANOMALOUS HIGH


BEVERLY
BOULEVARD
69
70
71
72
STREET
DRIVE
BEACHWOOD
GOWER
FIRST
SECOND
THIRD
TRACT NO. 4277
TRACT NO. 3743
TRACT NO. 3501
4139000
4139000
X SAMPLING LOCATION
ARDEN
LUCERNE
LARCHMONT
PLYMOUTH
IRVING
LORRAINE

BEVERLY

75

C.E. 67—63

BOULEVARD

67

68 VAR

VAR

70 AVENUE

74

73

STREET

AVENUE

ORDINANCE NO. 47172 N.S.

ORDINANCE NO. 43049 N.S.

ORDINANCE NO. 43049 N.S.

303 304 305 306 307 308 309 311 312 313 314 315 316 317

352 351 350 349 348 347 346 345 343 344 342 341 340 339 338 337 336 335

353 354 355 356 357 358 359

STREET

FIRST

STREET

376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395

HUDSON PLACE

360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375

MAPS 96-41-43

TRACT NO. 8320

PMLA NO. 1338

FORMER CITY BOUNDARY LINE

ESTABLISHED DEC. 20 1923

ESTABLISHED FEB. 28 1922

ESTABLISHED

4139000

4188000

SECOND

HUDSON AVENUE

320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335

X SAMPLING LOCATION

MUIRFIELD ROAD

ROAD

TRACT NO. 3668

1 2 3 4 5 6 7 8 9 10 11 12 13 14

TRACT NO. 4179

MAPS 48-12

MAPS 40-47

LOT B

26 28 29 30 41 42 43 44

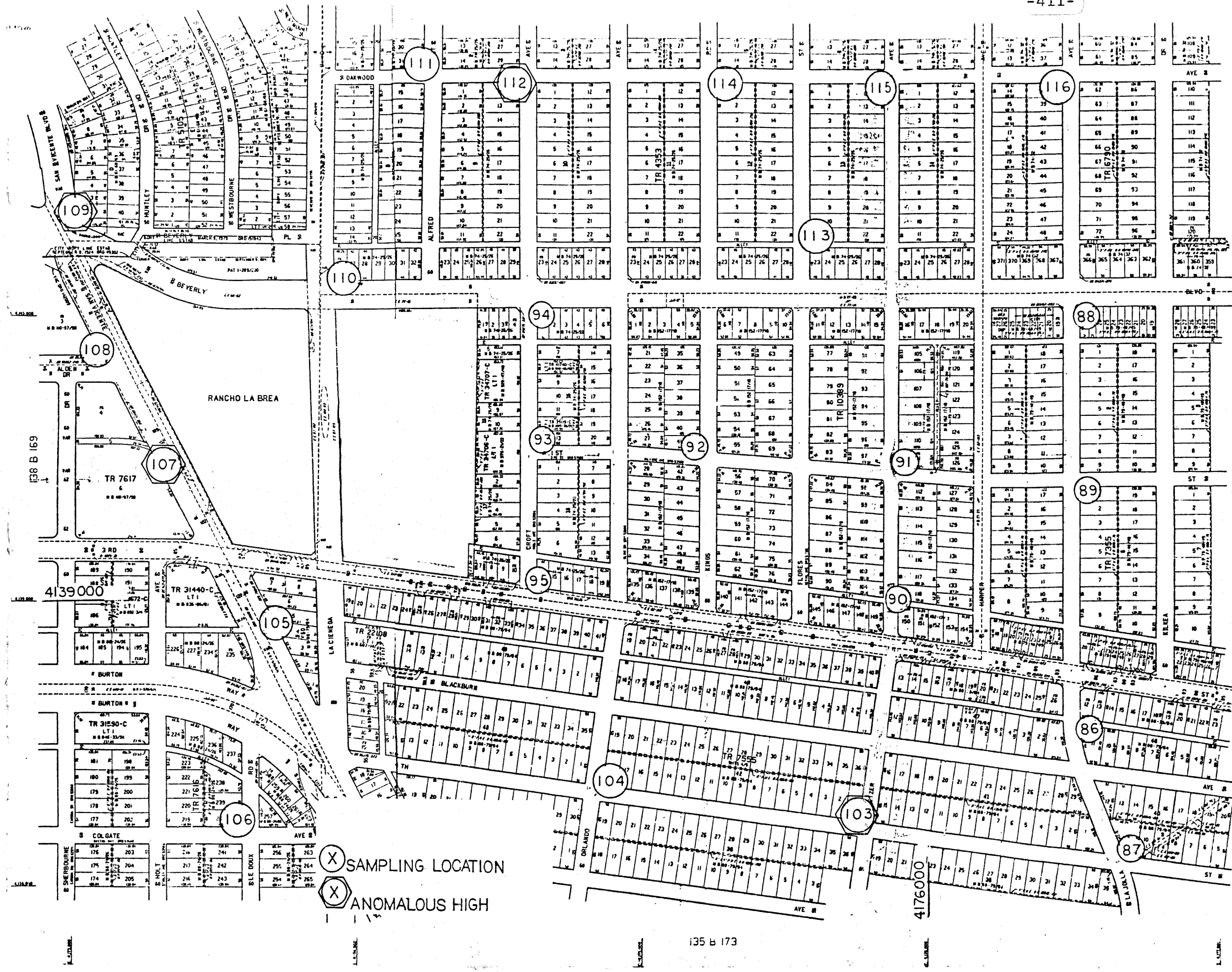
51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68

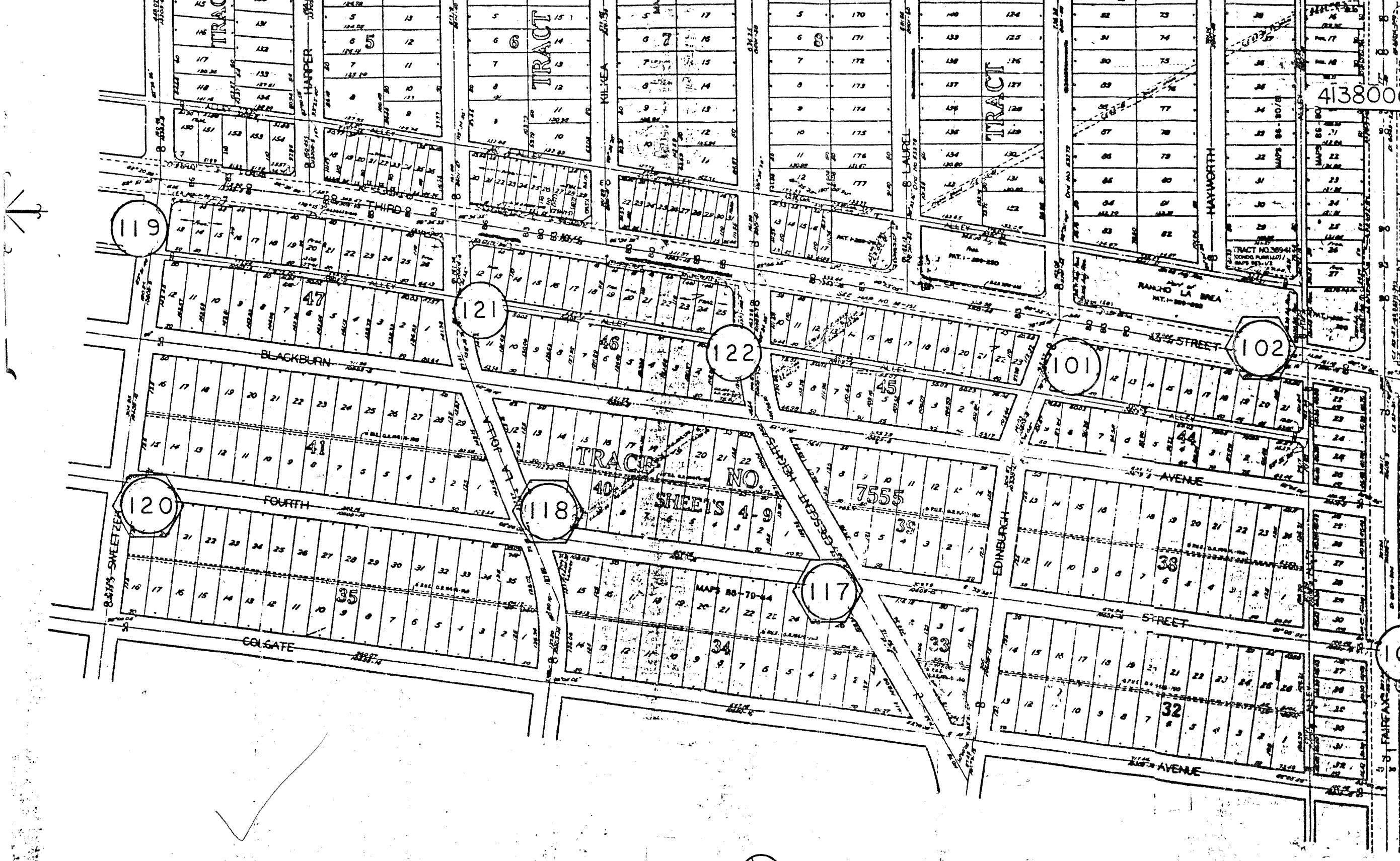
138 B 73

-410-

X SAMPLING LOCATION

X ANOMALOUS HIGH


RANCHO LA BREA
S BEVERLY
S SAN VICENTE BLVD
S HUNTLEY DR
S WESTBOURNE DR
S OAKWOOD
ALFRED
ALDEN DR
3RD
BURTON WAY
S COLGATE
S SHERBOURNE
S HOLT
SLE DOUX
RD
LA CIENEGA
BLACKBURN
TH
CROFT
KINGS
FLORES
HARPER
ORLANDO
KILKEA
LA JOLLA
AVE B
ST 2
BLVD
TR 5105
TR 7617
TR 31440-C
TR 31690-C
TR 7616
TR 22108
TR 7555
TR 4353
TR 10389
TR 6730
TR 7385
TR 34707-C
TR 35706-C
4139000
4176000
135 B 173
SAMPLING LOCATION
ANOMALOUS HIGH



X SAMPLING LOCATION

X ANOMALOUS HIGH

4138000

X SAMPLING SITE

X ANOMALOUS HIGH

FORMER CITY BDRY. LINE ESTAB. DEC. 11, 1948 ORD. NO. 87128

FORMER CITY BOUNDARY LINE ESTABLISHED DEC. 11, 1948 ORDINANCE NO. 87128

FORMER CITY BOUNDARY LINE ESTABLISHED APRIL 13, 1948 ORD NO 86040

FORMER CITY BDRY LINE ESTAB. JULY 29, 1941 ORD. NO. 85111

FORMER CITY BOUNDARY LINE ESTABLISHED JULY 29, 1941 ORD NO 85111

FORMER CITY BOUNDARY LINE ESTABLISHED JULY 29, 1941 ORD. NO. 85111

FORMER CITY BOUNDARY LINE ESTABLISHED SEPT. 6, 1923, 3RD. NO 49302 N.

FORMER CITY BOUNDARY LINE ESTABLISHED APRIL 13, 1948 ORD NO 86040

FORMER CITY BOUNDARY LINE ESTABLISHED DEC. 11, 1948 ORDINANCE NO. 87128

FORMER CITY BOUNDARY LINE ESTABLISHED SEPT. 6, 1923, 3RD. NO 49302 N.

FIRST ST.

THIRD

FRONT

GARDNER

DRIVE

OGDEN

BLACKBURN

GENESEE

COLGATE

AVENUE

BURNSIDE AVENUE

ORANGE GROVE AVENUE

97

123

124

125

6

MAPS 252 - 17/22

MAPS H07-01-63

TRACT NO.

RECREATION AND PARKS, P.P.

C.E. 300-46

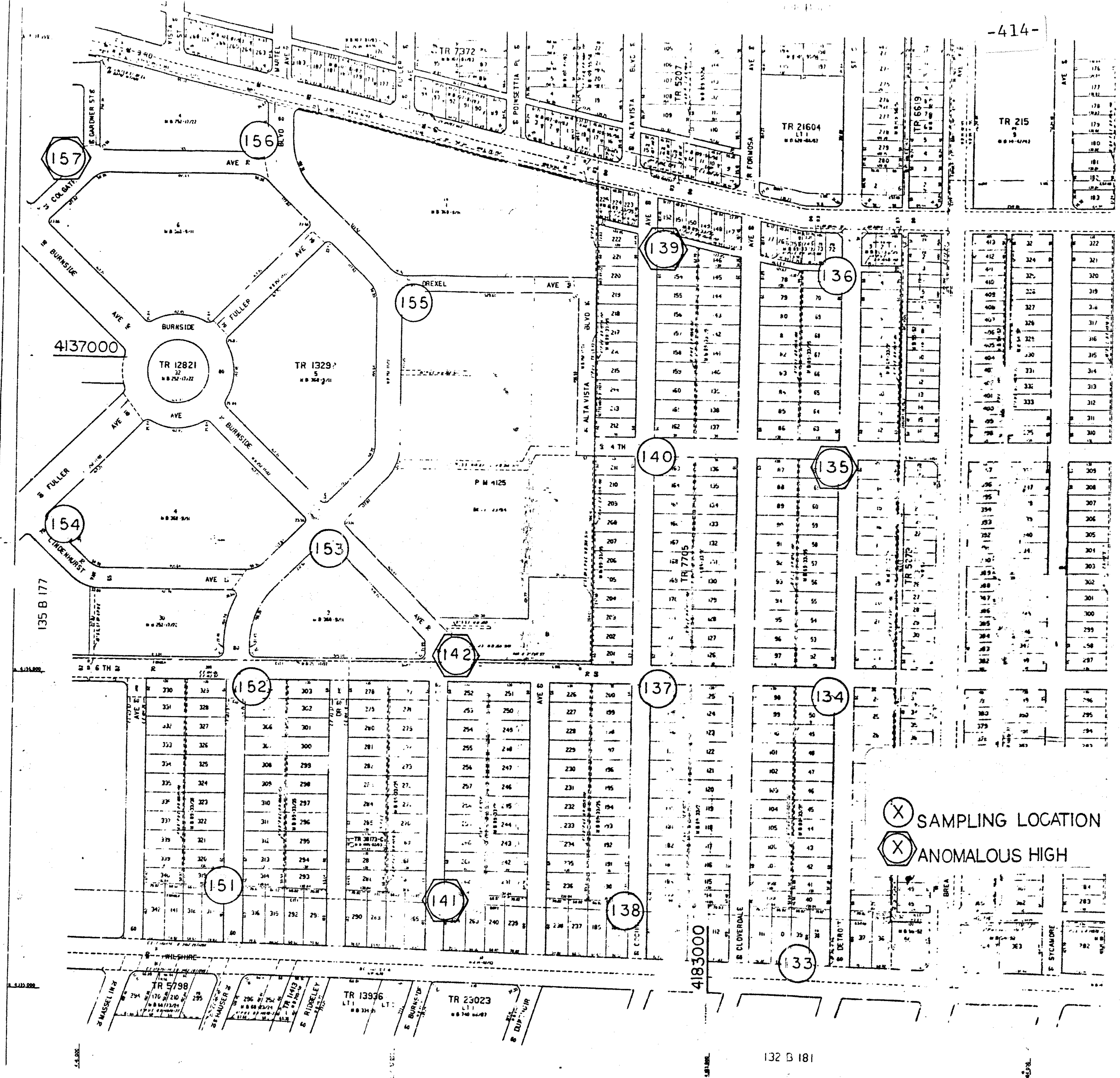
C.E. 100-63

C.E. 407-63

C.E. 600-163

4180000

DETAIL NO SCALE



135 B 177
132 B 181
4137000
4183000
TR 12821
TR 1329
TR 7705
TR 5207
TR 7372
TR 21604
TR 6619
TR 215
TR 5279
TR 5798
TR 11413
TR 13936
TR 23023
P M 4125
BURNSIDE AVE
FULLER AVE
COLGATE
GARDNER ST
LINDENHURST
DREXEL AVE
ALTA VISTA BLVD
6TH ST
4TH
MARTEL
POINSETTIA PL
FORMOSA
CLOVERDALE
DETROIT
BREA
SYCAMORE
WILSHIRE
MASSELIN
HAUSER
RIDGELEY
DUNSMUIR
151
152
153
154
155
156
157
133
134
135
136
137
138
139
140
141
142
SAMPLING LOCATION
ANOMALOUS HIGH

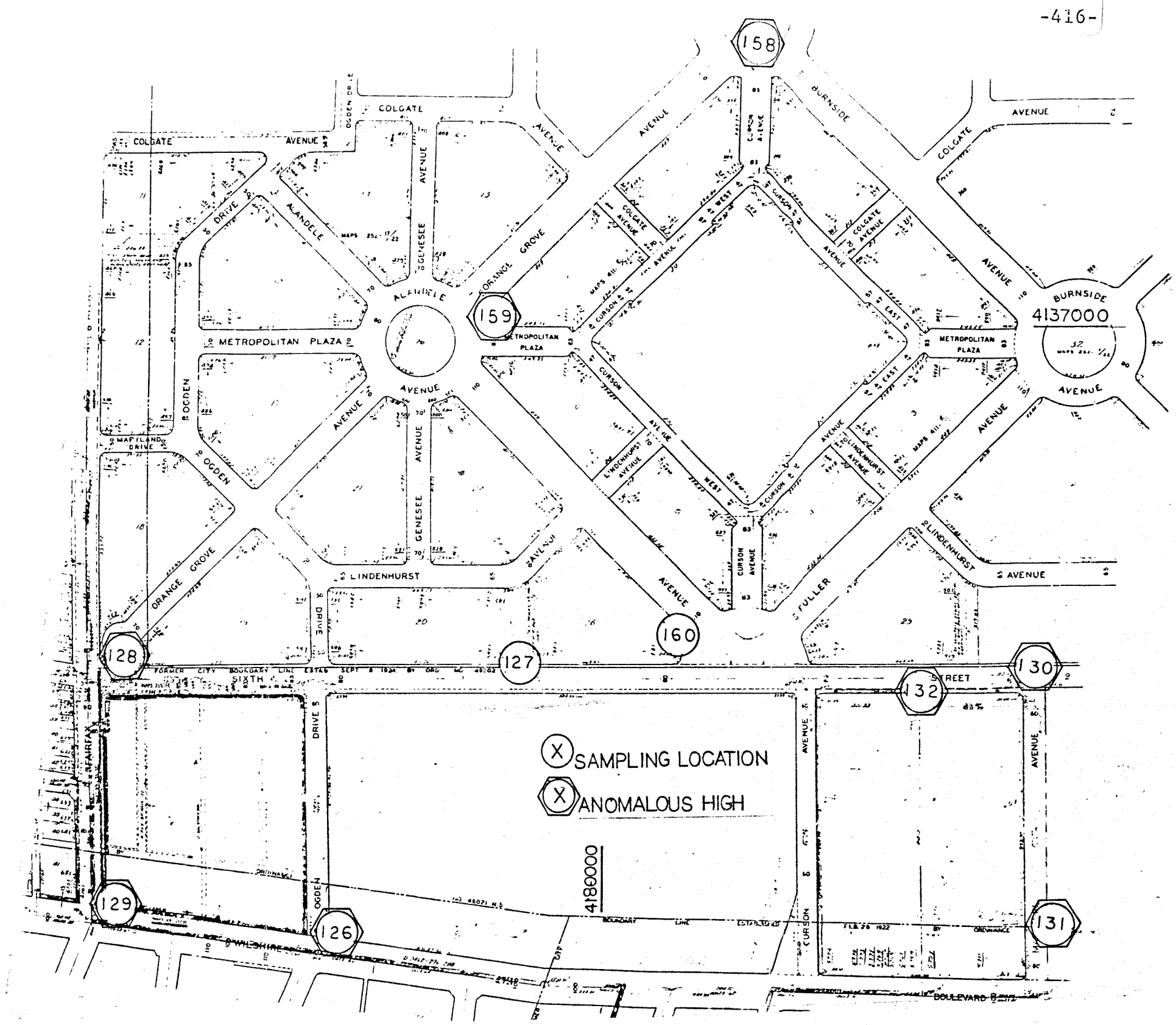
BOULEVARD
DRIVE
AVENUE
STREET
ALLEY
EIGHTH
NINTH
OLYMPIC
BOULEVARD
STREET
FORMER CITY BOUNDARY
EIGHTH LINE ESTABLISHED MAY 22
ORANGE
SYCAMORE
DETROIT
OVERDALE
LA BREA
COUNTRY CLUB DRIVE
BOUNDARY LINE
ESTABLISHED MAY 22

TRACT NO 469
TRACT NO 11413
TRACT NO 10333
TRACT NO 6252
TRACT NO 3821
PARCEL MAP L.A. NO. 3330

4183000
4134000

147
148
145
146
150
149
143
144

(X) SAMPLING LOCATION
(X) ANOMALOUS HIGH

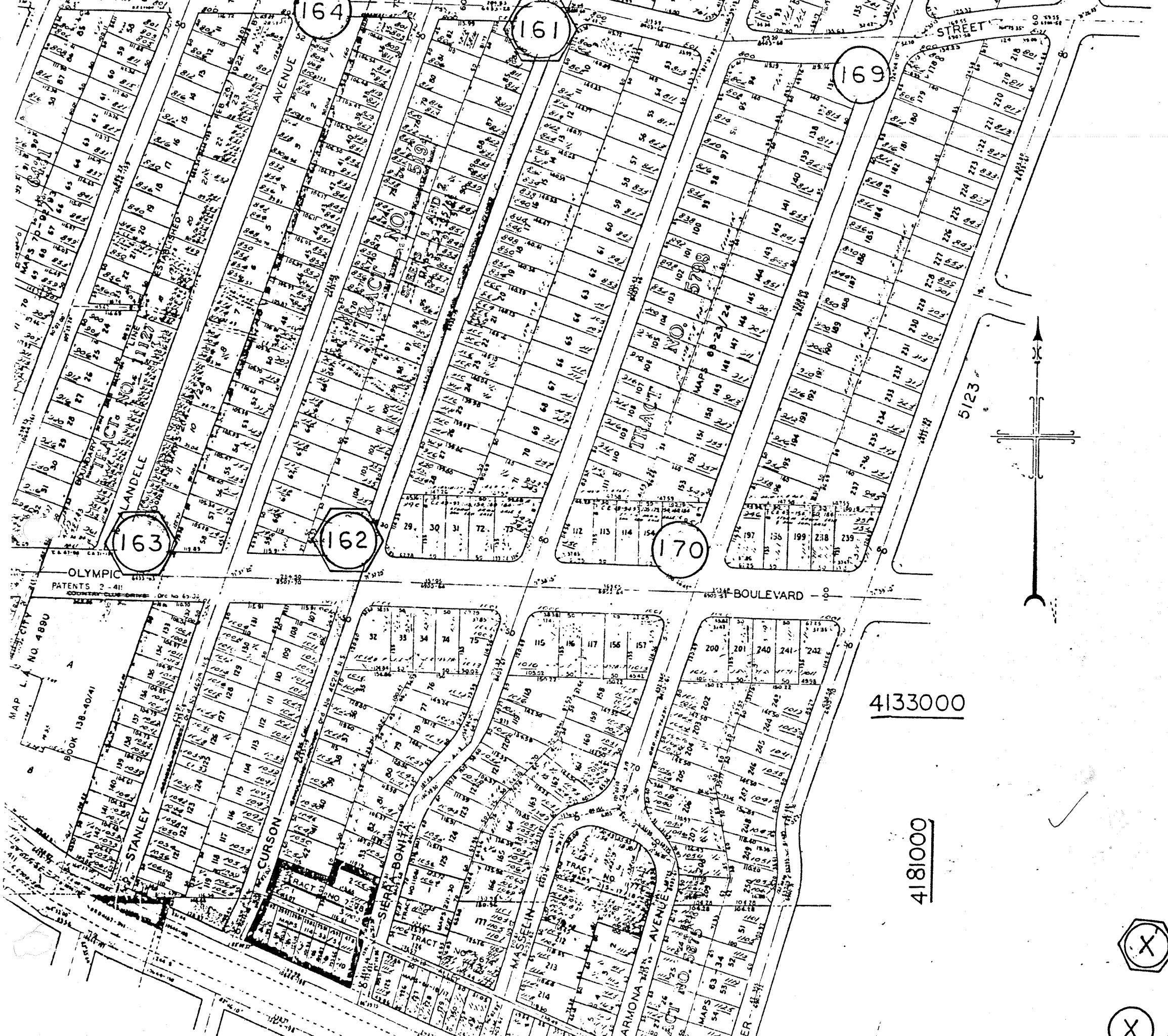


128
129

Anomalies
158
159

✓

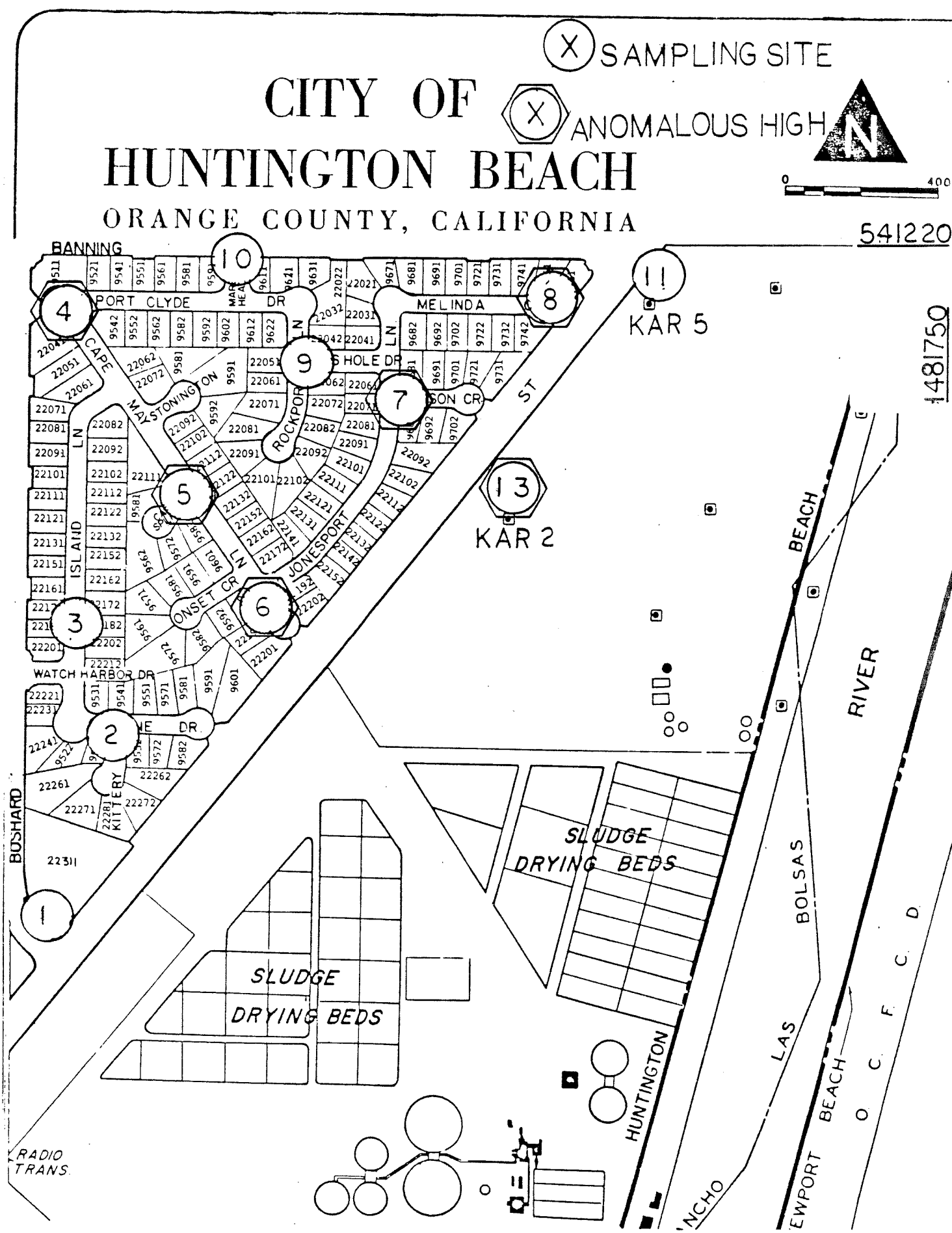

ANOMALOUS HIGH
SAMPLING LOCATION
4134000
4178000
168
166
167
165
CARRILLO
DRIVE
COMMODORE SLOAT
SAN VICENTE
BLVD
PACIFIC ELECTRIC RAILWAY COMPANY'S RIGHT OF WAY
BARROWS
DEL VALLE
McCARTHY
WARNER
FAIRFAX
ORANGE GROVE
OGDEN
GENESEE
BOULEVARD
SPAULDING
OLYMPIC
ALANDELE
EIGHTH
SAN DIEGO
TRACT NO 5542
MAPS 59-53/57
TRACT NO 6826
MAPS 88-82/84
TRACT NO 6421
MAPS 70-92/93
TRACT NO 30457
AVENUE
CITY BOUNDARY LINE



(X) ANOMALOUS HIGH

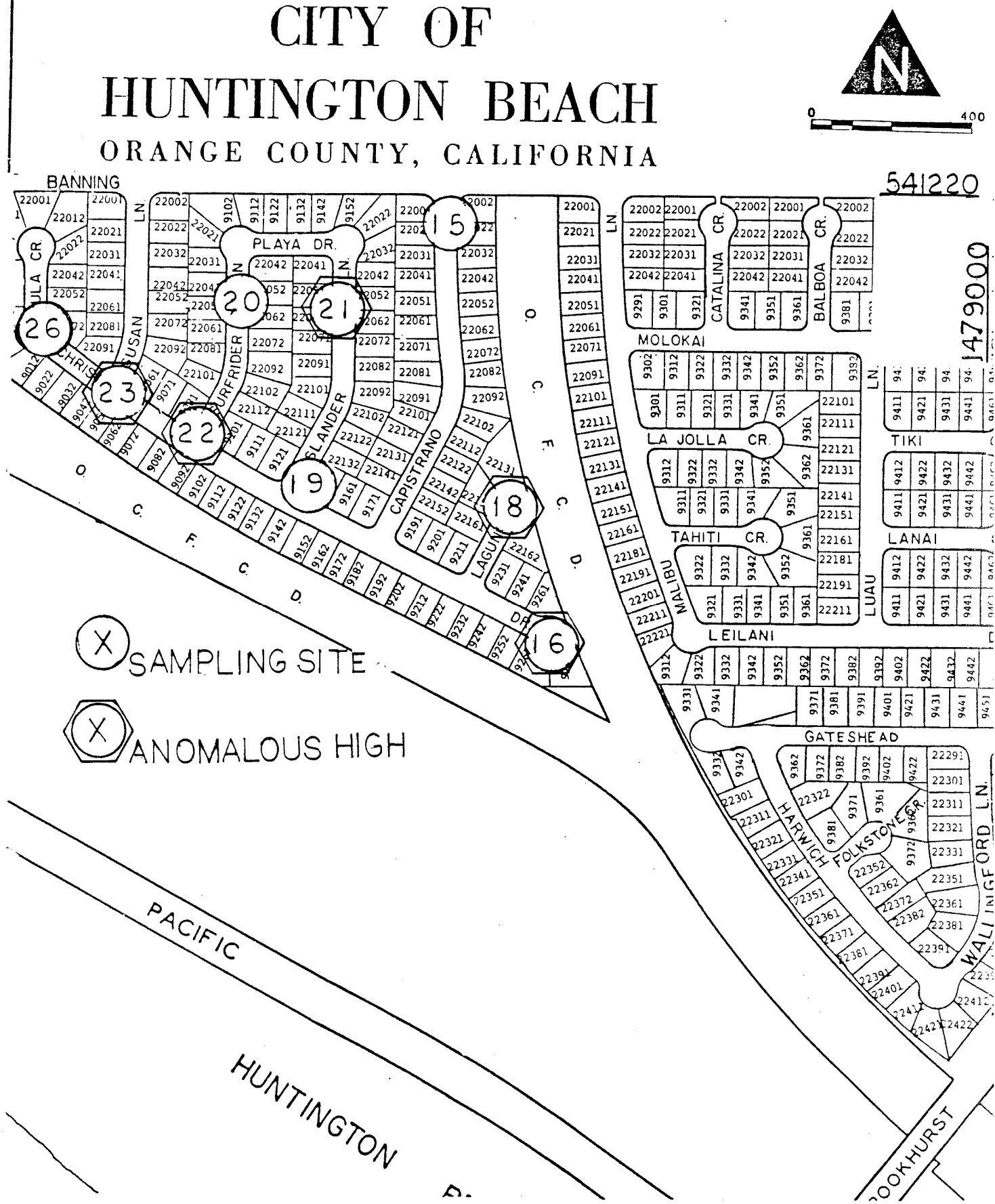
(X) SITE LOCATION

HUNTINGTON BEACH


X SAMPLING SITE
X ANOMALOUS HIGH
N
0
400
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
541220
1481750
BANNING
PORT CLYDE
MELINDA
CAPE
MAYSTONING ON
ROCKPORT
SHOLE DR
SON CR
ISLAND LN
ONSET CR
JONESPORT
WATCH HARBOR DR
BUSHARD
KITTERY
KAR 5
KAR 2
ST
BEACH
RIVER
BOLSAS
HUNTINGTON
LAS
SLUDGE
DRYING BEDS
SLUDGE
DRYING BEDS
RADIO
TRANS
O C F C D
EWPORT BEACH
NCHO

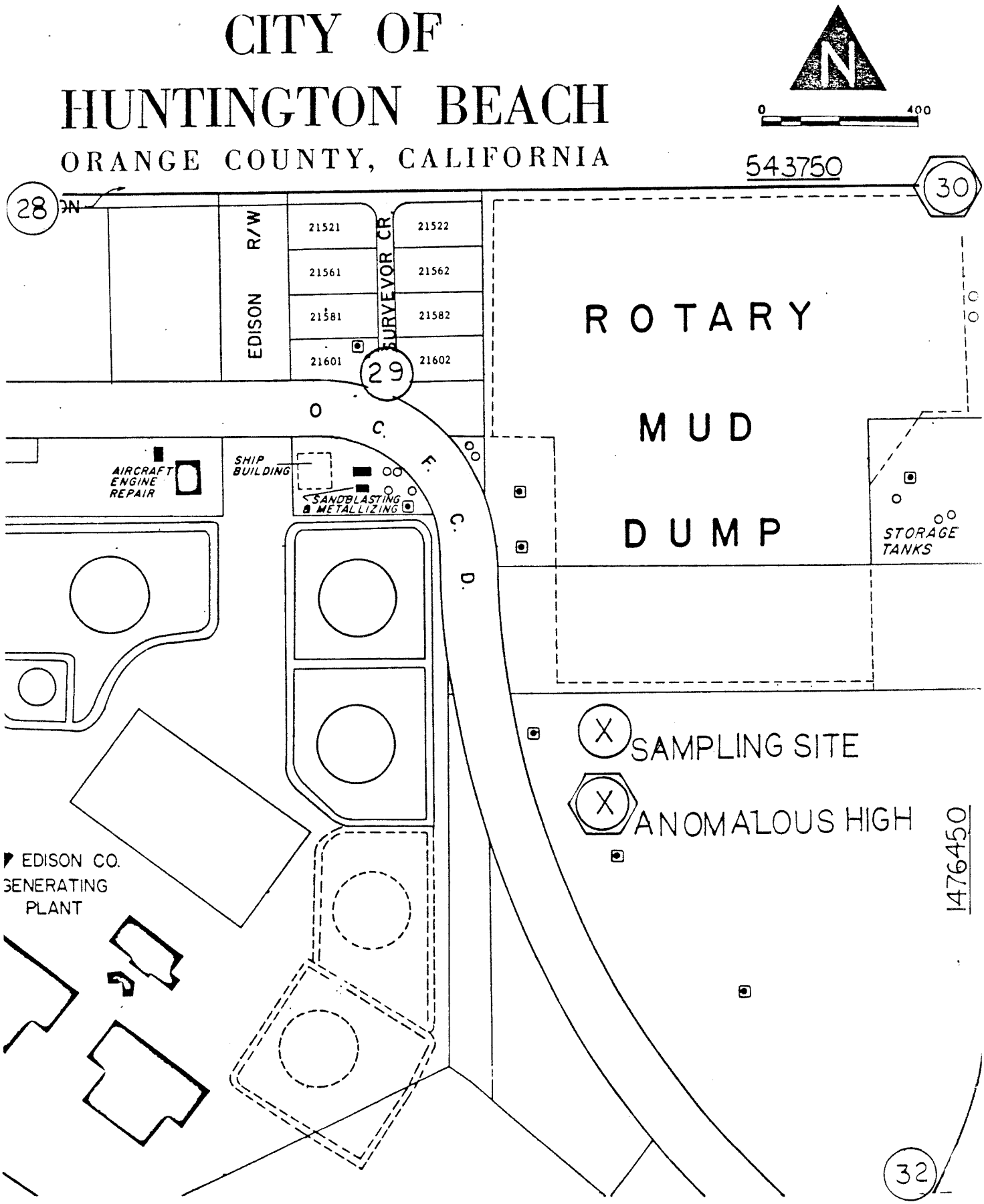
CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA



CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA

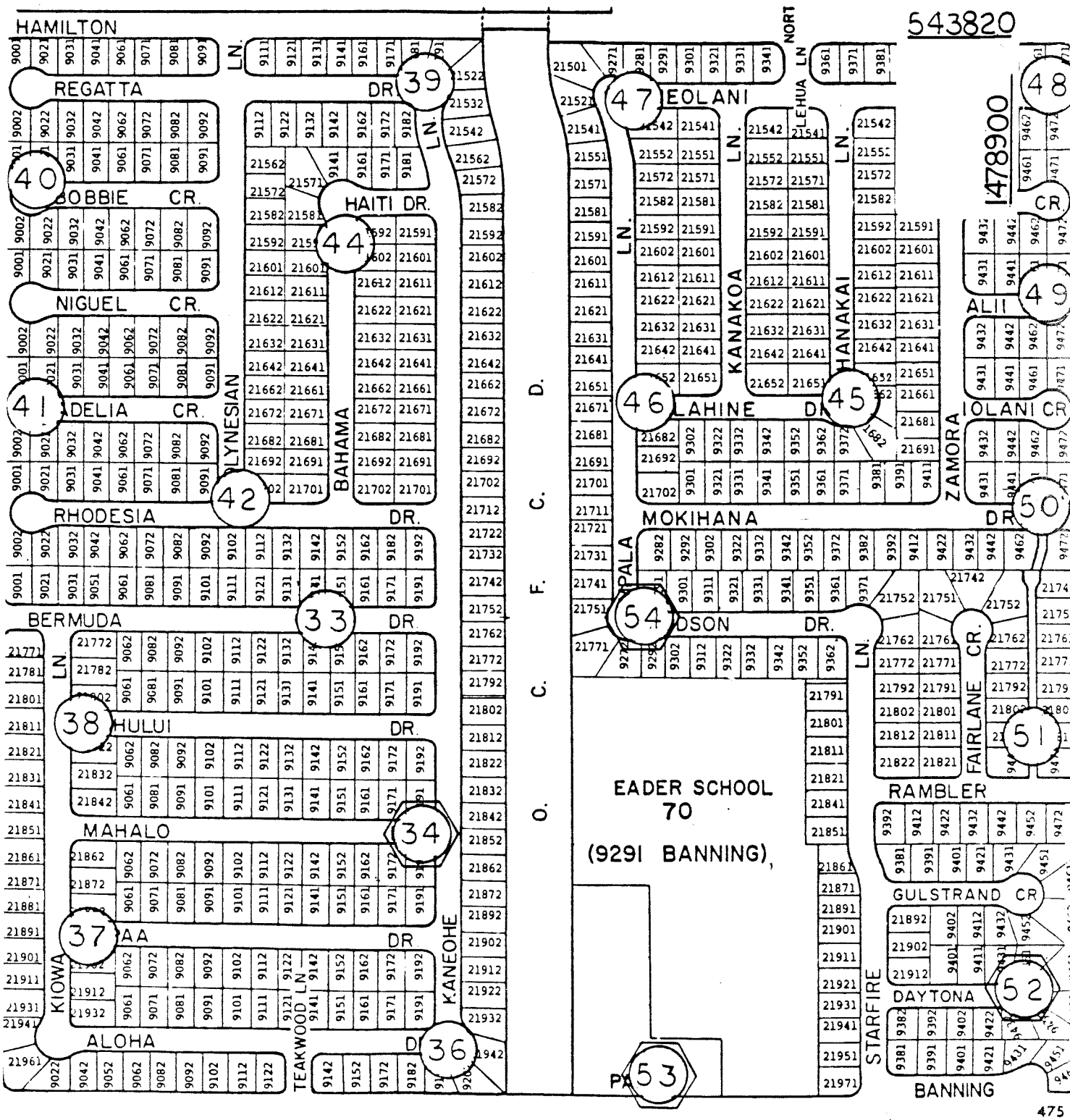


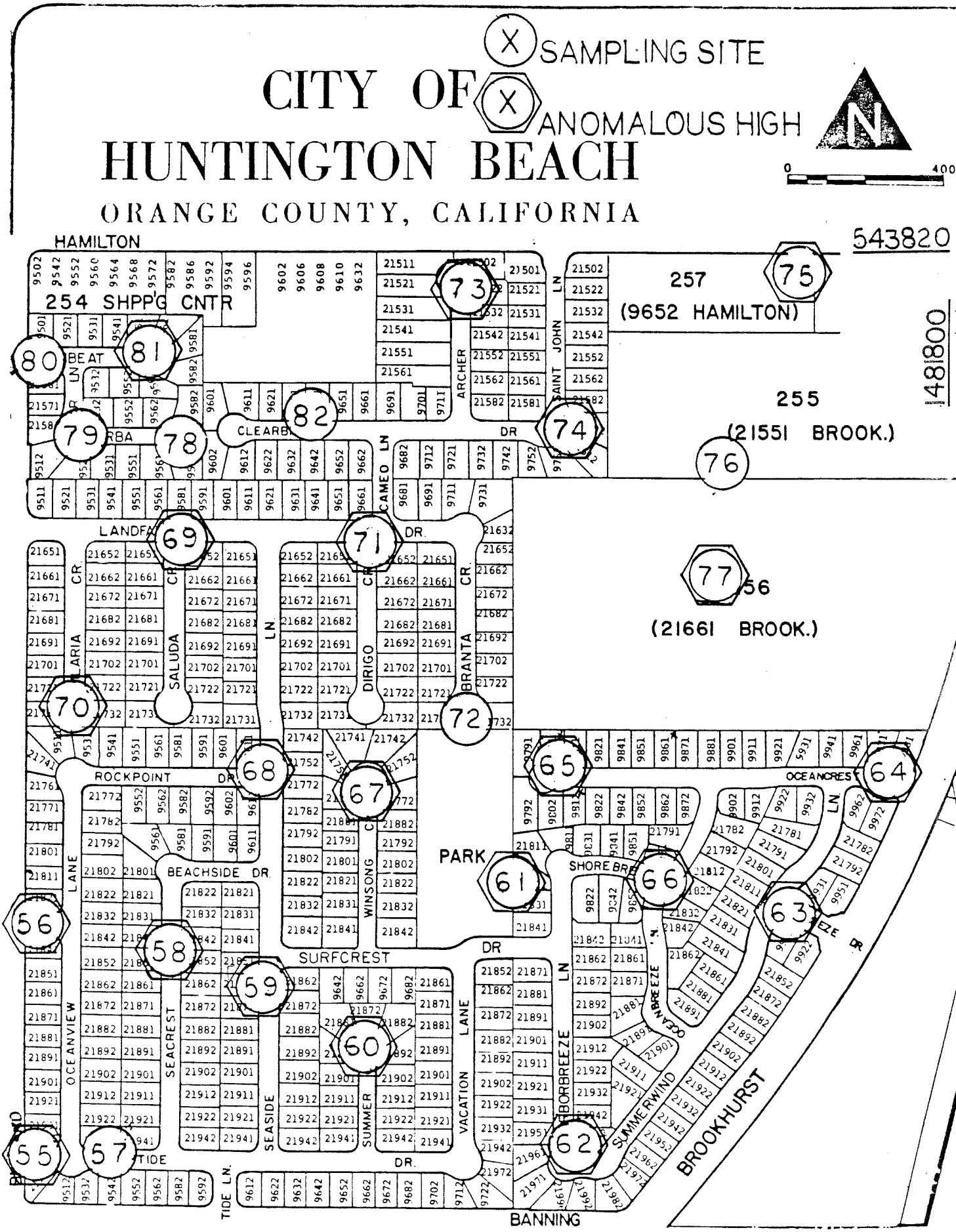
(X) SAMPLING SITE

(X) ANOMALOUS HIGH

CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA




X SAMPLING SITE
X ANOMALOUS HIGH
CITY OF HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
543820
481800
HAMILTON
254 SHPP'G CNTR
257
(9652 HAMILTON)
255
(21551 BROOK.)
256
(21661 BROOK.)
PARK
BEACHSIDE DR.
ROCKPOINT DR.
SURFCREST DR.
OCEANCREST
SHORE BREEZE
OCEANVIEW LANE
SEACREST
SEASIDE
SUMMER
VACATION LANE
SUMMERWIND
BROOKHURST
BANNING
TIDE LN.
TIDE
DR.
SALUDA
DIRIGO
BRANTA
WINSONG
CAMEO LN
JOHN
ARCHER
CLEARBROOK
LANDFALL
55
56
57
58
59
60
61
62
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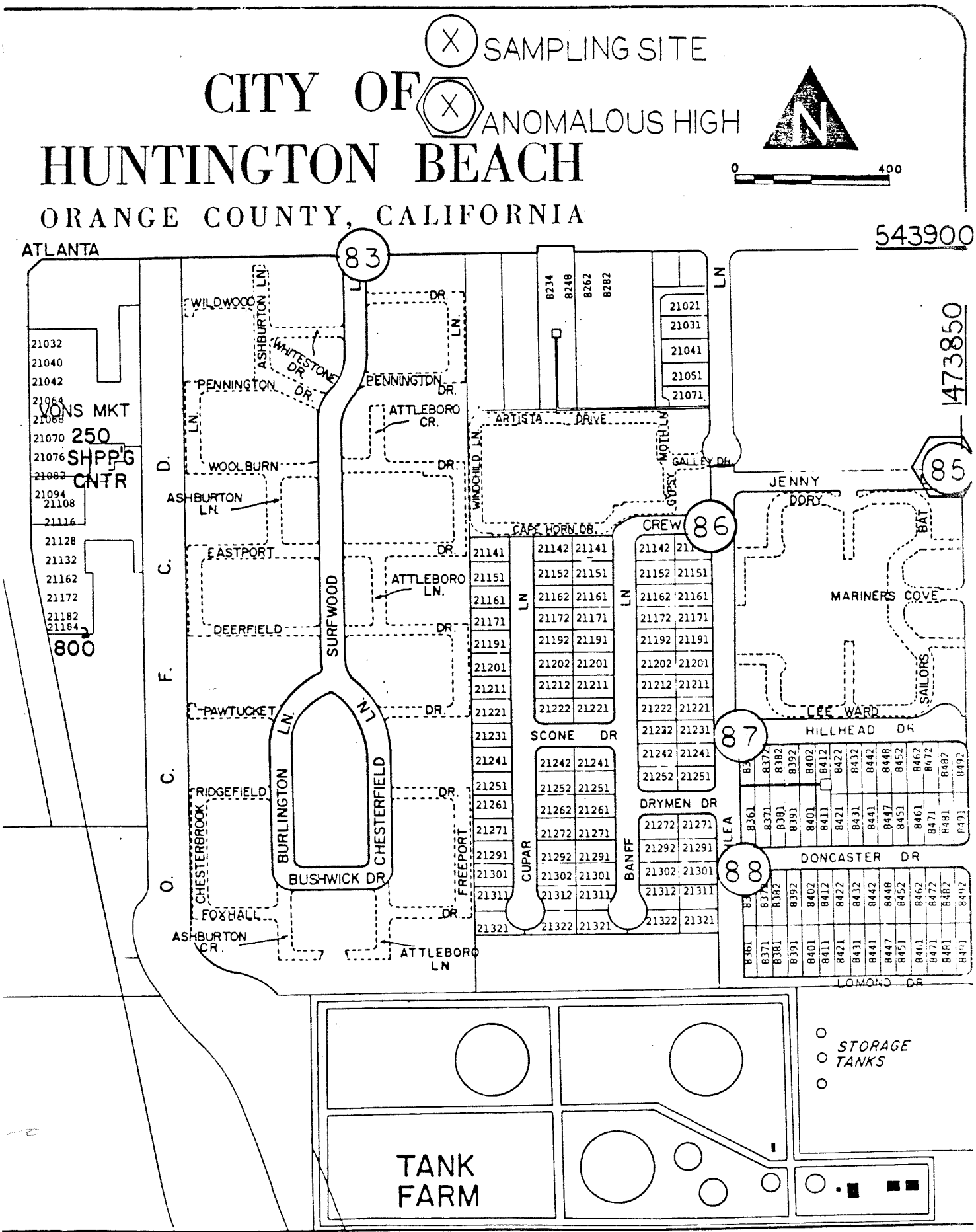
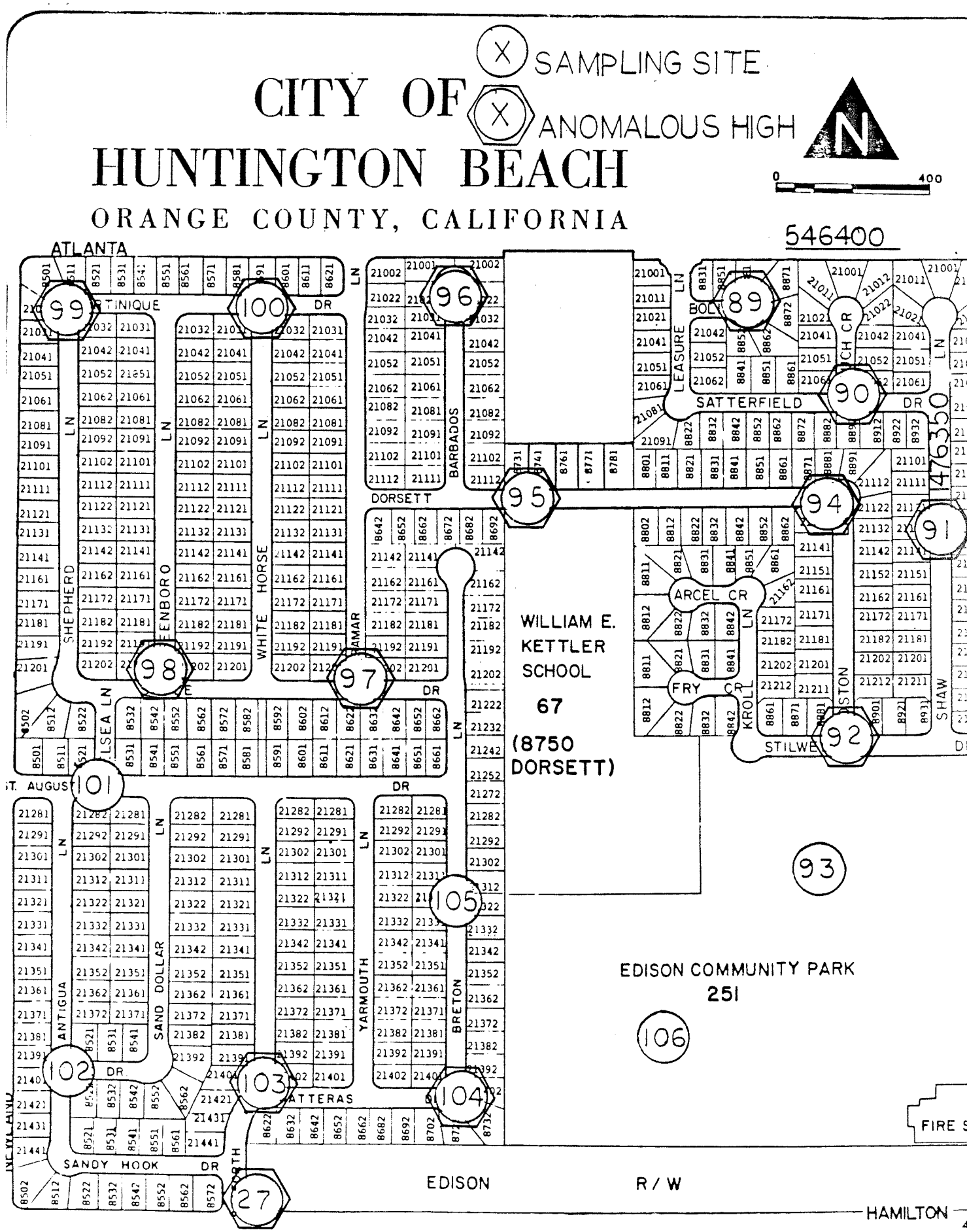
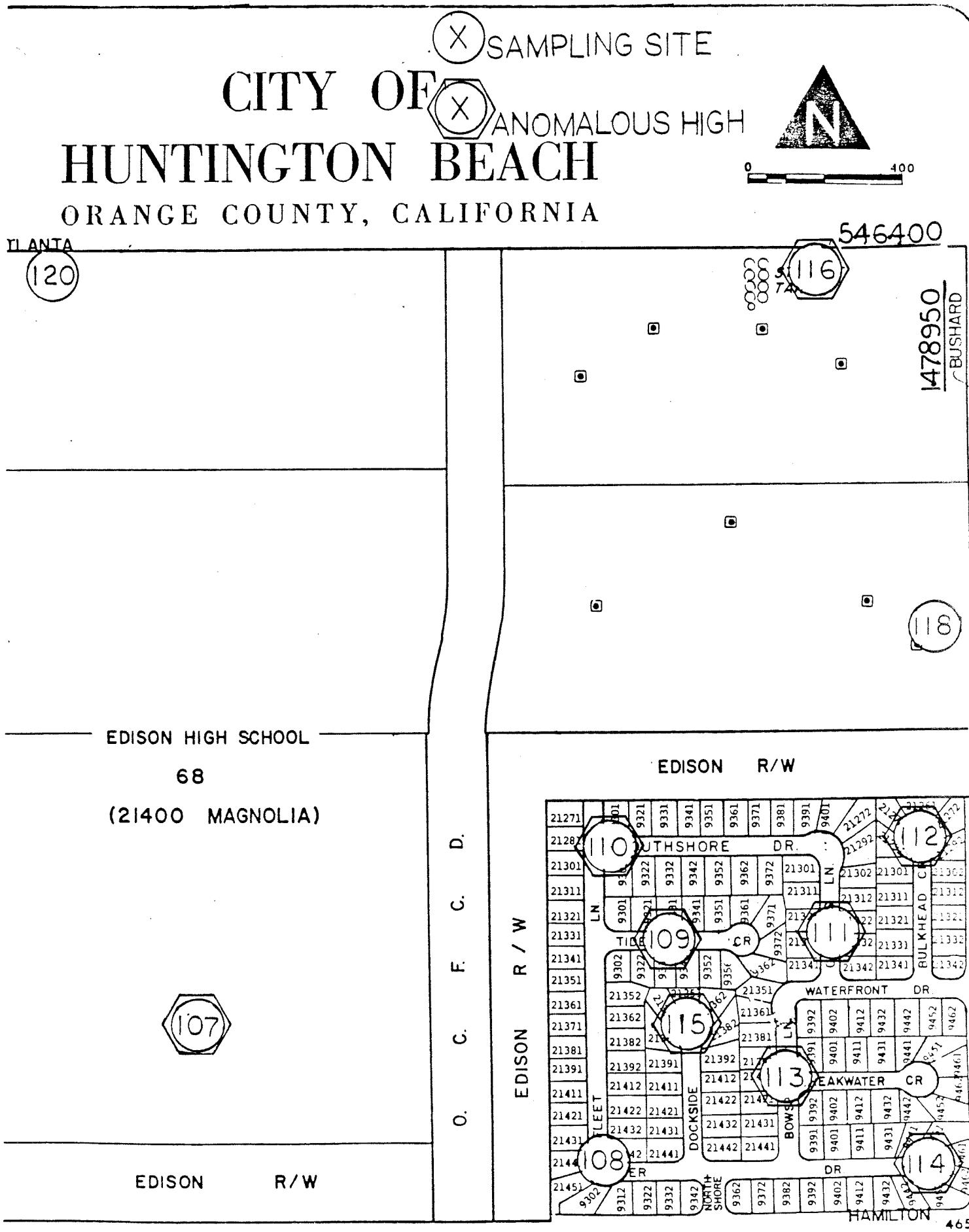

SAMPLING SITE
ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
0
400
543900
1473850
ATLANTA
83
85
86
87
88
WILDWOOD
ASHBURTON LN.
WHITESTONE DR.
PENNINGTON DR.
ATTLEBORO CR.
WOOLBURN
ASHBURTON LN.
EASTPORT
ATTLEBORO LN.
DEERFIELD
SURFWOOD
PAWTUCKET
RIDGEFIELD
CHESTERBROOK
FOXHALL
ASHBURTON CR.
BURLINGTON LN.
CHESTERFIELD LN.
BUSHWICK DR
FREEPORT
ATTLEBORO LN
VONS MKT
250
SHPPG
CNTR
800
ARTISTA DRIVE
WINDCHILD LN.
MOTH LN
GYPSY
GALLEY DR
CAPE HORN DR.
CREW
JENNY
DORY
BAT
MARINERS COVE
SAILORS
LEE WARD
HILLHEAD DR
SCONE DR
CUPAR
BANFF
DRYMEN DR
ILEA
DONCASTER DR
LOMOND DR
STORAGE TANKS
TANK FARM


X SAMPLING SITE
X ANOMALOUS HIGH
CITY OF HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
546400
4176350
ATLANTA
MARTINIQUE
DR
LN
SHEPHERD
GREENBORO
WHITE HORSE
BARBADOS
DORSETT
LEASURE
SATTERFIELD
ARCEL CR
FRY
KROLL
STILWELL
ASTON
SHAW
LSEA LN
JAMAR
WILLIAM E. KETTLER SCHOOL
67
(8750 DORSETT)
EDISON COMMUNITY PARK
251
ST. AUGUST
ANTIGUA
SAND DOLLAR
YARMOUTH
BRETON
HATTERAS
SANDY HOOK
EDISON
R / W
HAMILTON
FIRE S
99
100
96
89
90
95
94
91
98
97
92
93
101
105
102
103
104
106
27

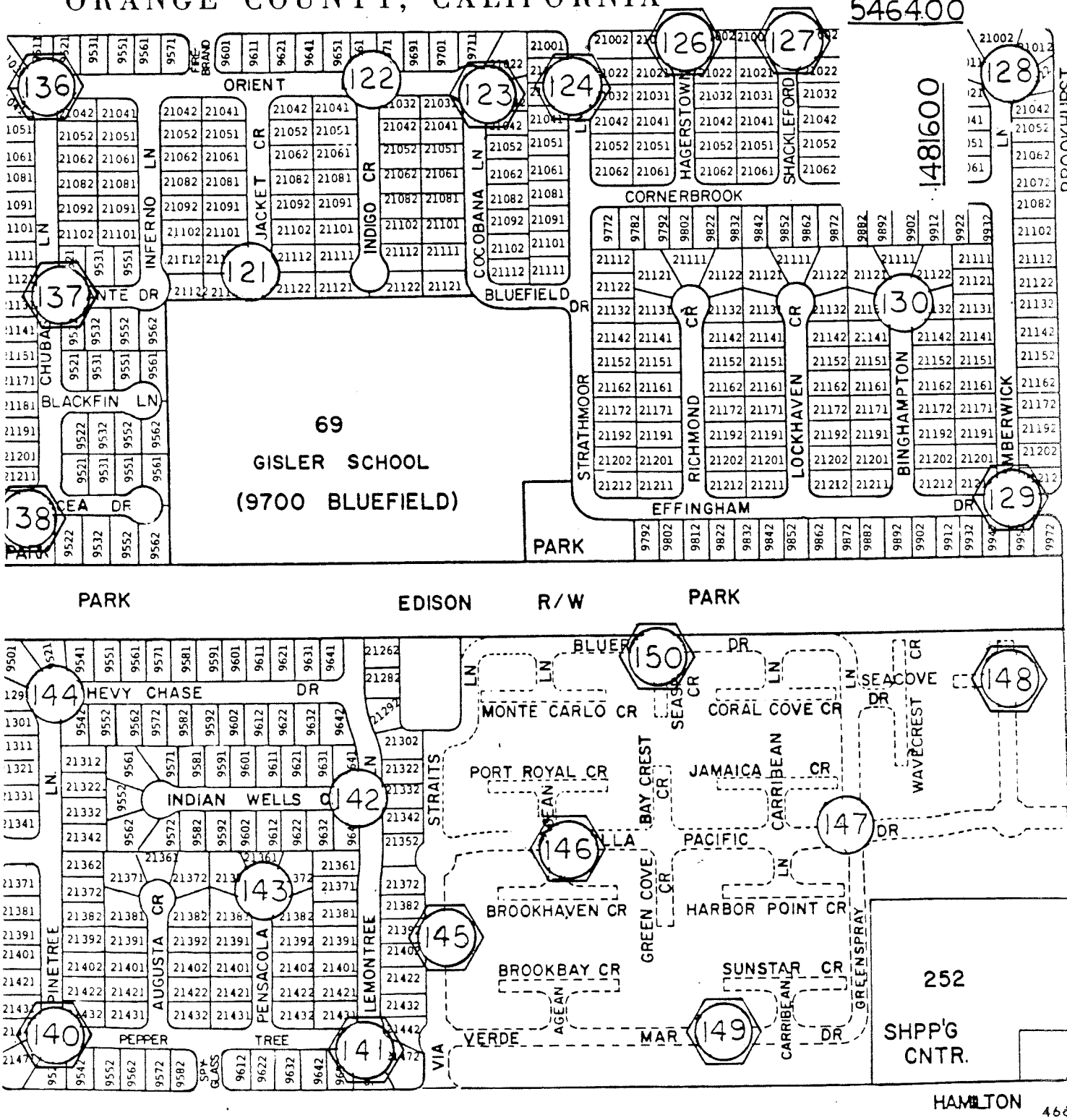

SAMPLING SITE
ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
0
400
546400
1478950
BUSHARD
PLANTA
120
116
118
EDISON HIGH SCHOOL
68
(21400 MAGNOLIA)
107
EDISON R/W
O. C. F. C. D.
EDISON R / W
EDISON R/W
110
112
109
111
115
113
108
114
SOUTHSHORE DR.
WATERFRONT DR
LEAKWATER CR
DOCKSIDE
FLEET
BOWSPRIT
NORTH SHORE
HAMILTON

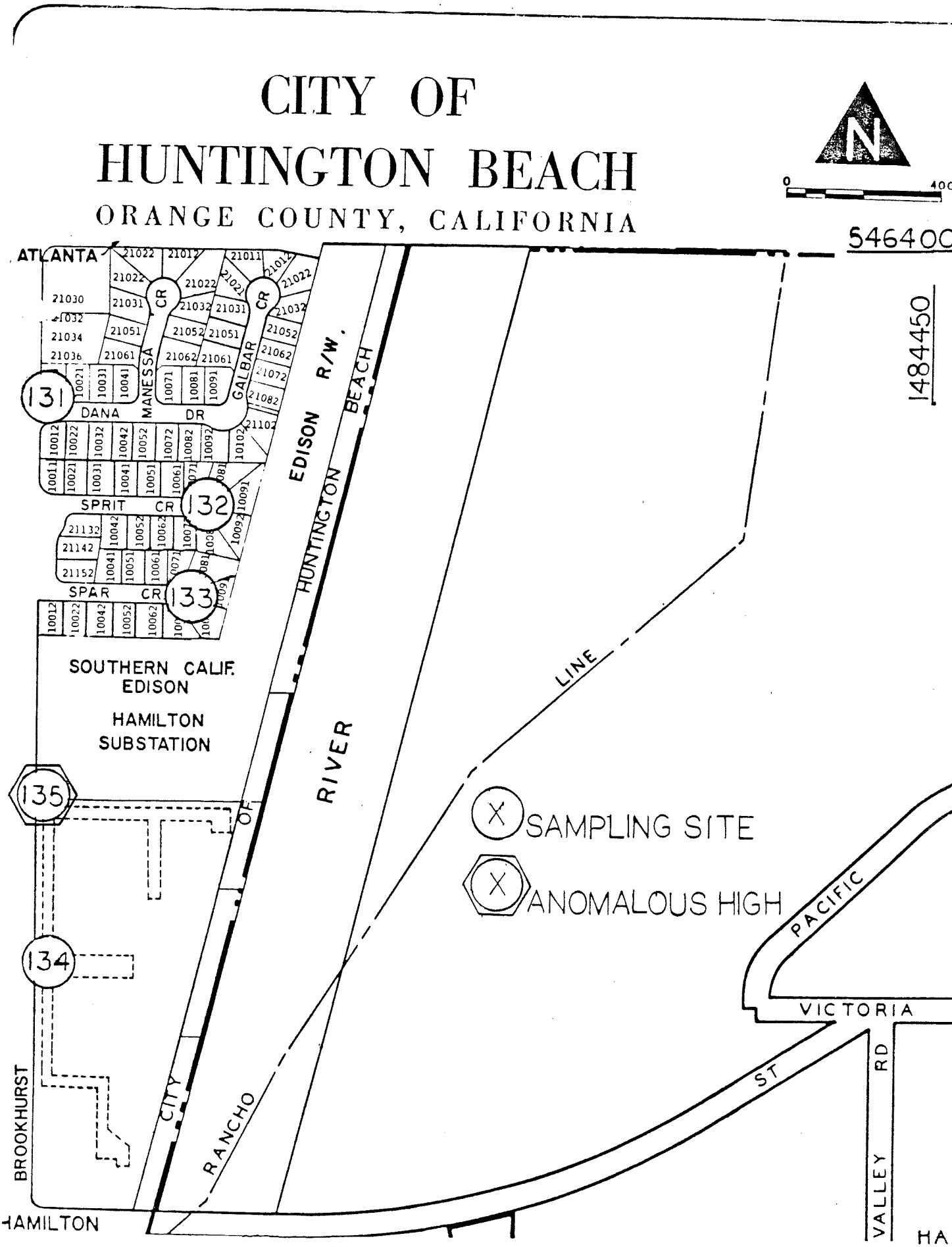
X SAMPLING SITE

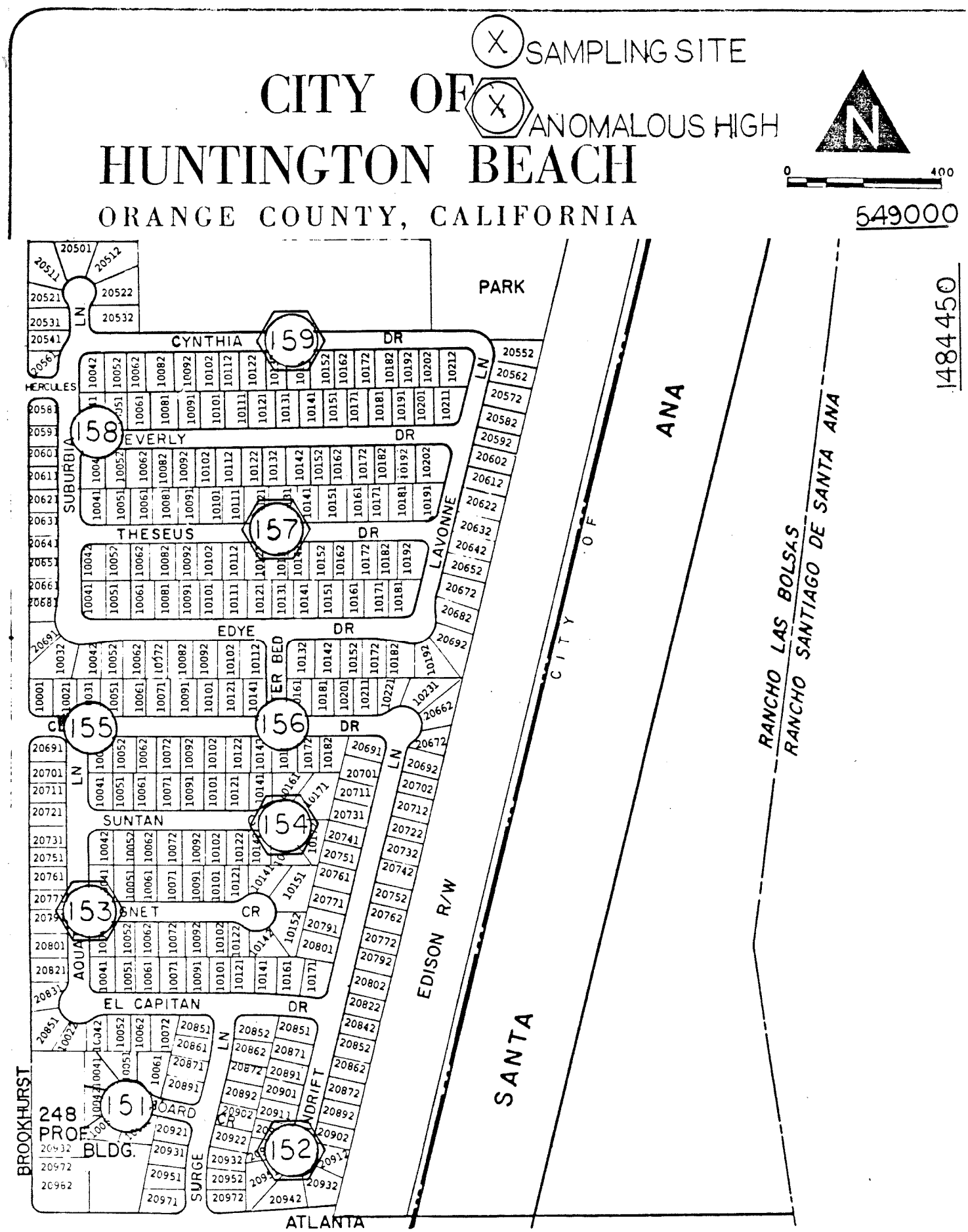
X ANOMALOUS HIGH

CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA

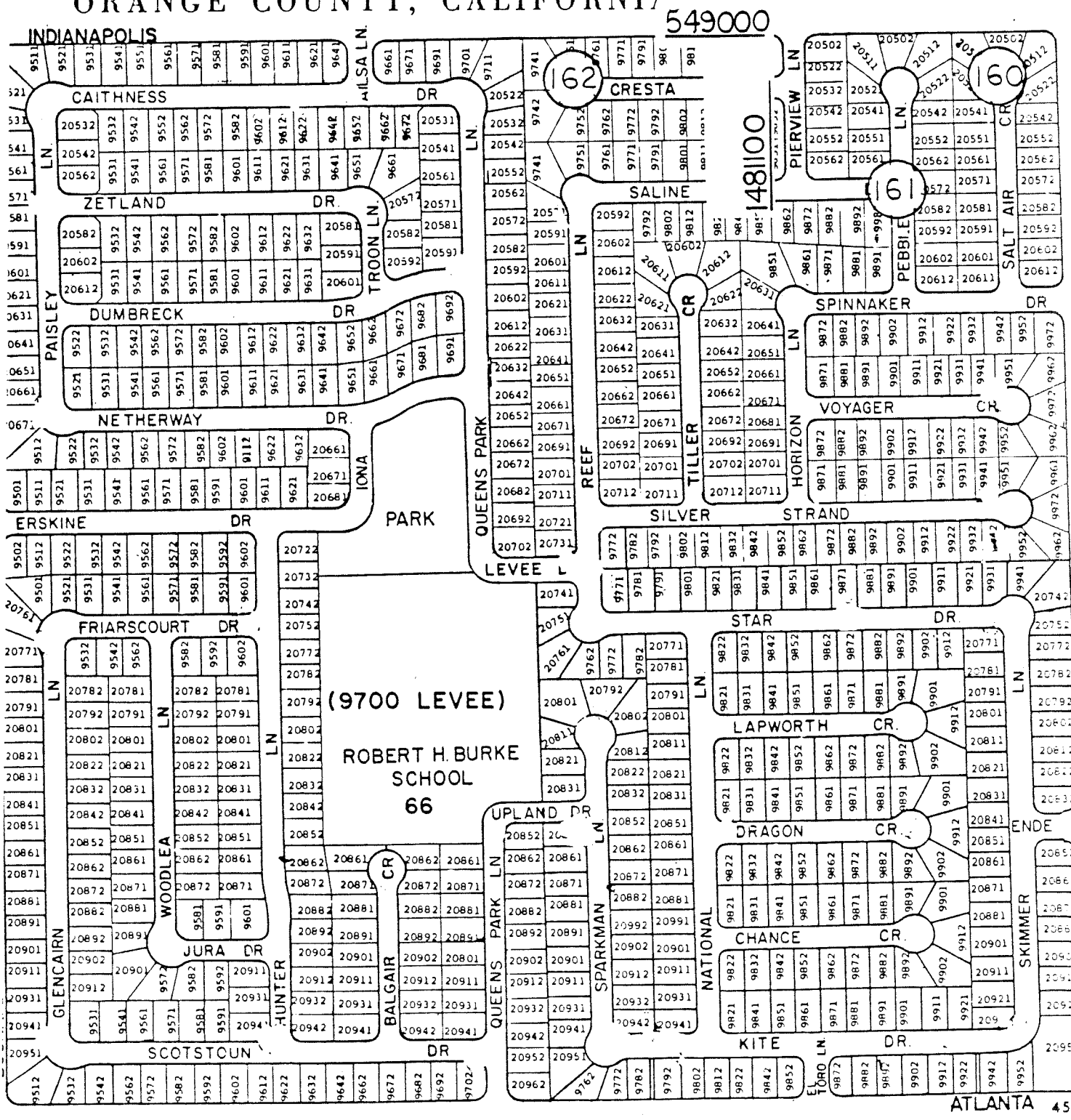



CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
546400
1484450
ATLANTA
CR
MANESSA
GALBAR
DANA
DR
131
132
133
SPRIT CR
SPAR CR
EDISON R/W.
HUNTINGTON BEACH
SOUTHERN CALIF. EDISON
HAMILTON SUBSTATION
135
134
OF
RIVER
LINE
SAMPLING SITE
ANOMALOUS HIGH
PACIFIC
VICTORIA
ST
RD
VALLEY
RANCHO
CITY
BROOKHURST
HAMILTON


SAMPLING SITE
ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
549000
1484450
PARK
CYNTHIA DR
HERCULES
SUBURBIA
EVERLY DR
THESEUS DR
LAVONNE
EDYE DR
ER BED
DR
SUNTAN
SNET CR
AQUA
EL CAPITAN DR
BROOKHURST
248
PROF. BLDG.
BOARD
SURGE
NDRIFT
ATLANTA
CITY OF SANTA ANA
EDISON R/W
RANCHO LAS BOLSAS
RANCHO SANTIAGO DE SANTA ANA
151
152
153
154
155
156
157
158
159

CITY OF (X) SAMPLING SITE HUNTINGTON BEACH

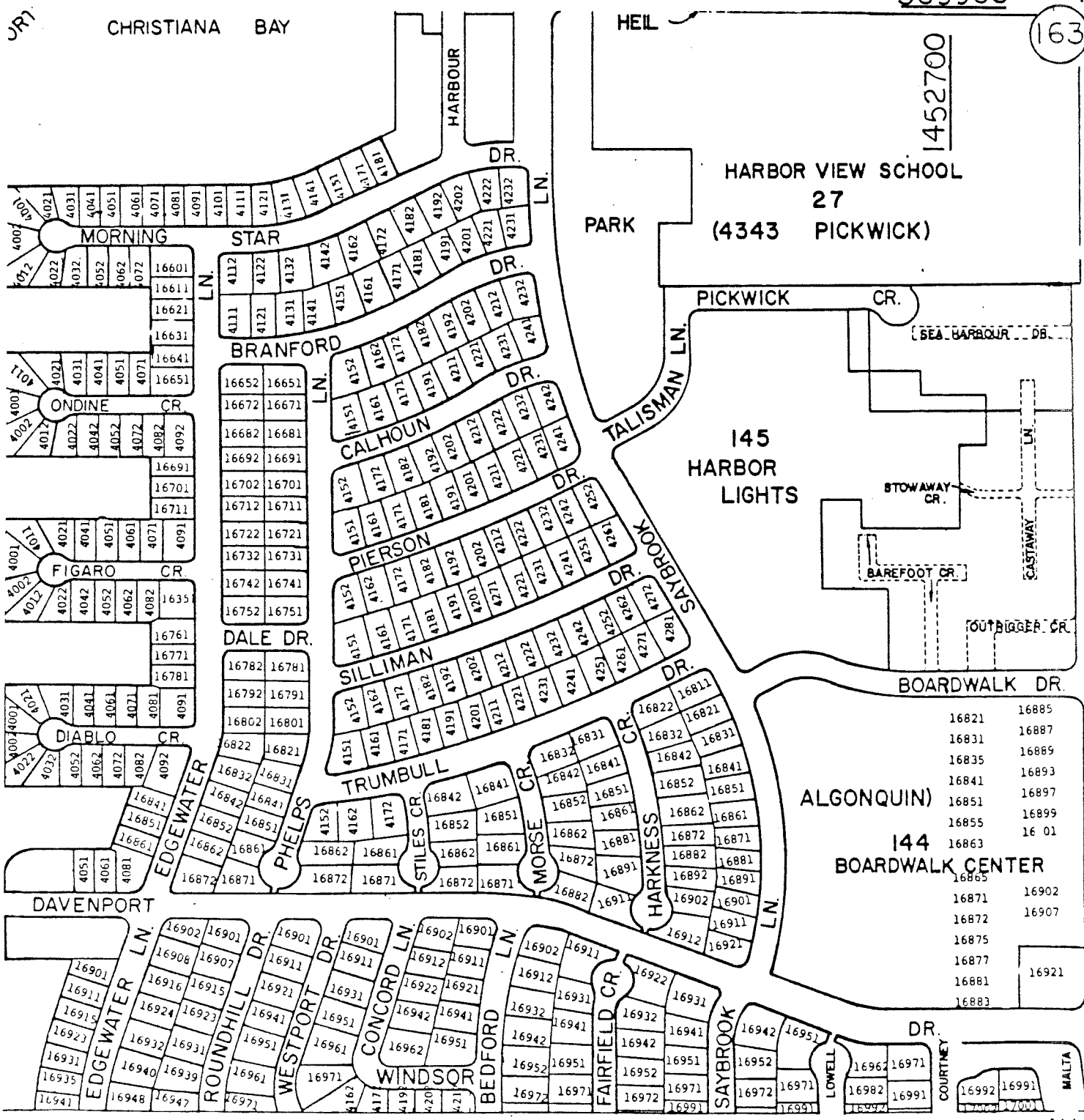
ORANGE COUNTY, CALIFORNIA

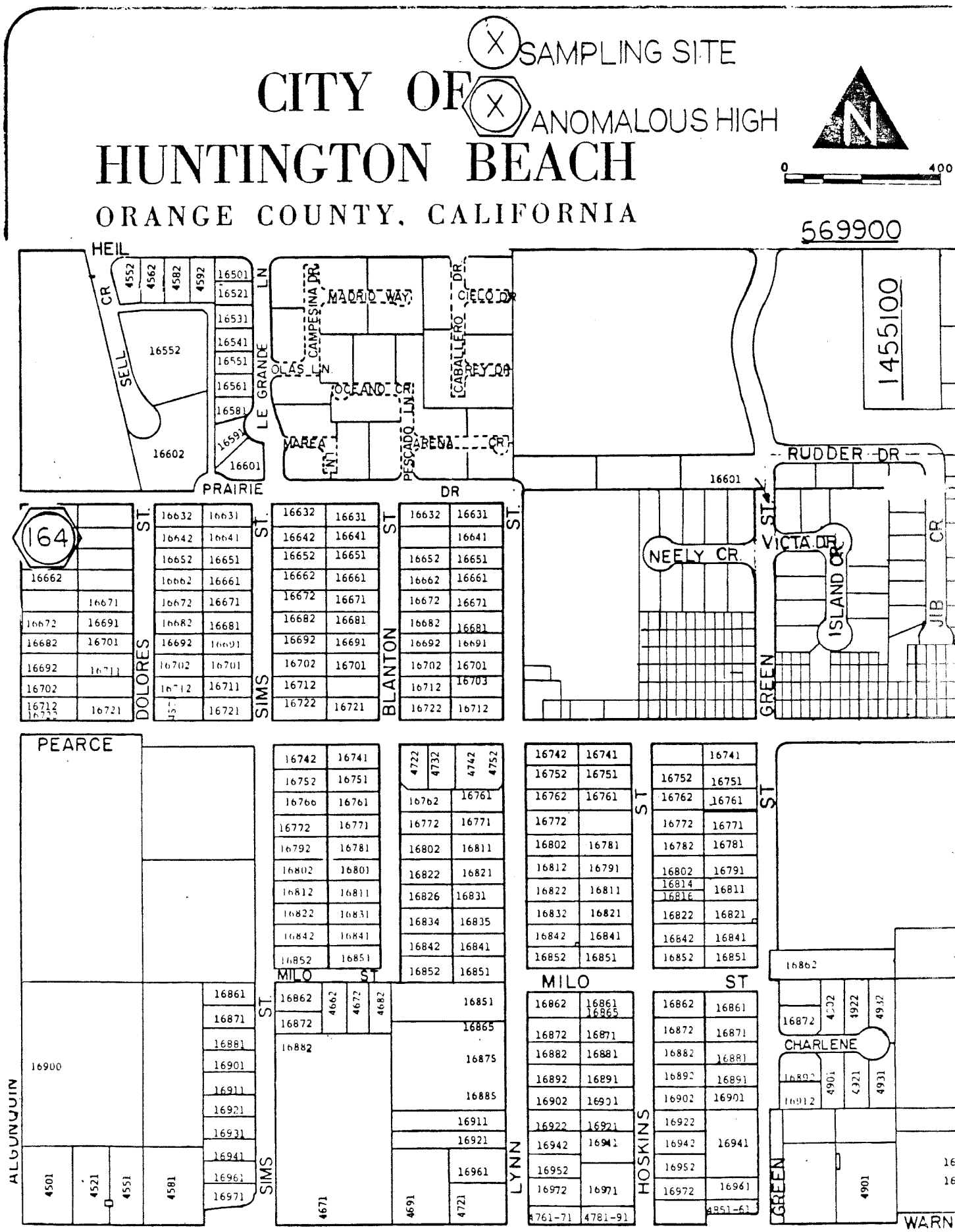


CITY OF HUNTINGTON BEACH

(X) SAMPLING SITE

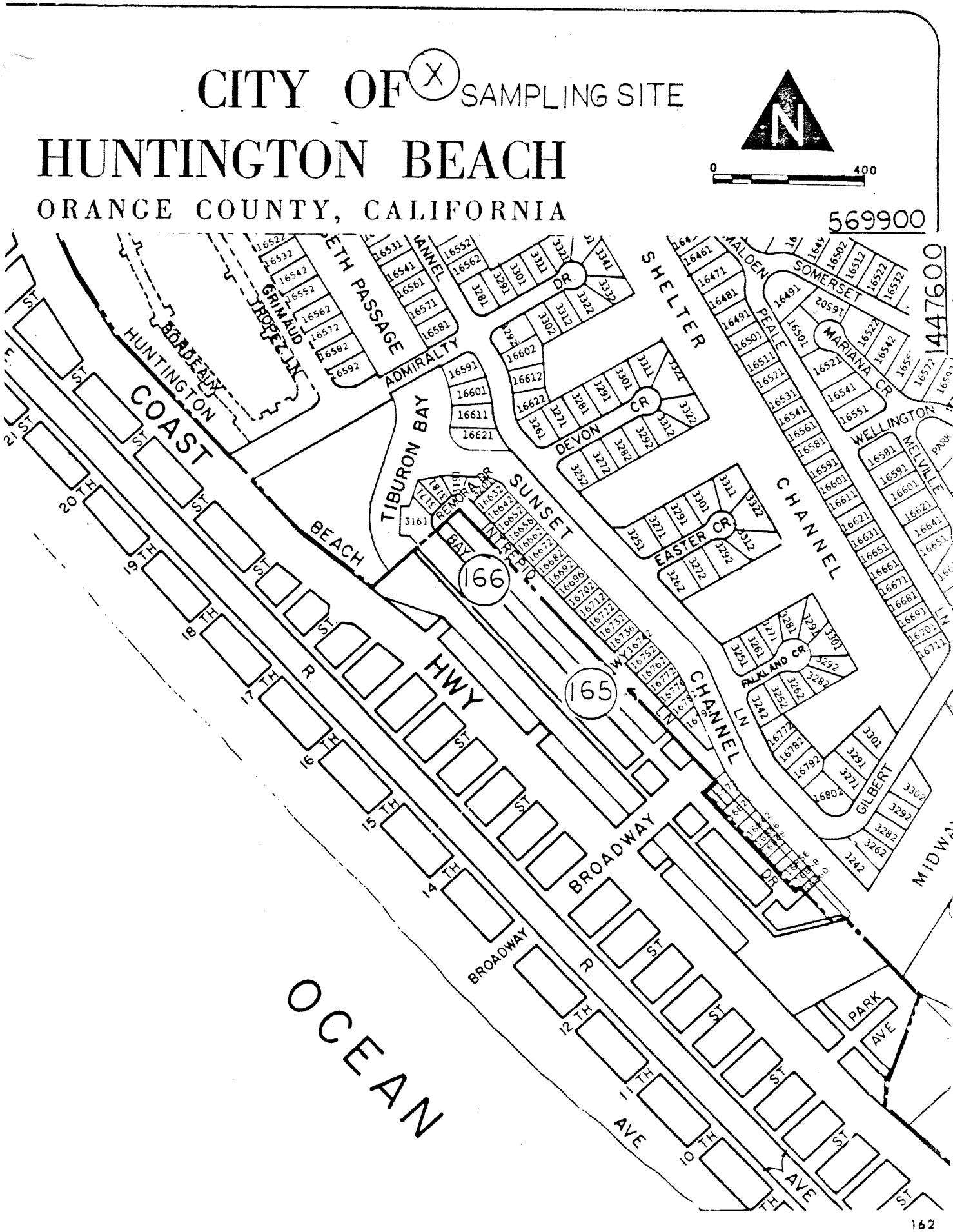
ORANGE COUNTY, CALIFORNIA

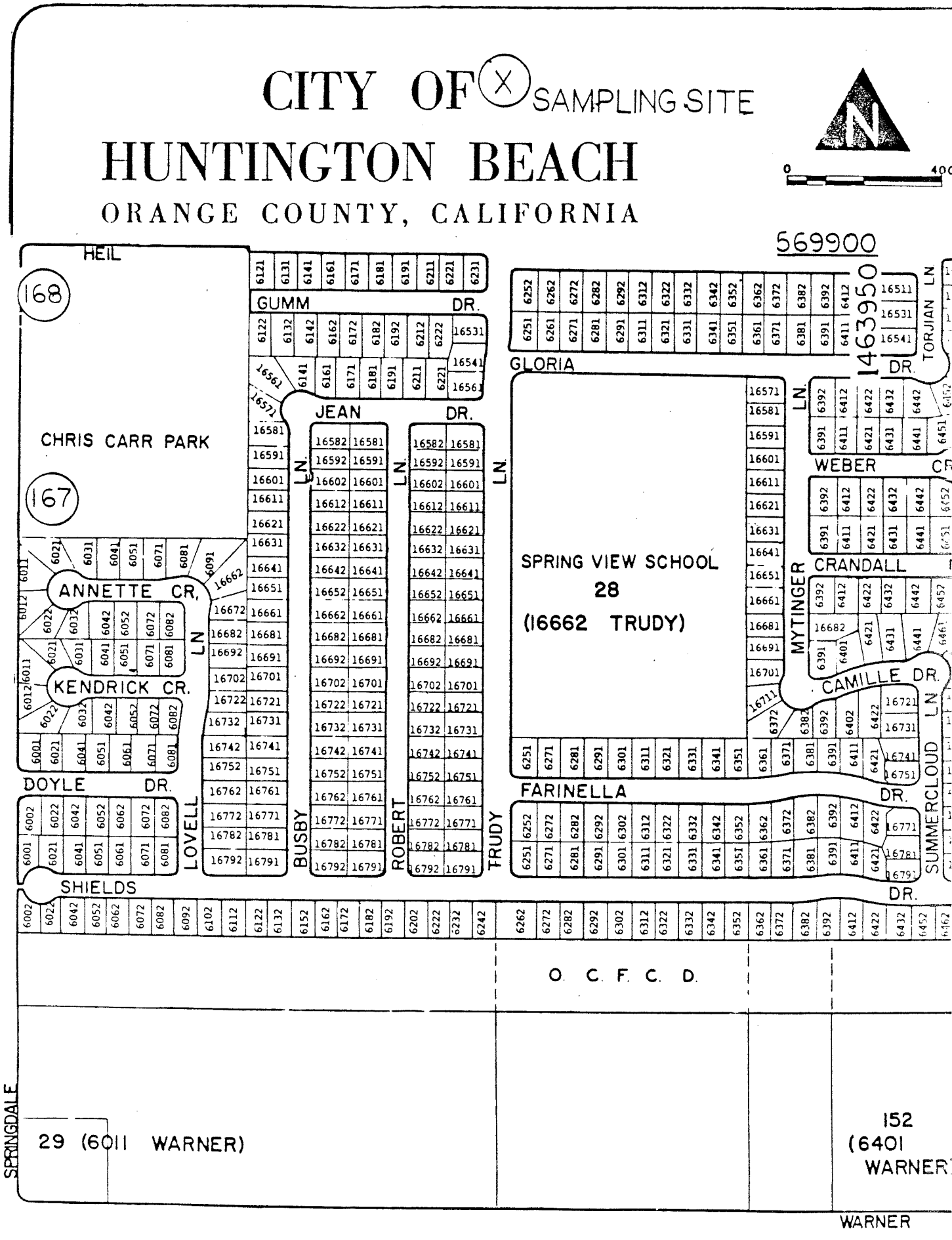



SAMPLING SITE
ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
569900
1455100
HEIL
SELL
LE GRANDE LN
MADRID WAY
CAMPESINA DR
CIECO DR
CABALLERO
REY DR
OCEANO CR
PESCADO LN
MAREA LN
BRISA CR
PRAIRIE
DR
RUDDER DR
NEELY CR
VICTA DR
ISLAND CR
JIB CR
GREEN
164
DOLORES ST
SIMS ST
BLANTON ST
PEARCE
MILO ST
LYNN
HOSKINS
ALGONQUIN
CHARLENE
WARN
16552
16602
16601
16900
4501
4521
4551
4581
4671
4691
4721
4761-71
4781-91
4851-61
4901
4921
4931
4932
16862
16872
16882
16892
16912

CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA




CITY OF HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
X SAMPLING SITE
N
0
400
569900
1463950
HEIL
168
167
CHRIS CARR PARK
GUMM DR.
JEAN DR.
GLORIA DR.
TORJIAN LN.
WEBER
CRANDALL
MYTINGER
CAMILLE DR.
SUMMERCLOUD LN.
FARINELLA DR.
SPRING VIEW SCHOOL
28
(16662 TRUDY)
ANNETTE CR.
KENDRICK CR.
DOYLE DR.
SHIELDS
LOVELL LN.
BUSBY LN.
ROBERT LN.
TRUDY LN.
O. C. F. C. D.
SPRINGDALE
29 (6011 WARNER)
152
(6401
WARNER
WARNER

CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA

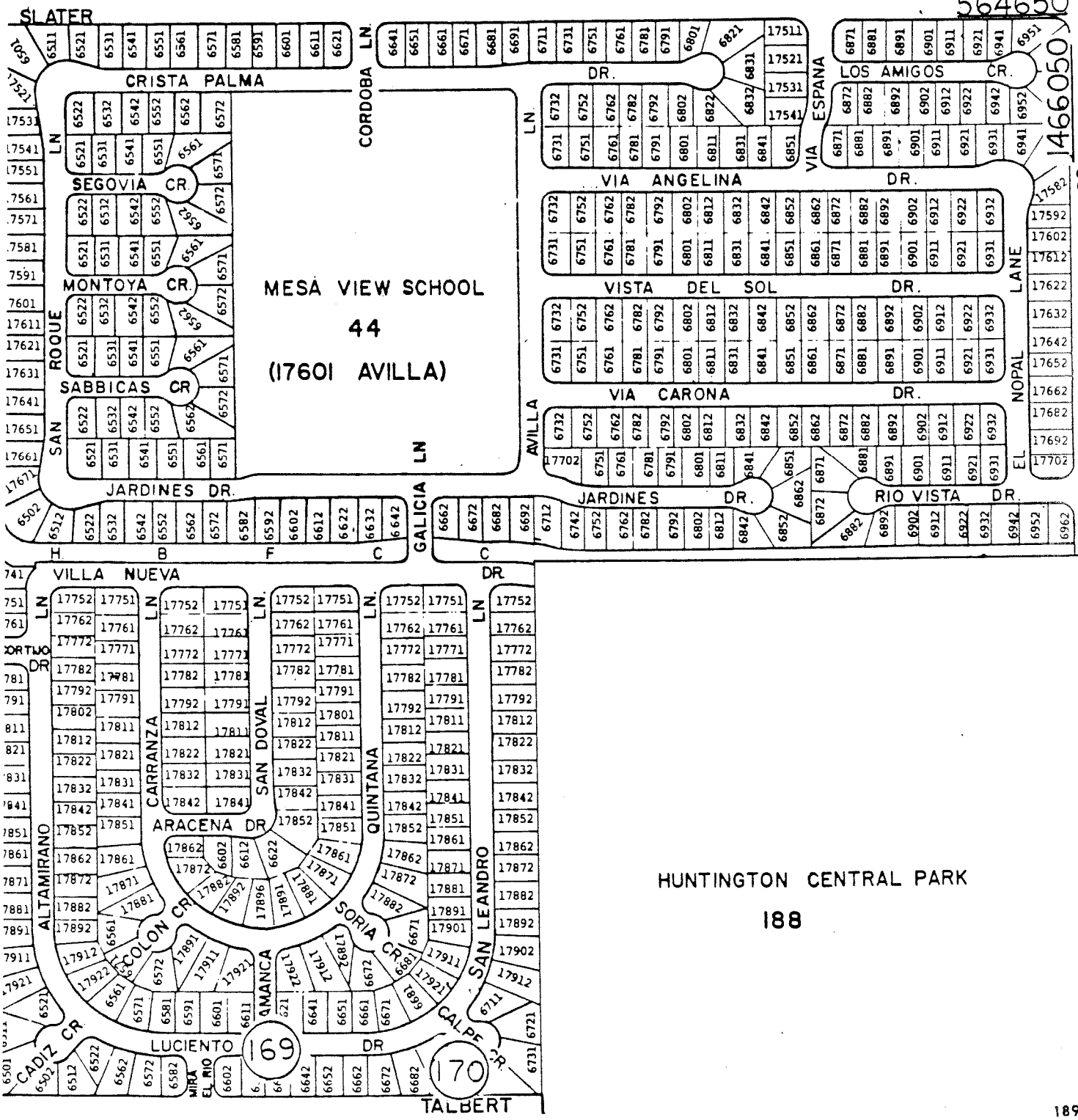
(X) SAMPLING SITE

N

0 400

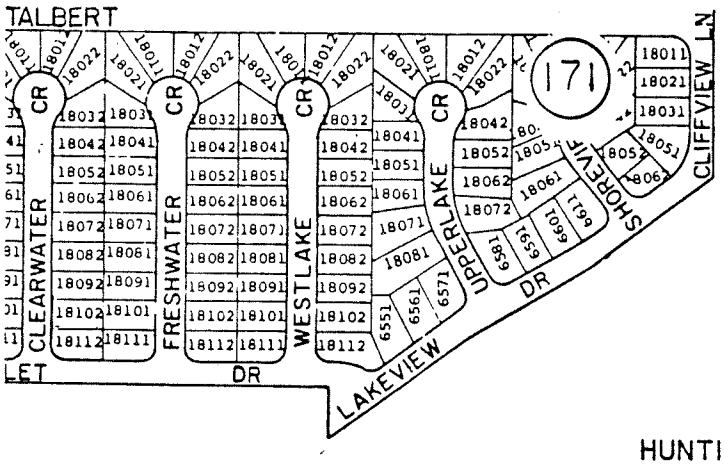
564650

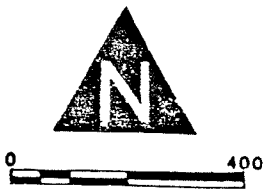
1466050



CITY OF HUNTINGTON BEACH

ORANGE COUNTY, CALIFORNIA





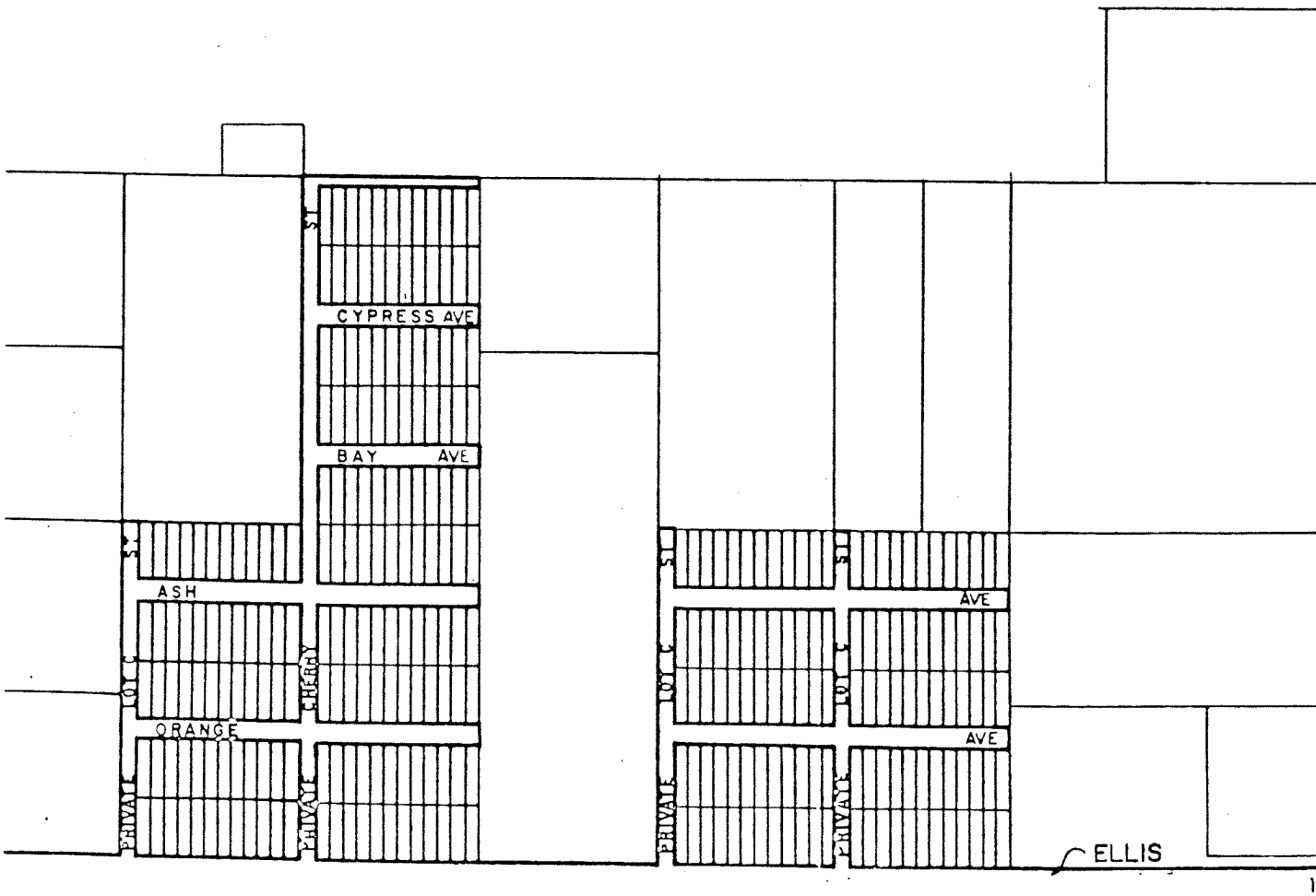
562150

1467000

X SAMPLING SITE

HUNTINGTON CENTRAL PARK

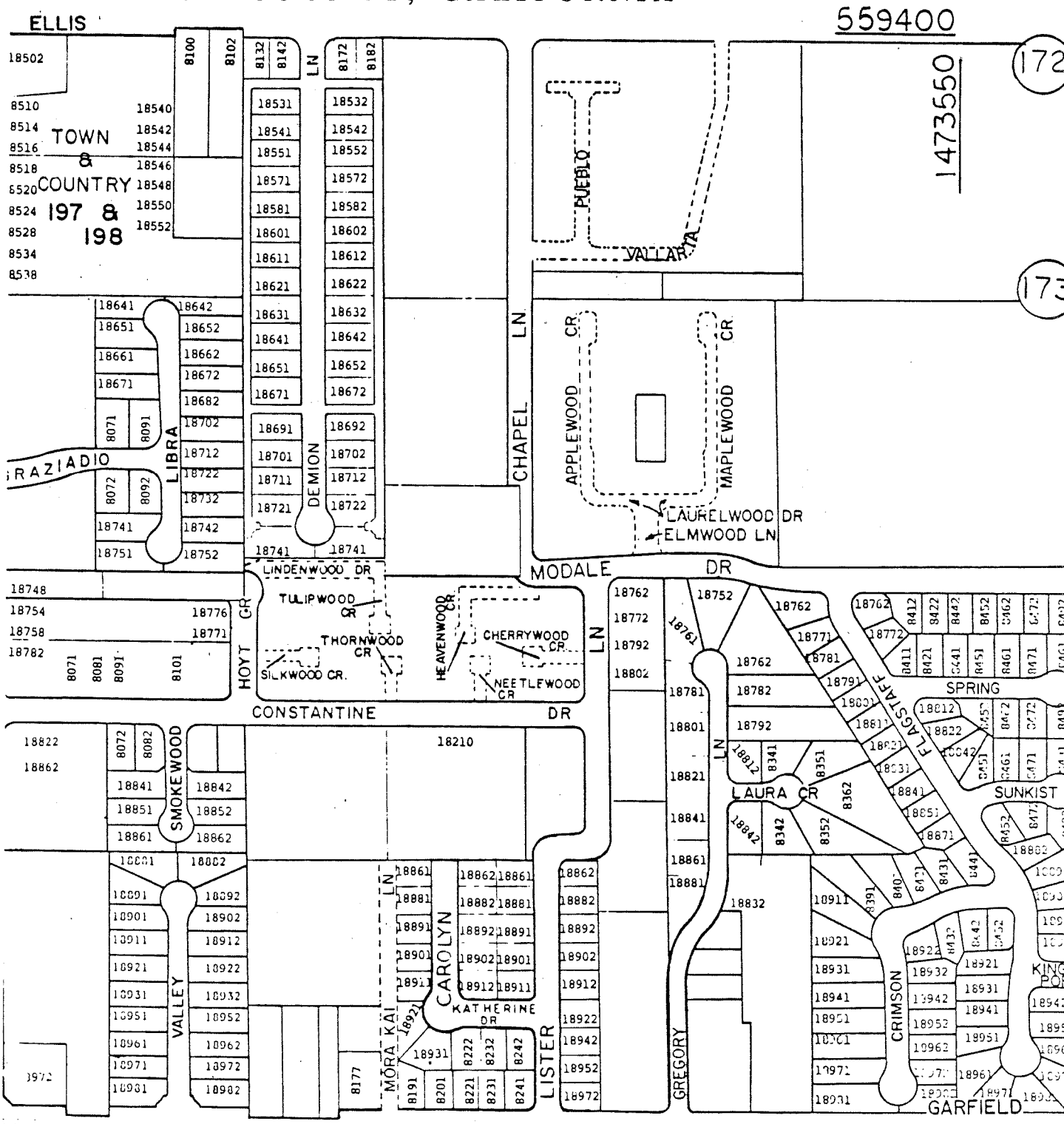
188



CITY OF HUNTINGTON BEACH

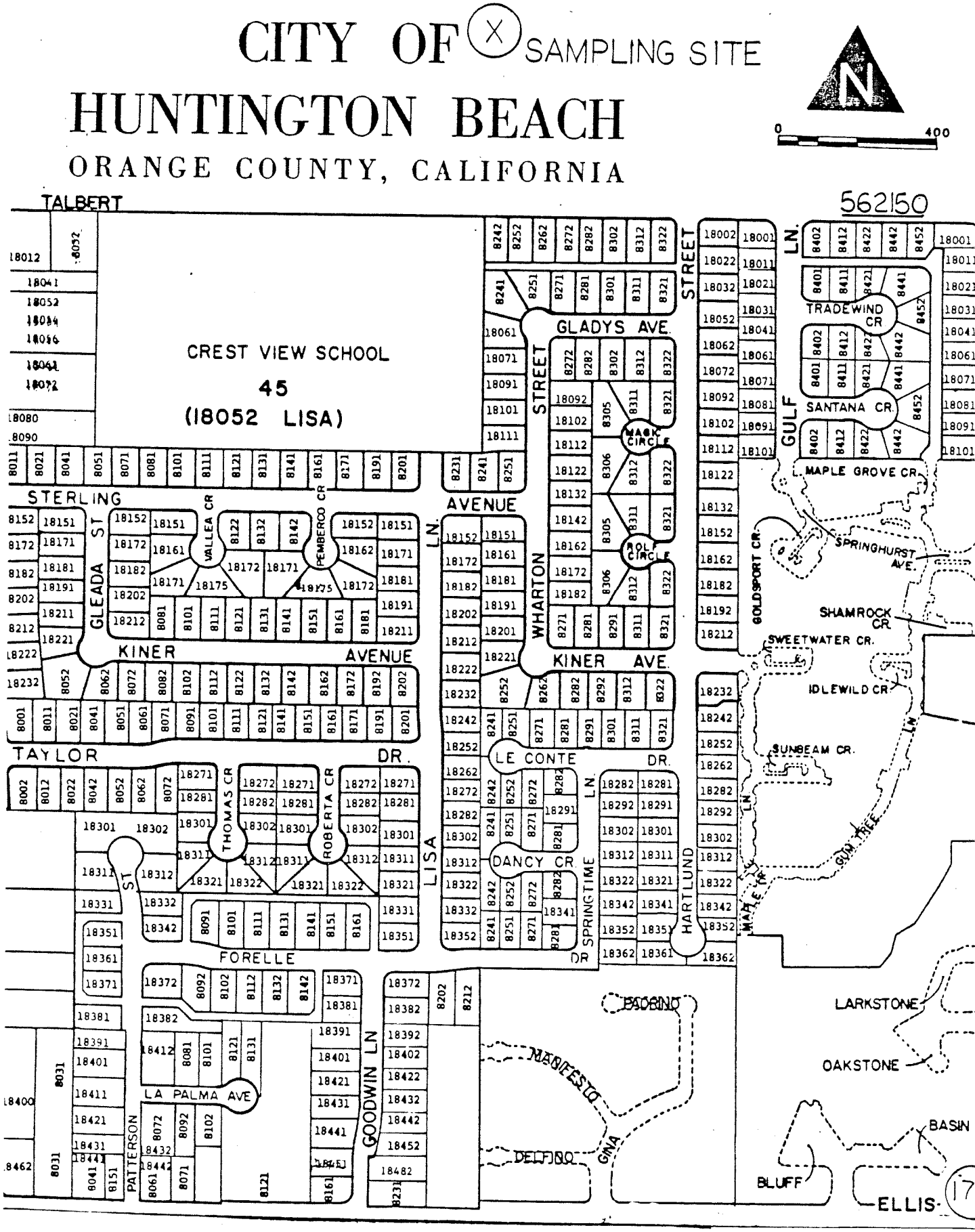
(X) SAMPLING SITE

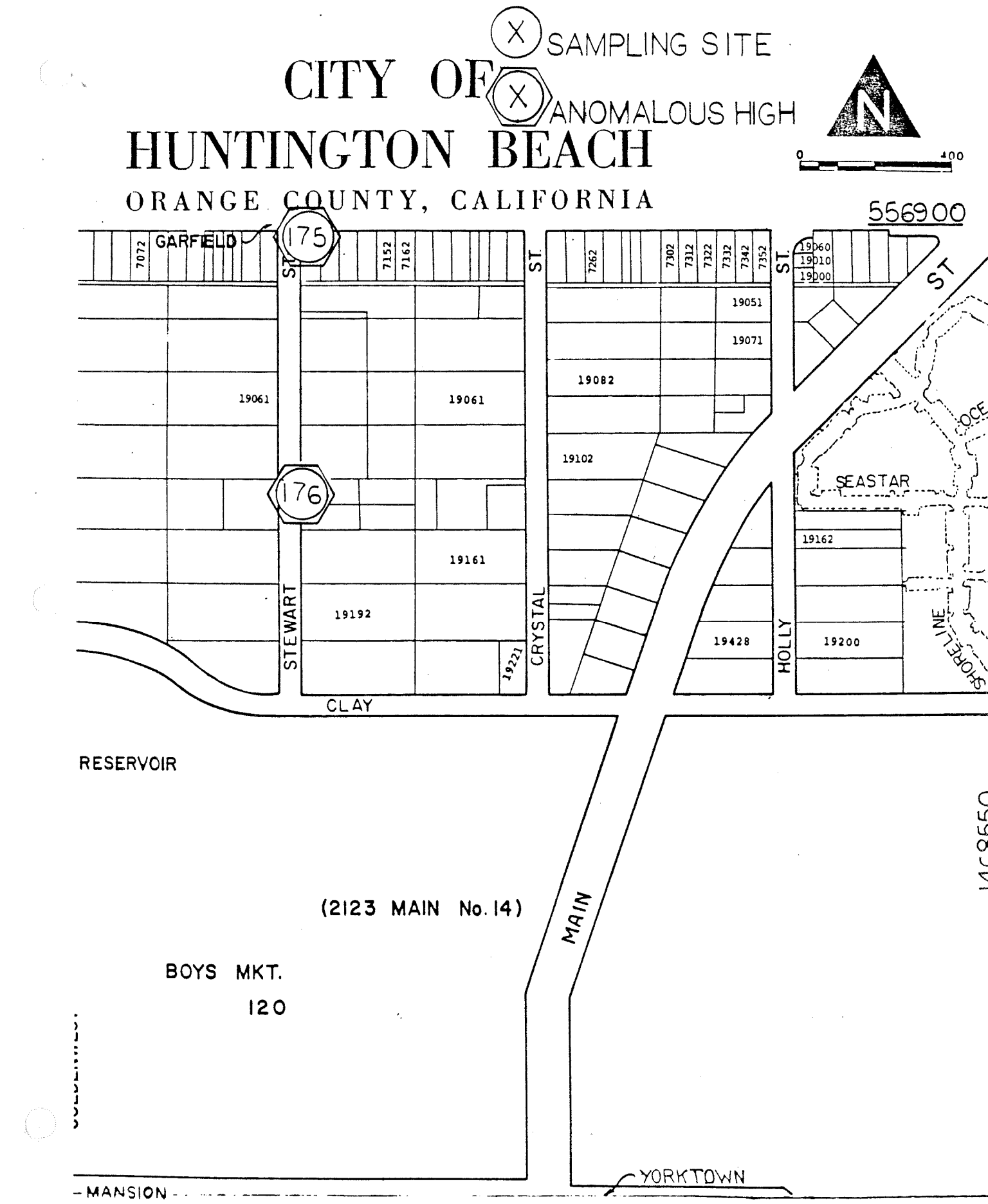
ORANGE COUNTY, CALIFORNIA



CITY OF HUNTINGTON BEACH

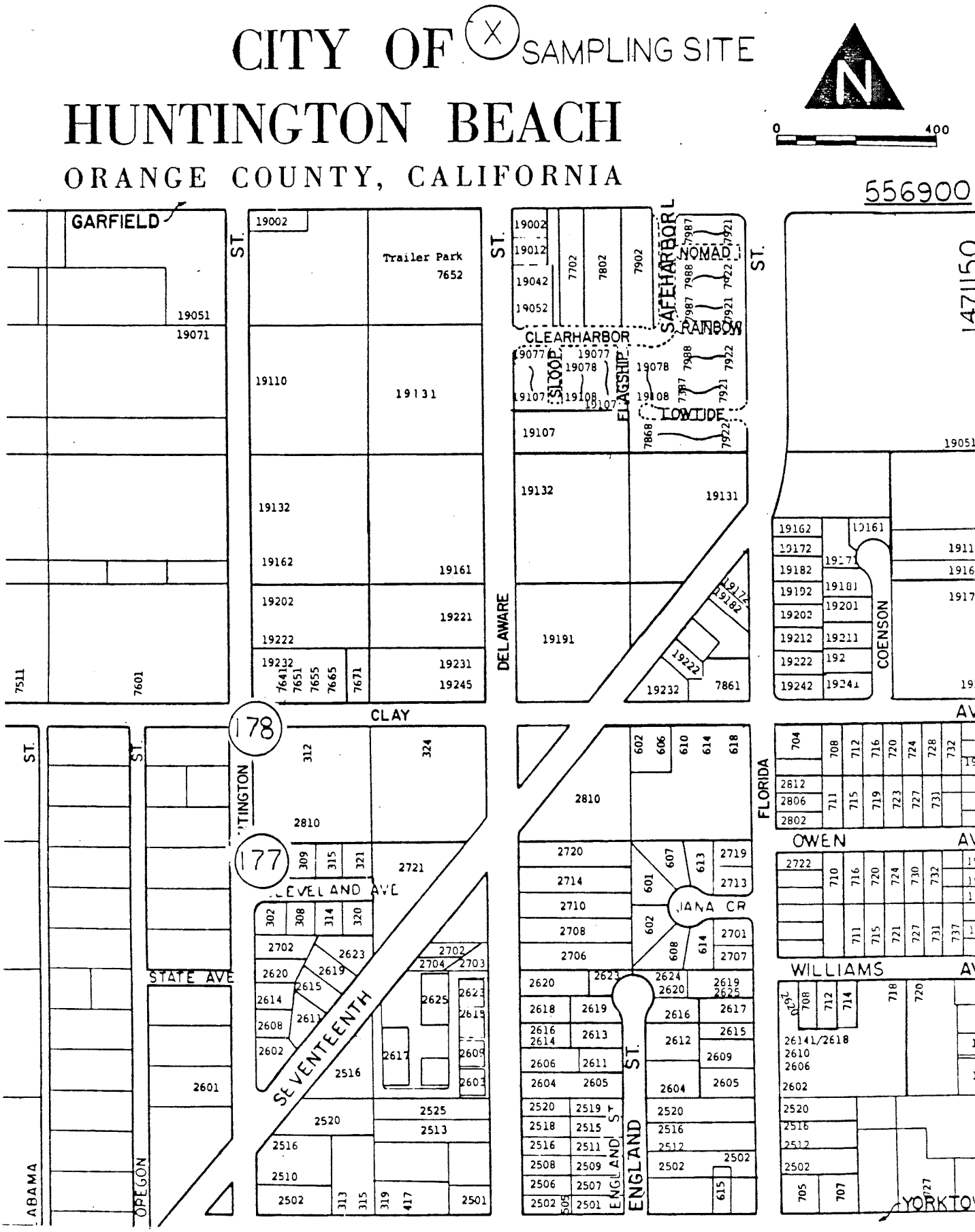
ORANGE COUNTY, CALIFORNIA

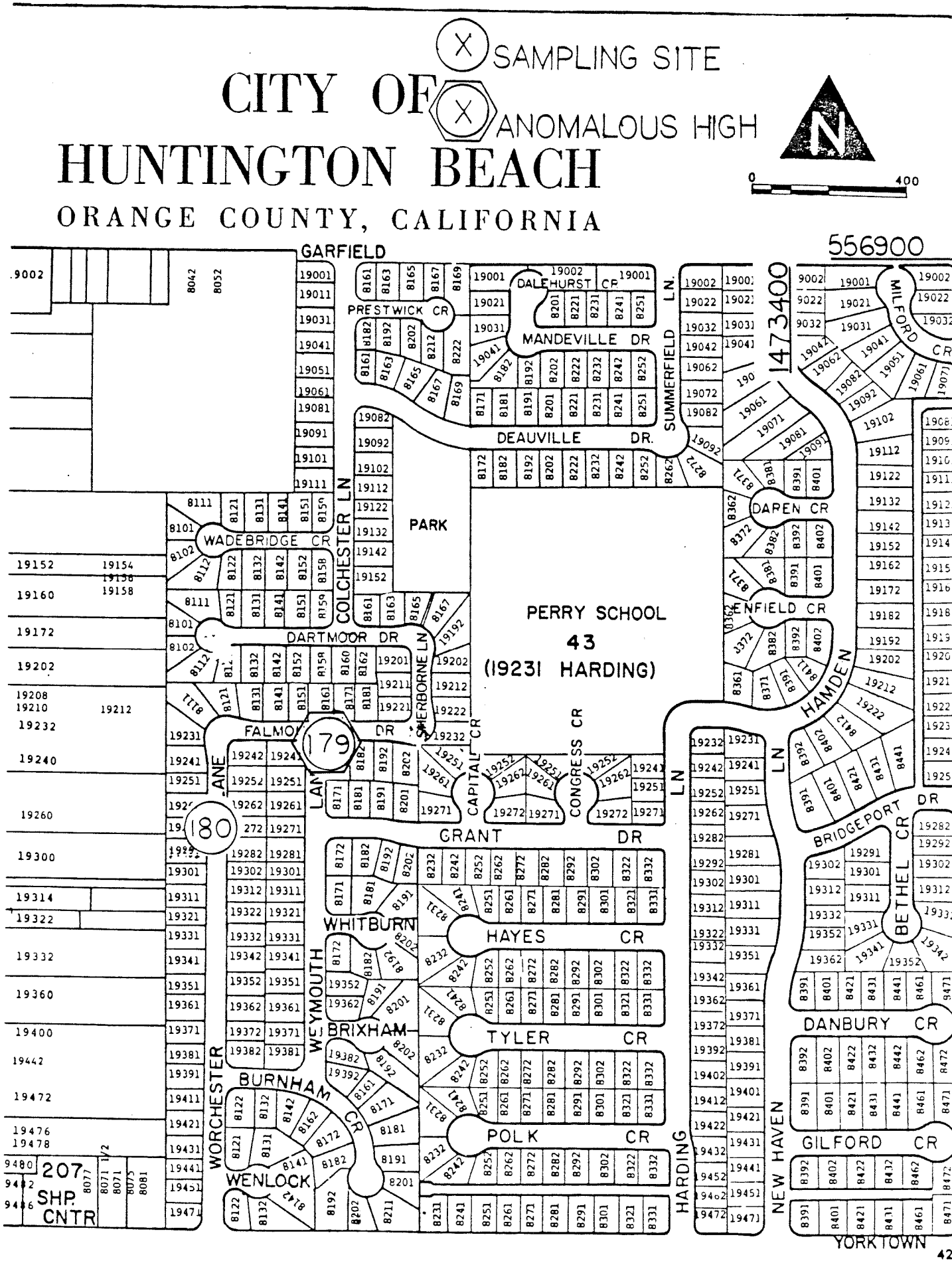



SAMPLING SITE
ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
556900
GARFIELD
175
176
ST.
7072
7152
7162
7262
7302
7312
7322
7332
7342
7352
19060
19010
19000
19051
19071
19082
19102
19061
19161
19192
19221
19428
19200
19162
SEASTAR
STEWART
CRYSTAL
HOLLY
CLAY
RESERVOIR
(2123 MAIN No. 14)
MAIN
BOYS MKT.
120
YORKTOWN
MANSION

CITY OF HUNTINGTON BEACH

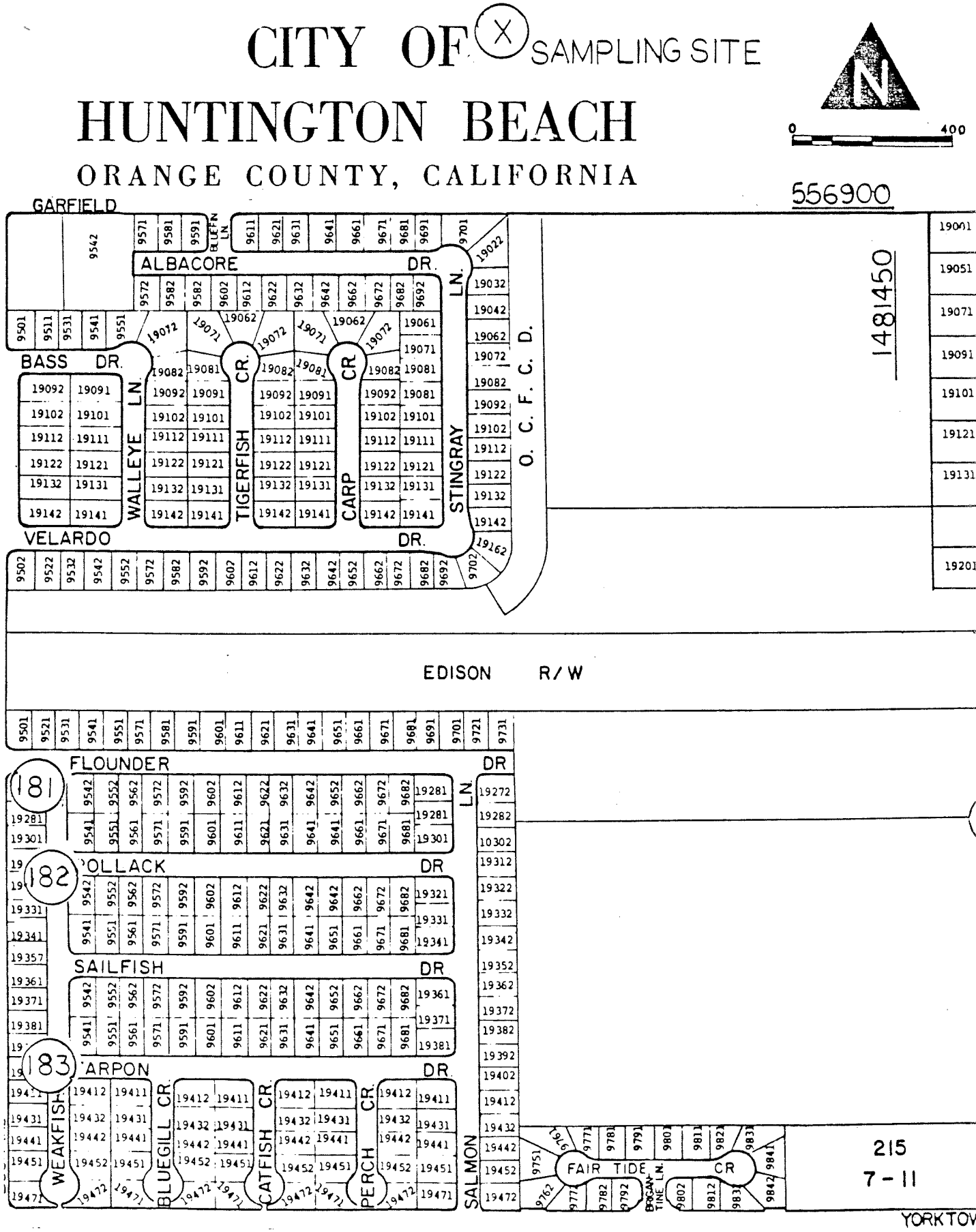
ORANGE COUNTY, CALIFORNIA

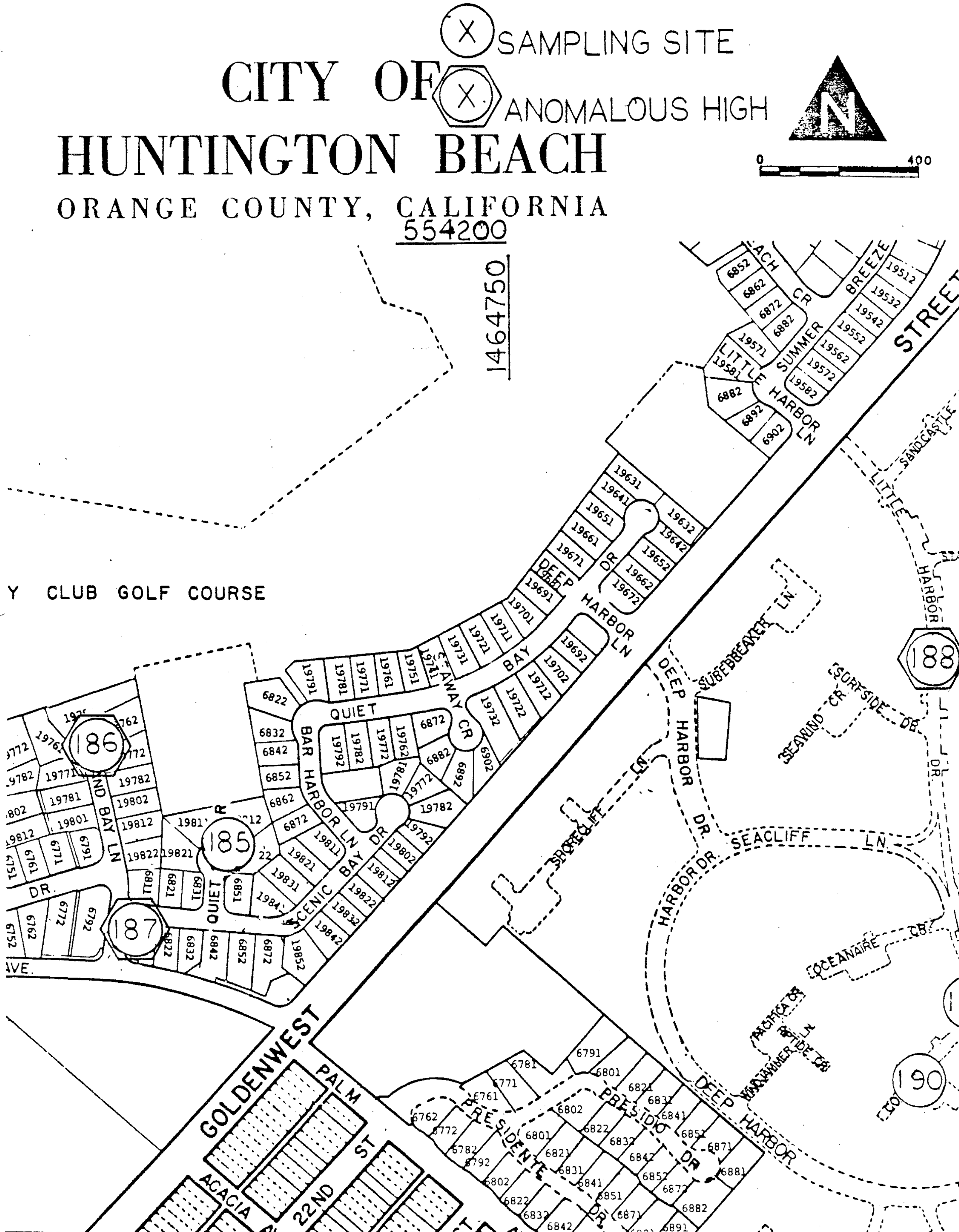



X SAMPLING SITE
X ANOMALOUS HIGH
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
N
0
400
556900
1473400
GARFIELD
PRESTWICK CR
DALEHURST CR
MANDEVILLE DR
SUMMERFIELD LN.
DEAUVILLE DR.
WILFORD CR
DAREN CR
ENFIELD CR
HAMDEN
BRIDGEPORT DR
BETHEL CR
DANBURY CR
GILFORD CR
YORKTOWN
WADEBRIDGE CR
COLCHESTER LN
PARK
PERRY SCHOOL
43
(19231 HARDING)
DARTMOOR DR
SHERBORNE LN
CAPITAL CR
CONGRESS CR
FALMOUTH
LANE
179
180
GRANT DR
WHITBURN
HAYES CR
WEYMOUTH
BRIXHAM
TYLER CR
BURNHAM CR
POLK CR
WORCHESTER
WENLOCK
HARDING LN
NEW HAVEN LN
207
SHP. CNTR

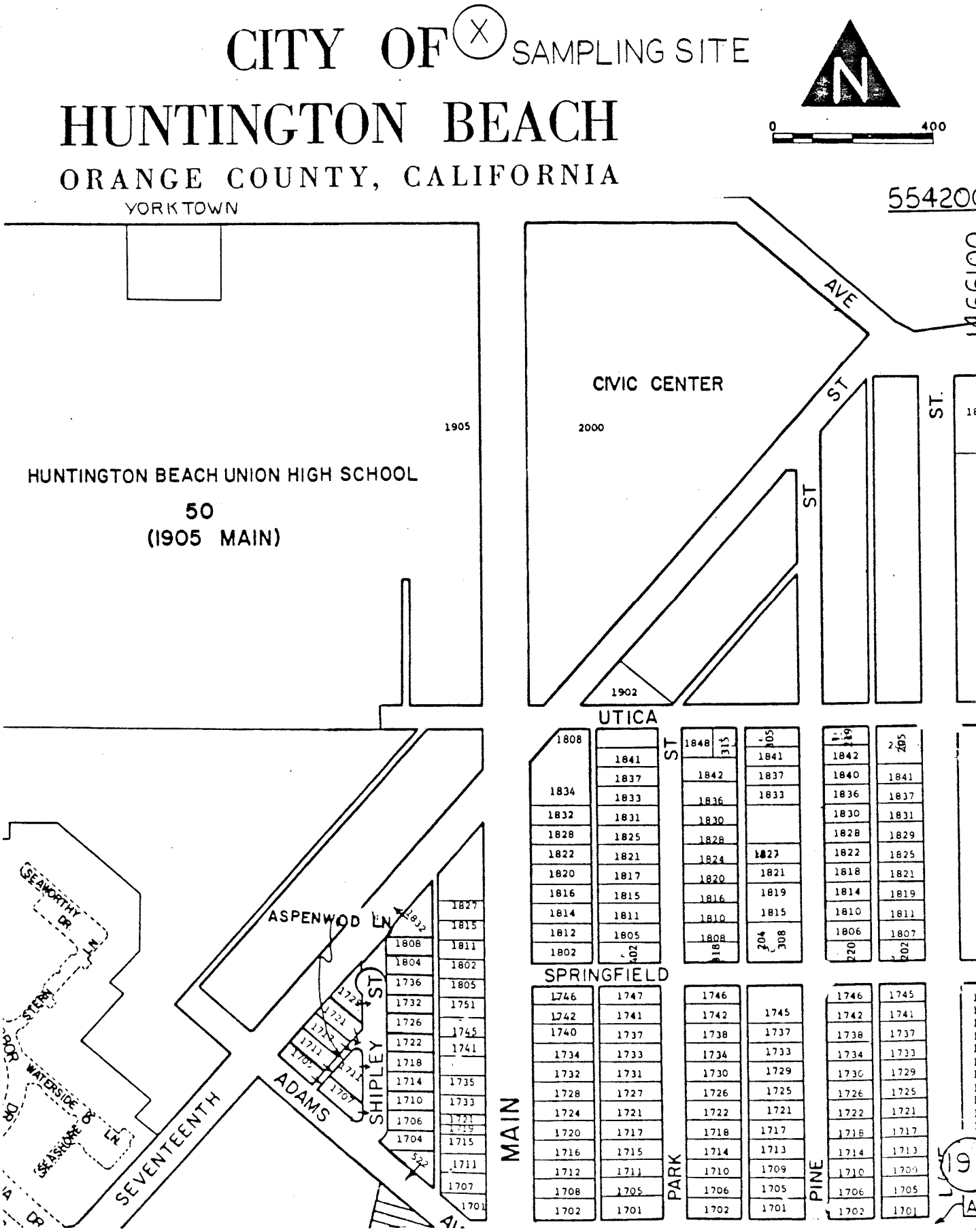
CITY OF HUNTINGTON BEACH

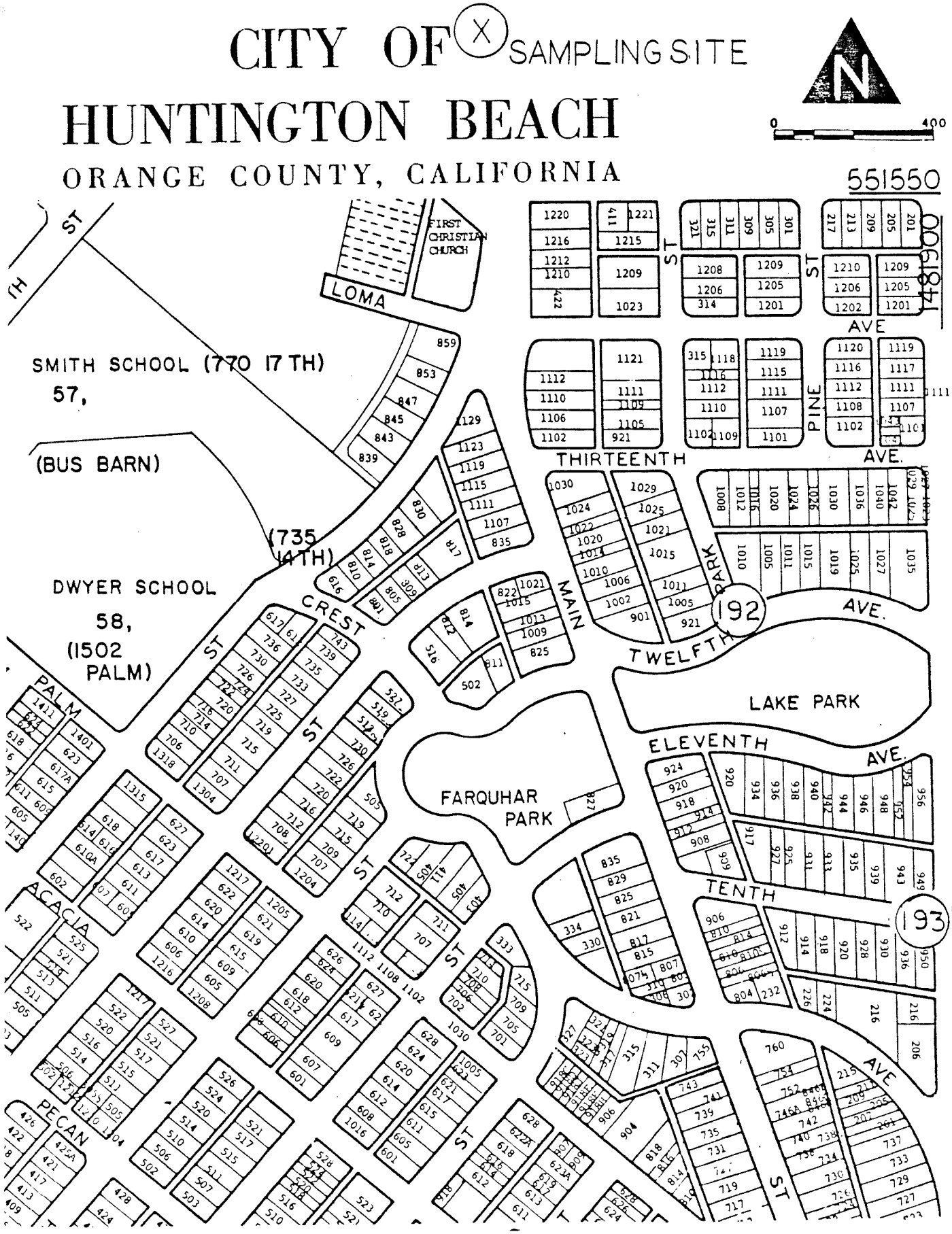
ORANGE COUNTY, CALIFORNIA





SAMPLING SITE
ANOMALOUS HIGH
N
0
400
CITY OF
HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
554200
1464750
Y CLUB GOLF COURSE
STREET
GOLDENWEST
DEEP HARBOR DR
DEEP HARBOR LN
QUIET BAY DR
BAR HARBOR LN
SCENIC BAY DR
LITTLE HARBOR LN
SUMMER BREEZE
SEACLIFF LN
HARBOR DR
PRESIDENTE DR
PRESIDIO DR
PALM
ACACIA
22ND ST
OCEANAIRE CR
SURFSIDE DR
SURFBREAKER LN
SHORECLIFF LN
185
186
187
188
190


CITY OF HUNTINGTON BEACH
ORANGE COUNTY, CALIFORNIA
X SAMPLING SITE
N
0
400
YORKTOWN
HUNTINGTON BEACH UNION HIGH SCHOOL
50
(1905 MAIN)
1905
CIVIC CENTER
2000
1902
AVE
ST
ST.
UTICA
SPRINGFIELD
ASPENWOD LN
SHIPLEY ST
ADAMS
SEVENTEENTH
MAIN
PARK
PINE
SEAWORTHY DR.
STORY
WATERSIDE
SEASHORE LN


CITY OF HUNTINGTON BEACH
X SAMPLING SITE
ORANGE COUNTY, CALIFORNIA
N
0
400
551550
1481900
SMITH SCHOOL (770 17 TH)
57,
(BUS BARN)
(735 14TH)
DWYER SCHOOL
58,
(1502 PALM)
FIRST CHRISTIAN CHURCH
LOMA
ST
CREST
MAIN
PARK
PALM
ACACIA
PECAN
PINE
AVE.
THIRTEENTH
TWELFTH
ELEVENTH
TENTH
LAKE PARK
FARQUHAR PARK
192
93
LAKE

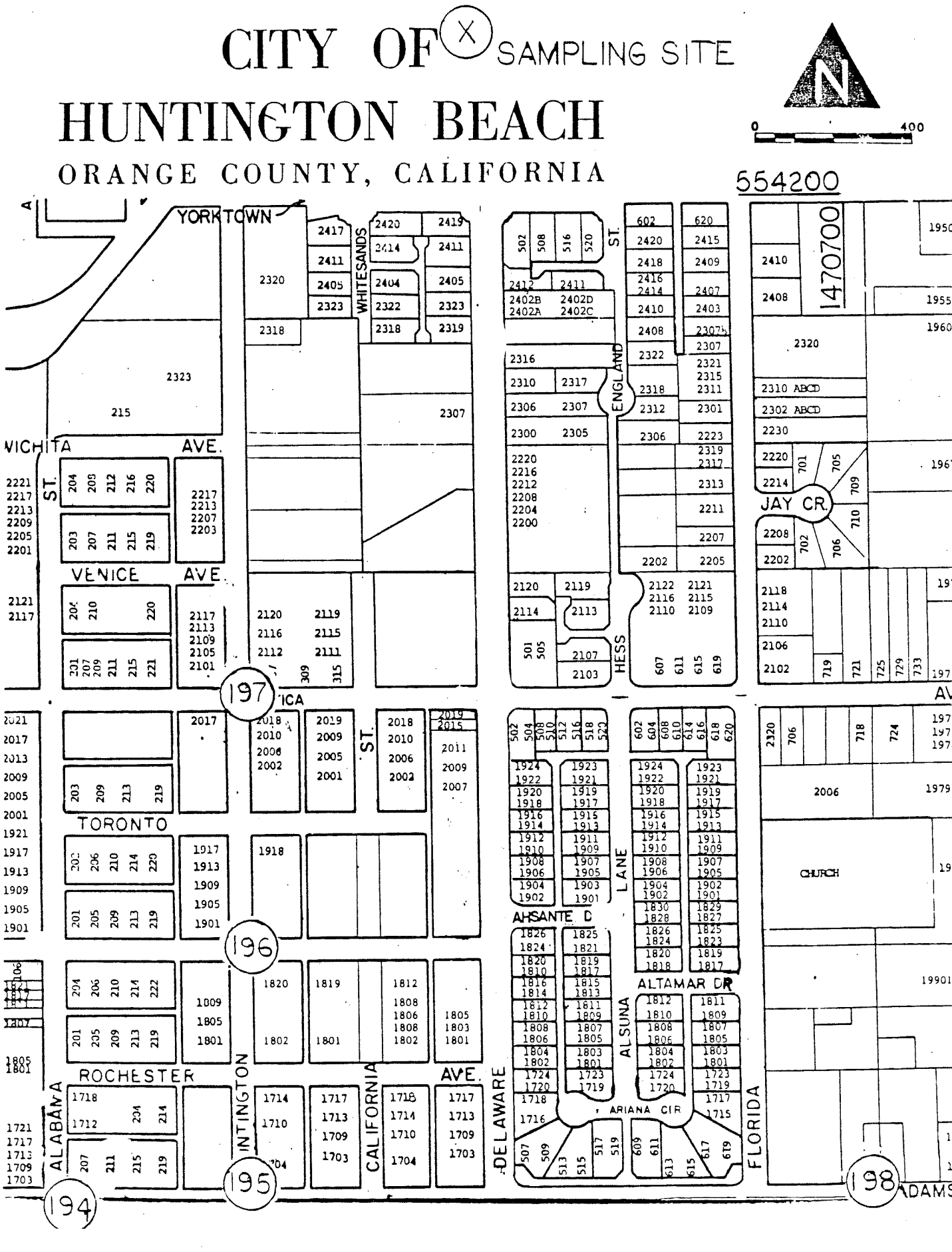

CITY OF HUNTINGTON BEACH
X SAMPLING SITE
ORANGE COUNTY, CALIFORNIA
N
0
400
554200
1470700
YORKTOWN
WHITESANDS
ENGLAND
HESS
JAY CR.
WICHITA AVE.
VENICE AVE.
TORONTO
ROCHESTER
ALABAMA
INTINGTON
CALIFORNIA
DELAWARE
ALSUNA
LANE
ALTAMAR DR
ARIANA CIR
FLORIDA
CHURCH
ST.
AVE.
197
196
195
194
198

FIGURE 12

TABLE "HB"

Identified Anomalies and/or Seeps with Probable Origin

4(B)H
5(B)
6(B)H
7(B)
8(B)
13(B)H
16(B)
18(B)
21(B)
22(B)
23(B)H
27(B)H
30(B)H
34(B)H
52(B)
53(B)H
54(B)H
55(B)
56(B)
58(B)
59(B)H
60(B)
61(B)D
62(B)H
63(B)H
64(B)H
65(B)
66(B)
67(B)
68(B)D
69(B)H
70(B)
71(B)
73(B)
74(B)
75(B)
77(B)
79(B)
81(B)
85(B)
89(B)
90(B)
91(B)
92(B)
94(B)
95(B)
96(T)D
97(B)H
98(B)
99(B)
100(B)
103(B)
104(B)
107(B)
109(B)D
110(B)D
111(B)
112(B)
113(B)
114(B)
115(B)
116(B)
117(B)
123(B)
124(B)D
126(B)H
127(B)H
129(B)
135(B)
136(B)
137(B)
138(B)
140(B)
144(B)
145(B)
146(B)
148(B)
149(B)
150(B)
152(B)
153(B)
154(B)
157(B)
159(B)
175(B)
176(B)
179(B)
186(B)H

187(B)

188(B)

189(B)D

(199) ?

B = Biogenic

T = Thermogenic

H = Hazardous

D = Dangerous

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

September 26, 2019

TO: Supervisor Janice Hahn, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Kathryn Barger

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

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

In accordance with the Board's motion, the Strike Team is submitting the seventh update report to the Board for the oil and gas subject areas within the unincorporated Los Angeles County listed below. This report is the second of six update reports for the Phase II effort. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines
- Oil and Gas Storage Facilities
- Review of Chemicals not identified in Hazardous Materials Business Plans

The Strike Team held a public meeting on September 24, 2019 to discuss the seventh update report and to hear public comment. The Strike Team passed a motion to direct staff to file this report with the Board. The next Strike Team report is due to the Board no later than March 29, 2020.

Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement – West Area Section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AJB:JS:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_20190924-report7.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

S_092619_LUR_L_OIL&GAS

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 23, 2019

TO: Supervisor Janice Hahn, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Kathryn Barger

FROM: AG Alex Garcia, Supervisor
Zoning Enforcement Special Projects

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning (DRP), in coordination with the Fire Chief, Director of the Department of Public Health, and Director of the Department of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Strike Team's seventh biannual report was submitted to the Board on September 26, 2019.

The Board also requested that a five-member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team to assess the team's findings and recommendations and to provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. The appointed Advisory Panel members are:

- First District Board Office appointee – Julia May
- Second District Board Office appointee – Andrew Weissman
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani

- Fifth District Board Office appointee – R. Rex Parris

The Advisory Panel's public meeting was held on October 21, 2019 to discuss the Advisory Panel's assessment of the Strike Team's report. Those Advisory Panel members who participated in the meeting were:

- First District Board Office appointee – Julia May
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani

This submittal includes the Advisory Panel's assessment of the Strike Team's seventh biannual report, including written comments from Advisory Panel members appointed by the First, Third, and Fourth Supervisorial Districts. The Advisory Panel report can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

The next Oil and Gas Strike Team report to the Board is due on March 29, 2020, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement Special Projects section, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AG:ts

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20191023-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Fire Department
Department of Public Health
Department of Public Works

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

Date: 10/22/2019

From: Julia E. May, First District Representative, Los Angeles County Oil & Gas Striketeam Advisory Committee

To: Timothy Stapleton and Board of Supervisors

Re: **Comments on Oil and Gas Assessment Project Phase II – Report Number 2 County of Los Angeles September 24, 2019 on Abandoned & Orphaned Wells, Pipelines, Oil & Gas Storage, and Hazardous Materials use**

These are comments I presented at the Advisory Committee meeting yesterday. We had a robust discussion.

1. **I appreciate the great deal of work** done on the most recent report.

2. **Thank you for adding CalEnviroscreen factors as a prioritization factor for action,** since the last report, as I requested. This identifies abandoned and orphaned wells in low income and highly pollution-burdened community census tracts. More information can be gleaned in the future from such data, although this will require a more detailed look.

3. **I also appreciate the comments of other Advisory Committee members including Timothy O'Connor and Matt Rezvani,** many which still need to be addressed, as do some of my own.

4. **Clearly there are data gaps or difficulties in accessing key information** on abandoned & orphaned wells, pipelines, hazardous material use, storage, and other issues. It appears from the discussion that many of this key infrastructure has not been tracked as necessary over time.

5. **As a result, this investigation is still at an interim point.** Many next steps have been identified, leading to developing recommendations later. Thus my comments are generalized at this point. However, it is clear the process has the potential to lead to much better coordinated and detailed data on oil and gas infrastructure and hazards.

6. **I have a few new requests and comments:**

    a. **I am concerned about follow-up on Mr. Rezvani's comment regarding pipelines owned by larger companies, which have been sold to smaller companies that may not have the same resources**. I strongly support follow-up, as pipeline ruptures onto public streets have occurred in the past.

    b. **Please provide specific locations (such as addresses) of abandoned and orphaned wells,** at least for the highest priority wells.

    c. **Providing all report maps in interactive online format would make them much more useful.** As they are now, many points can be only seen as overlapping

clusters, rather than individual points, and don't provide the report reader with enough specific information on locations. Ability to zoom in with high resolution would make these maps meaningful to local folks.

d. **There is a great need to consider earthquake impacts on health and safety relating to all of the oil and gas infrastructure discussed in the report**. I would appreciate highlighting this recommendation to the Board of Supervisors, since major earthquakes could happen any time. Earthquake issues would be consistent with the efforts to identify health and safety hazards relating to these operations. While it is a major subject, a start needs to be made.

e. **Please include information in the next report about the dramatic explosion at Nustar petroleum storage last week in Northern California, and any similarities between this facility and other Oil and Gas storage facilities in unincorporated LA County.** While the Nustar explosion and burning of two tanks involved ethanol, many nearby tanks were threatened, including crude oil storage. This facility was connected by pipeline to other facilities including the nearby Phillips 66 refinery. The explosion caused shutdown of the nearby freeway for 7 hours, spilling traffic onto local roads, which may have delayed mutual support of other oil industry fire resources. (The fire marshall reported during a press conference that mutual aid fire fighting resources of the petroleum industry had arrived, but this was two hours after the fire started.) Nustar employees were reported to have fled for their lives, failing to turn on fire suppression, but locking the gate, impeding fire department access. The resulting brush fire on the hillside required a helicopter, tractor to cut fire lines, and dozens of fire fighters. There was speculation on whether a small earthquake the night before could have led to this dangerous malfunction.

f. **Please include at least preliminary information in the next report about emergency response resources for fires and explosions relating to oil and gas infrastructure.** Although this is a major topic in itself, this fits with the reports' identified next steps to identify recommendations on health and safety evaluation relating to oil and gas infrastructure.

g. **Please also provide in the next update the chemicals and amounts reported for each company in Table 5.1 -- Facilities with the Largest Quantity of Chemicals,** since the work of pulling this information together is already done. It would be helpful and appreciated for the reader to have the specific information.

h. It would be helpful to have minutes of the Advisory Committee discussion provided after the meeting to the members, and to the Board of Supervisors.

Thank you to the County Board of Supervisors and staff for consideration.

Julia E. May, First District Representative, Advisory Committee, LA County Oil & Gas Striketeam
(Senior Scientist, Communities for a Better Environment, CBE, julia@cbecal.org)

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

October 22, 2019

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Re: Comments of Tim O'Connor (District 3 rep.) and EDF on the LA County Oil Well Strike Team's Biannual Report No. 7 (Phase II, Report No. 2)

Dear Mr. Stapleton and members of the LA County Oil Well Strike Team,

Please accept these comments on the sixth report of the LA County Oil Well Strike Team (Phase II, Report No. 2).

We again commend the effort maintained by your staff and experts to make progress on the lengthy but necessary task of conducting a comprehensive evaluation of the oil and gas industry in Los Angeles - in conformance with the direction within the LA County Board of Supervisors March 29, 2016 motion and follow-on September 4, 2018 direction.

In support of the Strike Team's effort, and to help ensure the work both lays a transparent foundation for appropriate action, and considers the most up to date information, please accept these comments and recommendations for inclusion in the Strike Team report as follows:

Comments on idle, abandoned and hazardous wells

- The Strike Team report proposes a prioritization matrix for idle, abandoned and hazardous wells based on a series of factors, including age of wells/field, proximity to people, and whether the well is in a disadvantaged community as identified within the Cal EnviroScreen 3.0 tool. While the clarity and transparency of the factors going into this prioritization seems appropriate, there may be other relevant indicators of the propensity of a well to leak and cause impacts to human health and the environment. For this reason, the Strike team should affirmatively seek out an external review of the chosen factors / prioritization matrix it has developed. Researchers at Stanford University led by Rob Jackson - rob.jackson@stanford.edu – would be especially capable of performing this review.

- My prior comments made after the first report in this series stated that additional criteria should be considered for the prioritization matrix, such as 1) water level recordings during regular tests by operators and 2) observations in county or other well records of negative integrity indications. While several of my other recommendations for inclusion were taken, an explanation of why these were not would be appreciated.

- In my prior comments I recommended the Strike team seek out water level records from DOGGR (now CalGEM) and add to the matrix a score for whether well records indicate any

communication between well liquids and the surrounding geologic formation. The report includes a reference to this work on page 13, saying that "DOGGR provided DRP with an excel spreadsheet with water level data from idle wells within the Los Angeles County." However, my review of the report did not find anything related to what that data showed or any incorporation into the prioritization matrix. The strike team should provide an explanation of what that data showed and a discussion of its usefulness for evaluating well integrity.

- Recently the California state legislature passed AB 1328 related to idle and abandoned well testing. This bill, thereafter signed by the Governor will result in significant testing for human health and local air contaminants coming from these wells across California. The Strike Team should reach out to state officials at CalGEM in charge of implementing this bill to ensure they are aware of the prioritization matrix that has been developed, and to capitalize on the investment in air monitoring that will be conducted by the state – making sure it is being deployed to advance the study of wells envisioned in this project.

- With respect to the next steps in this process, it is clear that the Strike Team plans to visit some or all high priority wells and evaluate their condition. Some of these wells are likely to be located under structures or on private land. Further, some of these wells are likely going to be leaking hydrocarbons or other compounds. To ensure the strike team performs a meaningful assessment of each of these wells, a clear protocol for site evaluation is needed. The Strike team should therefore share the draft site evaluation protocol with the panel before it becomes final and put to use, including the methodology that will be employed for finding the well, notifying the well owner in advance, sampling air emissions at the well, and dealing with wells that are inaccessible.

Comments on the evaluation of pipelines

- Based on the report and comments at the October 21, 2019 meeting of the Advisory Panel, it appears that the Strike Team plans to create a prioritization matrix for pipelines as it is doing for idle wells. This is an important task and the proposed criteria being used appear to be appropriate for this action. In addition to those proposed for evaluation though (and included in my prior letter from April 2019), the Strike team should include the additional factor of whether the pipeline operator has paid for and is maintaining a valid certificate of conveyance for operation in the public right-of-way. Operators who are not maintaining their permits according to the law are less likely to be keeping abreast of pipeline quality, and thuis may be an indicator of pipeline integrity.

- As stated in the report, the actual miles of pipe listed for natural gas does not include So Cal Gas data. To the extent the report includes a number for miles of pipe in natural gas service, it should strive for accuracy by seeking out and including So Cal Gas pipeline data.

Comments on the evaluation of oil and gas storage facilities

- Although this comment was made in my prior letter of April 2019 to the Strike Team, it is of renewed relevance because the Strike Team is only now getting to the evaluation of storage

systems. The Strike Team should conduct a thorough assessment of the Playa Vista gas storage facility owned and operated by So Cal Gas. At that facility, nearby residents have complained for years of strong odors and releases of gas. As a result, the Strike team should seek out the information for nearby residents and open the door to enhanced participation in this area of the report. To the extent that the county decides the facility is not within the charge area of the study, the Strike Team should provide a clear explanation why not, and then evaluate the lateral extent of subsurface stored gas to determine whether any below-ground gas storage extends into the county as opposed the facility fenceline.

Comments on the evaluation of hazardous chemicals

- My prior letter of April 2019 includes numerous comments on this issue. I reiterate those here since the Strike team has made little progress on this issue.

- As it relates to hazardous chemicals, the report seems to miss a discussion of the chemicals and constituents that are naturally entrained in the oil itself (and brought to the surface through produced water), or contained in leaks from oil and gas sites. As a result, it appears that the Strike Team is reading its direction form the board on this issue "Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans" in an overly narrow manner – because there are many chemicals that can be found from the oil and gas itself.

- As to the chemicals entrained in oil and gas leaks, there has been a lot of research – one such research report was written by EDF and summarizes a lot of the science on the hazardous compounds found in leaks. - https://www.edf.org/sites/default/files/california-monitoring_filling-the-void.pdf You can also see a CARB report on chemicals included in oil and gas leaks by Sage Environmental – CARB, (2015), "Air Resources Board RFP No. 13-414: Enhanced Inspection & Maintenance for GHG & VOCs at Upstream Facilities—Final (Revised)," Prepared by Sage ATC Environmental Consulting LLC, https://www.arb.ca.gov/cc/oil-gas/sage_i&m_ghg_voc_dec2016.pdf

- Given that the hazardous chemicals associated with hydraulic fracturing processes can additionally be used in on-site storage facilities and transportation of oil and gas, information related to their usage in such processes.

- As to produced water, much has been written about this. In considering spills of produced water, the Strike Team should investigate further the presence of hazardous chemicals such as benzene and compare the level of chemicals present to established exposure limits.

Thank you for considering these comments moving forward.

Sincerely,

Timothy O'Connor
County District 3 Representative, Oil and Gas Strike Team Advisory Panel
Senior Director and Senior Attorney, Energy Program, Environmental Defense Fund

FOURTH DISTRICT
ADVISORY PANEL MEMBER
MATT REZVANI
COMMENTS

October 17, 2019

Timothy Stapleton, AICP
Zoning Enforcement West
Department of Regional Planning
320 W. Temple Street
Los Angeles, CA 90012

Subject: Strike Team's Biannual Report number 7 - Comments of Matt Rezvani, representing 4th District.

Dear Mr. Stapleton and members of the LA County Strike Team,

We appreciate the efforts of the strike team and the staff in this lengthy task of obtaining an inventory and determining the status of oil and gas wells, pipelines and facilities in unincorporated sections of LA County.

My comments on this report addresses three areas: Abandoned and Orphan Wells, Hazardous Liquid Pipelines and Chemicals present in LA County.

Abandoned and Orphan Wells

As is evident in the report, there are significant numbers of abandoned and orphan oil and gas wells in LA County. Some of which, from time to time, present safety and possibly health hazards to members of the community. As it has been appropriately reported, rework and closure of these old wells is the responsibility of DOGGR. The county should advocate additional state funding for identifying and prioritizing and closing of the old orphan wells according to the latest well closure standard.

Hazardous Liquid Pipelines

The report does a great job of identifying federal and state laws and regulations, as wells as the regulatory agencies having jurisdiction over oil and gas pipelines. The report also identifies the number of lines and the operators. Unfortunately, the report lacks the maintenance data the status, and the leak history on these lines.

In the past few years a great number of oil pipelines in California, and in LA County that were historically owned and operated by reputable large oil companies have been acquired by investment firms with limited resources. It is significantly important for the county to understand the status of these pipelines, their maintenance records and leak history. Additionally, aside from Hazardous Liquid Pipelines there may be a number of pipelines that carry hazardous materials that may not be included in the definition of Hazardous Liquid Lines. Those could be lines transporting hazardous liquids and/or gases such as Anhydrous Ammonia,

Hydrogen, Sulfuric acid and other hazardous liquids and gases. I recommend the county consider obtaining an inventory of these lines and their status. It is vital for the County to understand the safety hazards of such lines, their locations and potential safety and health consequences in case of a leak.

Chemicals Present in LA County

Finally, the report identifies significant amount of chemical being used and stored in LA County. It would be helpful to have a section on the report from the Health Department on impact of such chemical, if any, on public health, considering the quantities reported in the report.

Matt Rezvani

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

March 23, 2020

TO: Supervisor Katherine Barger, Chair
Supervisor Hilda L. Solis
Supervisor March Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Janice Hahn

FROM: Alex Garcia
Supervising Regional Planner, Zoning Enforcement Special Projects

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 - AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

The Oil and Gas Strike Team meeting to discuss the eight report was scheduled for March 25, 2020. Subsequently, it was cancelled due to the recommendations to cease public meetings regarding the COVID-19 virus. The Oil and Gas Strike Team will reconvene to review and discuss the update Report #8 for submittal once public meetings are allowed.

AG:ts

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

June 4, 2020

TO: Supervisor Kathryn Barger, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Janice Hahn

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

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

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In accordance with the Board's motion, the Strike Team is submitting the eighth update report to the Board for the oil and gas subject areas within the unincorporated Los Angeles County listed below. This report is the third of six update reports for the Phase II effort. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines
- Oil and Gas Storage Facilities
- Review of Chemicals not identified in Hazardous Materials Business Plans

The Strike Team was to hold a public meeting on March 25, 2020. That meeting was postponed due to the COVID-19 pandemic and described in a memo submitted to the Board on March 23, 2020. A public meeting was held on June 1, 2020, to discuss the eighth update report and to hear public comment. The Strike Team unanimously passed a motion to direct staff to file this report with the Board. The next Strike Team report is due to the Board no later than September 29, 2020.

Should you have any questions about this report, please contact Timothy Stapleton, Zoning Enforcement Special Projects, at tstapleton@planning.lacounty.gov or (213) 974-6453.

AJB:JS:TS:ar

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_20200601-report8.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

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Oil and Gas Assessment Project

Phase II – Report Number 3

County of Los Angeles

June 1, 2020

Prepared for:
County of Los Angeles

Prepared by:
MRS Environmental (MRS)

Los Angeles Oil and Gas Strike Team

Bi-Annual Report Number Eight

Table of Contents

Executive Summary

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works, to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County (unincorporated County), excluding that area of the Inglewood Oil Field that is regulated under the Baldwin Hills Community Standards District. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

Phase I of the project was completed in September 2017 and provided an assessment of oil and gas facilities in unincorporated Los Angeles County with the following tasks:

- Verifying and updating an existing inventory of oil and gas facilities;
- Conducting site visits and compliance review of the oil and gas facilities;
- Developing a public health assessment screening tool; and,
- Researching the regulatory frameworks of other jurisdictions with similar oil and gas infrastructure.

The results of the Phase I efforts are detailed in biannual reports dated October 2016, March 2017, and September 2017 and concluded that additional investigation into oil and gas facilities was warranted.

On September 4, 2018, the Board approved contractual consulting services to continue the efforts of the Strike Team related to oil and gas facilities. This report is the third of six biannual reports to be provided to the Board during the current 36-month long Strike Team Phase II effort. Under Phase II the Strike Team is tasked with researching and investigating the following oil and gas elements:

- Abandoned and orphan wells;
- Storage facilities;
- Pipelines; and,
- Hazardous chemicals.

This third report provides an overview of the data obtained to date and presents an initial prioritization screening approach for the large number of wells, pipelines, chemicals, and facilities under review to guide future analysis. Forthcoming reports will reflect the progression in the collection and analysis of additional data and refined prioritization methodologies.

1.0 Background

This is the eighth report to update the Board on the Strike Team's efforts. The two board actions are summarized below. Consistent with the Phase I reports, the Phase II reports will be cumulative in the analysis: the findings of each Phase II report will be incorporated into forthcoming reports as information is collected and the analysis updated.

1.1 Board Motion Regarding Proactive Planning and Enforcement of Oil and Gas Facilities Operating in Unincorporated Los Angeles County

On March 29, 2016, the Los Angeles County Board of Supervisors passed a motion to:

- Convene a Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County;
- Review Los Angeles County Title 22: Zoning Code to ensure that oil and gas facilities may no longer operate by right in the unincorporated portion of the County and to ensure that regulations reflect best practices and current mitigation measures and technologies, minimize environmental impacts and protect sensitive uses and populations;
- Coordinate with cities throughout the County that are interested in collaborating on the development of regulatory requirements and protocols for monitoring and evaluating their local oil and gas facilities;
- Create an Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess the biannual reports of the Strike Team; and,
- Ensure that County Planning and Code Enforcement services are not negatively impacted.

1.2 Board Action Regarding Continued Strike Team Efforts Regarding Oil and Gas Facilities Operating in Unincorporated Los Angeles County (Phase II)

The results of the work completed under Phase I concluded that additional investigation was merited related to oil and gas facilities in the unincorporated County. Therefore, on September 4, 2018, the Los Angeles County Board of Supervisors approved contractual consulting services to continue assisting the efforts of the Strike Team on oil and gas facilities with focus on the following tasks:

- Continue the work of the Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County for the following:
    - Identify, assess, and prioritize orphaned and abandoned oil and gas wells in the unincorporated County;

  - Identify, assess, and inventory oil and gas pipelines within oil and gas fields, common carrier pipelines outside of oil fields and utility pipelines within the unincorporated County;
  - Identify and assess oil and gas storage facilities in the unincorporated County; and,
  - Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans.
- Continue the coordination and corroboration with the Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess and to provide written comments on the biannual reports.

1.3 Previous Reports

1.3.1 Los Angeles County Oil and Gas Well Inventory

On July 28, 2015, the Board directed the Department of Regional Planning (DRP), in consultation with the Department of Public Health (DPH), to develop a detailed inventory of all oil fields and the associated level of environmental monitoring of all oil wells currently operating within the unincorporated areas of the County of Los Angeles. MRS Environmental (MRS), a consulting firm with expertise in the oil and gas industry, along with County DRP Staff prepared the Los Angeles County Oil and Gas Well Inventory report dated December 2015. The Oil and Gas Well Inventory report identifies facility and well locations and includes a review of local, State, and Federal regulatory requirements for the drilling and operating of oil and gas wells. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/well).

1.3.2 Los Angeles County Oil and Gas Compliance Reports (Phase I)

As noted above, the Oil and Gas Facility Compliance Review Project reports completed under the Strike Team Phase I efforts were submitted to the Board in October 2016, March 2017, and September 2017. The reports included inspection checklists, a well inspection protocol, results from facility inspections and a screening public health assessment for 12 facilities and 557 oil and gas wells. The report also included review and recommendations for further review on legislative positions, regulatory positions, legal positions, and other facilities that may benefit the County by undergoing a similar review. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike).

1.3.3 Los Angeles County Oil and Gas Compliance Reports (Phase II)

The initial Phase II Oil and Gas Facility Compliance Review Project report was submitted to the Board in March 2019 and the second report in September 2019. The research, database development, and mapping in the initial two reports provided an overview of the Strike Team Phase II issue areas and provided staff with applicable tools to continue forward with the Project as reflected in this third report. The reports are available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike). Input from the Strike Team Advisory Panel on the second report is summarized in Appendix A.

1.4 Phase II Project Scope

As listed in Section 1.2 above, the Phase II scope includes review and assessment of orphaned and abandoned wells, oil and gas pipelines, oil and gas storage facilities, and chemicals not identified in Hazardous Materials Business Plans. Tasks also include a review of regulatory agency databases and permits, site visits, evaluation and prioritization of public health and safety risk, and recommendations for further action. The scope does not include a review of down-hole compliance issues (well testing and conditions of well bores below the surface of the ground) or ambient air monitoring such as the installation of toxic air pollutant monitoring stations.

1.5 County Departments and Their Roles

County Departments involved in the Strike Team include the following:

- Regional Planning;
- Public Health;
- Public Works;
- Fire; and
- County Counsel.

The role of each of these is discussed below.

1.5.1 Department of Regional Planning (DRP)

The DRP is the lead County agency for this compliance review effort. DRP is responsible for the following components and tasks:

- The Director or her designee to attend Strike Team public meetings;
- Project management;
- Hire and manage the consultant assisting the County;
- Coordinate and facilitate staff meetings;
- Coordinate and staff Advisory Panel and Strike Team meetings;
- Research and collection of regulatory mapping, infrastructure, and inspection data;
- Coordinate information exchange between all involved agencies;
- Develop an unincorporated County orphan and abandoned well database;
- Develop an unincorporated County pipeline database;
- Develop an unincorporated County chemical database;
- Attend the field site visits;
- Prepare field site findings; and
- Prepare biannual reports.

1.5.2 Department of Public Health (DPH)

The DPH's role on the Strike Team includes:

- The Director or her designee to attend Strike Team public meetings;
- Research and collection of DPH issues, complaints, and enforcement actions;
- Attend staff meetings;

- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.3 Department of Public Works (DPW)

The DPW's role on the Strike Team includes:

- The Director or his designee to attend Strike Team public meetings;
- Research and collection of DPW permits;
- Research and collection of DPW issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.4 County Fire Department (Fire)

The Fire Department's Fire Prevention Bureau/Petroleum Chemical Unit and the Health Hazardous Materials Division roles on the Strike Team includes:

- The Fire Chief or his designee to attend Strike Team public meetings;
- Research and collection of fire prevention permits;
- Research and collection of Certified Unified Program Agency-CUPA permits (hazardous materials, hazardous waste, above ground petroleum storage, and California Accidental Release Prevention Program-CalARP);
- Research and collection of fire issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.5 County Counsel

County Counsel provides the following assistance to the Strike Team:

- Review of contract for consultant assisting the County;
- Review and comment on Project documentation;
- Attend staff meetings;
- Attend Advisory Panel and Strike Team meetings;
- Advise County on legal positions as necessary; and
- Review and comment on draft reports.

1.5.6 Strike Team Members

The Strike Team consists of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief, or their designees. The Strike Team reviews the reports provided by Project Staff, holds public meetings to discuss the reports, and decides to submit the reports to the Board of Supervisors.

1.5.7 Project Staff

The Project Staff consists of staff from DRP, DPH, DPW, Fire, and MRS, the consultant assisting the County with the Project. In addition, staff from the California Geologic Energy Management Division (CalGEM) formerly known as the California Department of Conservation's Division of Oil, Gas and Geothermal Resources (DOGGR), the South Coast Air Quality Management District (SCAQMD), and Los Angeles Regional Water Quality Control Board (LARWQCB) have volunteered to assist the County in this effort.

1.5.8 Strike Team Advisory Panel

The Advisory Panel consists of five members. Each member was appointed by a Board District Office. The Advisory Panel members are issue area experts in oil and gas, environmental, and/or health issues. The Advisory Panel's role in the Project is to review, comment, and provide written input on the Project reports. The Advisory Panel consists of the following members listed below.

- Julia May (1st District)
- Andrew Weissman (2nd District)
- Tim O'Connor (3rd District)
- Matt Rezvani (4th District)
- R. Rex Parris (5th District)

2.0 Progress Update

This report is the third biannual report for the Strike Team Phase II effort; this section provides a summary of the Project activities completed through March 2020. Tasks completed include expanded and updated analysis for the following:

- Three Project Staff meetings;
- Coordination and correspondence with CalGEM (formerly DOGGR) on data request on orphan and abandoned wells;
- Review of the CalGEM WellSTAR database for orphan and abandoned wells;
- Development of unincorporated County orphan and abandoned well database and associated mapping;
- Coordination and correspondence with the Office of the State Fire Marshall on data request for pipeline mapping, pipeline operator data submittal forms (PSD-101) and pipeline inspection data;
- Review of Pipeline and Hazardous Materials Safety Administration National Pipeline Mapping System (NPMS) database;
- Development of unincorporated County pipeline (NPMS) database and associated mapping;
- Initial review of sources of data for oil and gas storage facilities;
- Review of South Coast Air Quality Management District (SCAQMD) Rule 1148.2 database for oil and gas drilling, well completion, and well rework chemical use;
- Refinement of the risk prioritization method for abandoned wells;
- Detailed mapping of abandoned wells;
- Preparation of an abandoned wells site inspection checklist;
- Review of an initial set of California State Fire Marshal (CSFM) PSD-101 Pipeline Operator Annual reports;
- Continued review of the EPA Toxic Release Inventory data base on chemical use; and
- Review of the California Environmental Reporting System (CERS) data base on chemical use.

2.1 Chronology of Project Meetings

2.1.1 Project Staff Meetings

Three Project Staff meetings have occurred with the first, the initial kick off meeting for the Project Staff, on Thursday October 25, 2018. The meetings are attended by representatives from DRP, DPH, DPW, Fire, CalGEM, and RWQCB. Staff from MRS also attended. The meetings are summarized below.

- Project Staff Kick Off Meeting - October 25, 2018.
    - Introduction of Project Staff – Staff from each participating County agency, CalGEM and MRS were introduced, and contact information was distributed.
    - Purpose of the Project – The Board motion was discussed along with primary Project tasks.
    - Timeline for first report – The first report would be issued as a draft in March 2019.

  - Roles and responsibilities and regulatory authority – Project goals and agency responsibilities were discussed with each department or agency providing input on the process.

- Project Staff Meeting Report 1 - March 11, 2019
  - Project Staff met to review and comment on the first draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB.
- Project Staff Meeting Report 2 – September 17, 2019.
  - Project Staff met to review and comment on the second draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB.

2.1.2 Strike Team Meetings

The Strike Team met on March 21, 2019 at the Regional Planning Commission (RPC) Hearing Room where the DRP and MRS provided a presentation to the Strike Team on the findings of the first report. Subsequently, members of the Strike Team asked questions on the Strike Team efforts and findings and provided comments on the Report. The DPH provided comments on the need to ensure that wells near people are assigned a higher ranking in the prioritization process to identify those abandoned wells with the potential to leak and impact the public health and safety of nearby communities. No public comments were provided at the meeting.

The second report was discussed by the Strike Team at a meeting held on September 24, 2019 at the RPC Hearing Room. No public comments were provided at the meeting.

2.1.3 Strike Team Advisory Panel Meetings

The Strike Team Advisory Panel met on April 22, 2019 with Advisory Panel members Timothy O'Connor and Matt Rezvani in attendance and Julia May via teleconference. The first report was discussed, and Advisory Panel comments were submitted to the Board on April 25, 2019.

The Advisory Panel discussed the second report at an October 21, 2019 meeting. Advisory Panel members Timothy O'Connor and Matt Rezvani attended with Julia May participating via teleconference. The Panel discussed and provided comments on the second report, those comments were subsequently forwarded to the Board.

3.0 Orphan and Abandoned Wells

Project Staff has continued coordination and correspondence with CalGEM on orphan and abandoned wells, provided review and input regarding the re-abandonment of Well DOW RGC-10, and developed a database of orphan and abandoned wells in the unincorporated County. Discussion on the status of this effort is provided in the following sections.

3.1 CalGEM Data Request

Staff from CalGEM (formerly DOGGR) attended the Kickoff meeting on October 25, 2018 and provided Project Staff with an overview to the WellSTAR project which updates and revises the WellFinder database, and input on CalGEM recent efforts on idle and abandoned wells. CalGEM's expertise and data are key components to the orphan and abandon well issue. Project Staff correspondence with CalGEM for additional input is listed below.

- 9/19/2018 – Project Staff correspondence including meeting request sent to CalGEM.
- 12/11/2018 – Project Staff correspondence and including meeting request sent to CalGEM.
- 1/14/2019 – Project Staff meeting request sent to CalGEM.
- 1/15/19 –Response received from CalGEM detailing CalGEM Central and Southern Section coordination efforts on Project Staff request.
- 5/8/19 – Project staff met with CalGEM via teleconference on the WellSTAR database status and abandoned well issues.
- 5/24/19 - CalGEM provided the County with additional information covering the following requests:
    - An excel spreadsheet containing updated well list for Los Angeles County. A data column with abandonment dates for wells that have been plugged and abandoned will be provided separately.
    - An excel spreadsheet containing the orphan well list for Los Angeles County as of May 23, 2019. Currently there are no "declared" orphan wells within Los Angeles County. However, CalGEM is currently evaluating approximately 1,272 potential orphan/deserted wells within the County.
    - An excel spreadsheet containing State-abandonment well list for Los Angeles County.
- On July 2, 2019, CalGEM provided DRP with an excel spreadsheet with water level data from idle wells within the Los Angeles County.
- February 20, 2020, CalGEM provided a response to a PRA for information on the 128 high priority wells including historical documents and plugging and abandonment information.

3.2 Marina Del Rey Well Incident

When a well reaches the end of its productive life, or if it fails to find economic quantities of oil or gas, the well operator is required by regulators to remove all equipment and plug the well to prevent leaks. Usually, cement is pumped into the well to fill at least the top and bottom portions of the well and any parts where oil, gas, or water may leak into or out of the well. This generally

prevents contamination of groundwater and leaks at the surface. However, a number of wells abandoned over the last 100 plus years in the unincorporated area of the County of Los Angeles were not abandoned to today's technological standards and have subsequently been re-abandoned. In some cases, wells are found at the site of a new construction project and the developer is tasked with the proper re-abandonment of the well even if no operator of record exists for that well. Throughout the region, some wells' locations are still unknown, unaccounted for, or their records do not exist.

In the Marina del Rey case, a land developer, MDR Hotels LLC., leased property from Los Angeles County on the Marina del Rey waterfront to build a hotel. The project involves constructing a six-story Residence Inn and five-story Courtyard Marriot (288 rooms with waterfront restaurant and amenities) on the site as part of a redevelopment Project. As part of the work, MDR Hotels was required by CalGEM to re-abandon the well "DOW RGC" 10 on the property to improve the long-term safety of surface development, protect shallow fresh water, and to re-abandon the well to current standards. The 1930s era well was originally abandoned and plugged in the 1950s. CalGEM issued a permit in June 2018 to MDR Hotels to re-abandon the well.

On January 11, 2019 during plugging operations, pressure built within the well casing which caused an uncontrolled release of fluids and gas spraying into the air. The material is believed to have included natural gas (mainly methane), heavy abandonment mud, and water. To address immediate health and safety concerns, CalGEM issued an emergency order to put into place precautions to protect health, safety, and property including testing protocols and twenty-four hour a day monitoring. The order also required that the operator prepare a report detailing what caused the blow out and emissions.

When the incident was first reported, the information provided to regulators, including DPH, was that the leak was quickly contained, and first responders reported that there was no continued release of methane. On January 18, 2019 CalGEM notified local authorities that they would be issuing an emergency order to the operator. In addition, DPH asked CalGEM to require the development of a Community Health, Safety and Notification Plan (Safety Plan) and requested that monitoring data be submitted for DPH review as it was generated. The Safety Plan was completed by the operator with the assistance of DPH, CalGEM , Los Angeles County Fire, and the Los Angeles County Department of Beaches and Harbors on February 22, 2019 (see Appendix B).

In the interim, first responders onsite reported to DPH that there were no measurable levels of natural gas in the air. Officials from CalGEM and Los Angeles County Fire Department Health Hazardous Materials Division were on site monitoring operations. Figure 3-1 shows an area map and Figure 3-2 shows the location of the well under abandonment and the adjacent proximity to residential areas.

Figure 3-1 Marina del Rey Well Area Map

Source: Incident Action Plan CA-LAC-011239 January 29, 2019.

Figure 3-2 Marina del Rey Well

Source: CalGEM January 18, 2019 Information Report.

This buried idle and improperly abandoned well is considered a typical case study of wells that can be found in the unincorporated area during construction and development activities. Note that the well, "DOW RGC" 10, was scored as a seven on the well risk prioritization scale (See Section 3.3.7). The well abandonment was completed on April 4th, 2019; however, because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, contractors were unable to complete the cement plugs below the depth of approximately 1,500 ft., as required by the permit approved by CalGEM. The final root cause analysis for this well re-abandonment was completed on June 7th, 2019 by Exponent at the request of CalGEM; however, the document was not released to DRP until September 19th, 2019.

The findings of the root cause analysis performed were as follows:

- Insufficient integrity of the old, circa 1931, casing strings in the well allowed inflow of gas into the wellbore and beneath old cement plugs through possible corrosion holes in production casing and non-plugged manmade cuts or perforations and led to lost mud circulation problems.
- Insufficient barriers placed during previous abandonments of the well, allowed shallow gas to enter the wellbore and led to lost mud circulation problems.
- The original operators, The Ohio Oil Company and Dow Chemical Company, did not adequately characterize the shallow gas formations in the region of the well, which caused a blowout in a previous abandonment of the well in 1956.
- Lost circulation problems and lost mud while drilling through and below cement plugs at about 786-887 ft. The loss of circulation led to the decision to reduce mud weight.
- Reducing the mud weight from 9.0 pounds per gallon (ppg) to 8.4 ppg in the days before the blowout.

Other findings were as follows:

- The CWS rig supervisor, rig operator, and a rig hand who worked on the Dow RGC 10 re-abandonment operations during the period October 23, 2018 through January 13, 2019 had no evidence of, or had expired, well control course certifications. In one case the certification had expired as early as July 21, 2013.
- The Dow RGC 10 re-abandonment operations presented significant well control challenges involving shallow gas pockets and kicks, and lost circulation of drilling mud. It is most likely that gas entered and mud exited the wellbore through very old casing strings (circa 1931), which likely experienced significant corrosion and which were not well cemented.
- InterAct and CWS brought the well under control shortly after the blowout January 11th about ten minutes after the blowout began and killed the well on or about January 15, 2019. Because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, InterAct and CWS were unable to complete the cement plugs below the depth of approximately 1,500 feet, as required by the permit approved by CalGEM. The final abandonment included more cement plugs than were required under the original permit.

The lessons learned at this well re-abandonment are applicable to a number of other wells that may need to be re-abandoned in the area in the future. The Playa del Rey oil field is located onshore of the Santa Monica Bay, primarily within and surrounding Marina del Rey. The field was discovered in 1929 and a total of 280 wells were drilled and plugged and abandoned. All these wells are in

close proximity to residences and the harbor. It is not surprising that 19 of the high priority wells identified for further investigation by the Strike Team are located in the Marina del Rey area.

Some of the lessons learned and recommendations arising from Exponent's review of the plugging and abandonment effort include:

- Consideration should be given to the use of a snubbing unit or stripping operations, and a drill string internal blowout preventer (IBOP) or check valve, for future Playa del Rey re-abandonment operations. The history of surface broaches and gas kicks during the 2018-2019 well re-abandonment operations, and the historical blowouts in the Dow RGC 10 and other wells in the area suggest that the use of an IBOP or check valve could have been beneficial. In particular, these considerations may be appropriate for drilling through old cement plugs, beneath which gas may accumulate through old corroded casing. The use of an IBOP or check valve as a contingency component of the BOPE system could have reduced the risk of gas flow up the drill pipe and likely could have prevented the blowout on January 11, 2019.
- Re-abandonment of old wells may seem rather straightforward, but as has been demonstrated in the Playa del Rey oilfield both historically and in contemporary time, well control due to the presence of shallow gas formation is challenging. The Operator should plan well control contingencies for shallow gas in this region, since there is a history of blowouts involving shallow wells. Old wells, such as the Dow RGC 10 spudded in 1931, in which casing and cement integrity is suspect, should be carefully examined for risk versus reward for determining if re-entry is truly warranted.
- The use of lost circulation materials as a means of plugging casing holes or leaks should be carefully considered. In most situations, it may be more efficacious and prudent to take the time to perform squeeze cementing operations. Squeeze cementing operations are not without risks. If a squeeze cementing protocol was established to "seal" annular flow paths, then drilling up the cement could lead to sidetracking operations. Drilling hard cement with weight on bit could cause the bit to mill corroded casing and formation easier than hard cement.
- During operations in which lost returns and gas kicks are occurring, weighting up the drilling mud should be the first priority to prevent gas influxes.
- Characterize shallow gas sands in the Playa del Rey Field, which have caused well control issues and blowouts in the past and again recently. It is recommended that a new well be drilled at a suitable location and depth in the Playa del Rey field area, in which a complete logging program should be performed, focusing on geological characterization. Also, production testing should be performed to investigate the extent and pressure of shallow natural gas formations.
- It is recommended that a study be performed to gather information on geological logging and wellbore abandonment configurations of all 279 Playa del Rey oil wells, at least for those wells for which such information exists. CalGEM data shows that all 279 wells are currently plugged and abandoned, as indicated by a "P" status in CalGEM online records.

The County notes here that downhole operations are under the jurisdiction of CalGEM and that CalGEM staff have reviewed the Exponent Report.

3.3 CalGEM Database and Abandoned Well Preliminary Prioritization

The CalGEM database of wells as provided by CalGEM in May 2019 was utilized to develop a prioritization scheme based on several different criteria. The prioritization scheme is utilized to identify those abandoned wells that are most likely to leak and, if they do leak, of impacting the public health and safety of nearby communities. This prioritization scheme was consulted with and ratified by CalGEM on a call conducted April 7, 2020 with CalGEM, DRP and MRS.

For many older wells the exact location of abandoned wells is only an estimate in the CalGEM database as illustrated by the Marina del Rey incident well location which was not found at the database location but was offset by 70-80 feet from the database location. However, the approximate location of the abandoned wells and other information in the CalGEM database such as the well location relative to other active wells and information on the field in which the wells are located allows for a prioritization scheme to be developed. In addition, the approximate location of the well along with the population density as estimated by historical census data allows for an understanding of potential impact if a well leaks or blowouts relative to populations.

The abandoned wells were prioritized based on their potential impact to public health and safety related to the potential for leakage of gas to the surface. Wells were prioritized based on the following characteristics:

- Well status (plugged or unknown);
- Well location and census block population density;
- Historical well type;
- Well location within 500 feet of an active injector well;
- Age of well by spud date (date on which well drilling commenced);
- Well located in an oil and gas field by field age;
- Reservoir characteristics;
- The location of the well relative to the Cal EnviroScreen 3.0 analysis; and
- The location of the well relative to the Los Angeles County methane zones and proximity to landfill methane areas.

Each of these along with the prioritization method are discussed below.

3.3.1 Well Status

Figure 3-3 shows the location of all plugged and abandoned wells in the unincorporated areas of the County of Los Angeles as of the May 2019 CalGEM database. The CalGEM database includes 4,443 total wells in the unincorporated areas, with the characteristics shown in Table 3.1.

Table 3.1 Wells in the Los Angeles County Incorporated Area

Category	Number
Active wells	1,046
Canceled wells (well application cancelled)	18

Category	Number
Idle wells[1]	637
Permitted (recent or currently being drilled)[2]	5
Plugged & Abandoned wells	2,731
Unknown wells (not classified by CalGEM)[3]	6
Total wells	**4,443**

Source: CalGEM May 2019.

1. Idle wells defined by CalGEM as a well that has not been used for two years or more and has not yet been "plugged and abandoned" per CalGEM requirements.
2. New wells are located at Sentinel Peak Resources Inglewood and at Matrix Sansinena oil fields.
3. Unknown wells are located at Sentinel Peak Resources Inglewood and at Browning-Ferris Industries of California, Inc.

3.3.2 Abandoned Well Location and Census Block Population Density

Well locations were overlaid with the census data by census block to identify wells that are located near high density areas. The focus of this effort is on the possible effects on human populations and not on other possible environmental degradation (e.g. Significant Ecological Areas). Wells that are in low density areas do not provide as high a priority since a leak would have a lower probability of impacting the public. Many abandoned wells are in sparsely populated areas and those wells are not as high a priority as the abandoned wells located in more densely populated areas. Figure 3-4 shows the location of the abandoned wells relative to the census population density. Table 3.2 shows the number of abandoned wells by location relative to the census population density.

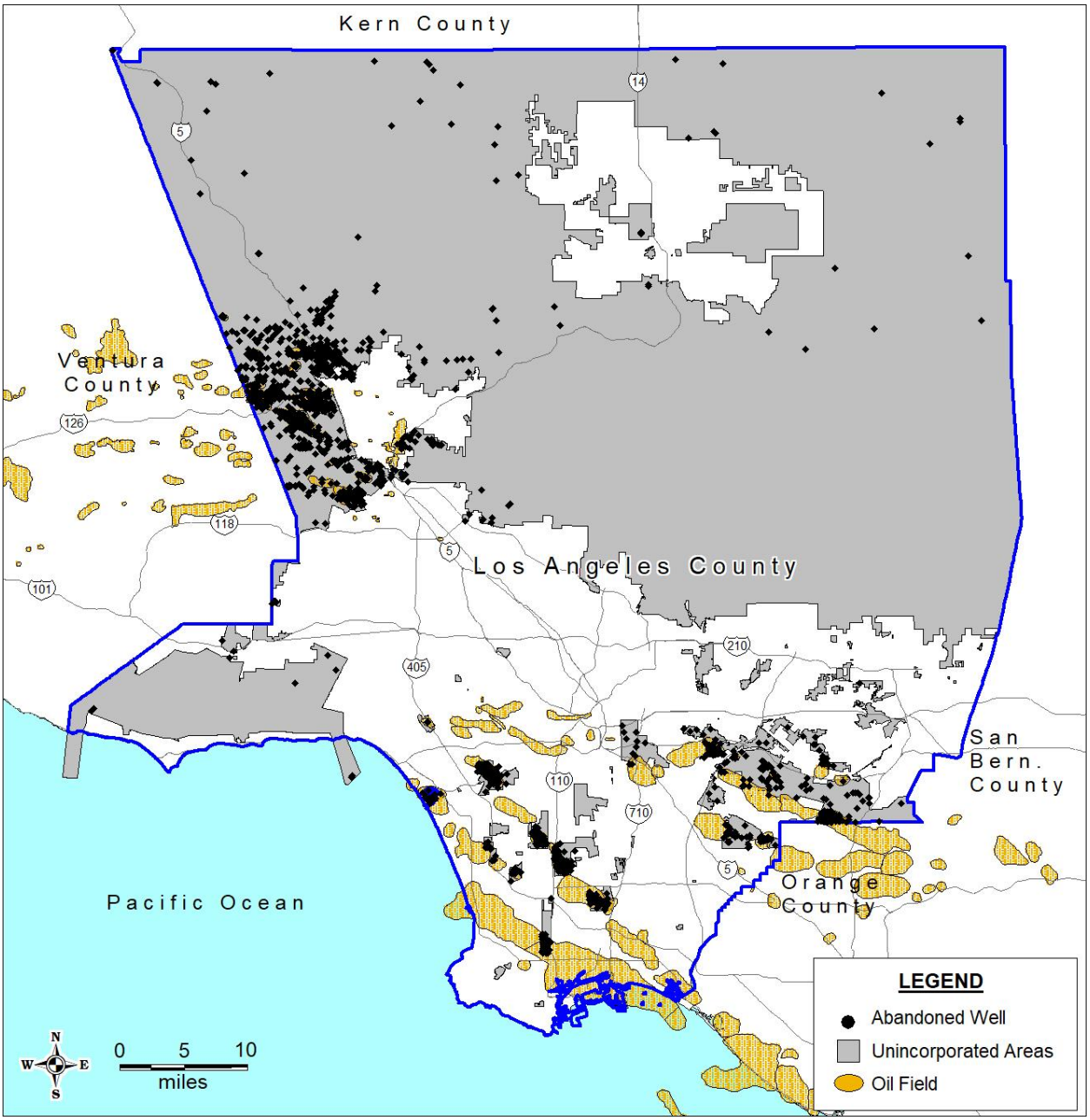
Table 3.2 Abandoned Wells by Population Density

Population Density	Number	Number Percent	Cumulative*	Cumulative Percent*
Between zero and 900 persons per square mile	2163	79%	2731	100%
Between 900 and 4,699 persons per square mile	285	10%	568	21%
Between 4,700 and 8,899 persons per square mile	110	4%	283	10%
Between 8,900 and 13,099 persons per square mile	99	4%	173	6%
More than 13,099 persons per square mile	74	3%	74	3%

Source: CalGEM May 2019.

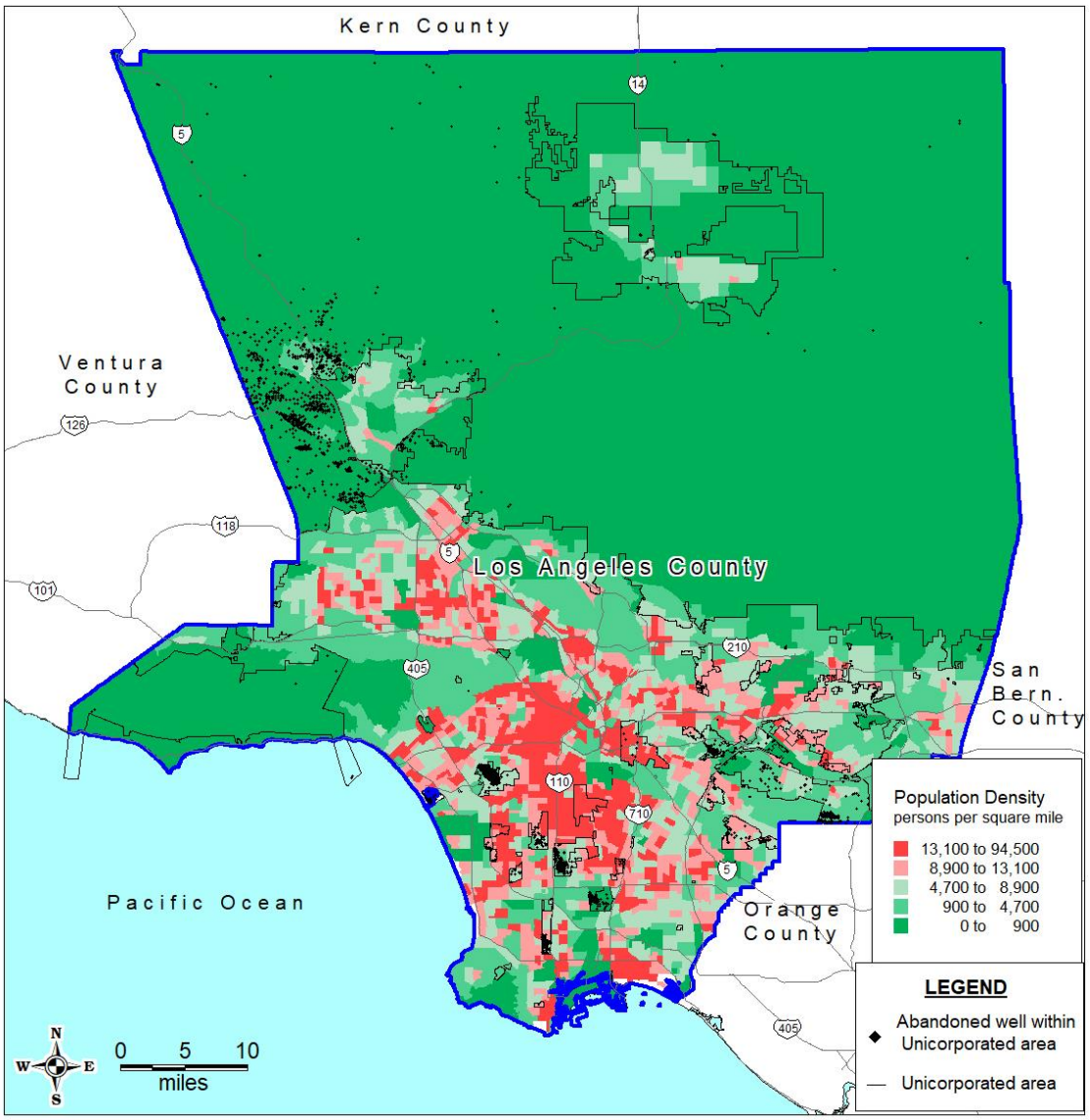
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e. defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-3 Plugged, Abandoned and Unknown Wells



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-4 Abandoned Wells and Census Block Population Density



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.3.3 Abandoned Well Type

Wells are classified by the type of well including oil and gas, gas storage, water source, etc. Wells that resulted in dry holes, for example, would present a lower priority than wells that were historically used for oil and gas production or multiple uses, although dry-hole wells could still present a risk if gas was encountered during the drilling process. A dry hole is commonly defined

as a well that is drilled but does not produce enough oil or gas to be a commercial success. Table 3.3 shows the number of abandoned wells by type in the unincorporated areas.

Table 3.3 Abandoned Wells by Type

Well Type	Number	Percent
Core Hole	9	0.3%
Dry Hole	636	23.3%
Gas	5	0.2%
Gas Storage	27	1.0%
Injection	157	5.7%
Multiple use	101	3.7%
Oil and Gas	1,793	65.7%
Water Source	3	0.1%
TOTAL	2,731	100 %

Source: CalGEM May 2019.

3.3.4 Well Location and Active Injector Well

The abandoned well location in relation to active injector wells gives rise to the potential for leakage from a well due to the increased reservoir pressures near the injection wells. Figure 3-5 shows the location of abandoned wells that are located within 500 feet of an active injection well and located within the unincorporated parts of the County. About 354 plugged and abandoned wells are located within 500 feet of an active injector well.

3.3.5 Well Age by Spud Date

Older wells increase the likelihood that abandonment was not performed to as high a level standard as the current requirements. Although the date the well was started is not the same as the date the well was abandoned, it does provide some indication of the potential for lower quality abandonments which would increase the probability of the well leaking and affecting public health. Information on the abandonment date of the wells is not located in the CalGEM database and is an issue that is proposed for further research once the wells are initially prioritized, which involves the review of historical paper files associated with each well. Information obtained from CalGEM only listed wells that have been abandoned since 2004 and does not include wells that were abandoned before that date.

The CalGEM database only lists the spud date (e.g. the date drilling was started) for a limited number of wells. For abandoned wells only about 8 percent have spud date information in the CalGEM database for wells located in the unincorporated areas. These wells, as a function of age, are shown in Figure 3-6 and listed in Table 3.4.

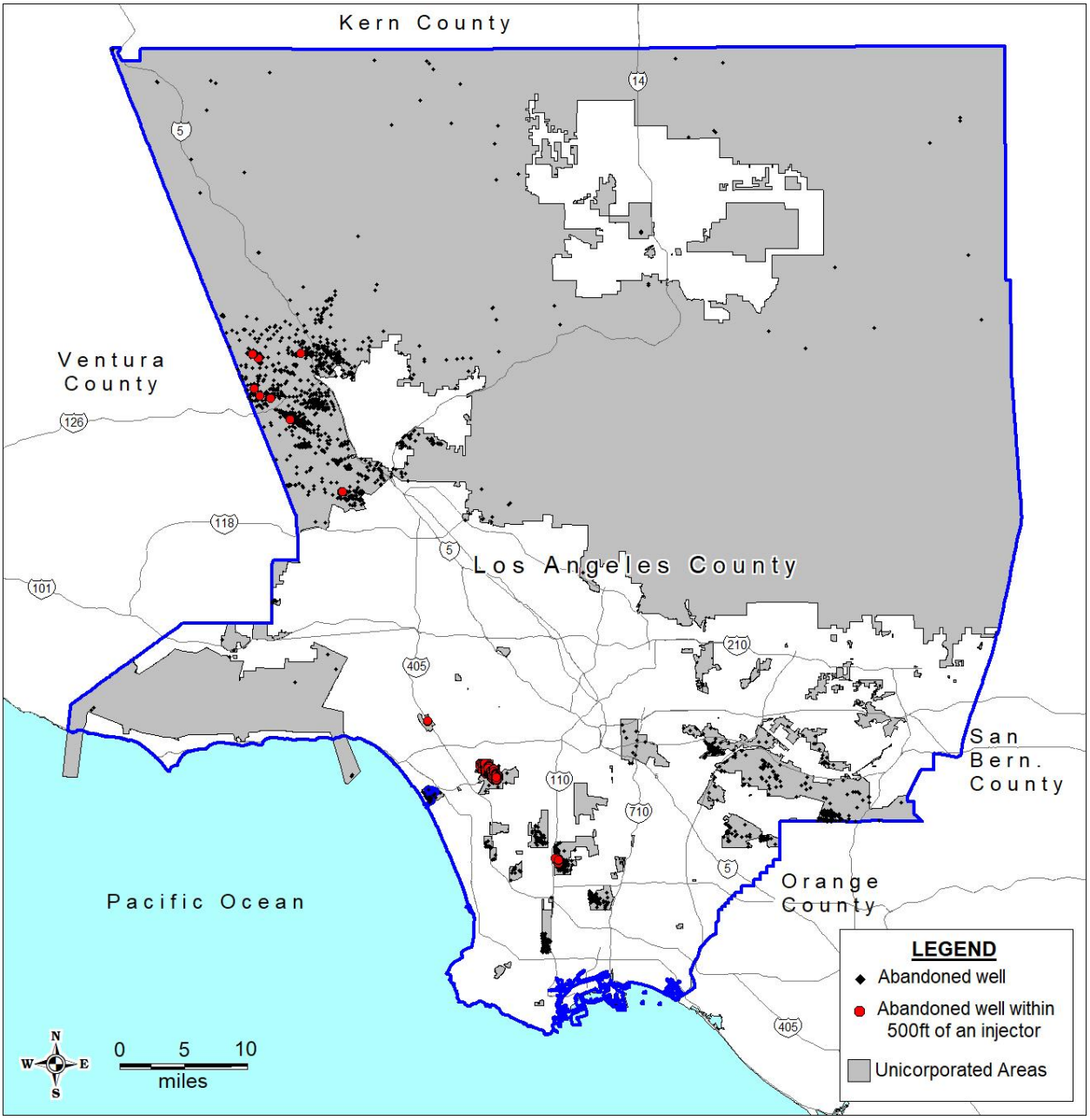
Table 3.4 Abandoned Wells by Spud Date Age

Well Spud Date Age, Years	Number	Percentage of Total	Cumulative*	Cumulative Percent*
Between zero and 25 years	6	3%	225	100%
Between 25 and 34 Years	8	4%	218	97%
Between 35 and 44 Years	19	8%	210	93%
Between 45 and 54 Years	8	4%	191	85%
Between 55 and 64 Years	32	14%	183	81%
Between 65 and 74 Years	105	47%	151	67%
Between 75 and 84 Years	36	16%	46	20%
More than 85 Years	5	2%	10	4%

Source: CalGEM May 2019.

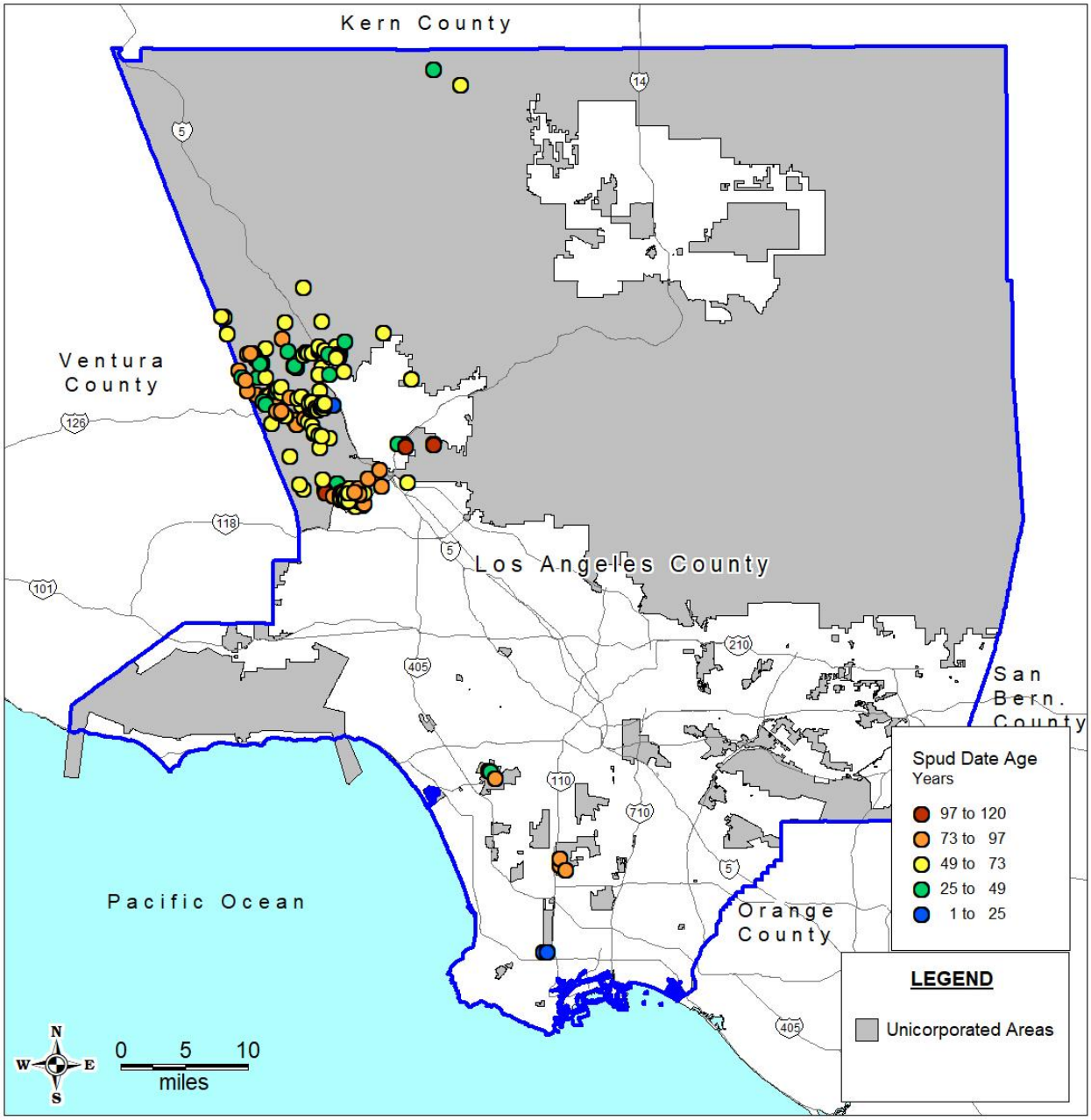
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e. defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-5 Wells Located within 500 feet of an Active Injector Well



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-6 Wells by Years from Spud Date



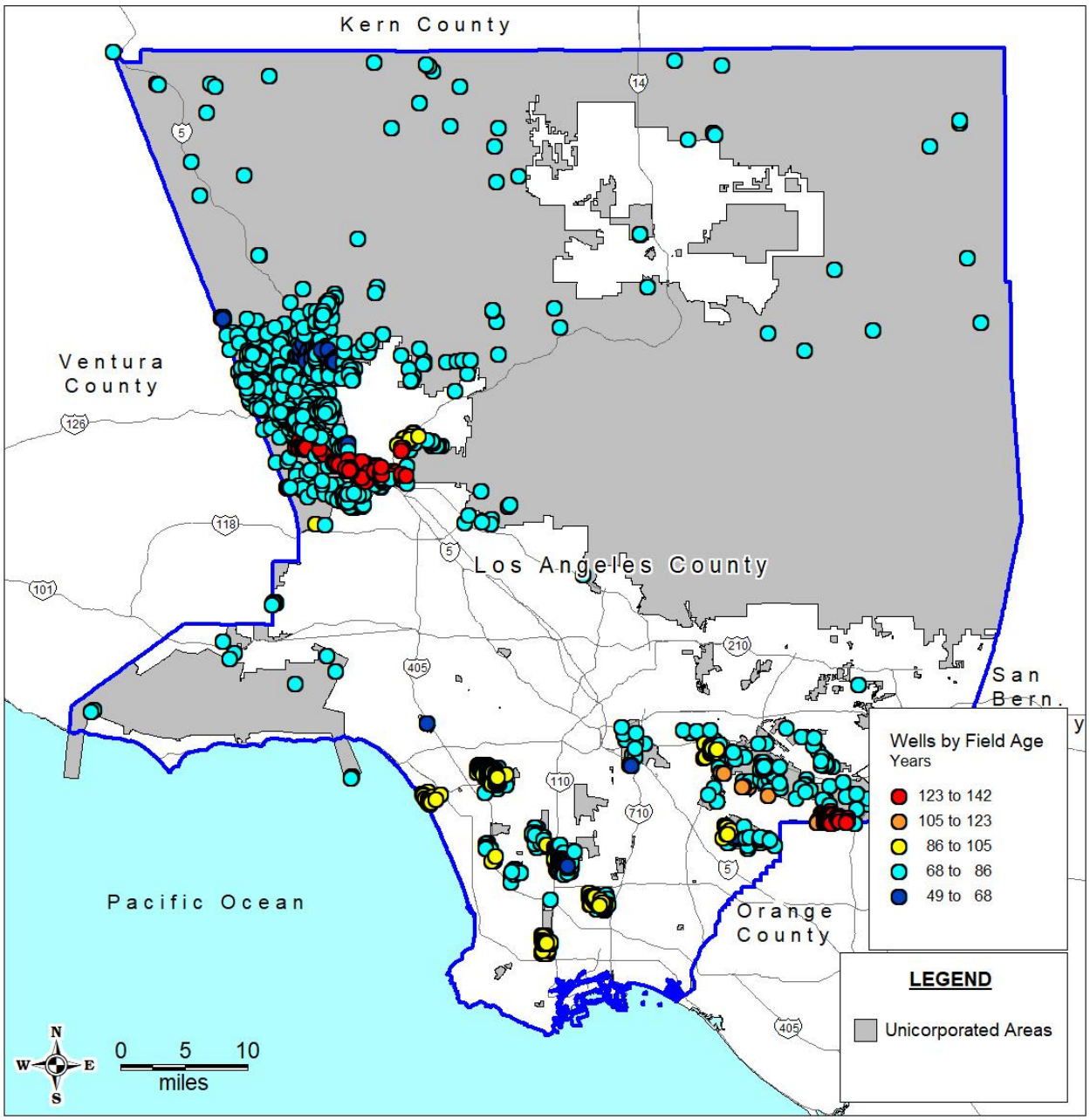
Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.3.6 Abandoned Wells by Field Age

There are 46 oil fields located in the unincorporated area of Los Angeles County with the earliest field discovered in 1876 (CalGEM Oil and Gas Fields Volume 2). Fields are shown in Figure 3-3 and listed in Appendix

Abandoned wells located in older fields may have a higher probability of having older abandonment dates. As mentioned above, the CalGEM database does not have abandonment date, and this is an issue that will be researched further after the prioritizations are applied. Field age is based on the oldest discovery date for all the reservoir pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Figure 3-7 and Table 3.5 show the wells by field age with each map dot representing one well and the age of the field in which the well is located.

Figure 3-7 Wells by Field Age



Source: CalGEM May 2019.NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Table 3.5 Wells by Field Age

Well Field Age, Years	Number	Percent of Total	Cumulative*	Cumulative Percent*
After 1969 (0 - 50 years)	5	0.2%	2731	100.0%
Prior to 1969 (51- 75 years)	393	14.4%	2726	99.8%
Prior to 1944 (76 - 100 years)	1846	67.6%	2333	85.4%
Prior to 1919 (101-124 years)	133	4.9%	487	17.8%
Prior to 1894 (more than 125 years)	354	13.0%	354	13.0%

Source: CalGEM May 2019.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e. defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

3.3.7 Abandoned Wells by Reservoir Characteristics

The fields in which the wells are located were ranked by several different characteristics that could contribute to increased risk of abandoned well leakage. Field information was developed from pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Issues that could contribute to increased risk of well leakage would include the following:

- High Gas Oil Ratio (GOR);
- Older Fields;
- Shallow reservoirs;
- High API gravity of the produced oil;
- High sulfur content of the crude oil; and
- High pressure gradients (psi per linear foot of well depth).

Each of these field characteristics were assigned points from zero to two based on the scoring matrix shown in Table 3.6. Fields were then ranked based on the sum total of the scores with a maximum ranking of 12 points. Fields with a higher rank score may have a higher probability of having abandoned wells that produce greater well leakage risk.

Table 3.6 Field Rank Scoring Matrix

Field Score			
Characteristic	**Score of 0 points**	**Score of 1 point**	**Score of 2 points**
GOR	Less than 100	Between 100-1000	Greater than 1000
Initial Production Date	After 1950	1930 - 1950	Before 1930
Depth	Greater than 5000 ft	Between 1000 - 5000 ft	Less than 1000 ft
API[1]	Less than 20	Between 20 - 30	Greater than 30
Sulfur/H_2S[2]	Less than 0.5 %	Between 0.5 - 1.5 %	Greater than 1.5
PSI/ft	Less than 1.0 psi/ft	between 1 - 2 psi/ft	Greater than 2.0 psi/ft

Source: CalGEM May 2019.
1 – American Petroleum Institute gravity of oil relative to water, higher numbers are associated with lighter oil.
2 – Only Torrance and Brea-Olinda fields have the potential for H2S, as per CalGEM Publication M10. These two fields were given the highest rating for sulfur. All other fields were based on crude sulfur content which is not necessarily indicative of H_2S levels but may indicate some elevated level of odor or hazard.

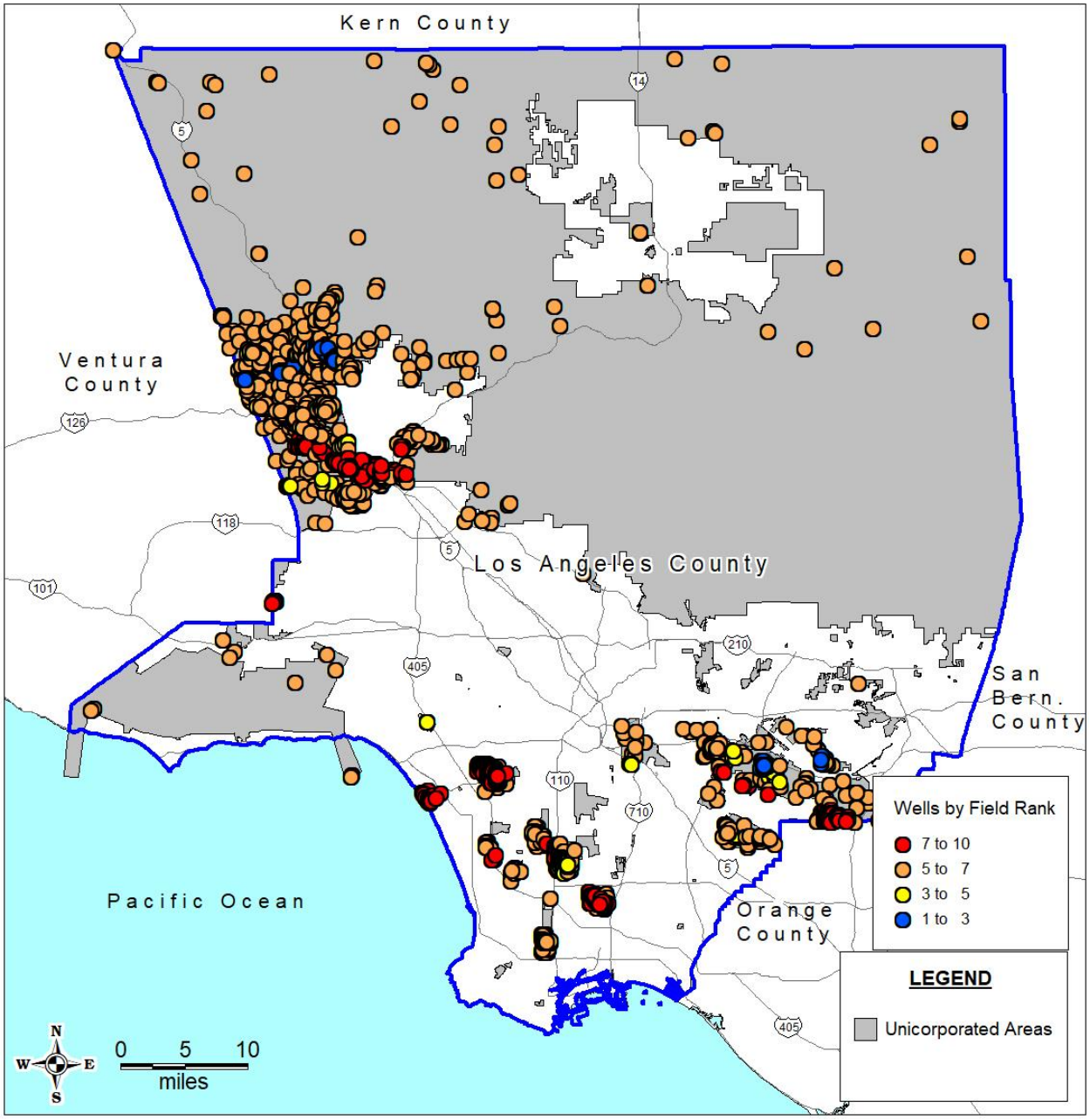
Figures 3-8 and Table 3.7 shows the wells based on the field rankings discussed above. Note that the Marina Del Rey field discussed in Section 3.2 above received a score of seven on the above matrix.

Table 3.7 Wells Based on Field Ranking

Well Field Rank	Number of Abandoned Wells	Percentage	Cumulative*	Cumulative Percent*
1	55	2%	2731	100%
2	52	2%	2676	98%
3	21	1%	2624	96%
4	61	2%	2603	95%
5	704	26%	2542	93%
6	487	18%	1838	67%
7	119	4%	1351	49%
8	278	10%	1232	45%
9	592	22%	954	35%
10	362	13%	362	13%
TOTAL	2,731	100%	-	-

Source: CalGEM May 2019.
Note: Maximum score is 12, no wells ranked scored 11 or 12.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e. defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-8 Wells by Field Rank



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.4 Abandoned Wells by EnviroScreen Score

In January 2017, the Office of Environmental Health Hazard Assessment (OEHHA), on behalf of the California Environmental Protection Agency (CalEPA), released Version 3.0 of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen version 3.0 identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. The tool ranks each of the state's 8,000 census tracts using data on 20 indicators of pollution, environmental quality, and socioeconomic and public health conditions. SB 535 requires CalEPA to identify disadvantaged communities based on geographic, socioeconomic, public health and environmental hazard criteria, and the CalEnviroScreen tool is utilized to allow for this requirement. Environmental exposures and effects examined as part of the CalEnviroScreen model include:

- Ozone concentrations in air.
- PM 2.5 concentrations in air.
- Diesel particulate matter emissions.
- Drinking water contaminants.
- Use of certain high-hazard, high volatility pesticides.
- Toxic releases from facilities.
- Traffic density.
- Drinking water quality.
- Cleanup sites.
- Groundwater threats.
- Hazardous and solid waste facilities/generators.
- Impaired water bodies.

Sensitive population and socioeconomic factors addressed include:

- Asthma rates.
- Cardiovascular disease rates.
- Low birth rate frequency.
- Education attainment.
- Housing burden.
- Linguistic isolation.
- Poverty.
- Unemployment.

Plugged and abandoned wells were classified based on the CalEnviroScreen percentile score for each census tract. The results are shown in Table 3.8 and Figure 3-9.

Table 3.8 Wells Based on CalEnviroscreen 3.0 Percentile

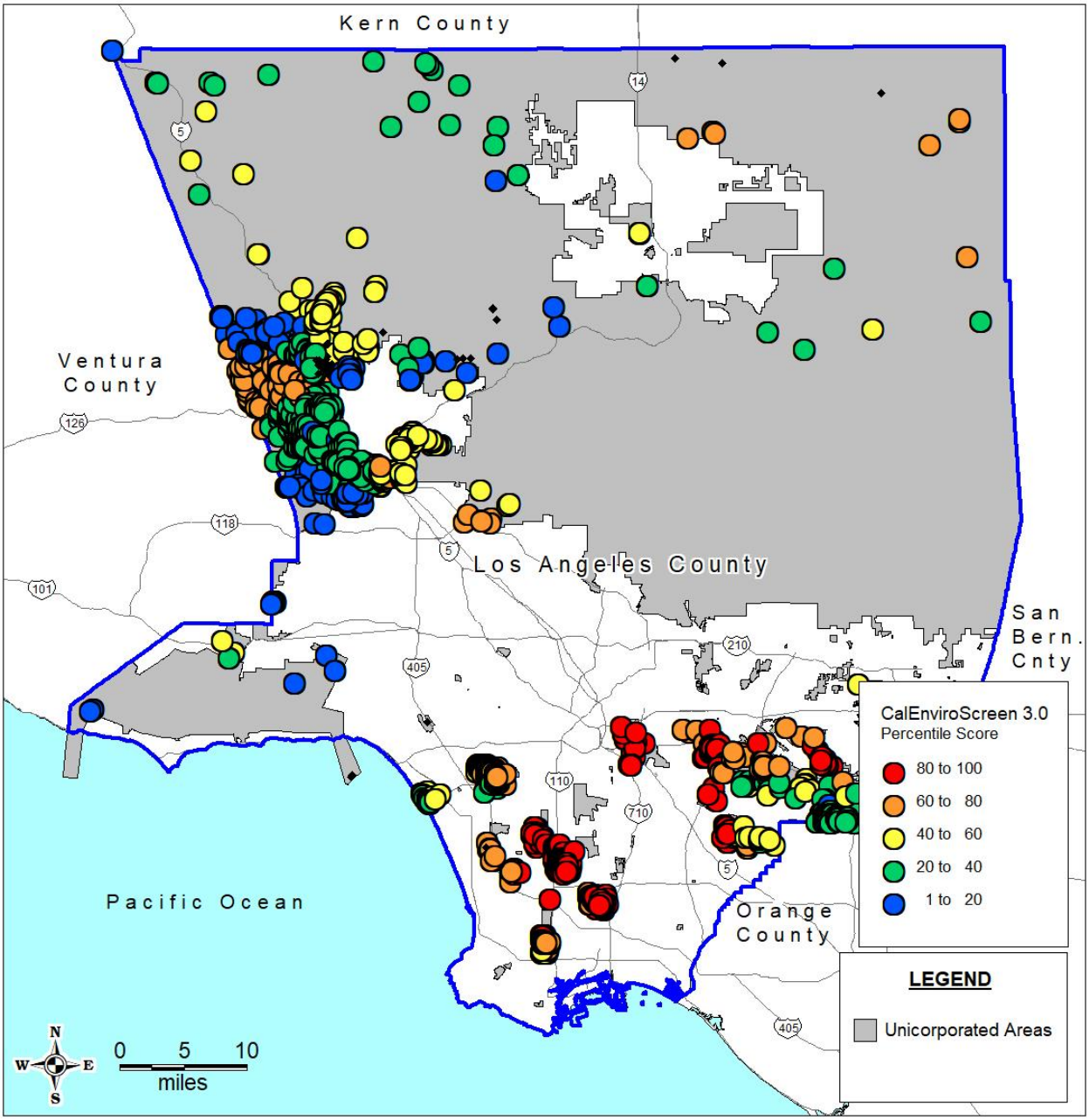
CalEnviroscreen 3.0 Percentile	Number	Number Percent	Cumulative*	Cumulative Percent*
More than 90%	345	13%	345	12.6%
Between 81 and 90%	130	5%	475	17.4%
Between 71 and 80%	175	6%	650	23.8%
Between 61 and 70%	614	22%	1264	46.3%
Between 51 and 60%	66	2%	1330	48.7%

Table 3.8 Wells Based on CalEnviroscreen 3.0 Percentile

CalEnviroscreen 3.0 Percentile	Number	Number Percent	Cumulative*	Cumulative Percent*
Between zero and 50%	1401	51%	2731	100.0%

Source: CalGEM May 2019. CalEPA 2018.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e. defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-9 Wells by CalEnviroscreen 3.0 Percentile



NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.5 Abandoned Wells by Methane Zone

The County of Los Angeles Building Code prohibits the issuance of building permits for new buildings, enclosed structures, additions, or conversions of a building or structure to habitable or occupiable space in the presence of an unmitigated potential gas hazard. Potential gas hazards exist within 1,000 feet of fill sites containing decomposable materials (Building Code Section 110.3), within 300 feet of nearby oil and gas wells (Building Code Section 110.4), and on contaminated soils (Building Code Section 110.5). Twenty-two plugged and abandoned wells were identified that are within 1,000 feet of a designated methane zone.

3.6 Abandoned Wells Prioritization

A prioritization scheme was developed based on the above factors to prioritize the plugged and abandoned wells for further, more detailed examination. Further examination included review of documents related to abandonment activities, such as blowouts and loss-of-well control history, that required detailed, historical paper records reviews. See the section below for a summary of the results of this detailed review. As the review of paper records is time consuming, the prioritization scheme is used to filter the thousands of wells in the CalGEM database to those of the highest priority to conduct a detailed paper document review and in-field testing and examinations.

The prioritization scheme goal is to identify those wells that have the highest probability of leaking to the surface and combine that with the potential for impacts to the community. This is a similar approach used to develop the Enviroscreen scores by OEHHA. Although a well might have a high potential for leakage, if it is in an area designated by census data as having very low or no populations, then it would not be classified as a high priority well. Table 3.9 shows the prioritization scheme.

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
Location Near injectors	0 - 5 points	0 points not near an injector 5 points if near an injector
Spud Data age	0 - 5 points	Less than 45 years old = 0 points 45 – 55 years = 1 point 55 – 65 years = 2 points 65 – 75 years = 3 points 75 – 85 years = 4 points > 85 years = 5 points No data= 3 points
Field Ranking	0 - 10 points	Field ranking of zero = zero points Field ranking = points Field ranking of 10 or more = 10 points
Methane zone	0 - 5 points	Not near a methane zone = zero points Near a methane zone = 5 points
Enviroscore	0 - 5 points	Below 50% = zero points 50 – 60% = 1 point 60 – 70% = 2 points 70 – 80% = 3 points

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
		80 – 100% = 4 points Score of 100 = 5 points
Census data	0-10 points	0 population = zero points Units in persons per square mile 0 – 2,000 = 1 point 2,000 – 4,000 = 2 points 4,000 – 6,000 = 3 points 6,000 – 8,000 = 4 points 8,000 - 10,000 = 5 points 10,000 – 12,000= 6 points 12,000 – 14,000 = 7 points 14,000 – 16,000 = 8 points 16,000 – 18,000 = 9 points More than 18,000 = 10 points

Source: CalGEM May 2019. CalEPA 2018.

The prioritization scheme is conducted by summing the points associated with factors that could increase the probability for a well to be leaking (location near injectors, spud date age, field ranking and methane zone) and then multiply that score by the sum of the census and the Enviroscreen. See Figure 3-10 for a schematic of the approach.

In total, the priority ranking produced scores ranging from zero to 143, with 128 wells ranking a score of above 75 and therefore classifying as a "higher priority well". Figure 3-11 shows the location of the higher priority wells. Note that the higher priority wells are generally located in the southern County areas in the areas with higher population density. Table 3.10 shows the number of higher priority wells by Planning District and by Supervisor District.

Appendix A shows details of the areas with the higher priority wells.

Table 3.10 Ranked Abandoned Wells by Districts

District	Number of Higher Priority Wells (Ranking 75 and above)
Planning District	
Westside Planning Area	19
East San Gabriel Valley Planning Area	8
Metro Planning Area	38
Gateway Planning Area	40
South Bay Planning Area	23
Supervisor District	
District 1	12
District 2	78
District 4	38

Note: Districts not shown have no high-ranking wells.
Note: Planning Districts from LA County General Plan November 2014.

Figure 3-10 Wells Prioritization Schematic

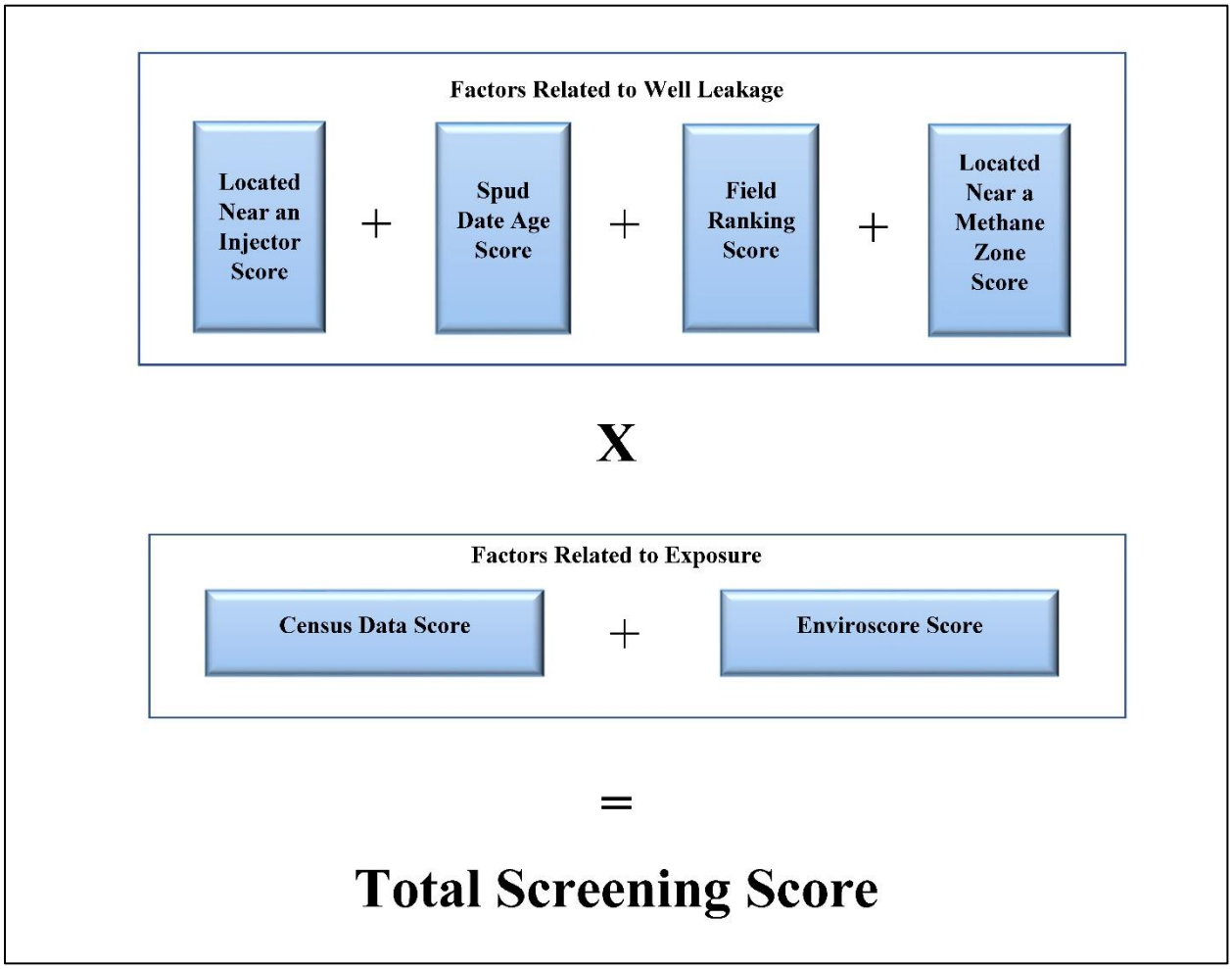
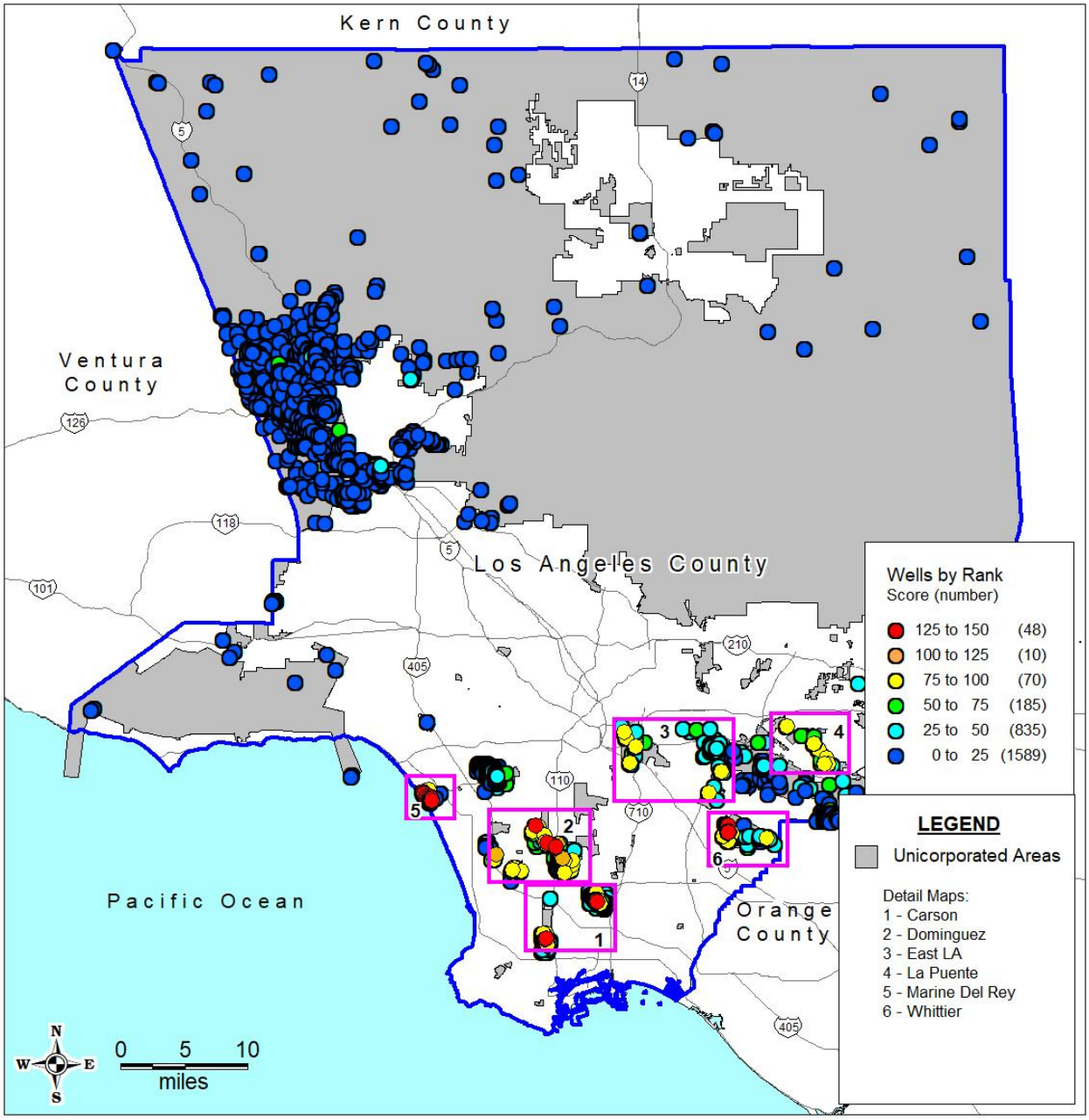


Figure 3-11 Wells by Ranking Score



NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.7 Detailed Review of High Priority Wells

The wells designated as high priority were then reviewed in detail by obtaining the paper files from CalGEM for each of the high priority wells and reviewing the well records for the following items:

- Abandonment date.
- Blowouts or loss of well control occurrence.
- Any gas pressure encountered during drilling or gas production.
- Any crude oil encountered during drilling or any crude production history.
- Any gas encounter at depths less than 1,000 feet.
- Any recent leak testing conducted (in the last 20 years).

These factors were utilized to estimate the risks of well leakage of the high priority wells. The results of this review are shown in the sections below. Note that any well, even a recently abandoned well to the most recent CalGEM standards, can still leak. The purpose of this exercise is to identify those wells that are at the highest risk of leaking - those wells abandoned when standards were lower; those wells that had gas present or caused problems during drilling; and those wells that have not been recently leak tested.

3.7.1 Abandonment Age

All of the well records had information on the abandonment procedures and abandonment date. The oldest well abandonment date was 1917 or over 100 years since abandonment. The years since abandonment are shown in the Table 3.11 below for the high priority wells.

Table 3.11 Year Since Abandonment

Years since Abandonment	Number of Abandoned Wells
Less than 50 years	37
50 to 75 years	49
75 to 100 years	40
More than 100 years	2

Note: For high priority wells only.

CalGEM requirements related to abandonment have evolved over the years. Generally, wells abandoned prior to 1950s may have required a surface plug (cement poured into the hole) of generally 10 feet in thickness from the surface generally with some installation of cement "plugs" installed across and above the producing reservoir. Wells abandoned between 1950s and 1970s would have required thicker surface plugs, maybe 25 feet. Wells abandoned since the 1980 would have required surface plugs of 25 feet and cement plugs across all oil/gas reservoirs. Current abandonment requirements include 25 feet of a surface plug, cement plugs 100 feet across all producing reservoirs and a 100 to 200-foot cement plug across all groundwater zones and muds placed in all remaining spaces (CCR 1723).

3.7.2 Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, would potentially exhibit a higher potential for leakage as gas located in the reservoir would be required to produce leakage at the surface. A well that did not exhibit any gas flow or pressures could still, subsequent to the well abandonment, become pressurized due to a shift in the formation geology or some other process, but would exhibit a significantly lower potential for gas leakage. Wells with gas history, no gas history, or wells not having any record and are therefore unknown are shown in Table 3.12 along with other issues discussed below.

Table 3.12 High Priority Well Characteristics

Issue Area		Number of Abandoned Wells
Gas History	With gas history	62
	No gas history	33
	No records of gas history	33
Crude History	With crude history	67
	No crude history	43
	No records of crude history	18
Shallow Gas History	Yes	1
	No	127
Blowout History	Yes	4
	No	124
Recent Leak Test	Yes	11
	No	117

Note: For high priority wells only. Note two wells did not have any data.

3.7.3 Crude History

Wells that have a history of producing crude oil or showed periods of time during the well drilling process that crude oil was produced, would potentially exhibit a higher potential for gas also being produced and therefore resulting in leakage of gas in the future. Wells with crude history, wells that have a record of no crude history, and the wells not having any record and are therefore unknown are shown in Table 3.12.

3.7.4 Shallow Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, as well as having the gas zone be close to the surface, could potentially exhibit a higher potential for leakage as gas would have a shorter distance to reach the surface. Wells with shallow gas history are shown in Table 3.12.

3.7.5 Blowout History

Wells that have a history of producing gas in sufficient quantities from unstable formations to produce a blowout, or an uncontrolled release of the gas to the environment, could potentially exhibit a higher potential for leakage. Wells with blowout history are shown in Table 3.12.

3.7.6 Recent Leak Testing History

Wells that were recently excavated and leak tested within the last 20 years, through the requirements associated with development, such as building structures in close proximity, would most likely have a lower propensity for leakage at this time as they were recently tested. Wells that were recently leak tested are shown in Table 3.12.

3.7.7 Wells In-field Inspection Priority

Through the examination of the detailed well records for all the higher priority wells, some additional prioritization was developed. This prioritization was based on the propensity for an abandoned well to leak. The date of the abandonment influences the propensity for a well leaking as wells that were abandoned before 1970s would have less stringent abandonment procedures. Wells that exhibited some gas or some gas/oil presence in the reservoir also would have a higher propensity for leakage than a well which had not exhibited any hydrocarbons in the reservoir area during drilling. Wells, even if poorly abandoned, if they have not access to hydrocarbon, would not leak hydrocarbons. This does not mean that wells that exhibited no oil or gas could not change and shift over time as the geology changes, but that they would present a lower frequency of leakage.

In addition, wells that exhibited shallow gas presence, meaning that the gas areas of the reservoirs were located close to the surface, could also present a greater propensity for leakage due to the short path lengths needed to reach the surface. And wells that had any history of a blowout would present a higher propensity for leakage due to the higher pressures and unstable nature of the reservoirs.

However, wells that have been recently leak tested (in the last 20 years) were assumed to present a lower risk for leakage.

Wells were also segregated into Priority 1, Priority 2 and Priority 3 categories to define those which should be inspected first (Priority 1).

Wells classified as Priority 1 wells would be those wells meeting the following criteria:

- Abandoned more than 50 years ago with both gas and crude oil history.
- Abandoned more than 50 years ago with only gas history (no crude history).
- Any well with shallow gas.
- Any well that had a blowout history.

The wells classified a “Priority 2” including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking of over 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking of over 100.

The wells classified a "Priority 3" including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking below 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking below 100.

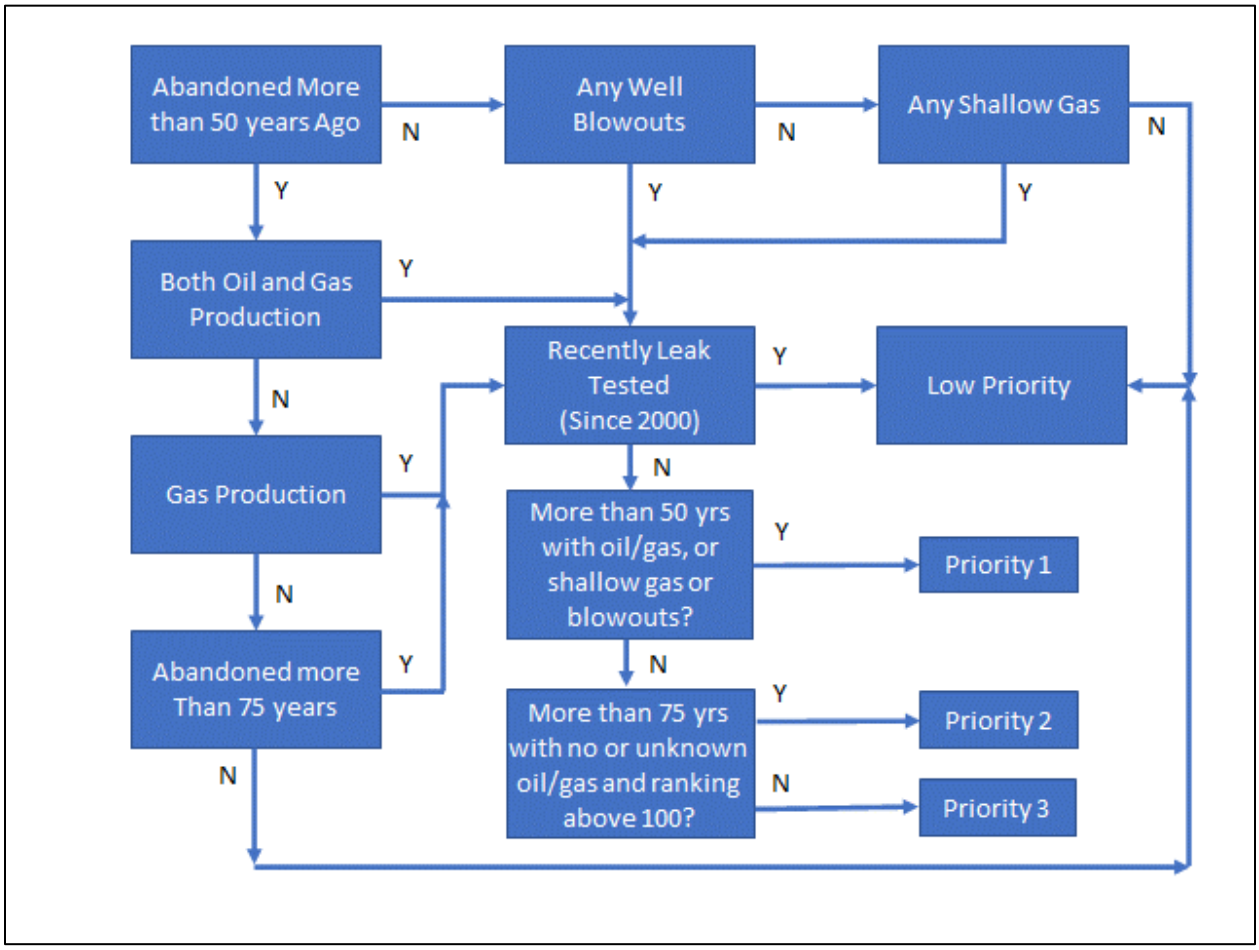
The wells breakdown is shown below. A flow chart of the well priority classification is shown in Figure 3-12.

Table 3.13 Wells Prioritization and Classification

Years	Number of Abandoned Wells	Number Percent	Cumulative	Cumulative Percent
Priority 1 inspection	43	34%	43	34%
Priority 2 inspection	13	10%	56	44%
Priority 3 inspection	25	20%	81	63%
Low priority for inspection	47	37%	128	100%

Note: For high priority wells only

Figure 3-12 Well Inspection Prioritization Flowchart



Detailed maps of high priority wells and the priority classifications are shown in Attachment D. Table 3.14 lists the highest-ranking wells and their corresponding classifications. A Draft Abandoned Well Inspection Protocol was developed for the forthcoming field inspections and is included as Appendix E.

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Rank	Abandoned Age, years	Blowouts?	Any gas?	Any oil?	Any gas at <1000'	Recent Leak Test?	Priority Class
0403700042	4073024001	80	73	none	no	no	N	N	Low
0403700801	4070016004	80	63	none	yes	yes	N	N	Priority 1
0403700802	4073014013	88	44	none	yes	yes	N	N	Low
0403700803	4070015003	88	72	none	yes	no	N	N	Priority 1
0403700804	4070012030	80	84	none	yes	no	N	N	Priority 1
0403700838	5241022022	84	63	none	yes	no	N	N	Priority 1
0403702080	4073017012	80	44	none	yes	yes	N	N	Low
0403705149	6077017028	77	94	none	no	no	N	N	Priority 3
0403705152	5232027021	98	74	none	no	no	N	N	Low

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Rank	Abandoned Age, years	Blowouts?	Any gas?	Any oil?	Any gas at <1000'	Recent Leak Test?	Priority Class
0403705166	8728009007	98	66	none	no	no	N	N	Low
0403705167	8728013033	91	71	none	UN	yes	N	N	Priority 3
0403705170	8728020013	91	66	none	no	no	N	N	Low
0403705171	8728008002	98	66	none	no	no	N	N	Low
0403705329	6132032001	110	77	none	yes	no	Y	N	Priority 1
0403705340	8262002024	77	87	none	no	no	N	N	Priority 3
0403705596	8028007003	98	95	none	no	no	N	N	Priority 3
0403705600	6077022009	77	79	Yes	yes	no	N	N	Priority 1
0403705602	6077008021	80	79	none	no	no	N	N	Priority 1
0403705644	6059014003	84	89	none	no	no	N	N	Priority 3
0403705736	6139026013	91	63	none	yes	no	N	N	Priority 1
0403705757	8745006013	77	69	none	UN	UN	N	N	Priority 3
0403705758	8745007017	77	69	none	no	no	N	N	Low
0403705832	6137014012	77	93	none	no	no	N	N	Priority 3
0403705963	8176023030	77	95	none	no	no	N	N	Priority 3
0403706039	5236020026	98	90	none	no	no	N	N	Priority 3
0403706135	5231010018	98	101	none	yes	no	N	N	Priority 1
0403706149	8026028037	77	95	none	yes	no	N	N	Priority 1
0403706152	8465018015	77	84	none	no	no	N	N	Low
0403706166	6077017015	77	100	none	no	no	N	N	Priority 3
0403706182	8029012014	84	97	none	no	no	N	N	Priority 3
0403706750	7318010025	132	94	none	UN	yes	N	N	Priority 1
0403706751	7318010025	77	36	none	yes	yes	N	N	Low
0403706752	7318022030	77	36	none	no	yes	N	N	Low
0403706757	7318008026	99	86	none	UN	UN	N	N	Priority 3
0403706767	7318022029	77	36	none	no	no	N	N	Low
0403706778	7318022030	77	36	none	no	no	N	N	Low
0403706801	7318010270	77	73	none	UN	yes	N	N	Priority 1
0403706802	7318010025	132	93	none	yes	yes	N	N	Priority 1
0403706803	7318010270	77	69	none	UN	yes	N	N	Priority 3
0403706804	7318010027	77	73	none	yes	yes	N	N	Priority 1
0403706805	7318022012	77	36	none	yes	yes	N	N	Low
0403706918	7318010025	132	103	none	no	no	N	N	Priority 2
0403707301	7318023028	77	21	none	yes	yes	N	Y	Low
0403707302	7318010026	77	17	none	yes	yes	N	N	Low
0403707303	7318010025	77	17	none	yes	yes	N	N	Low
0403707304	7318010025	132	17	none	yes	yes	N	N	Low
0403707305	7318010025	121	16	none	yes	yes	N	N	Low
0403707306	7318010025	132	19	none	UN	yes	N	Y	Low
0403707374	6078018004	80	94	none	no	no	N	N	Priority 3
0403707375	6078008024	80	74	none	yes	yes	N	N	Priority 1
0403707546	7318023050	77	35	none	yes	yes	N	N	Low
0403707547	7318010025	132	66	none	yes	yes	N	N	Priority 1
0403707552	7318022012	77	72	none	UN	yes	N	N	Priority 1
0403707635	6089014029	80	14	none	yes	yes	N	Y	Low
0403707638	6079004901	88	55	none	yes	no	N	N	Priority 1
0403707642	6089003006	112	95	none	yes	no	N	N	Priority 1
0403707650	6079004901	88	95	none	UN	UN	N	N	Priority 1
0403708589	4147021018	100	91	none	no	no	N	N	Priority 3
0403708594	4147023005	100	89	none	yes	yes	N	Y	Low
0403708628	4147004014	110	74	none	no	no	N	N	Low
0403708665	8040020024	80	50	none	yes	yes	N	N	Priority 3
0403709003	8011010021	126	64	none	yes	yes	N	N	Priority 1
0403710651	6131016047	121	16	none	yes	yes	N	N	Low
0403713572	6132019019	126	93	Yes	yes	UN	N	N	Priority 1
0403713641	6131010004	121	66	none	UN	yes	N	N	Priority 1
0403713797	4224002900	130	61	none	UN	UN	N	N	Priority 2
0403713798	4224002900	130	2	Yes	yes	no	N	N	Low

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Rank	Abandoned Age, years	Blowouts?	Any gas?	Any oil?	Any gas at <1000'	Recent Leak Test?	Priority Class
0403713802	4224005910	130	61	none	yes	yes	N	N	Priority 1
0403713804	4224004900	78	61	none	no	no	N	N	Low
0403713805	4224005903	130	9	none	yes	yes	N	N	Low
0403713806	4224005903	130	9	none	UN	yes	N	N	Low
0403713807	4224001904	130	61	none	UN	UN	N	N	Priority 2
0403713808	4224001904	130	61	none	yes	yes	N	N	Priority 1
0403713809	4224002900	130	61	none	yes	yes	N	N	Priority 1
0403713810	4224002900	130	61	none	UN	yes	N	N	Priority 2
0403713811	4224002900	130	61	none	yes	yes	N	Y	Low
0403713812	4224002900	130	61	none	yes	yes	N	N	Priority 1
0403713813	4224002900	130	61	none	UN	yes	N	N	Priority 2
0403713815	4224002900	130	61	none	UN	UN	N	N	Priority 2
0403713816	4224001904	130	61	none	yes	yes	N	N	Priority 2
0403714011	4224001904	130	51	none	yes	yes	N	N	Priority 2
0403714012	4224001904	130	51	none	yes	yes	N	N	Priority 2
0403714013	4224001904	130	51	none	yes	yes	N	N	Priority 2
0403714015	4224001800	130	8	none	yes	yes	N	N	Low
0403714370	6137018013	84	95	none	no	no	N	N	Priority 3
0403714401	6089012023	140	71	none	yes	yes	N	N	Priority 1
0403714418	6132019046	84	89	none	yes	yes	N	N	Priority 1
0403714457	6132019038	140	91	none	yes	yes	N	N	Priority 1
0403714461	6132019034	140	94	none	yes	yes	N	N	Priority 1
0403714488	6131016013	121	88	none	yes	yes	N	N	Priority 1
0403714493	6131018010	77	57	none	yes	yes	N	N	Priority 1
0403714592	6125007030	84	67	none	no	no	N	N	Low
0403714838	8011011003	126	79	none	UN	yes	N	N	Priority 1
0403714842	8011009059	126	24	none	no	no	N	Y	Low
0403714982	6131009045	121	88	none	yes	yes	N	N	Priority 1
0403714986	6131018032	77	88	none	yes	yes	N	N	Priority 1
0403715031	6131014025	77	94	none	UN	UN	N	N	Priority 1
0403715037	6132019013	126	66	Yes	yes	UN	N	N	Priority 1
0403715519	8026004009	90	96	none	UN	UN	N	N	Priority 3
0403715764	8011009011	126	26	none	UN	UN	N	N	Low
0403716093	8011009059	126	26	none	UN	UN	N	Y	Low
0403716370	8157026019	126	93	none	no	yes	N	N	Priority 2
0403716371	8157026011	126	89	none	no	no	N	N	Priority 2
0403716372	8029016005	126	73	none	UN	UN	N	N	Priority 1
0403716435	8011009059	126	26	none	UN	yes	N	Y	Low
0403716700	8029016022	126	94	none	yes	yes	N	N	Priority 1
0403716701	8011009932	126	26	none	UN	yes	N	Y	Low
0403716706	8011009934	126	26	none	yes	UN	N	Y	Low
0403716883	7344018023	99	74	none	UN	UN	N	N	Priority 1
0403717759	7409012009	81	56	none	yes	yes	N	N	Priority 3
0403717772	7409011031	81	56	none	yes	yes	N	N	Priority 3
0403717819	7344020024	99	5	none	UN	yes	N	N	Low
0403718469	7407031223	126	82	none	UN	yes	N	N	Priority 1
0403718471	7407031223	126	82	none	yes	yes	N	N	Priority 1
0403718472	7407023028	90	54	none	yes	yes	N	N	Priority 3
0403718483	7407027027	81	54	none	UN	UN	N	N	Priority 3
0403718484	7407027036	81	54	none	UN	UN	N	N	Priority 3
0403718485	7407031066	126	38	none	UN	yes	N	N	Low
0403718486	7407018044	99	46	none	UN	yes	N	N	Priority 3
0403718487	7407018051	99	46	none	UN	yes	N	N	Priority 3
0403718488	7407015088	99	32	none	UN	UN	N	N	Low
0403718922	8129013038	84	99	none	no	no	N	N	Priority 3
0403720682	6079005015	88	51	none	no	no	N	Y	Low
0403723481	6059009024	143	26	none	yes	yes	N	N	Low
0403723487	6059009024	132	27	none	yes	yes	N	N	Low

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Rank	Abandoned Age, years	Blowouts?	Any gas?	Any oil?	Any gas at <1000'	Recent Leak Test?	Priority Class
0403723499	6059009024	143	27	none	yes	yes	N	N	Low
0403723558	6059009024	143	27	none	yes	no	N	N	Low
0403725134	7407018045	99	33	none	no	no	N	N	Low

* APN/AIN shows the parcel that the well is located within or, for those wells located within street ROWs, the closest parcel APN/AIN.
UN=unknown

3.8 Next Steps

This analysis for wells provides an overview of the abandoned wells located in the unincorporated areas of Los Angeles County as well as presenting proposed factors that are used to prioritize the abandoned wells. Historical document reviews were completed on all of the high priority wells and some of the wells were eliminated based on the historical searches, including those wells abandoned recently or recently leak tested. Additional work that will be performed will include the following:

1. Research Public Works records on abandoned wells encountered during construction projects (such as at Marina del Rey).
2. Explore opportunities for interagency coordination to obtain additional types of well data to enhance the analysis.
3. Review interagency well drilling and well activity communication protocols for potential improvements in notification procedures.
4. Review technologies for identifying potentially leaking wells (as per AB1328 and CARB).
5. Develop a site visit and inspection protocol for the high priority wells. The protocol will include emissions testing and leak testing for wells that are of the highest priority.
6. Conduct site inspections of high priority wells.
7. Provide recommendations on potential public and environmental health and safety concerns of high priority wells.

4.0 Oil and Gas Pipelines

Initial Project Staff work on oil and gas pipelines consisted of a meeting with a member of the Advisory Panel (Matt Rezvani), review of pipeline inspection regulations, interactions with the Office of the State Fire Marshall to obtain detailed pipeline data, and review of the National Pipeline Mapping System (NPMS) data.

4.1 Advisory Panel Member Matt Rezvani Meeting

Project Staff met with Mr. Rezvani on October 25, 2018 at the County DRP offices. Mr. Rezvani was involved with drafting of the California Pipeline Safety Act as well as some California oil spill legislation and is an asset and resource to the Strike Team. The discussion included an overview of the Elder California Pipeline Safety Act of 1981 which authorized the State Fire Marshal to exercise exclusive safety, regulatory, and enforcement authority over intrastate hazardous liquid pipelines and implement the Federal Hazardous Liquid Pipeline Safety Act. Components of the legislation provide for annual inspections and testing of hazardous liquid pipelines as discussed in detail in Section 4.2 below. Mr. Rezvani also provided input and direction to Project Staff on obtaining pipeline data, the fact that regulatory agencies have staffing challenges with regards to pipeline oversight, that the State has a significant number of abandoned pipelines, and the fact that many utility transmission pipelines in the State were built long ago and are now in or adjacent to new residential development.

4.2 Pipeline Inspection Regulations

Pipeline regulations that dictate maintenance and testing requirements are based on State and Federal regulations for pipeline safety. The discussion below provides the basis for the State's regulations and the Federal guidance that is promulgated within those regulations.

4.2.1 State Regulations - California Pipeline Safety Act of 1981

This Act grants regulatory jurisdiction to the State Fire Marshal for the safety of all intrastate (i.e. within state) hazardous liquid pipelines and all interstate (i.e. between states) pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the governing rules for interstate pipelines to be the Federal Hazardous Liquid Pipeline Safety Act and Federal pipeline safety regulations. Recent amendments require pipelines to include leak prevention and cathodic protection (i.e. the application of an electrical charge to a pipeline to prevent corrosion) systems as reviewed and approved by the State Fire Marshal. All new pipelines must also be designed to accommodate passage of instrumented inspection devices (smart pigs) through the pipeline.

State of California Government Code Parts 51010 through 51018 provide specific safety requirements including periodic hydrostatic testing of pipelines, specific accuracy requirements on leak rate determination, hydrostatic testing by state-certified independent pipeline testing firms, pipeline leak detection, and reporting of all leaks. Specific testing requirements of various intrastate pipelines are as follows:

Under Section 51012.3(a)(3), pipelines must meet cathodic protection requirements in accordance with Section 195.414 of Title 49 of the Code of Federal Regulations. Section 195.416 requires also that each operator shall, at intervals not exceeding 15 months, but at least once each calendar year, conduct tests on each buried, in contact with the ground, or submerged pipeline facility in its pipeline system that is under cathodic protection to determine whether the protection is adequate. Each operator shall, at intervals not exceeding 2 ½ months, but at least six times each calendar year, inspect each of its cathodic protection rectifiers. Each operator shall, at intervals not exceeding 5 years, electrically inspect the bare pipe in its pipeline system that is not cathodically protected and must study leak records for that pipe to determine if additional protection is needed.

Pipelines built after 1990 are required to be piggable (accommodate the passage of instrumented internal inspection devices) (Section 51013).

Section 51013.5 of the Public Safety Code requires pipeline testing as follows:

- Pipelines without automatic pressure relief devices shall be hydrostatically tested annually;
- Pipelines over 10 years of age and not provided with effective cathodic protection shall be hydrostatically tested every three years, except for those on the State Fire Marshal's list of higher risk pipelines, which shall be hydrostatically tested annually;
- Pipeline over 10 years of age and provided with effective cathodic protection shall be hydrostatically tested every five years, except for those on the State Fire Marshal's list of higher risk pipelines which shall be hydrostatically tested every two years;
- Piping within a refined products bulk loading facility served by a pipeline shall be tested hydrostatically at 125 percent of maximum allowable operating pressure utilizing the product ordinarily transported in that piping if that piping is operated at a stress level of 20 percent or less of the specified minimum yield strength of the pipe. The frequency for pressure testing these pipelines shall be every five years for those pipelines with effective cathodic protection and every three years for those pipelines without effective cathodic protection. If that piping is observable, visual inspection may be the method of testing;
- Test methods other than the hydrostatic tests required above, including inspection by instrumented internal inspection devices, may be approved by the State Fire Marshal on an individual basis. If the State Fire Marshal approves an alternative to a pressure test in an individual case, the State Fire Marshal may require that the alternative test be given more frequently than the testing frequencies specified above;
- The test pressure for each pressure test conducted must be maintained throughout the part of the system being tested for at least 4 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure and, in the case of a pipeline that is not visually inspected for leakage during test, for at least an additional 4 continuous hours at a pressure equal to 110 percent, or more, of the maximum operating pressure; and,
- When hydrostatic testing is required by Section 51013.5, the test results shall be certified by an independent testing firm or person who is selected from a list, provided by the State

Fire Marshal, of independent testing firms or persons approved annually by the State Fire Marshal.

Section 51055.1 provides that commencing January 1, 2017, the State Fire Marshal, or an officer or employee authorized by the State Fire Marshal, shall annually inspect all intrastate pipelines and operators of intrastate pipelines under the jurisdiction of the State Fire Marshal to ensure compliance with applicable laws and regulations. Per the State Fire Marshal Guidelines each inspection shall contain the following:

- Evaluation of the risks to each intrastate hazardous liquid pipeline based upon the operator history, integrity testing results, preventative and mitigative measures, construction activities, leak history, and compliance history;
- An annual inspection of each operator of an intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016; and,
- An annual inspection of each intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016.

Each operator of an intrastate hazardous liquid pipeline shall complete and submit to the Office of the State Fire Marshal Form PSD-101 for each intrastate hazardous liquid pipeline no later than July 1st annually.

4.2.2 CalGEM Regulations

CalGEM has regulations that typically apply to smaller flowlines, pipelines within oil fields, gathering lines, production lines or injection lines typically within the administrative boundaries of an oil and gas field. New regulations for certain pipelines associated with California oil and gas production (Assembly Bill 1420) became effective on October 1, 2018. The regulations now require as follows:

- Operators shall visually inspect all aboveground pipelines for leaks and corrosion at least once a year;
- Operators shall inspect all active gas pipelines in sensitive areas (buildings within 300 feet of an active pipeline, areas determined to be a significant threat from a leak, or a pipeline with a chronic leak history) that are 10 or more years old for leaks or other defects at least once a year, or at a frequency approved by CalGEM's State Oil and Gas Supervisor and listed in the operator's Pipeline Management Plan. The operator shall conduct the inspection in accordance with applicable regulatory standards or, in the absence thereof, an accepted industry standard that is specified by the operator and listed in the Pipeline Management Plan;

- CalGEM may order such tests or inspections deemed necessary to establish the reliability of any pipeline system. Repair, replacement, or cathodic protection may be required;
- Operators shall conduct pressure testing using: (A) The guidelines recommended by industry standards, such as the American Petroleum Institute, American Society of Mechanical Engineers for oil or gas pipelines; or (B) The method approved by the State Fire Marshal, Pipeline Safety Division for liquid pipelines or U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration for gas pipelines; on any pipeline that has had a leak resulting in the release of a fluid in a quantity that triggers reporting of the release under any regulatory, statutory, or other legal requirement. The pipeline shall not be returned to service unless the pressure testing has been successfully completed. Test results shall be provided to the CalGEM for review within seven days following the test;
- The operator shall perform periodic mechanical integrity testing on all active environmentally sensitive pipelines that are gathering lines, all urban pipelines over 4" in diameter, and all active gas pipelines in sensitive areas. The mechanical integrity testing shall be conducted every two years, or at an alternative frequency approved by CalGEM based on demonstrated wall thickness and remaining service life over a period of at least two years. The testing frequencies shall be specified in the operator's Pipeline Management Plan. Pipelines less than 10 years old are exempt from the two-year testing requirements of this subdivision. These tests shall be performed to ensure the pipeline integrity by using at least one of the following methods: Subject to review and approval by CalGEM, the operator shall identify effective mechanical integrity testing methods based on pipeline type and use. The mechanical integrity testing methodology for compliance with this subdivision shall be specified in the operator's Pipeline Management Plan and shall include at least one of the following: (1) Nondestructive testing using ultrasonic or other techniques approved by CalGEM, to determine wall thickness; (2) Pressure testing consistent with CSFM regulations; (3) Internal inspection devices such as a smart pig, as approved by CalGEM; Any other method of ensuring the integrity of a pipeline that is approved by the State Oil and Gas Supervisor that ensures mechanical integrity so as to protect life, health, property and natural resources; and,
- Copies of mechanical integrity test results shall be maintained in a local office of the operator for ten years and made available to the CalGEM, upon request. The operator shall assess all test results to determine continued safe operations and that risks identified in the Pipeline Management Plan are adequately addressed. The operator shall repair and retest or remove from service any pipeline that fails the mechanical integrity test. CalGEM shall be promptly notified in writing by the operator of any pipeline taken out of service due to a test failure.

4.2.3 California Public Utility Commission Regulations

The California Public Utilities Commission (CPUC) regulations on pipelines are considered to not supersede the Federal Pipeline Safety Regulations but are supplements to the Federal Regulations. The Regulations provide minimum requirements for the design, construction, quality of materials, locations, testing, operations and maintenance of facilities used in the gathering, transmission and

distribution of gas and in liquefied natural gas facilities to safeguard life or limb, health, property and public welfare and to provide that adequate service will be maintained by gas operators under the jurisdiction of the CPUC.

For CPUC lines the following requirements apply: At least 60 days prior to the construction of a new pipeline, reconstruction, or reconditioning of an existing pipeline, a report shall be filed with the CPUC setting forth the proposed route and general specifications for such pipeline. The specifications shall include but not be limited to the following items:

- Description and purpose of the proposed pipeline;
- Specifications covering the pipe selected for installation, route map segregating incorporated areas, class locations and design factors, and terrain profile sketches indicating maximum and minimum elevations for each test section of pipeline;
- Maximum allowable operating pressure for which the line is being constructed;
- Test medium and pressure to be used during strength testing; and,
- Protection of pipeline from hazards and external corrosion.

For distribution and transmission systems the following regulations apply for leakage surveys and procedures:

- A gas leak survey, using leak detecting equipment, must be conducted in business districts and in the vicinity of schools, hospitals, and churches, including tests of the atmosphere in gas, electric, telephone, sewer, and water system manholes, at cracks in pavement, and sidewalks, and at other locations providing an opportunity for finding gas leaks, at intervals not exceeding 15 months, but at least once each calendar year; and,
- A gas leakage survey of transmission pipelines, using leak detecting equipment must be conducted at least twice each year and at intervals not exceeding 7 ½ months.

4.2.4 Federal Regulations

Some hazardous liquid pipelines are under the jurisdiction of the Department of Transportation (DOT) and must follow the regulations in 49 CFR Part 195, Transportation of Hazardous Liquids by Pipeline, as authorized by the Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. 2004). Other applicable Federal requirements are contained in 40 CFR Parts 109, 110, 112, 113, and 114, pertaining to the need for Oil Spill Prevention Control & Countermeasures (SPCC) Plans; 40 CFR Parts 109– 114 promulgated in response to the Oil Pollution Act of 1990.

Part 195.30 incorporates many of the applicable national safety standards of the:

- American Petroleum Institute (API);

- American Society of Mechanical Engineers (ASME);
- American National Standards Institute (ANSI); and,
- American Society for Testing and Materials (ASTM).

Part 195.50 requires reporting of accidents by telephone and in writing for:

- Explosion or fire not intentionally set by the operator;
- Spills of five gallons or more or five barrels if confined to company property and cleaned up promptly;
- Daily loss of five barrels a day to the atmosphere;
- Death or injury necessitating hospitalization; or
- Estimated property damage, including cleanup costs, greater than $50,000.

The Part 195.100 series includes design requirements for the temperature environment, variations in pressure, internal design pressure for pipe specifications, external pressure and external loads, new and used pipe, valves, fittings, and flanges.

The Part 195.200 series provides construction requirements for standards such as compliance, inspections, welding, siting and routing, bending, welding and welders, inspection and nondestructive testing of welds, external corrosion and cathodic protection, installing in-ditch and covering, clearances and crossings, valves, pumping, breakout tanks, and construction records.

The Part 195.300 series prescribes minimum requirements for hydrostatic testing, compliance dates, test pressures and duration, test medium, and records.

The Part 195.400 series specifies minimum requirements for operating and maintaining steel pipeline systems, including:

- Correction of unsafe conditions within a reasonable time;
- Procedural manual for operations, maintenance, and emergencies;
- Training;
- Maps;
- Maximum operating pressure;
- Communication system;
- Cathodic protection system;
- External and internal corrosion control;
- Valve maintenance;

- Pipeline repairs;
- Overpressure safety devices;
- Firefighting equipment; and,
- Public education program for hazardous liquid pipeline emergencies and reporting.

Part 195.452 addresses Pipeline Integrity Management Plans (IMP) in High Consequence Areas for Hazardous Liquid Operators which were existing on or after May 29, 2001. IMPs specify regulations to assess, evaluate, repair and validate, through comprehensive analysis, the integrity of hazardous liquid pipeline segments that, in the event of a leak or failure, could affect populated areas, areas unusually sensitive to environmental damage, and commercially navigable waterways. Section h.4 of 49 CFR 195.452 specifies repair criteria for pipelines based on smart pig results. These require that immediate repairs shall be conducted for the following conditions:

- Metal loss greater than 80% of nominal wall regardless of dimensions;
- Predicted burst pressure less than the established maximum operating pressure;
- A dent located on the top of the pipeline that has any indication of metal loss, cracking or a stress riser; and,
- A dent located on the top of the pipeline with a depth greater than 6% of the nominal pipe diameter.

An operator must schedule evaluation and remediation of the following conditions within 60 days for the following conditions:

- All the items listed above for the immediate repair period;
- A dent located on the top of the pipeline with a depth greater than 3% of the pipeline diameter (or 0.250 inches in depth for a pipeline diameter less than 12”); and,
- A dent located on the bottom of the pipeline that has any indication of metal loss, cracking or a stress riser.

An operator must schedule evaluation and remediation of the following conditions within 180 days for the following conditions:

- All the items listed above for the 60 day and immediate repair periods;
- A dent with a depth greater than 2% of the pipeline's diameter that affects pipe curvature at a girth weld or a longitudinal seam weld (or 0.250 inches in depth for a pipeline diameter less than 12”);
- A dent located on the top of the pipeline with a depth greater than 2% of the pipeline's diameter (or 0.250 inches in depth for a pipeline diameter less than 12” (NPS 12));

- A dent located on the bottom of the pipeline with a depth greater than 6% of the pipeline's diameter;
- An area of general corrosion with a predicted metal loss greater than 50% of nominal wall;
- Predicted metal loss greater than 50% of nominal wall that is located at a crossing of another pipeline, or is in an area with widespread circumferential corrosion, or is in an area that could affect a girth weld;
- A potential crack indication that when excavated is determined to be a crack;
- Corrosion of or along a longitudinal seam weld; and,
- A gouge or groove greater than 12.5% of nominal wall.

4.3 State Fire Marshall Data Request

The State Fire Marshal provides regulatory and enforcement authority over intrastate hazardous liquid pipelines and implements the Federal Hazardous Liquid Pipeline Safety Act. State Fire Marshall data relevant to the Project include geographic information files (GIS or Shapefiles), pipeline inspection data, and pipeline operator data submittal (PSD-101) forms. Data requests and discussion with the State Fire Marshall commenced in September 2018. Correspondence is summarized below.

- 9/19/2018 – Project Staff meeting request sent to CalFire.
- 11/6/2018 – Response received from CalFire stating the Public Records Act (PRA) process is required for CalFire information.
- 11/7/18 – Project Staff clarification correspondence sent to CalFire.
- 11/8/18 – Project Staff sent PRA request with requested data detail sent to CalFire.
- 11/15/18 – Request for conference call received from CalFire.
- 11/19/18 – Request from CalFire for additional time to address PRA request.
- 11/20/18 – Conference call with Project Staff and CalFire on data request.
- 11/30/18 – Background detail on data requested received from CalFire, no data received.
- 12/3/18 – Request and notice that the PRA data request time limit expired sent to CalFire.
- 12/10/18 – Project Staff request for follow-up on PRA data extension request sent to CalFire.
- 12/10/18 – Response but no data received from CalFire.
- 12/11/18 – Clarification about limiting scope of data request to unincorporated County sent to CalFire.
- 12/13/18 – CalFire response for more time on data request scope received.
- 1/30/19 – Telecon with Project Staff and CalFire on PRA request.
- 2/5/19 – Project Staff request for first subset of pipeline data sent to CalFire.
- 2/8/19 – Response received from CalFire stating first set of pipeline data will be provided middle March 2019.
- 4/15/19 – Project Staff received a first set of pipeline data from CalFire.

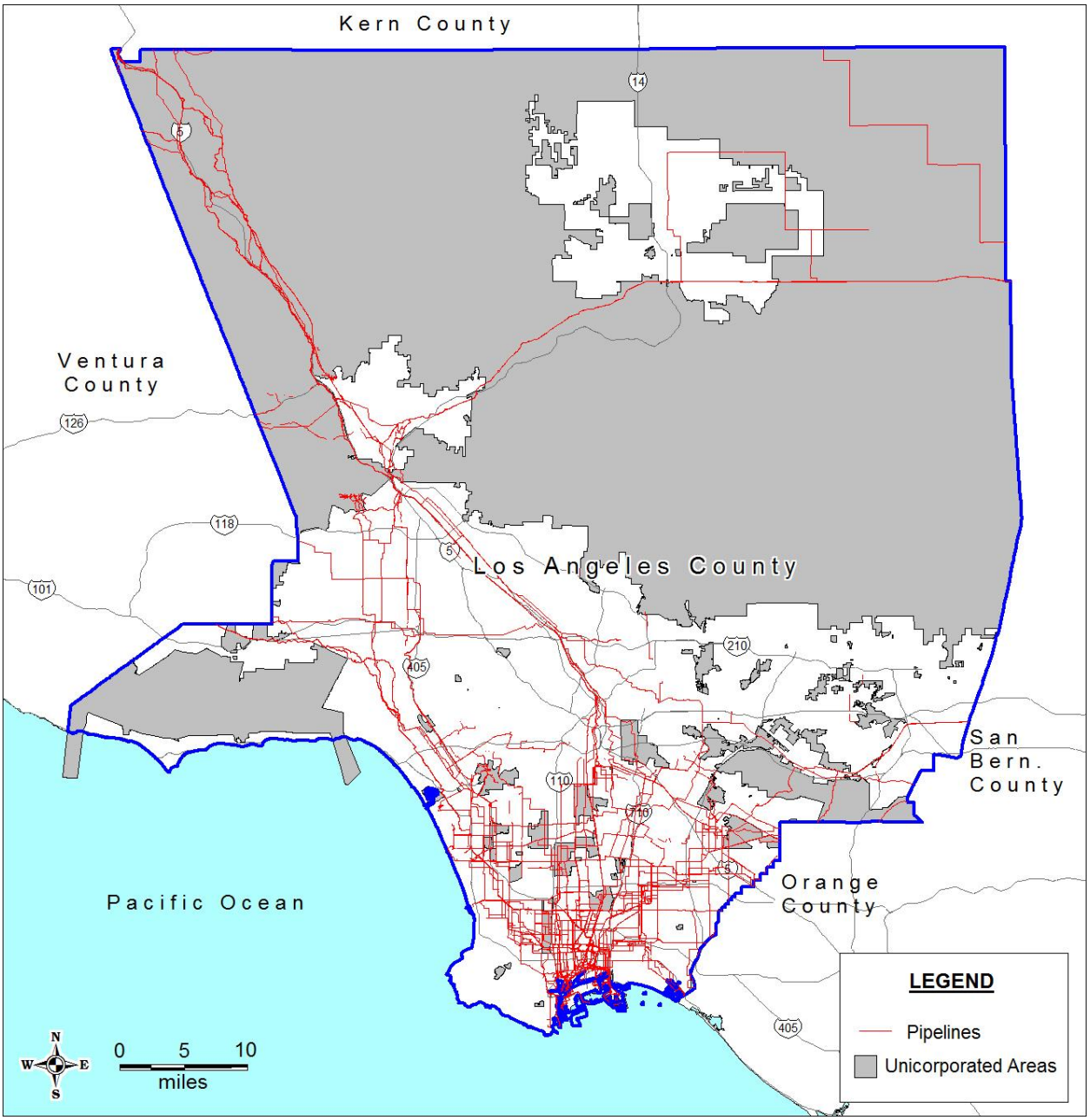
- 6/25/19 – Project Staff request for a second subset of pipeline data sent to CalFire.
- 8/8/19 – Project Staff received correspondence from CalFire stating a second set of pipeline data is available.
- 8/2/19 – Telecon with Project Staff and CalFire on PRA request.
- 10/19- Project staff received PSD-101 annual report submittals for pipelines twelve inches and greater.

As noted above, an initial set of PSD-101 Form data was received for 12 inch and larger pipelines. The PSD-101 forms contain current key information on pipeline specifications, pipeline commodities, integrity testing, hydrostatic pressure testing, leak detection system, and corrosion control. This set of data has been reviewed and is discussed in Section 4.5 below. Project Staff continues to work with the State Fire Marshall to obtain additional PSD-101 reports, and other applicable data, in support of the Strike Team Phase II project.

4.4 NPMS Pipeline Data

The National Pipeline Mapping System (NPMS) is a Geographic Information System (GIS) data set that contains the location and attributes of hazardous liquid and gas pipelines, liquified natural gas (LNG) plants, and tank farms. Data is required to be reviewed by operators annually and must be re-submitted if any of the data has changed. Some NPMS data is available to the public and additional specific data is available to government agencies. A data set was obtained in November 2018 for Los Angeles County containing a mapping and pipeline data set and was reviewed and mapped for the unincorporated County. A general map of the pipelines from the NPMS data is shown in Figure 4-1. Note that detailed locations for pipelines are not presented in this report for homeland security and safety reasons.

Figure 4-1 Los Angeles County NPMS Pipelines



Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Based on the NPMS data there are 1,400 hazardous liquid and gas pipelines managed by 20 different operators located in the unincorporated areas of Los Angeles County. For Los Angeles County as a whole, the NPMS data lists 4,342 pipelines with 42 operators. Table 4.1 lists the pipeline operators and number of pipelines for each in the unincorporated LA County. The database provides the status of the pipelines as "in service", "idle", "abandoned", or "retired" as follows:

- In Service – currently transports hazardous liquids or natural gas;
- Idle – pipeline is maintained such that it may be brought back into service;
- Abandoned – pipeline is permanently removed from service; and,
- Retired – removed from service and no longer maintained but not permanently abandoned.

Pipelines in Table 4.1 below identified as abandoned by the operator are identified as permanently removed from service in the NPMS database. The 1,031 pipelines in service, idle, or retired in the unincorporated LA County have an identified designated operator. Table 4.2 provides the number of pipelines for each category of pipeline.

Table 4.1 Unincorporated LA County Hazardous Liquid and Gas Pipeline and Operators

Pipeline Operator	Number of Pipelines
Southern California Gas Company	811
Abandoned	369
Chevron Pipeline Company	64
Crimson Pipeline L.P.	28
Plains Pipeline L.P.	24
Shell Pipeline CO., L.P.	14
Torrance Basin Pipeline Company LLC	14
Phillips 66 Pipeline LLC	11
Torrance Valley Pipeline Company LLC	11
SFPP, LP	10
Plains Marketing, L.P.	9
Torrance Pipeline Company LLC	8
Breitburn Management Company, LLC	7
Tesoro SoCal Pipeline Company LLC	7
Paramount Petroleum Corp	5
City of Vernon	2
DOD Defense Energy Support Center	2
West Coast Terminal Pipeline (WCTP)	2
Air Products and Chemicals Inc	1
CalNev Pipeline CO.	1
Total	**1,400**
Total less Abandoned	**1,031**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Table 4.2 Unincorporated LA County Pipelines by Service Status

Service Category	Number of Pipelines
In Service	935
Idle	79
Retired	17
Permanently Abandoned	369
Total	**1,400**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Pipelines by commodity and size are shown, less the permanently abandoned pipelines, in Tables 4.3 and 4.4. The NPMS data set lists 3,190 miles of hazardous liquid and gas pipelines in LA County with approximately 656 miles of those pipelines in the unincorporated LA County areas. It should be noted these totals do not include lengths for So Cal Gas pipelines as this data was not included in the NPMS data set. Table 4.3 provides the number of miles associated with each commodity type.

Table 4.3 Unincorporated LA County Pipelines by Commodity Type

Commodity	Number of Pipelines	Miles of Pipeline[1]
Crude Oil	147	202.6
Empty Gas	0	0
Empty Liquid	0	0
Fuel Grade Ethanol	0	0.0
Hydrogen Gas	1	1.0
Liquefied Petroleum Gas	0	0.0
Natural Gas[1]	821	221.1
Other Gas	0	0.0
Product (Non-Highly Volatile Liquid)	62	91.5
Totals	**1031**	**656.5**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1. National Pipeline Mapping System (NPMS) data set did not contain mileage data for So Cal Gas pipelines.

Table 4.4 Unincorporated LA County Pipelines by Diameter

Pipeline Diameter (Inches)	Number of Pipelines
20 to 24	20
18 to <20	0
16 to <18	23
14 to <16	11
12 to<14	23
10 to <12	21
8 to <10	36
6 to <8	33
4 to <6	34
Less than 4	8
No Data1	822
Total	1031

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1 The majority of these pipelines (811) are SoCal Gas Company pipelines with no size detail in data set.

4.5 California State Fire Marshall (CSFM) Pipeline Data

Annual pipeline operator reports (CSFM Form PS-101 California Intrastate Pipeline Operator Reports) contain data and validated inspection results from the previous calendar year for each pipeline under the CSFM jurisdiction. The annual PSD-101 reporting requirement began in 2017 under Senate Bill (SB) 295 (Government Code §51015.1(a) and Title 19, California Code of Regulations, Chapter 14, Article 2). SB 295 mandated the CSFM adopt regulations and conduct annual inspections to reduce the potential for jurisdictional hazardous liquid pipeline accidents in California.

Project staff received PS-101 reports in October 2019 for pipelines with diameters twelve inches and greater located in unincorporated LA County. The data in the PS-101 reports is organized by CSFM inspection units, also known as inspection modules, which are assigned by the CSFM. A single pipeline in the CSFM data set may have many inspection units and therefore a direct comparison between the NPMS and the CSFM data sets is not possible. Review of the initial set of PS-101 reports confirms pipeline operators are conducting integrity testing as required and as summarized in Table 4.5 below.

Table 4.5 CSFM Pipeline Inspection Review Summary – PSD-101 2018 Reporting Year

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0206	24	Crude Oil	In Line	11/14/2017	11/14/2022	6/30/1997
1069	24	Crude Oil	No Data	3/19/2013	3/19/2018	11/16/1999
0026	20	Refined Products	In Line	2/18/2016	2/18/2021	6/29/2010
0454	20	Refined Products	In Line	2/11/2015	2/20/2020	5/14/1992
0987	20	Crude Oil	In Line	4/24/2019	4/24/2019	Multiple
0988	20	Crude Oil	In Line	12/18/2017	12/18/2018	11/22/1998
1176	20	Crude Oil	No Data	No Data	3/29/2022	3/29/2017
0100	16	Refined Products	In Line	5/31/2017	5/31/2020	8/17/1983

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0104	16	Crude Oil	No Data	12/2/2014	12/2/2019	1/25/2000
0233	16	Crude Oil	In Line	5/19/20105	5/17/2020	9/16/1988
0233	16	Crude Oil	In Line	6/11/2009	6/3/2019	1992
0266	16	Refined Products	No Data	4/29/2016	4/26/2021	No Data
0390	16	Crude Oil	No Data	7/18/2016	7/18/2001	9/23/2003
0800	16	Crude Oil	No Data	7/12/2016	7/12/2021	No Data
1062	16	Crude Oil	No Data	6/4/2016	6/4/2018	10/30/2003
1102	16	Crude Oil	No Data	12/9/2014	12/9/2018	1/24/2011
1103	16	Crude Oil	No Data	12/9/2018	12/9/2018	1/24/2011
1104	16	Crude Oil	No Data	12/9/2014	12/9/2014	1/25/2000
1266	16	Crude Oil	In Line	8/13/2017	2/11/2019	1/17/1999
0125	14	Crude Oil	No Data	10/17/2015	1/17/2020	3/10/2016
1034	14	Crude Oil	No Data	No Data	No Data	6/17/2009
1323	14	Crude Oil	No Data	8/9/2016	8/9/2021	10/19/2014
1324	14	Crude Oil	In Line	1/24/2017	1/24/2019	8/9/2015
192	12.75	Crude Oil	In Line	2/21/2013	2/20/2018	1993
0042	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/3/2014
0127	12	Refined Products	In Line	4/20/2016	4/20/2019	4/22/2008
0455	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/31/94
0735	12	Refined Products	No Data	5/24/2016	5/24/2021	10/10/2001
1224	12	Refined Products	In Line	5/24/2016	5/24/2021	10/10/2001

Source: CSFM PS-101 Annual Reports for reporting year 2018, pipelines greater 12 inches and greater.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

As shown in Table 4.5 above, in line testing is the most common method for integrity testing of a hazardous material pipeline. In-line Inspection (ILI) involves the evaluation of pipes and pipelines using "smart pigs" (both tethered and non-tethered) that utilize non-destructive examination techniques to detect and size internal damage. ILI measures and records irregularities in pipelines including corrosion, cracks, deformations, or other defects. Smart pigs are inserted into the pipeline and are pushed along by the flowing product. Hydrostatic testing involves filling the pipe system with a liquid, usually water, which may be dyed to aid in visual leak detection, and pressurization of the line to the specified test pressure. The U.S. Department of Transportation Pipeline & Hazardous Materials Safety Administration requires that hydrostatic testing of hazardous liquid pipelines to at least 125% of the maximum operating pressure (MOP), for at least 4 continuous hours, and an additional 4 hours at a pressure of at least 110% of MOP if the piping is not visible.

Other data derived from the initial set of PSD-101 Annual Reports includes the following as listed in Table 4.6:

- High Consequence Areas. If the pipeline inspection unit sections have the potential to impact a high consequence area (HCA). The U.S. Department of Transportation on-line glossary defines an HCA as *"A location that is specially defined in pipeline safety regulations as an area where pipeline releases could have greater consequences to health*

and safety or the environment. For oil pipelines, HCAs include high population areas, other population areas, commercially navigable waterways and areas unusually sensitive to environmental damage";

- Corrosion Protection. The type of corrosion protection (cathodic protection) used on the pipeline inspection unit. Impressed current systems are used on every line in the initial PS-101 data set;
- Leak Detection Systems. If a Computational Pipeline Monitoring (CPM) or Supervisory Control and Data Acquisition (SCADA) system for leak detection is used. Of the inspection unit data sets with information for this category, most pipeline sections with this data utilized a SCADA system. Other pipeline leak detection methods included mass balance and volume balance/line pressure deviation;
- Corrosion Inhibitor Use; and,
- Pipeline Coatings Use.

Table 4.6 CSFM Pipeline Additional Data – PSD-101 2018 Reporting Year

CSFM Line ID	HCA	Corrosion Protection	Leak Detection System	Corrosion Inhibitor	Pipeline Coatings
0206	Yes	Yes	No	No	Yes
1069	Yes	Yes	No	Yes	Yes
0026	Yes	Yes	Yes	Yes	Yes
0454	Yes	Yes	Yes	No	Yes
0987	Yes	Yes	No Data	Yes	Yes
0988	Yes	Yes	Yes	Yes	Yes
1176	Yes	Yes	No	No	Yes
0100	Yes	Yes	Yes	No	Yes
0104	Yes	Yes	Yes	No	Yes
0233	Yes	Yes	No	No	Yes
0233	Yes	Yes	No	No	Yes
0266	Yes	Yes	No	No	Yes
0390	Yes	Yes	Yes	No	Yes
0800	Yes	Yes	Yes	No	Yes
1062	Yes	Yes	No	No	Yes
1102	Yes	Yes	Yes	Yes	Yes
1103	Yes	Yes	Yes	Yes	Yes
1104	Yes	Yes	Yes	Yes	Yes
1266	Yes	Yes	Yes	Yes	Yes
0125	Yes	Yes	Yes	No	Yes
1034	No	Yes	Yes	Yes	No
1323	Yes	Yes	Yes	Yes	Yes
1324	Yes	Yes	Yes	Yes	Yes
192	Yes	Yes	No	No	Yes
0042	Yes	Yes	Yes	No	Yes
0127	Yes	Yes	No Data	No	Yes
0455	Yes	Yes	Yes	No	Yes
0735	Yes	Yes	No Data	No	No
1224	Yes	Yes	Yes	No	Yes

Source: CSFM PS-101 Annual Reports for reporting year 2018, pipelines greater 12 inches and greater.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

The data in Table 4.6 is presented to provide pertinent information on pipelines available from the PSD-101 database. The data documents the preventative measures for corrosion monitoring and leak detection for those pipelines. A pipeline that is not undergoing cathodic protection, or that has a substantial amount of corrosion is more likely to leak than other pipelines that do not. Similarly, if a pipeline has a leak detection system is place, it is more likely to identify a problem shortly after it has occurred and, in that fashion, prevent further damage.

4.6 Next Steps

This analysis for pipelines provides a general overview of the data from the NPMS database and an initial set of CSFM PS-101 annual pipeline reports for hazardous liquid and gas pipelines located in the unincorporated areas of Los Angeles County. Additional work on pipelines that will be performed includes the following:

1. Continue to work with the State Fire Marshall to obtain pipeline data to obtain additional pipeline operator annual reports.
2. Develop a listing of the high priority pipelines based on the pipeline specific and inspection data listed above and census tract/population data.
3. Develop a site visit and inspection protocol for the high priority pipelines;
4. Conduct site inspections of high priority pipelines.
5. Provide recommendations on potential public and environmental health and safety concerns of oil and gas pipelines.
6. The Strike Team will continue to review pipeline inspection records, and compliance with existing regulations and make recommendations for additional County regulations if needed.

5.0 Oil and Gas Storage Facilities

Oil and gas storage facilities can present risk to the community through accidental releases of materials and routine air emissions of toxic pollutants. Oil and gas storage facilities are facilities that are not included in the oil production category (which includes wells and produced crude oil and gas storage).

5.1 Facility Listings in TRI

Oil and gas storage facilities were examined utilizing the EPA Toxic Release Inventory (TRI) data, which includes information in the industry type, the amount of chemicals stored onsite and the facility information in addition to toxic material release inventories. This information was compiled for Los Angeles County and the unincorporated areas for petroleum facilities, chemical facilities and for petroleum bulk storage facility industry types in order to encompass all potential oil and gas storage locations.

5.2 Facility Listings in CERS

The California Environmental Reporting System (CERS) is a database system that is utilized by facility and first responders in California to enter data about their facilities and allow for a lookup of a facilities hazardous materials inventory. The DRP gained access to the CERS system as a regulator-responder and was able to look up specific facilities to determine their current hazardous material storage status. Details in the CERS system includes the facility location, owner information, contact information and a hazardous materials inventory summary. The TRI facilities were queried to determine the status in the CERS system, and the CERS system was also reviewed for the unincorporated areas for additional facilities that may not have been listed in the TRI database. This allowed for the addition of additional facilities to the TRI data and to refine the hazardous material quantities in the TRI data.

The CERS system classifies materials at facilities into the following areas: flammable liquids, flammable gasses, flammable solids, toxic gasses, other toxic substances, oxidizers, corrosives, explosives, others.

Table 5.1 shows the listing of the facilities with the largest inventories. Figure 5-1 shows the location of potential oil and gas facilities in the unincorporated areas of Los Angeles County.

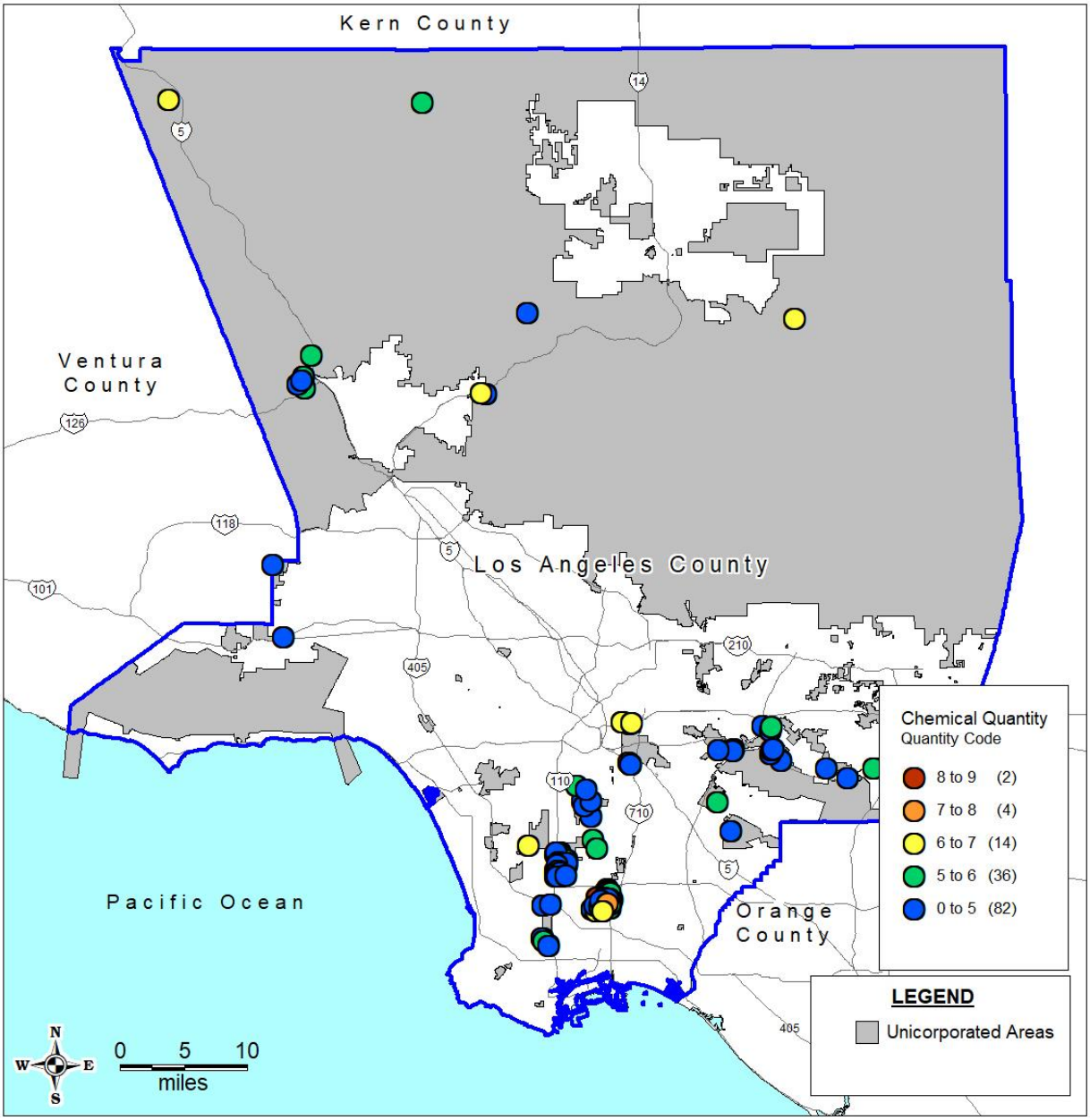
Table 5.1 Facilities with the Largest Quantity of Chemicals

Facility Name	City	Materials
Pacific Terminals - Dominguez Hills Pump Station	Compton	Flammable Combustible Liquids
Phillips 66 Los Angeles Terminal	Los Angeles	Flammable Combustible Liquids Other
General Petroleum	Rancho Dominguez	Other
Torrance Valley Pipeline Company LLC - Newhall Station	Valencia	Flammable Combustible Liquids
Alflex Corp Distribution Center	Rancho Dominguez	UN
American Racing Equipment Inc	Rancho Dominguez	UN
American Racing Custom Wheels	Rancho Dominguez	UN
Interplastic Corp	Hawthorne	Flammable Combustible Liquids Other

Facility Name	City	Materials
National Cement Co	Lebec	Other
Clean Harbors	Rancho Dominguez	Other
LA DWP Castiac Power Plant	Castaic	Other
Universal Studios LLC	Universal City	Other
Plaskolite West LLC	Compton	Flammable Combustible Liquids
Apple Plastics Inc	Rancho Dominguez	Other
Holliday Rock-Palmdale	Littlerock	Other
Valencia Water Reclamation Plant	Valencia	Other
A&A Ready Mixed Concrete Inc	Gardena	Other
A&A Ready Mixed Concrete Inc	Gardena	Flammable Combustible Liquids Other
Salon Centric	Valencia	Flammable Combustible Liquids Other
Crossfield Products Corp	Rancho Dominguez	Other

Source: TRI Database with over 1 million pounds for industry codes 324 Petroleum & Coal Products, 325 Chemicals, and 4247 Petroleum and Petroleum Products Merchant Wholesalers plus CERS data. UN = unknown

Figure 5-1 Potential Oil and Gas Storage Facilities



Notes: Chemical quantities are designated as: 5=greater than 100,000 pounds; 6=greater than 1 million pounds; 7= greater than 10 million pounds; 8 greater than 100 million pounds and 9=greater than 1 billion pounds.
Figure based on EPA Toxic Release Inventory data.

5.3 Facilities and Census Data

The facility locations were correlated with census data to identify those facilities that are in populated areas. Figure 5-2 shows the facilities and the census data population densities. Table 5.1 shows the number of facilities located in different population density areas.

Figure 5-2 Potential Oil and Gas Storage Facilities and Census Data

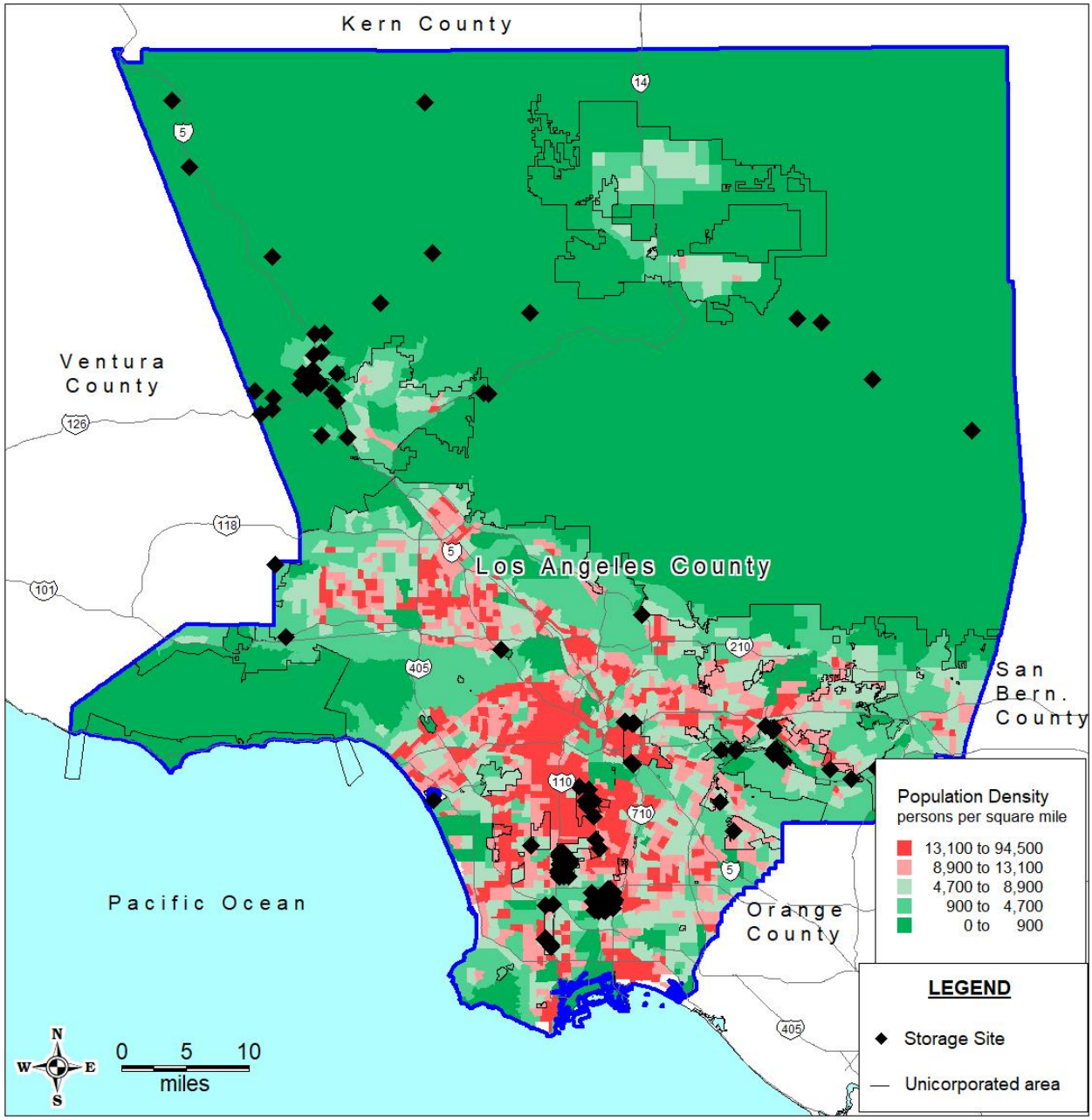


Figure based on EPA Toxic Release Inventory, CERS data and 2010 U.S. Census Bureau data.

Table 5.2 Facilities and Census Data Population Densities

Population Density	Number of Facilities	Density Rank
Less than 1,000 persons/square mile	99	0
More than 1,000 persons/square mile	78	2
More than 5,000 persons/square mile	32	4
More than 10,000 persons/square mile	15	6
More than 15,000 persons/square mile	8	8

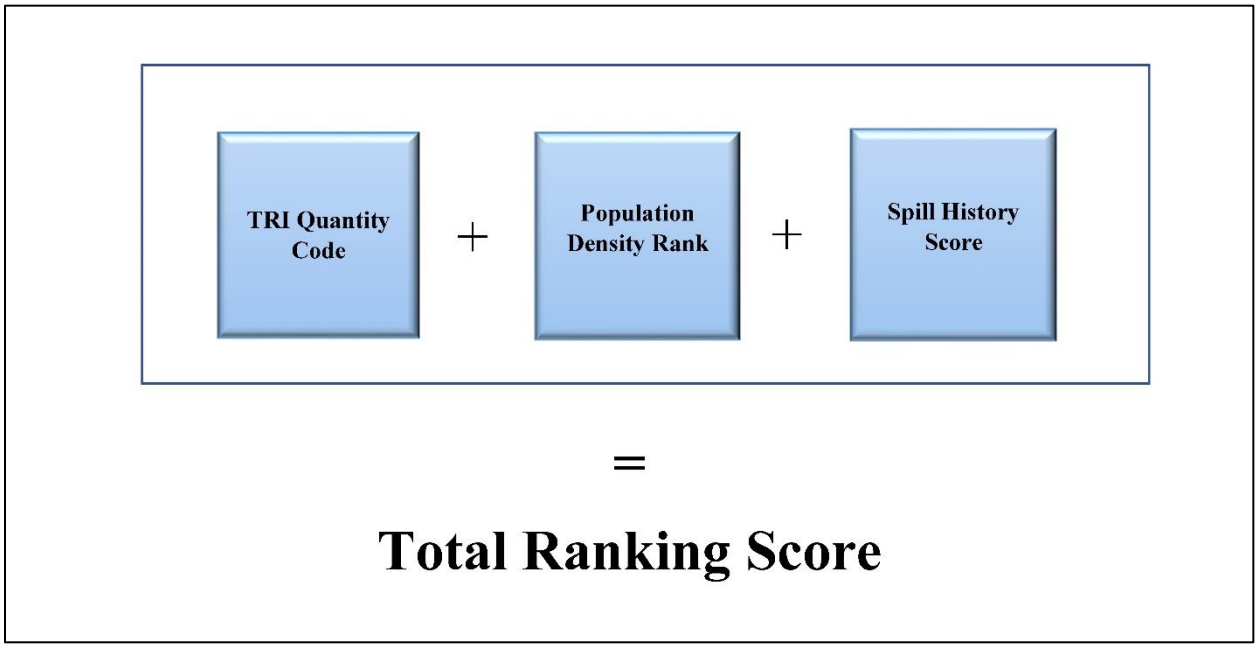
5.4 Facilities by Spill History

The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA) and California law require responsible parties to report hazardous material releases if certain criteria is met. The California Office of Emergency Services (OES) maintains a database of spills in California. While this spill database does not generally maintain GIS reference information or facility name, address matching was reviewed for spills over the last 5 years. Of the facilities identified from the TRI and CERS systems, 23 facilities experienced spills in the last 5 years.

5.5 Facilities Ranking

Based on the materials quantity and the census tract population density, the facilities were ranked by adding together the TRI quantity code, the census tract population density rank as shown in Table 5.2 and a score if there has been a spill in the last 5 years (0 for none, 5 for maybe and 10 for yes). The highest ranked facilities will therefore have a high quantity of materials located in high population density areas and have a history of some spills. These facilities are those that, because of the amount of materials stored, may present a higher frequency of releases of materials. If releases were to occur, due to the higher population densities, the probability of affecting the public would be higher. In addition, if there is a history of spills, then this also is an indication of the potential for a higher frequency of release of materials to the environment. A low-ranking facility would have less materials located in low population density areas and not have a spill history. A ranking schematic is shown in Figure 5-3.

Figure 5-3 Facility Ranking Schematic



The ranking for the top 10 facilities is shown in Table 5.3

Table 5.3 Facilities Ranking: Top 10 Facilities

Facility Name	Facility Rank
BOWMAN PLATING CO INC	23
PRECISION SPECIALTY METALS INC	20
GEORGE INDUSTRIES	20
HONOR RANCHO	19
AMERICAN POLYSTYRENE CORP	18
INTERPLASTIC CORP	18
PACIFIC SINTERED METALS	17
LA DWP CASTIAC POWER PLANT	16
CROSSFIELD PRODUCTS CORP	16
UNIVERSAL STUDIOS LLC	16

5.6 Next Steps

The initial review of potential oil and gas storage facilities utilizes the EPA TRI database to review those facilities that could be oil and gas storage facilities based on the industrial codes, and a comparison of the facility locations to the census data. Additional facilities and a refinement of the TRI data was implemented based on a DRP review of the CERS data and additional reviews of the OES spills databases. Additional details will be gathered including the following:

1. Review applicability of including underground natural gas storage facilities such as the Aliso Canyon, Playa del Rey, Montebello, and Honor Ranch storage facilities.
2. Add additional facilities and refine current listing by pursuing additional access capabilities with the area CUPA and CERS that would allow for hazardous material quantity queries instead of just facility look up.

6.0 Well Drilling and Well Maintenance Chemical Use

One of the Phase I Strike Team findings concerned the use of chemicals for well drilling, maintenance, and workover activities. These materials are not typically included in hazardous materials business plans because they are specific to each well activity, are only brought onsite as required and are not stored onsite. SCAQMD Rule 1148.2 requires reporting of all chemical use for oil or gas drilling, well completion, or well reworks for onshore wells located in the SCAQMD. Additional information required by Rule 1148.2 includes:

- Name and contact information of well owner and operator;
- Well name and API number;
- Well location;
- Nearest and type of sensitive receptor within 1,500 feet;
- Project schedule;
- Equipment data; and,
- Volumes and types of dry and fluid materials used.

Chemical specific data for each product used in a well drilling fluid, well rework fluid, or well completion fluid required by Rule 1148.2 includes:

- Identity and purpose;
- Total mass in pounds;
- CAS (Chemical Abstract Service Number);
- Mass of each chemical ingredient;
- Air toxic designation;
- Supplier data; and,
- Trade secret protection if applicable.

6.1 Well Activity

Data for the calendar years 2016 through June 2019 provided information on the type of well work activities and associated chemical use for wells subject to Rule 1148.2. Table 6.1 lists Rule 1148.2 well activity events for the 2016 through June 2019 time period for the entire Los Angeles County. As shown in Table 6.1, most of the chemical use reported was associated with maintenance acidizing, gravel packing, and well drilling. Maintenance acidizing is not defined in Rule 1148.2, however, most well operators use the term to describe a near-wellbore treatment to remove scale formation that can plug up well perforations. Definitions for these well activities can differ from agency to agency and no comprehensive single source is available. Table 6.2 lists the commonly used definitions and agency source used by the oil and gas industry. No hydraulic fracturing projects were reported in the Rule 1148.2 database for all of Los Angeles County in the time period 2016 to June 2019. Most of the well report locations were in the cities of Long Beach, Los Angeles, and Wilmington as listed in Table 6-3.

Due to the small sample size of well activity in the unincorporated LA County area and to present a general idea of the types and amounts of chemicals used for well work activities in the Los Angeles basin, the data set presented in this section of the report is for the entire Los Angeles County. Figures 6.1 through 6.3 map where these well activities occurred with unincorporated LA County shown in gray.

Table 6.1 2018 Rule 1148.2 Well Activity LA County

Rule 1148.2 Data 2016 through June 2019	
Well Activity Type	**Number**
Well Drilling	98
Matrix Acidizing	0
Hydraulic Fracturing	0
Gravel Packing	149
Maintenance Acidizing	515
Acid Fracturing	3
Other	2
Total	**767**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Table 6.2 Well Activity Definitions

Type	Definition	Source
Acid Fracturing	A well stimulation treatment that, in whole or in part, includes the pressurized injection of acid into an underground geologic formation in order to fracture the formation, thereby causing or enhancing, for the purposes of this division, the production of oil or gas from a well.	SB4
Acid Matrix Stimulation	An acid treatment conducted at pressures lower than the applied pressure necessary to fracture the underground geologic formation.	SB4
Acidizing	A treatment of the wellbore or reservoir formation with an acid to either clean out scale, damage, or other debris in the well, or react with the soluble substances in the formation to improve permeability and enhance production of oil and gas	SCAQMD Rule 1148.2
Gravel Packing	A method that uses water and additives to place sand and gravel near the wellbore itself with the objective of limiting entry of formation sands and fine-grained material into the wellbore	
Hydraulic Fracturing	A technique used in stimulating a formation or zone that involves the pressurized injection of hydraulic fracturing fluid, which is a carrier fluid mixed with chemical additives, and typically a proppant, into an underground geologic formation in order to fracture the formation, thereby causing or enhancing the production of oil or gas from a well	SCAQMD Rule 1148.2
Maintenance Acidizing	Commonly used by industry to describe the use of acid for well bore de-scaling maintenance activities.	Oil and Gas Industry

Source: SB4 Well Stimulation Regulations, SCAQMD Rule 1148.2, oil and gas industry staff.

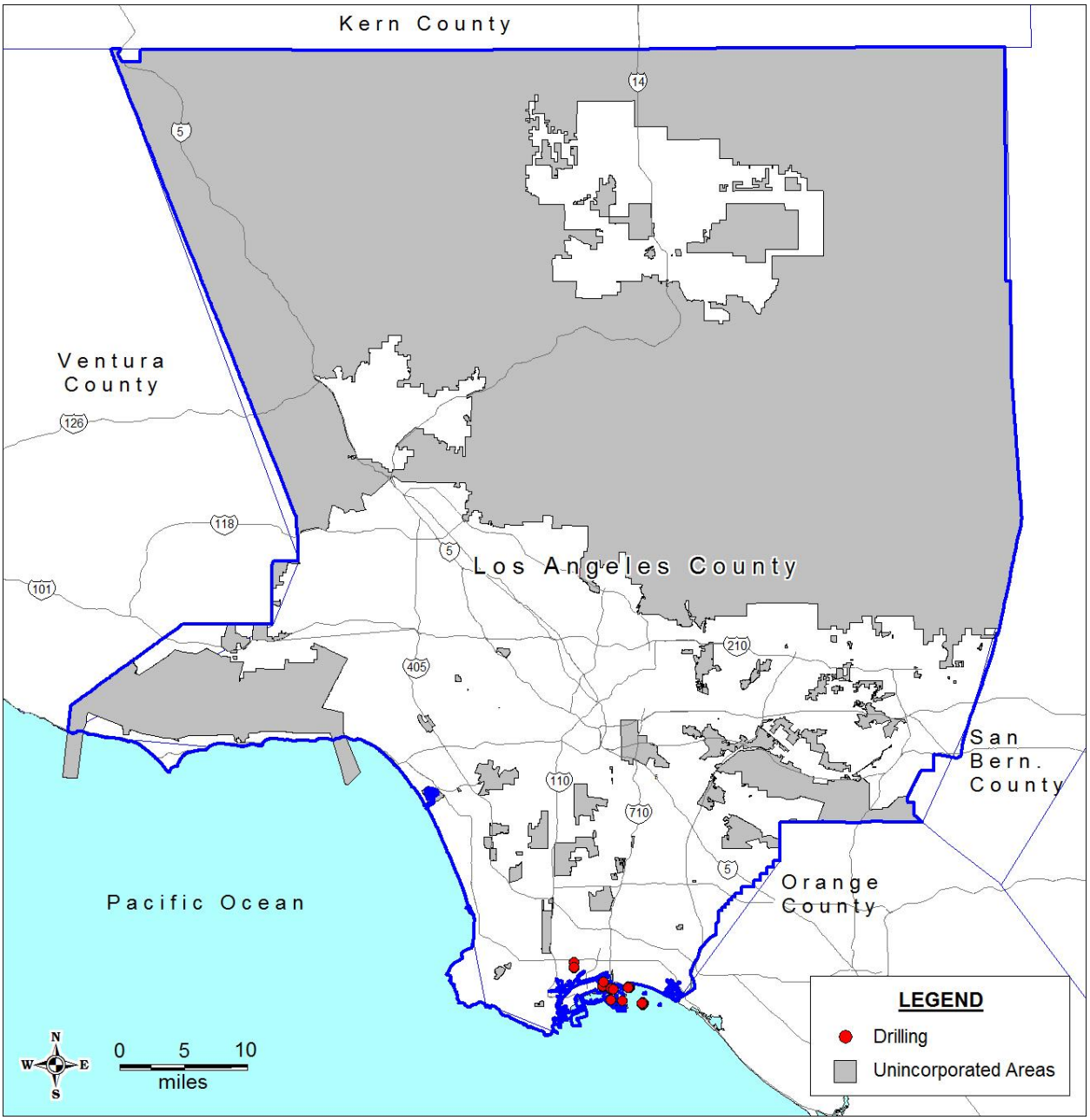
Table 6.3 Rule 1148.2 Well Drilling, Maintenance, and Workover Activities by City

Rule 1148.2 Data 2016 through June 2019	
City/Community	**Number of Well Activity Events**
Long Beach	635
Los Angeles and Unincorporated Los Angeles	54
Wilmington	40
Signal Hill	12
Carson	8
None identified	6
Montebello	3
Santa Fe Springs	3
Castaic	2
Harbor City	1
La Habra Heights	1
Northridge	1
Valencia	1
Total	**767**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

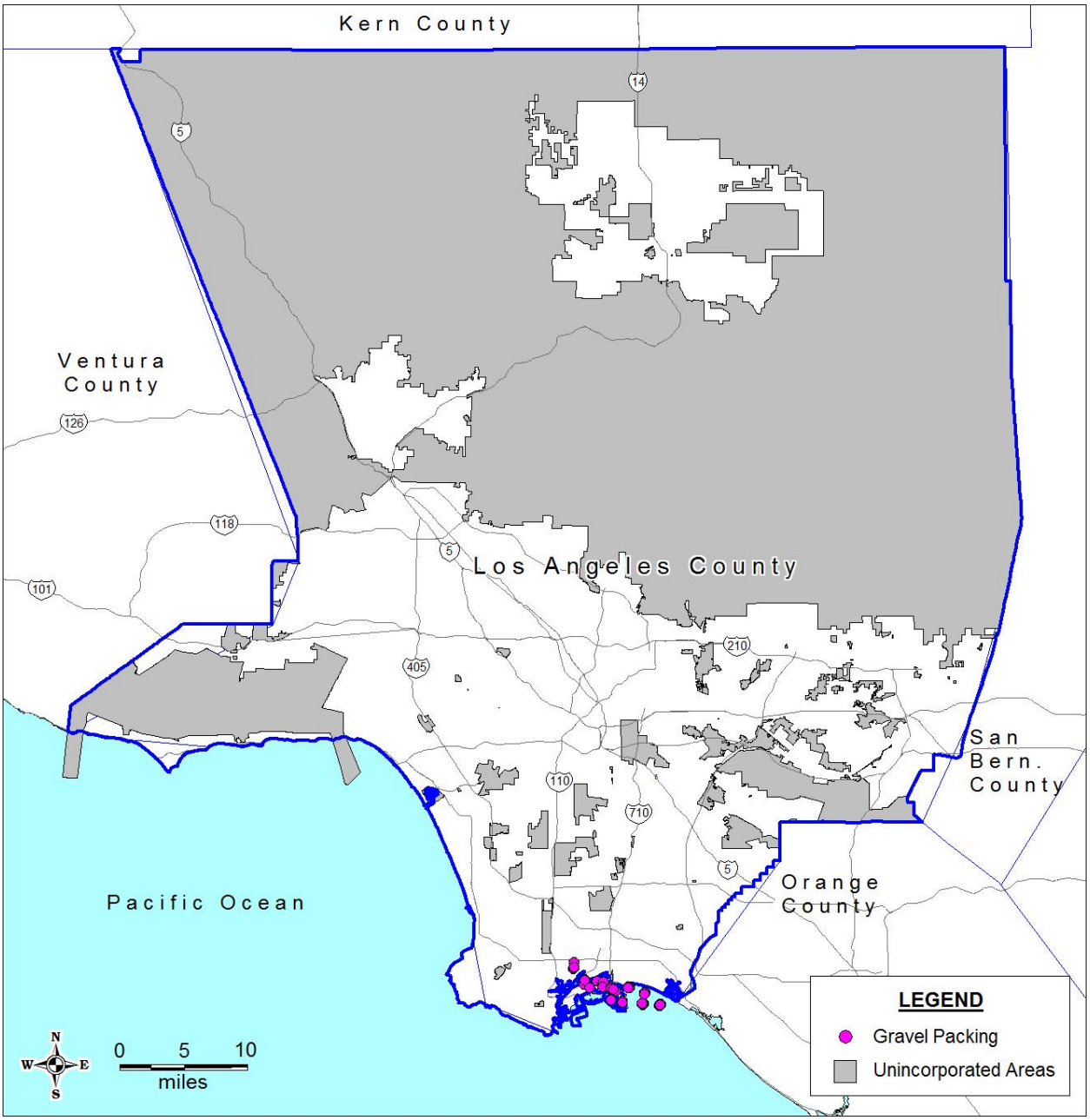
Figures 6-1 through 6-3 show the locations of the well activities listed in Table 6-1 above.

Figure 6-1 Rule 1148.2 Well Drilling Locations



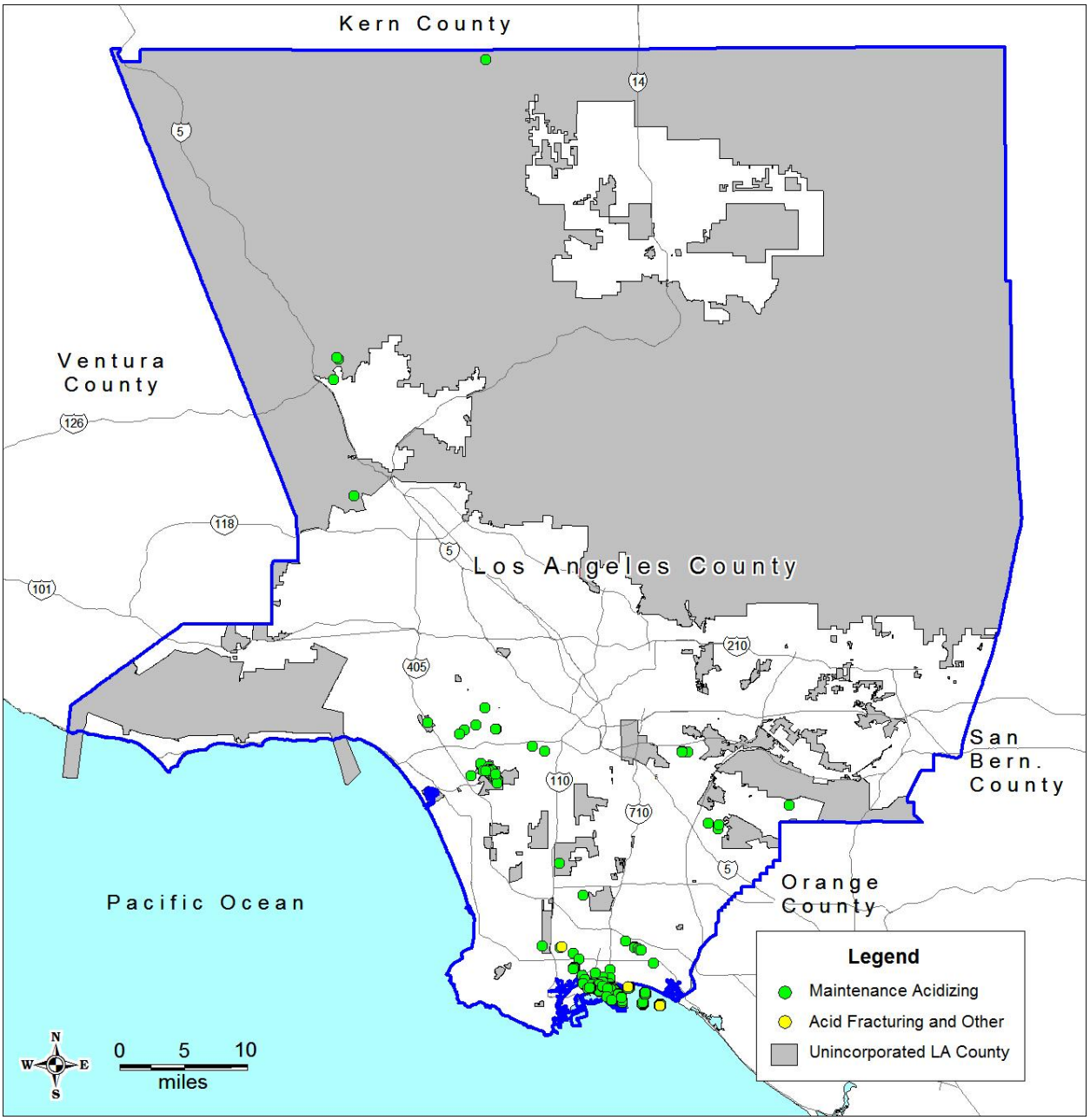
Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-2 Rule 1148.2 Gravel Packing Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-3 Rule 1148.2 Well Maintenance Acidizing, Acid Fracturing and Other Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

6.2 Well Fluid and Chemical Use

Rule 1148.2 provides quantities, total fluid, and chemical specific data for each product used in a well drilling fluid, well maintenance fluid, or well completion fluid. Table 6.4 lists the average fluid use for each well activity type reported for the 2016 through June 2019 time period. It is important to note the fluid use numbers include water and the Rule 1148.2 database reports total fluid use and does not break out individual types of materials by volumes of fluids.

Table 6.4 Rule 1148.2 Total Fluid Use by Well Activity

Rule 1148.2 Data 2016 through June 2019	
Well Activity Type	**Average Fluid Use Including Water (Gallons)**
Well Drilling	58,950
Gravel Packing	11,575
Maintenance Acidizing	32,600
Acid Fracturing	16,256
Other	47,880

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Review of the chemical use for the well activities in the 2016 through June 2019 Rule 1148.2 data set lists 224 different chemicals. The Rule 1148.2 database includes chemical use calculated by mass, in pounds. It is important to note that the values shown indicate the amount of material or chemical used down hole for each well activity and do not represent calculations for materials released into the atmosphere. Tables 6.5 through 6.9 identify the top 25 materials and the average amount, in pounds, used for each well activity in the 2016 to June 2019 data set. As listed in Table 6.1 above, matrix acidizing and hydraulic fracturing were not conducted during the 2016 through June 2019 reporting period. Note for well activities with less than 25 different material use types, all materials use types are listed. Appendix B provides a complete list of all the material and chemical types with CAS numbers for Los Angeles County for the Rule 1148.2 data set years 2016 through June 2019.

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	393,495
BARITE	7727437	38,211
PORTLAND CEMENT	65997151	36,500
POTASSIUM CHLORIDE	7447407	31,115
CALCIUM CHLORIDE	10043524	23,361
CALCIUM CARBONATE	471341	14,747
CRYSTALLINE SILICA	14808607	14,186
SODIUM CHLORIDE	7647145	8,215
SILICA, CRYSTALLINE, QUARTZ	14808607	4,898
GYPSUM	13397245	4,661
SAPONITE	1319411	4,054
AMORPHOUS SILICA	7631869	3,226

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
QUARTZ (SILICA)	14808607	2,658
MAGNESIUM OXIDE	1309484	2,600
CALCIUM OXIDE	1305788	2,514
SULFONATE	0	2,490
MICA	12001262	2,333
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	2,330
ANIONIC ACRYLAMIDE COPOLYMER	0	1,924
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	1,889
MAGNESIUM	7439954	1,341
AMORPHOUS SILICA FUME	69012642	1,124
ALUMINUM OXIDE	1344281	981
SODIUM CARBONATE	497198	911
CARBONIC ACID CALCIUM SALT (1:1)	471341	863

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.6 Rule 1148.2 Average Material Use by Well Activity-Gravel Packing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	39,633
POTASSIUM CHLORIDE	7447407	7,679
CRYSTALLINE SILICA	14808607	6,953
CALCIUM CHLORIDE	10043524	1,880
SODIUM CHLORIDE	7647145	867
MAGNESIUM	7439954	113
HYDROXYETHYL CELLULOSE	9004620	106
QUARTZ (SILICA)	14808607	105
ACETIC ACID, SODIUM SALT (1:1)	127093	9
CELLULOSE	9004346	2

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Table 6.7 Rule 1148.2 Average Material Use by Well Activity-Maintenance Acidizing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	131,673
HYDROCHLORIC ACID	7647010	2,149
BARITE	7727437	1,728
AMMONIUM CHLORIDE	12125029	1,107
PORTLAND CEMENT	65997151	1,028

Table 6.7 Rule 1148.2 Average Material Use by Well Activity-Maintenance Acidizing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
POTASSIUM CHLORIDE	7447407	891
HYDROGEN CHLORIDE	7647010	775
XYLENE	1330207	536
CRYSTALLINE SILICA	14808607	380
CALCIUM CHLORIDE	10043524	344
SODIUM CHLORIDE	7647145	289
HYDROFLUORIC ACID	7664393	256
ACETIC ACID	64197	240
SILICA, CRYSTALLINE, QUARTZ	14808607	189
ETHYLBENZENE	100414	144
GYPSUM	13397245	137
CITRIC ACID	77929	135
METHANOL	67561	117
MICA	12001262	92
AMORPHOUS SILICA	7631869	91
SULFONATE	0	88
SAPONITE	1319411	77
CALCIUM OXIDE	1305788	73
MAGNESIUM OXIDE	1309484	69
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	69

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.8 Rule 1148.2 Average Material Use by Well Activity-Acid Fracturing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	410,916
BARITE	7727437	91,434
PORTLAND CEMENT	65997151	72,216
POTASSIUM CHLORIDE	7447407	43,619
CRYSTALLINE SILICA	14808607	18,248
SILICA, CRYSTALLINE, QUARTZ	14808607	9,760
GYPSUM	13397245	9,629
CALCIUM OXIDE	1305788	5,079
SAPONITE	1319411	4,917
MICA	12001262	4,872
AMORPHOUS SILICA FUME	69012642	4,818
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	4,814
MAGNESIUM OXIDE	1309484	4,814
SULFONATE	0	4,167

Table 6.8 Rule 1148.2 Average Material Use by Well Activity-Acid Fracturing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
ANIONIC ACRYLAMIDE COPOLYMER	0	3,183
AMORPHOUS SILICA	7631869	2,985
HYDROCHLORIC ACID	7647010	2,761
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	2,500
SODIUM CHLORIDE	7647145	2,302
AMMONIUM CHLORIDE	12125029	1,810
ALUMINUM OXIDE	1344281	1,569
DISODIUM METASILICATE	6834920	1,555
LIGNITE	1415936	1,502
SODIUM CARBONATE	497198	1,217
BENTONITE	1302789	1,048

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.9 Rule 1148.2 Average Material Use by Well Activity-Other

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	44,250
BENTONITE	1302789	21,138
SULFURIC ACID, BARIUM SALT (1:1)	7727437	5,000
QUARTZ (SILICA)	14808607	3,598
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	875
ANIONIC POLYACRYLAMIDE	9003058	581
CARBONIC ACID SODIUM SALT (1:2)	497198	550
SODIUM BICARBONATE	144558	543
XANTHAN GUM	11138662	500
OIL, HYDROTREATED LIGHT NAPTHENIC DISTILLATE	64742478	291
SODIUM POLYACRYLATE	9003047	123
COMPOUND SYNTHETIC DIESTERS	8029398	78
SULFURIC ACID, IRON(2+) SALT (1:1), MONOHYDRATE	17375416	18
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-ISODECYL-.OMEGA.-HYDROXY-, PHOSPHATE, POTASSIUM SALT	68071170	14

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

6.3 Next Steps

This review of chemicals used for well drilling, maintenance, and workover activities consisted of an initial evaluation of the SCAQMD Rule 1148.2 database. Additional review and analysis of the Rule 1148.2 will continue along with the following:

1. Continue to review and analyze the Rule 1148.2 database including chemical quantities and sensitive receptor information.
2. Review chemical compositions and toxicity for potential to affect public health and safety.
3. Provide recommendations on potential public and environmental health and safety concerns of subject well activities and chemicals.

7.0 Conclusion

This report was completed pursuant to the Board's March 2016 Motion and September 2018 action continuing the Strike Team's efforts. The research, database development, and mapping in this report provides an overview of the Strike Team Phase II issue areas and provides staff with applicable tools to continue forward with the Project. Specific tasks, as outlined in the "Next Steps" sections above, will continue with the results presented in the next biannual report, due September 29, 2020.

Appendix A

Strike Team Advisory Panel Phase II Report 1 Input Summary

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
May-1	I am concerned about follow-up on Mr. Rezvani's comment regarding pipelines owned by larger companies, which have been sold to smaller companies that may not have the same resources. I strongly support follow-up, as pipeline ruptures onto public streets have occurred in the past.	The County holds franchise agreements with the various pipeline owners that occupy the public right of way, and will address the issue of change of ownership as a separate effort from the Strike Team
May-2	Please provide specific locations (such as addresses) of abandoned and orphaned wells, at least for the highest priority wells.	Specific locations not available for many wells and most wells are not connected to a street address. We have added APN number for those wells located within a parcel and the APN for those wells located in non-parcel areas (such as streets, etc.). Also, the general location of the wells is provided as part of the aerial maps included in the report with the approximate location of the wells per CalGEM data. Additional location information will be obtained during the well inspection process.
May-3	Providing all report maps in interactive online format would make them much more useful. As they are now, many points can be only seen as overlapping clusters, rather than individual points, and don't provide the report reader with enough specific information on locations. Ability to zoom in with high resolution would make these maps meaningful to local folks.	The Reports are available online at the County's Strike Team website. Well maps are available on CalGEM WellFinder website and we will be providing the APN and API numbers in this upcoming report.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
May-4	There is a great need to consider earthquake impacts on health and safety relating to all of the oil and gas infrastructure discussed in the report. I would appreciate highlighting this recommendation to the Board of Supervisors, since major earthquakes could happen any time. Earthquake issues would be consistent with the efforts to identify health and safety hazards relating to these operations. While it is a major subject, a start needs to be made.	Earthquakes are an important consideration, and the subject is being addressed as part of the Oil Code revisions, outside of the scope of the Strike Team Project. Note that the Strike Team Oil and Gas Facility Compliance Project reviewed oil and gas facility emergency response plans, spill plans, emergency drills, secondary containment and other issues related to emergencies from oil and gas facilities. Proximity to an earthquake fault could be added as a criteria for abandoned wells, although the impacts of an earthquake could be felt Countywide and are not necessarily associated with an earthquake fault.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
May-5	Please include information in the next report about the dramatic explosion at Nustar petroleum storage last week in Northern California, and any similarities between this facility and other Oil and Gas storage facilities in unincorporated LA County. While the Nustar explosion and burning of two tanks involved ethanol, many nearby tanks were threatened, including crude oil storage. This facility was connected by pipeline to other facilities including the nearby Phillips 66 refinery. The explosion caused shutdown of the nearby freeway for 7 hours, spilling traffic onto local roads, which may have delayed mutual support of other oil industry fire resources. (The fire Marshall reported during a press conference that mutual aid firefighting resources of the petroleum industry had arrived, but this was two hours after the fire started.) Nustar employees were reported to have fled for their lives, failing to turn on fire suppression, but locking the gate, impeding fire department access. The resulting brush fire on the hillside required a helicopter, tractor to cut fire lines, and dozens of fire fighters. There was speculation on whether a small earthquake the night before could have led to this dangerous malfunction.	Historical incidents can inform the development of response plans and other planning tools. Storage tanks are being addressed in later versions of the Strike Team Report and information will be provided on potential impacts of these facilities, along with potential recommendation to reduce impacts.
May-6	Please include at least preliminary information in the next report about emergency response resources for fires and explosions relating to oil and gas infrastructure. Although this is a major topic in itself, this fits with the reports' identified next steps to identify recommendations on health and safety evaluation relating to oil and gas infrastructure.	The Strike Team Oil and Gas Facility Compliance Project reviewed oil and gas facility emergency response plans, spill plans, emergency drills, secondary containment and other issues related to emergencies from specific oil and gas facilities. However, these are specific to the individual sites and their potential emergencies and their response. The Report does not examine the resources of agencies, which is outside the scope of the project.
May-7	Please also provide in the next update the chemicals and amounts reported for each company in Table 5.1 -- Facilities with the Largest Quantity of Chemicals, since the work of pulling this information together is already done. It would be helpful and appreciated for the reader to have the specific information.	Additional chemical information will be included in Report #3.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
O'Connor-1	The Strike Team report proposes a prioritization matrix for idle, abandoned and hazardous wells based on a series of factors, including age of wells/field, proximity to people, and whether the well is in a disadvantaged community as identified within the Cal EnviroScreen 3.0 tool. While the clarity and transparency of the factors going into this prioritization seems appropriate, there may be other relevant indicators of the propensity of a well to leak and cause impacts to human health and the environment. For this reason, the Strike team should affirmatively seek out an external review of the chosen factors / prioritization matrix it has developed. Researchers at Stanford University led by Rob Jackson - rob.jackson@stanford.edu – would be especially capable of performing this review.	External review of Strike Team reports is achieved by making all the reports public and available for review and comment. The current scope does not contemplate seeking out additional experts for review and comment. However, members of the public and Advisory Panel members are encouraged to reach out to experts that are willing to provide review and comment on the Strike Team efforts. All comments will be taken under consideration to achieve the best possible outcome for the Reports and additional expertise is welcome.
O'Connor-2	My prior comments made after the first report in this series stated that additional criteria should be considered for the prioritization matrix, such as 1) water level recordings during regular tests by operators and 2) observations in county or other well records of negative integrity indications. While several of my other recommendations for inclusion were taken, an explanation of why these were not would be appreciated.	Water levels at idle wells were obtained from DOGGR and reviewed. However, water levels varied substantially between idle wells in the same field and generalizations were therefore not able to be made. Negative integrity indications will be developed as detailed DOGGR/CalGEM records are reviewed, starting in this next report.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
O'Connor-3	In my prior comments I recommended the Strike team seek out water level records from DOGGR (now CalGEM) and add to the matrix a score for whether well records indicate any communication between well liquids and the surrounding geologic formation. The report includes a reference to this work on page 13, saying that "DOGGR provided DRP with an excel spreadsheet with water level data from idle wells within the Los Angeles County." However, my review of the report did not find anything related to what that data showed or any incorporation into the prioritization matrix. The strike team should provide an explanation of what that data showed and a discussion of its usefulness for evaluating well integrity.	Water levels at idle wells were obtained from DOGGR and reviewed. However, water levels varied substantially between idle wells in the same field and generalizations were therefore not able to be made in order to provide insight into abandoned wells located in the same field. Idle wells are not being examined as part of this project.
O'Connor-4	Recently the California state legislature passed AB 1328 related to idle and abandoned well testing. This bill, thereafter signed by the Governor will result in significant testing for human health and local air contaminants coming from these wells across California. The Strike Team should reach out to state officials at CalGEM in charge of implementing this bill to ensure they are aware of the prioritization matrix that has been developed, and to capitalize on the investment in air monitoring that will be conducted by the state – making sure it is being deployed to advance the study of wells envisioned in this project.	The Strike Team will take this new legislation into consideration and work with CalGEM to understand how this effort is going to be implemented. It usually takes some time for the agency to implement the legislative action and it may occur beyond the timeline of the Strike team efforts.
O'Connor-5	With respect to the next steps in this process, it is clear that the Strike Team plans to visit some or all high priority wells and evaluate their condition. Some of these wells are likely to be located under structures or on private land. Further, some of these wells are likely going to be leaking hydrocarbons or other compounds. To ensure the strike team performs a meaningful assessment of each of these wells, a clear protocol for site evaluation is needed. The Strike team should therefore share the draft site evaluation protocol with the panel before it becomes final and put to use, including the methodology that will be employed for finding the well, notifying the well owner in advance, sampling air emissions at the well, and dealing with wells that are inaccessible.	A well inspection protocol will be included in Report #3.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
O'Connor-6	Based on the report and comments at the October 21, 2019 meeting of the Advisory Panel, it appears that the Strike Team plans to create a prioritization matrix for pipelines as it is doing for idle wells. This is an important task and the proposed criteria being used appear to be appropriate for this action. In addition to those proposed for evaluation though (and included in my prior letter from April 2019), the Strike team should include the additional factor of whether the pipeline operator has paid for and is maintaining a valid certificate of conveyance for operation in the public right-of-way. Operators who are not maintaining their permits according to the law are less likely to be keeping abreast of pipeline quality, and thus may be an indicator of pipeline integrity.	The Strike Team is getting access to the various pipeline inspection reports from the State Fire Marshall's office and will be able to evaluate the compliance status of the various pipeline operators. Certificates of conveyance from the PUC would be applicable to common carrier lines and it may not address all other proprietary lines within the County.
O'Connor-7	As stated in the report, the actual miles of pipe listed for natural gas does not include So Cal Gas data. To the extent the report includes a number for miles of pipe in natural gas service, it should strive for accuracy by seeking out and including So Cal Gas pipeline data.	Utilities such as the Gas Company are regulated by the CPUC and have not been included as part of the scope of this effort. The Strike Team will check with County Counsel on the appropriateness of including the Gas Company pipelines as part of the review.
O'Connor-8	Although this comment was made in my prior letter of April 2019 to the Strike Team, it is of renewed relevance because the Strike Team is only now getting to the evaluation of storage systems. The Strike Team should conduct a thorough assessment of the Playa Vista gas storage facility owned and operated by So Cal Gas. At that facility, nearby residents have complained for years of strong odors and releases of gas. As a result, the Strike team should seek out the information for nearby residents and open the door to enhanced participation in this area of the report. To the extent that the county decides the facility is not within the charge area of the study, the Strike Team should provide a clear explanation why not, and then evaluate the lateral extent of subsurface stored gas to determine whether any belowground gas storage extends into the county as opposed the facility fenceline.	The Strike Team will discuss the appropriateness of evaluating Playa Vista as part of this effort.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
O'Connor-9	As it relates to hazardous chemicals, the report seems to miss a discussion of the chemicals and constituents that are naturally entrained in the oil itself (and brought to the surface through produced water) or contained in leaks from oil and gas sites. As a result, it appears that the Strike Team is reading its direction form the board on this issue "Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans" in an overly narrow manner – because there are many chemicals that can be found from the oil and gas itself.	Chemical composition of oil emulsion is captured by the knowledge that crude oil contains a range of potentially hazardous materials. The scope of the analysis is to identify additional chemicals that are used at oil and gas sites, particularly on an intermittent or periodic basis, and are not captured by the business plans. Crude oil is captured by the business plans program.
O'Connor-10	As to the chemicals entrained in oil and gas leaks, there has been a lot of research – one such research report was written by EDF and summarizes a lot of the science on the hazardous compounds found in leaks. - https://www.edf.org/sites/default/files/californiamonitoring_filling-the-void.pdf You can also see a CARB report on chemicals included in oil and gas leaks by Sage Environmental – CARB, (2015), "Air Resources Board RFP No. 13-414: Enhanced Inspection & Maintenance for GHG & VOCs at Upstream Facilities— Final (Revised)," Prepared by Sage ATC Environmental Consulting LLC, https://www.arb.ca.gov/cc/oil-gas/sage_i&m_ghg_voc_dec2016.pdf	Input noted for background information on Strike Team research.
O'Connor-11	Given that the hazardous chemicals associated with hydraulic fracturing processes can additionally be used in on-site storage facilities and transportation of oil and gas, information related to their usage in such processes.	Hydraulic fracturing chemicals are reported through the SCAQMD 1148.2 process. Chemical composition of oil emulsion is captured by the knowledge that crude oil contains a range of potentially hazardous materials. The scope of the analysis is to identify additional chemicals that are used at oil and gas sites, particularly on an intermittent or periodic basis, and are not captured by the business plans.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
O'Connor-12	As to produced water, much has been written about this. In considering spills of produced water, the Strike Team should investigate further the presence of hazardous chemicals such as benzene and compare the level of chemicals present to established exposure limits.	Chemical composition of oil emulsion (and therefore produced water) varies greatly from reservoir to reservoir and are captured by the business plan program. Spills are considered to be accidental releases and not part of the day to day operations of an oil facility. Produced water spills could contain VOCs, but at substantially lower levels than oil spills.
Rezvani-1	As is evident in the report, there are significant numbers of abandoned and orphan oil and gas wells in LA County. Some of which, from time to time, present safety and possibly health hazards to members of the community. As it has been appropriately reported, rework and closure of these old wells is the responsibility of DOGGR. The county should advocate additional state funding for identifying and prioritizing and closing of the old orphan wells according to the latest well closure standard.	Recent legislation allows for the County to request that CalGEM prioritize wells for plugging and abandonment under the Orphan Well program. Depending on the results of the studies to be conducted on the priority wells, the County may choose to approach CalGEM with requests for wells to be plugged and abandoned.

Advisory Panel Comments		
Commenter	**Comment**	**Resolution**
Rezvani-2	The report does a great job of identifying federal and state laws and regulations, as wells as the regulatory agencies having jurisdiction over oil and gas pipelines. The report also identifies the number of lines and the operators. Unfortunately, the report lacks the maintenance data the status, and the leak history on these lines. In the past few years a great number of oil pipelines in California, and in LA County that were historically owned and operated by reputable large oil companies have been acquired by investment firms with limited resources. It is significantly important for the county to understand the status of these pipelines, their maintenance records and leak history. Additionally, aside from Hazardous Liquid Pipelines there may be a number of pipelines that carry hazardous materials that may not be included in the definition of Hazardous Liquid Lines. Those could be lines transporting hazardous liquids and/or gases such as Anhydrous Ammonia, Hydrogen, Sulfuric acid and other hazardous liquids and gases. I recommend the county consider obtaining an inventory of these lines and their status. It is vital for the County to understand the safety hazards of such lines, their locations and potential safety and health consequences in case of a leak.	The Strike Team is evaluating data from CSFM PS-101 Forms to determine if maintenance data is available for County review.
Rezvani-3	Finally, the report identifies significant amount of chemical being used and stored in LA County. It would be helpful to have a section on the report from the Health Department on impact of such chemical, if any, on public health, considering the quantities reported in the report.	The portion of the report on chemicals will include the potential toxicity of those chemicals as available from OEHHA and the SCAQMD.

Appendix B

Community Health Safety and Notification Plan Marina Del Rey Well Abandonment

COMMUNITY HEALTH, SAFETY, AND NOTIFICATION PLAN

Marina del Rey Oil Well Abandonment Project

DOW RGC 10

February 22, 2019

Introduction

On January 11, 2019, an uncontrolled release of gas and mud from an old, abandoned oil well occurred on a construction site at 4360 Via Marina in Marina del Rey, California. The incident took place while a permitted contractor working for the property lessee, MDR Hotels, LLC ("Operator"), was performing well re-abandonment and activities to bring the formerly abandoned well into compliance with current California state abandonment standards. The Los Angeles County Fire Department responded to the incident and determined there were no injuries. Within ten minutes, the release was stopped using the blowout prevention equipment installed at the wellhead. The well is under control and being monitored continuously by the Operator and state officials.

Upon notification, the agency that permits and oversees oil and gas wells, California Department of Conservation – Division of Oil Gas, and Geothermal Resources (DOGGR), responded to the scene and engaged with the operator and contractor on their efforts to bring the well under control. On January 18, DOGGR issued an Order requiring the Operator to take additional steps, including transitioning to 24 hours per day, 7 days per week work schedule to ensure the work is done correctly, safely, and in a timely manner. At DOGGR's request, the California Office of Emergency Services (CalOES) established a Unified Command to manage the incident. The Los Angeles County Fire Department is serving as the Incident Commander and is coordinating public updates that are available on the DOGGR website. State and local agencies are working in coordination to ensure the protection of health, safety and the environment. These include DOGGR and the California Office of Emergency Services, and Los Angeles County Office of Emergency Management and the Departments of Fire, Public Health, Sheriff, Regional Planning, and Beaches and Harbors.

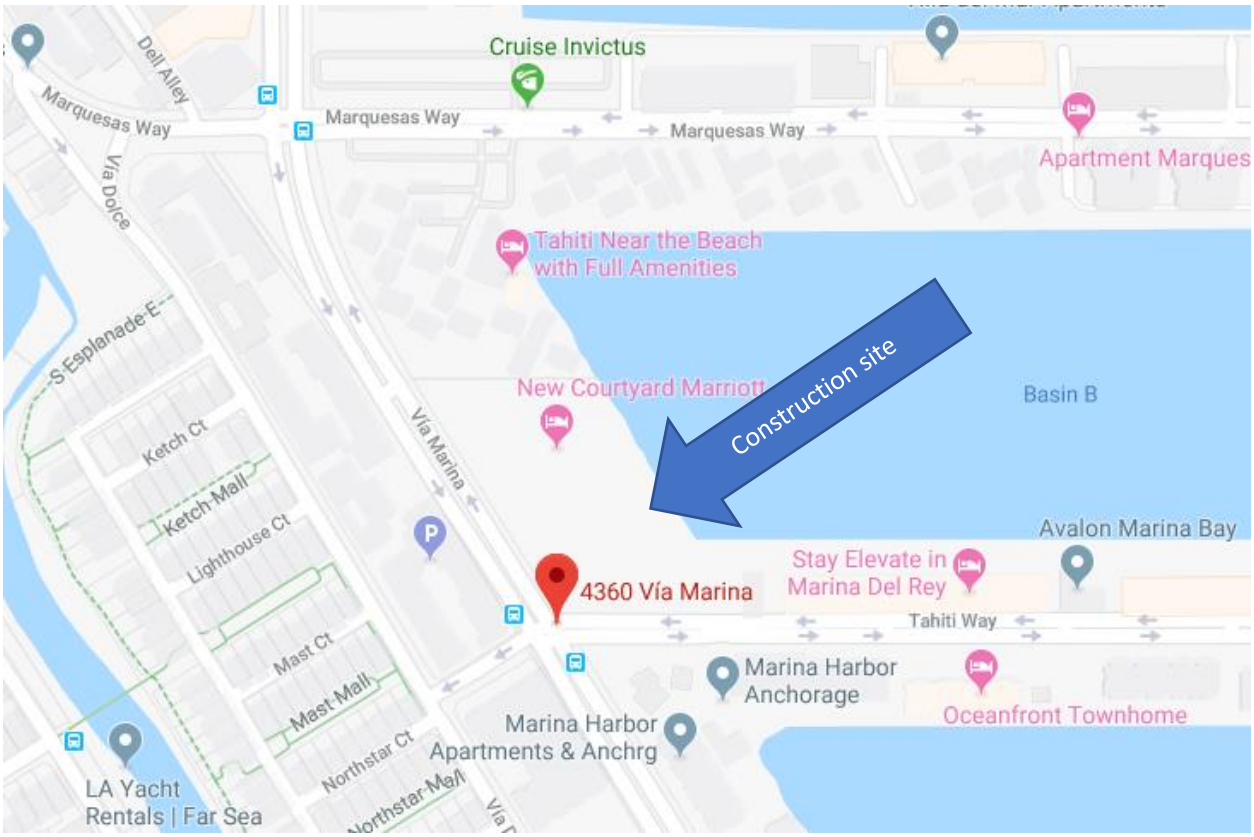
Purpose

The purpose of the Community Health, Safety, and Notification Plan is to inform community members of:

- The days and times work will happen, and how long it will take.
- Whom to call with questions or concerns, or in case of emergency.
- What to do in case of emergency.
- Strategies being used to protect the community from possible hazards.
- The government agencies that are overseeing the work.
- How updates will be provided from state and local agencies.

Worksite

The construction work is taking place at 4360 Via Marina in Marina del Rey, California. Streets bordering or near the construction site include Via Marina, Tahiti Way, Marquesas Way and Via Dolce.



Days and Times of Work, Expected Duration

Normally well abandonment work is not performed at night because it can be noisy and disruptive to nearby residents. After the incident and assessing the situation, DOGGR determined the operator must work 24 hours daily until the source of the gas has been located and contained. Once this has been done, work will return to a 12-hour schedule Monday-Friday. It is estimated that the work will take one to three months and may be completed by March or April 2019. During certain well work procedures, nearby streets may be temporarily closed. Security personnel will be onsite 24 hours daily, and only authorized personnel will be allowed entry.

Reporting Concerns

All members of the public should report concerns about the work at the site to the **MDR Hotels Hotline at (310) 908-1236 or via email to mdrhotelshotline@gmail.com**. Specific government agencies may be able to provide more assistance, depending on the type of concern. See the specific areas below for details.

In case of an emergency that could threaten health, life, safety, or the environment, dial 911. These calls should be for fire, police, emergency medical service, or hazardous materials spills.

Strategies to Protect the Community and Workers from Possible Hazards

Site Emergency and Evacuation Plans

If unsafe conditions occur at or near the well, streets bordering the site may be closed temporarily, and the Sheriff's Department will post signs to notify the public. All road closures will be conducted in coordination with local law enforcement and fire department.

Prior to entering the well site, all personnel shall be briefed on the full Site Emergency & Evacuation Plan. If an emergency evacuation of the construction site is needed, verbal command and/or three two-second blasts from an air horn will signal workers to leave immediately. The full Site Emergency & Evacuation Plan notes emergency evacuation exits, exit routes, and post-evacuation meeting location.

In the unlikely event of an emergency that requires evacuation of nearby buildings, police and fire officials will notify residents to evacuate. Evacuation alerts will be sent via Alert LA County (go to https://www.lacounty.gov/emergency/alert-la/ to sign up for alerts), via agency social media accounts listed below, and will be posted on the DOGGR website. Community members are urged to comply promptly with police and fire department instructions.

Site Access and Perimeter Protection

Perimeter fencing is in place between the work site and the public sidewalk on Via Marina. Site personnel and all truck / equipment deliveries enter the gate at the northwest corner. Security personnel are present at the gate, and only authorized personnel may enter. To ensure that the public is protected during certain well re-abandonment activities, the public sidewalk on Via Marina may be temporarily closed and foot traffic diverted to nearby pedestrian walkways and sidewalks. During critical well re-abandonment activities, the operator may request the public street (Via Marina) bordering the wellsite to the west be temporarily closed. Sidewalk and street closures will also happen if inert water-based mud used in the well re-abandonment or gases surface near the well.

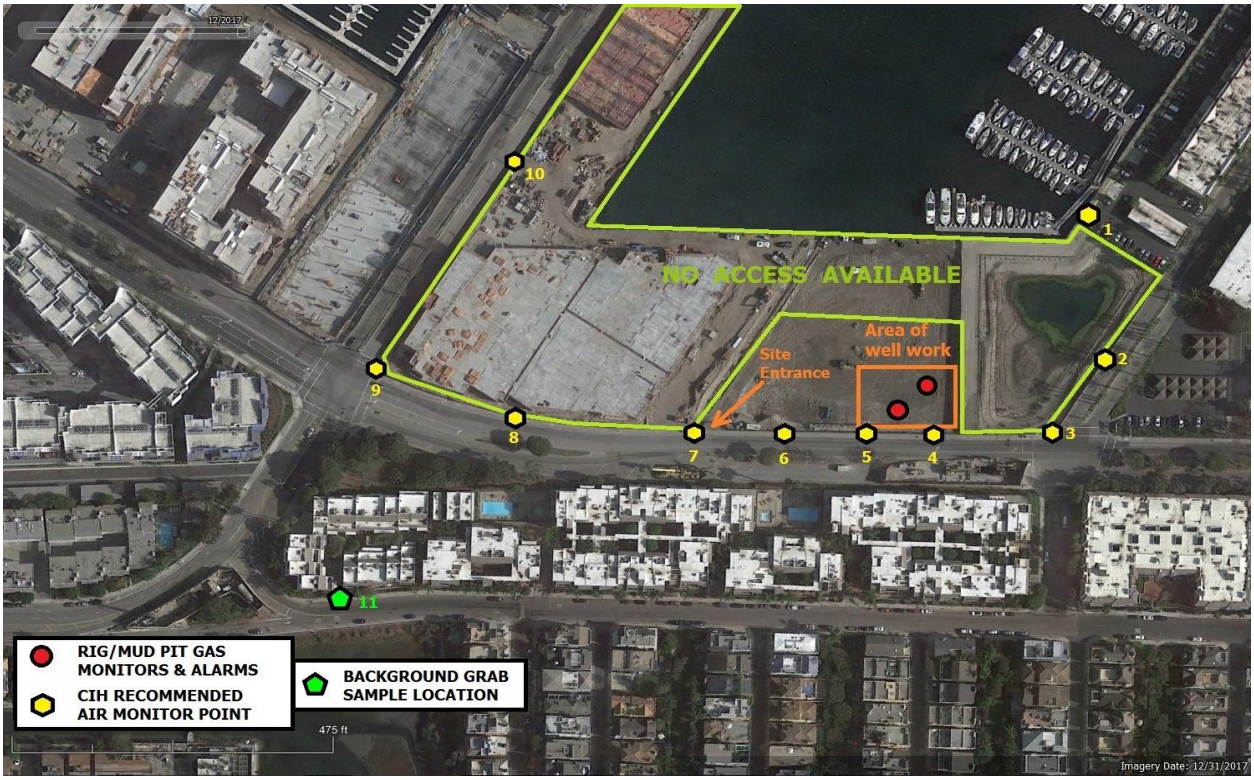
All road closure plans meet current code requirements and will be conducted in coordination with local law enforcement and fire department.

Worksite Hazards and Monitoring Protocol

Procedures have been developed to prevent hazards from toxic emissions of gases, spills, odors, noise, and dust. The operator has cooperated with state and local agencies on the following plans.

A. Worksite Emissions/Air Monitoring

The operator is monitoring for four gases (methane, carbon monoxide, oxygen and hydrogen sulfide) at 10 locations around the worksite on an hourly basis (see map below for locations). On a daily basis, the Operator reports air monitoring results to DOGGR and Public Health; state and local officials are coordinating with the South Coast Air Quality Management District as needed. If elevated levels are found, the public sidewalk along Via Marina may be temporarily closed to prevent community exposure, and the Sheriff's Department will post signs to notify the public.



B. Noise Control

Noise at the site consists primarily of pipes clanging, truck deliveries, and equipment loading and unloading on the site. Certain operations may be noisy and disruptive, causing vibrations that make the ground shake. The Operator put up a sound wall to reduce noise and will minimize noise during nighttime hours as much as possible. Some noisy work may be necessary at night to maintain safe operations. Once the 24/7 working conditions have ceased, operations will return to a 12-hour schedule Monday thru Friday. **To report noise or vibrations, contact the Los Angeles County Department of Public Health at 213-738-3220.**

C. Dust Control

The majority of the site area consists of concrete. Sand, gravel, and crushed rock (called “base”) have been spread over the dirt areas of the site to control dust. A ramp at the site entrance is equipped with rumble plates to reduce dirt from vehicles entering and exiting the site, with thicker base added at the entry ramp. New base is spread approximately once a month or as needed to control dust. As needed, the site is periodically dampened with water using an existing water hose to control dust.

D. Odor Monitoring and Control

The operator is monitoring around the worksite for hydrogen sulfide that can cause a rotten egg-like smell. The worksite rig has hydrogen sulfide monitors and alarms in place, and worksite personnel wear hydrogen sulfide monitors at all times. If elevated levels of hydrogen sulfide are detected, sidewalk and street closures are triggered. Signs will be posted to indicate the closures and the public will be notified of odor emissions via

the DOGGR website and agency Twitter accounts listed below. **If members of the public detect odors near the worksite, they can report them to the MDR Hotels Hotline at (310) 908-1236 and to South Coast Air Quality Management District at 1-800-CUT-SMOG.**

E. Lighting Control

During nighttime operations, lights are used in the immediate work site around the well. All lights are directed downward at the rig and are only used as needed to ensure safe operations. Nighttime illumination of the wellsite will cease once the 24/7 working conditions have ended.

F. Community Notifications

Those in the immediate surrounding area must be made aware right away if a blowout or uncontrolled release occurs. The general public and media must be notified thereafter (no longer than 2 hours).

These notices will be made through one or more of the following mechanisms: a press release to local media, press conference, social media, website posting, or in-person or door-to-door notifications. If evacuation is necessary, alerts will be sent via Alert LA County (go to https://www.lacounty.gov/emergency/alert-la/ to sign up for alerts) and via the DOGGR website and agency social media accounts listed below. Notifications will be in languages spoken by community members.

A Joint Information Center has been activated to coordinate public information from agencies monitoring the well re-abandonment project. Regular updates will be issued by Unified Command to ensure timely and relevant public information. For information on the well and operations, please visit the DOGGR website: https://www.conservation.ca.gov/dog/Pages/DOW-RGC10-well.aspx.

For Questions and Media Inquiries

For questions and media inquiries, please call the incident information line at (310) 908-1236.

Follow incident agencies on Twitter at the following handles:

Los Angeles County Fire Department: @LACoFDPIO

California Department of Conservation: @CalConservation

Los Angeles County Department of Public Health: @LAPublicHealth

Los Angeles County Department of Beaches and Harbors: @LACDBH

Agency Contacts

Agency	Name	Role	Telephone	Email
California Department of Conservation – Division of Oil Gas, and Geothermal Resources (DOGGR)	Teresa Schilling	Public Affairs Officer	(916) 323-1886	pao@conservation.ca.gov
L.A. County Department of Beaches and Harbors			(424) 526-7777	info@bh.lacounty.gov
MDR Hotels ("Operator")	Michael Hale	EVP of Construction	(858) 314-7906	mhale@hardagehospitality.com
L.A. County Department of Public Health	Katie Butler	Supervisor	(213) 738-3220	kbutler@ph.lacounty.gov
LA County Fire, Health HazMat	Ask for "on-call HAZMAT Specialist"	Duty Hazardous Materials Specialist	**M-F, 7a-5p:** (323) 890-4317 **After hours:** (323) 881-2455	info@fire.lacounty.gov
California Office of Emergency Services	Chief David Stone		(916) 642-3837	david.stone@caloes.ca.gov

Appendix C

SCAQMD Rule 1148.2 Chemical List

SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
1,2,3-TRIMETHYLBENZENE	526738
1,2,4-TRIMETHYLBENZENE	95636
1,3,5-TRIMETHYLBENZENE	108678
1-EICOSENE	3452071
1-HEXADECENE	629732
1-METHOXY-2-PROPANOL	107982
1-OCTADECENE	112889
1-TETRADECENE	1120361
2 PROPANOL	67630
2-BUTOXYETHANOL	111762
2-ETHYLHEXANOL	104767
2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID	77929
2-HYDROXYTRIMETHYLENE,BIS(TRIMETHYLAMMONIUM) DICHLORIDE	55636094
2-PENTANONE, 4-METHYL-	108101
2-PROPYN-1-OL	107197
3-PHENYL-2-PROPENAL	104552
4-ETHYL-1OCTYN-3-OL	5877429
ACETIC ACID	64197
ACETIC ACID ETHENYL ESTER, POLYMER WITH ETHENOL	25213245
ACETIC ACID, SODIUM SALT (1:1)	127093
ACETONE	67641
ACRYLIC POLYMER	9033798
ALCOHOLS, C12-14-SECONDARY, ETHOXYLATED	84133506
ALCOHOLS, C12-15, ETHOXYLATED	68131395
ALCOHOLS, C14-15, ETHOXYLATED	68951677
ALCOHOLS, C6-12, ETHOXYLATED	68439452
ALCOHOLS, C8-10, ETHOXYLATED PROPOXYLATED	68603258
ALKANES, C12-14-ISO-	68551199
ALKENES, C>10 .ALPHA.-	64743028
ALKYL BENZENESULFONIC ACID	68584225
ALKYLARYL SULFONATE	68484270
ALKYLBENZENE MIXTURE	68648873
ALUMINUM	7429905
ALUMINUM OXIDE	1344281
AMIDES, COCO, N-[3-(DIMETHYLAMINO)PROPYL], N-OXIDES	68155099
AMINES, HYDROGENATED TALLOW ALKYL, ACETATES	61790598
AMMONIA	7664417
AMMONIUM BIFLUORIDE	1341497

SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
AMMONIUM CHLORIDE	12125029
AMMONIUM HYDROXIDE	1336216
AMORPHOUS SILICA	7631869
AMORPHOUS SILICA FUME	69012642
AMPHOTERIC SURFACTANT	68155099
ANIONIC ACRYLAMIDE COPOLYMER	0
ANIONIC POLYACRYLAMIDE	9003058
AROMATIC PETROLEUM DISTILLATES	64742945
BARITE	7727437
BENTONITE	1302789
BENTONITE, QUARTZ, CRYSTALLINE SILICA	14808607
BENZENE	71432
BENZENE, 1,2,3-TRIMETHYL-	526738
BENZENESULFONIC ACID, C10-16-ALKYL DERIVS.	68584225
BENZENESULFONIC ACID, C10-16-ALKYL DERIVS., COMPDS. WITH CYCLOHEXYLAMINE	255043084
BENZOIC ACID	65850
BIS(2-HYDROXY ETHYL)AMINE	111422
C12-C14 ISOALKANES	68551199
C13-C16 ISOALKANES	6855102
CALCITE	13397267
CALCIUM BROMIDE	7789415
CALCIUM CARBONATE	471341
CALCIUM CHLORIDE	10043524
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653
CALCIUM HYDROXIDE	1305620
CALCIUM MAGNESIUM OXIDE	37247919
CALCIUM OXIDE	1305788
CARBON	7440440
CARBONIC ACID CALCIUM SALT (1:1)	471341
CARBONIC ACID SODIUM SALT (1:2)	497198
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324
CELLOPHANE	9005816
CELLULOSE	9004346
CINNAMIC ALDEHYDE DIMETHYL ACETAL	104552
CITRIC ACID	77929
CITRUS TERPENES	94266474
COCAMIDOPROPYL BETAINE	61789400
COMPOUND SYNTHETIC DIESTERS	8029398

SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
CROSSED POLYOL ESTER	129828315
CRYSTALLINE SILICA	14808607
CUMENE	98828
CYCLOHEXANAMINE, SULFATE (1:1)	19834027
CYCLOHEXANOL	108930
D-ERYTHRO-HEX-2-ENONIC ACID, .GAMMA.-LACTONE	89656
D-ERYTHRO-HEX-2-ENONIC ACID, .GAMMA.-LACTONE, SODIUM SALT (1:1)	6381777
DIISOPROPYLNAPHTHALENE	38640629
DINONYLPHENYL POLYOXYETHYLENE	9014931
DIPHOSSPHORIC ACID, TETRASODIUM SALT	7722885
DISODIUM METASILICATE	6834920
D-LIMONENE	138863
DODECYLBENZENESULFONIC ACID	27176870
ERYTHORBIC ACID	89656
ETHANEDIAL	107222
ETHANOL	64175
ETHOXYLATED ALCOHOL	68131395
ETHYL BENZENE	100414
ETHYL OCTYNOL	5877429
ETHYLBENZENE	100414
ETHYLENE GLYCOL	107211
ETHYLENE GLYCOL MONOBUTYL ETHER	111762
ETHYLENE OXIDE	75218
FATTY ACIDS	61790123
FERROUS SULFATE	17375416
FLY ASH, QUARTZ, CRYSTALLINE SILICA	14808607
FORMALDEHYDE	50000
FORMIC ACID	64186
FUMED SILICA	69012642
GLUTARAL	111308
GLYCERINE	56815
GLYCOL ETHER EB	111762
GLYOXAL	107222
GYPSUM	13397245
HEAVY AROMATIC NAPHTHA	64742945
HUMIC ACID	1415936
HYDROCARBONS, TERPENE PROCESSING BY-PRODUCTS	68956569
HYDROCHLORIC ACID	7647010

SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
HYDROFLUORIC ACID	7664393
HYDROGEN CHLORIDE	7647010
HYDROGEN FLUORIDE (HYDROFLUORIC ACID)	7664393
HYDROGEN PEROXIDE	7722841
HYDROTREATED LIGHT DISTILLATE	64742478
HYDROXY ETHYL CELLULOSE	9004620
HYDROXYACETIC ACID	79141
HYDROXYETHYL CELLULOSE	9004620
ISOPROPANOL	67630
ISOPROPYTOLUENE	25155151
ISOQUINOLINE	119653
LARYL DIMETHYL HYDROXYSULFOBETAINE	13197767
L-GLUTAMIC ACID, N, N-DIACETIC ACID	58976651
L-GLUTAMIC ACID, N,N-DIACETIC ACID, TETRASODIUM SALT	51981216
LIGHT AROMATIC NAPHTHA	64742956
LIGNITE	1415936
LIGNOSULFONIC ACID, SODIUM SALT	8061516
MAGNESIUM	7439954
MAGNESIUM OXIDE	1309484
MESITYLENE	108678
METHANOL	67561
METHYL AMYL ALCOHOL	108112
MICA	12001262
MODIFIED POLYMERIC ALKOXYLATE	52501072
MODIFIED SULFONATE	16106448
MULLITE 1302-93-8 10 - 30	1302938
NAPHTHALENE	91203
NAPHTHALENESULFONIC ACID, BIS(1-METHYLETHYL)-, COMPD. WITH CYCLOHEXANAMINE (1:1)	68425616
NATURAL WALNUT SHELL	84012431
NON-HAZARDOUS INGREDIENTS	0
NONYLPHENOL POLYETHYLENE GLYCOL ETHER	127087870
OIL, HYDROTREATED LIGHT NAPTHENIC DISTILLATE	64742478
OLEFIN	64743028
OXYAKYLATED AMINE QUAT	138879944
OXYALKYLATED ALKYLPHENOL	9016459
OXYALKYLATED ALKYLPHENOLIC RESIN	63428922
PENTANEDIAL	111308
PEROXYACETIC ACID	79210

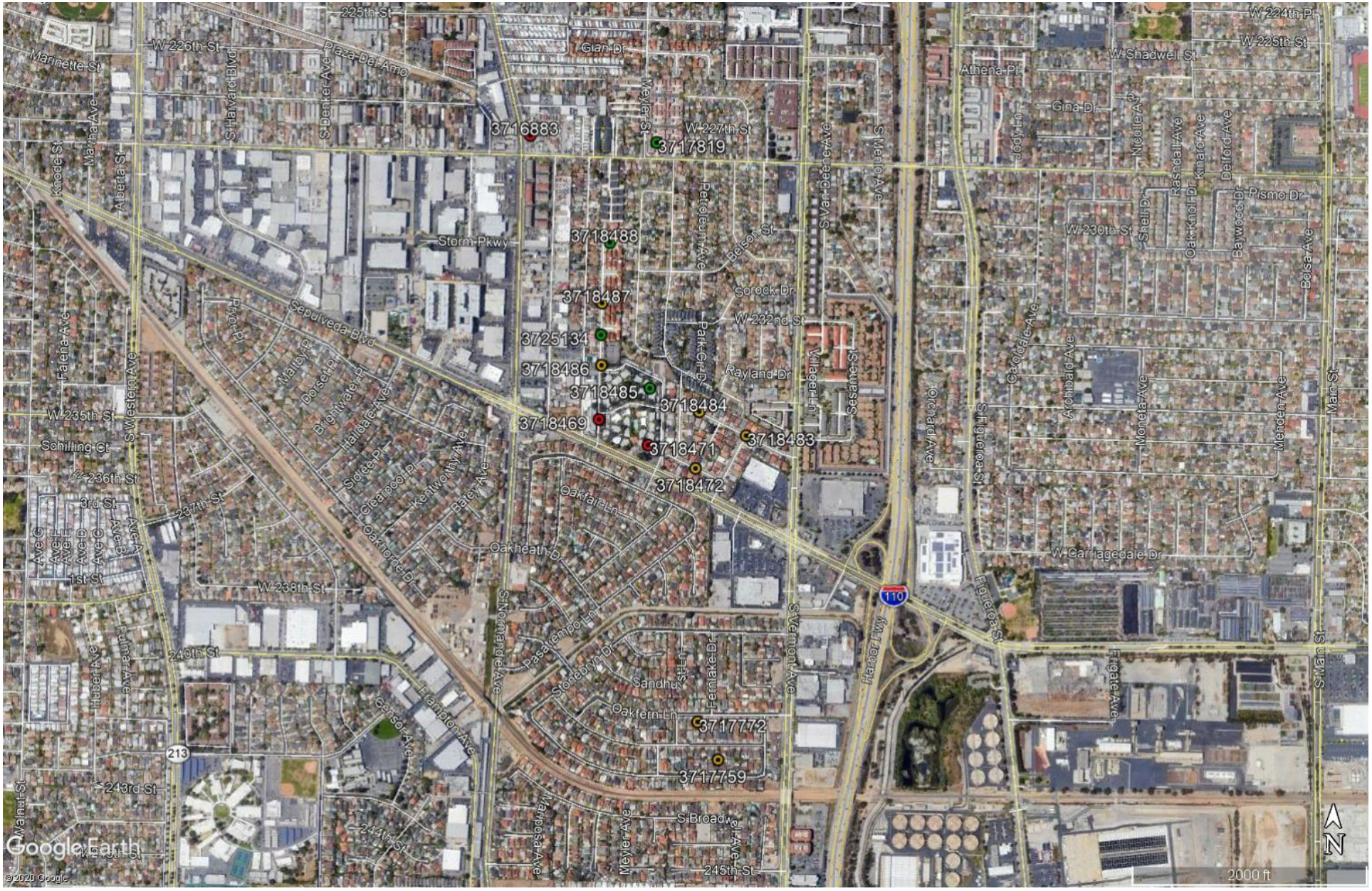
SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
PETROLEUM RESINS	64742161
PHOSPHONATE SALT	20592852
PHOSPHONIC ACID	15827608
PHOSPHONIUM, TETRAKIS(HYDROXYMETHYL)-, SULFATE (2:1)	55566308
PHOSPHORIC ACID	7664382
PHOSPHORIC ACID, CALCIUM SALT (2:3)	7758874
PHOSPONATE SALT	20592852
PINE OIL	8002093
PLURONIC	9003116
P-MENTHA-1,8-DIENE	138863
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-(4-NONYLPHENYL)-.OMEGA.-HYDROXY-, BRANCHED	127087870
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-[2,4,6-TRIS(1-PHENYLETHYL)PHENYL]-.OMEGA.-HYDROXY	70559250
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-HEXYL-.OMEGA.-HYDROXY-	31726348
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-ISODECYL-.OMEGA.-HYDROXY-, PHOSPHATE, POTASSIUM SALT	68071170
POLYACRYLATE	68479094
POLYAMINE POLYETHERS	68815651
POLYETHERS	68815656
POLYETHYLENE GLYCOL	25322683
POLYETHYLENE GLYCOL TRIMETHYL NONYL ETHER	84133506
POLYETHYLENE OXIDE	25322683
POLYGLYCOL ESTER	68400715
POLYMER	0
POLYOXYALKYLENES	68951677
POLYOXYETHYLENE DINONYLPHENOL	9014931
PORTLAND CEMENT	65997151
POTASSIUM CHLORIDE	7447407
POTASSIUM HYDROXIDE <10%	1310583
PROPARGYL ALCOHOL	107197
PROPENE HOMOPOLYMER	9003070
PROPYLENE GLYCOL	57556
QUARTZ (SILICA)	14808607
QUINALDINE	91634
QUINOLINE	91225
SAPONITE	1319411
SILANETRIOL, (3-AMINOPROPYL)-, HOMOPOLYMER	68400077
SILANETRIOL, 1-(3-AMINOPROPYL)-	58160999
SILICA, CRYSTALLINE, QUARTZ	14808607
SODA LIME BOROSILICATE GLASS	65997173

SCAQMD Rule 1148.2 Reported Chemicals List Well Drilling, Well Completion, Well Reworks 2016 through June 2019	
Chemical Name	**CAS Number***
SODIUM ACETATE	127093
SODIUM ACID PYROPHOSPHATE	7758169
SODIUM BICARBONATE	144558
SODIUM CARBONATE	497198
SODIUM CARBOXYMETHYLCELLULOSE	9004324
SODIUM CHLORIDE	7647145
SODIUM DICHLOROISOCYANURATE	2893789
SODIUM GLUCONATE	527071
SODIUM HYDROXIDE	1310732
SODIUM LIGNOSULFATE	8061516
SODIUM POLYACRYLATE	9003047
SOLVENT NAPHTHA (PETROLEUM), HEAVY AROM.	64742945
SOLVENT NAPHTHA (PETROLEUM), LIGHT AROM.	64742956
STEARIC ACID	57114
SULFONATE	0
SULFURIC ACID	7664939
SULFURIC ACID, BARIUM SALT (1:1)	7727437
SULFURIC ACID, IRON(2+) SALT (1:1), MONOHYDRATE	17375416
SULFURIC ACID, MONOPOTASSIUM SALT	7646937
SYNTHETIC RED IRON OXIDE	1309371
TAR BASES, QUINOLINE DERIVATIVES	68513871
TERPENE HYDROCARBON	68956569
TERPENES AND TERPENOIDS, SWEET ORANGE-OIL	68647723
TETRASODIUM ETHYLENEDIAMINETETRAACETATE	64028
THIOUREA POLYMER	68527491
TOLUENE	108883
TRIETHYLENE GLYCOL	112276
TRIHYDROXYTRIETHYLAMINE	102716
TRIMETHYLBENZENE	25551137
WATER	7732185
WELAN GUM	72121881
WOOD DUST, SOFT WOOD	9004346
XANTHAN GUM	11138662
XYLENE	1330207

*Note certain chemicals/compounds have multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

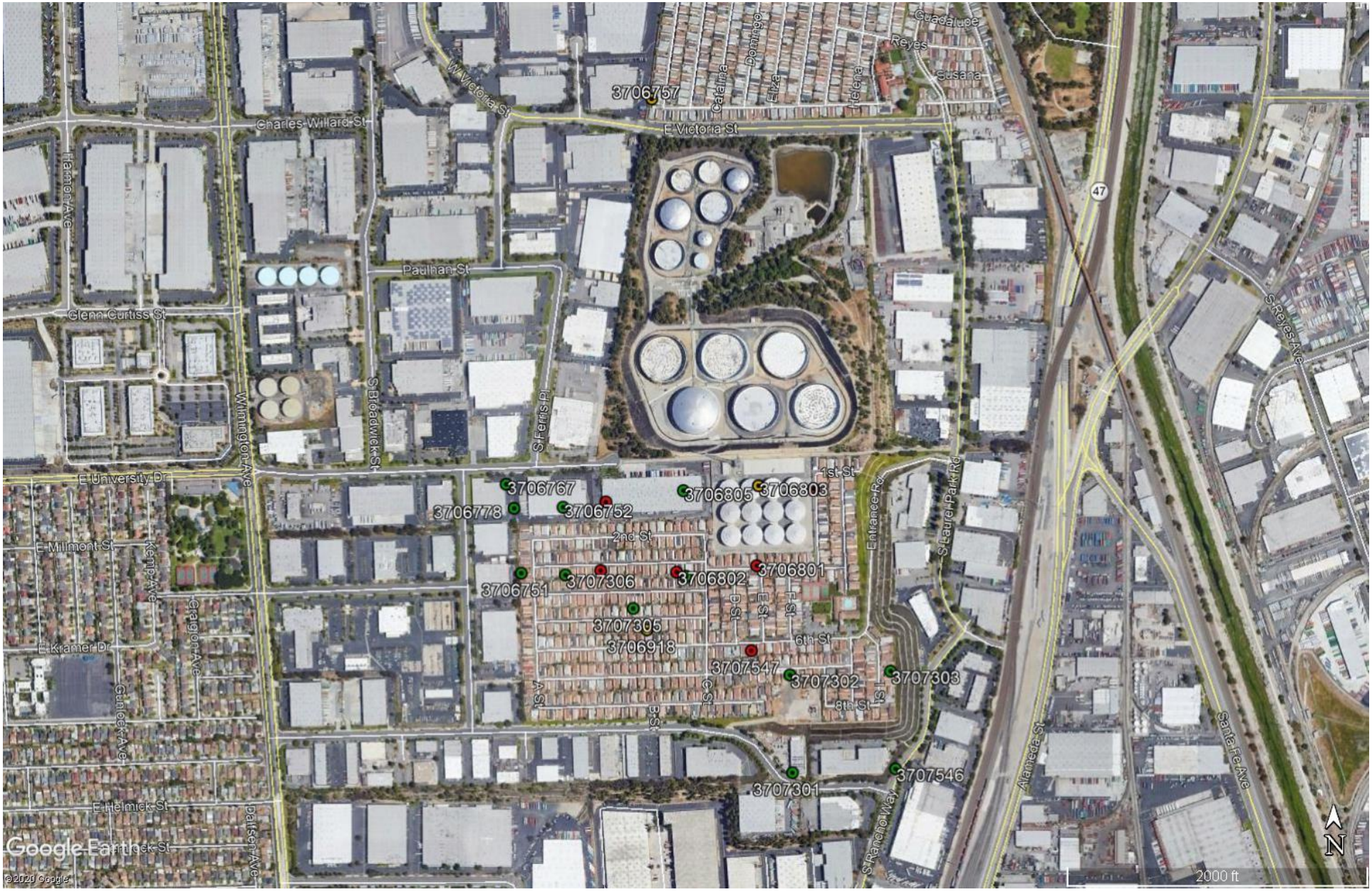
Appendix D

Detailed High Priority Well Maps



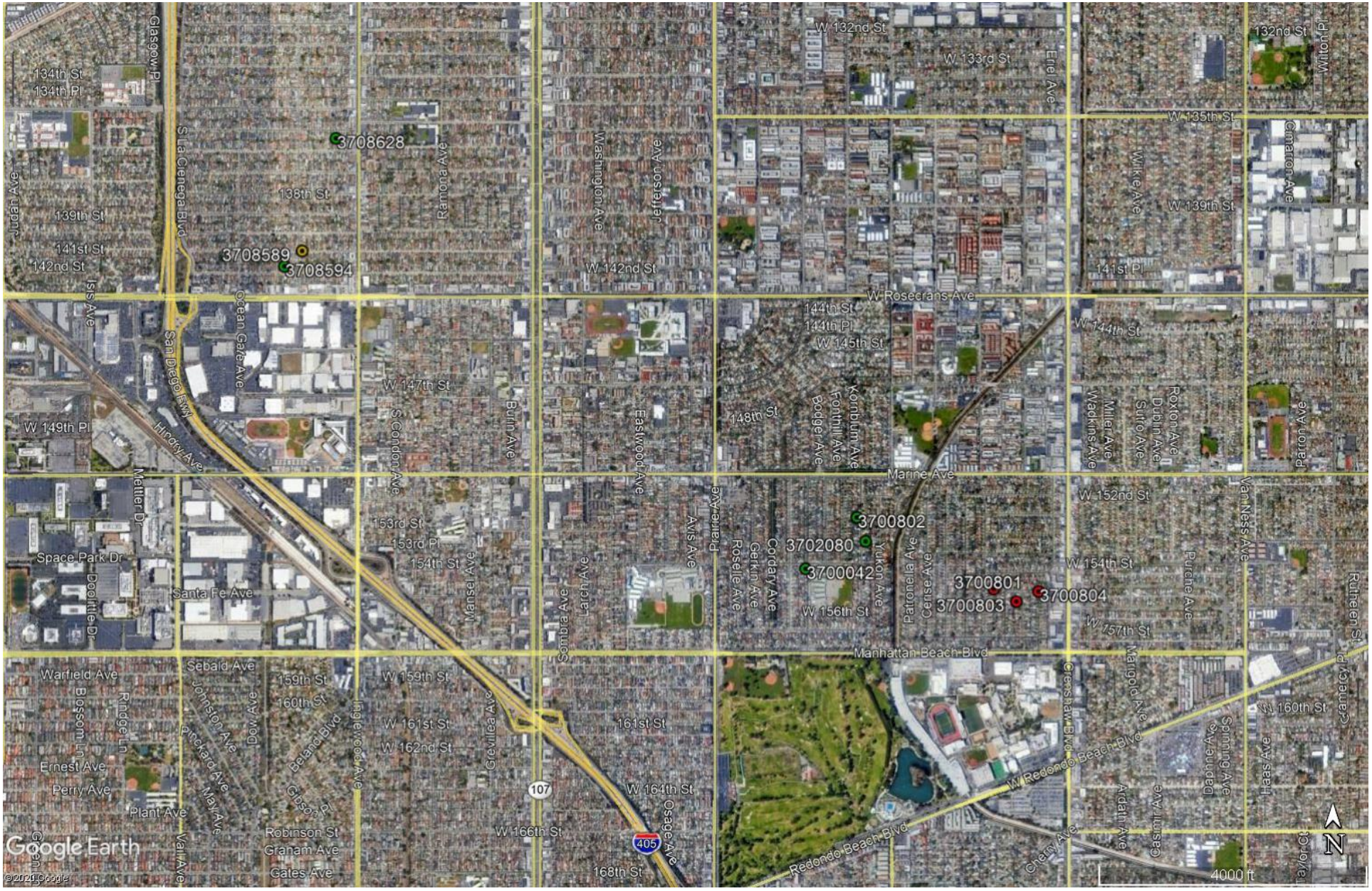
Carson Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



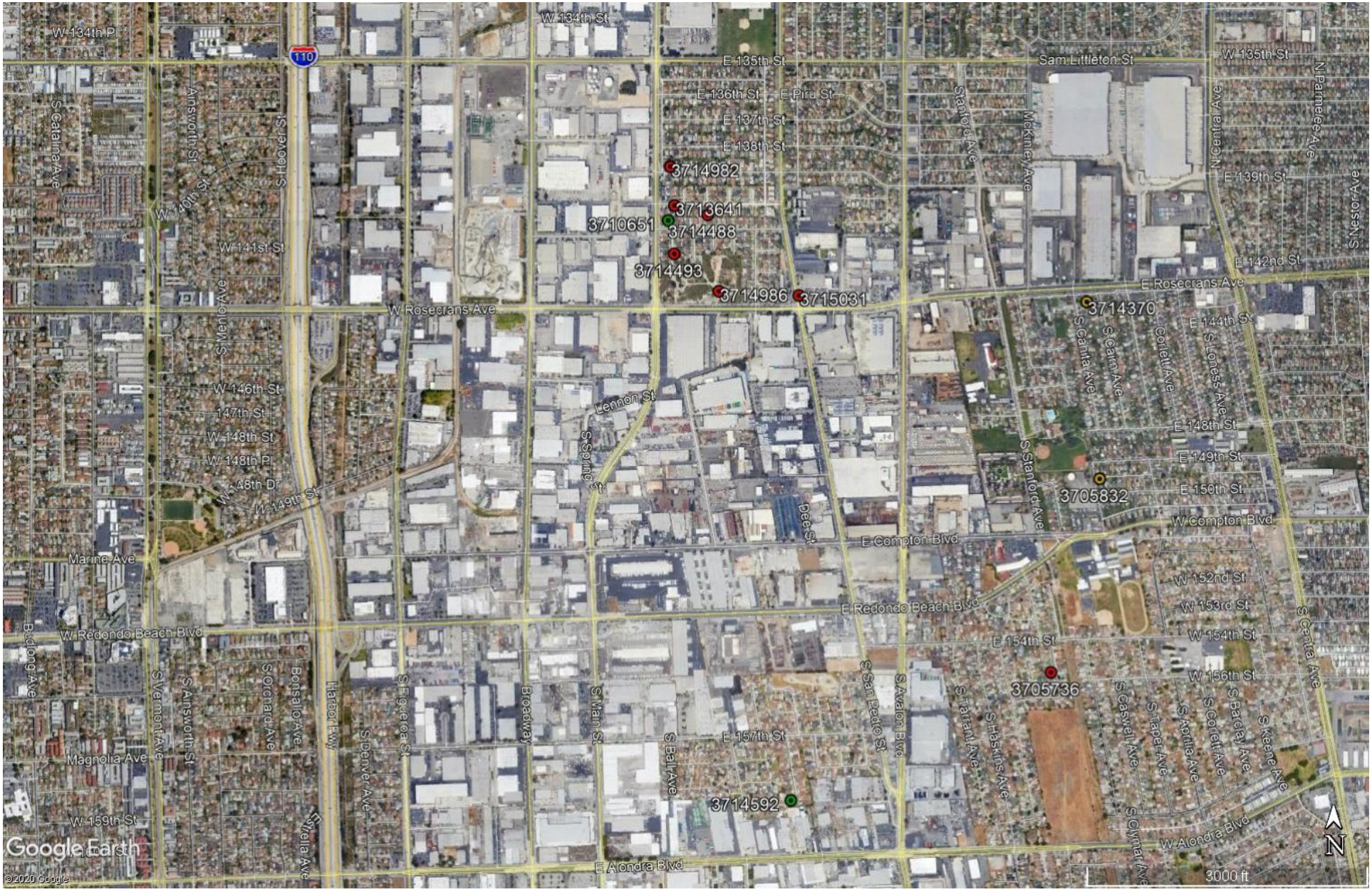
Carson Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



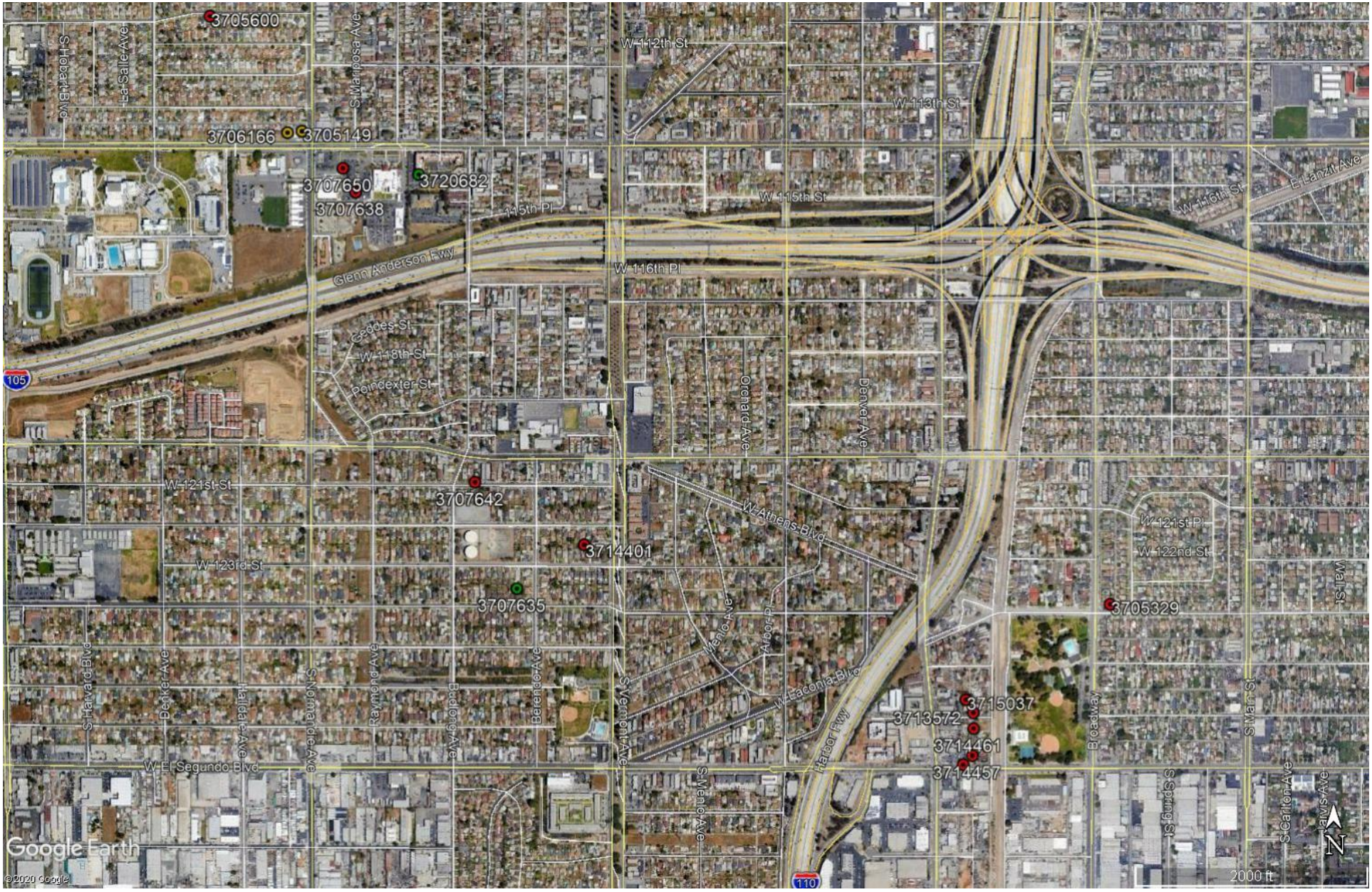
Dominguez Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



Dominguez Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

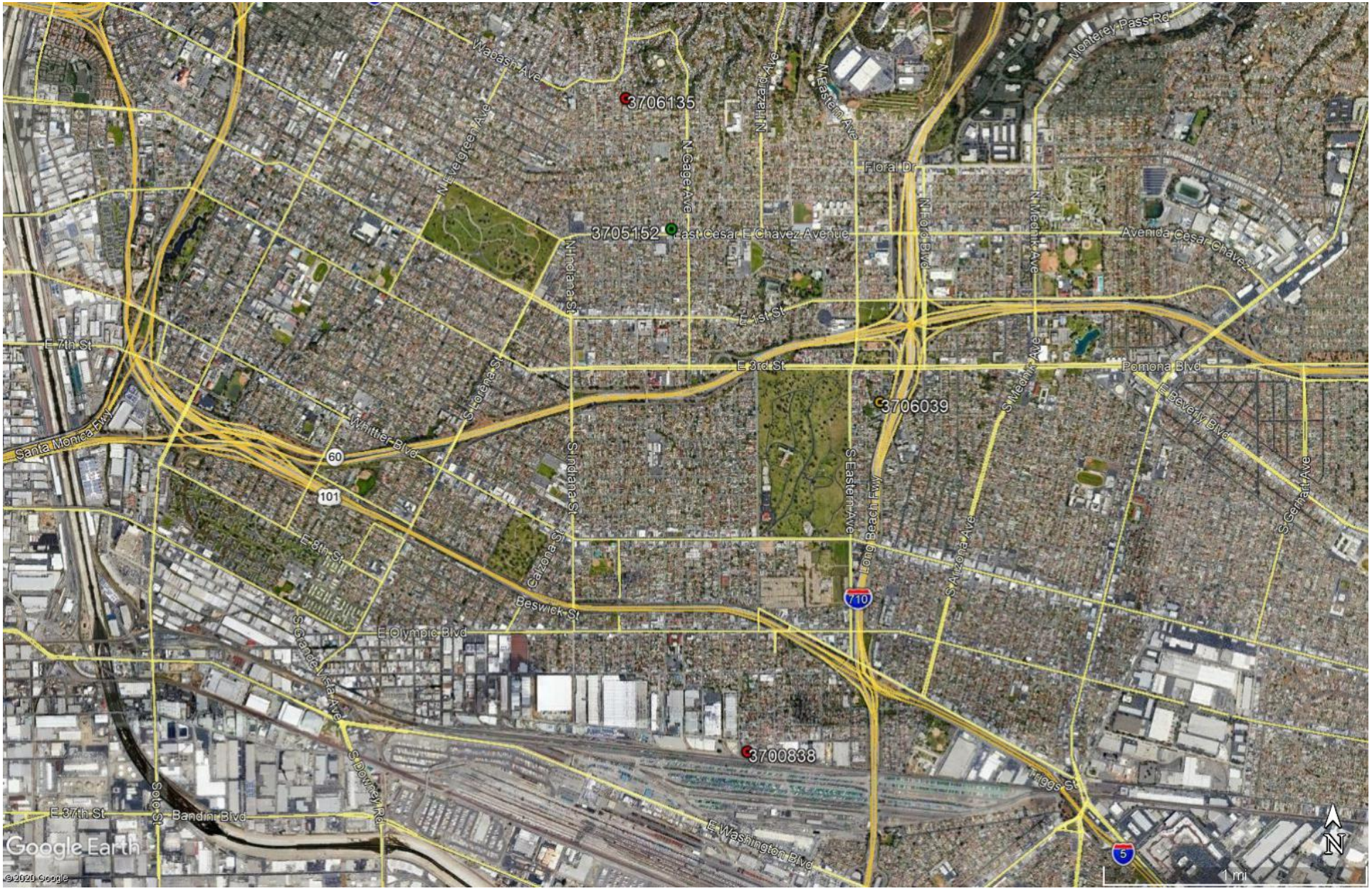


Dominguez Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

Dominguez Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



East Los Angeles Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

East Los Angeles Area Detailed Map

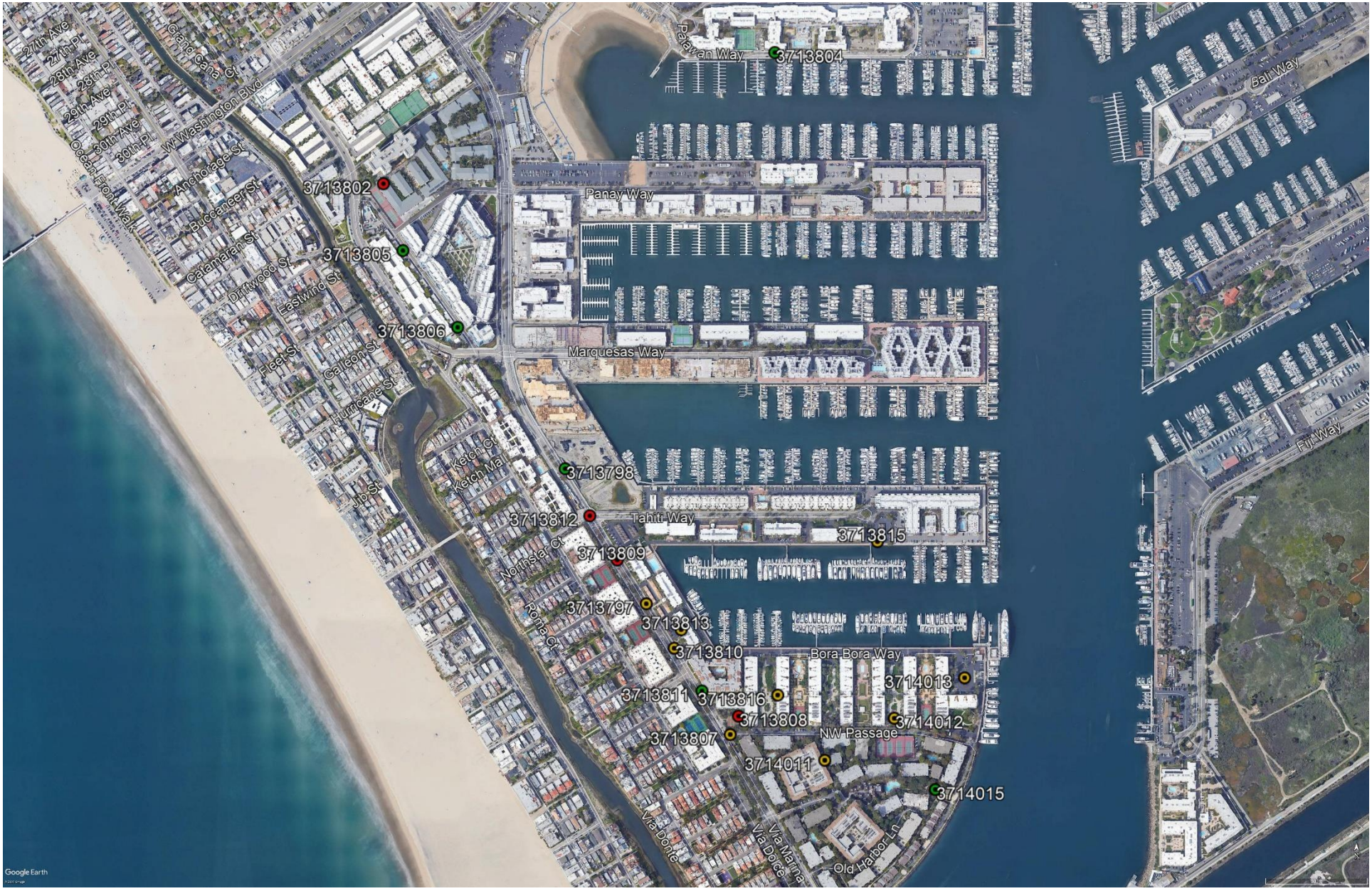
Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

La Puente Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

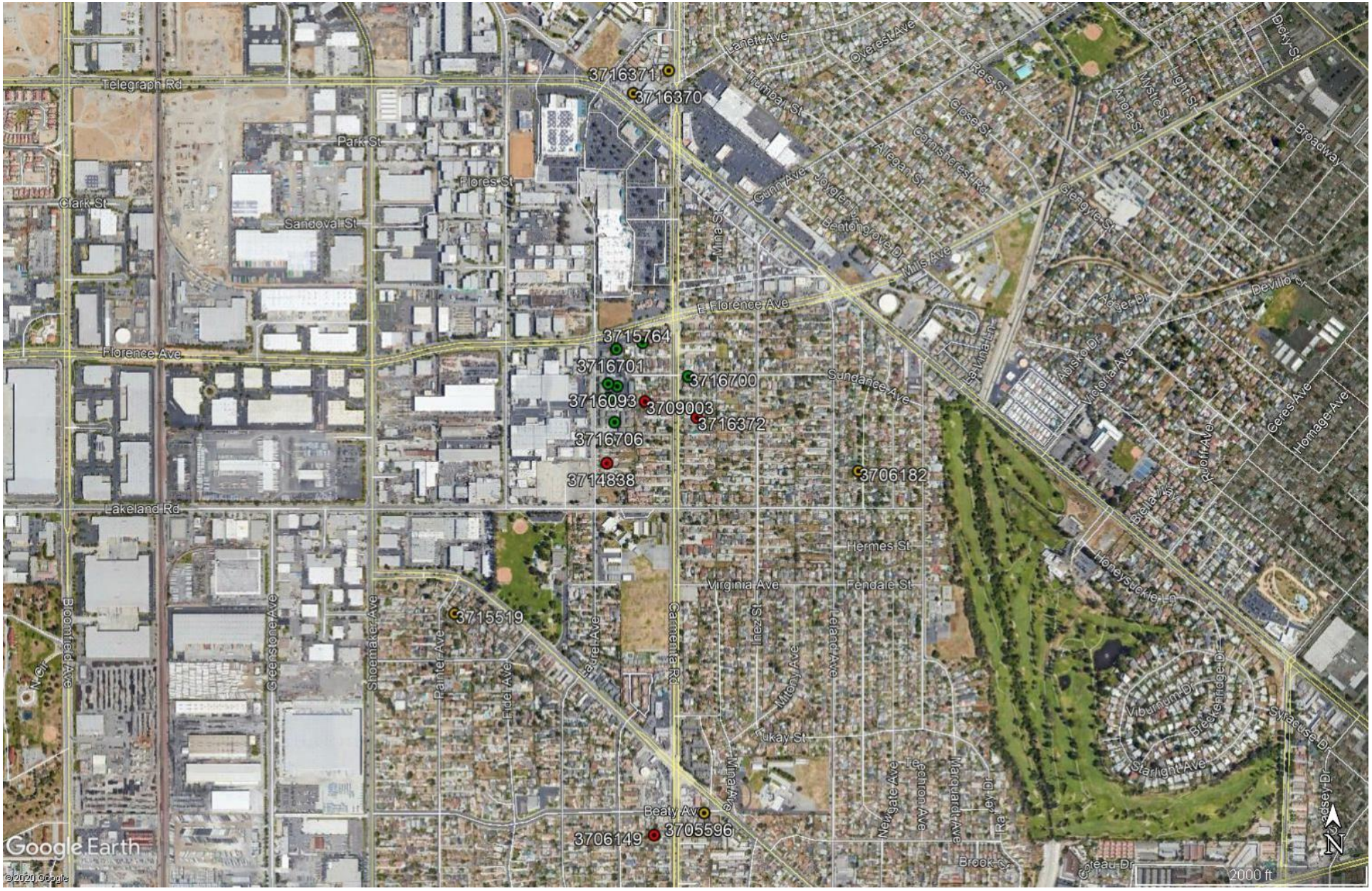
La Puente Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



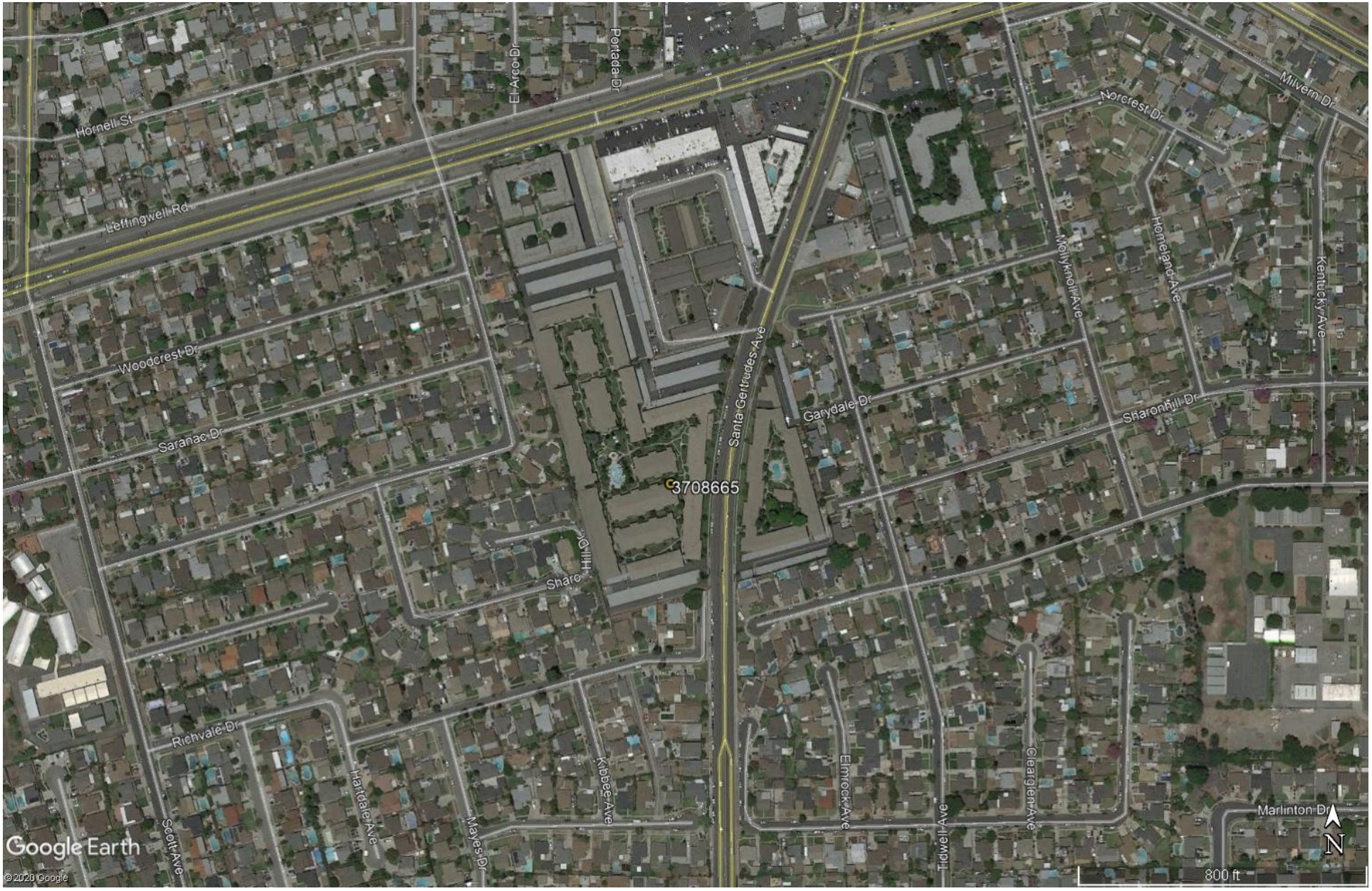
Marina Del Rey Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



Whittier Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.



Whittier Area Detailed Map

Wells in red= priority 1, wells in yellow = priority 2/3, wells in green = low priority.

Unincorporated LA Oil Fields Data

FIELDNAME	Oil, bbl	Gas, Mcf	Water	GOR	Earliest Discovery Date	Age	Minimum Depth, ft	Initial Reservior Pressure (at min depth), psi	PSI/ft	API, max	Crude Sulfur Content (% by wt)	H2S	Min Fluid Level	Reservior Score
Any Field				-		81.3					-	-		5.0
Canoga Park				-		81.3								5.0
Aliso Canyon	510	154		302	1938	80	4150	1260	0.30	29	0.94			5
Alondra (ABD)	897	295		329	1946	72	9000	3902	0.43	29	1.8			5
Bandini	6040	0	19984	0	1953	65	4200			40			1197	3
Brea-Olinda	986856	805663	6376074	816	1880	138	1200	2500	2.08	31	2	Maybe	153	10
Canton Creek (ABD)	29	40		1379	1957	61	900			30				5
Castaic Hills	396	185		467	1951	67	730			36	0.51			6
Castaic Junction (ABD)	581	640		1102	1950	68	8400	4952	0.59	30	3.4			6
Charlie Canyon (ABD)	5	0		0	1958	60	600			14				2
Del Valle	400	11000		27500	1940	78	6500	2600	0.40	43				5
Dominguez	28000	40529	52778	1447	1923	95	3900			33	0.96		3247	8
Elizabeth Canyon (ABD)	12	100		8333	1950	68	3200			41				6
Hasley Canyon	36	0		0	1944	74	5063			18				1
Honor Rancho	673	428		636	1950	68	3800	1900	0.50	37	0.4			5
Hopper Canyon	1	0		0	1884	134	1000			18				3
Howard Townsite	24	842		35083	1947	71	5650			60	0.39			5
Inglewood	2032002	915970	1.23E+08	451	1924	94	950	450	0.47	38	2.5		31	9
Lapworth (ABD)	220	0		0	1935	83	3100			31				4
Las Llajas	11	0		0	1945	73	977			28				4
Lawndale (ABD)	225	2250		10000	1928	90	6000			32	1.4			7
Leffingwell (ABD)	196	800		4082	1946	72	6875			42				5
Lyon Canyon (ABD)	475	2100		4421	1969	49	9130			35				4
Montalvo, West	154	1420		9221	1947	71	6000	4500	0.75	28	4.1			6
Montebello	416541	226292	32857423	543	1917	101	2200	1100	0.50	40			775	6
Newgate	54	480		8889	1956	62	7700			33				4
Newhall	30	50		1667	1876	142	145	900	6.21	38				10
Newhall-Potrero	118	200		1695	1937	81	6500	3100	0.48	42	0.81			6
Oak Canyon	398	212		533	1941	77	2750	1043	0.38	32	1.03			6
Oat Mountain	39	25		641	1946	72	6650	2800	0.42	20				3
Placerita	15	0		0	1920	98	600			25	1.3			6
Playa Del Rey	48765	115047	978888	2359	1929	89	6200	2760	0.45	30	3.2		799	7
Ramona	120	70		583	1943	75	2498			30	2.45			6
Ramona, North	34	0		0	1946	72	3100			19				2
Rosecrans	1086	3500		3223	1924	94	3750	2920	0.78	46	1.14		192	8

Unincorporated LA Oil Fields Data

FIELDNAME	Oil, bbl	Gas, Mcf	Water	GOR	Earliest Discovery Date	Age	Minimum Depth, ft	Initial Reservior Pressure (at min depth), psi	PSI/ft	API, max	Crude Sulfur Content (% by wt)	H2S	Min Fluid Level	Reservior Score
Rosecrans, East	373	500		1340	1959	59	5800			30				3
Rosecrans, South	8623	7725	18003	896	1939	79	6200			46				4
Sansinena	173049	174119	311400	1006	1898	120	1300			30			156	6
Santa Fe Springs	806219	249782	46961378	310	1922	96	3580	1480	0.41	35	0.44		62	6
Sawtelle	158776	51751	507855	326	1965	53	9500	4400	0.46	26	2.4			4
Tapia	120	0		0	1957	61	1050			17				1
Torrance	324043	68870	5824775	213	1922	96	2800	1385	0.49	30	2	Maybe	51	7
Turnbull (ABD)	305	0		0	1941	77	3370			28				3
Walnut	5404	0	5353	0	1948	70	1200			16				2
Wayside Canyon	33	0		0	1962	56	1495	525	0.35	22				2
Whittier	67139	158069	66637	2354	1896	122	900	950	1.06	36			186	9
Whittier Heights, North (ABD)	40	0		0	1944	74	1100			19				2

SOurce: Based primarily on CalGEM Oil and Gas Fields Volume 2 and Publication M10 and recent field production levels

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403700003	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	Ament-Dunn	5	-118.615921	34.47537613	1214.3	0	67	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403700013	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	72	-118.5498047	34.31581879	0.0	0	53	5	80	11	15	0	0	0	0	0	1	5	0	0	3	5
0403700015	Union Oil Company of California	Plugged & Abandoned	Oat Mountain	Wigdal	2	-118.6006546	34.3323822	1.3	0	63	3	72	11	15	0	0	0	0	0	2	3	0	0	3	5
0403700016	Magnum Resources Corp.	Plugged & Abandoned	Canton Creek (ABD)	Engman	14-2	-118.7373505	34.51612854	0.6	0	62	5	61	10	13	0	0	0	0	0	2	5	0	0	2	5
0403700022	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	18	-118.2777634	33.901371	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403700027	Bob Ferguson Independent	Plugged & Abandoned	Any Field	Hathaway	5	-118.7328796	34.49732208	0.6	0	53	5	81	10	13	0	0	0	0	0	1	5	0	0	2	5
0403700030	Aminoil U.S.A., Inc.	Plugged & Abandoned	Del Valle	Videgain	101	-118.6927872	34.42882156	3.6	0	78	5	78	34	67	0	0	0	2	0	4	5	0	18	2	5
0403700038	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	5	-118.5572662	34.31905746	0.0	0	78	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700042	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	British-American-Texas Bodger	2	-118.3393478	33.89083862	12906.2	0	0	5	72	42	78	0	0	7	3	0	3	5	0	80	11	2
0403700043	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	3	-118.2289658	33.86110306	0.0	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403700047	Hillcrest Beverly Oil Corp.	Plugged & Abandoned	Montebello	Baldwin	1	-118.0729599	34.03352356	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403700062	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Mayock	2	-118.5799332	34.35266113	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403700066	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	5	-118.4930878	34.36730194	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403700067	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	103	-118.6316757	34.3698082	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403700068	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	105	-118.6287537	34.37033081	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403700069	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	26	-118.6527252	34.40259171	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403700070	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	53	-118.6412506	34.40085983	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403700071	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	121	-118.6531372	34.40436172	432.9	0	65	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403700072	Hathaway Company	Plugged & Abandoned	Oak Canyon	Ram	3	-118.7049637	34.47426224	3.2	0	75	6	77	10	13	0	0	0	0	0	4	6	0	0	2	5
0403700092	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	21	-118.2803268	33.91151047	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403700127	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge	1	-118.594841	34.47485733	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403700128	Pacifica Oil Company	Plugged & Abandoned	Tapia	Louise	1	-118.5981369	34.47875977	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403700129	Deltron Drilling, Inc.	Plugged & Abandoned	Tapia	Royalty	1	-118.598587	34.47843552	0.0	0	56	1	61	0	0	0	0	0	0	0	2	1	0	0	2	5
0403700130	Oilco Petroleum Development	Plugged & Abandoned	Tapia	Royalty	2	-118.5949631	34.47917175	0.0	0	55	1	61	24	47	0	0	0	0	0	2	1	0	0	2	5
0403700133	Lawrence P. Kraemer	Plugged & Abandoned	Whittier	Kraemer	2	-118.0246887	33.98814774	544.4	0	0	9	122	20	38	0	0	0	0	0	3	9	0	0	10	4
0403700134	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier	Gregg	2	-118.0545578	34.00380707	0.0	0	0	9	122	38	73	0	0	0	3	0	3	9	0	36	10	4
0403700144	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	Ament	7	-118.6161041	34.47504425	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403700145	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Henning-Kennedy	101	-118.6271668	34.48722076	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403700146	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Kennedy	O-2	-118.6285019	34.48813629	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403700147	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	63	-118.6099472	34.42730331	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403700157	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	6	-118.2334442	33.85425568	0.0	0	0	8	95	37	72	0	0	0	3	0	3	8	0	33	10	2
0403700159	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	108	-118.2337265	33.8609581	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403700160	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	115	-118.233284	33.86483002	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403700184	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	13	-118.6102829	34.47169113	0.0	0	0	5	68	15	25	0	0	0	0	0	3	5	0	0	2	5
0403700185	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	31	-118.6034241	34.46348953	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403700186	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	32	-118.6100464	34.47567749	0.0	0	0	5	68	15	25	0	0	0	0	0	3	5	0	0	2	5
0403700188	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	44	-118.5965729	34.46385574	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403700189	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Moser Community	1	-118.3027649	33.92544174	224.8	0	0	5	71	62	97	1	0	0	4	0	3	5	3	44	9	2
0403700190	Monterey Resources, Inc.	Plugged & Abandoned	Howard Townsite	Union-Poindexter	3	-118.3044586	33.92731094	966.0	0	0	5	71	54	93	0	0	0	4	0	3	5	0	32	9	2
0403700198	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	53	-118.3619003	33.99903488	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403700201	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	131	-118.3646927	33.99785995	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403700202	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	172	-118.3594284	33.99799347	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403700204	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	542	-118.3633423	33.9983139	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403700207	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-BC-LW	16	-118.3671188	33.99684906	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700210	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-STK-LW	4	-118.3620071	33.99541855	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403700211	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers-LAI-LW	6	-118.3763809	34.00276184	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700213	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	27	-118.3729858	34.00310516	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700214	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	53	-118.3703766	33.99617767	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403700215	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	58	-118.3718338	34.00207138	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700216	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	112	-118.3722992	34.00348663	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700218	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	170	-118.366951	33.99007797	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403700220	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	189	-118.3710938	34.00001907	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700221	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A.Investment 1	203-A	-118.3674469	33.99530792	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403700222	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	222	-118.3660812	33.99268723	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403700223	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	239	-118.3676071	33.99046707	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403700225	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	263	-118.3688278	34.0015831	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700226	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	265	-118.3725586	34.00337982	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700227	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	289	-118.3712158	33.99807739	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403700228	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	295	-118.3726959	33.99708939	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403700230	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	307	-118.3661652	33.99226379	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403700231	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	37	-118.3612366	33.99547958	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403700236	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	89-A	-118.3796692	34.00099182	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403700237	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	95	-118.3763504	34.00304031	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700240	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	118	-118.3787766	34.00731659	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700247	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	45	-118.384346	34.0102272	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403700252	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	67	-118.3823319	34.00634766	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403700256	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	91	-118.3838959	34.00692749	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403700257	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	202	-118.3831863	34.00670242	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403700259	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	204	-118.3837891	34.00901413	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403700260	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	205	-118.3811188	34.00870895	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700261	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	206	-118.385231	34.01110458	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403700262	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	208	-118.3809662	34.00949097	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403700264	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Bleakwood Coreholea	1	-118.1600647	34.03639221	6207.1	0	0	5	81	60	96	0	0	4	4	0	3	5	0	64	9	1
0403700265	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker-L.A.I.-1 L.W.	202	-118.3618012	33.99284744	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403700266	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	5	-118.3617096	33.99557877	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403700470	Cedric E. Brown Gas & Oil Co., Ltd.	Plugged & Abandoned	Any Field	Unspecified	1	-118.067131	34.72769928	20.9	0	0	5	81	40	76	0	0	0	3	0	3	5	0	24	1	5
0403700511	California Resources Production Corporation	Plugged & Abandoned	Any Field	Chivo Canyon	1	-118.6486511	34.35419846	1.3	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403700546	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	9	-118.3821487	34.01071548	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403700549	California Resources Production Corporation	Plugged & Abandoned	Any Field	Blue Sage	1	-118.6450958	34.35897446	1.3	0	53	5	81	20	37	0	0	0	0	0	1	5	0	0	2	5
0403700627	Magnum Resources Corp.	Plugged & Abandoned	Canton Creek (ABD)	Engman	14-3	-118.7372971	34.51492691	0.6	0	0	5	61	10	13	0	0	0	0	0	3	5	0	0	2	5
0403700632	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Ward	1	-118.5480728	34.31882095	0.0	0	87	5	80	11	15	0	0	0	0	0	5	5	0	0	3	5
0403700633	Hamilton and Sherman	Plugged & Abandoned	Aliso Canyon	Orcutt	1	-118.5631943	34.32336044	0.0	0	58	5	80	20	37	0	0	0	0	0	2	5	0	0	3	5
0403700636	Edwin W. Pauley	Plugged & Abandoned	Oat Mountain	Biow	36	-118.6009293	34.32885361	0.0	0	0	3	72	11	15	0	0	0	0	0	3	3	0	0	3	5
0403700637	Placerita Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.5978775	34.32089615	1.0	0	106	5	81	11	15	0	0	0	0	0	5	5	0	0	3	5
0403700638	Placerita Oil Co.	Plugged & Abandoned	Any Field	Well No.	2	-118.5969544	34.31730652	1.0	0	104	5	81	11	15	0	0	0	0	0	5	5	0	0	3	5
0403700640	Porter Sesnon et al	Plugged & Abandoned	Aliso Canyon	Limekiln	1	-118.5557556	34.30530548	1.0	0	64	5	80	11	15	0	0	0	0	0	2	5	0	0	3	5
0403700641	Porter Sesnon et al	Plugged & Abandoned	Aliso Canyon	Limekiln	2	-118.5556946	34.30238342	1.0	0	72	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700642	Porter Sesnon et al	Plugged & Abandoned	Aliso Canyon	Limekiln	5	-118.5593262	34.30250931	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700643	Porter Sesnon et al	Plugged & Abandoned	Aliso Canyon	Limekiln	6	-118.5629959	34.30347061	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700644	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter Fee	1	-118.5481262	34.30773544	0.0	0	74	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700645	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter Fee	2	-118.5495529	34.30830383	0.0	0	73	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700646	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter Fee	3	-118.548645	34.30810547	0.0	0	67	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700647	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Sesnon Fee	1	-118.5673981	34.30825424	1.0	0	77	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700649	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Sesnon Fee	3	-118.5637131	34.31229019	1.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700655	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Del Aliso 1	1	-118.574028	34.31784058	1.0	1	75	5	80	11	15	0	0	0	0	3	4	5	0	0	3	5
0403700656	The Termo Company	Plugged & Abandoned	Aliso Canyon	Del Aliso 1	2	-118.576767	34.31780243	1.0	0	71	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700664	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Frew 1	1	-118.5864029	34.31415176	1.0	0	76	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700666	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	3	-118.577385	34.31560135	1.0	0	75	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700667	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	4	-118.5747986	34.31313705	1.0	0	72	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700668	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	5	-118.5765076	34.31259537	1.0	0	71	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700669	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	6	-118.5750504	34.31022644	1.0	0	71	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700670	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	7	-118.5747681	34.31318665	1.0	0	65	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700671	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	8	-118.5751572	34.31119537	1.0	0	64	5	80	11	15	0	0	0	0	0	2	5	0	0	3	5
0403700672	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Frew	9	-118.5794373	34.31097794	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700674	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Orcutt-Del Aliso-Sesnon L.W.	1	-118.5726852	34.3177681	1.0	1	65	5	80	11	15	0	0	0	0	3	3	5	0	0	3	5
0403700675	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Orcutt-Sesnon L.W.	1	-118.5722046	34.31971359	1.0	0	60	5	80	11	15	0	0	0	0	0	2	5	0	0	3	5
0403700676	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Orcutt Trustee	2	-118.544632	34.31774902	0.0	0	67	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700677	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Orcutt Trustee	3A	-118.5445862	34.31794357	0.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700680	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Ward	2	-118.554451	34.32047272	0.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700681	Chevron U.S.A. Inc.	Plugged & Abandoned	Aliso Canyon	Ward 3	1	-118.5518646	34.32326126	0.0	0	75	5	80	20	37	0	0	0	0	0	4	5	0	0	3	5
0403700683	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Fernando Fee	12	-118.5464706	34.3152771	0.0	1	68	5	80	11	15	0	1	0	0	3	3	5	3	0	3	5
0403700685	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Fernando Fee	31	-118.5460739	34.30908203	0.0	0	74	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700689	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Fernando Fee	35	-118.5457611	34.30906677	0.0	0	68	5	80	11	15	0	1	0	0	0	3	5	3	0	3	5
0403700691	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Mission-Adrian Fee	1	-118.5441208	34.30574417	0.0	0	73	5	80	11	15	0	1	0	0	0	3	5	3	0	3	5
0403700699	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	4	-118.553978	34.31789017	0.0	0	77	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700700	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	11	-118.641243	34.40086365	432.9	0	80	5	80	14	22	0	0	0	0	0	4	5	0	0	2	5
0403700702	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	13	-118.5507202	34.3167038	0.0	0	79	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700705	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	16	-118.5555191	34.31736755	0.0	0	79	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700716	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	29	-118.5536575	34.31396866	0.0	0	69	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700718	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	31	-118.5488892	34.31040955	0.0	0	75	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700721	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	34	-118.5536957	34.31069946	0.0	0	75	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700723	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	36	-118.5523911	34.30957031	0.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700725	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	38	-118.5610504	34.31244278	1.0	0	72	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700728	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	41	-118.5602264	34.3106842	1.0	0	71	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700729	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	42	-118.5549011	34.30957794	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700730	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	43	-118.5584183	34.30975723	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700734	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	47	-118.5601502	34.31374359	1.0	0	76	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700736	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	51	-118.5578613	34.31354904	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700740	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	55	-118.5598221	34.31361008	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700741	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	56	-118.5618973	34.3135643	1.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403700744	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	59	-118.5495911	34.31568909	0.0	0	0	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700752	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter-Sesnon	20	-118.5637207	34.31827927	1.0	0	71	5	80	20	37	0	0	0	0	0	3	5	0	0	3	5
0403700753	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter-Sesnon	42	-118.5624619	34.31105042	1.0	0	65	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700755	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	2	-118.5690155	34.314785	1.0	0	76	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700757	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	4	-118.5718308	34.31506729	1.0	0	75	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700765	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	13	-118.5637207	34.30988312	1.0	0	71	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700766	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	14	-118.569519	34.30951691	1.0	0	70	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700767	Crimson Resource Management Corp.	Plugged & Abandoned	Aliso Canyon	Standard-Sesnon 1	15P	-118.5657578	34.31814575	1.0	0	70	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700769	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	17	-118.5684891	34.31121826	1.0	0	67	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700770	Crimson Resource Management Corp.	Plugged & Abandoned	Aliso Canyon	Standard-Sesnon 1	18	-118.5712509	34.31908798	1.0	0	68	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700775	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	24	-118.5711517	34.31105423	1.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700780	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Standard Sesnon	30	-118.5651093	34.3091011	1.0	0	66	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700782	Crimson Resource Management Corp.	Plugged & Abandoned	Aliso Canyon	Standard-Sesnon 1	32	-118.571312	34.31801605	1.0	0	63	5	80	11	15	0	0	0	0	0	2	5	0	0	3	5
0403700786	Crimson Resource Management Corp.	Plugged & Abandoned	Aliso Canyon	Standard-Sesnon 1	39	-118.5648956	34.3175621	1.0	0	65	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700787	Crimson Resource Management Corp.	Plugged & Abandoned	Aliso Canyon	Standard-Sesnon 1	40	-118.5719147	34.31814575	1.0	0	65	5	80	11	15	0	0	0	0	0	3	5	0	0	3	5
0403700791	Union Oil Company of California	Plugged & Abandoned	Aliso Canyon	Santa Susana Orcutt	1-27	-118.5463409	34.31955719	0.0	0	80	5	80	11	15	0	0	0	0	0	4	5	0	0	3	5
0403700796	Arco Oil and Gas Co.	Plugged & Abandoned	Tapia	Benz	1	-118.6078873	34.48242188	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403700797	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	Bodger	3	-118.3357697	33.89385605	10140.1	0	0	5	72	40	76	0	0	6	3	0	3	5	0	72	11	2
0403700800	Grayson Service, Inc.	Plugged & Abandoned	Alondra (ABD)	Park Bodger	1	-118.3357239	33.88781738	9829.4	0	0	5	72	49	88	0	0	5	4	0	3	5	0	72	11	2
0403700801	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	Park Community	1	-118.3301239	33.89001846	10241.5	0	0	5	72	49	88	0	0	6	4	0	3	5	0	80	11	2
0403700802	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	Village Community	1	-118.3368378	33.89292908	12119.2	0	0	5	72	49	88	0	0	7	4	0	3	5	0	88	11	2
0403700803	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	Village Community	2	-118.3290176	33.88950348	13824.8	0	0	5	72	49	88	0	0	7	4	0	3	5	0	88	11	2
0403700804	Soverign Oil Corp.	Plugged & Abandoned	Alondra (ABD)	Sovereign-Long	1	-118.3279266	33.88991165	10241.5	0	0	5	72	49	88	0	0	6	4	0	3	5	0	80	11	2
0403700833	W. K. Barker	Plugged & Abandoned	Bandini	Aero-Bonsall-Crawley	A-1	-118.1778107	34.01196289	0.0	0	0	3	65	68	99	0	0	0	4	0	3	3	0	24	9	1
0403700834	W. K. Barker	Plugged & Abandoned	Bandini	Aero-Bonsall-Crawley	B-2	-118.1777725	34.01185226	0.0	0	0	3	65	68	99	0	0	0	4	0	3	3	0	24	9	1
0403700838	Custom Drilling Co.	Plugged & Abandoned	Bandini	M.N.S.	1	-118.1807251	34.01231766	20121.2	0	0	3	65	68	99	0	0	10	4	0	3	3	0	84	9	1
0403700865	Nordon Corp. Ltd.	Plugged & Abandoned	Bandini	Aeco-Bonsall-Crawley	A-3	-118.1778107	34.01187897	0.0	0	0	3	65	68	99	0	0	0	4	0	3	3	0	24	9	1
0403700878	Kay Oil Co.	Plugged & Abandoned	Rosecrans	Haviland	1	-118.2806015	33.91019821	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403701160	Cache Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	4-1	-118.6642532	34.19468307	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701162	Canoga Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	1-A	-118.664444	34.19492722	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701163	Canoga Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	3	-118.6643677	34.1949234	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701164	Canoga Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	4	-118.6661072	34.1944313	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701165	Canoga Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	5	-118.665947	34.19387054	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701166	Canoga Oil Co.	Plugged & Abandoned	Canoga Park	Knapp	6	-118.6652069	34.19471359	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701168	W. J. McCarthy-Wally Dennis	Plugged & Abandoned	Canoga Park	Knapp	2	-118.6652527	34.19418716	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701169	Wallace M. Nelson	Plugged & Abandoned	Canoga Park	Lunnon	1	-118.6673889	34.19142151	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403701170	Magnum Resources Corp.	Plugged & Abandoned	Canton Creek (ABD)	Engman	14-1	-118.7374115	34.51709366	0.6	0	0	5	61	10	13	0	0	0	0	0	3	5	0	0	2	5
0403701171	L. H. Glaser	Plugged & Abandoned	Canton Creek (ABD)	Government	1	-118.7361984	34.51492691	0.6	0	61	5	61	10	13	0	0	0	0	0	2	5	0	0	2	5
0403701172	H. C. Morton & H.S. Kohlbush	Plugged & Abandoned	Canton Creek (ABD)	Engman	2	-118.7402039	34.5160408	0.6	0	61	5	61	10	13	0	0	0	0	0	2	5	0	0	2	5
0403701189	Atlantic Oil Company	Plugged & Abandoned	Castaic Hills	Doyle	1	-118.6164093	34.47253799	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701190	Atlantic Oil Company	Plugged & Abandoned	Castaic Hills	Doyle	2	-118.6166534	34.47271729	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701194	Crimson Resource Management Corp.	Plugged & Abandoned	Castaic Hills	CHU	13-36	-118.6236954	34.47720337	1214.3	0	62	6	67	15	25	0	0	1	0	0	2	6	0	8	2	5
0403701196	Crimson Resource Management Corp.	Plugged & Abandoned	Castaic Hills	CHU	14-36	-118.6233444	34.47550201	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701200	Crimson Resource Management Corp.	Plugged & Abandoned	Castaic Hills	CHU	24-36	-118.6212997	34.47538376	1214.3	0	60	6	67	15	25	0	0	1	0	0	2	6	0	8	2	5
0403701201	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	25-36	-118.6209259	34.47387695	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701208	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	45-35	-118.6340027	34.47367859	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701213	Crimson Resource Management Corp.	Plugged & Abandoned	Castaic Hills	CHU	64-35	-118.6308136	34.47466278	1214.3	1	0	6	67	15	25	0	0	1	0	3	3	6	0	12	2	5
0403701218	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	84-35	-118.6256332	34.47582626	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701219	Crimson Resource Management Corp.	Plugged & Abandoned	Castaic Hills	CHU	134-36	-118.6192322	34.47539139	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701221	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	CHU	244-36	-118.6171265	34.47526932	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701222	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	Forst-Muller	16-36	-118.6228714	34.47187424	9127.8	0	0	6	67	15	25	0	0	5	0	0	3	6	0	45	2	5
0403701223	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	Harding	32-36	-118.6197357	34.47957993	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701224	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	Rynne-Fisher	11-36	-118.6244049	34.48099518	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701226	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	Ament-Dunn	4	-118.6160126	34.47558212	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701227	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	Ament-Dunn	6	-118.6161346	34.47527313	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701228	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Forst-Muller	36-36	-118.6190414	34.47298813	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701229	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Harding	31-36	-118.6199188	34.48126602	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701230	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Rynne-Fisher	2	-118.6291351	34.48105621	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701231	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Rynne-Fisher	22-36-A	-118.6218033	34.47931671	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701232	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Twomey	1	-118.6164703	34.47348404	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701233	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Twomey	2	-118.6159821	34.47448349	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701234	Conoco Inc.	Plugged & Abandoned	Castaic Hills	Twomey	3	-118.6161652	34.47460938	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701235	James Fischgrund	Plugged & Abandoned	Castaic Hills	Eskridge	1	-118.6161118	34.47650146	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701236	Macson Oil Company	Plugged & Abandoned	Castaic Hills	Lindsay	1	-118.627533	34.48512268	4298.0	0	0	6	67	15	25	0	0	3	0	0	3	6	0	27	2	5
0403701237	Macson Oil Company	Plugged & Abandoned	Castaic Hills	Radovich	1	-118.6271057	34.48773193	1214.3	0	0	6	67	10	13	0	0	1	0	0	3	6	0	9	2	5

Abandoned Wells Ranking Information

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0403701238	Macson Oil Company	Plugged & Abandoned	Castaic Hills	Radovich	2	-118.6278763	34.48739624	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701239	Morton and Dolley	Plugged & Abandoned	Castaic Hills	M.J.M. & M.-Linsay	1	-118.6279678	34.48540115	4298.0	0	0	6	67	15	25	0	0	3	0	0	3	6	0	27	2	5
0403701240	Morton and Dolley	Plugged & Abandoned	Castaic Hills	M.J.M. & M.-Radovich	1	-118.6295471	34.48583221	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701241	Morton and Dolley and M J M & M Oil Co.	Plugged & Abandoned	Castaic Hills	Hall	1	-118.632103	34.48311234	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701242	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Golden	175-4	-118.6277924	34.47369766	1214.3	0	56	6	67	15	25	0	0	1	0	0	2	6	0	8	2	5
0403701243	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Villa	15	-118.6406555	34.47375488	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701244	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Villa	26	-118.6382065	34.47190094	919.9	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701245	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Villa	36	-118.6361313	34.47190475	919.9	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701246	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Fischer	2	-118.6427536	34.47203445	13149.3	0	0	6	67	15	25	0	0	7	0	0	3	6	0	63	2	5
0403701247	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Forst	1	-118.6244736	34.46836853	2359.1	0	0	6	67	11	15	0	0	2	0	0	3	6	0	18	2	5
0403701248	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	1	-118.6151733	34.47236252	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701249	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	2	-118.6148987	34.47430801	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701250	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	3	-118.6151428	34.47323227	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701251	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	4	-118.6149216	34.47172546	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701252	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	5	-118.6150208	34.47354126	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701253	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	6	-118.6147385	34.47223663	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701254	California Resources Production Corporation	Plugged & Abandoned	Castaic Hills	Honor Rancho 'B' (NCT-1)	7	-118.6147461	34.47499847	0.0	0	0	6	67	15	25	0	0	0	0	0	3	6	0	0	2	5
0403701255	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Wickham	84-34	-118.6430054	34.47584152	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403701256	Wood-Callahan	Plugged & Abandoned	Castaic Hills	Castaic	36-1	-118.616806	34.47091293	9981.6	0	0	6	67	15	25	0	0	5	0	0	3	6	0	45	2	5
0403701977	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	66	-118.6055298	34.42974472	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403702078	SWC Resources Inc	Plugged & Abandoned	Newhall	Towsley	1	-118.578392	34.35046387	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403702080	Hondo Oil & Gas Company	Plugged & Abandoned	Alondra (ABD)	Bodger	1	-118.3364029	33.89195633	10226.5	0	0	5	72	49	88	0	0	6	4	0	3	5	0	80	11	2
0403702083	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Honor Rancho 'A' (NCT-2)	34	-118.6037369	34.47373962	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403702084	Monterey Resources Inc.	Plugged & Abandoned	Any Field	Sanborn	1	-118.5929947	34.37272644	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403702085	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Moore	4	-118.5983429	34.36260986	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403702086	Monterey Resources, Inc.	Plugged & Abandoned	Howard Townsite	Union-Poindexter	1	-118.3063889	33.92746353	966.0	0	0	5	71	54	93	0	0	0	4	0	3	5	0	32	9	2
0403705083	Robert E. Abbe	Plugged & Abandoned	Any Field	Montie	1	-118.681839	34.44273758	13.8	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705099	Aetna Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.6869507	34.44887924	26.3	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705100	Aetna Oil Co.	Plugged & Abandoned	Any Field	Well No.	2	-118.6864853	34.44793701	26.3	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705101	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	60	-118.6013565	34.4267807	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403705103	Ajax Oil and Development Co.	Plugged & Abandoned	Any Field	McCloskey-Hansen USL	1	-118.4843521	34.3304863	0.0	0	64	5	81	26	52	0	0	0	1	0	2	5	0	7	2	5
0403705106	Jacob Albert	Plugged & Abandoned	Any Field	Albert	1	-118.6794052	34.44867706	26.3	0	66	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705107	George Allen	Plugged & Abandoned	Any Field	Well No.	1	-118.604538	34.51007462	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705110	Louis Benjamin Altchuler	Plugged & Abandoned	Any Field	Larry	1	-117.8564301	33.9742012	3279.7	0	0	5	81	10	12	0	0	2	0	0	3	5	0	16	6	4
0403705112	Amax Petro. Corp.	Plugged & Abandoned	Any Field	Ayala	1	-118.6886444	34.49042892	3.2	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705113	Amax Petro. Corp.	Plugged & Abandoned	Any Field	Ayala	2	-118.6908569	34.48668671	3.2	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705117	American Pacific International	Plugged & Abandoned	Any Field	N. L. & F.	1	-118.5612183	34.44635773	1899.8	0	0	5	81	9	11	0	0	1	0	0	3	5	0	8	2	5
0403705119	F. G. Anderson	Plugged & Abandoned	Any Field	Mabel	1	-118.7351303	34.14970016	0.0	0	0	5	81	24	48	0	0	0	0	0	3	5	0	0	4	3
0403705127	Antelope Oil Company	Plugged & Abandoned	Any Field	Duhart	1	-118.4272156	34.73497009	32.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705131	Antelope Valley Petro. Co.	Plugged & Abandoned	Any Field	Antelope	1	-118.1667404	34.61376953	754.5	0	0	5	81	21	40	0	0	0	0	0	3	5	0	0	1	5
0403705133	Apex Petroleum Corporation, Ltd.	Plugged & Abandoned	Any Field	Weldon	1	-118.519043	34.33686066	0.0	0	0	5	81	20	37	1	0	0	0	0	3	5	3	0	3	5
0403705134	Arcadia Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.08078	34.0452652	672.2	0	0	5	81	51	90	0	0	0	4	0	3	5	0	32	7	1
0403705145	Atlantic Oil Company	Plugged & Abandoned	Any Field	Berryman	1	-118.6381302	34.49535751	554.9	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705146	Atlantic Oil Company	Plugged & Abandoned	Hasley Canyon	Good	1	-118.6393204	34.46094894	919.9	0	0	1	74	11	15	0	0	0	0	0	3	1	0	0	2	5
0403705147	Atlantic Oil Company	Plugged & Abandoned	Any Field	Nettleship	1	-118.592186	34.13418961	2735.4	0	0	5	81	8	9	0	0	2	0	0	3	5	0	16	4	3
0403705148	Atlantic Oil Company	Plugged & Abandoned	Any Field	Strawn	1	-118.6461716	34.4524231	2.1	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705149	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Anderson-Western	1	-118.3005524	33.93130493	12205.8	0	0	5	81	44	81	0	0	7	4	0	3	5	0	88	9	2
0403705150	Atlantic Richfield Company	Plugged & Abandoned	Howard Townsite	Anderson-Western	2	-118.3085022	33.93143082	5400.8	0	0	5	71	45	83	0	0	3	4	0	3	5	0	56	9	2
0403705152	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Boyle Community	33	-118.1857452	34.04086685	18414.5	0	0	5	81	44	81	0	0	10	4	0	3	5	0	112	9	1
0403705153	Arco Oil and Gas Co.	Plugged & Abandoned	Any Field	Brady Estate	1	-118.6220932	34.34047699	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705159	Arco Oil and Gas Co.	Plugged & Abandoned	Any Field	Lechler	1	-118.705864	34.45785904	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705162	Arco Oil and Gas Co.	Plugged & Abandoned	Tapia	Miller	1	-118.6138229	34.48456955	0.0	0	0	1	61	15	25	0	0	0	0	0	3	1	0	0	2	5
0403705166	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Petitfils	A-1	-117.9157181	34.01371384	20262.1	0	0	5	81	46	84	0	0	10	4	0	3	5	0	112	6	1
0403705167	Atlantic Richfield Company	Plugged & Abandoned	Any Field	R. M. Petitfils	1	-117.9132919	34.01842499	16219.4	0	0	5	81	46	84	0	0	9	4	0	3	5	0	104	6	1
0403705168	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Puente C. H.	1	-117.903717	34.01022339	5702.8	0	0	5	81	55	93	0	0	3	4	0	3	5	0	56	6	1
0403705170	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Puente C. H.	4	-117.9111328	34.01133728	16830.0	0	0	5	81	55	93	0	0	9	4	0	3	5	0	104	6	1
0403705171	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Puente C. H.	5	-117.9160538	34.01177216	18414.6	0	0	5	81	46	84	0	0	10	4	0	3	5	0	112	6	1
0403705172	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Puente C. H.	6	-117.9136429	34.01335144	0.0	0	0	5	81	46	84	0	0	0	4	0	3	5	0	32	6	1
0403705185	Atlas Oil Company	Plugged & Abandoned	Any Field	Acosta	1	-118.518692	34.49944687	0.0	0	70	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705186	Axis Petroleum Co.	Plugged & Abandoned	Any Field	W. R. Rowland	1	-117.9405441	33.98217773	29.0	0	0	5	81	23	46	0	0	0	0	0	3	5	0	0	6	4
0403705195	Barnes Core Drilling Co.	Plugged & Abandoned	Any Field	Mcnaughton	1	-118.3643341	34.67174911	153.7	0	0	5	81	6	4	0	0	0	0	0	3	5	0	0	1	5
0403705196	Jess C. Barnes	Plugged & Abandoned	Any Field	Faith	1	-118.4534226	34.37596512	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403705201	Bell Petroleum Co.	Plugged & Abandoned	Any Field	Bartholomaus	74-6	-118.3811798	34.28840256	380.5	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	3	5
0403705205	Paul Benz	Plugged & Abandoned	Any Field	McCown	8-1	-118.4798737	34.446064	12963.5	0	0	5	81	3	1	0	0	7	0	0	3	5	0	56	2	5
0403705207	Bevo Drilling Co.	Plugged & Abandoned	Placerita	Carter-Earl	4	-118.4815292	34.37958145	0.0	0	0	6	98	24	47	0	0	0	0	0	3	6	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403705208	Big 4 Oil Company	Plugged & Abandoned	Any Field	Brona	1	-118.577385	34.38857269	21148.3	0	0	5	81	14	22	0	0	10	0	0	3	5	0	80	2	5
0403705211	Bradford Bishop	Plugged & Abandoned	Any Field	Baldwin	1	-118.0286865	34.02620316	0.0	0	0	5	81	36	70	1	0	0	3	0	3	5	3	33	10	4
0403705216	Houston Bixby, Inc	Plugged & Abandoned	Any Field	English	2	-118.462616	34.46559906	297.7	0	0	5	81	3	1	0	0	0	0	0	3	5	0	0	2	5
0403705219	William C. Blanks	Plugged & Abandoned	Any Field	Blanks	1	-118.6629486	34.19428253	1594.0	0	0	5	81	6	5	0	0	1	0	0	3	5	0	8	3	3
0403705220	Fox M. Boswell and Assoc.	Plugged & Abandoned	Any Field	Foley	1	-118.6973877	34.45714951	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705221	Fox M. Boswell and Assoc.	Plugged & Abandoned	Any Field	Ruiz	1	-118.5457993	34.48740768	138.4	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705222	Boyle Royalties Co.	Plugged & Abandoned	Any Field	Unspecified	104-1	-118.1707306	34.03796387	0.0	0	0	5	81	53	91	0	0	0	4	0	3	5	0	32	9	1
0403705226	Joel Brandon	Plugged & Abandoned	Any Field	Mark VII	1	-118.5872726	34.48519897	3.8	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705230	B. B. Beckenridge	Plugged & Abandoned	Any Field	Hartje-Kosloff	1	-118.6015854	34.4827919	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705231	British-American Oil Producing Co.	Plugged & Abandoned	Any Field	Coleman	1	-118.719307	34.13738632	0.0	0	0	5	81	21	42	0	0	0	0	0	3	5	0	0	4	3
0403705232	The British American Oil Producing Company	Plugged & Abandoned	Any Field	General	41-13	-118.6183853	34.52462387	0.8	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705238	Jesse M. Butler	Plugged & Abandoned	Any Field	Butler-Mason	1	-118.5837402	34.48381042	3.7	0	61	5	81	24	47	0	0	0	0	0	2	5	0	0	2	5
0403705239	Jesse M. Butler	Plugged & Abandoned	Any Field	Butler-Mason	2	-118.5835648	34.48838806	3.8	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705240	Butte Petro. Co., Inc.	Plugged & Abandoned	Any Field	Ruby	1	-117.9013672	34.57348633	0.0	0	0	5	81	16	29	0	0	0	0	0	3	5	0	0	1	5
0403705241	California Medal Products Co.	Plugged & Abandoned	Any Field	Scott	1	-118.4577408	34.80318069	29.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705251	Shirley M. Lechler	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	1	-118.7004776	34.47574615	3.2	0	79	6	77	10	13	0	0	0	0	0	4	6	0	0	2	5
0403705252	The Termo Company	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	2	-118.6955109	34.47777939	3.2	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403705253	The Termo Company	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	3	-118.6999054	34.47789001	3.2	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403705254	The Termo Company	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	4	-118.6968994	34.47537231	8.6	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403705255	The Termo Company	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	5	-118.696228	34.47633362	3.2	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403705256	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	6	-118.6968689	34.4756279	8.6	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403705258	Calumet Gold Mines Co.	Plugged & Abandoned	Any Field	Jones-Central	1	-117.9906998	33.98345184	4728.2	0	0	5	81	19	37	0	0	3	0	0	3	5	0	24	6	4
0403705261	Alex N. Campbell, Oper.	Plugged & Abandoned	Any Field	Kinsey	1	-118.7502213	34.77870941	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705262	Canoga Oil Co.	Plugged & Abandoned	Any Field	Knapp	2	-118.6625366	34.19350433	6482.7	0	0	5	81	10	14	0	0	4	0	0	3	5	0	32	3	3
0403705264	W. J. Carter	Plugged & Abandoned	Any Field	Carter-Earl	1	-118.4743958	34.37617111	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705265	W. J. Carter	Plugged & Abandoned	Placerita	Carter-Earl	2	-118.4815216	34.37836075	73.2	0	0	6	98	24	47	0	0	0	0	0	3	6	0	0	2	5
0403705266	W. J. Carter	Plugged & Abandoned	Placerita	Carter-Earl	3	-118.4809494	34.37862015	73.2	0	0	6	98	24	47	0	0	0	0	0	3	6	0	0	2	5
0403705268	Castaic Highlands Oil Co.	Plugged & Abandoned	Any Field	W.W.	1	-118.6076737	34.51807022	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705269	Celito Oil Corp., Ltd.	Plugged & Abandoned	Any Field	Jepson	1	-118.0986252	34.04889297	7385.4	0	0	5	81	34	66	0	0	4	2	0	3	5	0	48	7	1
0403705273	Century Service Inc.	Plugged & Abandoned	Any Field	Evans	1	-118.5281067	34.32876587	0.0	0	0	5	81	20	37	1	0	0	0	0	3	5	3	0	3	5
0403705291	Coastline Oil Co., Ltd	Plugged & Abandoned	Any Field	Well No.	1	-118.6773834	34.49993515	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705292	C. W. Colgrove	Plugged & Abandoned	Any Field	Hughes	11	-118.0548554	34.80464554	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	1	5
0403705294	C. W. Colgrove	Plugged & Abandoned	Any Field	Schwandt	57-23	-118.3342133	34.67826843	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705305	Conoco Inc.	Plugged & Abandoned	Any Field	Alexander	1	-118.6354294	34.50120544	554.9	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705306	Conoco Inc.	Plugged & Abandoned	Any Field	Baldwin	1	-118.0231094	34.02105331	0.0	0	0	5	81	36	70	1	0	0	3	0	3	5	3	33	10	4
0403705308	Conoco Inc.	Plugged & Abandoned	Any Field	Buehler	1	-118.000679	33.99436188	1618.2	0	0	5	81	20	38	0	0	1	0	0	3	5	0	8	6	4
0403705311	Conoco Inc.	Plugged & Abandoned	Any Field	Elbe U. S. L.	1	-118.7099838	34.67803955	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	1	5
0403705316	Conoco Inc.	Plugged & Abandoned	Any Field	McCue USL	1	-118.7831726	34.69274521	0.3	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	1	5
0403705317	Conoco Inc.	Plugged & Abandoned	Any Field	Mcnally	1	-118.0195236	33.91796112	9340.4	0	0	5	81	37	71	0	0	5	3	0	3	5	0	64	10	4
0403705319	Conoco Inc.	Plugged & Abandoned	Any Field	Vier-Kenny	1	-118.6593018	34.50300217	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705329	E. L. Cragen	Plugged & Abandoned	Any Field	Unspecified	1	-118.2778244	33.92028809	12154.2	0	0	5	81	54	92	0	1	7	4	0	3	5	3	121	9	2
0403705333	Crown-Huntington Oils, Ltd.	Plugged & Abandoned	Any Field	Dodge	2	-118.5983734	34.4824791	3.8	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705335	Crude Oil Drilling Co., Ltd.	Plugged & Abandoned	Any Field	Crude Oil Gardena	1	-118.2871933	33.85988235	0.0	0	0	5	81	57	95	0	0	0	4	0	3	5	0	32	11	2
0403705338	Custom Drilling Co.	Plugged & Abandoned	Any Field	Jones	1	-118.6143494	34.4928093	950.6	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705340	D & B Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-117.9231186	34.02807617	12874.2	0	0	5	81	46	84	0	0	7	4	0	3	5	0	88	6	1
0403705341	Dafor Dev. Co.	Plugged & Abandoned	Any Field	Lyons Ranch	1	-118.5845413	34.54508972	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705342	O. F. Darling	Plugged & Abandoned	Any Field	Darling	1	-118.2114868	33.86539078	0.0	0	0	5	81	74	100	0	0	0	5	0	3	5	0	40	10	2
0403705343	W. E. David	Plugged & Abandoned	Any Field	Hidden Riches	1	-118.3623962	34.73289871	0.7	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705346	W. J. Dennis	Plugged & Abandoned	Any Field	Steele	1	-118.7248306	34.1303978	62.9	0	0	5	81	15	25	0	0	0	0	0	3	5	0	0	4	3
0403705350	Dielectric Laboratories, Inc.	Plugged & Abandoned	Any Field	Radin	2	-117.8645096	33.97083664	3386.3	0	0	5	81	15	26	0	0	2	0	0	3	5	0	16	6	4
0403705354	E. L. Doheny, Operator	Plugged & Abandoned	Any Field	E. L. D.-DeMille	1	-118.3688965	34.29001236	197.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	3	5
0403705361	Douglas Oil Company of California	Plugged & Abandoned	Any Field	Oak Canyon	1	-118.6688004	34.4605751	1180.2	0	0	5	81	34	67	0	0	1	2	0	3	5	0	24	2	5
0403705371	East Piru Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.7057114	34.46059418	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705376	Edwards & Cole	Plugged & Abandoned	Any Field	Well No.	1	-118.5211029	34.33388519	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403705378	Electrological Petro. Corp.	Plugged & Abandoned	Any Field	Overman	1	-118.5948334	34.37578583	2552.9	0	0	5	81	20	37	0	0	2	0	0	3	5	0	16	2	5
0403705379	C. W. Ellsworth	Plugged & Abandoned	Any Field	Paducah	1	-118.6455841	34.53442764	1.1	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705380	El Rancho Expl. Co.	Plugged & Abandoned	Any Field	Rancho	1	-117.8553085	33.96739197	686.9	0	0	5	81	15	26	0	0	0	0	0	3	5	0	0	6	4
0403705382	Enterprise Oil Company	Plugged & Abandoned	Any Field	Puckett	1	-118.4617996	34.46879578	152.5	0	0	5	81	3	1	0	0	0	0	0	3	5	0	0	2	5
0403705386	Fairco Drilling and Development Company	Plugged & Abandoned	Any Field	Radin	1	-117.8553696	33.96796799	686.9	0	0	5	81	15	26	0	0	0	0	0	3	5	0	0	6	4
0403705388	Fairmount Expl. Co.	Plugged & Abandoned	Any Field	Lane	1	-118.4610596	34.80518341	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705391	H. J. Farrington	Plugged & Abandoned	Whittier	Unspecified	1	-118.0181274	33.98710251	0.0	0	0	9	122	24	47	0	0	0	0	0	3	9	0	0	10	4
0403705392	Bob Ferguson Independent	Plugged & Abandoned	Any Field	Hathaway	4	-118.7179642	34.4966774	0.6	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705395	Fernando Oil Co.	Plugged & Abandoned	Hasley Canyon	Well No.	1	-118.6576691	34.4529686	325.9	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403705397	Filmland Oil Co., Ltd.	Plugged & Abandoned	Any Field	Martino	1	-118.6777878	34.45836639	325.9	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705402	The Flintkote Co.	Plugged & Abandoned	Any Field	Flintkote-Turnbull	1	-117.9764938	34.01013565	3317.6	0	0	5	81	36	70	0	0	2	3	0	3	5	0	40	6	4

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403705403	C. L. Fowler, Operator	Plugged & Abandoned	Tapia	Dodge-Scott	1	-118.5897598	34.47518539	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403705404	Fowler and Oles Oil Co.	Plugged & Abandoned	Any Field	Robinett	1	-118.5349579	34.48905945	5.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705406	N. M. Fraser	Plugged & Abandoned	Any Field	Gerard	1	-118.6042175	34.37646103	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403705407	Freeman & Nelson White Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.4497452	34.37375259	0.0	0	120	5	81	26	52	0	0	0	1	0	5	5	0	10	2	5
0403705408	Freeman & Nelson White Oil Co.	Plugged & Abandoned	Any Field	Unspecified	2	-118.4494782	34.37277985	0.0	0	119	5	81	26	52	0	0	0	1	0	5	5	0	10	2	5
0403705418	General Expl. Co. of Ca	Plugged & Abandoned	Any Field	N. L. & F.	1	-118.5888519	34.40476227	1394.7	0	0	5	81	14	22	0	0	1	0	0	3	5	0	8	2	5
0403705426	B. A. Gillespie	Plugged & Abandoned	Any Field	Well No.	1	-118.5384522	34.49279404	203.7	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705428	P. M. Girard	Plugged & Abandoned	Any Field	Fisher-Wosk	1	-118.5902481	34.37657166	6494.4	0	0	5	81	20	37	0	0	4	0	0	3	5	0	32	2	5
0403705436	Graves Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.4848023	34.34999084	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403705441	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Brady Estate	1	-118.6162491	34.34461975	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705443	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Devils Canyon	1	-118.6571808	34.49186325	40.0	0	73	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705444	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Foley	1	-118.6872482	34.45774841	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705445	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Salisbury	1	-118.9098511	34.07150269	0.0	0	0	5	81	7	6	0	0	0	0	0	3	5	0	0	4	3
0403705446	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Salisbury	2	-118.9132843	34.06904984	0.0	0	0	5	81	7	6	0	0	0	0	0	3	5	0	0	4	3
0403705447	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Unit-A	1	-118.0176773	33.92881393	9987.3	0	0	5	81	29	58	0	0	5	1	0	3	5	0	48	10	4
0403705454	H.F.S. Sales	Plugged & Abandoned	Any Field	Testhole	1	-118.5533676	34.60728836	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705455	H-K Exploartion Co.	Plugged & Abandoned	Any Field	Ben Hure	87-21	-118.4698105	34.76097107	2.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705456	Thomas Hagan and L.H. Scott	Plugged & Abandoned	Any Field	Engels	1	-118.4627914	34.46598053	297.7	0	0	5	81	3	1	0	0	0	0	0	3	5	0	0	2	5
0403705457	J. B. Halbert	Plugged & Abandoned	Any Field	Houston	1	-117.7011871	34.5133934	0.0	0	0	5	81	16	29	0	0	0	0	0	3	5	0	0	1	5
0403705459	Half Moon Oil	Plugged & Abandoned	Any Field	Well No.	1	-118.594162	34.36748505	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403705462	Melvin Hansen	Plugged & Abandoned	Any Field	Unspecified	1	-117.8768539	33.97930908	5858.3	0	0	5	81	16	28	0	0	3	0	0	3	5	0	24	6	4
0403705463	Melvin Hansen	Plugged & Abandoned	Any Field	Hansen	3	-117.8688507	33.97810745	4758.2	0	0	5	81	16	28	0	0	3	0	0	3	5	0	24	6	4
0403705470	Hathaway Company	Plugged & Abandoned	Any Field	La Mirada	1	-118.019165	33.92117691	2446.7	0	0	5	81	37	71	0	0	2	3	0	3	5	0	40	10	4
0403705487	Exxon Mobil Corporation	Plugged & Abandoned	Any Field	Castaic	1	-118.5909042	34.50432587	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705490	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	B-1	-118.6146393	34.43906784	0.0	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705491	Exxon Mobil Corporation	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	D-1	-118.5657959	34.4503746	1899.8	0	0	5	81	9	12	0	0	1	0	0	3	5	0	8	2	5
0403705492	Exxon Mobil Corporation	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	D-2	-118.5638809	34.45067215	1899.8	0	0	5	81	9	12	0	0	1	0	0	3	5	0	8	2	5
0403705493	Exxon Mobil Corporation	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	D-3	-118.5590439	34.44791794	1899.8	0	0	5	81	9	11	0	0	1	0	0	3	5	0	8	2	5
0403705496	Exxon Mobil Corporation	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	G-1	-118.6713181	34.39538193	0.0	0	55	5	81	20	37	0	0	0	0	0	2	5	0	0	2	5
0403705503	L. A. & Kern Oil Mining Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.4492798	34.37411118	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403705509	Hurley and Mandelbaum	Plugged & Abandoned	Any Field	Well No.	1	-118.6883316	34.44524765	26.3	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705510	Hurley and Mandelbaum	Plugged & Abandoned	Any Field	Exploration	1	-118.688858	34.44560242	26.3	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705512	Indian Oil Company	Plugged & Abandoned	Tapia	Dodge	13-32	-118.5897675	34.47755814	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403705514	International Oil Devel Inc. Lt	Plugged & Abandoned	Any Field	Powell	301	-118.5481033	34.47894287	138.4	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705515	International Oil Devel Inc. Lt	Plugged & Abandoned	Any Field	Powell	302	-118.5524139	34.47921371	138.4	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705518	Tesoro Petroleum Corp.	Plugged & Abandoned	Any Field	Cleeves	1	-118.34655	34.30422211	5.8	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	3	5
0403705519	Tesoro Petroleum Corp.	Plugged & Abandoned	Any Field	Cleeves	2	-118.3439484	34.30649948	5.8	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	3	5
0403705520	Tesoro Petroleum Corp.	Plugged & Abandoned	Tapia	Fisher USL	1	-118.6130829	34.483181	0.0	0	0	1	61	15	25	0	0	0	0	0	3	1	0	0	2	5
0403705522	Tesoro Petroleum Corp.	Plugged & Abandoned	Any Field	Toon	1	-118.4051895	34.28625107	0.0	0	0	5	81	38	73	0	0	0	3	0	3	5	0	24	3	5
0403705524	Jackson, Pearson & Todd	Plugged & Abandoned	Any Field	Well No.	1	-118.3985977	34.46974564	33.9	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705526	R. W. and Geo. H. Jackson	Plugged & Abandoned	Any Field	Jackson-Leuzinger	1	-118.370697	33.91654587	0.0	0	0	5	81	42	78	0	0	0	3	0	3	5	0	24	11	2
0403705529	A. S. Johnston Drilling Corp.	Plugged & Abandoned	Any Field	Unspecified	32	-118.0550995	34.02293777	0.0	0	0	5	81	49	88	0	0	0	4	0	3	5	0	32	7	1
0403705535	M. V. Kahler	Plugged & Abandoned	Any Field	Eadie	1	-118.5165176	34.33118057	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403705536	Claude Kavanaugh & L R Wilhite	Plugged & Abandoned	Any Field	Ramona Hills	1	-118.6889496	34.44273758	26.3	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705541	Henry King	Plugged & Abandoned	Any Field	Urtasun	1	-118.5956879	34.49033356	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705542	Myron T. King	Plugged & Abandoned	Any Field	Wright-Kovaleski	1	-118.3636017	34.51356888	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705549	H. L. Kitselman	Plugged & Abandoned	Any Field	Kitselman	2	-118.3728714	33.92382431	7945.9	0	0	5	81	42	78	0	0	4	3	0	3	5	0	56	11	2
0403705553	A.L. Kitselman	Plugged & Abandoned	Any Field	Leuzinger	1	-118.3740921	33.91696167	10362.8	0	0	5	81	0	0	0	0	6	0	0	3	5	0	48	11	2
0403705554	A.L. Kitselman	Plugged & Abandoned	Any Field	Leuzinger	2	-118.3718109	33.9180336	9741.3	0	0	5	81	0	0	0	0	5	0	0	3	5	0	40	11	2
0403705562	Howard H. Lange	Plugged & Abandoned	Any Field	Benz	1-A	-118.4793472	34.44661331	3866.5	0	0	5	81	3	1	0	0	2	0	0	3	5	0	16	2	5
0403705568	Latimer Pictures, Inc.	Plugged & Abandoned	Any Field	Latimer	1	-118.527359	34.55237961	13.1	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705569	Latimer Pictures, Inc.	Plugged & Abandoned	Any Field	Testhole	1	-118.5301361	34.54636383	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705572	W. Y. Lee	Plugged & Abandoned	Placerita	Heil	1	-118.4794083	34.38336182	94.5	0	0	6	98	21	41	0	0	0	0	0	3	6	0	0	2	5
0403705573	W. Y. Lee	Plugged & Abandoned	Placerita	Lee	1	-118.4755173	34.38807678	94.5	0	0	6	98	21	41	0	0	0	0	0	3	6	0	0	2	5
0403705574	Lehr Co.	Plugged & Abandoned	Any Field	Unspecified	1	-117.7288742	34.73890305	0.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	1	5
0403705584	Lomi Oil Corp.	Plugged & Abandoned	Any Field	John Rowland	1	-117.8901596	33.99303436	4597.5	0	0	5	81	36	70	0	0	3	3	0	3	5	0	48	6	4
0403705587	Lehr Co.	Plugged & Abandoned	Any Field	Unspecified	2	-117.7288895	34.74229813	0.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	1	5
0403705589	Los Angeles Brewing Co.	Plugged & Abandoned	Any Field	Jones Community	1	-117.9922257	33.98743439	1618.2	0	0	5	81	19	37	0	0	1	0	0	3	5	0	8	6	4
0403705593	Los Nietos Valley Oil Co.	Plugged & Abandoned	Any Field	Woodard	1	-118.0612335	33.97072601	3394.4	0	0	5	81	51	90	0	0	2	4	0	3	5	0	48	10	4
0403705596	Luneta Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.0456848	33.92451477	28795.3	0	0	5	81	58	96	0	0	10	4	0	3	5	0	112	10	4
0403705597	Luneta Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1-A	-118.0455246	33.92468262	0.0	0	0	5	81	58	96	0	0	0	4	0	3	5	0	32	10	4
0403705600	Robert S. Lytle, Operator	Plugged & Abandoned	Any Field	Anderson	1	-118.3031006	33.93395615	13253.6	0	0	5	81	44	81	0	0	7	4	0	3	5	0	88	9	2
0403705602	Robert S. Lytle, Operator	Plugged & Abandoned	Howard Townsite	Anderson	2	-118.305275	33.93484879	10568.8	0	0	5	71	45	83	0	0	6	4	0	3	5	0	80	9	2
0403705603	Robert S. Lytle, Operator	Plugged & Abandoned	Any Field	Central	1	-118.0169983	33.99423599	0.0	0	0	5	81	20	38	0	0	0	0	0	3	5	0	0	10	4
0403705604	M J M & M Oil Co.	Plugged & Abandoned	Any Field	Guyton	1	-118.6528931	34.51074982	0.0	0	65	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403705609	Mangold and Morse Oil Co., Inc.	Plugged & Abandoned	Any Field	McDermott	1	-118.6350861	34.48706436	7767.5	0	0	5	81	15	25	0	0	4	0	0	3	5	0	32	2	5
0403705610	Mangrum & Page	Plugged & Abandoned	Any Field	Lintz	1	-118.4501114	34.37339401	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403705613	Marathon Oil Company	Plugged & Abandoned	Any Field	Austin Estate	1	-118.6593247	34.48802567	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705614	Marathon Oil Company	Plugged & Abandoned	Any Field	Douglas	1	-118.6609421	34.46323013	12440.7	0	0	5	81	34	67	0	0	7	2	0	3	5	0	72	2	5
0403705618	Marathon Oil Company	Plugged & Abandoned	Any Field	Hathaway	1	-118.7094498	34.50061417	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705619	Marathon Oil Company	Plugged & Abandoned	Any Field	Hathaway	2	-118.6958542	34.49864197	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705620	Marathon Oil Company	Plugged & Abandoned	Any Field	Hathaway	3	-118.7283554	34.48100281	0.6	0	0	5	81	33	65	0	0	0	2	0	3	5	0	16	2	5
0403705621	Marathon Oil Company	Plugged & Abandoned	Any Field	Mabel S. Henderson	1	-118.6523056	34.44036484	2.1	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705623	Marathon Oil Company	Plugged & Abandoned	Any Field	Romero	1	-118.6659775	34.50603104	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705629	Morris B. Marks	Plugged & Abandoned	Any Field	Gloria	1	-118.119812	34.80944824	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	1	5
0403705632	Mascot Oil Company	Plugged & Abandoned	Any Field	Unspecified	1	-117.9453888	34.04388809	10554.9	0	0	5	81	39	75	0	0	6	3	0	3	5	0	72	6	1
0403705637	MCOR Oil and Gas Corporation	Plugged & Abandoned	Any Field	McCulloch NC	1	-118.6112671	34.40463257	432.9	0	0	5	81	14	22	0	0	0	0	0	3	5	0	0	2	5
0403705638	MCOR Oil and Gas Corporation	Plugged & Abandoned	Any Field	McCulloch-Senegram	1	-118.6693878	34.4609642	1180.2	0	0	5	81	34	67	0	0	1	2	0	3	5	0	24	2	5
0403705640	McFaddin, McDowell & Bering	Plugged & Abandoned	Any Field	Unspecified	1	-118.3718262	33.91681671	10362.8	0	0	5	81	0	0	0	0	6	0	0	3	5	0	48	11	2
0403705644	McKeon Oil Co.	Plugged & Abandoned	Any Field	Western	1	-118.3051224	33.9399147	14468.8	0	0	5	81	48	87	0	0	8	4	0	3	5	0	96	9	2
0403705646	H. H. McVicar	Plugged & Abandoned	Any Field	Rowland Estate	1	-117.9418793	33.98857117	0.0	0	0	5	81	27	54	0	0	0	1	0	3	5	0	8	6	4
0403705651	Bradford Bishop	Plugged & Abandoned	Any Field	Core Hole Signal Union Calvary	1	-118.1761322	34.02376175	8491.0	0	0	5	81	44	81	0	0	5	4	0	3	5	0	72	9	1
0403705653	Midfield Oil Co.	Plugged & Abandoned	Any Field	Midfield-Walker	1	-118.0653839	33.98641586	1791.3	0	0	5	81	46	85	0	0	1	4	0	3	5	0	40	10	4
0403705655	Midway Gas Co.	Plugged & Abandoned	Any Field	Leuzinger	1	-118.3755341	33.92202759	8995.8	0	0	5	81	0	0	0	0	5	0	0	3	5	0	40	11	2
0403705656	Midway Drilling Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.6316681	34.32757187	0.0	0	66	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705660	G. Everett Miller	Plugged & Abandoned	Any Field	Garvey Hills South Unit	1	-118.1074982	34.05151749	9993.5	0	0	5	81	36	69	0	0	5	2	0	3	5	0	56	7	1
0403705673	Mobil Oil Corporation	Plugged & Abandoned	Any Field	Joughlin	1	-118.6272659	34.32427216	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705676	Mobil Oil Corporation	Plugged & Abandoned	Any Field	Lieber	1	-118.0893936	34.05083847	12047.1	0	0	5	81	34	66	0	0	7	2	0	3	5	0	72	7	1
0403705679	Mobil Oil Corporation	Plugged & Abandoned	Any Field	Stone	1	-118.064064	34.03949738	0.0	0	0	5	81	49	88	0	0	0	4	0	3	5	0	32	7	1
0403705684	Mojave Petroleum Co.	Plugged & Abandoned	Any Field	Jennings Lease	1	-118.3606033	34.47697067	47.0	0	0	5	81	12	18	0	0	0	0	0	3	5	0	0	2	5
0403705701	Monarch Oil Corp.	Plugged & Abandoned	Any Field	Sylvia Park	1	-118.5809097	34.11750793	3206.2	0	0	5	81	8	9	0	0	2	0	0	3	5	0	16	4	3
0403705706	Monterey Park Land co.	Plugged & Abandoned	Any Field	Monterey Park	1	-118.0528412	34.02339935	0.0	0	0	5	81	49	88	0	0	0	4	0	3	5	0	32	7	1
0403705707	Morgan and Harris	Plugged & Abandoned	Placerita	Dandy	1	-118.6096802	34.28340149	243.8	0	0	6	98	11	15	0	0	0	0	0	3	6	0	0	3	5
0403705709	Morton and Sons	Plugged & Abandoned	Any Field	Wm. Rowland Estate	2-1	-117.9400559	33.9964447	9018.2	0	0	5	81	27	54	0	0	5	1	0	3	5	0	48	6	4
0403705710	Morton and Sons	Plugged & Abandoned	Any Field	Wm. Rowland Estate	3-1	-117.9412842	33.99023056	0.0	0	0	5	81	27	54	0	0	0	1	0	3	5	0	8	6	4
0403705711	Mutal Dev. Corp.	Plugged & Abandoned	Any Field	Sanborn	1	-118.5912476	34.3719902	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403705712	Mutal Dev. Corp.	Plugged & Abandoned	Any Field	Sanborn	2	-118.5931625	34.37239456	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403705714	Nadot Oil Co.	Plugged & Abandoned	Any Field	Nadot	1	-118.3838501	34.32139206	1.2	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	3	5
0403705723	Nordon Corp. Ltd.	Plugged & Abandoned	Any Field	Nordon-Lipka	1-6	-118.1728363	34.02161789	0.0	0	0	5	81	61	97	0	0	0	4	0	3	5	0	32	9	1
0403705725	North Star Mining & Dev. Co.	Plugged & Abandoned	Any Field	North Star-Lyons	2	-118.5841751	34.54060364	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705733	H. P Oates & Irene L. Oates	Plugged & Abandoned	Any Field	Well No.	1	-118.5370102	34.48286057	902.3	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705736	Occidental Petroleum Corporation	Plugged & Abandoned	Any Field	Mckinley	1	-118.2600632	33.89136505	16359.2	0	0	5	81	61	97	0	0	9	4	0	3	5	0	104	9	2
0403705739	Oceanic Oil Co.	Plugged & Abandoned	Any Field	Demille	1	-118.3696976	34.28488541	0.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	3	5
0403705740	Oceanic Oil Co.	Plugged & Abandoned	Any Field	Oceanic-Dubois	1	-118.3825836	34.28700638	380.5	0	0	5	81	40	76	0	0	0	3	0	3	5	0	24	3	5
0403705744	O'Kane & Brain, Inc.	Plugged & Abandoned	Any Field	O'Kane & Brain & Barnsdall	1	-118.5894699	34.51759338	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705746	Orlando Oil Corp.	Plugged & Abandoned	Any Field	Orlando	1	-117.9412918	34.48190689	22.1	0	0	5	81	16	29	0	0	0	0	0	3	5	0	0	1	5
0403705753	Pasadena Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-117.98172	33.98534012	6112.5	0	0	5	81	19	37	0	0	4	0	0	3	5	0	32	6	4
0403705756	M. R. Peck & Sons	Plugged & Abandoned	Any Field	Drunford	1	-118.6896057	34.58759308	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705757	M. R. Peck & Sons	Plugged & Abandoned	Any Field	Layaye	1	-117.9287491	34.03430939	13783.5	0	0	5	81	46	84	0	0	7	4	0	3	5	0	88	6	1
0403705758	M. R. Peck & Sons	Plugged & Abandoned	Any Field	Layaye	1-A	-117.9307938	34.03429031	13783.5	0	0	5	81	46	84	0	0	7	4	0	3	5	0	88	6	1
0403705759	Pedro Petroleum Corporation	Plugged & Abandoned	Any Field	Oates	1	-118.6115112	34.50840759	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705764	Petrolum Securites Co.	Plugged & Abandoned	Any Field	Diablo	1	-118.7247696	34.49978638	0.6	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705771	Pine Canyon Oil Co.	Plugged & Abandoned	Any Field	Davidson	1	-118.7625351	34.74821854	1.3	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	1	5
0403705772	Carl R. Pohland Assoc.	Plugged & Abandoned	Any Field	Pohl-Green	1	-118.4688034	34.4834671	14.1	0	0	5	81	14	21	0	0	0	0	0	3	5	0	0	2	5
0403705775	Max Pray	Plugged & Abandoned	Any Field	Max Pray-Newhall L. & F.	1	-118.6237793	34.49927139	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705776	Premier Petroleum Corp.	Plugged & Abandoned	Any Field	Carla	1	-118.0488586	34.01486588	36.3	0	0	5	81	41	77	0	0	0	3	0	3	5	0	24	10	4
0403705777	Carl Pressel, Frank Perry & Gilbert Tull	Plugged & Abandoned	Any Field	Thornhill	1	-117.855545	33.97398758	3279.7	0	0	5	81	10	12	0	0	2	0	0	3	5	0	16	6	4
0403705780	H. B. Proctor	Plugged & Abandoned	Any Field	Comer	1	-118.1010666	34.72035217	4.9	0	0	5	81	40	76	0	0	0	3	0	3	5	0	24	1	5
0403705783	Puente Dev. Assoc.	Plugged & Abandoned	Any Field	Wilson	1	-117.8734512	33.97945786	5858.3	0	0	5	81	16	28	0	0	3	0	0	3	5	0	24	6	4
0403705789	Harold C. Ramser	Plugged & Abandoned	Any Field	Charlie	1	-118.6042252	34.48741531	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403705793	Range Oil Corp.& Lee A. Ault	Plugged & Abandoned	Placerita	Dorothy	1	-118.4818802	34.3806076	94.5	0	0	6	98	24	47	0	0	0	0	0	3	6	0	0	2	5
0403705794	Rankin & Williams	Plugged & Abandoned	Any Field	Unspecified	1	-118.2749481	33.92180634	10645.8	0	0	5	81	56	94	0	0	6	4	0	3	5	0	80	9	2
0403705796	Tom Reed Gold Mines Co.	Plugged & Abandoned	Any Field	Rowland	1	-117.9083405	33.98821259	14916.5	0	0	5	81	18	33	0	0	8	0	0	3	5	0	64	6	4
0403705797	Gene Reid Drilling, Inc.	Plugged & Abandoned	Any Field	General American	81-13	-118.609375	34.52466965	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705800	Republic Operator, Inc.	Plugged & Abandoned	Any Field	Fee	1	-118.6110153	34.51272583	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705807	C. M. Rood	Plugged & Abandoned	Any Field	Anita	1	-118.4191666	34.43548965	1225.4	0	0	5	81	21	41	0	0	1	0	0	3	5	0	8	2	5
0403705810	Rothschild Oil Co.	Plugged & Abandoned	Any Field	Ayala	1	-118.6936798	34.49038315	3.2	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705812	Rothschild Oil Co.	Plugged & Abandoned	Any Field	East Santa Fe Springs Communit	1	-118.0279694	33.92868805	573.0	0	0	5	81	40	76	0	0	0	3	0	3	5	0	24	10	4
0403705813	Rothschild Oil Co.	Plugged & Abandoned	Any Field	Ramona Community	1	-118.6815949	34.44445038	518.4	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705814	Rothschild Oil Co.	Plugged & Abandoned	Placerita	Wickham-Ferrier	1	-118.4695969	34.38341141	94.5	0	0	6	98	24	47	0	0	0	0	0	3	6	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403705822	Rucker, Smith, Croul	Plugged & Abandoned	Any Field	Unspecified	1	-117.9138947	33.97277451	6934.1	0	0	5	81	15	24	0	0	4	0	0	3	5	0	32	6	4
0403705823	Russell Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.6203613	34.31423187	1.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705824	Russell Oil Co.	Plugged & Abandoned	Any Field	Well No.	2	-118.6117859	34.32070923	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705825	Ryan and Morrow	Plugged & Abandoned	Any Field	Ryan And Morrow	1	-118.0239639	33.94316864	118.2	0	0	5	81	25	50	0	0	0	1	0	3	5	0	8	10	4
0403705826	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Torrance	Joughin Unit	1-H	-118.2974625	33.80162811	7617.7	0	0	7	96	30	59	0	0	4	1	0	3	7	0	50	11	2
0403705828	S. D. M. Oil Co.	Plugged & Abandoned	Any Field	Orvel	1	-118.4022446	34.45527649	41.3	0	0	5	81	12	18	0	0	0	0	0	3	5	0	0	2	5
0403705829	St. Anthony Oil Corp.	Plugged & Abandoned	Any Field	Smith-Mizner	1	-118.0371857	33.93566513	10612.2	0	0	5	81	58	95	0	0	6	4	0	3	5	0	80	10	4
0403705830	St. Bernard Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.593338	34.34958267	1.3	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403705831	Petro-Tek	Plugged & Abandoned	Any Field	Petro-Tek	1	-118.53022	34.54582596	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705832	Sandburg Petro. Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.2583771	33.89702225	13143.1	0	0	5	81	62	97	0	0	7	4	0	3	5	0	88	9	2
0403705834	San Gabriel Oil Co.	Plugged & Abandoned	Placerita	San Gabriel	1	-118.4768372	34.3868866	94.5	0	0	6	98	21	41	0	0	0	0	0	3	6	0	0	2	5
0403705840	San Roque Oil & Exploration Co.	Plugged & Abandoned	Any Field	Skelton	1	-118.5086517	34.73287582	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705848	James R. Saul	Plugged & Abandoned	Any Field	Germaine	1	-118.2763977	34.50778961	22.5	0	0	5	81	8	7	0	0	0	0	0	3	5	0	0	2	5
0403705849	H. W. Schafer	Plugged & Abandoned	Any Field	Munz	1	-118.3668823	34.7126236	7.2	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705851	Schroeder Oil Syndicate	Plugged & Abandoned	Lyon Canyon (ABD)	Well No.	1	-118.5659103	34.3759346	3058.5	0	0	4	49	20	37	0	0	2	0	0	3	4	0	14	2	5
0403705856	Security Land & Water Co.	Plugged & Abandoned	Any Field	Unspecified	1	-118.0513229	34.0130043	36.3	0	0	5	81	41	77	0	0	0	3	0	3	5	0	24	10	4
0403705861	Porter Sesnon et al	Plugged & Abandoned	Aliso Canyon	Limekiln	3	-118.5467529	34.30389023	0.0	0	62	5	80	11	15	0	0	0	0	0	2	5	0	0	3	5
0403705870	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Unspecified	1	-117.9949875	34.03664017	3929.6	0	0	5	81	39	74	0	0	2	3	0	3	5	0	40	6	1
0403705873	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Baldwin Hills	1	-118.3589478	34.00841522	0.0	0	0	5	81	33	66	0	1	0	2	0	3	5	3	22	5	2
0403705882	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Daugherty	1	-118.6680145	34.44322205	518.4	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403705883	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Dominguez Estate	100	-118.2105255	33.86063766	33.0	0	0	5	81	74	100	0	0	0	5	0	3	5	0	40	10	2
0403705884	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Garnier	1	-117.9288788	34.04276276	11348.8	0	0	5	81	38	73	0	0	6	3	0	3	5	0	72	6	1
0403705885	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Hart	1	-118.0018082	33.99645615	93.4	0	0	5	81	20	38	0	0	0	0	0	3	5	0	0	6	4
0403705887	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Loma Verde	515-29	-118.6843567	34.49562836	34.2	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705890	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Menchego	1-A	-117.8737793	33.9463768	0.0	0	0	5	81	15	26	0	0	0	0	0	3	5	0	0	6	4
0403705895	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Puente C.H.	2	-117.9082031	33.96646118	2449.6	0	0	5	81	13	19	0	0	2	0	0	3	5	0	16	6	4
0403705899	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Shell-Continental	86-20	-118.6784821	34.50111008	34.2	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705900	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Shell Ferguson	2-7	-118.6058197	34.3918457	1394.7	0	0	5	81	14	22	0	0	1	0	0	3	5	0	8	2	5
0403705902	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Ybarra	1	-117.8717194	33.96208191	866.5	0	0	5	81	15	26	0	0	0	0	0	3	5	0	0	6	4
0403705908	Phillips Oil Company	Plugged & Abandoned	Any Field	The Newhall Corporation	1	-118.5970535	34.38404465	889.3	0	0	5	81	8	9	0	0	0	0	0	3	5	0	0	2	5
0403705914	Phillips Oil Company	Plugged & Abandoned	Any Field	Hoco.-Romero Loma Verde	55-21	-118.6673584	34.50339127	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705915	Phillips Oil Company	Plugged & Abandoned	Any Field	Romero Loma Verde	77-21	-118.673851	34.50374222	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403705917	Phillips Oil Company	Plugged & Abandoned	Any Field	Van Couvering	26-26	-118.6392899	34.48697281	1214.3	0	0	5	81	15	25	0	0	1	0	0	3	5	0	8	2	5
0403705919	Silver Leaf Oil Co.	Plugged & Abandoned	Any Field	Realty Title Company	1	-118.1562195	34.55314636	37.4	0	0	5	81	16	27	0	0	0	0	0	3	5	0	0	1	5
0403705922	Walter Siravo	Plugged & Abandoned	Any Field	Ralph Arnold	1	-117.7182083	34.58639145	11.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	1	5
0403705928	Solar Oil Co., Inc.	Plugged & Abandoned	Any Field	Singer	1	-118.4146957	34.78021622	0.0	0	69	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705930	H. C. Sommer	Plugged & Abandoned	Any Field	K	1	-118.7703247	34.65538406	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403705933	Southern California Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1-A	-118.0584946	34.00879288	0.0	0	0	5	81	49	88	0	0	0	4	0	3	5	0	32	10	1
0403705942	W. W. Stabler	Plugged & Abandoned	Any Field	Jenkins	1	-118.6067429	34.51274872	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705943	W. W. Stabler	Plugged & Abandoned	Any Field	New Castaic	1	-118.6029587	34.51001358	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403705948	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Austin	1	-118.6358795	34.10240173	122.1	0	0	5	81	8	9	0	0	0	0	0	3	5	0	0	4	3
0403705952	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Bodger	1	-118.3407898	33.88801956	4757.0	0	0	5	81	42	78	0	0	3	3	0	3	5	0	48	11	2
0403705954	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Bohon	1A	-118.3690262	33.91710663	2898.4	0	0	5	81	42	78	0	0	2	3	0	3	5	0	40	11	2
0403705955	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Brady 2	1	-118.6176758	34.34228134	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705956	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Brady 2	1A	-118.6159287	34.34444809	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705959	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Community	1	-118.022049	33.93002319	9936.0	0	0	5	81	29	58	0	0	5	1	0	3	5	0	48	10	4
0403705960	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Cowan	1	-118.2690353	33.91238403	8202.3	0	0	5	81	57	94	0	0	5	4	0	3	5	0	72	9	2
0403705963	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Culp Community	1	-118.0730057	33.97864151	12557.0	0	0	5	81	51	90	0	0	7	4	0	3	5	0	88	10	4
0403705972	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	A. R. Joughin Community	1	-118.6263123	34.32218933	0.0	0	65	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403705973	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Landowners	1	-118.3689041	33.91562653	0.0	0	0	5	81	42	78	0	0	0	3	0	3	5	0	24	11	2
0403705976	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	L.A. Investment 2	6	-118.3597488	33.9849205	7672.9	0	0	5	81	20	39	0	0	4	0	0	3	5	0	32	5	2
0403705977	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Los Angeles Investment	4-1	-118.3716812	33.98646927	6843.8	0	0	5	81	20	39	0	0	4	0	0	3	5	0	32	5	2
0403705978	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Los Angeles Investment	4-3	-118.3767548	33.98058319	5281.4	0	0	5	81	20	39	0	0	3	0	0	3	5	0	24	5	2
0403705982	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Newhall	1	-118.4916992	34.33480453	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403705988	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Orcutt Trustee 2	1	-118.5514755	34.32952118	1.3	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	3	5
0403705992	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Rowland Estate	1	-117.9347	33.98442841	6638.8	0	0	5	81	23	46	0	0	4	0	0	3	5	0	32	6	4
0403705999	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	1	-118.3475647	34.00065231	6122.5	0	0	9	94	33	64	0	0	4	2	0	3	9	0	72	5	2
0403706002	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Videgain	1	-118.6664276	34.45409012	325.9	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706007	Stanton & Bingham	Plugged & Abandoned	Any Field	Unspecified	1	-117.8856201	33.97651672	9487.7	0	0	5	81	25	50	0	0	5	1	0	3	5	0	48	6	4
0403706010	Wm. J. Stava	Plugged & Abandoned	Any Field	Gorrindo	1	-118.5327072	34.80636215	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403706011	Horace Steele, Oper.	Plugged & Abandoned	Any Field	Kenwood	1	-117.9415817	33.99020004	0.0	0	0	5	81	27	54	0	0	0	1	0	3	5	0	8	6	4
0403706015	Neal Stivers	Plugged & Abandoned	Any Field	Well No.	1	-118.6354599	34.51910782	0.8	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706017	The Sun Drilling Co.	Plugged & Abandoned	Any Field	Ayers	1	-118.5650177	34.36677933	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706018	Sun Oil Company	Plugged & Abandoned	Any Field	Fred H. Bixby Ranch Co.	1	-117.9478149	33.98693085	8905.2	0	0	5	81	27	54	0	0	5	1	0	3	5	0	48	6	4
0403706020	Oryx Energy Company	Plugged & Abandoned	Any Field	Dodge	1	-118.5829544	34.4789505	3.7	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403706023	Oryx Energy Company	Plugged & Abandoned	Any Field	N. L. & F.	A-1	-118.6411667	34.38209152	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706024	Oryx Energy Company	Plugged & Abandoned	Any Field	N. L. & F.	A-2	-118.6589279	34.38196945	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706025	Oryx Energy Company	Plugged & Abandoned	Any Field	Rancho San Francisco	103	-118.6505661	34.38808441	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706026	Oryx Energy Company	Plugged & Abandoned	Any Field	Rancho San Francisco	117	-118.6422958	34.38620758	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706027	Oryx Energy Company	Plugged & Abandoned	Any Field	SMC-McCulloch-Wilson	1	-118.5800705	34.37743759	1759.8	0	0	5	81	8	9	0	0	1	0	0	3	5	0	8	2	5
0403706028	Oryx Energy Company	Plugged & Abandoned	Any Field	Sinray McCulloch NCS	1	-118.609848	34.40660095	432.9	0	0	5	81	14	22	0	0	0	0	0	3	5	0	0	2	5
0403706029	Sun Oil Company	Plugged & Abandoned	Any Field	Merlo	1	-118.0048904	34.03638458	9420.5	0	0	5	81	43	80	0	0	5	4	0	3	5	0	72	6	1
0403706039	The Superior Oil Co.	Plugged & Abandoned	Any Field	Anderson A	1	-118.1720276	34.03145218	19796.9	0	0	5	81	54	93	0	0	10	4	0	3	5	0	112	9	1
0403706040	The Superior Oil Co.	Plugged & Abandoned	Any Field	Andres	1	-117.9888153	34.0085144	2917.1	0	0	5	81	36	70	0	0	2	3	0	3	5	0	40	6	4
0403706045	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Any Field	N. L. & F.	3	-118.5701981	34.45144653	1224.5	0	0	5	81	9	12	0	0	1	0	0	3	5	0	8	2	5
0403706049	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Any Field	Romero	51-28	-118.6682129	34.49563599	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403706055	T. P. & G. Oil Co.	Plugged & Abandoned	Any Field	Mary Austin	1	-118.6887817	34.58781052	7.5	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706056	John Q. Tannehill	Plugged & Abandoned	Any Field	Community	1	-118.6761627	34.79122925	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403706057	Charles R. Tatum & Sons	Plugged & Abandoned	Any Field	Benz	6	-118.4768219	34.4510498	0.0	0	0	5	81	3	1	0	0	0	0	0	3	5	0	0	2	5
0403706059	Tejon Ranch Oil	Plugged & Abandoned	Any Field	Well No.	1	-118.7568512	34.78180313	0.0	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403706060	Temple & Lafever	Plugged & Abandoned	Any Field	Well No.	1	-118.625145	34.4980011	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403706063	Terminal Drilling Company	Plugged & Abandoned	Any Field	Lloyd	1	-118.4001541	34.29410553	619.1	0	0	5	81	38	73	0	0	0	3	0	3	5	0	24	3	5
0403706068	Chevron U.S.A. Inc.	Plugged & Abandoned	Howard Townsite	Century Park Unit One	1	-118.3096466	33.92938232	2081.3	0	0	5	71	54	93	0	0	2	4	0	3	5	0	48	9	2
0403706071	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Covina	27-1	-117.867981	34.1034317	5818.3	0	0	5	81	28	57	0	0	3	1	0	3	5	0	32	6	5
0403706072	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Daries	1	-118.6283264	34.54954529	0.0	0	68	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706073	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Denault	1	-118.5708008	34.47943878	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706074	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Dominguez	57-1	-118.7167435	34.45574951	8.6	0	76	5	81	33	65	0	0	0	2	0	4	5	0	18	2	5
0403706077	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Eadie	1	-118.5248795	34.33168411	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403706078	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Eadie	2	-118.5211411	34.3356781	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403706082	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Fernando	1	-118.6400452	34.45042419	2.1	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706083	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Fischer	1	-118.6479492	34.47444534	1214.3	0	0	5	81	15	25	0	0	1	0	0	3	5	0	8	2	5
0403706087	Chevron U.S.A. Inc.	Plugged & Abandoned	Tapia	Honor Rancho 'B' (NCT-2)	1	-118.6091919	34.48250198	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403706091	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Malis	1	-118.6495285	34.44316101	2.1	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706097	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-2	-118.5570374	34.45973587	2303.1	0	0	5	81	9	12	0	0	2	0	0	3	5	0	16	2	5
0403706100	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-5	-118.5646362	34.46129227	4255.0	0	0	5	81	9	12	0	0	3	0	0	3	5	0	24	2	5
0403706101	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-6	-118.5595703	34.45107651	1899.8	0	0	5	81	9	11	0	0	1	0	0	3	5	0	8	2	5
0403706102	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-7	-118.5604782	34.45274353	1899.8	0	0	5	81	9	11	0	0	1	0	0	3	5	0	8	2	5
0403706103	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-8	-118.57267	34.4549942	0.0	0	55	5	81	9	12	0	0	0	0	0	2	5	0	0	2	5
0403706107	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Newhall	B-1	-118.6315613	34.4442215	0.0	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706108	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Newhall	D-1	-118.6312256	34.4440918	0.0	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706109	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Any Field	Newhall	D-2	-118.6208954	34.44405365	0.0	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706111	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Newhall	F-1	-118.603096	34.44061279	0.0	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706117	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Seaboard-So. Cal. Pet. Daugherty	1	-118.6624451	34.43894958	13.8	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706120	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Stanley	1	-118.6477814	34.48052979	1214.3	0	0	5	81	15	25	0	0	1	0	0	3	5	0	8	2	5
0403706121	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Clara Stanley	1	-118.6615524	34.47393799	672.1	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403706126	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Towle	1	-118.6513214	34.45884323	56.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706127	Chevron U.S.A. Inc.	Plugged & Abandoned	Tapia	Yule	1	-118.6069565	34.483078	0.0	0	65	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403706128	Tick Canon Oil Syndicate	Plugged & Abandoned	Any Field	Well No.	1	-118.4317932	34.46801758	0.0	0	0	5	81	3	1	0	0	0	0	0	3	5	0	0	2	5
0403706134	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Durfee	1	-118.0573807	34.03499985	0.0	0	0	5	81	49	88	0	0	0	4	0	3	5	0	32	7	1
0403706135	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Huntington	1	-118.1887131	34.04787445	31457.6	0	0	5	81	50	89	0	0	10	4	0	3	5	0	112	9	1
0403706136	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Huntington	2	-118.190918	34.05531311	0.0	0	0	5	81	71	99	0	0	0	4	0	3	5	0	32	9	1
0403706138	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Joughlin	1	-118.6190262	34.31817627	9.7	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403706140	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Leuzinger	1	-118.3750763	33.91915131	1206.7	0	0	5	81	0	0	0	0	1	0	0	3	5	0	8	11	2
0403706148	Tonner Oil Co.	Plugged & Abandoned	Any Field	Unspecified	1	-117.8121796	33.96770859	0.0	0	0	5	81	16	27	0	0	0	0	0	3	5	0	0	6	4
0403706149	Top Notch Syndicate	Plugged & Abandoned	Any Field	Unspecified	1	-118.0471191	33.92399216	12772.1	0	0	5	81	58	96	0	0	7	4	0	3	5	0	88	10	4
0403706150	Transamerica Development Company	Plugged & Abandoned	Any Field	Unspecified	3-1	-117.9917908	34.01158142	6120.0	0	0	5	81	36	70	0	0	4	3	0	3	5	0	56	6	4
0403706152	General American Oil Co. of Texas	Plugged & Abandoned	Any Field	Smith	3-1	-117.9663925	34.05358124	16180.8	0	0	5	81	34	66	0	0	9	2	0	3	5	0	88	6	1
0403706153	Transamerica Development Company	Plugged & Abandoned	Any Field	Unspecified	3-2	-117.9881897	34.00882339	2917.1	0	0	5	81	36	70	0	0	2	3	0	3	5	0	40	6	4
0403706160	Troy Petro. Co.	Plugged & Abandoned	Any Field	Troy	1	-117.9174805	33.97331238	5942.0	0	0	5	81	15	24	0	0	3	0	0	3	5	0	24	6	4
0403706163	Turner & Tricke Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.4576187	34.37908936	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706165	Union Oil Company of California	Plugged & Abandoned	Any Field	Alexander	1	-118.6463165	34.5063858	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403706166	Union Oil Company of California	Plugged & Abandoned	Any Field	Anderson	1	-118.3009491	33.93126678	12205.8	0	0	5	81	44	81	0	0	7	4	0	3	5	0	88	9	2
0403706175	Union Oil Company of California	Plugged & Abandoned	Any Field	Horowitz	1	-118.2690277	33.91318893	9309.7	0	0	5	81	57	94	0	0	5	4	0	3	5	0	72	9	2
0403706178	Union Oil Company of California	Plugged & Abandoned	Any Field	Kellogg	1	-118.2644806	33.88959122	3282.1	0	0	5	81	68	99	0	0	2	4	0	3	5	0	48	9	2
0403706182	Union Oil Company of California	Plugged & Abandoned	Any Field	Meyer	5	-118.041275	33.93264008	15027.8	0	0	5	81	58	95	0	0	8	4	0	3	5	0	96	10	4
0403706185	Union Oil Company of California	Plugged & Abandoned	Any Field	Odeen	1	-118.6101532	34.36107254	1.3	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403706186	Union Oil Company of California	Plugged & Abandoned	Any Field	Orchardale Community	1	-118.0170441	33.93119812	9716.5	0	0	5	81	29	58	0	0	5	1	0	3	5	0	48	10	4
0403706187	Union Oil Company of California	Plugged & Abandoned	Any Field	Puente Farms	1	-118.0259094	33.99441147	0.0	0	0	5	81	20	38	0	0	0	0	0	3	5	0	0	10	4
0403706188	The Termo Company	Plugged & Abandoned	Any Field	Simi	12	-118.637619	34.32497787	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403706189	The Termo Company	Plugged & Abandoned	Any Field	Simi	13	-118.6369476	34.32508469	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403706190	Union Oil Company of California	Plugged & Abandoned	Any Field	Simi	23	-118.6636505	34.3538475	0.0	0	0	5	81	13	20	0	0	0	0	0	3	5	0	0	2	5
0403706191	Union Oil Company of California	Plugged & Abandoned	Any Field	Somers	1	-118.3412323	33.87922668	3.0	0	0	5	81	42	79	0	0	0	3	0	3	5	0	24	11	2
0403706192	Union Oil Company of California	Plugged & Abandoned	Any Field	Stern	1	-117.9825134	33.92043304	8203.3	0	0	5	81	21	41	0	0	5	0	0	3	5	0	40	10	4
0403706193	Union Oil Company of California	Plugged & Abandoned	Any Field	Union-Ferguson	1	-118.5919418	34.37984085	889.3	0	68	5	81	8	9	0	0	0	0	0	3	5	0	0	2	5
0403706205	U. S. Natural Gas Corp. & Fred Manning	Plugged & Abandoned	Any Field	Strawn	1	-118.649147	34.45261765	56.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706211	Leslie D. Vaughn & Assoc.	Plugged & Abandoned	Any Field	Bullock	1	-118.8914414	34.8162384	6.5	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	1	5
0403706216	Von Glahn Oil Co., Inc.	Plugged & Abandoned	Any Field	Alma	1	-118.3692856	34.52636337	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706217	Von Glahn Oil Co., Inc.	Plugged & Abandoned	Any Field	Ralphsanch	1	-118.8308563	34.78071976	5.1	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403706218	Von Glahn Oil Co., Inc.	Plugged & Abandoned	Any Field	Ralphsanch	2	-118.8293381	34.77973557	5.1	0	0	5	81	17	30	0	0	0	0	0	3	5	0	0	1	5
0403706219	Von Glahn Oil Co., Inc.	Plugged & Abandoned	Any Field	Sandy R	1	-118.3691406	34.52709579	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706221	Paul O. Waggoner	Plugged & Abandoned	Any Field	Queen	1	-118.603981	34.49307632	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706225	Webb Oil Co.	Plugged & Abandoned	Any Field	Lawrence	1	-117.9745712	33.98589706	5003.2	0	0	5	81	19	37	0	0	3	0	0	3	5	0	24	6	4
0403706227	Carl S. Weller	Plugged & Abandoned	Any Field	White Oil Co.	1-13	-118.4514237	34.37561798	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403706228	Raymond D. Weller	Plugged & Abandoned	Any Field	Unspecified	1	-118.1562271	34.55411911	37.4	0	0	5	81	16	27	0	0	0	0	0	3	5	0	0	1	5
0403706231	West American Oil Co.	Plugged & Abandoned	Any Field	Del-Amo	1	-118.224678	33.84877396	0.0	0	0	5	81	74	100	0	0	0	5	0	3	5	0	40	10	2
0403706242	Freeman & Nelson White Oil Co.	Plugged & Abandoned	Any Field	Walker	3	-118.4484177	34.37317657	14.7	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403706243	James F. Whitehorn	Plugged & Abandoned	Any Field	Whitehorn-Card	1	-117.7704544	34.71324921	0.0	0	0	5	81	36	70	0	0	0	3	0	3	5	0	24	1	5
0403706248	E. T. Willard	Plugged & Abandoned	Any Field	Lawrence Estate	1	-117.9536972	33.97393036	3750.3	0	0	5	81	20	38	0	0	2	0	0	3	5	0	16	6	4
0403706249	Forestar Chatsworth, LLC	Plugged & Abandoned	Any Field	Sweet	1	-118.5962448	34.28314209	10.4	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403706250	J. E. Willette	Plugged & Abandoned	Any Field	Chief Paduke	1	-117.9920578	34.50136185	8.3	0	0	5	81	16	29	0	0	0	0	0	3	5	0	0	1	5
0403706252	Willette Oil Co., Inc.	Plugged & Abandoned	Any Field	Virginia Lee	1	-117.8480148	34.50497437	5.8	0	0	5	81	22	43	0	0	0	0	0	3	5	0	0	1	5
0403706253	Harold E. Willhoit & John D. Willhoit	Plugged & Abandoned	Any Field	Willhoit	1	-118.4506302	34.37249374	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403706254	Thomas F. Williams, Oper.	Plugged & Abandoned	Placerita	Williams	1	-118.4767761	34.38678741	94.5	0	0	6	98	21	41	0	0	0	0	0	3	6	0	0	2	5
0403706257	L. R. Wilhite & Claude Kavanaugh	Plugged & Abandoned	Any Field	Wilhite 1 Jenkins	Unspecified	-118.6038284	34.51200485	0.0	0	71	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706259	E. T. Wix	Plugged & Abandoned	Any Field	Benz	1	-118.4808121	34.44740677	6948.6	0	70	5	81	3	1	0	0	4	0	0	3	5	0	32	2	5
0403706262	Woodmar Partnership	Plugged & Abandoned	Any Field	Union Fee	1	-117.9956055	33.99140549	1618.2	0	0	5	81	19	37	0	0	1	0	0	3	5	0	8	6	4
0403706263	Worland Oil Co.	Plugged & Abandoned	Any Field	Jenkins-Owens	1	-118.6023407	34.5131073	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706264	World Continental Enterprises	Plugged & Abandoned	Any Field	Boldt	1	-118.4174728	34.46905518	33.9	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706267	Youngs Bros.	Plugged & Abandoned	Any Field	Rentchler	1	-118.5387421	34.4787178	902.3	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403706268	Young Napoleon Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.5738678	34.37030029	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403706270	Wm. I. Zidell	Plugged & Abandoned	Any Field	W.I.Z.	1	-118.2847824	34.52923584	154.9	0	0	5	81	8	7	0	0	0	0	0	3	5	0	0	2	5
0403706271	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Honor Rancho 'A' (NCT-2)	40	-118.59478	34.47164154	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706272	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Honor Rancho 'A' (NCT-2)	42	-118.5878677	34.46257782	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706273	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-1	-118.5725861	34.4667778	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706274	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	N. L. & F.	G-9	-118.5723724	34.46456528	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706285	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	3	-118.603302	34.45933533	0.0	0	68	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706286	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	1	-118.6063919	34.45933151	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706287	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	4	-118.6025848	34.45669556	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706292	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Anderson	1	-118.2677002	33.8989563	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403706298	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Corporation	3	-118.6075363	34.41140366	0.0	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706299	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	71	-118.6028976	34.42869568	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706300	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	29	-118.6018524	34.42021942	391.9	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706315	Shell Western E&P Inc.	Plugged & Abandoned	Any Field	Puente C.H.	1	-117.8414078	33.94774246	0.0	0	0	5	81	17	29	0	0	0	0	0	3	5	0	0	6	4
0403706326	W. J. Frick	Plugged & Abandoned	Any Field	W. J. Frick Core Hole	1	-117.8708649	33.98007584	2701.8	0	0	5	81	16	28	0	0	2	0	0	3	5	0	16	6	4
0403706342	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	View Park Corehole	1	-118.3481903	33.98947906	10509.5	0	0	5	81	33	64	0	0	6	2	0	3	5	0	64	5	2
0403706353	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	36	-118.5952148	34.41672516	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706354	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	44	-118.5925827	34.41371155	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706355	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	47	-118.5970917	34.40967941	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706358	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	53	-118.6232758	34.41306686	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706359	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Corporation	1	-118.6108093	34.41391754	0.0	0	68	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706364	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	32	-118.6282196	34.37096024	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403706397	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	39	-118.5792465	34.46954727	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403706403	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	2	-118.6092911	34.45917892	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706404	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	7	-118.6079407	34.46062088	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403706405	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	136	-118.6514435	34.40504074	432.9	0	64	6	81	14	22	0	0	0	0	0	2	6	0	0	2	5
0403706408	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	224	-118.3655167	34.00215149	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403706409	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	39	-118.615181	34.42288589	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403706420	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Pellissier	1	-117.9984283	34.00902939	6818.1	0	0	2	74	36	70	0	0	4	3	0	3	2	0	35	6	4
0403706421	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Pellissier	2	-117.9980164	34.0100708	5856.8	0	0	2	74	36	70	0	0	3	3	0	3	2	0	30	6	4
0403706422	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Pellissier	3	-117.998909	34.01104736	0.0	0	0	2	74	36	70	1	0	0	3	0	3	2	3	24	6	4
0403706423	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Pellissier	4	-117.9974365	34.01176071	2921.3	0	0	2	74	36	70	0	0	2	3	0	3	2	0	25	6	4
0403706424	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Pellissier	5	-117.9976959	34.01039886	5622.7	0	0	2	74	36	70	0	0	3	3	0	3	2	0	30	6	4
0403706486	Power Run Oil, LLC	Plugged & Abandoned	Howard Townsite	Moser	1	-118.3008118	33.92434311	224.8	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403706489	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	113	-118.2342453	33.86283875	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706493	Olson & Gregg, Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Kline	2	-117.9972382	34.01079178	5622.7	0	0	2	74	36	70	0	0	3	3	0	3	2	0	30	6	4

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403706494	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 1	17	-118.3794403	34.00542068	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403706497	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	61	-118.3764954	34.00170898	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403706526	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	20	-118.2344055	33.85926056	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706531	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	25	-118.2351456	33.86538315	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706536	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	30	-118.2335129	33.86371994	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706539	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	33	-118.2336502	33.86207581	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706540	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	33-A	-118.2331467	33.86207581	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706541	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	34	-118.2334366	33.86554337	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706547	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	42	-118.23172	33.86244202	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706549	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	44	-118.2353287	33.86724854	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706550	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	45	-118.23172	33.86383438	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706558	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	58	-118.2347641	33.86241531	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706559	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	59	-118.2339478	33.8662796	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706560	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	60	-118.2346954	33.8649292	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706562	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	62	-118.2346726	33.86372375	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706564	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	64	-118.2332535	33.86352158	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706568	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	68	-118.2332459	33.86395645	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706569	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	69	-118.2330627	33.86555099	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706570	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	70	-118.2351456	33.86509705	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706578	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	81	-118.2325821	33.86494827	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706582	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	85	-118.2341156	33.86237335	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706600	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	103	-118.2327118	33.86318207	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706601	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	3	-118.2261505	33.86106873	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706602	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	4	-118.2258606	33.86231232	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706603	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	5	-118.2256851	33.86367416	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706604	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	6	-118.2231751	33.85943222	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706605	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	7	-118.2262421	33.86088181	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706614	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	9	-118.2344742	33.86721039	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706617	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	12	-118.2317886	33.86215973	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706622	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	16	-118.2315064	33.8637886	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706623	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	17	-118.2322769	33.85938644	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706624	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	18	-118.2321701	33.86086273	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706626	Amax Petro. Corp.	Plugged & Abandoned	Del Valle	Barbour	1	-118.6668854	34.43331146	1.4	0	69	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706627	Amax Petro. Corp.	Plugged & Abandoned	Del Valle	Barbour	2	-118.6642227	34.43293762	13.8	0	69	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706628	Amax Petro. Corp.	Plugged & Abandoned	Del Valle	Barbour	3	-118.6624908	34.43253326	13.8	0	88	5	78	34	67	0	0	0	2	0	5	5	0	20	2	5
0403706629	Amax Petro. Corp.	Plugged & Abandoned	Del Valle	Kinler	1	-118.6678162	34.43399811	1.4	0	69	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706630	Amax Petro. Corp.	Plugged & Abandoned	Del Valle	Kinler	2	-118.6686096	34.43228149	13.8	0	69	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706631	The British American Oil Producing Company	Plugged & Abandoned	Del Valle	Kinler-So. Cal	1	-118.668251	34.43757248	13.8	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706632	Conoco Inc.	Plugged & Abandoned	Del Valle	Newhall	1	-118.6791687	34.42156219	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706633	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Encinas Fee	1	-118.6774368	34.42325592	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706634	Havenstrite Oil Co.	Plugged & Abandoned	Del Valle	Vasquez	1	-118.6598587	34.42329788	1.4	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706638	Exxon Mobil Corporation	Plugged & Abandoned	Del Valle	Castaic Junction Gas Unit No. 1	1	-118.6514969	34.42498398	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706639	Keck Investment Co.	Plugged & Abandoned	Del Valle	Pena	1	-118.7001343	34.42509079	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403706641	Marathon Oil Company	Plugged & Abandoned	Del Valle	Vasquez	2	-118.6928406	34.42693329	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706643	LBTH Inc.	Plugged & Abandoned	Del Valle	Vasquez	4	-118.6796417	34.42876816	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706644	LBTH Inc.	Plugged & Abandoned	Del Valle	Vasquez	5	-118.677475	34.4268837	0.0	0	77	5	78	34	67	0	0	0	2	0	4	5	0	18	2	5
0403706647	LBTH Inc.	Plugged & Abandoned	Del Valle	Vasquez	8	-118.6774216	34.42869949	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706653	LBTH Inc.	Plugged & Abandoned	Del Valle	Vasquez	14	-118.6775971	34.4252739	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706657	LBTH Inc.	Plugged & Abandoned	Del Valle	Vasquez	18	-118.6867218	34.42565155	3.6	1	0	5	78	34	67	0	0	0	2	3	3	5	0	22	2	5
0403706660	Mobil Oil Corporation	Plugged & Abandoned	Del Valle	N. L. & F.	1	-118.6806717	34.41708374	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706661	Mobil Oil Corporation	Plugged & Abandoned	Del Valle	N. L. & F.	3	-118.6832886	34.41242599	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706662	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Del Valle	Socal	1	-118.6744766	34.42052078	3.6	0	68	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706663	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Del Valle	Socal	2	-118.6723099	34.42066193	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706664	Rothschild Oil Co.	Plugged & Abandoned	Del Valle	Barbour	1	-118.662262	34.43540955	13.8	0	67	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706665	Scope Industries Inc.	Plugged & Abandoned	Del Valle	Handy	1	-118.6950989	34.42682266	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706666	Scope Industries Inc.	Plugged & Abandoned	Del Valle	Kinler	16-1	-118.6708145	34.43421555	13.8	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706667	Scope Industries Inc.	Plugged & Abandoned	Del Valle	N. L. & F.	2	-118.6873779	34.41596222	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706668	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Blair	5	-118.6577911	34.43035126	2.1	0	66	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706669	LBTH Inc.	Plugged & Abandoned	Del Valle	Blair	7	-118.6578751	34.42718124	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706670	LBTH Inc.	Plugged & Abandoned	Del Valle	Blair	27	-118.6552734	34.42660522	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706671	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Boobier	1	-118.6580505	34.43776321	2.1	0	72	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706672	Nahama & Weagant Energy Company	Plugged & Abandoned	Del Valle	N. L. & F.	1	-118.6856461	34.41445923	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706673	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Newhall Land & Farming 3	1	-118.6903839	34.42047501	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706674	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Newhall Land & Farming 3	2	-118.6981506	34.4203186	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403706675	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Newhall Land & Farming 3	3	-118.6936951	34.42046356	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403706676	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Newhall Land & Farming 10	1	-118.6905594	34.4140358	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706678	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Sepulveda	2	-118.6884308	34.43032074	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706681	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Sepulveda	5	-118.6773911	34.43038559	13.8	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706686	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Sepulveda	10	-118.6858292	34.43027878	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706692	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Vasquez	4	-118.6724777	34.42318344	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706695	Chevron U.S.A. Inc.	Plugged & Abandoned	Del Valle	Newhall	1	-118.6460266	34.42505264	0.0	0	94	5	78	34	67	1	0	0	2	0	5	5	3	26	2	5
0403706696	Freeport-McMoRan Oil & Gas LLC	Plugged & Abandoned	Del Valle	Barnes	1	-118.6690369	34.42860031	1.4	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706697	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	2	-118.6686554	34.42644882	1.4	0	77	5	78	34	67	0	0	0	2	0	4	5	0	18	2	5
0403706701	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	6	-118.6754379	34.42526245	3.6	0	74	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706703	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	8	-118.6697693	34.42495728	1.4	0	73	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706705	Freeport-McMoRan Oil & Gas LLC	Plugged & Abandoned	Del Valle	Barnes	10	-118.6750031	34.42842484	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706706	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	11	-118.6747513	34.42790604	0.0	0	69	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706707	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	12	-118.6741486	34.42445755	3.6	0	68	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706712	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	17	-118.6710281	34.42816925	1.4	0	68	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706714	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Barnes	19	-118.6741562	34.42763138	0.0	0	68	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706717	Union Oil Co. of Calif., Opr.	Plugged & Abandoned	Del Valle	Liebhart	1	-118.6574783	34.42882156	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706718	Union Oil Co. of Calif., Opr.	Plugged & Abandoned	Del Valle	Liebhart	2	-118.6553116	34.42829132	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706720	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	2	-118.6620789	34.42676163	0.0	0	79	5	78	34	67	0	0	0	2	0	4	5	0	18	2	5
0403706721	Freeport-McMoRan Oil & Gas LLC	Plugged & Abandoned	Del Valle	Lincoln	3	-118.6595078	34.42469788	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706724	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	6	-118.666359	34.42844772	1.4	0	78	5	78	34	67	0	0	0	2	0	4	5	0	18	2	5
0403706726	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	8	-118.6664505	34.42643356	1.4	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706727	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	9	-118.6661911	34.42455673	1.4	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706729	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	11	-118.662178	34.42632294	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706732	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	14	-118.6659393	34.42657089	0.0	0	74	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706735	California Resources Production Corporation	Plugged & Abandoned	Del Valle	Lincoln	17	-118.662262	34.42867279	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706740	Freeport-McMoRan Oil & Gas LLC	Plugged & Abandoned	Del Valle	Newhall Land & Farming	1	-118.6841278	34.41270447	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403706743	Atlantic Richfield Company	Plugged & Abandoned	Dominguez	Dominguez Extension	1	-118.2092743	33.85464478	15.2	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706748	Conoco Inc.	Plugged & Abandoned	Dominguez	Dominguez	1	-118.2312775	33.8574295	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706749	Conoco Inc.	Plugged & Abandoned	Dominguez	Dominguez	4	-118.233078	33.85730362	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706750	Conoco Inc.	Plugged & Abandoned	Dominguez	Dominguez	5	-118.227272	33.85635757	12256.3	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403706751	Conoco Inc.	Plugged & Abandoned	Dominguez	Dominguez	6	-118.2289887	33.85630798	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706752	Conoco Inc.	Plugged & Abandoned	Dominguez	Dominguez	7	-118.2280808	33.85749054	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706756	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	1	-118.212265	33.85559464	15.2	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706757	Dominguez Oil Co.	Plugged & Abandoned	Dominguez	Del Amo	1	-118.2261734	33.86482239	7686.3	0	0	8	95	74	100	0	0	4	5	0	3	8	0	99	10	2
0403706762	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Dominguez Estate	1	-118.2255783	33.86344528	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706767	Herley Supply Co.	Plugged & Abandoned	Dominguez	Quinn	1	-118.2293091	33.85790253	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706778	Morton & Elder	Plugged & Abandoned	Dominguez	Dominguez	1	-118.2291412	33.85747147	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706781	Oak Ridge Oil Co.	Plugged & Abandoned	Dominguez	Dominguez	1	-118.2155228	33.85464096	26.6	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706801	Selbar Oil Co.	Plugged & Abandoned	Dominguez	Dominguez	3	-118.2239075	33.85644531	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706802	Selbar Oil Co.	Plugged & Abandoned	Dominguez	Dominguez	4	-118.2256317	33.85633087	12256.3	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403706803	Selbar Oil Co.	Plugged & Abandoned	Dominguez	Selbar	1	-118.2238693	33.85787582	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706804	Selbar Oil Co.	Plugged & Abandoned	Dominguez	Selbar	2	-118.2226791	33.8578186	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706805	Selbar Oil Co.	Plugged & Abandoned	Dominguez	Selbar	3	-118.2254868	33.85778809	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403706806	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	2	-118.2301102	33.86074066	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706807	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	4	-118.2283859	33.8593483	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706808	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	6	-118.2278214	33.86252975	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706809	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	11	-118.2300949	33.86252594	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706810	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	12	-118.2299881	33.86115646	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706811	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	14	-118.229126	33.86175919	0.0	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706812	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	15	-118.2288742	33.86222458	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706813	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	De Francis	16	-118.2273865	33.86286163	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706814	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Dominguez Estate	2-1	-118.2163467	33.85687256	26.6	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706815	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	3	-118.2323532	33.85678482	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706816	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	4	-118.231987	33.85723495	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706817	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	5	-118.2332611	33.8541832	0.0	0	0	8	95	37	72	0	0	0	3	0	3	8	0	33	10	2
0403706818	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	7	-118.232933	33.85417557	0.0	0	0	8	95	37	72	0	0	0	3	0	3	8	0	33	10	2
0403706820	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	9	-118.2321091	33.85420609	0.0	0	0	8	95	37	72	0	0	0	3	0	3	8	0	33	10	2
0403706821	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Dominguez Estate	10	-118.2325211	33.85416412	0.0	0	0	8	95	37	72	0	0	0	3	0	3	8	0	33	10	2
0403706824	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	1	-118.2245178	33.85919189	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706825	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Manuel	2	-118.2264175	33.85932922	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706857	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	111	-118.2350464	33.86389542	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706859	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	114	-118.2341538	33.86465454	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706876	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	133	-118.2350235	33.86457825	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706878	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	135	-118.2341309	33.86598587	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706882	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	141	-118.2324905	33.86410141	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403706885	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	144	-118.2350693	33.86360931	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706889	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	151	-118.2350006	33.86408234	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706896	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	159	-118.2346115	33.86522293	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706906	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	172	-118.2315369	33.86341095	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706907	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	173	-118.2324143	33.86302567	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706912	Shell Western E&P Inc.	Plugged & Abandoned	Dominguez	Reyes-De-Francis	1	-118.2312546	33.8611908	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706918	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Unspecified	1	-118.2262726	33.85529709	13333.0	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403706920	Sunrise Petroleum Co.	Plugged & Abandoned	Dominguez	Unspecified	1	-118.2343292	33.85792923	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706923	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Del Amo 'A' (NCT-1)	1	-118.2137909	33.84724426	26.6	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706924	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Del Amo 'A' (NCT-1)	2	-118.2136917	33.84899139	26.6	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706925	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Del Amo 'A' (NCT-1)	3	-118.2134094	33.85087204	26.6	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706926	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Del Amo 'B' (NCT-1)	1	-118.2113037	33.85219955	15.2	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706927	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	Dominguez Estate (NCT-1)	1	-118.2200241	33.85958481	102.9	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706929	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	De Francis	1	-118.2298508	33.86252594	0.0	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706930	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	De Francis	1-A	-118.2299118	33.86227417	0.0	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403706931	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	De Francis	1-B	-118.2299576	33.86213684	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403706932	Chevron U.S.A. Inc.	Plugged & Abandoned	Dominguez	De Francis	5	-118.2304688	33.85903549	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403707259	Federal Oil Co. of Cal	Plugged & Abandoned	Hasley Canyon	Federal-Towle	1	-118.6532593	34.45431519	56.6	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403707260	G. R. Nance Co., Inc.	Plugged & Abandoned	Hasley Canyon	Towle	17	-118.657402	34.45554352	325.9	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403707261	Porsco Operating Co.	Plugged & Abandoned	Hasley Canyon	Claiborne	88-4	-118.6602478	34.45428848	325.9	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403707262	British-American Oil Producing Co.	Plugged & Abandoned	Honor Rancho	Wayside Honor Farm	1	-118.6140518	34.45425034	0.0	0	0	5	68	14	23	0	0	0	0	0	3	5	0	0	2	5
0403707263	Exxon Mobil Corporation	Plugged & Abandoned	Honor Rancho	Newhall Land & Farming	C-1	-118.6161041	34.45981216	2359.1	0	0	5	68	14	23	0	0	2	0	0	3	5	0	16	2	5
0403707264	Oryx Energy Company	Plugged & Abandoned	Honor Rancho	Honor Rancho	A 17-1	-118.5886002	34.45430756	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707265	Oryx Energy Company	Plugged & Abandoned	Honor Rancho	Honor Rancho	A19-1	-118.5922623	34.45169449	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707266	Mobil Oil Corporation	Plugged & Abandoned	Honor Rancho	N. L. & F.	8	-118.5746384	34.44860458	0.0	0	0	5	68	9	12	0	0	0	0	0	3	5	0	0	2	5
0403707268	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	5	-118.6064072	34.46189117	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707270	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	9	-118.6058426	34.46440887	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707272	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	11	-118.6060791	34.46703339	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707273	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	14	-118.6093521	34.46735001	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707274	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	15	-118.6043701	34.4603653	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707275	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	16	-118.6019058	34.4607811	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707277	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	18	-118.6036987	34.46344376	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707278	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	19	-118.5998001	34.45698929	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707279	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	20	-118.5965576	34.4540596	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707280	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	21	-118.6094818	34.45684433	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707281	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	27	-118.6112366	34.45318604	0.0	0	0	5	68	14	23	0	0	0	0	0	3	5	0	0	2	5
0403707282	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-1)	29	-118.6090164	34.45411301	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707283	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	1	-118.6002197	34.46190262	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707284	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	2	-118.5939941	34.45935822	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707286	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	4	-118.6045456	34.46806335	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707288	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	6	-118.5933838	34.45928192	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707289	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	7	-118.5906601	34.45680618	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707290	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	8	-118.5904236	34.45927048	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707292	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	10	-118.6002197	34.46449661	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707293	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	11	-118.6011581	34.47334671	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707294	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	15X	-118.5825958	34.44823074	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707296	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	21	-118.6054306	34.47370911	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707297	California Resources Production Corporation	Plugged & Abandoned	Honor Rancho	Honor Rancho 'A' (NCT-2)	35	-118.6034775	34.4702301	0.0	0	0	5	68	0	0	0	0	0	0	0	3	5	0	0	2	5
0403707301	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Del Amo	1	-118.223114	33.85269165	2235.2	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403707302	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Dominguez Estate	1	-118.2231903	33.85449219	2235.2	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403707303	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Dominguez Estate	2	-118.2210083	33.85454941	2235.2	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403707304	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Dominguez Estate	3	-118.2254334	33.85625839	12256.3	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403707305	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Dominguez Estate	5	-118.2265701	33.85567856	11207.5	0	0	8	95	74	100	0	0	6	5	0	3	8	0	121	10	2
0403707306	Brea Canon Oil Co.	Plugged & Abandoned	Dominguez	Dominguez Estate	6	-118.228035	33.85627747	12256.3	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403707374	Chevron U.S.A. Inc.	Plugged & Abandoned	Howard Townsite	Bilhorn	1	-118.3098297	33.93619156	11467.8	0	0	5	71	45	83	0	0	6	4	0	3	5	0	80	9	2
0403707375	J. Paul Getty	Plugged & Abandoned	Howard Townsite	Westmore	1	-118.312355	33.93493271	10657.3	0	0	5	71	45	83	0	0	6	4	0	3	5	0	80	9	2
0403707384	Silver Petro. Co.	Plugged & Abandoned	Inglewood	Baldwin Hills	1	-118.3575592	33.99147034	7655.9	0	0	9	94	33	64	0	0	4	2	0	3	9	0	72	5	2
0403707388	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Rindge	1	-118.3724976	34.00644684	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707390	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	186	-118.3724136	34.00814819	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707391	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	187	-118.3723679	34.00898743	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707392	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	188	-118.3713303	34.00645065	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707393	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	189	-118.3701477	34.00642014	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707394	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	190	-118.3723145	34.00982285	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707395	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Rindge	8	-118.3689957	34.00637817	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707397	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VR	192	-118.3714066	34.0083313	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2

Abandoned Wells Ranking Information

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0403707399	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Rindge	12	-118.3678284	34.0063324	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707400	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	194	-118.3723145	34.01063919	0.0	0	0	9	94	22	42	0	1	0	0	0	3	9	3	0	5	2
0403707401	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Rindge	14	-118.368782	34.00719833	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707402	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Rindge	15	-118.3677902	34.00716019	0.0	0	0	9	94	32	62	0	1	0	2	0	3	9	3	30	5	2
0403707403	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	195	-118.3723297	34.00658417	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707408	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	197	-118.3706436	34.00657654	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707409	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	198	-118.3706665	34.0082016	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707411	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Rindge	24	-118.3698883	34.00794983	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707412	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Rindge	25	-118.3719788	34.0069046	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707422	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	BC-LAI-LW	206	-118.3665009	34.00426102	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707423	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	BC-LAI 1-LW	240	-118.3636017	33.99741745	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707424	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC-STK-LW	281	-118.3594666	33.99747467	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707426	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	11	-118.3669739	33.9982872	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707427	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	12	-118.3669663	33.9994278	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707428	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	13	-118.36689	34.00062561	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707429	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	14	-118.3668213	34.00165558	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707430	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	15	-118.3667526	34.00269699	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707431	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	16	-118.3664856	34.00420761	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707433	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	18	-118.3665695	34.0061264	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707435	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	21	-118.3656387	33.99791336	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707436	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	22	-118.3657303	33.9990921	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707437	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	23	-118.3656693	34.00016022	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707438	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	24	-118.3656006	34.00124741	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707439	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	25	-118.3655243	34.00232697	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707440	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	26	-118.3654709	34.0034256	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707441	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	27	-118.3653641	34.00452042	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707442	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	28	-118.365303	34.00556564	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707444	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	31	-118.364502	33.99756622	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707445	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	32A	-118.3644714	33.99871063	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707446	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin Cienega	33	-118.3644333	33.99978638	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707448	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	35	-118.3642883	34.00195694	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707449	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	36	-118.3642349	34.00305557	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707450	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	37	-118.3641129	34.0041275	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707463	Atlantic Richfield Company	Plugged & Abandoned	Inglewood	Sentous	1	-118.3766327	33.99883652	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707464	Atlantic Richfield Company	Plugged & Abandoned	Inglewood	Sentous	2	-118.3763657	33.99920273	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707465	Atlantic Richfield Company	Plugged & Abandoned	Inglewood	Sentous	7	-118.3764038	33.99808502	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707546	Union Oil Company of California	Plugged & Abandoned	Dominguez	Morton & Sons-Union Del Amo	2	-118.2208481	33.8527298	2235.2	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403707547	Union Oil Company of California	Plugged & Abandoned	Dominguez	Morton&sons-Union Dominguez Es	4	-118.2240219	33.85492706	12072.9	0	0	8	95	74	100	0	0	7	5	0	3	8	0	132	10	2
0403707551	Atlantic Oil Company	Plugged & Abandoned	Elizabeth Canyon (ABD)	Behrendt Estate	1	-118.5958023	34.52513885	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707552	Westkern Oil Co.	Plugged & Abandoned	Dominguez	United Dominguez	1	-118.2271576	33.85758591	2649.9	0	0	8	95	74	100	0	0	2	5	0	3	8	0	77	10	2
0403707553	Ember Oil and Gas Co.	Plugged & Abandoned	Elizabeth Canyon (ABD)	Lyons	1	-118.5894547	34.53506088	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707554	Ember Oil and Gas Co.	Plugged & Abandoned	Elizabeth Canyon (ABD)	Seattle-Toledo-Lyons	1	-118.5971985	34.53390884	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707555	G & E Oil Co.	Plugged & Abandoned	Elizabeth Canyon (ABD)	G & E	1	-118.5894013	34.53623199	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707556	John A. Kochergen	Plugged & Abandoned	Elizabeth Canyon (ABD)	Benson	1	-118.5898438	34.52937317	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707557	Edward M Lang	Plugged & Abandoned	Elizabeth Canyon (ABD)	Rupy	1	-118.5923157	34.53673935	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707558	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Elizabeth Canyon (ABD)	Daries	1	-118.5985336	34.52394104	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707559	Chevron U.S.A. Inc.	Plugged & Abandoned	Elizabeth Canyon (ABD)	Lyons	1	-118.5940781	34.53401947	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707560	T & M Exploration Company	Plugged & Abandoned	Elizabeth Canyon (ABD)	Kinler	1	-118.6002884	34.52498245	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707561	U S Natural Resources	Plugged & Abandoned	Elizabeth Canyon (ABD)	Kinler	43-18	-118.6008225	34.52099991	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403707574	Atlantic Richfield Company	Plugged & Abandoned	Any Field	Leuzinger	1	-118.3756714	33.91730118	1206.7	0	0	5	81	0	0	0	0	1	0	0	3	5	0	8	11	2
0403707615	Southern California Gas Company	Plugged & Abandoned	Honor Rancho	WEZU	26	-118.6073608	34.45145035	0.0	0	60	5	68	0	0	0	0	0	0	0	2	5	0	0	2	5
0403707628	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Geddes	1	-118.2994385	33.92363358	3147.6	0	0	5	71	62	97	0	0	2	4	0	3	5	0	48	9	2
0403707629	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Park Community	1	-118.2995071	33.9236412	3147.6	0	0	5	71	62	97	0	0	2	4	0	3	5	0	48	9	2
0403707630	Petro-Lewis Corp.	Plugged & Abandoned	Howard Townsite	Howard Park Fee	1	-118.3042679	33.92573547	6720.4	0	0	5	71	54	93	0	0	4	4	0	3	5	0	64	9	2
0403707631	Petro-Lewis Corp.	Plugged & Abandoned	Howard Townsite	Howard Park Fee	2	-118.3042755	33.92504501	6720.4	0	0	5	71	54	93	0	0	4	4	0	3	5	0	64	9	2
0403707632	Petro-Lewis Corp.	Plugged & Abandoned	Howard Townsite	Howard Park Fee	3	-118.3057632	33.92473602	6720.4	0	0	5	71	54	93	0	0	4	4	0	3	5	0	64	9	2
0403707633	Petro-Lewis Corp.	Plugged & Abandoned	Howard Townsite	Howard Park Fee	4	-118.3048706	33.92436218	6720.4	0	0	5	71	54	93	0	0	4	4	0	3	5	0	64	9	2
0403707635	John Guzman Crane Service, Inc.	Plugged & Abandoned	Howard Townsite	Mills	1	-118.2945328	33.92065048	10464.1	0	0	5	71	55	93	0	0	6	4	0	3	5	0	80	9	2
0403707636	Hondo Oil & Gas Company	Plugged & Abandoned	Howard Townsite	Geddes	1	-118.3009796	33.92703247	0.0	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403707637	Hondo Oil & Gas Company	Plugged & Abandoned	Howard Townsite	SCL & E	1	-118.3010101	33.9271431	0.0	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403707638	Hondo Oil & Gas Company	Plugged & Abandoned	Howard Townsite	SCL & E	2-A	-118.2990494	33.92988968	7197.5	0	0	5	71	44	81	1	0	4	4	0	3	5	3	88	9	2
0403707639	Hondo Oil & Gas Company	Plugged & Abandoned	Howard Townsite	S.R.G. Community	1	-118.3011093	33.9271431	0.0	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403707641	J. E. Pettijohn	Plugged & Abandoned	Howard Townsite	Westmore Land Co.	1	-118.3124542	33.93269348	9964.7	0	0	5	71	38	74	0	0	5	3	0	3	5	0	64	9	2
0403707642	Sentinel Oil Co.	Plugged & Abandoned	Howard Townsite	Athens	1	-118.2957077	33.92313766	33246.4	0	0	5	71	62	97	0	0	10	4	0	3	5	0	112	9	2
0403707643	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	1-1	-118.3075333	33.92435837	8577.6	0	0	5	71	54	93	0	0	5	4	0	3	5	0	72	9	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403707644	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	1-2	-118.3027573	33.92248154	9299.1	0	0	5	71	55	93	0	0	5	4	0	3	5	0	72	9	2
0403707645	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	1-3	-118.3055954	33.92364502	8099.5	0	0	5	71	54	93	0	0	5	4	0	3	5	0	72	9	2
0403707646	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	1-4	-118.3053894	33.92342758	8099.5	0	0	5	71	54	93	0	0	5	4	0	3	5	0	72	9	2
0403707647	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	2-1	-118.3013306	33.92271042	9942.4	0	0	5	71	62	97	0	0	5	4	0	3	5	0	72	9	2
0403707648	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	2-2	-118.2991943	33.92083359	7253.1	0	0	5	71	55	93	0	0	4	4	0	3	5	0	64	9	2
0403707649	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Howard Community	4-1	-118.2980957	33.91981125	9879.9	0	0	5	71	55	93	0	0	5	4	0	3	5	0	72	9	2
0403707650	Shell Western E&P Inc.	Plugged & Abandoned	Howard Townsite	Leonis	1	-118.299408	33.93044662	7197.5	0	0	5	71	44	81	1	0	4	4	0	3	5	3	88	9	2
0403707651	Geo Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Moser Community	2	-118.301857	33.92517471	224.8	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403707652	Monterey Resources, Inc.	Plugged & Abandoned	Howard Townsite	Union-Poindexter	2	-118.3073883	33.92651367	966.0	0	0	5	71	54	93	0	0	0	4	0	3	5	0	32	9	2
0403707653	Tri State Petro. Corp., Ltd.	Plugged & Abandoned	Howard Townsite	Unspecified	3	-118.3061371	33.91884232	9363.5	0	0	5	71	54	93	0	0	5	4	0	3	5	0	72	9	2
0403707654	Union Oil Company of California	Plugged & Abandoned	Howard Townsite	Mosier	1	-118.3023987	33.92420959	224.8	0	0	5	71	62	97	0	0	0	4	0	3	5	0	32	9	2
0403707655	Woodward Oil Company, Ltd.	Plugged & Abandoned	Howard Townsite	Scher	81	-118.3083878	33.9223175	8234.9	0	0	5	71	54	93	0	0	5	4	0	3	5	0	72	9	2
0403707658	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	41	-118.3632813	33.99720764	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707659	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	42	-118.3631744	33.99832535	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707660	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	43	-118.3631668	33.99940109	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707661	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	44	-118.363121	34.00049591	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707662	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	45	-118.3630219	34.00159073	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707663	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	46	-118.362915	34.00268173	0.0	0	0	9	94	33	66	0	1	0	2	0	3	9	3	30	5	2
0403707664	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	47	-118.3628311	34.00376892	0.0	0	0	9	94	33	66	0	1	0	2	0	3	9	3	30	5	2
0403707666	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	51	-118.3620758	33.99685287	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707667	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	52	-118.3619766	33.99793625	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707668	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	54	-118.3618393	34.00011444	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707669	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	55	-118.3617783	34.00121307	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707670	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	56	-118.361557	34.00245285	0.0	0	0	9	94	33	66	0	1	0	2	0	3	9	3	30	5	2
0403707671	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	57	-118.3624344	34.00351715	0.0	0	0	9	94	33	66	0	1	0	2	0	3	9	3	30	5	2
0403707672	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	61	-118.3607178	33.99663544	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707673	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Baldwin-Cienega	62	-118.3606415	33.99766922	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707674	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	63	-118.360611	33.99885941	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707675	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	64	-118.3604889	33.99998093	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707685	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	10	-118.3794708	34.00766754	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707686	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	16	-118.3799439	34.00645828	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707687	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	1	-118.3742447	33.99994278	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707688	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	2	-118.3782578	34.00882721	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707689	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	3	-118.3740768	33.99982834	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707691	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	5	-118.3804092	34.00943375	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707694	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	8	-118.3767014	34.00544739	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707695	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	9	-118.3806229	34.00835037	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707697	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	12	-118.3782425	34.00577164	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707699	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	14	-118.3761215	34.0042305	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707700	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 1	15	-118.3778687	34.00797272	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707701	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	71	-118.3595123	33.99720001	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707702	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	72	-118.3594971	33.99818039	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707705	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	81	-118.3583908	33.99740982	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707707	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	114	-118.3662567	34.00218582	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707710	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	117	-118.3659668	34.00524521	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707713	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	124	-118.365387	34.00202179	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707715	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	126	-118.3648911	34.00385284	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707717	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	133	-118.3636627	34.0001564	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707719	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	135	-118.3637848	34.00246811	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707720	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	136	-118.3634796	34.00338364	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707721	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	141	-118.3625717	33.99799728	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707723	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	143	-118.3625946	33.99976349	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707724	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	144	-118.3627853	34.00117493	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707725	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	151	-118.3613739	33.99712753	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707727	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	153	-118.3611755	33.99946976	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707728	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	154	-118.3623352	34.0006218	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707730	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	163	-118.360054	33.99905777	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707731	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	211	-118.3667984	33.9982338	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707734	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	218	-118.3666153	34.0058403	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707735	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	225	-118.3645096	34.00255203	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707737	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	234	-118.3635101	34.00067139	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707739	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	236	-118.3641739	34.00337219	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707740	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	237	-118.3639298	34.00349808	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403707741	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	244	-118.3623657	34.00072098	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707742	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	245	-118.3630676	34.00196075	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403707743	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	255	-118.3620682	34.00157928	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707744	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	262-A	-118.3605576	33.997715	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707746	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	312	-118.3664627	33.99973297	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707747	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	314	-118.3663559	34.00162506	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707748	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	321	-118.3647232	33.9976387	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707749	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	322-A	-118.3650742	33.99930954	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707754	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	333	-118.3638535	34.00034714	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707755	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	341	-118.3636398	33.99757385	0.0	0	0	9	94	33	66	0	0	0	2	0	3	9	0	24	5	2
0403707756	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	343	-118.3631821	33.99974442	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707757	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	345	-118.3697281	33.99496841	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707758	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	351	-118.3618317	33.99702454	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707761	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	423	-118.3656845	34.00051117	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707763	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	422	-118.3647003	34.00014114	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707764	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	451	-118.361496	33.99683762	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707767	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	443	-118.3633041	33.99967194	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707768	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	523	-118.3650284	34.00101089	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707769	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	543	-118.3634338	33.99958038	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403707770	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	551	-118.3615341	33.99690247	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707776	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Cienega	2	-118.3625031	34.00606537	0.0	0	0	9	94	33	66	0	1	0	2	0	3	9	3	30	5	2
0403707778	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	125	-118.3782196	34.00963211	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707780	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	127	-118.3791428	34.0112381	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403707781	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	128	-118.3781662	34.01129913	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403707783	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	130	-118.3766632	34.00971222	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707784	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	131	-118.3759079	34.0113678	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403707786	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	133	-118.3747406	34.01140594	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403707788	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	135	-118.3735809	34.01144028	0.0	1	0	9	94	22	42	0	1	0	0	3	3	9	3	0	5	2
0403707790	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	137	-118.3762207	34.01055908	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403707802	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	241	-118.3662567	33.99488831	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707804	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	243	-118.3681641	33.99665451	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707805	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	244	-118.3720093	33.99773788	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403707806	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	245	-118.3685379	33.9899292	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707807	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	246	-118.3716049	34.00320435	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707808	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	247	-118.3621445	33.99265671	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707809	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	248	-118.3722687	33.99791336	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707810	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	249	-118.3720322	33.99793243	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707811	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	250	-118.3680344	33.99753189	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707812	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	251	-118.3693008	33.99321747	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707813	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	252	-118.3710098	33.99909592	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707814	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	253	-118.3671341	33.99250412	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707815	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	254	-118.3684845	33.98997116	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707816	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	255	-118.3620453	33.99228668	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707817	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	256	-118.3619385	33.99549484	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707818	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	258	-118.3682709	33.99111938	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707819	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	259	-118.3724747	34.0050354	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707820	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	260	-118.3695297	33.99319458	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707821	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	261	-118.3705368	33.99830246	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707823	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	264	-118.3693314	34.0022049	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707826	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	268	-118.3669891	33.99666595	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707827	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	269	-118.3631592	33.99029922	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707828	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	270	-118.3646393	33.99412918	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707829	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	271	-118.3646622	33.99406433	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707830	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	272	-118.3646851	33.993927	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707831	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	273	-118.3646851	33.99398422	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707834	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	277	-118.3698273	34.00289917	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707835	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	278	-118.3669281	33.99410248	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707836	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	281	-118.3704758	33.9984436	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403707838	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	283	-118.3684158	34.00167465	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707840	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	285	-118.3667374	33.98983765	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707841	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	286	-118.3630447	33.99365234	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707843	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	290	-118.3619766	33.99110031	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707844	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	291	-118.3662109	33.99488068	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707846	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	293	-118.3638458	33.99387741	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707848	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	296	-118.3615723	33.99471664	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707849	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	297	-118.3617401	33.99478149	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707852	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	300	-118.3703384	33.99822235	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403707853	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	301	-118.3641663	33.9921875	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707854	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	302	-118.364151	33.99525452	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403707856	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	304	-118.364708	33.99419403	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403707857	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	353	-118.3704224	34.00428391	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707861	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	354	-118.3705826	34.00314713	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707862	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	334	-118.3622284	33.99253845	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403707864	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	402	-118.3650436	33.98918915	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403707865	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 2	1	-118.3711319	33.99426651	4721.2	0	0	9	94	20	39	0	0	3	0	0	3	9	0	36	5	2
0403707866	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 3	1	-118.3739777	33.99705124	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403707886	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	150	-118.3772354	34.00894547	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707887	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	151	-118.3768616	34.00813293	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707888	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	152	-118.3764496	34.00726318	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707889	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	153	-118.3760757	34.00643921	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707890	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	154	-118.3762131	34.00901413	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707893	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	157	-118.3737488	34.00822449	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707894	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	158	-118.3736877	34.00642776	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707895	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	159	-118.3749542	34.00648499	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403707899	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	163	-118.3746185	34.00714874	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708001	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	94	-118.3638992	33.99104309	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708002	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	95	-118.3701172	34.00254059	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708003	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	96	-118.3681793	33.99405289	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708004	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	97	-118.3745041	33.99834061	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708005	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	98	-118.3679962	33.9969902	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708006	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	99	-118.3628998	33.9901886	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708007	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	101-A	-118.3703537	34.0002594	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708008	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	102	-118.3665772	33.99641418	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708009	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	103	-118.3718948	34.00144196	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708010	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	104	-118.3691635	33.99765015	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708011	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	105	-118.3714523	34.00257874	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708012	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	106	-118.3630066	33.99521255	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708013	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	107	-118.369812	34.00276566	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708014	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	108-A	-118.3748245	34.00506592	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708015	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	109	-118.3687439	34.00135803	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708016	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	110	-118.3628235	33.99233627	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708017	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	RU	350	-118.3722229	34.00459671	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708019	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	114	-118.3648377	33.99623108	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708021	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	116	-118.3615723	33.9948616	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708023	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	118	-118.3741455	34.0039711	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708026	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	121	-118.3639603	33.99462128	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708027	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	122	-118.3645401	33.99349976	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708028	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	123	-118.3625107	33.99423981	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708029	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	124	-118.3686981	34.00246048	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708030	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	125	-118.3626862	33.9948349	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708031	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	126	-118.3652725	33.99555206	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708032	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	127	-118.364357	33.99581528	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708034	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	129	-118.3651047	33.9907608	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708035	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	130	-118.3659439	33.99198914	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708036	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	131	-118.3655853	33.99479294	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708039	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	134	-118.3660202	33.99332047	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708040	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	135	-118.3667069	33.99096298	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708043	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	139	-118.3698578	34.00368118	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708045	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	141	-118.369606	33.99966049	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708046	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	142	-118.3727722	34.00052643	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708047	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	143	-118.3718338	34.00058365	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708049	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	145	-118.3741226	34.00167084	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708052	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	148-A	-118.3704071	33.99729919	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708053	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	149	-118.3641815	33.99528503	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708054	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	150	-118.3648605	33.99635315	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708056	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	152	-118.3669815	33.99414444	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708057	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	153	-118.3720398	33.99750137	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708058	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	154	-118.3663025	33.99636459	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708059	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	155	-118.3703766	33.99739838	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708060	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	156	-118.362854	33.99491501	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708061	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	157	-118.3705292	33.99715042	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708062	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	158	-118.3638535	33.9940567	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403708063	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	159	-118.3654099	33.99564362	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708064	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	160	-118.3623505	33.99376297	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708065	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	161	-118.3650131	33.99412155	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708067	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	163	-118.3632736	33.99286652	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708068	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	164	-118.3670578	33.9956398	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708069	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	165	-118.3631821	33.99452591	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708070	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	166	-118.365387	33.9926796	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708071	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	167	-118.3711624	33.99811172	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708072	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	168	-118.3672333	33.99087524	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708073	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	169	-118.367981	33.99460983	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708074	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	171	-118.3680649	33.99642181	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708076	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	15	-118.3714294	34.00533676	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708077	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	16	-118.3702622	34.0052681	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708079	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	18	-118.3679504	34.00517273	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708080	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	19	-118.3726578	34.00426865	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708081	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	20	-118.3725586	33.99915314	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708082	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	21	-118.3714905	34.00421143	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708083	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	22	-118.3703232	34.00417328	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708084	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	23	-118.3681107	33.99744034	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708085	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	24	-118.3691559	34.00413132	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708086	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	25	-118.3693848	34.00304031	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708087	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	26	-118.3707199	34.00309372	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708088	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	28	-118.3733749	34.00338364	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708091	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	31	-118.3680267	34.00408936	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708092	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	32	-118.3716126	33.99817276	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708094	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	34	-118.3620911	33.99263382	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708096	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	36	-118.3681412	34.00188446	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708097	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	37	-118.3680725	34.00296783	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708098	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A.Investment 1	38	-118.3620071	33.99417877	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708099	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	39	-118.3694534	34.00196838	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708100	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	40	-118.3695145	34.00089264	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708103	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-Stocker-BC-LW	1	-118.3619003	33.99576187	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708104	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-Stocker-BC-LW	10	-118.3615646	33.99560165	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708109	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-VIC-LW	5	-118.3739395	34.00148773	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708110	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI Comm. 1	1	-118.3618851	33.99578857	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708112	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	1	-118.3653183	33.99468994	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708113	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	2	-118.3655472	33.99491119	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708114	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	3	-118.3650894	33.99359512	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708115	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A.Investment 1	4	-118.3663635	33.99578857	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708117	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	6	-118.3731537	34.00012589	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708118	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	7	-118.3651199	33.99237823	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708119	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	8	-118.3725586	34.00535583	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708120	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	9	-118.3738785	34.00570297	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708121	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	10	-118.3748245	34.00564575	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708122	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	11	-118.3757019	34.00562286	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708123	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	12	-118.375206	34.00451279	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708124	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	13	-118.3737335	34.00453949	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708125	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	14	-118.3630142	33.9958992	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708136	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-BC-LW	1	-118.3678207	34.00450134	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708137	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	2	-118.3617172	33.99582672	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708140	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	5-A	-118.3679276	34.00237274	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708141	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	6	-118.3676224	33.99745178	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708142	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-BC-LW	7	-118.3680878	34.00004578	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708143	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	8	-118.3660889	33.99700928	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708144	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI1-BC-LW	9	-118.3644791	33.996521	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708145	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	11	-118.3630295	33.99606705	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708146	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	12	-118.3680801	34.00261307	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708147	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	13	-118.3645248	33.99649048	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708148	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	14	-118.3667374	33.99705505	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708149	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-BC-LW	15	-118.367981	34.00087738	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708150	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC-LAI-LW	313	-118.3666382	34.00096512	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708152	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	182	-118.3699265	34.00492096	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708155	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	185	-118.3704987	34.00419235	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708157	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	188-A	-118.3717423	34.00327301	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708159	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	191	-118.370224	34.00006866	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403708160	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	192	-118.3722382	33.99986649	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708162	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	194	-118.37117	33.9978981	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708164	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	196	-118.3694153	34.00217056	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708166	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	198	-118.3680649	33.99660873	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708167	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	199-A	-118.3683701	34.00190735	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708169	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	201	-118.3628845	33.99225616	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708172	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	205	-118.3693085	33.99335861	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708173	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	206	-118.3703079	34.00122833	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708175	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	208	-118.3699951	34.00191116	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708177	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	210	-118.3680267	33.99532318	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708178	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	211	-118.363739	33.99570465	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708180	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	213	-118.364563	33.99159622	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708182	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	215	-118.3630371	33.99160767	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708184	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	217	-118.3681488	34.00008774	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708185	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	218	-118.3647537	33.99473572	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708186	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	219	-118.3658981	33.99104691	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708188	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	221	-118.3731232	34.00169754	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708190	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	224	-118.371315	33.99979019	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708191	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	225	-118.3630676	33.99087524	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708193	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	227	-118.3671646	33.99286652	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708194	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	228	-118.3649597	33.99000931	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708195	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	229	-118.3705826	33.99710464	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708196	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	230	-118.3661575	33.99429703	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708197	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	231	-118.3707886	34.00246429	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708199	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	233	-118.3692856	33.99331284	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708200	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	234	-118.3680573	33.99590302	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708201	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	41	-118.3695831	33.99980545	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708202	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	42	-118.3695831	33.99723053	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708204	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	44	-118.3680954	33.99617767	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708205	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	45	-118.3748932	33.99827194	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708206	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	46	-118.3736115	33.9990387	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708207	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	47	-118.373085	33.99773788	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708208	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	48	-118.3723831	33.99665833	7622.0	0	0	9	94	32	62	0	0	4	2	0	3	9	0	72	5	2
0403708209	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	49	-118.3651199	33.9965744	2811.9	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708210	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	50	-118.3636169	33.99614716	2811.9	0	93	9	94	20	39	0	0	2	0	0	5	9	0	28	5	2
0403708211	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	51	-118.3636017	33.9948616	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708212	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	52	-118.3676834	33.99510574	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708213	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	54	-118.3666153	33.99449539	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708214	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	55	-118.3713684	34.00000381	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708216	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	57	-118.3722305	34.00085449	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708217	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	59	-118.3724136	34.00202942	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708218	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	60	-118.3708954	33.99901199	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708219	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	61	-118.3707733	33.99746323	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403708220	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	62	-118.3665161	33.9934845	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708221	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	63	-118.3745346	34.00343704	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708223	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	65	-118.3734741	34.00118256	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708224	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	66-A	-118.3730621	34.00264359	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708225	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A.Investment 1	67	-118.3721695	33.99995804	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708226	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	68	-118.3703537	33.99817276	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708227	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	69	-118.3689117	33.99789047	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708234	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	77	-118.3724594	34.00392532	0.0	1	84	9	94	32	62	0	0	0	2	3	4	9	0	32	5	2
0403708239	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	RU	345	-118.372139	34.00391006	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708241	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	L.A. Investment 1	84	-118.369072	34.00468063	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708242	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	85	-118.3735199	34.00453949	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708244	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	87	-118.3620834	33.99121475	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708246	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	89	-118.3737564	34.00296402	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708247	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	348	-118.3733902	34.00517273	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708249	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	92	-118.3732681	34.00170898	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708250	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	93	-118.3641205	33.99227524	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403708279	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	311	-118.3738174	34.00687027	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708280	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	169	-118.3738937	34.00874329	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708282	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	RU	314	-118.3752213	34.00823975	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708284	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	170	-118.3754044	34.00771713	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708286	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	316	-118.3765106	34.00848389	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708289	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	171	-118.3757553	34.00865936	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403708291	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	173	-118.374321	34.00849915	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708293	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	175	-118.3750763	34.0069313	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708295	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	177	-118.3741455	34.00775528	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708297	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	179	-118.3760147	34.00937271	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708298	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	RU	312	-118.3766632	34.00849152	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708299	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	1	-118.3753433	33.99876785	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708300	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	2	-118.3763351	33.99934387	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708301	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	3	-118.3756714	33.99925995	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708302	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	4	-118.3755951	33.99872208	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708303	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	4-16	-118.3769608	33.99943161	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708304	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	5	-118.3758469	33.99841309	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708305	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Sentous	6	-118.3746719	33.99915314	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708306	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Sentous	7	-118.3747864	33.99910355	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708307	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	STK-BC-LAI-LW	21	-118.3613739	33.99575806	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708308	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	STK-BC-LW	23	-118.3600235	33.99620056	0.0	1	0	9	94	33	64	0	0	0	2	3	3	9	0	30	5	2
0403708309	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	STK-LAI-LW	15	-118.361351	33.99388504	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708310	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Buckler	1A	-118.3602219	33.98997116	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708311	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	2	-118.3607636	33.99256516	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708312	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	3	-118.3607788	33.99402618	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708313	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	4	-118.3593063	33.99407196	0.0	1	0	9	94	33	64	0	0	0	2	3	3	9	0	30	5	2
0403708314	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	6	-118.3592758	33.99597931	0.0	0	0	9	94	33	64	0	0	0	2	0	3	9	0	24	5	2
0403708316	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	8	-118.3579636	33.99625778	3069.4	0	0	9	94	33	64	0	0	2	2	0	3	9	0	48	5	2
0403708317	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	9	-118.3550797	33.99825668	4462.3	0	0	9	94	33	66	0	0	3	2	0	3	9	0	60	5	2
0403708318	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	10	-118.3583069	33.99503326	3069.4	1	0	9	94	33	64	0	0	2	2	3	3	9	0	60	5	2
0403708319	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	11	-118.3607559	33.99106979	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708320	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	12	-118.3610611	33.98926926	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708326	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	19	-118.3605042	33.99376297	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708327	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	20	-118.3593216	33.99527359	0.0	1	0	9	94	33	64	0	0	0	2	3	3	9	0	30	5	2
0403708328	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	22	-118.3603821	33.9954071	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403708334	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	30	-118.3612442	33.99422836	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708335	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	31	-118.3606949	33.99160004	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403708336	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	32	-118.3593445	33.99464417	0.0	1	0	9	94	33	64	0	0	0	2	3	3	9	0	30	5	2
0403708338	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker	34	-118.3608017	33.99275208	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708342	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	201	-118.3608322	33.99282455	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708344	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker-BC-LAI 1-LW	2	-118.3680496	34.00124741	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708345	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker-LAI 1-LW	4	-118.36129	33.99446869	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708346	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker-L.A.I.-1 L.W.	216	-118.3613663	33.99475479	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708347	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	STK-LAI-LW	302	-118.3610916	33.99359894	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708348	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Stocker-LAI 1-LW	316	-118.3605804	33.99476624	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403708351	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	18	-118.3790283	34.00439835	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708352	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	19	-118.3808823	34.00724792	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708353	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	20	-118.3811264	34.00596619	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708354	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	21	-118.3804092	34.00771332	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708355	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	22	-118.3804627	34.0092926	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708356	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 1	23	-118.3773727	34.00378799	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708357	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	24	-118.3756867	34.00302124	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708358	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	25	-118.3752823	34.00205994	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708359	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	26	-118.3746872	34.00094986	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708365	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	RU	383	-118.3783188	34.00825882	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708373	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	42	-118.3756409	33.9997139	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708374	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	43	-118.3754883	34.00125122	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708576	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	4	-118.6490402	34.32486725	0.0	0	0	4	73	13	20	0	0	0	0	0	3	4	0	0	3	5
0403708577	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	5	-118.6465454	34.32402039	0.0	0	0	4	73	11	15	0	0	0	0	0	3	4	0	0	3	5
0403708578	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	7	-118.6458206	34.32574844	0.0	0	0	4	73	11	15	0	0	0	0	0	3	4	0	0	3	5
0403708579	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	8	-118.6455994	34.32458878	0.0	0	0	4	73	11	15	0	0	0	0	0	3	4	0	0	3	5
0403708580	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	9	-118.6437073	34.32559586	0.0	0	0	4	73	11	15	0	0	0	0	0	3	4	0	0	3	5
0403708589	Conoco Inc.	Plugged & Abandoned	Lawndale (ABD)	Alexander	1	-118.3639984	33.90374756	13992.8	0	0	7	90	39	74	0	0	7	3	0	3	7	0	100	11	2
0403708594	Ethyl Oil Co.	Plugged & Abandoned	Lawndale (ABD)	Unspecified	1	-118.3648682	33.90312195	14916.1	0	0	7	90	31	61	0	0	8	2	0	3	7	0	100	11	2
0403708619	Shell Western E&P Inc.	Plugged & Abandoned	Lawndale (ABD)	Harvey Smith	1	-118.3669128	33.90283966	9291.1	0	0	7	90	31	61	0	0	5	2	0	3	7	0	70	11	2
0403708628	Chevron U.S.A. Inc.	Plugged & Abandoned	Lawndale (ABD)	West Hawthorne Water Well	1	-118.3623428	33.90831757	14821.1	0	0	7	90	39	74	0	0	8	3	0	3	7	0	110	11	2
0403708658	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Finck	1	-117.9942093	33.92621613	14044.2	0	0	5	72	22	44	0	0	8	0	0	3	5	0	64	10	4
0403708660	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Lochmiller	1	-117.9962006	33.92566299	9799.5	0	0	5	72	22	44	0	0	5	0	0	3	5	0	40	10	4
0403708661	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Lochmiller	2	-117.9919052	33.92678833	7023.5	0	0	5	72	22	44	0	0	4	0	0	3	5	0	32	10	4
0403708662	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Shoemaker	1	-117.996933	33.92762375	12594.2	0	0	5	72	23	46	0	0	7	0	0	3	5	0	56	10	4
0403708663	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Woodward	1	-117.9979477	33.92505646	9863.8	0	0	5	72	22	44	0	0	5	0	0	3	5	0	40	10	4

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403708664	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Woodward	2	-117.998764	33.92642975	12594.2	0	0	5	72	22	44	0	0	7	0	0	3	5	0	56	10	4
0403708665	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Tanamachi	1	-117.9949265	33.92785263	63774.4	0	0	5	72	22	44	0	0	10	0	0	3	5	0	80	10	4
0403708666	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Woodward	3	-118.0006485	33.92539215	3738.4	0	0	5	72	16	27	0	0	2	0	0	3	5	0	16	10	4
0403708667	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Woodward	4	-118.0025635	33.92421341	3738.4	0	0	5	72	16	27	0	0	2	0	0	3	5	0	16	10	4
0403708668	Pyramid Oil Company	Plugged & Abandoned	Leffingwell (ABD)	Woodward-Lewis	1	-118.0033493	33.92702484	3738.4	0	0	5	72	23	46	0	0	2	0	0	3	5	0	16	10	4
0403708669	Rothschild Oil Co.	Plugged & Abandoned	Leffingwell (ABD)	Fouquet	1	-118.0023499	33.92988205	8809.3	0	0	5	72	23	46	0	0	5	0	0	3	5	0	40	10	4
0403708670	Rothschild Oil Co.	Plugged & Abandoned	Leffingwell (ABD)	Lopicollo	1	-117.9925385	33.92975616	14044.2	0	0	5	72	23	46	0	0	8	0	0	3	5	0	64	10	4
0403708671	Rothschild Oil Co.	Plugged & Abandoned	Leffingwell (ABD)	Woodward	1	-117.9994965	33.92855835	9912.5	0	0	5	72	23	46	0	0	5	0	0	3	5	0	40	10	4
0403708672	Shell Western E&P Inc.	Plugged & Abandoned	Leffingwell (ABD)	Stubbs	1	-118.0018463	33.93040085	8809.3	0	0	5	72	23	46	0	0	5	0	0	3	5	0	40	10	4
0403708674	Phillips Petroleum Co.	Plugged & Abandoned	Leffingwell (ABD)	Signal-Stern Realty	1	-117.9887543	33.9274826	7023.5	0	0	5	72	22	44	0	0	4	0	0	3	5	0	32	10	4
0403708676	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	45	-118.3762817	33.99982834	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708679	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	50	-118.377327	34.00559235	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708681	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	52	-118.3768082	34.00466537	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708682	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	53	-118.380806	34.00658035	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708684	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	55	-118.3788147	34.00840378	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708692	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	65	-118.3800201	34.00554276	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708693	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	66	-118.3792343	34.00450516	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708694	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	67	-118.3793335	34.00447083	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708696	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	69	-118.3779755	34.00367355	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708697	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	70	-118.3799667	34.00662613	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708698	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	71	-118.3759232	34.00254059	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708700	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	73	-118.3776627	34.00235748	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708705	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	78	-118.3748779	34.00123978	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708707	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	80	-118.3793488	34.00381088	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708708	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	81	-118.3753281	34.00164413	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708709	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	83	-118.3811646	34.00521469	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708712	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	86	-118.3813095	34.0058136	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708713	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	87	-118.3762894	34.00407791	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708715	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	90	-118.3792114	34.00291061	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708721	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	98	-118.3807678	34.00770569	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708723	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	100	-118.3812714	34.00505066	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403708725	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	103	-118.3802567	34.00440216	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708727	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	105	-118.3806992	34.00802612	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708728	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	106	-118.3765259	34.00152206	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708732	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	110	-118.3764954	34.00338745	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708737	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	116	-118.3796082	34.00838089	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708740	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	1	-118.3852387	34.01210785	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403708741	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	2	-118.3860016	34.01078033	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708742	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	3	-118.3866577	34.00988007	5.4	0	0	9	94	21	41	0	0	0	0	0	3	9	0	0	5	2
0403708743	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	4	-118.3848343	34.01105118	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708744	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	5	-118.384552	34.00999069	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403708745	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	6	-118.3842621	34.00891113	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708747	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	8	-118.383934	34.00788879	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708748	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	9	-118.3837051	34.00673676	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708749	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	10	-118.3833695	34.0056076	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708750	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	11	-118.3855362	34.00962448	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708754	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	15	-118.3854904	34.0085144	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708757	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	18	-118.3871765	34.00343323	0.0	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708758	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 2	19	-118.3857956	34.01085281	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708759	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	20	-118.386322	34.0105896	5.4	0	0	9	94	21	41	0	0	0	0	0	3	9	0	0	5	2
0403708761	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	22	-118.3851166	34.00735092	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708763	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	24	-118.3840866	34.00628662	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403708770	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	206	-118.3843994	34.0092392	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403708771	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Vickers 3	1	-118.387085	34.0091629	5.4	0	0	9	94	21	41	0	0	0	0	0	3	9	0	0	5	2
0403708773	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VIC-LAI-LW	2	-118.3742905	34.00021744	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403708775	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	210	-118.3778687	34.00926208	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709001	Associated Oil Co.	Plugged & Abandoned	Santa Fe Springs	Benton	1	-118.0435486	33.93887329	4291.5	0	0	6	96	58	95	0	0	3	4	0	3	6	0	63	10	4
0403709003	Atlantic Oil Company	Plugged & Abandoned	Santa Fe Springs	James	1	-118.0473785	33.93428802	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403709077	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	208	-118.376503	34.00611115	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709078	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	209	-118.3773117	34.00770187	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709091	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	201	-118.3819199	34.00588608	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403709094	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers	3	-118.3796463	34.01073074	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709106	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers	17	-118.3815994	34.00849915	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709108	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	19	-118.3830948	34.00831223	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403709110	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers	21	-118.3818054	34.0074501	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403709114	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	26	-118.382782	34.00723648	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403709116	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers	28	-118.3822174	34.00631714	5.4	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403709119	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	31	-118.3817825	34.01182938	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709128	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	42	-118.3829804	34.01102829	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709131	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	46	-118.3815155	34.01062012	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709134	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	49	-118.383728	34.01127243	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709135	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	50	-118.3796616	34.01001358	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403709138	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	53	-118.3818588	34.00884247	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709142	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	58	-118.3813095	34.00932312	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709148	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	TVIC	73	-118.3824463	34.01194763	5.4	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403709161	R. R. Bush Oil Co.	Plugged & Abandoned	Lapworth (ABD)	Pellissier	1	-118.0373383	34.02288437	0.0	0	0	4	83	41	77	0	0	0	3	0	3	4	0	21	10	4
0403709164	Jack Herley and Paul L. Kelley	Plugged & Abandoned	Lapworth (ABD)	Lapworth	1	-118.037674	34.02145004	0.0	0	0	4	83	41	77	0	0	0	3	0	3	4	0	21	10	4
0403709165	Hilo Oil Company	Plugged & Abandoned	Lapworth (ABD)	Bishop-Hilo-Lapworth	1	-118.0401535	34.01969147	0.0	0	0	4	83	41	77	0	0	0	3	0	3	4	0	21	10	4
0403709166	Exxon Mobil Corporation	Plugged & Abandoned	Lapworth (ABD)	Pellissier	1	-118.0370102	34.01889038	0.0	0	0	4	83	41	77	0	0	0	3	0	3	4	0	21	10	4
0403709167	Shell Western E&P Inc.	Plugged & Abandoned	Lapworth (ABD)	Pellissier	1	-118.0394516	34.02716827	0.0	0	0	4	83	41	77	0	0	0	3	0	3	4	0	21	7	1
0403710651	John Guzman Crane Service, Inc.	Plugged & Abandoned	Rosecrans	Evelyn	1	-118.2735519	33.90454865	13849.0	0	0	8	94	57	94	0	0	7	4	0	3	8	0	121	9	2
0403710654	Terra Exploration & Production Co., Inc.	Plugged & Abandoned	Rosecrans	Pacific-Clark	3	-118.2810898	33.91273499	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403710658	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	148	-118.6327972	34.4072113	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403710660	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	24	-118.5825424	34.46947479	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403710663	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	66	-118.6511154	34.40732193	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403710668	Apex Dev. Corp.	Plugged & Abandoned	Any Field	Core Hole	1	-118.2543869	33.91374969	0.0	0	0	5	81	50	88	0	0	0	4	0	3	5	0	32	9	2
0403711376	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	1	-117.9125595	33.95505524	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711377	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	2	-117.9123764	33.95504379	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711378	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	3	-117.9121704	33.95497513	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711379	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	4	-117.9115372	33.95508957	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711380	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	5	-117.9103241	33.95545959	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711381	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	6	-117.9127274	33.95571518	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711382	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	7	-117.9141846	33.9568634	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711383	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	8	-117.9089813	33.95604706	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711384	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	9	-117.9077835	33.95619583	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711385	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	10	-117.9150848	33.956707	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711386	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	11	-117.908165	33.95534134	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711387	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	12	-117.9084091	33.95768356	9022.2	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711388	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	13	-117.9100571	33.95682144	8451.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711389	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	14	-117.9061737	33.9564476	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711390	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	15	-117.9115219	33.95606232	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711391	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	16	-117.9127579	33.95679092	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711392	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	17	-117.9159775	33.95931244	668.3	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711393	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	18	-117.9065018	33.95546341	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711394	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	19	-117.909195	33.95504761	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711395	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	20	-117.9072571	33.95559311	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711396	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	21	-117.906456	33.9544487	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711397	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	22	-117.9078598	33.95405197	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711398	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	23	-117.9098969	33.95432663	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711399	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	24	-117.9061585	33.95289612	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711400	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	25	-117.9088898	33.95329285	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711401	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	26	-117.9051361	33.95346451	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711402	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	27	-117.9068527	33.9538269	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711403	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	28	-117.9059296	33.95359421	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711404	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	29	-117.908905	33.95452881	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711405	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	30	-117.9073944	33.95417786	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711406	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	31	-117.9109955	33.95411301	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711407	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	32	-117.9082947	33.95440292	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711408	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	33	-117.9057159	33.95418549	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711409	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	34	-117.9049606	33.95421982	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711410	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	35	-117.9074097	33.95471954	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711411	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	36	-117.8828125	33.95278168	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711412	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	37	-117.912796	33.95460892	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711413	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	38	-117.9150314	33.95512009	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711414	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	39	-117.9115295	33.9546051	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711415	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	41	-117.9039993	33.95290756	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711416	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	42	-117.904686	33.95535278	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711417	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	43	-117.9055557	33.95599365	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711418	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	44	-117.9048996	33.95670319	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711419	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	40	-117.883194	33.94951248	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403711420	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	45	-117.9066925	33.95637131	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711421	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	46	-117.9088898	33.95679474	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711422	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	47	-117.9041901	33.95584488	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711423	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	48	-117.9103622	33.95608521	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711424	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	49	-117.9093628	33.95741653	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711425	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	50	-117.9078522	33.95669937	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711426	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	51	-117.9091034	33.95667648	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711427	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	52	-117.9043884	33.95572281	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711428	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	53	-117.9098587	33.95698929	8451.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711429	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	54	-117.9113846	33.9570961	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711430	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	55	-117.9107285	33.95676422	8451.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711431	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	56	-117.9106369	33.95753479	8451.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711432	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	57	-117.911499	33.95651627	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711433	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	58	-117.9125443	33.95730591	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711434	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	59	-117.9113007	33.95814514	8451.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711435	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	60	-117.9080963	33.95606613	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711436	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	61	-117.9121933	33.95809555	5184.3	0	0	10	138	15	26	0	0	3	0	0	3	10	0	39	6	4
0403711437	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	62	-117.9048767	33.95272827	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711438	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	63	-117.9055634	33.95493317	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711439	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	64	-117.9141388	33.95410156	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711440	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	65	-117.9136963	33.95605469	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711441	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	66	-117.908577	33.95388412	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711442	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	67	-117.9121552	33.95417786	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711443	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	68	-117.9075623	33.95355988	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711444	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	69	-117.9100723	33.95364761	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711445	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	70	-117.9085617	33.95671463	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711446	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	71	-117.9076691	33.95434952	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711447	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	72	-117.9059525	33.95507853	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711448	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	73	-117.9072952	33.95982742	9456.8	0	0	10	138	15	26	0	0	5	0	0	3	10	0	65	6	4
0403711449	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-1	-117.9039154	33.95544052	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711450	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-2	-117.9089127	33.95444489	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711452	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-5	-117.9088821	33.95724487	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711453	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-6	-117.9051209	33.95681	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711454	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-7	-117.909935	33.95335007	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711455	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-9	-117.911232	33.95376587	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711457	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-1	-117.9071808	33.94615936	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711463	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-11	-117.9088898	33.94863892	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711465	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-13	-117.9067307	33.94637299	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711468	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-16	-117.9114838	33.94755936	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711469	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-17	-117.9132233	33.94865417	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711471	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-19	-117.9139099	33.94735718	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711472	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-20	-117.9115601	33.94672012	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711473	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-21	-117.9127579	33.95222855	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711577	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-25	-117.9124069	33.94681931	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711580	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-29	-117.9058914	33.94617462	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711583	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-32	-117.907196	33.95190811	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711584	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-33	-117.9105377	33.94700623	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711585	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-2	-117.9143295	33.95272446	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711589	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-6	-117.9169769	33.94834137	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711594	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-11	-117.9202805	33.95014191	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711598	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-15	-117.9211578	33.94869232	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711600	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-17	-117.922348	33.95028687	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711601	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-18	-117.916954	33.95280457	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711603	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-20	-117.9237518	33.94982147	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711611	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-32	-117.9198837	33.94927216	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711612	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-33	-117.9217835	33.94959641	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711614	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-1	-117.9204941	33.9561882	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711615	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-2	-117.9196167	33.95714188	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711617	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-4	-117.920311	33.95617294	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711618	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-5	-117.9191361	33.95748901	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711620	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-7	-117.9151077	33.95462799	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711621	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-8	-117.9177628	33.95577621	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711624	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-11	-117.9193573	33.9552269	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711625	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-12	-117.9169159	33.95488739	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711626	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-13	-117.9157944	33.95484161	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403711629	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-16	-117.9128723	33.9539566	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711630	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-17	-117.9201584	33.95624924	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711631	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-18	-117.9192047	33.95503235	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711633	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-20	-117.9150009	33.95412827	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711634	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-21	-117.915123	33.95475769	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711635	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-22	-117.9168472	33.95511627	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711637	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-24	-117.9178696	33.95553589	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711640	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-27	-117.913475	33.95433044	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711641	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	D-28	-117.9194794	33.95515442	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711644	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Scott	1	-117.9045639	33.94853592	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711645	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	1	-117.9020538	33.95174789	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711646	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	2	-117.9029388	33.95319748	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711647	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	3	-117.8994217	33.95342636	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711648	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	4	-117.9033814	33.9553299	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711649	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	5	-117.9014969	33.9548912	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711650	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	6	-117.9021454	33.95515442	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711651	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	7	-117.9003601	33.95412064	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711652	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	8	-117.9024658	33.95427704	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711653	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	9	-117.9030685	33.95591736	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711654	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	10	-117.9032745	33.95451355	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711655	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	11	-117.9015656	33.95379257	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711657	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Rowland	A-2	-117.8986511	33.95280457	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711662	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-8	-117.90551	33.94894791	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711663	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	B-6	-117.9064484	33.94742966	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711665	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-29	-117.9167862	33.94765854	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711666	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	2	-117.8966217	33.95341492	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711667	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	3	-117.8966599	33.95514679	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711668	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	4	-117.8966904	33.95249939	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711669	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	5	-117.8966675	33.95138931	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711671	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	11	-117.891922	33.9485321	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711675	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	15	-117.8936386	33.9478569	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403711676	Boeco Drilling Co.	Plugged & Abandoned	Oak Canyon	Gilmour	1	-118.6795654	34.48125839	34.2	0	55	6	77	10	13	0	0	0	0	0	2	6	0	0	2	5
0403711677	Conoco Inc.	Plugged & Abandoned	Oak Canyon	Wickham	1	-118.6920624	34.46894836	8.6	0	94	6	77	34	67	0	0	0	2	0	5	6	0	22	2	5
0403711678	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	Foley	2	-118.686203	34.46158218	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711680	The Termo Company	Plugged & Abandoned	Oak Canyon	L. W. Gilmour Fee	2	-118.6870346	34.47392273	0.0	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711682	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	M. A. Gilmour	1	-118.6843567	34.46801758	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711687	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-F	13	-118.6958389	34.47286987	8.6	1	1	6	77	34	67	0	0	0	2	3	0	6	0	18	2	5
0403711688	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-F	15	-118.6971359	34.47274399	8.6	1	1	6	77	10	13	0	0	0	0	3	0	6	0	0	2	5
0403711690	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-G	3	-118.6930237	34.47611618	8.6	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403711691	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-G	6	-118.6912384	34.47465134	8.6	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403711695	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	USL-H	4	-118.6887207	34.46880722	8.6	1	0	6	77	34	67	0	0	0	2	3	3	6	0	24	2	5
0403711696	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	USL-H	5	-118.6925278	34.46904755	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711697	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-H	7	-118.693985	34.47039795	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711699	The Termo Company	Plugged & Abandoned	Oak Canyon	USL-H	10	-118.6909256	34.47189331	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711700	Hathaway Company	Plugged & Abandoned	Oak Canyon	Ram	1	-118.7033157	34.47439194	3.2	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403711701	Hathaway Company	Plugged & Abandoned	Oak Canyon	Ram	2	-118.703476	34.47325134	8.6	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403711703	Pyramid Oil Company	Plugged & Abandoned	Oak Canyon	USA-VC	1	-118.7029343	34.47961807	3.2	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403711704	Geo W. Johnsonny	Plugged & Abandoned	Oak Canyon	Wickham	1	-118.6900559	34.46992493	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711705	Loma Verde Petro. Co.	Plugged & Abandoned	Oak Canyon	Well No.	1	-118.6877518	34.46336746	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403711920	Sentinel Peak Resources California LLC	Plugged & Abandoned	Montebello	Temple	5	-118.0729828	34.02974319	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711923	Sentinel Peak Resources California LLC	Plugged & Abandoned	Montebello	Temple	8	-118.0722733	34.0293541	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711932	Sentinel Peak Resources California LLC	Plugged & Abandoned	Montebello	Temple	17	-118.0729675	34.02946854	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711954	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Repetto	15	-118.069931	34.03207397	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403711955	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Repetto	16	-118.069931	34.03227615	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403711956	Lacal Oil Corporation	Plugged & Abandoned	Montebello	Repetto	17	-118.0709	34.03210449	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711957	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Repetto	18	-118.0707474	34.03170013	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711965	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	2	-118.0657272	34.0281868	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403711966	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	3	-118.0715866	34.02996063	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711967	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	5	-118.0685043	34.02909088	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711968	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	7	-118.0716248	34.0309639	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711970	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	11	-118.0723648	34.03063583	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711971	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Baldwin	18	-118.0627289	34.02910233	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403711973	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-1)	4	-118.0721588	34.03207016	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711974	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-1)	7-A	-118.0726547	34.03125	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711975	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-1)	8	-118.0728226	34.03154373	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403711979	Harry H. Hillman	Plugged & Abandoned	Montebello	C. & M.	1	-118.0624313	34.02583313	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403711981	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	1A	-118.0730743	34.02407074	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403711982	Hillcrest Beverly Oil Corp.	Plugged & Abandoned	Montebello	Mc Ginley	2	-118.0718689	34.02909088	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711985	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	4	-118.0726929	34.02824783	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711991	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	10	-118.0728378	34.02900314	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711993	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	12	-118.0694504	34.02873611	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711994	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	13	-118.0698776	34.02794647	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711995	Hillcrest Beverly Oil Corp.	Plugged & Abandoned	Montebello	Mc Ginley	14	-118.072609	34.02918243	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711996	Hillcrest Beverly Oil Corp.	Plugged & Abandoned	Montebello	Mc Ginley	15	-118.0703888	34.02909088	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403711998	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	17	-118.0698013	34.02888489	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712002	Energy Production & Sales Co.	Plugged & Abandoned	Montebello	Mc Ginley	21	-118.0707779	34.02829361	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712003	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	22	-118.0717545	34.02731705	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712007	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	F-28	-118.0701981	34.02888489	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712008	Hillcrest Beverly Oil Corp.	Plugged & Abandoned	Montebello	Mc Ginley	F-29	-118.0723572	34.028965	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712009	Exxon Mobil Corporation	Plugged & Abandoned	Montebello	Montebello	1	-118.0606461	34.02759933	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712013	Davis Investment LLC	Plugged & Abandoned	Montebello	Baldwin	2	-118.0654221	34.0359726	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712028	Montebello Crude Oil Co.	Plugged & Abandoned	Montebello	Estrada	1	-118.0644989	34.02331924	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712034	I. B. Nutt	Plugged & Abandoned	Montebello	Nutt	1	-118.0625382	34.0271759	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712035	I. B. Nutt	Plugged & Abandoned	Montebello	Nutt	2	-118.0624161	34.02758408	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712037	Pacific Crude Oil	Plugged & Abandoned	Montebello	Pasadena	1-A	-118.0652237	34.02649307	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712247	Kernview Oil Co.	Plugged & Abandoned	Montebello	Alvitre	2	-118.0707016	34.03297043	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712248	Atlantic Oil Company	Plugged & Abandoned	Montebello	Alvitre	3	-118.0696411	34.03317261	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712249	Kernview Oil Co.	Plugged & Abandoned	Montebello	Alvitre	4	-118.0712662	34.03244781	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712251	Atlantic Oil Company	Plugged & Abandoned	Montebello	Cruz	1	-118.0687714	34.0297699	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712252	Atlantic Oil Company	Plugged & Abandoned	Montebello	Cruz	1-J	-118.0697022	34.02967834	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712253	Atlantic Oil Company	Plugged & Abandoned	Montebello	Cruz	2	-118.0672989	34.03044891	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712254	Atlantic Oil Company	Plugged & Abandoned	Montebello	Cruz	3	-118.0698624	34.02959824	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712262	Atlantic Richfield Company	Plugged & Abandoned	Montebello	Ciocca	1	-118.0615234	34.02419662	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712263	Atlantic Richfield Company	Plugged & Abandoned	Montebello	Ciocca	2	-118.0596542	34.02460098	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712264	Atlantic Richfield Company	Plugged & Abandoned	Montebello	Estrada	1	-118.0634232	34.0252533	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712265	Atlantic Richfield Company	Plugged & Abandoned	Montebello	Pasadena	1	-118.0650101	34.02701187	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712266	Atlantic Richfield Company	Plugged & Abandoned	Montebello	Pasadena	2	-118.0658493	34.02612305	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712273	Bradford Bishop	Plugged & Abandoned	Montebello	Friendship Eleven	1	-118.0651169	34.02350998	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712274	Bradford Bishop	Plugged & Abandoned	Montebello	Friendship Eleven	2	-118.0676727	34.02422333	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712275	Bradford Bishop	Plugged & Abandoned	Montebello	Siphon Road Unit	1	-118.0625839	34.0243988	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712299	Roy R. Farmer	Plugged & Abandoned	Montebello	Unspecified	1	-118.0606918	34.02634048	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712309	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Alvitre	1	-118.0688782	34.03432465	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712310	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	B.C.	1	-118.0608063	34.02518463	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712311	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	F	1	-118.0607224	34.02614212	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712312	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	F	2	-118.0598297	34.02591705	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712313	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	N	3	-118.0610809	34.02708054	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712314	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	P	1	-118.0641403	34.02634811	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712315	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	P	2	-118.065506	34.02519226	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712316	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Alvitre	1-J	-118.0705948	34.03277588	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712317	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Nutt	1-J	-118.0644608	34.02784348	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712318	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Nutt	2-J	-118.0635605	34.02799988	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712320	Republic Petroleum Co.	Plugged & Abandoned	Montebello	Republic Fee	1	-118.0670319	34.02593613	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712321	Republic Petroleum Co.	Plugged & Abandoned	Montebello	Walter	1	-118.0694885	34.02686691	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712322	Republic Petroleum Co.	Plugged & Abandoned	Montebello	Walter	1-A	-118.0696564	34.02693558	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712332	Rothschild Oil Co.	Plugged & Abandoned	Montebello	Walter	2	-118.0682449	34.02655792	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403712338	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Barry	1	-118.0696945	34.03147125	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712339	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Barry	2	-118.068718	34.03184128	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712340	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Barry	3	-118.0697098	34.03066254	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712341	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Barry	4	-118.0698013	34.0300293	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712342	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Barry	5	-118.0683594	34.03069305	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712349	Sierra Oil Co.	Plugged & Abandoned	Montebello	Sierra, Bishop Durkee	1	-118.0792007	34.01976013	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403712501	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	16	-118.0661774	34.02843857	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712502	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	9-A	-118.067009	34.02870178	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712503	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	10	-118.068573	34.0293045	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712504	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-1)	12	-118.0715179	34.0303421	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712505	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	13	-118.0638962	34.02878952	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712506	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	14	-118.0647125	34.02869797	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712507	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	15	-118.0655136	34.02833939	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712508	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	17	-118.066597	34.0297966	0.0	0	0	6	101	51	90	0	0	0	4	0	3	6	0	36	7	1
0403712509	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	19	-118.0649185	34.02991867	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403712510	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	19-A	-118.0652542	34.02986145	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712511	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	20	-118.068367	34.02925873	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712512	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Ciocca	1	-118.0574341	34.02559662	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712513	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	City Of Pasadena	1	-118.0671768	34.02199173	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712514	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Darlington	1	-118.0766144	34.03525162	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712515	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Darlington	2	-118.077507	34.03604507	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712516	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Darlington	3	-118.0762253	34.03484726	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712526	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Mullender	1	-118.0760422	34.02363205	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403712528	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma & Briano	1	-118.0684891	34.02841187	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712529	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma & Briano	2	-118.0672379	34.02787399	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712530	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	1	-118.0732956	34.03234863	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712531	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	2	-118.0726776	34.03240585	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712532	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	3	-118.0740433	34.03279877	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712533	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	4	-118.0759277	34.0345459	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712534	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	5	-118.0730896	34.03216171	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712535	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	6	-118.0747147	34.03344345	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712536	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	7	-118.0752945	34.03396988	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712537	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	8	-118.0733337	34.03348923	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712538	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	9	-118.0734711	34.03253555	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712539	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	10	-118.0729752	34.03247833	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712540	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Prugh	11	-118.0739136	34.03271103	302.3	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712542	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Shofner	1	-118.0769882	34.02180862	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403712543	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Taylor	1	-118.0781555	34.03684616	2985.5	0	0	6	101	40	76	0	0	2	3	0	3	6	0	45	7	1
0403712601	Downey Oil Corp.	Plugged & Abandoned	Newhall-Potrero	Well No.	1	-118.6072998	34.38127899	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712602	Shell Oil Company	Plugged & Abandoned	Newhall-Potrero	Shell Ferguson	1-7	-118.6070786	34.38795471	889.3	0	0	6	81	8	9	0	0	0	0	0	3	6	0	0	2	5
0403712604	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Ferguson	2	-118.6129074	34.38508224	0.0	0	76	6	81	20	37	0	0	0	0	0	4	6	0	0	2	5
0403712606	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Ferguson	4	-118.6130905	34.38722229	889.3	0	71	6	81	8	9	0	0	0	0	0	3	6	0	0	2	5
0403712609	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Ferguson	7-2	-118.606926	34.38341522	0.0	0	69	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712611	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Ferguson	9-2	-118.6029587	34.38227844	0.0	0	69	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712613	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	1	-118.6265183	34.40121078	432.9	0	79	6	81	14	22	0	0	0	0	0	4	6	0	0	2	5
0403712614	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	2-7	-118.6266937	34.39975739	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712615	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	3-5	-118.6208572	34.39775085	432.9	0	69	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712616	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	4-5	-118.6186066	34.39587784	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712617	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	5-5	-118.6158218	34.39428711	1394.7	0	68	6	81	14	22	0	0	1	0	0	3	6	0	9	2	5
0403712618	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Corp.-Wolfson	6-7	-118.6249085	34.40241623	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712619	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Newhall Land and Farming	1	-118.6422195	34.41133881	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712620	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	1	-118.6383514	34.39667892	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712622	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	3	-118.6360779	34.3948555	0.0	0	81	6	81	20	37	0	0	0	0	0	4	6	0	0	2	5
0403712623	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	4	-118.6363678	34.39713669	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712624	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	5	-118.6382599	34.39842224	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712625	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	6	-118.6405029	34.3982811	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712627	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	8	-118.6404038	34.40042114	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712628	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	9	-118.6428375	34.39692688	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712629	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	10	-118.6352463	34.39713287	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712630	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	11	-118.6359253	34.39860916	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712631	DKM Offshore Energy, Inc.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	12	-118.6395187	34.39549255	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712632	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	13	-118.6425552	34.40055466	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712633	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	14	-118.6331406	34.39574814	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712634	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	15	-118.6382675	34.40022659	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712636	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	17	-118.645134	34.40216827	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712637	DKM Offshore Energy, Inc.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	18	-118.6352234	34.39894485	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712639	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	20	-118.6473618	34.40228271	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712641	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	22	-118.6483612	34.40076828	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712643	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	24	-118.6491928	34.40193939	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712644	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	25	-118.6527176	34.40450668	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712645	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	27	-118.6530609	34.40559006	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712646	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	28	-118.6462631	34.40388489	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712648	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	30	-118.6440201	34.39893341	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712649	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	31	-118.6295548	34.39295197	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712650	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	32	-118.6167526	34.38498306	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712653	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	151	-118.6318665	34.39212418	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712654	DKM Offshore Energy, Inc.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	152	-118.6279984	34.39082336	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712655	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	153	-118.6268997	34.39058304	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712656	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	154	-118.642395	34.40671539	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712657	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	155	-118.6271286	34.40620422	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5

Abandoned Wells Ranking Information

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0403712658	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall-Potrero	N. L. & F.	1	-118.6635056	34.40998077	0.0	0	75	6	81	34	67	0	0	0	2	0	4	6	0	20	2	5
0403712659	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall-Potrero	N. L. & F.	2	-118.6650162	34.41057968	0.0	0	74	6	81	34	67	0	0	0	2	0	3	6	0	18	2	5
0403712660	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall-Potrero	Newhall	1	-118.6577377	34.40972519	0.0	0	77	6	81	14	22	0	0	0	0	0	4	6	0	0	2	5
0403712775	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	44	-118.6413117	34.40222549	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712776	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Nutt	1	-118.0645218	34.02767181	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712777	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma Briano	1-X1	-118.0695725	34.027771	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712778	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Piuma-Briano	2	-118.0693359	34.02858734	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712779	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Piuma-Briano	3	-118.0680313	34.02708054	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403712780	Pacific Energy Resources Ltd.	Plugged & Abandoned	Montebello	Piuma-Briano	5	-118.0694885	34.02785492	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712781	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma Briano	6	-118.0689316	34.02803421	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403712782	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma Briano	7	-118.0663834	34.02743149	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712783	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Piuma Briano	8	-118.0667496	34.02659607	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403712801	B & L Drilling Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5208283	34.34206772	15.1	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403712809	Garliepp & Assoc.	Plugged & Abandoned	Newhall	Well No.	1	-118.5294647	34.34392166	15.1	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712810	Grapevine Canon Oil Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5415192	34.33592224	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403712818	International Oil & Mining	Plugged & Abandoned	Newhall	C-H	1	-118.5788498	34.35159302	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712819	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Andrews	8	-118.5786057	34.35142136	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712820	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Caswell-Ellis	3	-118.5778198	34.35167313	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712821	SWC Resources Inc	Plugged & Abandoned	Newhall	Caswell-Ellis	4	-118.5786057	34.35137558	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712822	International Oil & Mining	Plugged & Abandoned	Newhall	Caswell-Ellis	6	-118.5789108	34.35219574	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712823	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Caswell-Ellis	7	-118.5786133	34.3516655	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712824	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Climax	1	-118.5811234	34.35305023	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712825	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Climax	2	-118.5813141	34.35295868	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712826	International Oil & Mining	Plugged & Abandoned	Newhall	Foster	1	-118.5788498	34.35158539	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712827	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	G.P.-Towsley	7	-118.5781174	34.35215759	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712828	SWC Resources Inc	Plugged & Abandoned	Newhall	Guaranty	2	-118.5794601	34.35195923	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712830	The Sun Drilling Co.	Plugged & Abandoned	Newhall	Lassalle	2	-118.5652847	34.35703278	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712831	Oryx Energy Company	Plugged & Abandoned	Newhall	Limbocker	1	-118.5796051	34.34899521	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712832	Crown Central Petro. Corp.	Plugged & Abandoned	Newhall	McCloskey-Bering	1	-118.5226364	34.34460449	0.0	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403712835	Terminal Drlg & Prod Co.	Plugged & Abandoned	Newhall	Hamilton	1	-118.5275574	34.34815598	0.0	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403712836	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Whitnah	1	-118.5238266	34.34392548	15.1	0	78	10	142	33	65	0	0	0	2	0	4	10	0	28	2	5
0403712838	Union Oil Company of California	Plugged & Abandoned	Any Field	Union-Tidewater Stuck	1	-118.6356583	34.34601974	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403712841	St. Anthony Oil Corp.	Plugged & Abandoned	Newhall	Lassalle	1	-118.5472946	34.35552216	185.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712847	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	33	-118.6264801	34.38995743	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712848	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	34	-118.634079	34.39315796	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712849	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	35	-118.6209641	34.38887024	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712850	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	36	-118.6313019	34.39310837	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712851	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	37	-118.6272583	34.39307404	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712852	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	38	-118.6272583	34.39136505	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712853	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	39	-118.625267	34.39158249	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712854	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	40	-118.6233215	34.38942337	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712855	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	41	-118.6536255	34.40723038	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712856	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	42	-118.6185913	34.3870697	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712857	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	43	-118.6297531	34.39458847	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712859	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	46	-118.6443787	34.40368652	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712860	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	47	-118.6468277	34.4054451	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712861	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	48	-118.6426697	34.40379333	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712862	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	49	-118.6210251	34.38720703	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712863	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	50	-118.6364365	34.40016937	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712864	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	51	-118.6318665	34.39672852	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712865	DKM Offshore Energy, Inc.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	52	-118.6396942	34.40256119	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712866	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	54	-118.6418533	34.40243912	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712867	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	55	-118.6316071	34.3985672	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712868	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	56	-118.6551895	34.40604019	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712869	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	57	-118.6339874	34.40063095	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712871	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	59	-118.6406632	34.40398026	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712872	DKM Offshore Energy, Inc.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	60	-118.6296158	34.39674377	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712873	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	61	-118.6339569	34.39981461	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712874	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	156	-118.6567841	34.4078331	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712875	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	62	-118.6580048	34.40776825	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712876	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	63	-118.6535721	34.40384674	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712877	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	64	-118.6418533	34.39171219	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712878	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	124	-118.6453705	34.40572739	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712879	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	125	-118.6378403	34.40567017	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712883	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	129	-118.6402588	34.40304565	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403712884	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	130	-118.6423492	34.39670563	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712885	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	131	-118.6451798	34.40320587	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712886	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	132	-118.632515	34.40395737	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712887	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	133	-118.6585312	34.4016037	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712888	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	134	-118.6540604	34.4079628	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712889	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	135	-118.6413879	34.40766144	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712891	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	138	-118.6425324	34.40454483	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712892	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	139	-118.6247559	34.39173508	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403712893	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	140	-118.6512604	34.40242386	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712895	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	142	-118.6452026	34.40797806	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712897	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	144	-118.6379242	34.40670776	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712898	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	145	-118.6448517	34.40777206	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712899	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	146	-118.6528473	34.4067421	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712900	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	147	-118.6303864	34.40529251	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403712901	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	27	-118.620903	34.37055206	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712902	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	28	-118.6241303	34.37088013	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712903	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	29	-118.62146	34.36955261	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712904	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	30	-118.6189423	34.37352371	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712905	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	31	-118.6196671	34.36918259	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712906	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	32	-118.623169	34.36825562	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712907	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	33	-118.6262512	34.36846542	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712908	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	34	-118.6257324	34.36935425	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712909	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	35	-118.6227188	34.36906052	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712910	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	36	-118.6233902	34.36882782	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712911	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	37	-118.6236801	34.37183762	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712912	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	39	-118.624588	34.37031937	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712913	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	40	-118.6246643	34.37324524	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712914	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	41	-118.6253662	34.37055969	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712915	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	42	-118.6211929	34.36856461	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712916	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	43	-118.6254807	34.3694458	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712917	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Rice	1	-118.5509186	34.33789444	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403712918	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Rice	2	-118.5524521	34.33837128	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403712919	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Rice	3	-118.551857	34.33847427	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712920	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Star	1	-118.6301346	34.37117386	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712921	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	3	-118.5645981	34.34636307	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712922	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	4	-118.5642929	34.34610367	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712923	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	5	-118.5643692	34.34594727	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712924	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	6	-118.5646133	34.34449768	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712925	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	7	-118.5635376	34.34822083	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712926	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	8	-118.5650406	34.34420395	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712927	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	9	-118.5638809	34.34835434	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712928	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	10	-118.5658569	34.34599304	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712929	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	11	-118.564003	34.34540558	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712930	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	12	-118.5638886	34.34444046	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712931	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	13	-118.563179	34.34368134	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712932	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	14	-118.5671539	34.34552765	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712933	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	15	-118.5651856	34.34539413	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712934	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	16	-118.5682068	34.34573364	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712935	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	17	-118.5637894	34.34780502	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712936	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	18	-118.5654068	34.34458923	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712937	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	19	-118.5663528	34.34528351	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712938	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	20	-118.5662994	34.34627151	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712939	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	21	-118.5662308	34.3445015	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712940	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	22	-118.5629349	34.34493256	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712941	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	23	-118.5671539	34.34496689	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712942	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	24	-118.5680161	34.34448624	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712943	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	25	-118.5653992	34.34724426	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712944	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	26	-118.5687714	34.34640884	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712945	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	27	-118.5696869	34.34672546	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712946	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	28	-118.5621185	34.34497833	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712947	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	29	-118.5615997	34.34451294	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712948	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	30	-118.5625153	34.34526825	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712949	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	31	-118.5645523	34.34546661	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712954	Buick Oil	Plugged & Abandoned	Newhall	Well No.	1	-118.4868774	34.33852005	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403712955	Buick Oil	Plugged & Abandoned	Newhall	Well No.	2	-118.4868851	34.33850479	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403712958	California Oil Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5400238	34.34611511	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712959	California Reliance	Plugged & Abandoned	Newhall	Simi	1	-118.6377869	34.37001419	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712971	Consolidated Midway Chief Oil Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5806274	34.34954071	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712973	Cormac Drilling & Prod.	Plugged & Abandoned	Newhall	Cormac	1	-118.6054916	34.36938095	0.0	0	65	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403712975	Dividend Oil Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5421448	34.35334778	185.7	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403712976	Deuel Pet. Co. Inc.	Plugged & Abandoned	Newgate	Newgate Unit A	1	-118.0349808	33.93154907	2760.2	0	0	4	62	36	71	0	0	2	3	0	3	4	0	35	10	4
0403712977	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Newgate Unit B	1	-118.0377197	33.92949295	122.3	0	0	5	81	36	71	0	0	0	3	0	3	5	0	24	10	4
0403712989	Alliance Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.5069199	34.33544159	0.0	0	0	5	81	33	65	0	0	0	2	0	3	5	0	16	2	5
0403712994	Arco Oil and Gas Co.	Plugged & Abandoned	Newhall	Watson	1	-118.5192184	34.33965302	0.0	0	0	10	142	28	57	0	0	0	1	0	3	10	0	13	2	5
0403712997	Cecil Basenberg	Plugged & Abandoned	Newhall	Hamilton	1	-118.5207291	34.34820175	0.0	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403713001	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	1	-118.6290817	34.36936951	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713002	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	2	-118.6284256	34.36927032	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713003	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	3	-118.6285782	34.36972046	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713004	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	4	-118.6293411	34.37001419	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713005	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	5	-118.6289978	34.37081528	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713006	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	6	-118.6307373	34.37009048	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713007	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	7	-118.6281662	34.37019348	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713008	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	8	-118.6315842	34.36885071	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713009	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	8A	-118.6312943	34.36824036	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713010	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	9	-118.6278458	34.37157059	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713011	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	10	-118.6290512	34.36862183	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713012	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	11	-118.6281662	34.3682785	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713013	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	12	-118.6328125	34.36971283	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713014	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	13	-118.6331177	34.37063599	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713015	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	14	-118.6344376	34.37015533	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713016	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	15	-118.631691	34.37076569	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713017	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	16	-118.6286926	34.3687439	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713018	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	17	-118.6337128	34.3691864	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713019	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	18	-118.631958	34.37025833	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713020	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	19	-118.6300964	34.36976624	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713021	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	20	-118.6287918	34.3715477	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713022	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	20A	-118.6289597	34.37158203	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713023	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	21	-118.6308441	34.37073517	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713024	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	22	-118.6274567	34.37082672	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713025	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	23	-118.6340637	34.37036896	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713026	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	24	-118.6295624	34.37047958	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713027	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	25	-118.6338882	34.36988068	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713028	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	26	-118.6339645	34.37097931	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713029	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	27	-118.629036	34.36898804	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713030	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	28	-118.6298981	34.36903381	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713031	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	29	-118.6295776	34.36877441	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713032	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	30	-118.6307221	34.36896133	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713033	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	31	-118.6320496	34.36919785	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713034	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	101	-118.6281662	34.37049103	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713035	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	102	-118.6288986	34.37137222	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713036	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	106	-118.6288834	34.37018967	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713037	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	107	-118.6323776	34.37891769	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713065	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Elsmere	24	-118.500145	34.34371948	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713066	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Hill	1	-118.6185913	34.36915588	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713068	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Hill	2	-118.61689	34.36909485	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713069	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Hill	3	-118.6210098	34.36903381	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713070	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Caswell-Ellis	3	-118.5785599	34.35198593	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713073	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Newhall Land & Farming	1	-118.6369782	34.36988449	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713074	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Newhall Land & Farming	7-1	-118.6262894	34.3775444	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713075	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	1	-118.6261063	34.36872101	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713077	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	2	-118.6251221	34.3696022	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713078	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	3	-118.6234589	34.36936951	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713079	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	4	-118.6261292	34.37074661	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713080	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	5	-118.6248703	34.37080383	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713081	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	6	-118.622673	34.37059402	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713082	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	7	-118.6238709	34.37178802	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713083	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	8	-118.6266022	34.36987305	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713084	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	9	-118.6243057	34.36990356	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713085	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	10	-118.6211624	34.37110519	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713086	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	11	-118.6221848	34.36857605	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403713087	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	12	-118.6203919	34.37152863	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713088	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	13	-118.6222611	34.36953354	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713089	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	14	-118.6206207	34.37001419	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713090	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	15	-118.619484	34.37005615	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713091	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	17	-118.6242371	34.36894608	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713092	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	18	-118.6227951	34.36999893	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713093	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	19	-118.6250992	34.36895752	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713094	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	20	-118.6261063	34.36869049	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713095	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	21	-118.6259003	34.36915207	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713096	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	22	-118.6266403	34.37123108	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713097	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	23	-118.6253357	34.37115097	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713098	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	24	-118.6218643	34.37005615	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713099	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	25	-118.6235504	34.37006378	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713100	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	P.C.O.	26	-118.621048	34.36853027	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713122	Occidental Petroleum Corporation	Plugged & Abandoned	Newhall	Well No.	1	-118.540596	34.33297729	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403713126	International Oil & Mining	Plugged & Abandoned	Newhall	H&E Unknown	1	-118.5780716	34.35293961	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713127	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	1	-118.5830383	34.35302353	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713128	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	2	-118.5839233	34.35363388	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713129	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	3	-118.5815964	34.35272598	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713130	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	4	-118.5846176	34.35307693	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713131	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	5	-118.5842896	34.35388565	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713132	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Hammon	6	-118.5812912	34.35311508	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713133	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	7	-118.5865326	34.35433197	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713134	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Mayhugh	1	-118.5793762	34.3509407	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713135	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Mayock	1	-118.5795059	34.35217667	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713136	Estate of Welburn Mayock	Plugged & Abandoned	Newhall	Washington	2	-118.5792999	34.35230255	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713137	SWC Resources Inc	Plugged & Abandoned	Newhall	Washington	3	-118.5791321	34.35257721	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713139	Mobil Oil Corporation	Plugged & Abandoned	Newhall	Mendota	1	-118.5384827	34.3339119	9.7	0	76	10	142	20	37	0	0	0	0	0	4	10	0	0	3	5
0403713165	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	1	-118.4925003	34.36991501	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713166	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	2	-118.4902344	34.37026215	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713167	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	3	-118.4931641	34.36737442	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713168	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	4	-118.4914932	34.36972809	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713169	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	6	-118.4918671	34.36860275	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713170	Atlantic Richfield Company	Plugged & Abandoned	Newhall	Banner	7	-118.4929733	34.3702774	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713199	Kernview Oil Co.	Plugged & Abandoned	Montebello	Baldwin	1	-118.0718613	34.03310394	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403713201	Oro Negra Dev. Corp.	Plugged & Abandoned	Newhall	Well No.	1	-118.5302124	34.34202194	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713202	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Moore	1	-118.6017532	34.36486053	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713203	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Moore	2	-118.5993576	34.36457062	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713204	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Moore	3	-118.6010284	34.36413574	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713205	Parton Transportation Co. & Assoc	Plugged & Abandoned	Newhall	Brown	1	-118.4929733	34.34086609	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713206	M. R. Peck & Sons	Plugged & Abandoned	Newhall	Brown	1	-118.4930801	34.3384552	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713208	Pico Dome Oil & Gas Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.5358429	34.35098267	185.7	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403713209	Pioneer Petro. Co., Ltd	Plugged & Abandoned	Newhall	Well No.	1	-118.5357361	34.34817505	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713216	Hubbard S. Russell	Plugged & Abandoned	Newhall	Needham	1	-118.5252075	34.35116959	0.0	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403713218	San Marino Oil Company	Plugged & Abandoned	Newhall	Rice-Hunter-Jackson	1	-118.5463028	34.33604431	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403713220	Santa Ana Oil Co.	Plugged & Abandoned	Newhall	Well No.	1	-118.4931183	34.34102249	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403713244	Spencer & Brubaker	Plugged & Abandoned	Newhall	Well No.	1-A	-118.5819855	34.35357285	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403713245	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	65	-118.6373825	34.40258789	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713246	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	67	-118.6597519	34.40970993	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713250	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	71	-118.6383209	34.38993835	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403713251	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	72	-118.6401901	34.40243912	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713252	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	73	-118.628685	34.39699173	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713254	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	75	-118.6407929	34.40343475	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713256	California Resources Production Corporation	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	77	-118.6245575	34.39377213	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713257	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	78	-118.625412	34.39468765	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713258	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	79	-118.6295853	34.39840317	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713262	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	83	-118.6272278	34.39830017	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713263	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	84	-118.6337204	34.4020195	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713264	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	85	-118.6287079	34.4000206	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713265	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	86	-118.6557236	34.40736389	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713266	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	87	-118.6367493	34.39523315	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713267	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	88	-118.6235199	34.39637756	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713268	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	89	-118.6295166	34.39168167	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403713271	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	91-A	-118.620079	34.3943367	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713272	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	92	-118.6367798	34.3971138	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5

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0403713274	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	94	-118.625679	34.38967514	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403713275	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	95	-118.6455307	34.39907074	432.9	1	0	6	81	14	22	0	0	0	0	3	3	6	0	0	2	5
0403713277	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	97	-118.6381989	34.40312958	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713278	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	98	-118.6489029	34.40127182	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713280	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	100	-118.6401444	34.39551163	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713283	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	104	-118.6599197	34.40771866	0.0	0	67	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713284	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	105	-118.6374207	34.39944458	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713289	Oryx Energy Company	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	110	-118.6500168	34.40576553	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713290	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	111	-118.6554031	34.40687561	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713291	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	112	-118.6431503	34.40380859	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713292	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	113	-118.6459961	34.40296936	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713294	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	115	-118.6378403	34.4019165	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713295	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	116	-118.6549149	34.4067955	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713296	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	118	-118.6401978	34.40053558	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713297	Medallion Calif Properties Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco	119	-118.6419983	34.40551376	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713357	Myers & Wilhite	Plugged & Abandoned	Placerita	Myers & Wilhite	1	-118.4853516	34.38265991	94.5	0	0	6	98	21	41	0	0	0	0	0	3	6	0	0	2	5
0403713359	Nelson-Phillips Oil Co.	Plugged & Abandoned	Placerita	Swall-Ferrier	3	-118.4885941	34.38148117	94.5	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403713368	Oro Negro, Inc.	Plugged & Abandoned	Placerita	Albert	10	-118.4910965	34.37350464	0.0	0	65	6	98	26	52	0	0	0	1	0	3	6	0	9	2	5
0403713371	Oro Negro, Inc.	Plugged & Abandoned	Placerita	Albert	13	-118.494133	34.37387848	0.0	0	64	6	98	21	40	0	0	0	0	0	2	6	0	0	2	5
0403713401	Occidental Petroleum Corporation	Plugged & Abandoned	Placerita	Tunnel	1	-118.4934692	34.37137222	0.0	0	0	6	98	26	52	0	0	0	1	0	3	6	0	9	2	5
0403713409	Chevron U.S.A. Inc.	Plugged & Abandoned	Placerita	Placerita	23	-118.4936981	34.37494659	0.0	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403713410	Chevron U.S.A. Inc.	Plugged & Abandoned	Placerita	Placerita	24	-118.4923477	34.37472534	0.0	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403713411	Occidental Petroleum Corporation	Plugged & Abandoned	Placerita	Placerita	501	-118.4930496	34.37430573	0.0	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403713506	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	37	-118.597229	34.41316986	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713507	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	71	-118.371666	34.00236893	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403713508	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	173	-118.3672485	33.99068451	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403713511	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	176	-118.3679047	34.00330353	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403713512	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	177	-118.3688126	34.00244522	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403713513	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	178	-118.370575	33.99836349	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403713514	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	179	-118.3679886	33.99500656	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403713515	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	180	-118.3734055	33.99905014	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403713516	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	235	-118.3682785	33.99397659	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403713517	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	236	-118.3653412	33.99345016	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403713518	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	237	-118.3677292	33.99080276	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403713519	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	238	-118.3703766	33.99722672	2760.6	0	0	9	94	32	62	0	0	2	2	0	3	9	0	48	5	2
0403713520	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	47	-118.3770065	34.00121307	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403713521	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	280	-118.3683243	33.99570847	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403713527	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	51	-118.5923691	34.41147614	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403713528	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Miley	1	-118.2696075	33.90058136	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403713529	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	12	-118.2773285	33.90659714	0.0	0	0	8	94	64	98	0	0	0	4	0	3	8	0	44	9	2
0403713551	Reuben Agran, Trustee	Plugged & Abandoned	Rosecrans	Watson	1	-118.2662964	33.89754105	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713553	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Boren	1	-118.268219	33.90083313	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403713554	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Cannon	1	-118.2660675	33.90099716	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403713555	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Colby	1	-118.2699204	33.89845657	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713556	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Colby	2	-118.2686768	33.89848328	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713557	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Colby	3	-118.2698212	33.89857101	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713558	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Exeter	1	-118.2703247	33.89959717	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713559	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Exeter	2	-118.2689056	33.89944839	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713560	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Exeter	3	-118.2698059	33.8994751	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713561	Terra Exploration & Production Co., Inc.	Plugged & Abandoned	Rosecrans	Kishima	1	-118.2676392	33.89945984	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713562	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Miley	2	-118.2700424	33.90062332	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403713563	Atlantic Oil Company	Plugged & Abandoned	Rosecrans	Wilcox	1	-118.2676926	33.89745712	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713570	Arco Western Energy Co.	Plugged & Abandoned	Rosecrans	Rosecrans	1	-118.2694778	33.90001678	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713571	BP Exploration U.S.A. Inc.	Plugged & Abandoned	Rosecrans	Walsh	1	-118.267868	33.89907837	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713572	Ball & Gerner	Plugged & Abandoned	Rosecrans	Bud Gerner	2	-118.2816696	33.91775131	8919.4	0	0	8	94	54	92	0	1	5	4	0	3	8	3	126	9	2
0403713575	Henry F. Bloomfield	Plugged & Abandoned	Rosecrans	Gordon	1	-118.2820892	33.9111557	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713576	Bradley and Menveg	Plugged & Abandoned	Rosecrans	Halverson	1	-118.2801209	33.91309357	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713577	Calstar Petroleum Co.	Plugged & Abandoned	Rosecrans	Shoemaker	2	-118.2787933	33.91119766	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713579	Century Oil Co.	Plugged & Abandoned	Rosecrans	Century-Wright	16	-118.2769013	33.91360474	0.0	0	0	8	94	56	94	0	0	0	4	0	3	8	0	44	9	2
0403713580	Chicago Oil Co.	Plugged & Abandoned	Rosecrans	Founders	1	-118.2693405	33.89560318	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713581	W. J. Cole	Plugged & Abandoned	Rosecrans	Cole	1	-118.2751846	33.89744568	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713582	Asioco Inc.	Plugged & Abandoned	Rosecrans	Duchess	1	-118.2759781	33.89746857	0.0	0	81	8	94	68	99	0	0	0	4	0	4	8	0	48	9	2
0403713586	Delaney Petroleum Corp.	Plugged & Abandoned	Rosecrans	Mars	1	-118.2699814	33.90014267	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713590	Emmons & Emmons	Plugged & Abandoned	Rosecrans	Rosecrans	1	-118.2720718	33.89862442	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713591	F. E. Fairfield	Plugged & Abandoned	Rosecrans	Abel	1	-118.2752762	33.89885712	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403713605	Goodknight, Bass & Garner	Plugged & Abandoned	Rosecrans	Garner	1	-118.2694778	33.90020752	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713606	El Chico Corp.	Plugged & Abandoned	Rosecrans	Gordon	1	-118.2797089	33.89770889	0.0	0	0	8	94	64	98	0	0	0	4	0	3	8	0	44	9	2
0403713608	Graner Oil Co.	Plugged & Abandoned	Rosecrans	Swigert	1	-118.2794342	33.91400146	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713610	Chevron U.S.A. Inc.	Plugged & Abandoned	Rosecrans	Universal-Trust	3	-118.2815552	33.90234375	0.0	0	0	8	94	64	98	0	1	0	4	0	3	8	3	56	9	2
0403713625	Howard Oil Co., Inc.	Plugged & Abandoned	Rosecrans	Gordon	1	-118.2771072	33.89808273	0.0	0	0	8	94	64	98	0	0	0	4	0	3	8	0	44	9	2
0403713627	Exxon Mobil Corporation	Plugged & Abandoned	Rosecrans	Athens	1	-118.2804565	33.91677475	0.0	0	0	8	94	54	92	0	1	0	4	0	3	8	3	56	9	2
0403713629	Isco Petro. Corp.	Plugged & Abandoned	Rosecrans	Rosecrans Abel	2	-118.2761078	33.89878845	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713634	Kay Oil Co.	Plugged & Abandoned	Rosecrans	Dozen	1	-118.2792587	33.91123199	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713635	Kay Oil Co.	Plugged & Abandoned	Rosecrans	Mahler	1	-118.2799759	33.91119003	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713636	Kay Oil Co.	Plugged & Abandoned	Rosecrans	Shoemaker	1	-118.279213	33.91114044	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403713639	Lyman Investment Co.	Plugged & Abandoned	Rosecrans	Marine	41	-118.2681274	33.8995285	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403713641	Macrate Oil Co.	Plugged & Abandoned	Rosecrans	Gray	1	-118.2733307	33.90498352	13849.0	0	0	8	94	57	94	0	0	7	4	0	3	8	0	121	9	2
0403713645	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Trust	3	-118.2814941	33.90414429	0.0	1	0	8	94	64	98	0	1	0	4	3	3	8	3	68	9	2
0403713646	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Trust	4	-118.2822189	33.90416336	0.0	0	0	8	94	64	98	0	1	0	4	0	3	8	3	56	9	2
0403713648	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Trust	6	-118.2822037	33.90560913	0.0	0	0	8	94	64	98	0	1	0	4	0	3	8	3	56	9	2
0403713708	California Resources Production Corporation	Plugged & Abandoned	Ramona	Kern	2	-118.7037354	34.43748093	0.0	0	0	6	75	33	65	0	0	0	2	0	3	6	0	18	2	5
0403713720	California Resources Production Corporation	Plugged & Abandoned	Ramona	Kern	30	-118.694458	34.4401207	13.8	0	0	6	75	34	67	0	0	0	2	0	3	6	0	18	2	5
0403713725	Cook Westrn Oil & Gas Prod Inc	Plugged & Abandoned	Ramona	Kern	38	-118.6991196	34.4388504	0.0	0	0	6	75	34	67	0	0	0	2	0	3	6	0	18	2	5
0403713730	Phillips Petroleum Company	Plugged & Abandoned	Ramona	Handy	104	-118.69487	34.43411636	0.0	1	0	6	75	34	67	0	0	0	2	3	3	6	0	24	2	5
0403713731	California Resources Production Corporation	Plugged & Abandoned	Ramona	Orduno	103	-118.703682	34.43250275	0.0	0	76	6	75	33	65	0	0	0	2	0	4	6	0	20	2	5
0403713737	Chevron U.S.A. Inc.	Plugged & Abandoned	Ramona	Sepulveda	15	-118.690033	34.43906784	13.8	0	0	6	75	34	67	0	0	0	2	0	3	6	0	18	2	5
0403713745	Chevron U.S.A. Inc.	Plugged & Abandoned	Ramona	Sepulveda	24	-118.6888962	34.4382515	13.8	0	0	6	75	34	67	0	0	0	2	0	3	6	0	18	2	5
0403713746	Tesoro Petroleum Corp.	Plugged & Abandoned	Ramona, North	Intex S.P.-Fiedler	1	-118.7062073	34.44485092	0.0	0	0	2	72	34	67	0	0	0	2	0	3	2	0	10	2	5
0403713747	St. Helens Petro. Corp., Ltd	Plugged & Abandoned	Ramona, North	Ladd	1	-118.7057114	34.44715118	0.0	0	0	2	72	34	67	0	0	0	2	0	3	2	0	10	2	5
0403713748	Chevron U.S.A. Inc.	Plugged & Abandoned	Ramona, North	Deaton	1	-118.7071304	34.44484711	0.0	0	74	2	72	34	67	0	0	0	2	0	3	2	0	10	2	5
0403713797	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Dow R.G.C.	7	-118.456337	33.97238541	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713798	MDR Hotels, LLC	Plugged & Abandoned	Playa Del Rey	Dow R.G.C.	10	-118.4579163	33.9745636	20988.6	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713801	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio D.R.L. & W.	2	-118.4456253	33.97678375	984.8	0	0	7	89	23	45	0	1	0	0	0	3	7	3	0	5	4
0403713802	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio Dickinson	1	-118.4614334	33.97914886	25710.8	0	0	7	89	23	44	0	1	10	0	0	3	7	3	130	5	4
0403713804	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio Howland	1	-118.4538345	33.9812851	11923.4	0	0	7	89	23	45	0	1	6	0	0	3	7	3	78	5	4
0403713805	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	1	-118.4610748	33.97808456	25710.8	0	0	7	89	23	44	0	1	10	0	0	3	7	3	130	5	4
0403713806	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	2	-118.4600067	33.97684479	25710.8	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713807	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	3	-118.4547043	33.97027588	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713808	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	4	-118.4545441	33.97057343	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713809	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	5	-118.4569016	33.97309113	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713810	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	6	-118.4557953	33.97166824	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713811	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	8	-118.4552536	33.97097778	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713812	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Dow R.G.C.	9	-118.4574356	33.97380447	20988.6	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713813	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	11	-118.455658	33.97196579	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713814	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	12	-118.4545136	33.9720459	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713815	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	13	-118.4518356	33.97338486	20135.5	0	0	7	89	23	45	0	1	10	0	0	3	7	3	130	5	4
0403713816	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	14	-118.4537811	33.97091293	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403713817	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	15	-118.4522553	33.97161865	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713818	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	16	-118.4509735	33.97219849	0.0	0	0	7	89	23	45	0	1	0	0	0	3	7	3	0	5	4
0403713819	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	17	-118.4531632	33.97273254	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713820	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Ohio R.G.C.	18	-118.4477387	33.97523499	0.0	0	0	7	89	23	45	0	1	0	0	0	3	7	3	0	5	4
0403713827	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	S.C.G.	1	-118.4502182	33.96891022	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713830	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Union D.R.	1	-118.454361	33.96947861	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713831	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Union D.R.	2	-118.454216	33.96925354	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713832	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Union D.R.	3	-118.4519959	33.96728516	0.0	0	0	7	89	19	36	0	1	0	0	0	3	7	3	0	5	4
0403713836	County of Los Angeles	Plugged & Abandoned	Playa Del Rey	Vulcan	1	-118.4376602	33.97826385	0.0	0	0	7	89	23	45	0	1	0	0	0	3	7	3	0	5	4
0403713890	Chevron U.S.A. Inc.	Plugged & Abandoned	Placerita	Placerita	6	-118.4904327	34.37960815	94.5	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403714011	Southern California Gas Company	Plugged & Abandoned	Playa Del Rey	Del Rey	6	-118.4528732	33.96987534	48573.9	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403714012	Southern California Gas Company	Plugged & Abandoned	Playa Del Rey	Del Rey	7	-118.4515152	33.97053909	20135.5	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403714013	Southern California Gas Company	Plugged & Abandoned	Playa Del Rey	Del Rey	8	-118.4501419	33.97118759	20135.5	0	0	7	89	23	45	0	1	10	0	0	3	7	3	130	5	4
0403714015	Southern California Gas Company	Plugged & Abandoned	Playa Del Rey	Del Rey	10	-118.4507141	33.96938705	48573.9	0	0	7	89	19	36	0	1	10	0	0	3	7	3	130	5	4
0403714021	Southern California Gas Company	Plugged & Abandoned	Playa Del Rey	Del Rey	16	-118.443985	33.97256088	984.8	0	0	7	89	23	45	0	1	0	0	0	3	7	3	0	5	4
0403714153	Crown Central Petro. Corp.	Plugged & Abandoned	Placerita	Indian-Kraft	3	-118.4901581	34.38050461	0.0	0	0	6	98	21	40	0	0	0	0	0	3	6	0	0	2	5
0403714353	Charles T. McCowin, Jr.	Plugged & Abandoned	Rosecrans	Unspecified	1	-118.278122	33.91320038	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714354	Charles T. McCowin, Jr.	Plugged & Abandoned	Rosecrans	Unspecified	2	-118.2780762	33.91385269	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714355	Charles T. McCowin, Jr.	Plugged & Abandoned	Rosecrans	Unspecified	3	-118.2771454	33.91319656	0.0	0	0	8	94	56	94	0	0	0	4	0	3	8	0	44	9	2
0403714356	Charles T. McCowin, Jr.	Plugged & Abandoned	Rosecrans	Unspecified	4	-118.2779083	33.91452789	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714358	Midfield Corp.	Plugged & Abandoned	Rosecrans	Murdock	1	-118.2698822	33.89732116	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714363	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	1	-118.2778473	33.90958023	0.0	0	0	8	94	56	94	0	0	0	4	0	3	8	0	44	9	2
0403714364	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	2	-118.2778626	33.91046524	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403714365	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	2-A	-118.2778549	33.91055298	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714366	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	3	-118.2767944	33.90959549	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714367	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	4	-118.2778473	33.91239166	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714368	Mobil Oil Corporation	Plugged & Abandoned	Rosecrans	Vaughn	5	-118.2768707	33.91239166	0.0	0	0	8	94	56	94	0	0	0	4	0	3	8	0	44	9	2
0403714370	William W. Moreland	Plugged & Abandoned	Any Field	Moreland	1	-118.2588348	33.90217972	14868.6	0	0	5	81	57	94	0	0	8	4	0	3	5	0	96	9	2
0403714372	Smith International, Inc.	Plugged & Abandoned	Rosecrans	Burson	1	-118.2668152	33.89855957	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714373	Smith International, Inc.	Plugged & Abandoned	Rosecrans	Burson	2	-118.2668686	33.89839554	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714374	W. E. Nicolai & Son	Plugged & Abandoned	Rosecrans	Smith	1	-118.2662354	33.89740372	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714375	O'Donnell Oil, LLC	Plugged & Abandoned	Rosecrans	Unspecified	46	-118.2752533	33.897995	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714378	Pacific Petro. Corp.	Plugged & Abandoned	Rosecrans	Unspecified	1	-118.2664185	33.89935303	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714379	W. S. Payne, Jr., Oper.	Plugged & Abandoned	Rosecrans	Murdock	2	-118.2689056	33.89559174	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714381	Planet Oil Co.	Plugged & Abandoned	Rosecrans	Unspecified	2	-118.2800827	33.91242981	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714383	F. Robert Reynolds	Plugged & Abandoned	Rosecrans	Planet	3	-118.2801514	33.91267014	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714386	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Gordon	2	-118.2770462	33.89851379	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403714387	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Gordon	3	-118.2770081	33.8973465	0.0	0	0	8	94	64	98	0	0	0	4	0	3	8	0	44	9	2
0403714396	R. W. Russell	Plugged & Abandoned	Rosecrans	Athens	2	-118.2814789	33.91090775	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714398	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Unspecified	47	-118.2775116	33.91221237	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714399	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Russell	1	-118.2779388	33.9095726	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714400	Marmac Resources Co.	Plugged & Abandoned	Rosecrans	Russell	6	-118.2778778	33.91157913	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714401	Scope Industries	Plugged & Abandoned	Rosecrans	Howard Townsite Owners	1	-118.2926331	33.92168045	10443.1	0	0	8	94	55	93	0	1	6	4	0	3	8	3	140	9	2
0403714411	Shell Western E&P Inc.	Plugged & Abandoned	Rosecrans	Rosecrans	1	-118.2752533	33.90149689	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714412	Shell Western E&P Inc.	Plugged & Abandoned	Rosecrans	Rosecrans	2	-118.2771378	33.90158463	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403714413	Phillips Petroleum Co.	Plugged & Abandoned	Rosecrans	Kirby	1	-118.2711029	33.89861298	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714414	Phillips Petroleum Co.	Plugged & Abandoned	Rosecrans	Kirby	2	-118.2723312	33.89866257	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714415	Ronald C. Smith and Assoc.	Plugged & Abandoned	Rosecrans	Bolson	1	-118.2677994	33.89808655	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714418	Guy N. Stafford	Plugged & Abandoned	Rosecrans	Athens	8	-118.2819519	33.91653824	3332.7	0	0	8	94	54	92	0	1	2	4	0	3	8	3	84	9	2
0403714426	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Higgins	1	-118.2724915	33.89966583	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714427	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Higgins	2	-118.2711182	33.9001236	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714428	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Higgins	3	-118.2715912	33.89942932	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714429	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Higgins	4	-118.2722931	33.89979172	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714430	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	1	-118.2777329	33.90876389	0.0	0	0	8	94	56	94	0	0	0	4	0	3	8	0	44	9	2
0403714432	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	3	-118.274704	33.90237427	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714434	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	4	-118.274704	33.90611649	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714436	Robert W. Shull Co. Property Mgmnt.	Plugged & Abandoned	Rosecrans	O'dea	6	-118.2759323	33.90287018	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714441	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	13	-118.2773743	33.90277481	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403714449	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	O'dea	21	-118.2763367	33.90562057	0.0	0	78	8	94	57	94	0	0	0	4	0	4	8	0	48	9	2
0403714450	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	1	-118.2732925	33.900177	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714457	Crown Central Petro. Corp.	Plugged & Abandoned	Rosecrans	Athens	13	-118.2816925	33.91674805	11328.3	0	0	8	94	54	92	0	1	6	4	0	3	8	3	140	9	2
0403714461	Crown Central Petro. Corp.	Plugged & Abandoned	Rosecrans	Kreitz Community	3	-118.281662	33.91738129	11328.3	0	0	8	94	54	92	0	1	6	4	0	3	8	3	140	9	2
0403714463	Crown Central Petro. Corp.	Plugged & Abandoned	Rosecrans	Marine	32	-118.2714386	33.89816666	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714466	Crown Central Petro. Corp.	Plugged & Abandoned	Rosecrans	Marine	36	-118.2707138	33.89831543	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714475	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	1	-118.2731628	33.8995018	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714476	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	2	-118.2744293	33.89900589	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714477	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	3	-118.2710724	33.89909363	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714478	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	4	-118.2731552	33.8981514	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714479	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	5	-118.2707291	33.89909744	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714480	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	7	-118.2705841	33.89767838	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714481	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	8	-118.2745895	33.89910507	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714482	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	9	-118.2735062	33.89940262	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714483	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	10	-118.2721405	33.89907074	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714484	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	11	-118.2731705	33.89801025	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714485	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Maxwell Community	12	-118.2742157	33.8978157	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714487	Mobil Oil Exploration & Production North America, Inc.	Plugged & Abandoned	Rosecrans	Weaver	1	-118.2694931	33.89764786	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714488	William Harrison Taylor, Trustee	Plugged & Abandoned	Rosecrans	Unspecified	1	-118.2721634	33.90471649	13849.0	0	0	8	94	57	94	0	0	7	4	0	3	8	0	121	9	2
0403714493	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Chandler	2	-118.2733383	33.9035759	4817.4	0	0	8	94	57	94	0	0	3	4	0	3	8	0	77	9	2
0403714498	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	2	-118.2817535	33.91140747	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714499	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	3	-118.281807	33.91365814	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714502	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	6	-118.281868	33.91065216	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714507	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	11	-118.2795258	33.90956879	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714517	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	24	-118.2818832	33.91615295	0.0	0	0	8	94	54	92	0	1	0	4	0	3	8	3	56	9	2
0403714518	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	25	-118.2814331	33.91600418	0.0	0	0	8	94	54	92	0	1	0	4	0	3	8	3	56	9	2
0403714519	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	26	-118.2804413	33.91595459	82.0	0	0	8	94	54	92	0	1	0	4	0	3	8	3	56	9	2
0403714521	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	28	-118.2818527	33.91495895	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714522	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	29	-118.2804947	33.91378403	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714523	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	30	-118.2788162	33.91360092	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2

Abandoned Wells Ranking Information

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0403714524	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	31	-118.2788315	33.91246796	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714525	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	32	-118.2788162	33.91453552	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714526	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	34	-118.2801285	33.91495514	82.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714528	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	36	-118.2817459	33.91200638	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714530	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	38	-118.2816162	33.91053009	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714531	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	39	-118.2799377	33.9095993	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714533	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	41	-118.2819748	33.91510773	0.0	0	0	8	94	54	92	0	1	0	4	0	3	8	3	56	9	2
0403714534	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	42	-118.281807	33.91394424	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714535	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	43	-118.2799835	33.91361618	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714536	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Howard Park	44	-118.2803803	33.91400909	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714537	Geo Petroleum Inc.	Plugged & Abandoned	Rosecrans	Howard Park	46	-118.280571	33.91271591	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714538	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Hursey	1	-118.2662506	33.90239334	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714539	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Jamison	1	-118.2798767	33.91256714	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714551	Crest Petro. Co.	Plugged & Abandoned	Rosecrans, South	Wolf	1	-118.2687531	33.89270401	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714552	Worldwide Energy Corp.	Plugged & Abandoned	Rosecrans, South	Unspecified	102	-118.2766037	33.89244843	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714553	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans, South	Larsen	1	-118.2694702	33.89460373	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714554	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans, South	Pierce	2	-118.2681732	33.89464188	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714555	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans, South	Reed	1	-118.2690125	33.89354706	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714557	CRG Properties Ltd.	Plugged & Abandoned	Rosecrans, South	Mc Millen Community	1	-118.2737122	33.89453506	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714558	CRG Properties Ltd.	Plugged & Abandoned	Rosecrans, South	Mc Millen Community	2	-118.2749023	33.89453125	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714559	CRG Properties Ltd.	Plugged & Abandoned	Rosecrans, South	Mc Millen Community	3	-118.2757797	33.89451599	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714560	CRG Properties Ltd.	Plugged & Abandoned	Rosecrans, South	Mc Millen Community	4	-118.2747803	33.89356232	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714561	CRG Properties Ltd.	Plugged & Abandoned	Rosecrans, South	Mc Millen Community	5	-118.2758942	33.89338303	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714562	Alma K. Larabee and A. Chas. Lantz	Plugged & Abandoned	Rosecrans, South	Unspecified	1	-118.2765808	33.89067841	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714563	Mission Oil Corp.	Plugged & Abandoned	Rosecrans, South	Pierce	1	-118.2686691	33.89453506	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714564	R. F. Oakes, E. E. Combs, et al	Plugged & Abandoned	Rosecrans, South	Willis	1	-118.2700195	33.89369202	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714565	Worldwide Energy Corp.	Plugged & Abandoned	Rosecrans, South	Unspecified	A-W-1	-118.2757034	33.89254379	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714566	Worldwide Energy Corp.	Plugged & Abandoned	Rosecrans, South	Unspecified	A-W-3	-118.2747269	33.89257431	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714567	Worldwide Energy Corp.	Plugged & Abandoned	Rosecrans, South	Unspecified	A-W-4	-118.2754211	33.89170837	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714570	Royalty Service Corp., Ltd.	Plugged & Abandoned	Rosecrans, South	Stein	1	-118.2745743	33.89086151	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714571	Scope Industries	Plugged & Abandoned	Rosecrans, South	Maxell Comm.	13	-118.2740326	33.89629745	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714572	Scope Industries Inc.	Plugged & Abandoned	Rosecrans, South	Rowena	1	-118.2747955	33.89533615	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714573	Scope Industries Inc.	Plugged & Abandoned	Rosecrans, South	Rowena	2	-118.2758713	33.89569092	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714574	Scope Industries Inc.	Plugged & Abandoned	Rosecrans, South	Slabaugh	1	-118.2735062	33.89536285	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714575	Scope Industries Inc.	Plugged & Abandoned	Rosecrans, South	Slabaugh	2	-118.2725449	33.89537048	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714576	Scope Industries Inc.	Plugged & Abandoned	Rosecrans, South	Van Nuys	1	-118.2758865	33.89624786	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714578	Asioco Inc.	Plugged & Abandoned	Rosecrans, South	Darling Community	1	-118.2675247	33.89174271	2300.2	0	80	4	79	68	99	0	0	2	4	0	4	4	0	48	9	2
0403714579	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans, South	Santa Fe Corp.	1	-118.2651215	33.89167023	3282.1	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714580	Fred-Lite Blocks, Inc.	Plugged & Abandoned	Rosecrans, South	Frederick's Black Gold	1	-118.2710571	33.89286423	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714581	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	2	-118.2767258	33.89526749	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714582	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	3	-118.2767716	33.89608765	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714583	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	4	-118.2767639	33.89445877	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714584	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	5	-118.2766647	33.8936882	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714585	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	6	-118.2780304	33.89613342	0.0	0	0	4	79	64	98	0	0	0	4	0	3	4	0	28	9	2
0403714586	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	7	-118.2778473	33.89322662	0.0	0	0	4	79	70	99	0	0	0	4	0	3	4	0	28	9	2
0403714587	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	8	-118.2791443	33.89463043	0.0	0	0	4	79	70	99	0	0	0	4	0	3	4	0	28	9	2
0403714588	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	9	-118.2774429	33.89567566	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714589	Union Oil Company of California	Plugged & Abandoned	Rosecrans, South	Gordon	10	-118.2774353	33.89479446	0.0	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403714592	E. T. Wix	Plugged & Abandoned	Rosecrans, South	Simmons	1	-118.2692184	33.88760376	14673.9	0	0	4	79	68	99	0	0	8	4	0	3	4	0	84	9	2
0403714593	John Guzman Crane Service, Inc.	Plugged & Abandoned	Rosecrans, South	Hatfield	1	-118.2704086	33.89080048	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403714651	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	2	-118.2719421	33.90048218	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714652	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	3	-118.2734299	33.90136337	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714653	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	3-A	-118.2730942	33.90136337	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714654	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	4	-118.2707138	33.9008255	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714655	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	5	-118.2718201	33.90138626	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714657	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	6	-118.2725678	33.90039444	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714658	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	7	-118.2701492	33.90136719	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714659	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	8	-118.2734451	33.90081787	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714660	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	9	-118.2733917	33.90003204	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714661	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	10	-118.2732849	33.90120316	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714662	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	11	-118.272728	33.9002533	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714663	Sun Exploration & Production Co.	Plugged & Abandoned	Rosecrans	Rosecrans	12	-118.273407	33.90057755	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714664	Pacific Coast Energy Company LP	Plugged & Abandoned	Rosecrans	Rosecrans A	13	-118.2720871	33.90067673	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714665	Pacific Coast Energy Company LP	Plugged & Abandoned	Rosecrans	Rosecrans A	14	-118.2724381	33.90145111	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714838	A. B. Edler	Plugged & Abandoned	Santa Fe Springs	Unspecified	1	-118.0484695	33.93282318	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403714842	F. W. W. Drilling Co.	Plugged & Abandoned	Santa Fe Springs	Unspecified	1	-118.0484161	33.93436813	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403714982	Chevron U.S.A. Inc.	Plugged & Abandoned	Rosecrans	Brockley	1	-118.2734757	33.90611649	12469.3	0	0	8	94	57	94	0	0	7	4	0	3	8	0	121	9	2
0403714983	Chevron U.S.A. Inc.	Plugged & Abandoned	Rosecrans	Hoge	1	-118.2738724	33.89860535	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714986	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Padelford	1	-118.2717667	33.90248871	4817.4	0	0	8	94	57	94	0	0	3	4	0	3	8	0	77	9	2
0403714992	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	1	-118.2744293	33.90152359	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714993	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	2	-118.2761993	33.90106583	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403714994	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	3	-118.2790527	33.90875626	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403714995	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	4	-118.2746506	33.89979553	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403714996	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	5	-118.276001	33.89940643	0.0	1	0	8	94	68	99	0	0	0	4	3	3	8	0	56	9	2
0403714997	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	6	-118.2792969	33.9044342	0.0	1	0	8	94	64	98	0	1	0	4	3	3	8	3	68	9	2
0403714998	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	7	-118.2744141	33.90142441	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715000	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	9	-118.2744064	33.90100861	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715001	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	10	-118.2754288	33.9010582	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715002	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	12	-118.274437	33.90074921	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715003	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans	Rosecrans	13	-118.2807922	33.90552521	0.0	1	0	8	94	64	98	0	1	0	4	3	3	8	3	68	9	2
0403715005	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	15	-118.2769394	33.90151215	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403715006	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	21	-118.2745361	33.90133667	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715008	Pacific Coast Energy Company LP	Plugged & Abandoned	Rosecrans	Rosecrans	25	-118.2759018	33.90135574	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715010	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	30	-118.2756195	33.89942169	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403715011	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	31	-118.2763977	33.89913177	0.0	1	0	8	94	68	99	0	0	0	4	3	3	8	0	56	9	2
0403715013	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans	Rosecrans	34	-118.2790604	33.89839935	0.0	0	0	8	94	64	98	0	0	0	4	0	3	8	0	44	9	2
0403715017	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans	Rosecrans	38	-118.2789764	33.90040588	0.0	1	0	8	94	64	98	0	0	0	4	3	3	8	0	56	9	2
0403715019	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Rosecrans	40	-118.2802734	33.89799118	0.0	0	0	8	94	64	98	0	1	0	4	0	3	8	3	56	9	2
0403715023	BreitBurn Operating LP	Plugged & Abandoned	Rosecrans	Rosecrans	44	-118.2807999	33.90662384	0.0	0	0	8	94	64	98	0	1	0	4	0	3	8	3	56	9	2
0403715024	Pacific Coast Energy Company LP	Plugged & Abandoned	Rosecrans	Rosecrans	49	-118.2790375	33.90887451	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403715029	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Trust	4	-118.2820129	33.90832138	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403715031	Petro-Lewis Corp.	Plugged & Abandoned	Rosecrans	Zins	1	-118.2689591	33.90236664	4801.5	0	0	8	94	57	94	0	0	3	4	0	3	8	0	77	9	2
0403715032	Burl G. Varner	Plugged & Abandoned	Rosecrans	Bradford	1	-118.2723084	33.89826202	0.0	0	0	8	94	68	99	0	0	0	4	0	3	8	0	44	9	2
0403715035	Westoil Corp.	Plugged & Abandoned	Rosecrans	Marland-Miley	4	-118.2663956	33.90113449	0.0	0	0	8	94	57	94	0	0	0	4	0	3	8	0	44	9	2
0403715037	Cameron Wright	Plugged & Abandoned	Rosecrans	Athens	12	-118.2818832	33.91805649	9196.5	0	0	8	94	54	92	0	1	5	4	0	3	8	3	126	9	2
0403715038	BP Exploration U.S.A. Inc.	Plugged & Abandoned	Rosecrans, East	Rowell	1	-118.2649918	33.9005394	2024.7	0	0	3	59	57	94	0	0	2	4	0	3	3	0	36	9	2
0403715039	California Resources Long Beach, Inc.	Plugged & Abandoned	Rosecrans, East	Unspecified	SBU-1	-118.2640762	33.89805603	1188.6	0	0	3	59	68	99	0	0	1	4	0	3	3	0	30	9	2
0403715040	California Resources Long Beach, Inc.	Plugged & Abandoned	Rosecrans, East	Unspecified	SJ-01	-118.2640839	33.89808273	1188.6	0	0	3	59	68	99	0	0	1	4	0	3	3	0	30	9	2
0403715041	Royalty Service Corp., Ltd.	Plugged & Abandoned	Rosecrans, East	Compton	1	-118.264122	33.89588928	1188.6	0	0	3	59	68	99	0	0	1	4	0	3	3	0	30	9	2
0403715042	Atlantic Oil Company	Plugged & Abandoned	Rosecrans, South	Stein	1	-118.2685165	33.88914871	3754.9	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403715043	Dr. George G. Averill	Plugged & Abandoned	Rosecrans, South	Averill	2	-118.2729034	33.89260864	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403715044	Dr. George G. Averill	Plugged & Abandoned	Rosecrans, South	Averill	3	-118.2729034	33.89159393	2300.2	0	0	4	79	68	99	0	0	2	4	0	3	4	0	42	9	2
0403715045	Belmont Oil Co.	Plugged & Abandoned	Rosecrans, South	Averill	1	-118.2727127	33.89462662	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403715046	Belmont Oil Co.	Plugged & Abandoned	Rosecrans, South	H. O.	2	-118.2720718	33.89408875	75.4	0	0	4	79	68	99	0	0	0	4	0	3	4	0	28	9	2
0403715352	Matrix Oil Corporation	Plugged & Abandoned	Sansinena	Sansinena	9 A 10	-117.9248657	33.9473114	146.9	0	0	6	120	15	26	0	0	0	0	0	3	6	0	0	6	4
0403715362	Matrix Oil Corporation	Plugged & Abandoned	Sansinena	Sansinena	9 B 16	-117.9249344	33.94710922	146.9	0	0	6	120	15	26	0	0	0	0	0	3	6	0	0	6	4
0403715471	Grunwell Oil Corp.	Plugged & Abandoned	Santa Fe Springs	Unspecified	1	-118.0502091	33.94362259	3322.6	0	0	6	96	58	95	0	0	2	4	0	3	6	0	54	10	4
0403715519	Exxon Mobil Corporation	Plugged & Abandoned	Santa Fe Springs	Unspecified	1	-118.0528336	33.92925644	11261.2	0	0	6	96	54	92	0	0	6	4	0	3	6	0	90	10	4
0403715764	Illuminating Petro. Well No. 1	Plugged & Abandoned	Santa Fe Springs	Unspecified	1	-118.0474472	33.9356842	37559.8	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716093	Santa Fe Extension	Plugged & Abandoned	Santa Fe Springs	Sunshine Farms	1	-118.0484314	33.93470764	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716198	Chevron U.S.A. Inc.	Plugged & Abandoned	Santa Fe Springs	Pierce-Crawford	1	-118.048851	33.94234467	3322.6	0	0	6	96	58	95	0	0	2	4	0	3	6	0	54	10	4
0403716370	Chevron U.S.A. Inc.	Plugged & Abandoned	Santa Fe Springs	Brownrigg-Keller	1	-118.0477142	33.94160461	24598.3	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716371	Chevron U.S.A. Inc.	Plugged & Abandoned	Santa Fe Springs	Brownrigg-Keller	2	-118.0466995	33.94215775	24598.3	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716372	Chevron U.S.A. Inc.	Plugged & Abandoned	Santa Fe Springs	Carmenita Community	1	-118.0458984	33.93390656	18115.6	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716435	Max Pray & Elisha Walker, Jr.	Plugged & Abandoned	Santa Fe Springs	Loftus Community	1	-118.048172	33.93465042	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716451	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Orange-Rowland	4	-117.9009094	33.94726944	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716454	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-4	-117.9113617	33.95624161	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716455	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	A-8	-117.9121323	33.9536972	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716456	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-1	-117.9144516	33.95000076	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716457	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Puente	C-35	-117.9161606	33.9474678	847.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716458	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Orange-Grazide	2	-117.8959122	33.9476738	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716459	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Orange-Grazide	3	-117.8931503	33.94881058	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716462	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	25-35	-118.6384277	34.47378922	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716463	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	35-35	-118.6363525	34.47387314	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716465	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	CHU	55-35	-118.6318436	34.47386551	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716466	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	CHU	75-35	-118.6275711	34.47385406	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716467	Decalta International Corporation	Plugged & Abandoned	Castaic Hills	CHU	85-35	-118.625412	34.47401428	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716468	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	15-36	-118.6231232	34.47381973	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716469	Petrominerals Corp.	Plugged & Abandoned	Castaic Hills	CHU	35-36	-118.6192856	34.47446823	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403716470	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	65	-118.6166	34.42771149	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403716471	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Corporation	2	-118.6132736	34.41215897	0.0	0	68	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716472	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	1	-118.626236	34.42203522	78.2	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716473	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	2	-118.6357346	34.4247818	0.0	0	69	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716474	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	3	-118.620079	34.41768646	0.0	0	69	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716475	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	4	-118.6057892	34.41674423	391.9	0	69	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716476	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	5	-118.6132278	34.41470337	0.0	0	68	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716477	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	6	-118.6196899	34.41933823	0.0	0	68	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716478	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	7	-118.6096497	34.41614914	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716479	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	8	-118.6171265	34.418396	0.0	0	62	6	68	14	22	0	0	0	0	0	2	6	0	0	2	5
0403716480	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	9	-118.6302643	34.42682266	0.0	0	67	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716481	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	10	-118.6238632	34.4189682	0.0	0	67	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716482	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	11	-118.6148453	34.41357422	0.0	0	67	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716483	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	12	-118.6182175	34.42167664	0.0	0	67	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716484	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	13	-118.6080399	34.41806412	0.0	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716485	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	14	-118.6130142	34.41989517	0.0	0	67	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716486	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	15	-118.6114121	34.41722107	0.0	0	67	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716487	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	16	-118.6089859	34.42234039	0.0	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716488	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	17	-118.6075287	34.42021561	0.0	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716489	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	18	-118.6216888	34.41440582	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716490	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	19	-118.6039734	34.41461563	391.9	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716491	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	20	-118.6046829	34.41930008	391.9	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716492	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	21	-118.603241	34.41749573	391.9	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716493	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	22	-118.6187897	34.41262436	0.0	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716494	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	23	-118.61763	34.41433334	0.0	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716495	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	24	-118.6068878	34.41394043	391.9	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716496	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	25	-118.6192932	34.41894531	0.0	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716497	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	26	-118.6143723	34.41695786	0.0	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716498	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	27	-118.615654	34.42023468	0.0	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716499	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	28	-118.6018677	34.41394424	391.9	0	66	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716500	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	30	-118.5996018	34.41318893	391.9	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716501	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	31	-118.5991592	34.41671753	391.9	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716502	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	32	-118.6098557	34.41929626	0.0	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716503	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	33	-118.6133347	34.4229393	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716504	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	34	-118.6057968	34.42220306	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716505	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	35	-118.5992508	34.41906357	391.9	0	65	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716506	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	38	-118.5950394	34.41331482	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716507	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	40	-118.6108933	34.42226028	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716508	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	41	-118.6044617	34.41236877	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716509	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	42	-118.6220398	34.41781616	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716510	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	43	-118.5952606	34.41123962	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716511	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	45	-118.6356888	34.42064667	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716512	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	46	-118.6265183	34.41785431	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716513	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	48	-118.5994873	34.41117096	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716514	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	49	-118.6007385	34.4102211	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716515	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	50	-118.6409912	34.4252243	0.0	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716516	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	52	-118.6280441	34.41732025	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716517	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	54	-118.6390152	34.42011642	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716518	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	55	-118.6373596	34.43382263	0.0	0	0	6	68	34	67	1	0	0	2	0	3	6	3	24	2	5
0403716519	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	56	-118.6264343	34.41809464	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716520	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	57	-118.6304016	34.41716385	0.0	0	63	6	68	14	22	0	0	0	0	0	2	6	0	0	2	5
0403716521	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	58	-118.6180496	34.4256897	0.0	0	63	6	68	14	22	0	0	0	0	0	2	6	0	0	2	5
0403716522	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	59	-118.6048584	34.42571259	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716523	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	61	-118.5963516	34.42599106	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716524	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	62	-118.5931473	34.42598724	60.4	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716525	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	64	-118.6139069	34.42695618	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716526	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	67	-118.6217651	34.42866516	78.2	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716527	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	68	-118.6256332	34.42982864	0.0	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716528	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	69	-118.6059799	34.43336868	0.0	0	59	6	68	14	22	0	0	0	0	0	2	6	0	0	2	5
0403716529	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	70	-118.6292801	34.43183517	0.0	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403716530	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	72	-118.6131058	34.42908096	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716531	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	73	-118.5975189	34.42984772	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716532	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	74	-118.5938492	34.43009949	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716533	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	75	-118.5922852	34.43263626	78.2	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716534	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	76	-118.6098023	34.43037033	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716535	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co. 12	2	-118.6182175	34.43312454	78.2	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403716536	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming 6	52-19	-118.5972672	34.42081451	391.9	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403716537	Dutch Oil Co.	Plugged & Abandoned	Charlie Canyon (ABD)	Howell	1	-118.5948334	34.48618698	3.8	0	0	2	60	0	0	0	0	0	0	0	3	2	0	0	2	5
0403716538	Phillip L. Pike	Plugged & Abandoned	Charlie Canyon (ABD)	Howell	2	-118.5946884	34.48609161	3.8	0	0	2	60	0	0	0	0	0	0	0	3	2	0	0	2	5
0403716539	Phillip L. Pike	Plugged & Abandoned	Charlie Canyon (ABD)	Howell	3	-118.5941162	34.48591232	3.8	0	0	2	60	0	0	0	0	0	0	0	3	2	0	0	2	5
0403716560	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	Baldwin-Cienega	253	-118.3610611	33.99957657	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403716561	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	BC-LAI-Stocker	110	-118.3610382	33.996521	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403716562	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	93	-118.3778381	34.00148392	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403716568	Cozi Oil Co.	Plugged & Abandoned	Rosecrans	Schafer	2	-118.2787552	33.90977478	0.0	0	0	8	94	56	94	0	1	0	4	0	3	8	3	56	9	2
0403716570	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	32	-118.5777664	34.46543121	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403716572	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Grazide	1	-117.8951721	33.94852448	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716573	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Menchego	6	-117.8862076	33.94654846	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716574	Bridge Energy LLC	Plugged & Abandoned	Brea-Olinda	Orange-Grazide	4	-117.8948364	33.94797897	0.0	0	0	10	138	15	26	0	0	0	0	0	3	10	0	0	6	4
0403716700	Union Oil Company of California	Plugged & Abandoned	Santa Fe Springs	Meyer	3	-118.0461426	33.93488312	18115.6	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716701	Union Oil Company of California	Plugged & Abandoned	Santa Fe Springs	Meyer	4	-118.0481949	33.93553162	37559.8	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716706	Union Oil Company of California	Plugged & Abandoned	Santa Fe Springs	Meyer	13	-118.0482483	33.93379593	19186.1	0	0	6	96	58	95	0	0	10	4	0	3	6	0	126	10	4
0403716757	BreitBurn Operating LP	Plugged & Abandoned	Sawtelle	Sawtelle	1	-118.455574	34.0590744	18.1	1	0	4	53	0	0	0	1	0	0	3	3	4	3	0	5	3
0403716762	E. S. Arnn	Plugged & Abandoned	Tapia	Arnn-Lackie	1	-118.594902	34.47437668	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403716763	R. E. Bering	Plugged & Abandoned	Tapia	Hartje	1	-118.6025009	34.48099899	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403716764	Crown-Huntington Oils, Ltd.	Plugged & Abandoned	Tapia	Dodge	3	-118.594307	34.48179245	3.8	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403716765	Deltron Drilling, Inc.	Plugged & Abandoned	Tapia	Dodge	1	-118.5989609	34.47874451	0.0	0	61	1	61	0	0	0	0	0	0	0	2	1	0	0	2	5
0403716766	Deltron Drilling, Inc.	Plugged & Abandoned	Tapia	Louise	3	-118.598999	34.47904205	0.0	0	58	1	61	0	0	0	0	0	0	0	2	1	0	0	2	5
0403716767	Planet Oil Co.	Plugged & Abandoned	Tapia	Louise	2	-118.5972595	34.47926331	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403716800	Campeet Oil Co.	Plugged & Abandoned	Torrance	Kleinmeyer	10-A	-118.2874298	33.81096649	0.0	0	0	7	96	32	63	0	0	0	2	0	3	7	0	20	11	2
0403716883	W. E. McCaslin	Plugged & Abandoned	Torrance	Ross Comm.	1	-118.2979202	33.81946945	12629.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403716909	Norman P. Miller	Plugged & Abandoned	Torrance	Faith	64	-118.2974625	33.80093765	7617.7	0	0	7	96	30	59	0	0	4	1	0	3	7	0	50	11	2
0403716918	Mobil Oil Corporation	Plugged & Abandoned	Torrance	South Torrance Unit	2	-118.2942581	33.80166626	8936.4	0	0	7	96	36	71	0	0	5	3	0	3	7	0	80	11	2
0403716921	Mobil Oil Corporation	Plugged & Abandoned	Torrance	South Torrance Unit	AC-5	-118.2891769	33.80158234	0.0	0	0	7	96	36	71	0	0	0	3	0	3	7	0	30	11	2
0403716933	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	AC-16	-118.2941818	33.79996109	5732.0	0	0	7	96	30	59	0	0	3	1	0	3	7	0	40	11	2
0403716934	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	AC-17	-118.2928085	33.8000145	5043.0	0	1	7	96	36	71	0	0	3	3	0	0	7	0	42	11	2
0403716937	Mobil Oil Corporation	Plugged & Abandoned	Torrance	South Torrance Unit	20	-118.2912293	33.79818726	7617.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403716947	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	AC-32-W	-118.2938385	33.79833984	5923.3	0	0	7	96	30	59	0	0	3	1	0	3	7	0	40	11	2
0403716950	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	D-35	-118.2926102	33.8016243	7617.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717015	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	1	-118.2978668	33.81355667	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717016	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	2	-118.2967453	33.8131752	5561.2	0	0	7	96	44	81	0	0	3	4	0	3	7	0	70	11	2
0403717017	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	3	-118.2966766	33.81427383	5561.2	0	0	7	96	44	81	0	0	3	4	0	3	7	0	70	11	2
0403717018	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	4	-118.2966919	33.81535721	5561.2	0	0	7	96	44	81	0	0	3	4	0	3	7	0	70	11	2
0403717019	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	5	-118.2978973	33.81479263	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717020	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	6	-118.2978363	33.81594467	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717021	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Scarborough	7	-118.2969284	33.81749725	5561.2	0	0	7	96	44	81	0	0	3	4	0	3	7	0	70	11	2
0403717078	Crown Central Petro. Corp.	Plugged & Abandoned	Tapia	Lackie-USL	A-2	-118.5964203	34.47520828	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403717079	Crown Central Petro. Corp.	Plugged & Abandoned	Tapia	Lackie-USL	A-3	-118.5985184	34.47705078	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403717081	S.A.M. Enterprises	Plugged & Abandoned	Tapia	Snow-USL	2	-118.608757	34.48023224	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403717082	TEG Oil & Gas USA, Inc.	Plugged & Abandoned	Tapia	Yule	1	-118.6073303	34.47872543	0.0	0	62	1	61	0	0	0	0	0	0	0	2	1	0	0	2	5
0403717108	Atlantic Richfield Company	Plugged & Abandoned	Torrance	Andrews	1	-118.2988281	33.81727219	0.0	0	0	7	96	44	81	0	0	0	4	0	3	7	0	40	11	2
0403717109	Atlantic Richfield Company	Plugged & Abandoned	Torrance	Dewitt	1	-118.298851	33.8164444	0.0	0	0	7	96	44	81	0	0	0	4	0	3	7	0	40	11	2
0403717115	Atlantic Richfield Company	Plugged & Abandoned	Torrance	Palmer	1	-118.2977142	33.81824875	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717116	Atlantic Richfield Company	Plugged & Abandoned	Torrance	Pate	1	-118.2976837	33.81689072	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717117	Atlantic Richfield Company	Plugged & Abandoned	Torrance	Pate	2	-118.2977219	33.81770706	7227.8	0	0	7	96	44	81	0	0	4	4	0	3	7	0	80	11	2
0403717127	Barnhart-Morrow Consolidated	Plugged & Abandoned	Torrance	P. E.	1	-118.2989273	33.79968262	4821.3	0	0	7	96	30	59	0	1	3	1	0	3	7	3	52	11	2
0403717242	Storm Plaza Torrance, LLC	Plugged & Abandoned	Torrance	Bluemle	6	-118.2989578	33.81398392	0.0	0	0	7	96	44	81	0	0	0	4	0	3	7	0	40	11	2
0403717615	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Standard-Superior Joughin 4-LW	1	-118.294281	33.80544662	11216.7	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2
0403717643	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	Joughin Unit	7-D	-118.2981262	33.80379486	8791.3	0	0	7	96	30	59	0	0	5	1	0	3	7	0	60	11	2
0403717662	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	19	-118.2976532	33.81255341	6070.3	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717663	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	21	-118.297699	33.81127167	9324.4	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717664	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	25	-118.2977829	33.80997086	6070.3	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717665	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	30	-118.2966614	33.81206894	6070.3	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717666	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	31	-118.2967529	33.81076813	9901.8	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717667	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	32	-118.2967148	33.80948639	9526.3	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717668	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	33	-118.2950821	33.81139755	8667.5	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717669	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	34	-118.295044	33.81006622	9901.8	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717670	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	35	-118.2950897	33.808815	6601.7	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717672	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	41	-118.295105	33.80765533	11742.6	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2
0403717673	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	47	-118.2950897	33.80625534	9758.3	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717674	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	50	-118.2966766	33.80653763	9758.3	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717675	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	53	-118.2950516	33.80507278	10554.0	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403717677	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	66	-118.2978363	33.80812836	9526.3	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717678	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Torrance	67	-118.2966003	33.8055687	10554.0	0	0	7	96	30	59	0	0	6	1	0	3	7	0	70	11	2
0403717751	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	6	-118.293808	33.80715179	11742.6	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2
0403717752	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	9	-118.293808	33.80601883	11216.7	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2
0403717753	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	10	-118.2922134	33.81039429	6601.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717755	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	13	-118.2938156	33.80483246	10617.8	0	0	7	96	16	28	0	0	6	0	0	3	7	0	60	11	2
0403717756	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	14	-118.2922211	33.80915451	6601.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717757	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	15	-118.2921448	33.80783463	9251.8	0	0	7	96	36	71	0	0	5	3	0	3	7	0	80	11	2
0403717758	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	16	-118.2922363	33.80666733	9251.8	0	0	7	96	36	71	0	0	5	3	0	3	7	0	80	11	2
0403717759	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	17	-118.2922821	33.80507278	10617.8	0	0	7	96	36	71	0	0	6	3	0	3	7	0	90	11	2
0403717760	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	20	-118.2922287	33.80284882	7617.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717769	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 4	3	-118.2929916	33.80277252	7617.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717770	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 4	4	-118.2912369	33.8027916	8791.3	0	0	7	96	36	71	0	0	5	3	0	3	7	0	80	11	2
0403717772	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 4	7	-118.2928772	33.80593872	10554.4	0	0	7	96	36	71	0	0	6	3	0	3	7	0	90	11	2
0403717776	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 4	11	-118.2923813	33.80833435	6601.7	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403717777	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 4	13	-118.2924957	33.80680466	9251.8	0	0	7	96	36	71	0	0	5	3	0	3	7	0	80	11	2
0403717819	Brighton Community Association	Plugged & Abandoned	Torrance	Keystone Community	1	-118.2943802	33.81937408	12842.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403717874	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Carson	1	-118.2989502	33.8194809	0.0	0	0	7	96	44	81	0	0	0	4	0	3	7	0	40	11	2
0403717898	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	1	-118.293869	33.81098175	8667.5	0	0	7	96	16	28	0	0	5	0	0	3	7	0	50	11	2
0403717899	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	2	-118.2938767	33.80971146	6601.7	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717900	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	3	-118.2906189	33.80978775	0.0	0	0	7	96	36	71	0	0	0	3	0	3	7	0	30	11	2
0403717924	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	4	-118.2938614	33.80840683	6601.7	0	0	7	96	16	28	0	0	4	0	0	3	7	0	40	11	2
0403717925	Chevron U.S.A. Inc.	Plugged & Abandoned	Torrance	Joughin 1	5	-118.2906113	33.80876923	0.0	0	0	7	96	36	71	0	0	0	3	0	3	7	0	30	11	2
0403717988	Castaic Oil Association	Plugged & Abandoned	Any Field	Well No.	1	-118.603569	34.51311111	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403717993	Exxon Mobil Corporation	Plugged & Abandoned	Whittier Heights, North (ABD)	Baldwin C	1	-117.9958572	34.01331329	6128.0	0	0	2	74	36	70	0	0	4	3	0	3	2	0	35	6	4
0403717994	Shell Western E&P Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Baldwin	1	-118.0006485	34.01605225	0.0	0	0	2	74	36	70	1	0	0	3	0	3	2	3	24	6	4
0403717995	Shell Western E&P Inc.	Plugged & Abandoned	Whittier Heights, North (ABD)	Cole	1	-117.9995422	34.00564194	655.0	0	0	2	74	36	70	0	0	0	3	0	3	2	0	15	6	4
0403717996	Sun Exploration & Production Co.	Plugged & Abandoned	Whittier Heights, North (ABD)	Baldwin	1	-118.0028763	34.00752258	0.0	0	0	2	74	36	70	1	0	0	3	0	3	2	3	24	6	4
0403717997	Crown Central Petro. Corp.	Plugged & Abandoned	Whittier Heights, North (ABD)	Baldwin	1	-117.9985352	34.01539612	0.0	0	0	2	74	36	70	1	0	0	3	0	3	2	3	24	6	4
0403717998	E. D. Taylor Co.	Plugged & Abandoned	Whittier Heights, North (ABD)	Unspecified	1	-117.9988861	34.00870132	6204.8	0	0	2	74	36	70	0	0	4	3	0	3	2	0	35	6	4
0403717999	Transamerica Development Company	Plugged & Abandoned	Whittier Heights, North (ABD)	Unspecified	1-1	-117.992981	34.00876617	655.0	0	0	2	74	36	70	0	0	0	3	0	3	2	0	15	6	4
0403718000	Transamerica Development Company	Plugged & Abandoned	Whittier Heights, North (ABD)	Unspecified	1-2	-117.9970703	34.00958633	5856.8	0	0	2	74	36	70	0	0	3	3	0	3	2	0	30	6	4
0403718012	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	Joughin Unit	14-F	-118.2896347	33.80272293	0.0	0	0	7	96	36	71	0	0	0	3	0	3	7	0	30	11	2
0403718434	Montebello Mascot Oil Co.	Plugged & Abandoned	Whittier	Unspecified	2	-118.0554733	34.00371933	1677.6	0	0	9	122	38	73	0	0	1	3	0	3	9	0	48	10	4
0403718445	Venoco, LLC	Plugged & Abandoned	Whittier	Gregg	1-A	-118.0522766	34.00321579	0.0	0	0	9	122	0	0	0	0	0	0	0	3	9	0	0	10	4
0403718446	Venoco, LLC	Plugged & Abandoned	Whittier	Gregg	3	-118.0522308	34.0032196	0.0	0	0	9	122	41	77	0	0	0	3	0	3	9	0	36	10	4
0403718469	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	1-A	-118.2958221	33.81291199	28181.0	0	0	7	96	44	81	0	0	10	4	0	3	7	0	140	11	2
0403718471	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	2-A	-118.2944336	33.8123436	28181.0	0	0	7	96	44	81	0	0	10	4	0	3	7	0	140	11	2
0403718472	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	3-A	-118.2930908	33.8118248	14989.6	0	0	7	96	32	63	0	0	8	2	0	3	7	0	100	11	2
0403718473	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	4-A	-118.2916794	33.81133652	2666.0	0	0	7	96	32	63	0	0	2	2	0	3	7	0	40	11	2
0403718474	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	Joughin Unit	5-R	-118.290184	33.81071854	7184.6	0	0	7	96	32	63	0	0	4	2	0	3	7	0	60	11	2
0403718475	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	6-A	-118.2890091	33.81023407	7184.6	0	0	7	96	36	71	0	0	4	3	0	3	7	0	70	11	2
0403718477	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	7-A	-118.2874756	33.80960846	0.0	0	0	7	96	36	71	0	0	0	3	0	3	7	0	30	11	2
0403718481	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	11-A	-118.2889786	33.81155396	7184.6	0	0	7	96	32	63	0	0	4	2	0	3	7	0	60	11	2
0403718482	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	11 A-2	-118.2891464	33.8115387	7184.6	0	0	7	96	32	63	0	0	4	2	0	3	7	0	60	11	2
0403718483	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	13-A	-118.2916946	33.81261063	12855.8	0	0	7	96	32	63	0	0	7	2	0	3	7	0	90	11	2
0403718484	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Kleinmeyer	14-A	-118.2930222	33.81314468	12855.8	0	0	7	96	32	63	0	0	7	2	0	3	7	0	90	11	2
0403718485	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Joughin Unit	15-R	-118.2944183	33.81366348	42361.4	0	0	7	96	44	81	0	0	10	4	0	3	7	0	140	11	2
0403718486	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Joughin Unit	16-R	-118.295784	33.81417084	12855.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403718487	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Joughin Unit	17-R	-118.2958069	33.81561279	12855.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403718488	Mobil Oil Corporation	Plugged & Abandoned	Torrance	Joughin Unit	32-R	-118.2956238	33.81702423	12855.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403718494	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	AC-201-W	-118.2977982	33.79818726	4821.3	0	0	7	96	30	59	0	0	3	1	0	3	7	0	40	11	2
0403718495	John P. Wallace, Operator	Plugged & Abandoned	Torrance	Ring-Hawkins	2	-118.2985077	33.79923248	2470.4	0	0	7	96	30	59	0	1	2	1	0	3	7	3	39	11	2
0403718497	John P. Wallace, Operator	Plugged & Abandoned	Torrance	Ring-Hawkins	4	-118.2971802	33.79903412	7617.7	0	0	7	96	30	59	0	0	4	1	0	3	7	0	50	11	2
0403718498	Brea Canon Oil Co.	Plugged & Abandoned	Torrance	South Torrance Unit	D-205	-118.297142	33.80000305	7617.7	0	2	7	96	30	59	0	0	4	1	0	0	7	0	35	11	2
0403718526	Richard M. Ferguson	Plugged & Abandoned	Wayside Canyon	Safarik-Hansen	1	-118.5860291	34.47359848	3.7	0	57	2	56	24	47	0	0	0	0	0	2	2	0	0	2	5
0403718527	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	12	-118.5828247	34.46683884	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718528	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	26	-118.5885391	34.46873856	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718529	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	25	-118.5792313	34.46939468	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718530	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	27	-118.576683	34.4693222	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718531	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	30	-118.5780106	34.46801758	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718532	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	33	-118.578537	34.4638443	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718533	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	36	-118.5822983	34.46371841	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718534	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	37	-118.5798416	34.46482468	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718536	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	23	-118.5855942	34.4693718	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403718537	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	28	-118.5808182	34.46801376	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718538	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	29	-118.5779953	34.4707756	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718539	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	31	-118.5840988	34.46733093	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403718735	Fowler Drilling Co.	Plugged & Abandoned	Turnbull (ABD)	Saunders	1	-117.9765549	33.99163437	6199.3	0	0	3	77	19	37	0	0	4	0	0	3	3	0	24	6	4
0403718736	Conoco Inc.	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	6	-117.990593	33.99681854	1264.5	0	0	3	77	36	70	0	0	1	3	0	3	3	0	24	6	4
0403718737	W. M. & M. T. Killingsworth	Plugged & Abandoned	Turnbull (ABD)	Tandberg	1	-117.9855118	34.00325012	1630.9	0	0	3	77	36	70	0	0	1	3	0	3	3	0	24	6	4
0403718738	Southern California Gas Company	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	1	-117.9806137	33.99465942	2477.6	0	0	3	77	31	61	0	0	2	2	0	3	3	0	24	6	4
0403718739	Southern California Gas Company	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	2	-117.9817429	33.99482346	2477.6	0	0	3	77	36	70	0	0	2	3	0	3	3	0	30	6	4
0403718740	Southern California Gas Company	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	3	-117.9795761	33.9982872	3735.3	0	0	3	77	31	61	0	0	2	2	0	3	3	0	24	6	4
0403718741	Southern California Gas Company	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	4	-117.9826965	33.99661636	3735.3	0	0	3	77	36	70	0	0	2	3	0	3	3	0	30	6	4
0403718742	Southern California Gas Company	Plugged & Abandoned	Turnbull (ABD)	Turnbull Community	5	-117.9831543	33.99880219	1630.9	0	0	3	77	36	70	0	0	1	3	0	3	3	0	24	6	4
0403718743	The Superior Oil Co.	Plugged & Abandoned	Turnbull (ABD)	Unspecified	A-1	-117.9857941	34.00289536	1630.9	0	0	3	77	36	70	0	0	1	3	0	3	3	0	24	6	4
0403718745	Atlantic Richfield Company	Plugged & Abandoned	Walnut	Peel	1	-117.9196549	34.01209259	22190.4	0	0	2	70	54	92	0	0	10	4	0	3	2	0	70	6	1
0403718746	BP Exploration U.S.A. Inc.	Plugged & Abandoned	Walnut	Garnier	1	-117.9185181	34.02127457	12666.1	0	0	2	70	46	84	0	0	7	4	0	3	2	0	55	6	1
0403718747	BP Exploration U.S.A. Inc.	Plugged & Abandoned	Walnut	Garnier	1-B	-117.9184647	34.02096939	12666.1	0	0	2	70	46	84	0	0	7	4	0	3	2	0	55	6	1
0403718749	Bardeen Oil Co.	Plugged & Abandoned	Walnut	Unspecified	2	-117.9193955	34.01737213	24636.0	0	0	2	70	46	84	0	0	10	4	0	3	2	0	70	6	1
0403718824	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	1	-118.5787964	34.47209549	3.7	0	56	2	56	24	47	0	0	0	0	0	2	2	0	0	2	5
0403718825	Transamerica Development Company	Plugged & Abandoned	Whittier Heights, North (ABD)	Unspecified	1-3	-117.9973831	34.00857162	6818.1	0	0	2	74	36	70	0	0	4	3	0	3	2	0	35	6	4
0403718922	Union Oil Company of California	Plugged & Abandoned	Whittier	Gregg	1	-118.0564957	34.00301743	7222.2	0	0	9	122	38	73	0	0	4	3	0	3	9	0	84	10	4
0403718924	Union Oil Company of California	Plugged & Abandoned	Whittier	Los Nietos Whittier Crude	2	-118.0275269	33.98735809	544.4	0	0	9	122	20	38	0	0	0	0	0	3	9	0	0	10	4
0403718937	Whitley Oil Refining Co.	Plugged & Abandoned	Whittier	Unspecified	2	-118.0563278	34.0042305	1168.7	0	0	9	122	38	73	0	0	1	3	0	3	9	0	48	10	4
0403718939	Phillip L. Pike	Plugged & Abandoned	Any Field	Mark VII	2	-118.6762314	34.46953964	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403718941	Tesoro Petroleum Corp.	Plugged & Abandoned	Any Field	Intex-N.L.F.	1	-118.5682221	34.46346664	1224.5	0	0	5	81	0	0	0	0	1	0	0	3	5	0	8	2	5
0403718942	Rose Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.6029663	34.51645279	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403718943	Department of Water Res.	Plugged & Abandoned	Elizabeth Canyon (ABD)	Well No.	1	-118.6027603	34.5201683	0.0	0	0	6	68	24	47	0	0	0	0	0	3	6	0	0	2	5
0403719047	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Wiley	2	-118.5648193	34.34619904	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403719061	International Oil & Mining	Plugged & Abandoned	Newhall	H&E Unknown	1A	-118.5819855	34.35277176	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403719070	SWC Resources Inc	Plugged & Abandoned	Newhall	Hammon	8	-118.5830689	34.35315323	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403720049	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	45	-118.5912094	34.47294617	0.0	0	0	2	56	24	47	0	0	0	0	0	3	2	0	0	2	5
0403720085	Union Oil Company of California	Plugged & Abandoned	Newhall-Potrero	R. S. F.	1	-118.6461411	34.39123917	0.0	0	0	6	81	20	37	0	0	0	0	0	3	6	0	0	2	5
0403720095	Atlantic Oil Company	Plugged & Abandoned	Newhall	Weldon Canyon	1	-118.5058365	34.338974	0.0	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403720117	Dominguez Energy, L.P.	Plugged & Abandoned	Dominguez	Reyes	177	-118.2313461	33.8625946	0.0	0	0	8	95	40	76	0	0	0	3	0	3	8	0	33	10	2
0403720150	Bob Ferguson Independent	Plugged & Abandoned	Any Field	Hathaway	6	-118.7054672	34.51573181	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403720164	Chevron U.S.A. Inc.	Plugged & Abandoned	Wayside Canyon	Hansen-Safarik-USL	1	-118.5904312	34.47404099	3.7	0	52	2	56	24	47	0	0	0	0	0	1	2	0	0	2	5
0403720202	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	46	-118.5905609	34.47137833	0.0	0	52	2	56	0	0	0	0	0	0	0	1	2	0	0	2	5
0403720205	Tenneco Oil Company	Plugged & Abandoned	Oak Canyon	Alden Martino, et al	1	-118.6849365	34.46324921	8.6	0	52	6	77	34	67	0	0	0	2	0	1	6	0	14	2	5
0403720206	Occidental Petroleum Corporation	Plugged & Abandoned	Any Field	Kazarian	1	-118.1717987	34.04795074	1875.8	0	0	5	81	60	96	0	0	1	4	0	3	5	0	40	9	1
0403720250	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	310	-118.3729477	34.0006485	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403720309	Oxy Petroleum Inc.	Plugged & Abandoned	Howard Townsite	West Athens	1	-118.3086472	33.93286133	5400.8	0	0	5	71	45	83	0	0	3	4	0	3	5	0	56	9	2
0403720315	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	47	-118.592804	34.47331238	0.0	0	0	2	56	24	47	0	0	0	0	0	3	2	0	0	2	5
0403720339	Paul Benz	Plugged & Abandoned	Any Field	Duignan	1	-118.6760864	34.49026871	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403720355	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 2	37	-118.3859482	34.01075745	5.4	0	0	9	94	22	42	0	0	0	0	0	3	9	0	0	5	2
0403720367	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Dodge	1	-118.5849762	34.47549438	3.7	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403720374	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	314	-118.3720322	34.00076294	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403720375	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	313	-118.3714905	33.99987411	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403720390	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	315-A	-118.3701859	34.00008774	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403720436	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	48	-118.5831528	34.4705925	0.0	0	51	2	56	0	0	0	0	0	0	0	1	2	0	0	2	5
0403720440	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-Sent-Vic-LW	1	-118.3738022	33.99895477	0.0	0	0	9	94	32	62	0	0	0	2	0	3	9	0	24	5	2
0403720505	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	LAI 1-Vickers-LW	9	-118.3750763	34.00385666	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403720558	Montara Petroleum Company	Plugged & Abandoned	Del Valle	Handy	1-18	-118.6979446	34.42972946	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403720560	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	320	-118.3655396	33.99583054	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403720561	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Honor Rancho 'A' (NCT-2)	49	-118.5852432	34.46608734	0.0	0	0	2	56	0	0	0	0	0	0	0	3	2	0	0	2	5
0403720665	Harry J. Riskas	Plugged & Abandoned	Any Field	Rosemead	1	-118.0708084	34.05184555	0.0	0	0	5	81	51	90	0	0	0	4	0	3	5	0	32	7	1
0403720667	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	Honor Rancho 'A' (NCT-2)	50	-118.5970459	34.4686203	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403720682	Chevron U.S.A. Inc.	Plugged & Abandoned	Howard Townsite	Puente Corehole	1	-118.2972794	33.93030167	7197.5	0	0	5	71	44	81	1	0	4	4	0	3	5	3	88	9	2
0403720716	Schweitzer Expl. Co.	Plugged & Abandoned	Any Field	Carson	1	-118.4830246	34.46032333	217.9	0	0	5	81	14	21	0	0	0	0	0	3	5	0	0	2	5
0403720726	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	322	-118.3653183	33.99248886	0.0	0	0	9	94	20	39	0	0	0	0	0	3	9	0	0	5	2
0403720738	Lyon Canyon Oil Corp.	Plugged & Abandoned	Lyon Canyon (ABD)	Well No.	35X-4	-118.5658798	34.37466431	3058.5	0	0	4	49	20	37	0	0	2	0	0	3	4	0	14	2	5
0403720753	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	C.S.O.	108	-118.6349564	34.36961365	0.0	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403720815	Lyon Canyon Oil Corp.	Plugged & Abandoned	Lyon Canyon (ABD)	Well No.	26X-4	-118.5699692	34.37212753	1759.8	0	0	4	49	20	37	0	0	1	0	0	3	4	0	7	2	5
0403720838	L. H. Glaser	Plugged & Abandoned	Any Field	Walker	1	-118.6465912	34.4921875	554.9	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403720885	Little Four Limited	Plugged & Abandoned	Lyon Canyon (ABD)	Well No.	36X-4	-118.5666428	34.37218475	3058.5	0	0	4	49	20	37	0	0	2	0	0	3	4	0	14	2	5
0403720890	Conoco Inc.	Plugged & Abandoned	Any Field	Conoco Romero-Loma Verde	1	-118.6638184	34.49936676	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403720899	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	B. F. Gilmour, et al	1	-118.6843948	34.47094345	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403720920	Pacific Oil and Gas Development Corp.	Plugged & Abandoned	Any Field	N. L. & F.	1	-118.5620422	34.45836258	1666.8	0	0	5	81	9	12	0	0	1	0	0	3	5	0	8	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403720921	MACPET	Plugged & Abandoned	Any Field	Blinn	86X-5	-118.5744476	34.37263107	1759.8	0	0	5	81	20	37	0	0	1	0	0	3	5	0	8	2	5
0403720942	Lyon Canyon Oil Corp.	Plugged & Abandoned	Lyon Canyon (ABD)	Well No.	24X-4	-118.5699005	34.3747139	3058.5	0	0	4	49	20	37	0	0	2	0	0	3	4	0	14	2	5
0403720960	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	B. F. Gilmour, et al	2	-118.682785	34.46944046	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403720981	Prudential Minerals Exploration Corp.	Plugged & Abandoned	Dominguez	Alpine-Dominguez Estate	1	-118.212677	33.85569	15.2	0	0	8	95	74	100	0	0	0	5	0	3	8	0	55	10	2
0403720985	Charles C Townsend	Plugged & Abandoned	Any Field	Townsend-Allen	1	-118.4398499	34.37260818	14.7	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403720994	MACPET	Plugged & Abandoned	Any Field	Gross et al	67X-5	-118.5767822	34.36956024	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403721015	Montara Petroleum Company	Plugged & Abandoned	Del Valle	Orduno	1	-118.6990738	34.4282074	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403721037	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	200	-118.3703461	34.00630188	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721039	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	202	-118.3716431	34.00617981	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721040	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR-LW	203	-118.3736038	34.0057373	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721041	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU-LAI-LW	204	-118.3737488	34.0058136	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721067	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	1	-118.5946732	34.47510529	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721086	Charles C Townsend	Plugged & Abandoned	Any Field	Tommy Walker	1	-118.4384308	34.3727417	14.7	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403721095	L. C. Enterprises, Inc.	Plugged & Abandoned	Any Field	Well No.	1	-118.4933472	34.47529221	14.1	0	0	5	81	14	21	0	0	0	0	0	3	5	0	0	2	5
0403721099	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	180	-118.3759003	34.00936508	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721105	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	323	-118.3703003	34.00210953	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721107	William Y. Lee	Plugged & Abandoned	Any Field	Gov	1	-118.4812622	34.36867905	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403721168	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	182	-118.3725281	34.00892639	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721178	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	148	-118.3748932	34.01157761	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403721180	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	146	-118.3771668	34.0111618	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403721182	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	WRZU	364	-118.3725891	34.00760269	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721187	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	VR	183	-118.3715363	34.00830841	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721280	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	3	-118.593689	34.47487259	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721311	Cree Oil LLC	Plugged & Abandoned	Any Field	Magic Fountain	1	-118.5622406	34.45299911	1899.8	0	0	5	81	9	12	0	0	1	0	0	3	5	0	8	2	5
0403721326	Shell Oil Company	Plugged & Abandoned	Newhall	Well No.	1	-118.537262	34.3428421	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403721351	Woodland Oil Co.	Plugged & Abandoned	Any Field	N. L. & F.	1	-118.5647202	34.4529953	0.0	0	0	5	81	9	12	0	0	0	0	0	3	5	0	0	2	5
0403721364	Heinz H. Herrmann	Plugged & Abandoned	Placerita	Albert-Trinity	1	-118.4876785	34.37083435	0.0	0	104	6	98	26	52	0	0	0	1	0	5	6	0	11	2	5
0403721365	G. R. Nance Co., Inc.	Plugged & Abandoned	Del Valle	Gallagher	1	-118.6736527	34.43320847	13.8	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403721369	Petroleum Development Corp.	Plugged & Abandoned	Del Valle	USL	1	-118.7009735	34.42521667	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403721371	Jean Martinez	Plugged & Abandoned	Tapia	Dodge	1	-118.5894318	34.47727203	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721372	Montara Petroleum Company	Plugged & Abandoned	Newhall	Patric-Pet-Towsley Canyon	1	-118.5753326	34.35522842	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403721454	Woodland Oil Co., Opr.	Plugged & Abandoned	Tapia	Dodge	2	-118.5893402	34.47702026	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721461	Coastal Energy Dev. Co.	Plugged & Abandoned	Any Field	Withall	I-8	-118.5811997	34.47505569	3.7	0	45	5	81	24	47	0	0	0	0	0	1	5	0	0	2	5
0403721464	The Termo Company	Plugged & Abandoned	Oat Mountain	Gardett	1-20	-118.58918	34.32826614	1.3	0	0	3	72	20	37	0	0	0	0	0	3	3	0	0	3	5
0403721465	Hilliard Oil & Gas, Inc.	Plugged & Abandoned	Aliso Canyon	Orcutt Trust	1	-118.5810928	34.32874298	1.3	0	45	5	80	20	37	0	0	0	0	0	1	5	0	0	3	5
0403721466	Montara Petroleum Company	Plugged & Abandoned	Hasley Canyon	Sterling	81X	-118.6420364	34.45281982	2.1	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403721472	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge	3-A	-118.5913239	34.47542953	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721543	Chevron U.S.A. Inc.	Plugged & Abandoned	Howard Townsite	West Athens	1	-118.2964325	33.92737579	9018.4	0	0	5	71	62	97	0	0	5	4	0	3	5	0	72	9	2
0403721674	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Anita Baldwin (nct-2)	21	-118.0609741	34.03043365	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403721686	Union Oil Company of California	Plugged & Abandoned	Any Field	Marvel Ranch	1-14	-118.6361313	34.33779907	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403721687	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Henning-Kennedy	102	-118.6274796	34.48762894	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403721688	Chevron U.S.A. Inc.	Plugged & Abandoned	Castaic Hills	Henning-Kennedy	103	-118.6277847	34.48767853	1214.3	0	0	6	67	15	25	0	0	1	0	0	3	6	0	9	2	5
0403721689	Petrominerals Corp.	Plugged & Abandoned	Hasley Canyon	Hilgenfeld	1	-118.6577148	34.45514297	325.9	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403721698	Southern California Gas Company	Plugged & Abandoned	Honor Rancho	WEZU	18A	-118.5922318	34.45187759	0.0	0	43	5	68	0	0	0	0	0	0	0	0	5	0	0	2	5
0403721699	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	W.S.W.	1	-118.6997299	34.46910095	8.6	0	0	6	77	34	67	0	0	0	2	0	3	6	0	18	2	5
0403721702	Dekalb Energy Co.	Plugged & Abandoned	Any Field	Newhall Land & Farming Co.	1	-118.5889893	34.41953278	391.9	0	0	5	81	14	22	0	0	0	0	0	3	5	0	0	2	5
0403721703	Lawrence Barker, Jr	Plugged & Abandoned	Any Field	Barker-Conoco	1	-118.6904144	34.44830322	26.3	0	43	5	81	34	67	0	0	0	2	0	0	5	0	10	2	5
0403721704	Shirley M. Lechler	Plugged & Abandoned	Oak Canyon	Lechler	101	-118.7005692	34.47537613	0.0	0	0	6	77	10	13	0	0	0	0	0	3	6	0	0	2	5
0403721705	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge	3-B	-118.593277	34.47591019	3.7	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403721706	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	J. I. Hathaway et al	1	-118.7071838	34.50061035	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403721707	Woodland Oil Co., Opr.	Plugged & Abandoned	Wayside Canyon	U.S.L.	1	-118.5824585	34.47285843	3.7	0	43	2	56	24	47	0	0	0	0	0	0	2	0	0	2	5
0403721717	Chevron U.S.A. Inc.	Plugged & Abandoned	Any Field	J. I. Hathaway et al	2	-118.7084198	34.50064468	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403721755	Chevron U.S.A. Inc.	Plugged & Abandoned	Montebello	Montebello Unit One	1	-118.0608521	34.030159	0.0	0	0	6	101	49	88	0	0	0	4	0	3	6	0	36	7	1
0403721792	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	181	-118.3736649	34.00771332	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721801	Catellus Valencia LLC	Plugged & Abandoned	Hasley Canyon	Sterling	1-10	-118.6442566	34.45224762	2.1	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403721816	Catellus Valencia LLC	Plugged & Abandoned	Hasley Canyon	Sterling	2-10	-118.6431198	34.4523468	2.1	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403721819	Oro Negro, Inc.	Plugged & Abandoned	Placerita	Albert	28	-118.4982529	34.37355804	0.0	0	42	6	98	21	40	0	0	0	0	0	0	6	0	0	2	5
0403721821	Arco Oil and Gas Co.	Plugged & Abandoned	Tapia	Benz	2	-118.6069412	34.48248672	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403721870	Cabeen Exploration Corp	Plugged & Abandoned	Any Field	Hathaway	1	-118.7153091	34.48858261	0.6	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403721871	Catellus Valencia LLC	Plugged & Abandoned	Hasley Canyon	Sterling	3-10	-118.6452789	34.45094299	2.1	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403721880	B & M Projects	Plugged & Abandoned	Any Field	Rowe	1	-118.5208588	34.33731842	0.0	0	0	5	81	20	37	1	0	0	0	0	3	5	3	0	3	5
0403721885	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	Blum	1	-118.6841354	34.46429825	8.6	0	40	6	77	34	67	0	0	0	2	0	0	6	0	12	2	5
0403721886	Chevron U.S.A. Inc.	Plugged & Abandoned	Oak Canyon	A. A. Garcia, Jr.	1	-118.6873856	34.46344376	8.6	0	40	6	77	34	67	0	0	0	2	0	0	6	0	12	2	5
0403721890	The Termo Company	Plugged & Abandoned	Oak Canyon	Geo. M. Lechler	7	-118.6972809	34.47541046	8.6	0	40	6	77	10	13	0	0	0	0	0	0	6	0	0	2	5
0403721893	Core Drill Ltd	Plugged & Abandoned	Any Field	Core	1	-118.5782929	34.47615051	3.7	0	40	5	81	24	47	0	0	0	0	0	0	5	0	0	2	5

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0403721909	Oxy Petroleum Inc.	Plugged & Abandoned	Howard Townsite	Mono Racetrack	1	-118.3086472	33.93291473	5400.8	0	0	5	71	45	83	0	0	3	4	0	3	5	0	56	9	2
0403721928	Matrix Oil Corporation	Plugged & Abandoned	Whittier	Mitchell Energy Corp	S-20	-118.0519409	34.00329208	0.0	0	0	9	122	41	77	0	0	0	3	0	3	9	0	36	10	4
0403721947	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU-LAI-LW	212	-118.3725357	34.00630188	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403721948	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	149	-118.3741303	34.01138306	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403722025	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	30	-118.0709152	34.02681732	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403722026	Marathon Oil Company	Plugged & Abandoned	Del Valle	Vasquez	20	-118.6775131	34.42918396	0.0	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722030	Chevron U.S.A. Inc.	Plugged & Abandoned	Newhall	Le Tournour	1	-118.5039063	34.34394073	0.0	0	0	10	142	26	52	0	0	0	1	0	3	10	0	13	2	5
0403722047	The Newhall Land and Farming Company, LLC	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	77	-118.6301651	34.42631149	0.0	0	0	6	68	34	67	0	0	0	2	0	3	6	0	18	2	5
0403722049	Argo Petroleum Corp.	Plugged & Abandoned	Any Field	Hamiliton Bros B R	12-84	-118.7115326	34.44797516	0.0	0	40	5	81	33	65	0	0	0	2	0	0	5	0	10	2	5
0403722053	Blackfoot-Cherokee Energy Inc.	Plugged & Abandoned	Any Field	Donchin	1	-118.6661224	34.45590591	325.9	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722056	Monterey Resources Inc.	Plugged & Abandoned	Castaic Junction (ABD)	N. L. & F.	1	-118.6387482	34.43435669	0.0	0	0	6	68	34	67	1	0	0	2	0	3	6	3	24	2	5
0403722059	Argo Petroleum Corp.	Plugged & Abandoned	Ramona, North	Black Ranch	7-15	-118.7103806	34.44468307	0.0	0	0	2	72	33	65	0	0	0	2	0	3	2	0	10	2	5
0403722062	Argo Petroleum Corp.	Plugged & Abandoned	Ramona, North	Black Ranch	7-25	-118.7068863	34.44484711	0.0	0	0	2	72	34	67	0	0	0	2	0	3	2	0	10	2	5
0403722064	Southern California Gas Company	Plugged & Abandoned	Aliso Canyon	Porter	12A	-118.5499115	34.31558609	0.0	0	39	5	80	11	15	0	0	0	0	0	0	5	0	0	3	5
0403722070	Gods Right Arm Oil Corp.	Plugged & Abandoned	Any Field	Jesus	1	-118.6727219	34.49104691	40.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403722072	Petrominerals Corp.	Plugged & Abandoned	Hasley Canyon	Mabel Strawn	5	-118.6483383	34.45381927	56.6	0	0	1	74	34	67	0	0	0	2	0	3	1	0	8	2	5
0403722073	Rincon Operating Co.	Plugged & Abandoned	Any Field	Woodcraft Rgrs	6X-34	-118.6494141	34.47799301	1214.3	0	39	5	81	15	25	0	0	1	0	0	0	5	0	5	2	5
0403722265	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	340	-118.3706055	34.00312042	0.0	1	39	9	94	32	62	0	0	0	2	3	0	9	0	24	5	2
0403722266	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	303	-118.3731537	34.00155258	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403722308	California Resources Production Corporation	Plugged & Abandoned	Del Valle	N. L. & F.	4-20	-118.678894	34.41762161	3.6	0	38	5	78	34	67	0	0	0	2	0	0	5	0	10	2	5
0403722312	James C. Haggard & Assoc.	Plugged & Abandoned	Any Field	G.G.H.O.	1	-118.4414978	34.37277222	14.7	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403722315	Quintana Petroleum Corporation	Plugged & Abandoned	Del Valle	Newhall SCP	1	-118.6855164	34.41369629	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722322	California Resources Production Corporation	Plugged & Abandoned	Del Valle	N. L. & F.	7-20	-118.6831207	34.42032242	3.6	0	38	5	78	34	67	0	0	0	2	0	0	5	0	10	2	5
0403722331	Quintana Petroleum Corporation	Plugged & Abandoned	Del Valle	Newhall SCP	2	-118.6858292	34.41369247	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722347	Quintana Petroleum Corporation	Plugged & Abandoned	Del Valle	N. L. & F.	1-21	-118.6763001	34.41438293	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722352	Quintana Petroleum Corporation	Plugged & Abandoned	Newhall-Potrero	NL&F-Trifield	1	-118.6472397	34.41472626	0.0	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403722353	Quintana Petroleum Corporation	Plugged & Abandoned	Del Valle	U.S.A.-Heisler	1	-118.6999435	34.42166901	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403722355	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	4	-118.5940933	34.47555923	0.0	0	34	1	61	24	47	0	0	0	0	0	0	1	0	0	2	5
0403722424	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	343	-118.3713455	34.00538635	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403722477	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	344	-118.3696594	33.99459457	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403722479	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	FCLI	2-1A	-118.3696823	33.99477005	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403722480	Titan Energy, Inc.	Plugged & Abandoned	Montebello	Mc Ginley	31	-118.0709152	34.02845383	0.0	0	0	6	101	40	76	0	0	0	3	0	3	6	0	27	7	1
0403722519	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	345	-118.3696899	33.99485779	2760.6	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403722539	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	347	-118.3618012	33.99486542	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403722707	Black Hawk Resources Corp.	Plugged & Abandoned	Del Valle	N. L. & F.	1-16	-118.6643753	34.43237305	13.8	0	37	5	78	34	67	0	0	0	2	0	0	5	0	10	2	5
0403722708	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	2-A	-118.5943146	34.47512436	0.0	0	0	1	61	24	47	0	0	0	0	0	3	1	0	0	2	5
0403722711	Magnum Resources Corp.	Plugged & Abandoned	Canton Creek (ABD)	Magnum	14-5	-118.7382507	34.51714325	0.6	0	0	5	61	10	13	0	0	0	0	0	3	5	0	0	2	5
0403722728	Exxon Mobil Corporation	Plugged & Abandoned	Castaic Junction (ABD)	Newhall Land & Farming Co.	78	-118.6241684	34.41320419	0.0	0	0	6	68	14	22	0	0	0	0	0	3	6	0	0	2	5
0403722729	Magnum Resources Corp.	Plugged & Abandoned	Canton Creek (ABD)	Magnum	14-7	-118.7391586	34.51713562	0.6	0	0	5	61	10	13	0	0	0	0	0	3	5	0	0	2	5
0403722735	Tidelands Oil Production Co.	Plugged & Abandoned	Newhall-Potrero	Rancho San Francisco A	1	-118.6473236	34.40328979	432.9	0	0	6	81	14	22	0	0	0	0	0	3	6	0	0	2	5
0403722736	Quintana Petroleum Corporation	Plugged & Abandoned	Any Field	N. L. & F.-Valencia	1	-118.5851364	34.41105652	0.0	0	0	5	81	14	22	0	0	0	0	0	3	5	0	0	2	5
0403722743	Conoco Inc.	Plugged & Abandoned	Any Field	Hathaway	1-17	-118.6916809	34.51308823	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403722744	Quintana Petroleum Corporation	Plugged & Abandoned	Any Field	N. L. & F.-Valencia	2	-118.5855179	34.41414261	0.0	0	0	5	81	14	22	0	0	0	0	0	3	5	0	0	2	5
0403722936	California Resources Production Corporation	Plugged & Abandoned	Wayside Canyon	Wayside Canyon Unit	51	-118.5824204	34.4701767	0.0	0	36	2	56	0	0	0	0	0	0	0	0	2	0	0	2	5
0403722941	Conoco Inc.	Plugged & Abandoned	Any Field	Hathaway	30-1	-118.7008438	34.49477386	0.0	0	0	5	81	10	13	0	0	0	0	0	3	5	0	0	2	5
0403722944	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Burns Crist	9	-118.6404572	34.46102524	919.9	0	35	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403722947	PanCanadian Petroleum Company	Plugged & Abandoned	Del Valle	N. L. & F.	1-16	-118.6608963	34.43798065	13.8	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403722948	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	4	-118.6374283	34.45916367	919.9	0	35	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403722953	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	5	-118.6373367	34.4593277	919.9	0	0	1	74	11	15	0	0	0	0	0	3	1	0	0	2	5
0403722954	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	6	-118.6371384	34.46113968	919.9	0	0	1	74	11	15	0	0	0	0	0	3	1	0	0	2	5
0403722965	Hart Expl. & Prod. Co.	Plugged & Abandoned	Del Valle	N. L. & F.	16-19	-118.6968155	34.42004395	3.6	0	0	5	78	33	65	0	0	0	2	0	3	5	0	16	2	5
0403722967	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Burns Crist	8	-118.6407471	34.4610939	919.9	0	33	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403723004	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC-LAI-LW	251	-118.3613129	33.99676132	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403723165	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC-LAI-LW	215	-118.3667603	34.00276566	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403723215	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-VIC-LW	11	-118.3758087	34.00543594	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723229	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	354	-118.3606644	33.99775696	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403723232	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-STK-BC-LW	412	-118.3617783	33.99576569	2811.9	1	0	9	94	20	39	0	0	2	0	3	3	9	0	30	5	2
0403723244	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	402	-118.3629456	33.99595642	2811.9	0	0	9	94	20	39	0	0	2	0	0	3	9	0	24	5	2
0403723247	Trio Petroleum Inc.	Plugged & Abandoned	Montebello	Montebello	1-6	-118.0689774	34.02554703	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403723254	Commander Oil Company, Ltd.	Plugged & Abandoned	Tapia	Seville West Tapia	3	-118.609993	34.48407364	0.0	0	0	1	61	0	0	0	0	0	0	0	3	1	0	0	2	5
0403723259	Argosy Oil Company	Plugged & Abandoned	Any Field	N. L. & F.	1	-118.6811371	34.39046097	0.0	0	0	5	81	33	65	0	0	0	2	0	3	5	0	16	2	5
0403723266	Fairhaven Oil Co. Inc.	Plugged & Abandoned	Any Field	Gilbert	C-1	-118.5714417	34.48949814	0.0	0	33	5	81	24	47	0	0	0	0	0	0	5	0	0	2	5
0403723267	Milton R. Schulz	Plugged & Abandoned	Any Field	Whithall Ltd.	1	-118.5782776	34.47479248	3.7	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403723268	Argosy Oil Company	Plugged & Abandoned	Any Field	N. L. & F.	2	-118.6706543	34.39257813	0.0	0	0	5	81	20	37	0	0	0	0	0	3	5	0	0	2	5
0403723269	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Burns Crist	12	-118.6398773	34.46138	919.9	0	0	1	74	11	15	0	0	0	0	0	3	1	0	0	2	5

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0403723270	Union Oil Company of California	Plugged & Abandoned	Any Field	Joughlin	67X-24	-118.6119461	34.32485199	0.0	0	0	5	81	11	15	0	0	0	0	0	3	5	0	0	3	5
0403723363	Chevron U.S.A. Inc.	Plugged & Abandoned	Inglewood	L.A. Investment 1	360	-118.3707199	34.00212479	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723364	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	361	-118.3714676	34.00239563	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723370	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	363	-118.3694153	34.00222397	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723373	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	426	-118.3654404	34.00210571	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403723378	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	428	-118.3657608	34.00513458	0.0	1	0	9	94	33	66	0	1	0	2	3	3	9	3	36	5	2
0403723383	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	203	-118.3638992	34.00032425	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403723390	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	303	-118.3626404	33.99887466	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403723408	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	504	-118.3593979	33.99446869	0.0	1	0	9	94	33	64	0	0	0	2	3	3	9	0	30	5	2
0403723480	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI 1	368	-118.3698654	34.00483322	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723481	Horizon Operating Co.	Plugged & Abandoned	Howard Townsite	Kanada	1	-118.3085632	33.94128418	17662.4	0	0	5	71	45	83	0	1	9	4	0	3	5	3	143	9	2
0403723487	Lion Oil & Gas Company LLC	Plugged & Abandoned	Howard Townsite	Kanada	2	-118.308754	33.9408989	15774.1	0	0	5	71	45	83	0	1	8	4	0	3	5	3	132	9	2
0403723499	Horizon Operating Co.	Plugged & Abandoned	Howard Townsite	Kanada	3	-118.3087616	33.94099426	17662.4	0	0	5	71	45	83	0	1	9	4	0	3	5	3	143	9	2
0403723558	Horizon Operating Co.	Plugged & Abandoned	Howard Townsite	Kanada	4	-118.3087616	33.94104385	17662.4	0	0	5	71	45	83	0	1	9	4	0	3	5	3	143	9	2
0403723569	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	266	-118.3726959	34.00640106	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723612	Trio Petroleum Inc.	Plugged & Abandoned	Montebello	Benton Montebello	2-6	-118.068924	34.02552414	0.0	0	0	6	101	47	86	0	0	0	4	0	3	6	0	36	7	1
0403723620	California Resources Long Beach, Inc.	Plugged & Abandoned	Rosecrans, East	Unspecified	SS-20	-118.2638092	33.8980484	1188.6	0	0	3	59	68	99	0	0	1	4	0	3	3	0	30	9	2
0403723665	City of Whittier	Plugged & Abandoned	Whittier	Central Fee	2	-117.992012	33.97713089	128.3	0	0	9	122	24	47	0	0	0	0	0	3	9	0	0	6	4
0403723750	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU-LAI-LW	216	-118.3727264	34.00624466	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403723807	BreitBurn Operating LP	Plugged & Abandoned	Sawtelle	Sawtelle	4	-118.4555969	34.0587883	18.1	1	0	4	53	0	0	0	1	0	0	3	3	4	3	0	5	3
0403724010	Hunt Oil USA, Inc.	Plugged & Abandoned	Any Field	Goldberg	1-10	-118.4522476	34.79667664	0.0	0	29	5	81	17	30	0	0	0	0	0	0	5	0	0	1	5
0403724031	Monterey Resources Inc.	Plugged & Abandoned	Del Valle	Texaco Encinas Fee	1	-118.690979	34.42233658	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403724040	The Termo Company	Plugged & Abandoned	Las Llajas	Las Llajas	6	-118.6475372	34.32394409	0.0	0	0	4	73	11	15	0	0	0	0	0	3	4	0	0	3	5
0403724129	Padua Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.5188065	34.33375931	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403724154	SWC Resources Inc	Plugged & Abandoned	Newhall	Unknown	1	-118.5789414	34.35189438	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724160	Unknown Operator	Plugged & Abandoned	Newhall	Unknown	2	-118.5839615	34.35383224	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724172	J. M. Queen	Plugged & Abandoned	Newhall	Well No.	1	-118.5490341	34.33796692	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403724173	Pioneer	Plugged & Abandoned	Any Field	White Oil Co.	1	-118.4440308	34.37321854	14.7	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403724174	Castaic Oil Company	Plugged & Abandoned	Any Field	Well No.	1	-118.627121	34.50597	4885.8	0	0	5	81	10	13	0	0	3	0	0	3	5	0	24	2	5
0403724175	Bradshaw & Beville	Plugged & Abandoned	Newhall	Well No.	2	-118.5419617	34.3323822	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	3	5
0403724176	Henry R. Dabney	Plugged & Abandoned	Newhall	McCormick	1	-118.5742493	34.35336685	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724178	New Century Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.4506226	34.37630844	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403724179	New Century Oil Co.	Plugged & Abandoned	Any Field	Well No.	2	-118.450264	34.37668991	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403724180	New Century Oil Co.	Plugged & Abandoned	Any Field	Well No.	3	-118.4500427	34.37612534	0.0	0	0	5	81	26	52	0	0	0	1	0	3	5	0	8	2	5
0403724181	New Century Oil Co.	Plugged & Abandoned	Any Field	Well No.	4	-118.4512787	34.37862396	0.0	0	0	5	81	24	47	0	0	0	0	0	3	5	0	0	2	5
0403724191	Unknown Operator	Plugged & Abandoned	Newhall	Towsley	5	-118.5842896	34.35360336	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724192	Unknown Operator	Plugged & Abandoned	Newhall	Unknown	3	-118.5833588	34.35277176	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724200	Dan Murphy	Plugged & Abandoned	Newhall	Well No.	1	-118.5212097	34.34150314	15.1	0	0	10	142	33	65	0	0	0	2	0	3	10	0	26	2	5
0403724202	Shell Oil Company	Plugged & Abandoned	Newhall	Well No.	1	-118.5370331	34.34263611	9.7	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403724204	Berkeley Oil Co.	Plugged & Abandoned	Any Field	Well No.	1	-118.7124786	34.45995712	8.6	0	0	5	81	34	67	0	0	0	2	0	3	5	0	16	2	5
0403724206	Newhall Consolidated Oil Co	Plugged & Abandoned	Any Field	Well No.	1	-118.4097366	34.4700737	33.9	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	2	5
0403724219	Seneca Resources Company, LLC	Plugged & Abandoned	Any Field	N.L.&F. Magic Mountain	1	-118.5872498	34.41680527	391.9	0	18	5	81	14	22	0	0	0	0	0	0	5	0	0	2	5
0403724238	TEG Oil & Gas USA, Inc.	Plugged & Abandoned	Tapia	Yule	6	-118.6056061	34.48015594	0.0	0	17	1	61	0	0	0	0	0	0	0	0	1	0	0	2	5
0403724247	M. V. Kahler	Plugged & Abandoned	Any Field	Eadie	1A	-118.5165939	34.33115005	0.0	0	0	5	81	28	57	1	0	0	1	0	3	5	3	11	3	5
0403724310	Havenstrite Oil Co.	Plugged & Abandoned	Del Valle	Liebhart	3	-118.6564179	34.42719269	2.1	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403725017	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	639	-118.3615418	33.99782944	0.0	1	0	9	94	33	66	0	0	0	2	3	3	9	0	30	5	2
0403725134	Las Flores Dev.	Plugged & Abandoned	Torrance	Unknown	1	-118.2958145	33.81487656	12855.8	0	0	7	96	44	81	0	0	7	4	0	3	7	0	110	11	2
0403725156	Hamman Brothers	Plugged & Abandoned	Any Field	Core Hole	1	-118.1667099	34.61233902	558.6	0	0	5	81	21	40	0	0	0	0	0	3	5	0	0	1	5
0403725157	Hamman Brothers	Plugged & Abandoned	Any Field	Core Hole	2	-118.1667328	34.61317444	754.5	0	0	5	81	21	40	0	0	0	0	0	3	5	0	0	1	5
0403725206	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	BC	647	-118.3616028	33.99690247	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403725254	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	VRU	285	-118.3758545	34.01148224	0.0	1	0	9	94	22	42	0	0	0	0	3	3	9	0	0	5	2
0403725257	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	LAI-BC-LW	403	-118.3758469	34.00553894	0.0	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403725398	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Vickers 1	133	-118.3793411	34.00906372	5.4	1	0	9	94	32	62	0	0	0	2	3	3	9	0	30	5	2
0403726346	Great Angelus Oil & Land Corp.	Plugged & Abandoned	Any Field	Unspecified	1	-117.83653	34.771208	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	1	5
0403726459	Cedric E. Brown Gas & Oil Co., Ltd.	Plugged & Abandoned	Any Field	Unspecified	2	-118.0640335	34.72591019	20.9	0	0	5	81	40	76	0	0	0	3	0	3	5	0	24	1	5
0403726690	Sentinel Peak Resources California LLC	Plugged & Abandoned	Inglewood	Stocker	2268	-118.3613205	33.99579239	0.0	1	0	9	94	20	39	0	0	0	0	3	3	9	0	0	5	2
0403729956	Nahama & Weagant Energy Company	Plugged & Abandoned	Del Valle	Del Valle	1-20	-118.6856461	34.41405106	3.6	0	0	5	78	34	67	0	0	0	2	0	3	5	0	16	2	5
0403729962	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	7	-118.6369324	34.46105957	919.9	0	35	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403729964	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Burns Crist	10	-118.6405716	34.46110535	919.9	0	34	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403729966	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	5	-118.5935364	34.47463989	3.7	0	34	1	61	24	47	0	0	0	0	0	0	1	0	0	2	5
0403729967	Samedan Oil Corporation	Plugged & Abandoned	Newhall	Chevron Towsley	1	-118.5702744	34.35542679	1.3	0	0	10	142	20	37	0	0	0	0	0	3	10	0	0	2	5
0403729968	Kaye R. McCown	Plugged & Abandoned	Tapia	Dodge-Kaye	6	-118.5945969	34.47600937	0.0	0	0	1	61	24	47	0	0	0	0	0	0	3	1	0	0	2	5
0403729970	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	9	-118.637085	34.46110916	919.9	0	34	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0403729971	Crimson Resource Management Corp.	Plugged & Abandoned	Hasley Canyon	Sadd	8	-118.6372681	34.46118546	919.9	0	33	1	74	11	15	0	0	0	0	0	0	1	0	0	2	5
0423718970	Mobil Oil Corporation	Plugged & Abandoned	Any Field	S.M.	1	-118.5576706	33.99816513	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	5	3

Abandoned Wells Ranking Information

API	OPERATOR_N	CURRENT_ST	FIELD	LEASE_NAME	WELL_NUMBE	XCOORD	YCOORD	POPDEN_PPS	NearActiveInj	SpudDateAge	FieldRank	FieldAge	CIScore	COScore%	Methane	MethaneZone	CensusRank	EnviroRank	InjectorRank	SpudAgeRank	FieldRank	MethaneRank	RankTotal	PlanningDistrict	SupDistrict
0423719050	Mobil Oil Corporation	Plugged & Abandoned	Any Field	S.M.	4	-118.5590973	33.99653244	0.0	0	0	5	81	0	0	0	0	0	0	0	3	5	0	0	5	3

District 1 Oil Fields

California Department of Conservation
Division of Oil, Gas, and Geothermal Resources
April 16, 2001

Sherman (Abd)
Salt Lake
San Vicente
Los Angeles City
Sawtelle
Beverly Hills
South Salt Lake
Union Station
Cheviot Hills
Boyle Heights (Abd)
Los Angeles Downtown
Las Cienegas
Montebello
North Whittier Heights (Abd)
Lapworth (abd)
Walnut
Inglewood
Bandini
East Los Angeles
Turnbull (Abd)
Rowland (Abd)
Venice Beach (Abd)
Whittier
Playa Del Rey
Sansinena
Potrero
Chino-Soquel
Hyperion
Sana Fe Springs
Newgate
Brea-Olinda
Howard Townsite
El Segundo
Leffingwell (Abd)
Rosecrans
West Coyote
Mahala
Prado-Corona
Lawndale
East Coyote
Esperanza
East Rosecrans
Yorba Linda
Alondra
South Rosecrans
La Mirada (Abd)
Richfield
Northeast Kraemer (Abd)
West Buena Park (Abd)
Kraemer (Abd)
Dominguez
West Kraemer (Abd)
East Buena Park (Abd)
Olive
Torrance
Long Beach Airport
Anaheim (Abd)
Long Beach
Gaffey (Abd)
Wilmington
Seal Beach
Sunset Beach (Abd)
Belmont Offshore
Talbert (Abd)
Huntington Beach
West Newport
Newport
Beta Offshore (Fed)

Los Angeles
Beverly Hills
Santa Monica
Inglewood
Compton
Torrance
Long Beach
Signal Hill
Cypress
Anaheim
Ontario
Pomona
Montebello
Santa Fe Springs
Santa Ana
Irvine
Huntington Beach

PACIFIC OCEAN

N

0 2 4
miles


Signal Hill field at Atlantic and 28th Streets, circa 1930.


Signal Hill field, April 4, 1930.


Signal Hill field, circa 1930.


E. L. Doheny discovery well, Los Angeles City field.


Los Angeles City field, in the 1890's.


First Street, Los Angeles City field, 1895.


Corner of 1st and Belmont Streets Los Angeles City field, circa 1900.

W:\datadb\fdist1\dist1 -all fields\dist1_all fields.wor

W1-2

W1-1

Wayside Canyon

Hasley Canyon

Honor Rancho

Map 253

Map 252

Ramona

Del Valle

4N17W

Castaic Junction (Abd.)

4S16W

Bouquet Canyon (Abd.)

4N15W

4N14W

Saugus

Placerita

Newhall-Portrero

Map 212

Map 251

Newhall

Lyon Canyon (Abd.)

Santa Susana

Tapo Canyon, S.

3N17W

Map 211

Simi

3S16W

Oat Mountain

Aliso Canyon

Cascade

Map 254

3N15W

3N14W

Map B

Horse Meadows (Abd.)

Mission (Abd.)

San Fernando

Edward L. Grafton

Los Angeles County
Ventura County

Santa Susana

2N17W

2S16W

2S15W

2N14W

Pacoima

Map A

1N17W

1N16W

1S15W

1N14W

W2-1

San Bernardino Base Line

Topanga

1S17W

1S16W

Malibu Beach

PACIFIC OCEAN

0 2 4
miles

District 2 Boundary

District 1 Boundary

WO-2

For wells in San Gabriel Mountain Area, see insert map below.

See Reference Map J

February 26, 2004

San Gabriel Mountains Area

REGIONAL WILDCAT MAP

SHOWING WELLS NOT ON DIVISION FIELD MAPS

State of California - Department of Conservation

Division of Oil, Gas, and Geothermal Resources

NOTE: Wells with directional surveys on file with the division are indicated with a short line under the well symbol.
Current well status should be confirmed at the appropriate division office.

The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.

LEGEND

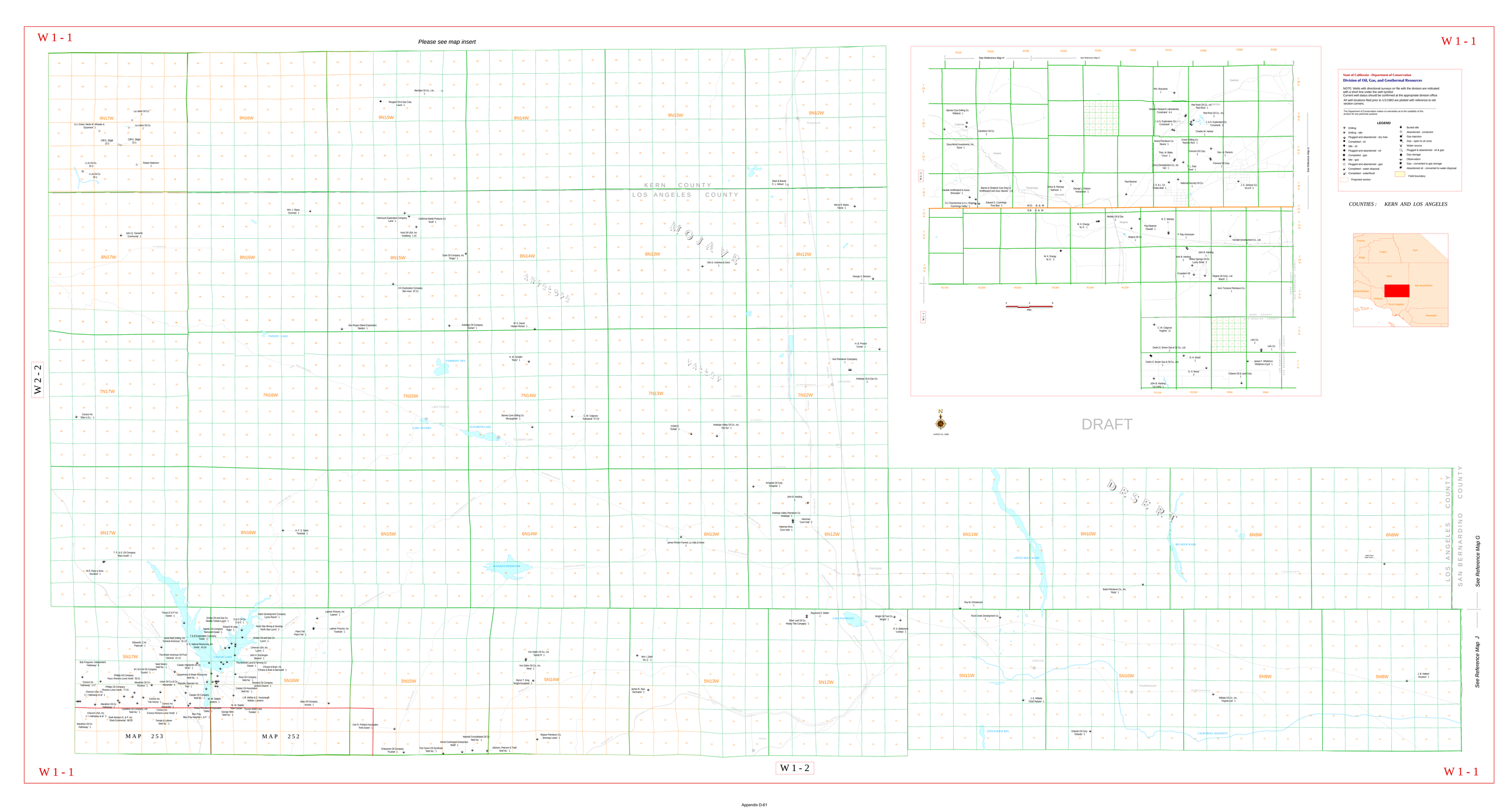
- Drilling
- Drilling - idle
- Plugged and abandoned - dry hole
- Completed - oil
- Idle - oil
- Plugged and abandoned - oil
- Completed - gas
- Idle - gas
- Plugged and abandoned - gas
- Completed - water disposal
- Completed - waterflood
- Idle - observation
- Oil - converted to water disposal
- Completed - gas injection
- Buried idle
- Abandoned - conductor
- Gas injection
- Gas - open to oil zone
- Water source
- Plugged & abandoned - oil & gas
- Gas storage
- Observation
- Gas - converted to gas storage
- Abandoned oil - converted to water disposal
- Oil - converted to air storage
- Plugged and abandoned - waterflood
- Plugged and abandoned - oil to waterflood
- Idle - dual completion - producing oil and disposal
- Field map boundary
- Field boundary
- Division Administrative District boundary

COUNTIES: Los Angeles, Ventura

Map A

Map B - District 2

DRAFT


W 1 - 1
W 1 - 1
W 2 - 2
W 1 - 2
W 1 - 1
W 1 - 1
Please see map insert
KERN COUNTY
LOS ANGELES COUNTY
MOJAVE
ANTELOPE VALLEY
DESERT
SAN BERNARDINO COUNTY
LOS ANGELES COUNTY
See Reference Map G
See Reference Map J
See Reference Map H
See Reference Map G
See Reference Map D
MAP 253
MAP 252
DRAFT
State of California - Department of Conservation
Division of Oil, Gas, and Geothermal Resources
NOTE: Wells with directional surveys on file with the division are indicated with a short line under the well symbol.
Current well status should be confirmed at the appropriate division office.
All well locations filed prior to 1/1/1983 are plotted with reference to old section corners.
The Department of Conservation makes no warranties as to the suitability of this product for any particular purpose.
LEGEND
Drilling
Drilling - idle
Plugged and abandoned - dry hole
Completed - oil
Idle - oil
Plugged and abandoned - oil
Completed - gas
Idle - gas
Plugged and abandoned - gas
Completed - water disposal
Completed - waterflood
Buried idle
Abandoned - conductor
Gas injection
Gas - open to oil zone
Water source
Plugged & abandoned - oil & gas
Gas storage
Observation
Gas - converted to gas storage
Abandoned oil - converted to water disposal
Projected section
Field boundary
COUNTIES : KERN AND LOS ANGELES
Fresno
Tulare
Inyo
Kings
Kern
San Bernardino
Santa Barbara
Ventura
Los Angeles
Riverside
MARCH 01, 2008

Appendix E

Draft Abandoned Well Inspection Protocol

LA County Oil and Gas Facility Compliance Review Project
Abandoned Well Inspection Protocol

CalGEM Records Review Summary			
Well API		Original Spud Date	
Well Risk Ranking		Blowout History?	
Well Name		Gas or Gas Production?	
Abandonment Date		Oil Production?	
Years Since Abandonment		CalGEM Maps?	
Other Regulatory Agency Records?			
• Attach CalGEM Maps • Attach Other Agency Records			
Well Location Detail			
APN			
Nearest Address			
Nearest Cross Street(s)			
Land Use Type			
Nearest Residence			
Nearest School			
Other Sensitive Receptor			
Active Wells in Area?			
Active Oil and Gas Equip?			
• Attach Location Map from WellSTAR • Attach Google Earth Map • Attach Google Earth Image • Attach Site Photographs			
Well Inspection			
Inspection Date		Inspectors	
Is Well Visible?			
Surface Description			
Any Signage?			
Fencing?			
Cone system?			
Notes			

LA County Oil and Gas Facility Compliance Review Project
Abandoned Well Inspection Protocol

Air Quality Monitoring

Location	CH4	VOC	H2S

Neighborhood Interviews

Name	Comment(s)

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

July 2, 2020

TO: Supervisor Kathryn Barger, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Janice Hahn

FROM: Alex Garcia, Supervisor AG.
Zoning Enforcement Special Projects

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

The Board also requested that a five-member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team to assess the team's findings and recommendations and to provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. The appointed Advisory Panel members are:

- First District Board Office appointee – Julia May
- Second District Board Office appointee – Andrew Weissman
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani
- Fifth District Board Office appointee – R. Rex Parris

The Advisory Panel was to hold a public meeting following the March 25, 2020, Strike Team public meeting. The Strike Team meeting was postponed due to the COVID-19 pandemic as described in a memo submitted to the Board on March 23, 2020. The Strike Team's eighth biannual report was submitted to the Board on June 4, 2020. The Advisory Panel's public meeting was subsequently held on June 30, 2020, to discuss the Advisory Panel's assessment of the Strike Team's report. Those Advisory Panel members who participated in the meeting were:

- Second District Board Office appointee – Andrew Weissman
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani

No written comments were received from Advisory Panel members as part of this submittal. The Advisory Panel report can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

The next Oil and Gas Strike Team report to the Board is due on September 29, 2020, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Ai-Viet Huynh, Zoning Enforcement Special Projects section, at ahuynh@planning.lacounty.gov.

AG:ah

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20200702-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Department of Public Works
Department of Public Health
Fire Department

NO COMMENTS RECEIVED

FROM ADVISORY PANEL MEMBERS

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

August 31, 2020

TO: Supervisor Kathryn Barger, Chair
Supervisor Hilda L. Solis
Supervisor Mark Ridley-Thomas
Supervisor Sheila Kuehl
Supervisor Janice Hahn

FROM: Alex Garcia, Supervising Regional Planner
Zoning Enforcement Special Projects

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

The Strike Team Report #9 is due to the Board by September 29, 2020. The main discussion for this report edition was intended for inspection outcomes of high priority abandoned wells. However, there have been substantial delays on the inspection progress due to the COVID-19 pandemic. Multi-agency inspections had to be postponed until it is safe for staff to do so. In addition, the current reporting period has been significantly truncated to three months, rather than six. The Strike Team meeting to discuss and submit the previous Report #8, scheduled for March 25, 2020, was cancelled due to the County's order to cease public meetings. This resulted in a report submittal delayed until June 4, 2020.

Since Report #8, staff has had productive collaboration efforts with outside agencies on the inspection protocol. Staff has also made progress on data collection and analysis of oil and gas storage facilities and pipelines. However, given the inspection setbacks and reduced reporting period window, the Strike Team's progress has not been substantial enough to merit submitting Report #9 at this time. Instead, the Oil and Gas Strike Team will reconvene to review and discuss Report #9 for submittal to the Board no later than March 29, 2021.

Should you have any questions, please have your staff contact me or Ai-Viet Huynh, Zoning Enforcement Special Projects, at ahuynh@planning.lacounty.gov.

AG:ah

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Department of Public Works
Department of Public Health
Fire Department

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

March 25, 2021

TO: Supervisor Hilda L. Solis, Chair
Supervisor Holly J. Mitchell
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

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

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

In accordance with the Board's motion, the Strike Team is submitting the ninth update report to the Board for the oil and gas subject areas within the unincorporated Los Angeles County listed below. This report is the fourth of five update reports for the Phase II effort. The report and the appendices can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines
- Oil and Gas Storage Facilities
- Hazardous Chemicals

The Strike Team held a public meeting on March 24, 2021, to discuss the ninth update report and to hear public comment. The Strike Team passed a motion to direct staff to file this report with the Board. The next Strike Team report is due to the Board no later than September 29, 2021.

Should you have any questions about this report, please contact Ai-Viet Huynh, Zoning Enforcement Special Projects, at ahuynh@planning.lacounty.gov or (213) 974-6483.

AJB:JS:AG:ah

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_20210324-report9.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

S_03/25/2021_LUR_L_OILANDGAS

Oil and Gas Assessment Project

Phase II – Report Number 4

County of Los Angeles

March 2021

Prepared for:
County of Los Angeles

Prepared by:
MRS Environmental (MRS)

Los Angeles Oil and Gas Strike Team

Bi-Annual Report Number Nine

Table of Contents

Executive Summary

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works, to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County (unincorporated County), excluding that area of the Inglewood Oil Field that is regulated under the Baldwin Hills Community Standards District. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

Phase I of the project was completed in September 2017 and provided an assessment of oil and gas facilities in unincorporated Los Angeles County with the following tasks:

- Verifying and updating an existing inventory of oil and gas facilities;
- Conducting site visits and compliance review of the oil and gas facilities;
- Developing a public health assessment screening tool; and,
- Researching the regulatory frameworks of other jurisdictions with similar oil and gas infrastructure.

The results of the Phase I efforts are detailed in biannual reports dated October 2016, March 2017, and September 2017 and concluded that additional investigation into oil and gas facilities was warranted.

On September 4, 2018, the Board approved contractual consulting services to continue the efforts of the Strike Team related to oil and gas facilities. This report is the fourth of five (reports four and five were combined due to the Covid pandemic) biannual reports to be provided to the Board during the current 36-month long Strike Team Phase II effort. Under Phase II the Strike Team is tasked with researching and investigating the following oil and gas elements:

- Abandoned and orphan wells;
- Storage facilities;
- Pipelines; and,
- Hazardous chemicals.

This fourth report provides additional data obtained to date and presents prioritization screening for a large number of wells, pipelines, chemicals, and facilities reviewed under this analysis. The final report will summarize the collection and analysis of the data and present recommendations for public safety and environmental improvements to the regulation and operation of the facilities analyzed in this Project.

1.0 Background

This is the ninth report to update the Board on the Strike Team's efforts. The two board actions are summarized below. Consistent with the Phase I reports, the Phase II reports will be cumulative in the analysis: the findings of each Phase II report will be incorporated into forthcoming reports as information is collected and the analysis updated.

1.1 Board Motion Regarding Proactive Planning and Enforcement of Oil and Gas Facilities Operating in Unincorporated Los Angeles County

On March 29, 2016, the Los Angeles County Board of Supervisors passed a motion to:

- Convene a Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County;
- Review Los Angeles County Title 22: Zoning Code to ensure that oil and gas facilities may no longer operate by right in the unincorporated portion of the County and to ensure that regulations reflect best practices and current mitigation measures and technologies, minimize environmental impacts and protect sensitive uses and populations;
- Coordinate with cities throughout the County that are interested in collaborating on the development of regulatory requirements and protocols for monitoring and evaluating their local oil and gas facilities;
- Create an Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess the biannual reports of the Strike Team; and,
- Ensure that County Planning and Code Enforcement services are not negatively impacted.

1.2 Board Action Regarding Continued Strike Team Efforts Regarding Oil and Gas Facilities Operating in Unincorporated Los Angeles County (Phase II)

The results of the work completed under Phase I concluded that additional investigation was merited related to oil and gas facilities in the unincorporated County. Therefore, on September 4, 2018, the Los Angeles County Board of Supervisors approved contractual consulting services to continue assisting the efforts of the Strike Team on oil and gas facilities with focus on the following tasks:

- Continue the work of the Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County for the following:
    - Identify, assess, and prioritize orphaned and abandoned oil and gas wells in the unincorporated County;

  - Identify, assess, and inventory oil and gas pipelines within oil and gas fields, common carrier pipelines outside of oil fields and utility pipelines within the unincorporated County;
  - Identify and assess oil and gas storage facilities in the unincorporated County; and,
  - Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans.
- Continue the coordination and corroboration with the Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess and to provide written comments on the biannual reports.

1.3 Previous Reports

1.3.1 Los Angeles County Oil and Gas Well Inventory

On July 28, 2015, the Board directed the Department of Regional Planning (DRP), in consultation with the Department of Public Health (DPH), to develop a detailed inventory of all oil fields and the associated level of environmental monitoring of all oil wells currently operating within the unincorporated areas of the County of Los Angeles. MRS Environmental (MRS), a consulting firm with expertise in the oil and gas industry, along with County DRP Staff prepared the Los Angeles County Oil and Gas Well Inventory report dated December 2015. The Oil and Gas Well Inventory report identifies facility and well locations and includes a review of local, State, and Federal regulatory requirements for the drilling and operating of oil and gas wells. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/well).

1.3.2 Los Angeles County Oil and Gas Compliance Reports (Phase I)

As noted above, the Oil and Gas Facility Compliance Review Project reports completed under the Strike Team Phase I efforts were submitted to the Board in October 2016, March 2017, and September 2017. The reports included inspection checklists, a well inspection protocol, results from facility inspections and a screening public health assessment for 12 facilities and 557 oil and gas wells. The report also included review and recommendations for further review on legislative positions, regulatory positions, legal positions, and other facilities that may benefit the County by undergoing a similar review. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike).

1.3.3 Los Angeles County Oil and Gas Compliance Reports (Phase II)

The initial Phase II Oil and Gas Facility Compliance Review Project report was submitted to the Board in March 2019 and the second report in September 2019. The research, database development, and mapping in the first three reports provided the Strike Team Phase II data on the issue areas and provided staff with applicable tools to continue forward with the Project as reflected in this fourth report. The reports are available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike). Input from the Strike Team Advisory Panel on the second report is summarized in Appendix A.

1.4 Phase II Project Scope

As listed in Section 1.2 above, the Phase II scope includes review and assessment of orphaned and abandoned wells, oil and gas pipelines, oil and gas storage facilities, and chemicals not identified in Hazardous Materials Business Plans. Tasks also include a review of regulatory agency databases and permits, site visits, evaluation and prioritization of public health and safety risk, and recommendations for further action. The scope does not include a review of down-hole compliance issues (well testing and conditions of well bores below the surface of the ground) or ambient air monitoring such as the installation of toxic air pollutant monitoring stations.

1.5 County Departments and Their Roles

County Departments involved in the Strike Team include the following:

- Regional Planning;
- Public Health;
- Public Works;
- Fire; and
- County Counsel.

The role of each of these is discussed below.

1.5.1 Department of Regional Planning (DRP)

The DRP is the lead County agency for this compliance review effort. DRP is responsible for the following components and tasks:

- The Director or her designee to attend Strike Team public meetings;
- Project management;
- Hire and manage the consultant assisting the County;
- Coordinate and facilitate staff meetings;
- Coordinate and staff Advisory Panel and Strike Team meetings;
- Research and collection of regulatory mapping, infrastructure, and inspection data;
- Coordinate information exchange between all involved agencies;
- Develop an unincorporated County orphan and abandoned well database;
- Develop an unincorporated County pipeline database;
- Develop an unincorporated County chemical database;
- Attend the field site visits;
- Prepare field site findings; and
- Prepare biannual reports.

1.5.2 Department of Public Health (DPH)

The DPH's role on the Strike Team includes:

- The Director or her designee to attend Strike Team public meetings;
- Research and collection of DPH issues, complaints, and enforcement actions;
- Attend staff meetings;

- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.3 Department of Public Works (DPW)

The DPW's role on the Strike Team includes:

- The Director or his designee to attend Strike Team public meetings;
- Research and collection of DPW permits;
- Research and collection of DPW issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.4 County Fire Department (Fire)

The Fire Department's Fire Prevention Bureau/Petroleum Chemical Unit and the Health Hazardous Materials Division roles on the Strike Team includes:

- The Fire Chief or his designee to attend Strike Team public meetings;
- Research and collection of fire prevention permits;
- Research and collection of Certified Unified Program Agency-CUPA permits (hazardous materials, hazardous waste, above ground petroleum storage, and California Accidental Release Prevention Program-CalARP);
- Research and collection of fire issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.5 County Counsel

County Counsel provides the following assistance to the Strike Team:

- Review of contract for consultant assisting the County;
- Review and comment on Project documentation;
- Attend staff meetings;
- Attend Advisory Panel and Strike Team meetings;
- Advise County on legal positions as necessary; and
- Review and comment on draft reports.

1.5.6 Strike Team Members

The Strike Team consists of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief, or their designees. The Strike Team reviews the reports provided by Project Staff, holds public meetings to discuss the reports, and decides to submit the reports to the Board of Supervisors.

1.5.7 Project Staff

The Project Staff consists of staff from DRP, DPH, DPW, Fire, and MRS, the consultant assisting the County with the Project. In addition, staff from the California Geologic Energy Management Division (CalGEM) formerly known as the California Department of Conservation's Division of Oil, Gas and Geothermal Resources (DOGGR), the South Coast Air Quality Management District (SCAQMD), and Los Angeles Regional Water Quality Control Board (LARWQCB) have volunteered to assist the County in this effort.

1.5.8 Strike Team Advisory Panel

The Advisory Panel consists of five members. Each member was appointed by a Board District Office. The Advisory Panel members are issue area experts in oil and gas, environmental, and/or health issues. The Advisory Panel's role in the Project is to review, comment, and provide written input on the Project reports. The Advisory Panel consists of the following members listed below.

- Julia May (1st District)
- Andrew Weissman (2nd District)
- Tim O'Connor (3rd District)
- Matt Rezvani (4th District)
- R. Rex Parris (5th District)

2.0 Progress Update

This report is the fourth biannual report for the Strike Team Phase II effort; this section provides a summary of the Project activities completed through March 2021. Tasks completed include expanded and updated analysis for the following:

- Three Project Staff meetings;
- Coordination and correspondence with CalGEM (formerly DOGGR) on data request on orphan and abandoned wells;
- Review of the CalGEM WellSTAR database for orphan, abandoned, and idle wells;
- Update of unincorporated County orphan and abandoned well database and associated mapping;
- Development of an idle well data base and associated mapping;
- Coordination and correspondence with the Office of the State Fire Marshall on data request for pipeline mapping, pipeline operator data submittal forms (PSD-101) and pipeline inspection data;
- Review of Pipeline and Hazardous Materials Safety Administration National Pipeline Mapping System (NPMS) database;
- Development of unincorporated County pipeline (NPMS) database and associated mapping;
- Continued review of sources of data for oil and gas storage facilities;
- Review of South Coast Air Quality Management District (SCAQMD) Rule 1148.2 database for oil and gas drilling, well completion, and well rework chemical use;
- Refinement of the risk prioritization method for abandoned wells;
- Detailed mapping of abandoned wells;
- Updating the abandoned and idle well site inspection checklist;
- Continued review of an additional sets of California State Fire Marshal (CSFM) PSD-101 Pipeline Operator Annual reports;
- Continued review and update of the EPA Toxic Release Inventory data base on chemical use;
- Continued review of the California Environmental Reporting System (CERS) data base on chemical use;
- Development of a risk prioritization method for idle wells;
- Mapping of the high priority idle wells; and
- Development of a risk prioritization method for pipelines.

2.1 Chronology of Project Meetings

2.1.1 Project Staff Meetings

Three Project Staff meetings have occurred with the first, the initial kick off meeting for the Project Staff, on Thursday October 25, 2018. The meetings are attended by representatives from DRP, DPH, DPW, Fire, CalGEM, and RWQCB. Staff from MRS also attended. The meetings are summarized below.

- Project Staff Kick Off Meeting - October 25, 2018.

  - Introduction of Project Staff – Staff from each participating County agency, CalGEM and MRS were introduced, and contact information was distributed.
  - Purpose of the Project – The Board motion was discussed along with primary Project tasks.
  - Timeline for first report – The first report would be issued as a draft in March 2019.
  - Roles and responsibilities and regulatory authority – Project goals and agency responsibilities were discussed with each department or agency providing input on the process.

- Project Staff Meeting Report 1 - March 11, 2019
  - Project Staff met to review and comment on the first draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB.
- Project Staff Meeting Report 2 – September 17, 2019.
  - Project Staff met to review and comment on the second draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB.
- Project Staff Meeting Report 3 – March 11, 2020.
  - Project Staff met to review and comment on the second draft report. Comments were received from DRP, DPH, DPW, and CalGEM.

2.1.2 Strike Team Meetings

The Strike Team met on March 21, 2019 at the Regional Planning Commission (RPC) Hearing Room where the DRP and MRS provided a presentation to the Strike Team on the findings of the first report. Subsequently, members of the Strike Team asked questions on the Strike Team efforts and findings and provided comments on the Report. The DPH provided comments on the need to ensure that wells near people are assigned a higher ranking in the prioritization process to identify those abandoned wells with the potential to leak and impact the public health and safety of nearby communities. No public comments were provided at the meeting.

The second report was discussed by the Strike Team at a meeting held on September 24, 2019 at the RPC Hearing Room. No public comments were provided at the meeting.

The Strike Team met on June 1, 2020 virtually via a Zoom meeting to discuss the third report. No public comments were received at the meeting.

2.1.3 Strike Team Advisory Panel Meetings

The Strike Team Advisory Panel met on April 22, 2019 with Advisory Panel members Timothy O'Connor and Matt Rezvani in attendance and Julia May via teleconference. The first report was discussed, and Advisory Panel comments were submitted to the Board on April 25, 2019.

The Advisory Panel discussed the second report at an October 21, 2019 meeting. Advisory Panel members Timothy O'Connor and Matt Rezvani attended with Julia May participating via

teleconference. The Panel discussed and provided comments on the second report, those comments were subsequently forwarded to the Board.

The third report was discussed by the Advisory Panel in a virtual Zoom meeting dated June 30, 2020. The Panel discussed the report but did not provide any comments.

3.0 Orphan and Abandoned Wells

Project Staff has continued coordination and correspondence with CalGEM on orphan and abandoned wells, provided review and input regarding the re-abandonment of Well DOW RGC-10, and developed a database of orphan and abandoned wells in the unincorporated County. Discussion on the status of this effort is provided in the following sections.

3.1 CalGEM Data Request

Staff from CalGEM (formerly DOGGR) attended the Kickoff meeting on October 25, 2018 and provided Project Staff with an overview to the WellSTAR project which updates and revises the WellFinder database, and input on CalGEM recent efforts on idle and abandoned wells. CalGEM's expertise and data are key components to the orphan and abandon well issue. Project Staff correspondence with CalGEM for additional input is listed below.

- 9/19/2018 – Project Staff correspondence including meeting request sent to CalGEM.
- 12/11/2018 – Project Staff correspondence and including meeting request sent to CalGEM.
- 1/14/2019 – Project Staff meeting request sent to CalGEM.
- 1/15/19 –Response received from CalGEM detailing CalGEM Central and Southern Section coordination efforts on Project Staff request.
- 5/8/19 – Project staff met with CalGEM via teleconference on the WellSTAR database status and abandoned well issues.
- 5/24/19 - CalGEM provided the County with additional information covering the following requests:
    - An excel spreadsheet containing updated well list for Los Angeles County. A data column with abandonment dates for wells that have been plugged and abandoned will be provided separately.
    - An excel spreadsheet containing the orphan well list for Los Angeles County as of May 23, 2019. Currently there are no "declared" orphan wells within Los Angeles County. However, CalGEM is currently evaluating approximately 1,272 potential orphan/deserted wells within the County.
    - An excel spreadsheet listing the LA County wells abandoned by the State.
- On July 2, 2019, CalGEM provided DRP with an excel spreadsheet with water level data from idle wells within the Los Angeles County.
- February 20, 2020, CalGEM provided a response to a PRA for information on the 128 high priority wells including historical documents and plugging and abandonment information.

3.2 CalGEM Database and Abandoned Well Preliminary Prioritization

The CalGEM database of wells as provided by CalGEM in May 2019 was utilized to develop a prioritization scheme based on several different criteria. The prioritization scheme is utilized to identify those abandoned wells that are most likely to leak and, if they do leak, of impacting the public health and safety of nearby communities. This prioritization scheme was consulted with and ratified by CalGEM on a call conducted April 7, 2020 with CalGEM, DRP and MRS.

For many older wells the exact location of abandoned wells is only an estimate in the CalGEM database as illustrated by the Marina del Rey incident well location which was not found at the database location but was offset by 70-80 feet from the database location. However, the approximate location of the abandoned wells and other information in the CalGEM database such as the well location relative to other active wells and information on the field in which the wells are located allows for a prioritization scheme to be developed. In addition, the approximate location of the well along with the population density as estimated by historical census data allows for an understanding of potential impact if a well leaks or blowouts relative to populations.

The abandoned wells were prioritized based on their potential impact to public health and safety related to the potential for leakage of gas or other hazardous substances to the surface. Wells were prioritized based on the following characteristics:

- Well status (plugged or unknown);
- Well location and census block population density;
- Historical well type;
- Well location within 500 feet of an active injector well;
- Age of well by spud date (date on which well drilling commenced);
- Well located in an oil and gas field by field age;
- Reservoir characteristics;
- The location of the well relative to the Cal EnviroScreen 3.0 analysis; and
- The location of the well relative to the Los Angeles County methane zones and proximity to landfill methane areas.

Each of these along with the prioritization method are discussed below.

3.2.1 Well Status

Figure 3-1 shows the location of all plugged and abandoned wells in the unincorporated areas of the County of Los Angeles as of the May 2019 CalGEM database. The CalGEM database includes 4,443 total wells in the unincorporated areas, with the characteristics shown in Table 3.1.

Table 3.1 Wells in the Los Angeles County Unincorporated Area

Category	Number
Active wells[1]	1,046
Canceled wells (well application cancelled)[2]	18
Idle wells[3]	637
Permitted (recent or currently being drilled)[4]	5
Plugged & Abandoned wells[5]	2,731
Unknown wells (not classified by CalGEM)[6]	6
Total wells	**4,443**

Source: CalGEM May 2019.

1. Active wells are well that are currently producing oil and/or gas.
2. Cancelled wells are wells that were planned to be drilled and received permits but were not drilled.
3. Idle wells defined by CalGEM as a well that has not been used for two years or more and has not yet been "plugged and abandoned" per CalGEM requirements. This could include an idle well that is actively managed as part of an Idle Well Management Program, or an idle well that is buried and no longer accessible or maintained.
4. New wells are wells that are recent or are currently being drilled and are currently only located at Sentinel Peak Resources Inglewood and at Matrix Sansinena oil fields.
5. Plugged and abandoned wells are wells that have undergone a plugging and abandonment procedure according to CalGEM procedures at the time of the plugging and abandonment.
6. Unknown wells are wells whose status is not known and are currently only located at Sentinel Peak Resources Inglewood and at Browning-Ferris Industries of California, Inc.

Note: an orphan well is a well that has no party responsible for it, leaving the State to plug it if needed.

3.2.2 Abandoned Well Location and Census Block Population Density

Well locations were overlaid with the census data by census block to identify wells that are located near high density areas. The focus of this effort is on the possible effects on human populations and not on other possible environmental degradation (e.g., Significant Ecological Areas). Wells that are in low density areas do not provide as high a priority since a leak would have a lower probability of impacting the public. Many abandoned wells are in sparsely populated areas and those wells are not as high a priority as the abandoned wells located in more densely populated areas. Figure 3-2 shows the location of the abandoned wells relative to the census population density. Table 3.2 shows the number of abandoned wells by location relative to the census population density.

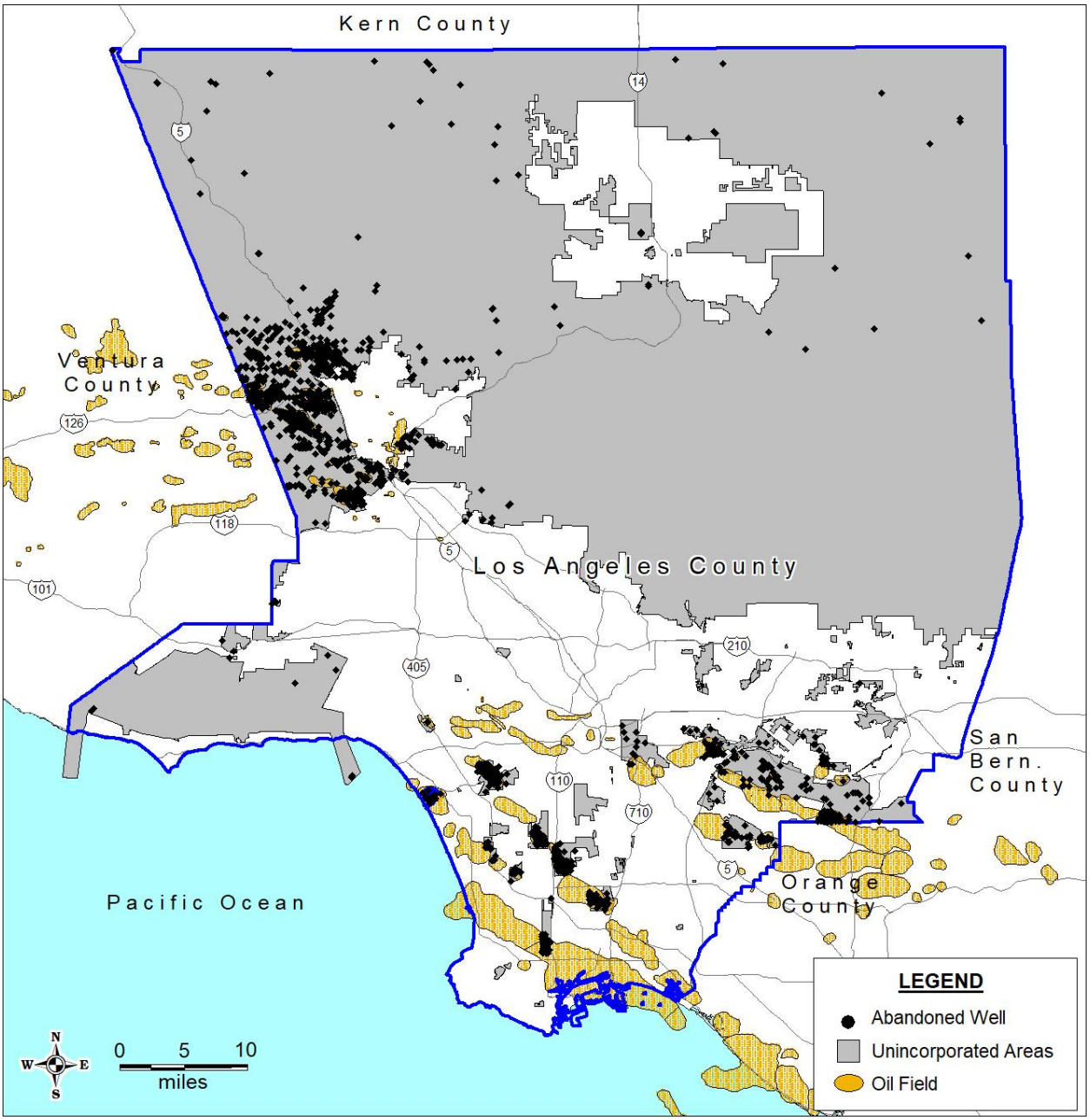
Table 3.2 Abandoned Wells by Population Density

Population Density	Number	Number Percent	Cumulative*	Cumulative Percent*
Between zero and 900 persons per square mile	2163	79%	2731	100%
Between 900 and 4,699 persons per square mile	285	10%	568	21%
Between 4,700 and 8,899 persons per square mile	110	4%	283	10%
Between 8,900 and 13,099 persons per square mile	99	4%	173	6%
More than 13,099 persons per square mile	74	3%	74	3%

Source: CalGEM May 2019.

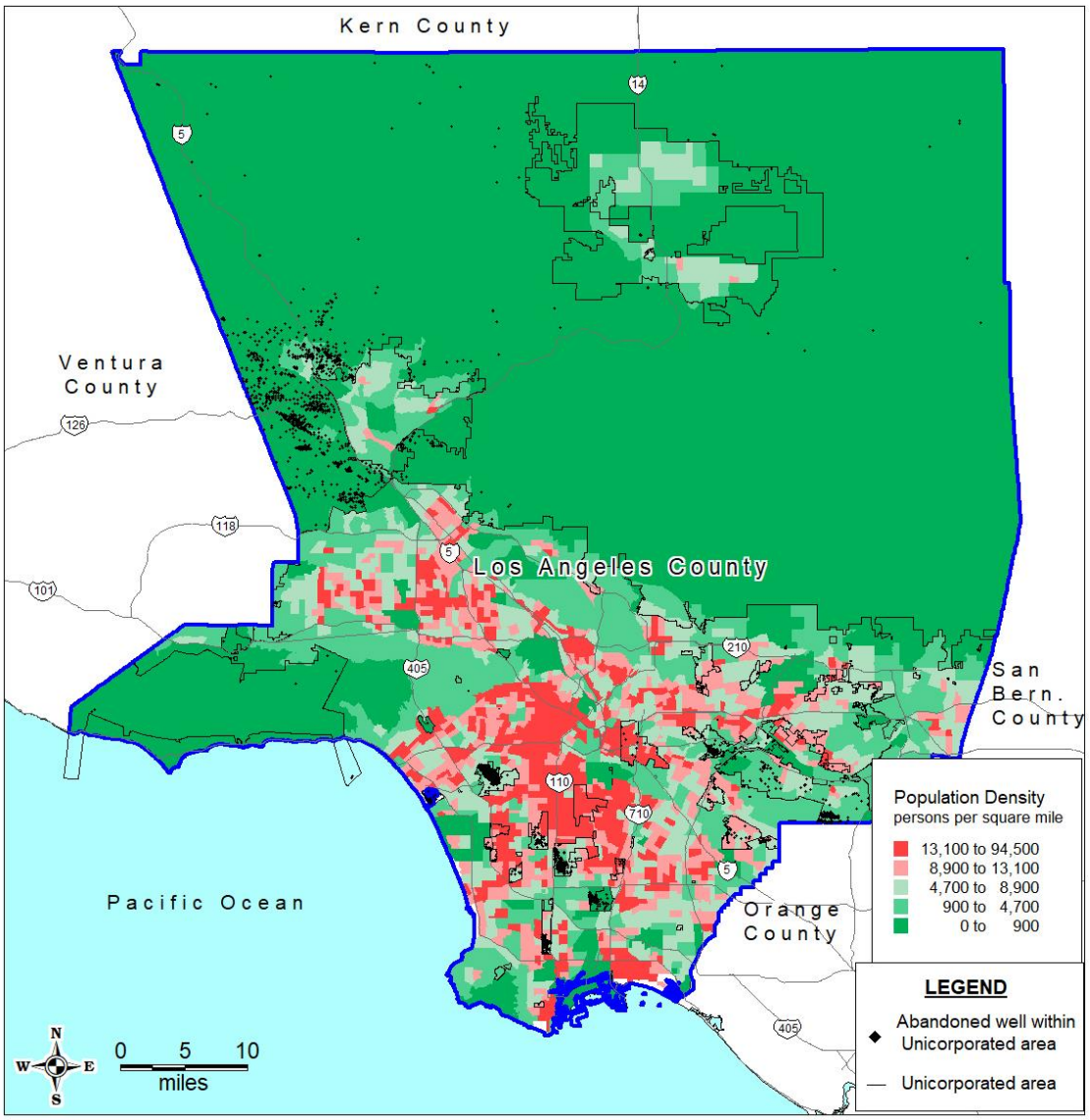
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-1 Plugged, Abandoned and Unknown Wells



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-2 Abandoned Wells and Census Block Population Density



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.3 Abandoned Well Type

Wells are classified by the type of well including oil and gas, gas storage, water source, etc. Wells that resulted in dry holes, for example, would present a lower priority than wells that were historically used for oil and gas production or multiple uses, although dry-hole wells could still present a risk if gas was encountered during the drilling process. A dry hole is commonly defined

as a well that is drilled but does not produce enough oil or gas to be a commercial success. Table 3.3 shows the number of abandoned wells by type in the unincorporated areas.

Table 3.3 Abandoned Wells by Type

Well Type	Number	Percent
Core Hole	9	0.3%
Dry Hole	636	23.3%
Gas	5	0.2%
Gas Storage	27	1.0%
Injection	157	5.7%
Multiple use	101	3.7%
Oil and Gas	1,793	65.7%
Water Source	3	0.1%
TOTAL	2,731	100 %

Source: CalGEM May 2019.

3.2.4 Well Location and Active Injector Well

The abandoned well location in relation to active injector wells gives rise to the potential for leakage from a well due to the increased reservoir pressures near the injection wells. Figure 3-3 shows the location of abandoned wells that are located within 500 feet of an active injection well and located within the unincorporated parts of the County. About 354 plugged and abandoned wells are located within 500 feet of an active injector well.

3.2.5 Well Age by Spud Date

Older wells increase the likelihood that abandonment was not performed to as high a level standard as the current requirements. Although the date the well was started is not the same as the date the well was abandoned, it does provide some indication of the potential for lower quality abandonments which would increase the probability of the well leaking and affecting public health. Information on the abandonment date of the wells is not located in the CalGEM database and is an issue that is proposed for further research once the wells are initially prioritized, which involves the review of historical paper files associated with each well. Information obtained from CalGEM only listed wells that have been abandoned since 2004 and does not include wells that were abandoned before that date.

The CalGEM database only lists the spud date (e.g., the date drilling was started) for a limited number of wells. For abandoned wells only about 8 percent have spud date information in the CalGEM database for wells located in the unincorporated areas. These wells, as a function of age, are shown in Figure 3-4 and listed in Table 3.4.

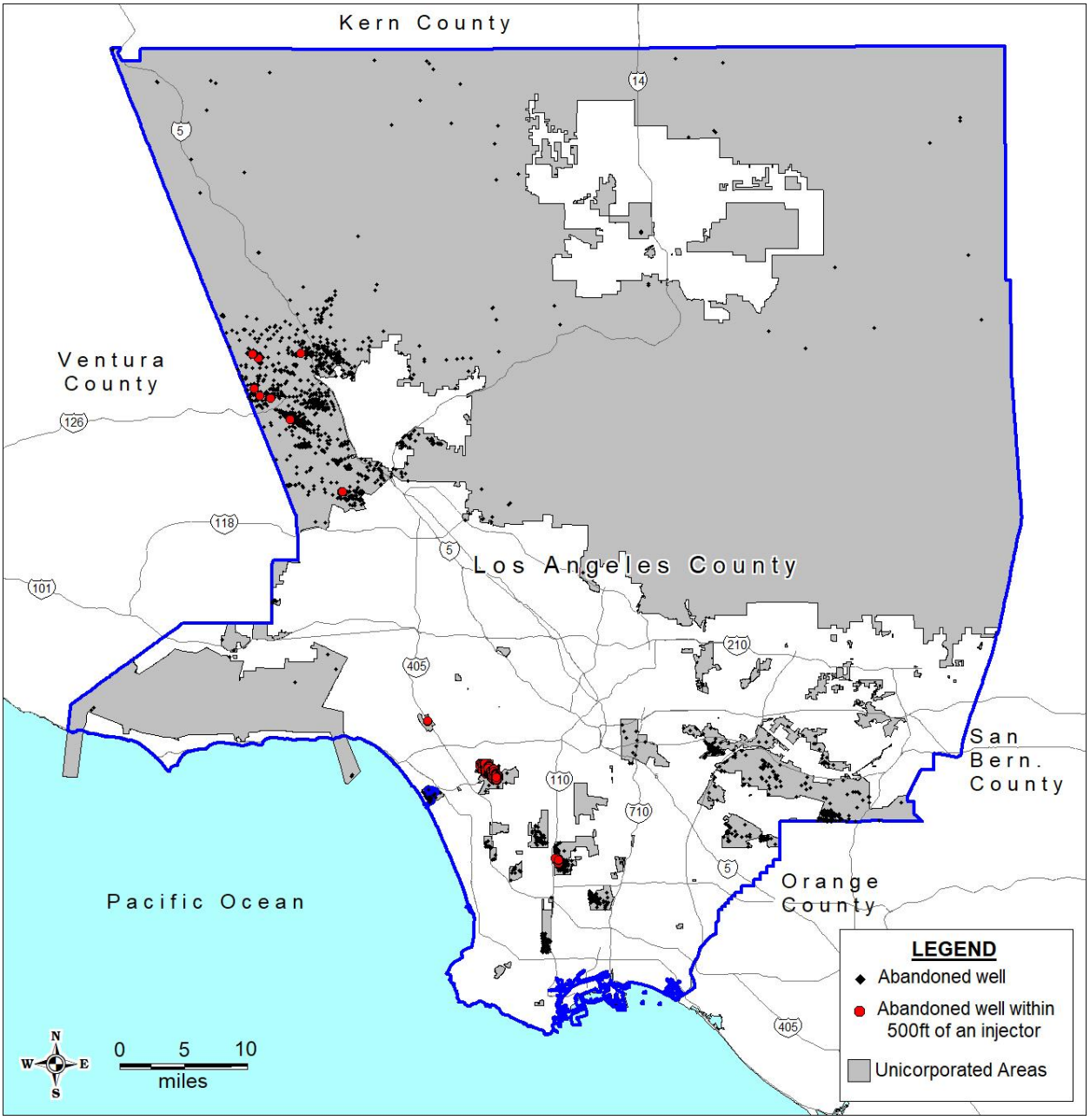
Table 3.4 Abandoned Wells by Spud Date Age

Well Spud Date Age, Years	Number	Percentage of Total	Cumulative*	Cumulative Percent*
Between zero and 25 years	6	3%	225	100%
Between 25 and 34 Years	8	4%	218	97%
Between 35 and 44 Years	19	8%	210	93%
Between 45 and 54 Years	8	4%	191	85%
Between 55 and 64 Years	32	14%	183	81%
Between 65 and 74 Years	105	47%	151	67%
Between 75 and 84 Years	36	16%	46	20%
More than 85 Years	5	2%	10	4%

Source: CalGEM May 2019.

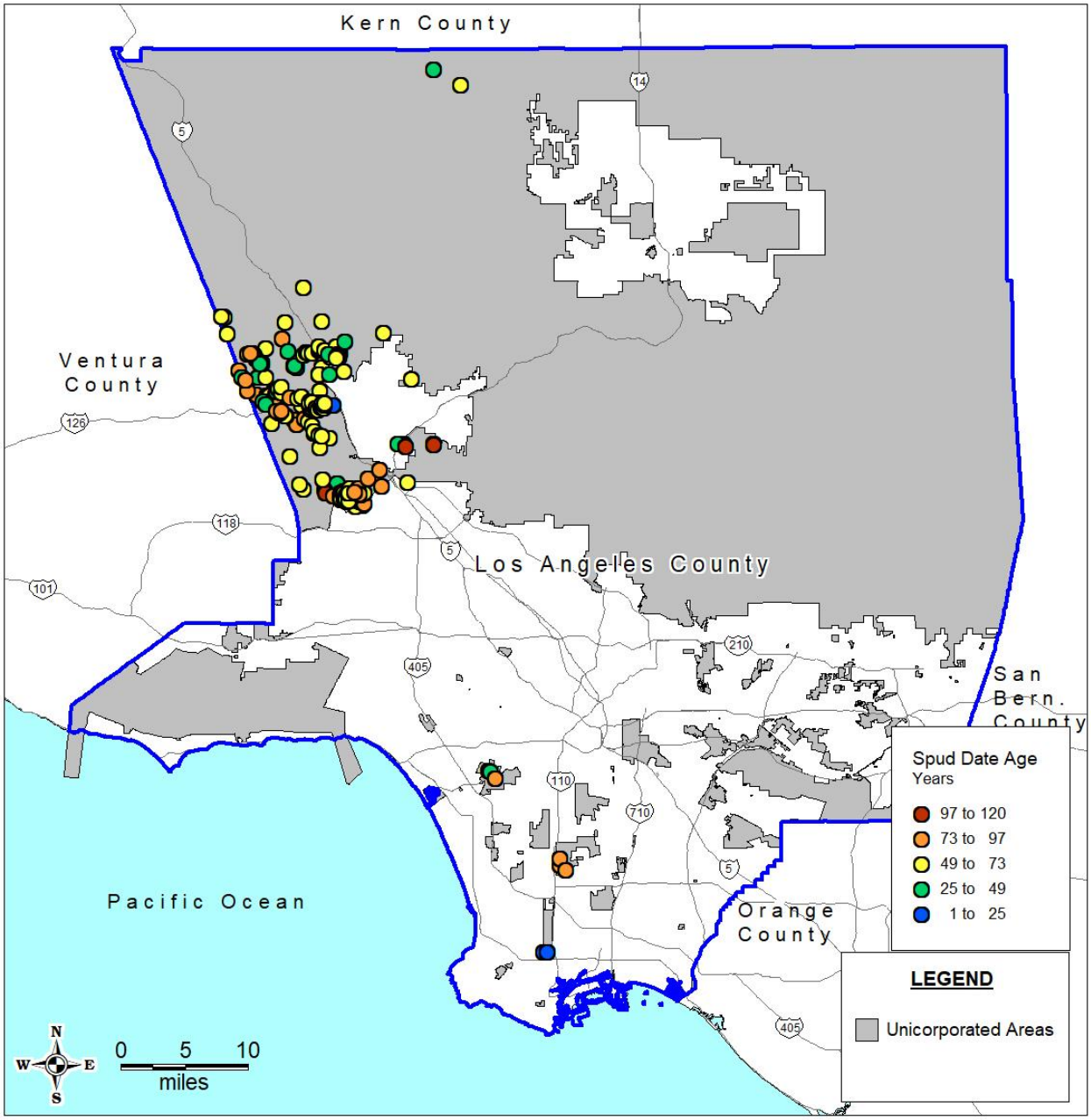
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-3 Wells Located within 500 feet of an Active Injector Well



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-4 Wells by Years from Spud Date



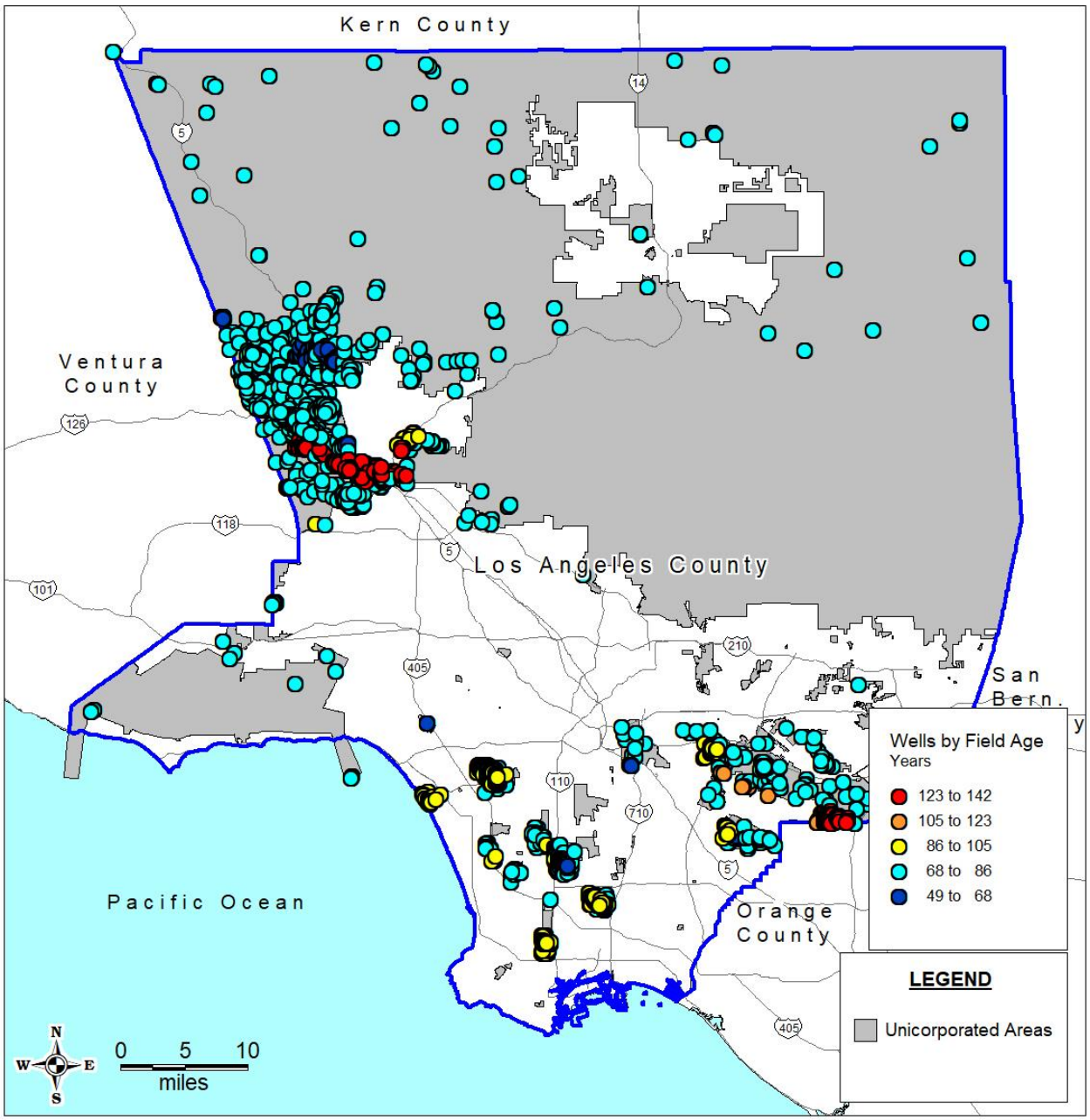
Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.6 Abandoned Wells by Field Age

There are 46 oil fields located in the unincorporated area of Los Angeles County with the earliest field discovered in 1876 (CalGEM Oil and Gas Fields Volume 2). Fields are shown in Figure 3-5 and listed in Appendix D.

Abandoned wells located in older fields may have a higher probability of having older abandonment dates. As mentioned above, the CalGEM database does not have abandonment date, and this is an issue that will be researched further after the prioritizations are applied. Field age is based on the oldest discovery date for all the reservoir pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Figure 3-6 and Table 3.5 show the wells by field age with each map dot representing one well and the age of the field in which the well is located.

Figure 3-5 Wells by Field Age



Source: CalGEM May 2019.NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Table 3.5 Wells by Field Age

Well Field Age, Years	Number	Percent of Total	Cumulative*	Cumulative Percent*
After 1969 (0 - 50 years)	5	0.2%	2731	100.0%
Prior to 1969 (51- 75 years)	393	14.4%	2726	99.8%
Prior to 1944 (76 - 100 years)	1846	67.6%	2333	85.4%
Prior to 1919 (101-124 years)	133	4.9%	487	17.8%
Prior to 1894 (more than 125 years)	354	13.0%	354	13.0%

Source: CalGEM May 2019.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

3.2.7 Abandoned Wells by Reservoir Characteristics

The fields in which the wells are located were ranked by several different characteristics that could contribute to increased risk of abandoned well leakage. Field information was developed from pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Issues that could contribute to increased risk of well leakage would include the following:

- High Gas Oil Ratio (GOR);
- Older Fields;
- Shallow reservoirs;
- High API gravity of the produced oil;
- High sulfur content of the crude oil; and
- High pressure gradients (psi per linear foot of well depth).

Each of these field characteristics were assigned points from zero to two based on the scoring matrix shown in Table 3.6. Fields were then ranked based on the sum total of the scores with a maximum ranking of 12 points. Fields with a higher rank score may have a higher probability of having abandoned wells that produce greater well leakage risk.

Table 3.6 Field Rank Scoring Matrix

Field Score			
Characteristic	**Score of 0 points**	**Score of 1 point**	**Score of 2 points**
GOR	Less than 100	Between 100-1000	Greater than 1000
Initial Production Date	After 1950	1930 - 1950	Before 1930
Depth	Greater than 5000 ft	Between 1000 - 5000 ft	Less than 1000 ft
API[1]	Less than 20	Between 20 - 30	Greater than 30
Sulfur/H_2S[2]	Less than 0.5 %	Between 0.5 - 1.5 %	Greater than 1.5
PSI/ft	Less than 1.0 psi/ft	between 1 - 2 psi/ft	Greater than 2.0 psi/ft

Source: CalGEM May 2019.
1 – American Petroleum Institute gravity of oil relative to water, higher numbers are associated with lighter oil.
2 – Only Torrance and Brea-Olinda fields have the potential for H2S, as per CalGEM Publication M10. These two fields were given the highest rating for sulfur. All other fields were based on crude sulfur content which is not necessarily indicative of H_2S levels but may indicate some elevated level of odor or hazard.

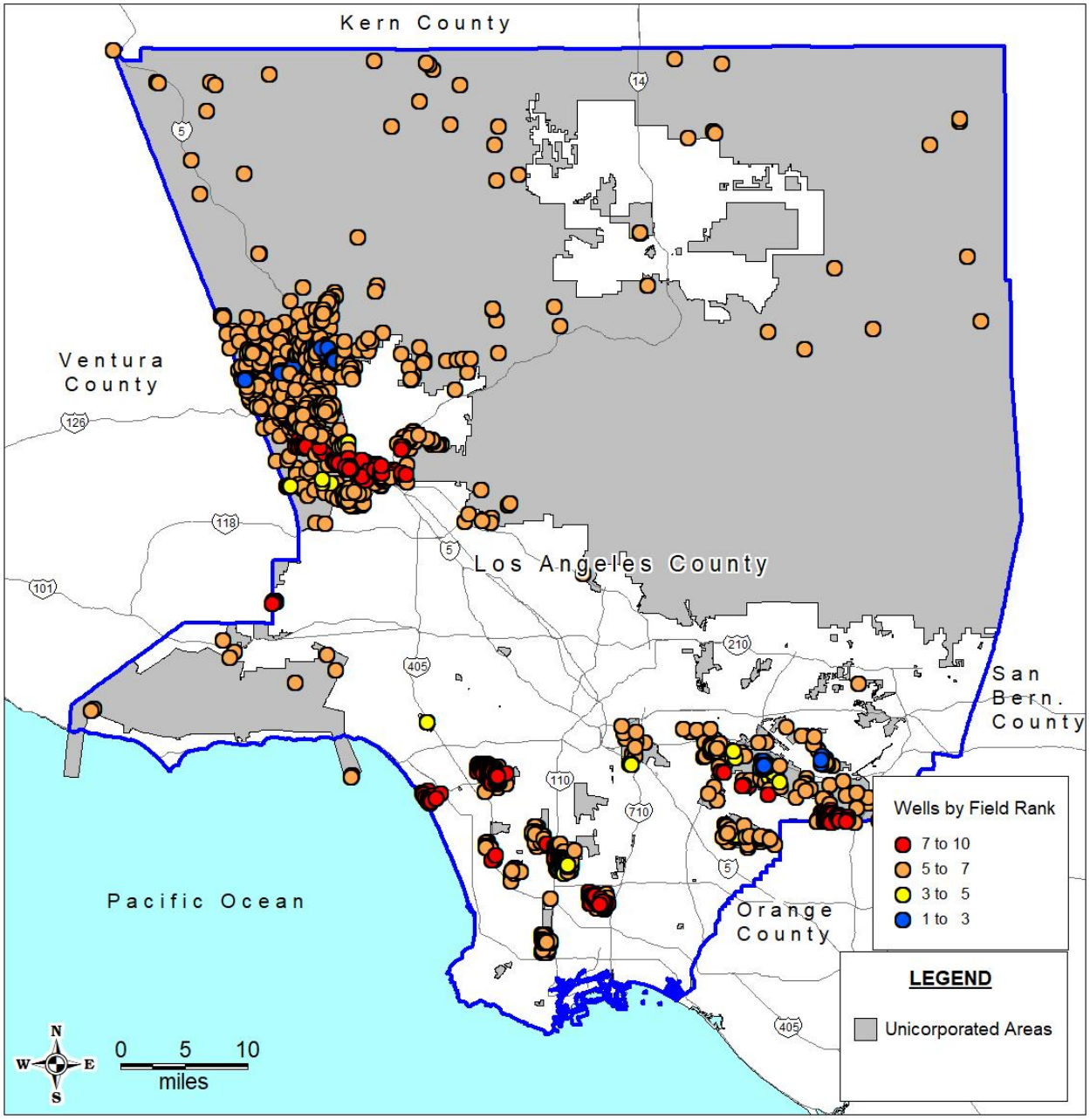
Figure 3-6 and Table 3.7 shows the wells based on the field rankings discussed above. Note that the Marina Del Rey field discussed in Section 3.2 above received a score of seven on the above matrix.

Table 3.7 Wells Based on Field Ranking

Well Field Rank	Number of Abandoned Wells	Percentage	Cumulative*	Cumulative Percent*
1	55	2%	2731	100%
2	52	2%	2676	98%
3	21	1%	2624	96%
4	61	2%	2603	95%
5	704	26%	2542	93%
6	487	18%	1838	67%
7	119	4%	1351	49%
8	278	10%	1232	45%
9	592	22%	954	35%
10	362	13%	362	13%
TOTAL	2,731	100%	-	-

Source: CalGEM May 2019.
Note: Maximum score is 12, no wells ranked scored 11 or 12.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-6 Wells by Field Rank



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.8 Abandoned Wells by EnviroScreen Score

In January 2017, the Office of Environmental Health Hazard Assessment (OEHHA), on behalf of the California Environmental Protection Agency (CalEPA), released Version 3.0 of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen version 3.0 identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. The tool ranks each of the state's 8,000 census tracts using data on 20 indicators of pollution, environmental quality, and socioeconomic and public health conditions. SB 535 requires CalEPA to identify disadvantaged communities based on geographic, socioeconomic, public health and environmental hazard criteria, and the CalEnviroScreen tool is utilized to allow for this requirement. Environmental exposures and effects examined as part of the CalEnviroScreen model include:

- Ozone concentrations in air.
- PM 2.5 concentrations in air.
- Diesel particulate matter emissions.
- Drinking water contaminants.
- Use of certain high-hazard, high volatility pesticides.
- Toxic releases from facilities.
- Traffic density.
- Drinking water quality.
- Cleanup sites.
- Groundwater threats.
- Hazardous and solid waste facilities/generators.
- Impaired water bodies.

Sensitive population and socioeconomic factors addressed include:

- Asthma rates.
- Cardiovascular disease rates.
- Low birth rate frequency.
- Education attainment.
- Housing burden.
- Linguistic isolation.
- Poverty.
- Unemployment.

Plugged and abandoned wells were classified based on the CalEnviroScreen percentile score for each census tract. The results are shown in Table 3.8 and Figure 3-7.

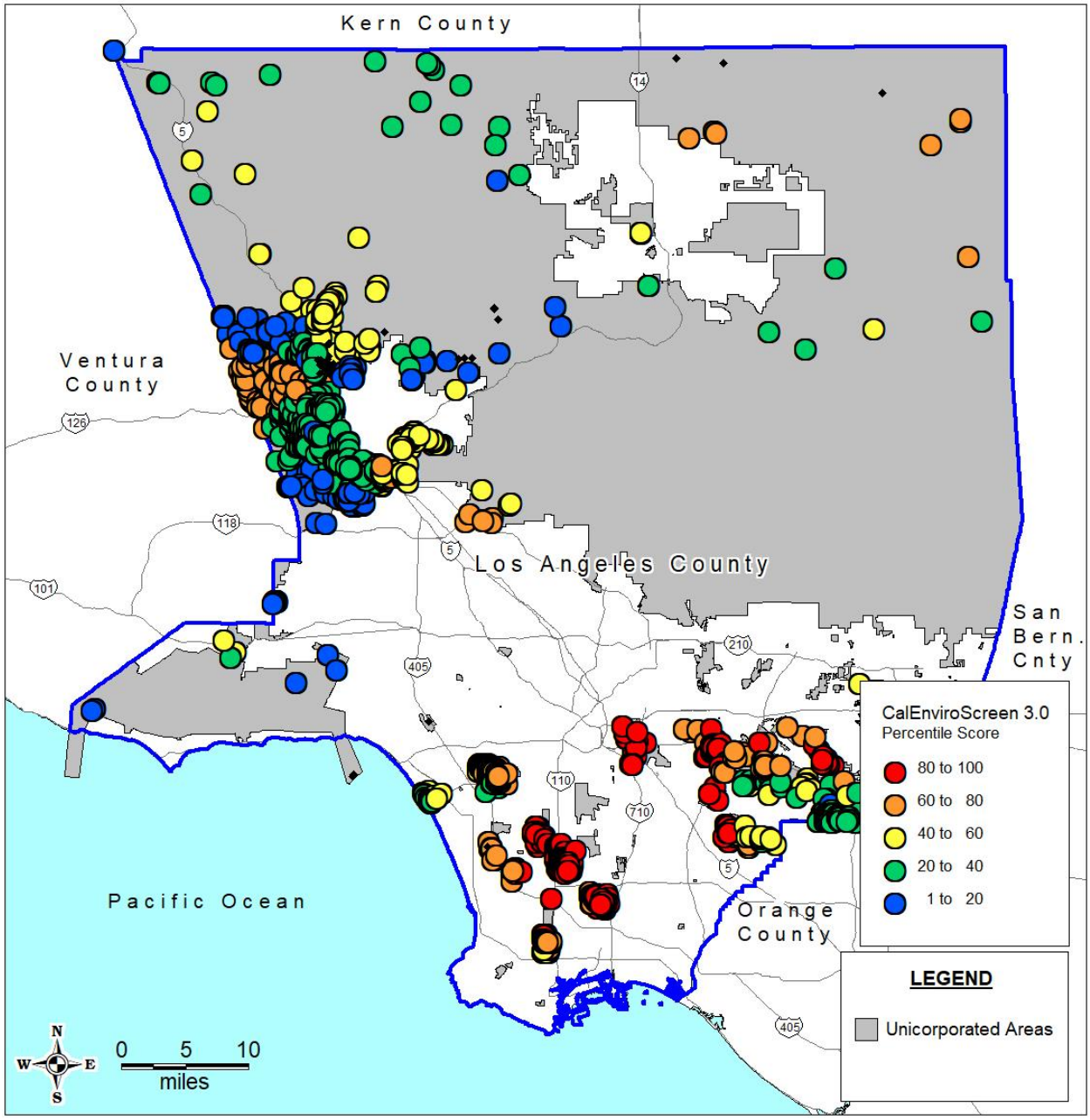
Table 3.8 Wells Based on CalEnviroscreen 3.0 Percentile

CalEnviroscreen 3.0 Percentile	Number	Number Percent	Cumulative*	Cumulative Percent*
More than 90%	345	13%	345	12.6%
Between 81 and 90%	130	5%	475	17.4%
Between 71 and 80%	175	6%	650	23.8%
Between 61 and 70%	614	22%	1264	46.3%
Between 51 and 60%	66	2%	1330	48.7%
Between zero and 50%	1401	51%	2731	100.0%

Source: CalGEM May 2019. CalEPA 2018.

Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-7 Wells by CalEnviroscreen 3.0 Percentile



NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.9 Abandoned Wells by Methane Zone

The County of Los Angeles Building Code prohibits the issuance of building permits for new buildings, enclosed structures, additions, or conversions of a building or structure to habitable or occupiable space in the presence of an unmitigated potential gas hazard. Potential gas hazards exist within 1,000 feet of fill sites containing decomposable materials (Building Code Section 110.3),

within 300 feet of nearby oil and gas wells (Building Code Section 110.4), and on contaminated soils (Building Code Section 110.5). Twenty-two plugged and abandoned wells were identified that are within 1,000 feet of a designated methane zone.

3.2.10 Abandoned Wells Prioritization

A prioritization scheme was developed based on the above factors to prioritize the plugged and abandoned wells for further, more detailed examination. Further examination included review of documents related to abandonment activities, such as blowouts and loss-of-well control history, that required detailed, historical paper records reviews. See the section below for a summary of the results of this detailed review. As the review of paper records is time consuming, the prioritization scheme is used to filter the thousands of wells in the CalGEM database to those of the highest priority to conduct a detailed paper document review and in-field testing and examinations.

The prioritization scheme goal is to identify those wells that have the highest probability of leaking to the surface and combine that with the potential for impacts to the community. This is a similar approach used to develop the Enviroscreen scores by OEHHA. Although a well might have a high potential for leakage, if it is in an area designated by census data as having very low or no populations, then it would not be classified as a high priority well. Table 3.9 shows the prioritization scheme.

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
Location Near injectors	0 - 5 points	0 points not near an injector 5 points if near an injector
Spud Data age	0 - 5 points	Less than 45 years old = 0 points 45 – 55 years = 1 point 55 – 65 years = 2 points 65 – 75 years = 3 points 75 – 85 years = 4 points > 85 years = 5 points No data= 3 points
Field Ranking	0 - 10 points	Field ranking of zero = zero points Field ranking = points Field ranking of 10 or more = 10 points
Methane zone	0 - 5 points	Not near a methane zone = zero points Near a methane zone = 5 points
Enviroscore	0 - 5 points	Below 50% = zero points 50 – 60% = 1 point 60 – 70% = 2 points 70 – 80% = 3 points 80 – 100% = 4 points Score of 100 = 5 points

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
Census data	0-10 points	0 population = zero points Units in persons per square mile 0 – 2,000 = 1 point 2,000 – 4,000 = 2 points 4,000 – 6,000 = 3 points 6,000 – 8,000 = 4 points 8,000 - 10,000 = 5 points 10,000 – 12,000= 6 points 12,000 – 14,000 = 7 points 14,000 – 16,000 = 8 points 16,000 – 18,000 = 9 points More than 18,000 = 10 points

Source: CalGEM May 2019. CalEPA 2018.

The prioritization scheme is conducted by summing the points associated with factors that could increase the probability for a well to be leaking (location near injectors, spud date age, field ranking and methane zone) and then multiply that score by the sum of the census and the Enviroscreen. See Figure 3-8 for a schematic of the approach.

In total, the priority ranking produced scores ranging from zero to 143, with 128 wells ranking a score of above 75 and therefore classifying as a "higher priority well". Figure 3-9 shows the location of the higher priority wells. Note that the higher priority wells are generally located in the southern County areas in the areas with higher population density. Table 3.10 shows the number of higher priority wells by Planning District and by Supervisor District.

Appendix A shows details of the areas with the higher priority wells.

Table 3.10 Ranked Abandoned Wells by Districts

District	Number of Higher Priority Wells (Ranking 75 and above)
Planning District	
Westside Planning Area	19
East San Gabriel Valley Planning Area	8
Metro Planning Area	38
Gateway Planning Area	40
South Bay Planning Area	23
Supervisor District	
District 1	12
District 2	78
District 4	38

Note: Districts not shown have no high-ranking wells.
Note: Planning Districts from LA County General Plan November 2014.

Figure 3-8 Wells Prioritization Schematic

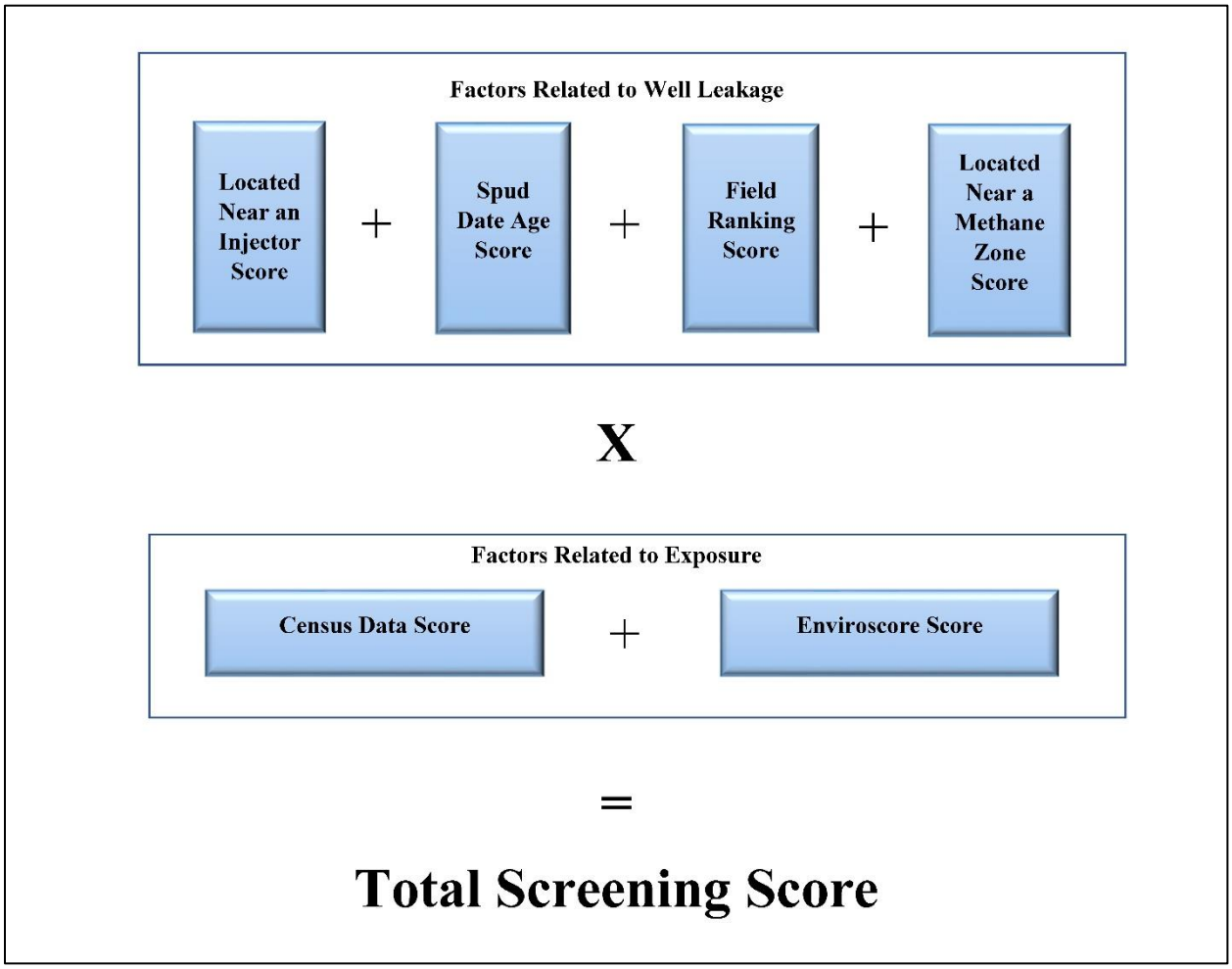
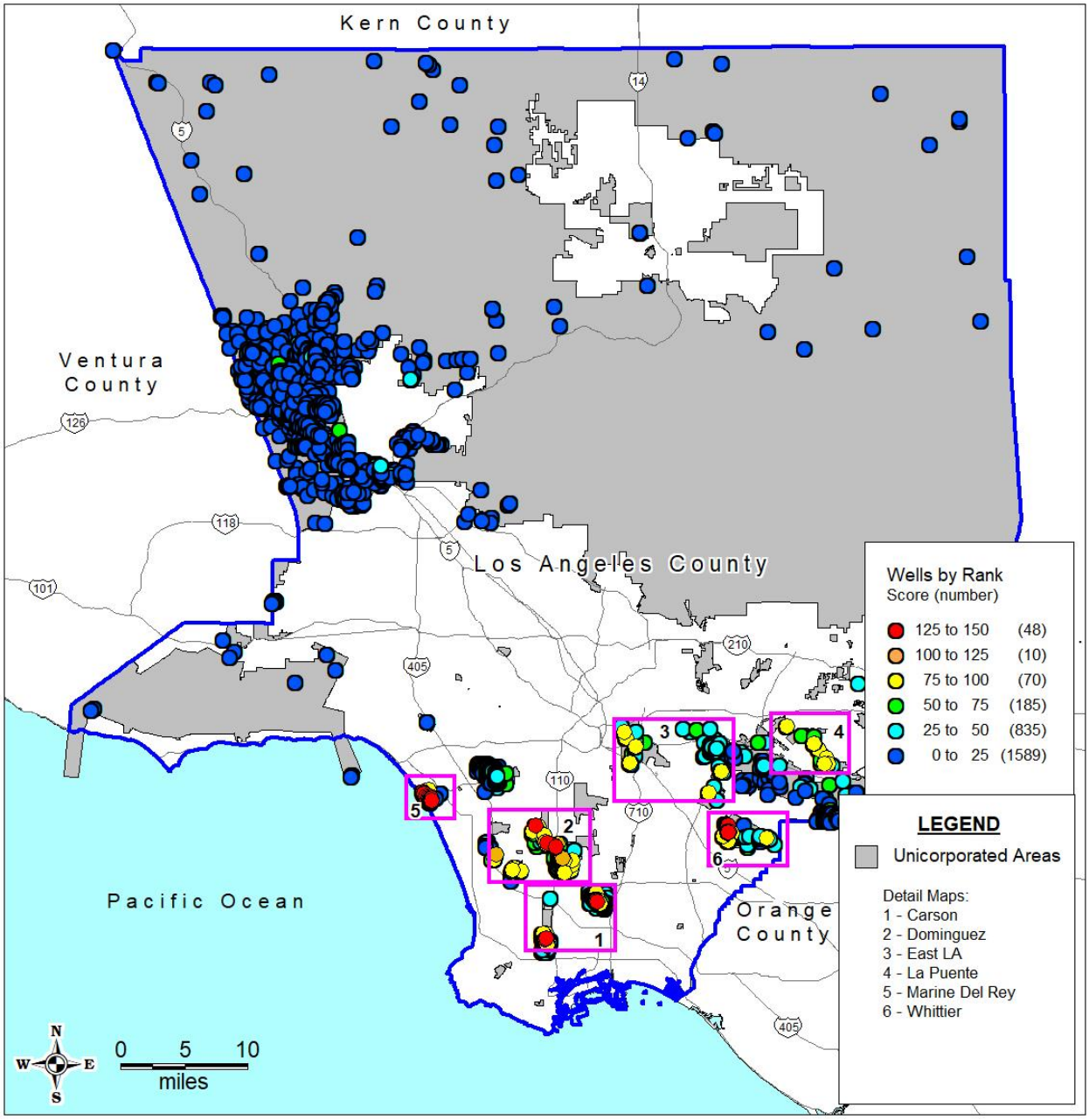


Figure 3-9 Wells by Ranking Score



NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.3 Detailed Review of High Priority Wells

The wells designated as high priority were then reviewed in detail by obtaining the paper files from CalGEM for each of the high priority wells and reviewing the well records for the following items:

- Abandonment date.
- Blowouts or loss of well control occurrence.
- Any gas pressure encountered during drilling or gas production.
- Any crude oil encountered during drilling or any crude production history.
- Any gas encounter at depths less than 1,000 feet.
- Any recent leak testing conducted (in the last 20 years).

These factors were utilized to estimate the risks of well leakage of the high priority wells. The results of this review are shown in the sections below. Note that any well, even a recently abandoned well to the most recent CalGEM standards, can still leak. The purpose of this exercise is to identify those wells that are at the highest risk of leaking - those wells abandoned when standards were lower; those wells that had gas present or caused problems during drilling; and those wells that have not been recently leak tested.

3.3.1 Abandonment Age

All of the well records had information on the abandonment procedures and abandonment date. The oldest well abandonment date was 1917 or over 100 years since abandonment. The years since abandonment are shown in the Table 3.11 below for the high priority wells.

Table 3.11 Year Since Abandonment

Years since Abandonment	Number of Abandoned Wells
Less than 50 years	37
50 to 75 years	49
75 to 100 years	40
More than 100 years	2

Note: For high priority wells only.

CalGEM requirements related to abandonment have evolved over the years. Generally, wells abandoned prior to 1950s may have required a surface plug (cement poured into the hole) of generally 10 feet in thickness from the surface generally with some installation of cement “plugs” installed across and above the producing reservoir. Wells abandoned between 1950s and 1970s would have required thicker surface plugs, maybe 25 feet. Wells abandoned since the 1980 would have required surface plugs of 25 feet and cement plugs across all oil/gas reservoirs. Current abandonment requirements include 25 feet of a surface plug, cement plugs 100 feet across all producing reservoirs and a 100 to 200-foot cement plug across all groundwater zones and muds placed in all remaining spaces (CCR 1723).

3.3.2 Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, would potentially exhibit a higher potential for leakage as gas located in the reservoir would be required to produce leakage at the surface. A well that did not exhibit any gas flow or pressures could still, subsequent to the well abandonment, become pressurized due to a shift in the formation geology or some other process, but would exhibit a significantly lower potential for gas leakage. Wells with gas history, no gas history, or wells not having any record and are therefore unknown are shown in Table 3.12 along with other issues discussed below.

Table 3.12 High Priority Well Characteristics

Issue Area		Number of Abandoned Wells
Gas History	With gas history	62
	No gas history	33
	No records of gas history	33
Crude History	With crude history	67
	No crude history	43
	No records of crude history	18
Shallow Gas History	Yes	1
	No	127
Blowout History	Yes	4
	No	124
Recent Leak Test	Yes	11
	No	117

Note: For high priority wells only. Note two wells did not have any data.

3.3.3 Crude History

Wells that have a history of producing crude oil or showed periods of time during the well drilling process that crude oil was produced, would potentially exhibit a higher potential for gas also being produced and therefore resulting in leakage of gas in the future. Wells with crude history, wells that have a record of no crude history, and the wells not having any record and are therefore unknown are shown in Table 3.12.

3.3.4 Shallow Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, as well as having the gas zone be close to the surface, could potentially exhibit a higher potential for leakage as gas would have a shorter distance to reach the surface. Wells with shallow gas history are shown in Table 3.12.

3.3.5 Blowout History

Wells that have a history of producing gas in sufficient quantities from unstable formations to produce a blowout, or an uncontrolled release of the gas to the environment, could potentially exhibit a higher potential for leakage. Wells with blowout history are shown in Table 3.12.

3.3.6 Recent Leak Testing History

Wells that were recently excavated and leak tested and repaired to prevent leakage within the last 20 years, through the requirements associated with development, such as building structures in close proximity, would most likely have a lower propensity for leakage at this time since they were recently tested. It was assumed that all wells that were leak tested, if a leak was found, were repaired as per CalGEM requirements. Wells that were recently leak tested are shown in Table 3.12.

3.3.7 Abandoned Wells Refined Prioritization

Through the examination of the detailed well records from CalGEM for all the higher priority wells, some additional prioritization was developed. This prioritization was based on the propensity for an abandoned well to leak. The date of the abandonment influences the propensity for a well leaking as wells that were abandoned before 1970s would have less stringent abandonment procedures. Wells that exhibited some gas or some gas/oil presence in the reservoir also would have a higher propensity for leakage than a well which had not exhibited any hydrocarbons in the reservoir area during drilling. Wells, even if poorly abandoned, if they have no access to hydrocarbon, would not leak hydrocarbons. This does not mean that wells that exhibited no oil or gas could not change and shift over time as the geology changes, but that they would present a lower likelihood and frequency of leakage.

In addition, wells that exhibited shallow gas presence, meaning that the gas areas of the reservoirs were located close to the surface, could also present a greater propensity for leakage due to the short path lengths needed to reach the surface. And wells that had any history of a blowout would present a higher propensity for leakage due to the higher pressures and unstable nature of the reservoirs.

However, wells that have been recently leak tested (in the last 20 years) were assumed to present a lower risk for leakage.

Wells were also segregated into Priority 1, Priority 2 and Priority 3 categories to define those which should be inspected first (Priority 1).

Wells classified as Priority 1 wells would be those wells meeting the following criteria:

- Abandoned more than 50 years ago with both gas and crude oil history.
- Abandoned more than 50 years ago with only gas history (no crude history).
- Any well with shallow gas.
- Any well that had a blowout history.

The wells classified a "Priority 2" including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking of over 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking of over 100.

The wells classified a "Priority 3" including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking below 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking below 100.

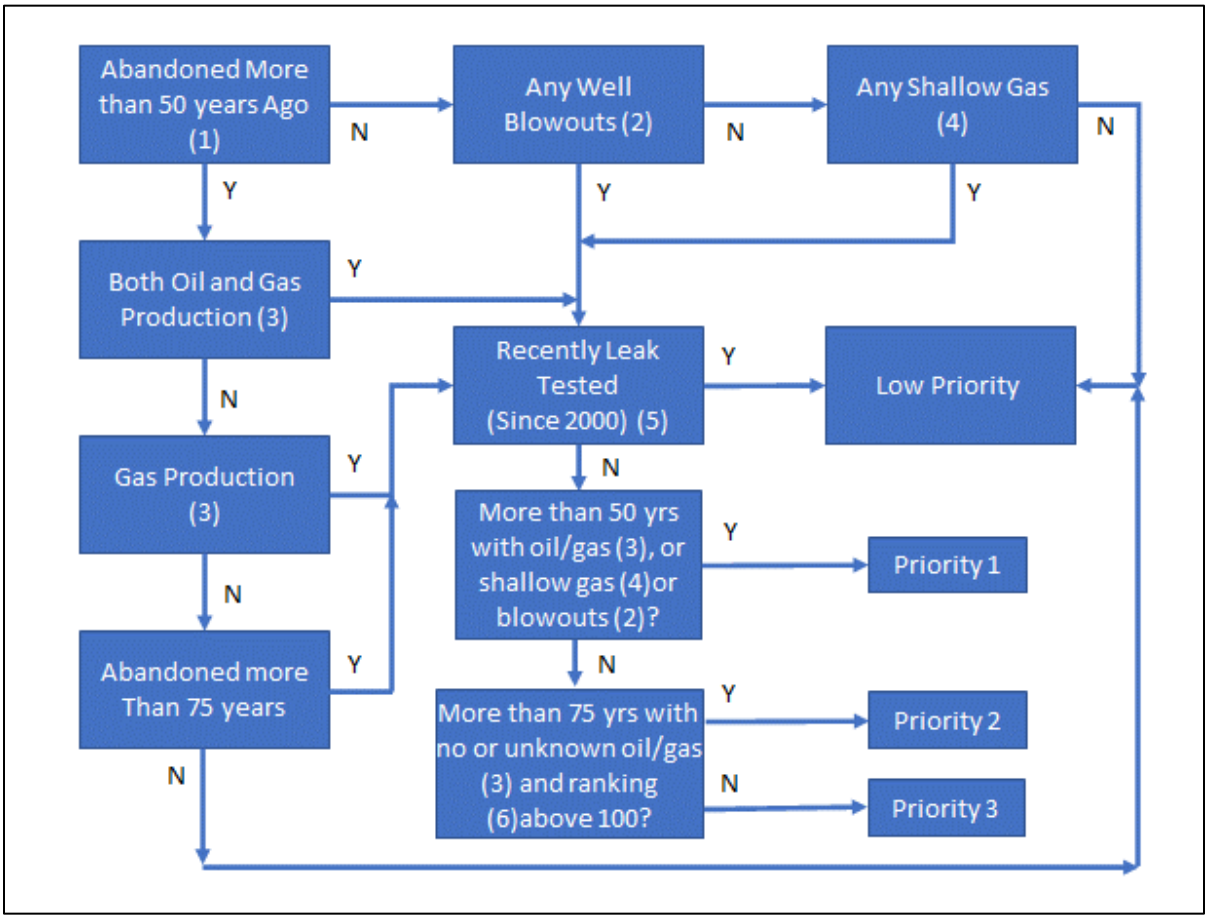
The wells breakdown is shown below. A flow chart of the well priority classification is shown in Figure 3-10.

Table 3.13 Wells Prioritization and Classification

Years	Number of Abandoned Wells	Number Percent	Cumulative	Cumulative Percent
Priority 1 inspection	43	34%	43	34%
Priority 2 inspection	13	10%	56	44%
Priority 3 inspection	25	20%	81	63%
Low priority for inspection	47	37%	128	100%

Note: For high priority wells only

Figure 3-10 Well Inspection Prioritization Flowchart



Notes: numbers correlate with the table below.

Detailed maps of high priority wells and the priority classifications are shown in Attachment D. Table 3.14 lists the highest-ranking wells and their corresponding classifications. A Draft Abandoned Well Inspection Protocol was developed for the forthcoming field inspections and is included as Appendix E. Appendix F contains the inspection sheets for each well completed to the extent feasible at this time, including all the available historical data from CalGEM, and the mapped locations.

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403723481	6059009024	Howard Townsite	143	26	none	yes	yes	N	N	Low
0403723499	6059009024	Howard Townsite	143	27	none	yes	yes	N	N	Low
0403723558	6059009024	Howard Townsite	143	27	none	yes	no	N	N	Low
0403714401	6089012023	Rosecrans	140	71	none	yes	yes	N	N	Priority 1
0403714457	6132019038	Rosecrans	140	91	none	yes	yes	N	N	Priority 1
0403714461	6132019034	Rosecrans	140	94	none	yes	yes	N	N	Priority 1
0403706750	7318010025	Dominguez	132	94	none	UN	yes	N	N	Priority 1

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403706802	7318010025	Dominguez	132	93	none	yes	yes	N	N	Priority 1
0403706918	7318010025	Dominguez	132	103	none	no	no	N	N	Priority 2
0403707304	7318010025	Dominguez	132	17	none	yes	yes	N	N	Low
0403707306	7318010025	Dominguez	132	19	none	UN	yes	N	Y	Low
0403707547	7318010025	Dominguez	132	66	none	yes	yes	N	N	Priority 1
0403723487	6059009024	Howard Townsite	132	27	none	yes	yes	N	N	Low
0403713797	4224002900	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713798	4224002900	Playa Del Rey	130	2	Yes	yes	no	N	N	Low
0403713802	4224005910	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713805	4224005903	Playa Del Rey	130	9	none	yes	yes	N	N	Low
0403713806	4224005903	Playa Del Rey	130	9	none	UN	yes	N	N	Low
0403713807	4224001904	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713808	4224001904	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713809	4224002900	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713810	4224002900	Playa Del Rey	130	61	none	UN	yes	N	N	Priority 2
0403713811	4224002900	Playa Del Rey	130	61	none	yes	yes	N	Y	Low
0403713812	4224002900	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713813	4224002900	Playa Del Rey	130	61	none	UN	yes	N	N	Priority 2
0403713815	4224002900	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713816	4224001904	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 2
0403714011	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714012	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714013	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714015	4224001800	Playa Del Rey	130	8	none	yes	yes	N	N	Low
0403709003	8011010021	Santa Fe Springs	126	64	none	yes	yes	N	N	Priority 1
0403713572	6132019019	Rosecrans	126	93	Yes	yes	UN	N	N	Priority 1
0403714838	8011011003	Santa Fe Springs	126	79	none	UN	yes	N	N	Priority 1
0403714842	8011009059	Santa Fe Springs	126	24	none	no	no	N	Y	Low
0403715037	6132019013	Rosecrans	126	66	Yes	yes	UN	N	N	Priority 1
0403715764	8011009011	Santa Fe Springs	126	26	none	UN	UN	N	N	Low
0403716093	8011009059	Santa Fe Springs	126	26	none	UN	UN	N	Y	Low
0403716370	8157026019	Santa Fe Springs	126	93	none	no	yes	N	N	Priority 2
0403716371	8157026011	Santa Fe Springs	126	89	none	no	no	N	N	Priority 2
0403716372	8029016005	Santa Fe Springs	126	73	none	UN	UN	N	N	Priority 1
0403716435	8011009059	Santa Fe Springs	126	26	none	UN	yes	N	Y	Low
0403716700	8029016022	Santa Fe Springs	126	94	none	yes	yes	N	N	Priority 1
0403716701	8011009932	Santa Fe Springs	126	26	none	UN	yes	N	Y	Low
0403716706	8011009934	Santa Fe Springs	126	26	none	yes	UN	N	Y	Low
0403718469	7407031223	Torrance	126	82	none	UN	yes	N	N	Priority 1
0403718471	7407031223	Torrance	126	82	none	yes	yes	N	N	Priority 1
0403718485	7407031066	Torrance	126	38	none	UN	yes	N	N	Low
0403707305	7318010025	Dominguez	121	16	none	yes	yes	N	N	Low

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403710651	6131016047	Rosecrans	121	16	none	yes	yes	N	N	Low
0403713641	6131010004	Rosecrans	121	66	none	UN	yes	N	N	Priority 1
0403714488	6131016013	Rosecrans	121	88	none	yes	yes	N	N	Priority 1
0403714982	6131009045	Rosecrans	121	88	none	yes	yes	N	N	Priority 1
0403707642	6089003006	Howard Townsite	112	95	none	yes	no	N	N	Priority 1
0403705329	6132032001	NS	110	77	none	yes	no	Y	N	Priority 1
0403708628	4147004014	Lawndale	110	74	none	no	no	N	N	Low
0403708589	4147021018	Lawndale	100	91	none	no	no	N	N	Priority 3
0403708594	4147023005	Lawndale	100	89	none	yes	yes	N	Y	Low
0403706757	7318008026	Dominguez	99	86	none	UN	UN	N	N	Priority 3
0403716883	7344018023	Torrance	99	74	none	UN	UN	N	N	Priority 1
0403717819	7344020024	Torrance	99	5	none	UN	yes	N	N	Low
0403718486	7407018044	Torrance	99	46	none	UN	yes	N	N	Priority 3
0403718487	7407018051	Torrance	99	46	none	UN	yes	N	N	Priority 3
0403718488	7407015088	Torrance	99	32	none	UN	UN	N	N	Low
0403725134	7407018045	Torrance	99	33	none	no	no	N	N	Low
0403705152	5232027021	NS	98	74	none	no	no	N	N	Low
0403705166	8728009007	NS	98	66	none	no	no	N	N	Low
0403705171	8728008002	NS	98	66	none	no	no	N	N	Low
0403705596	8028007003	NS	98	95	none	no	no	N	N	Priority 3
0403706039	5236020026	NS	98	90	none	no	no	N	N	Priority 3
0403706135	5231010018	NS	98	101	none	yes	no	N	N	Priority 1
0403705167	8728013033	NS	91	71	none	UN	yes	N	N	Priority 3
0403705170	8728020013	NS	91	66	none	no	no	N	N	Low
0403705736	6139026013	NS	91	63	none	yes	no	N	N	Priority 1
0403715519	8026004009	Santa Fe Springs	90	96	none	UN	UN	N	N	Priority 3
0403718472	7407023028	Torrance	90	54	none	yes	yes	N	N	Priority 3
0403700802	4073014013	Alondra	88	44	none	yes	yes	N	N	Low
0403700803	4070015003	Alondra	88	72	none	yes	no	N	N	Priority 1
0403707638	6079004901	Howard Townsite	88	55	none	yes	no	N	N	Priority 1
0403707650	6079004901	Howard Townsite	88	95	none	UN	UN	N	N	Priority 1
0403720682	6079005015	Howard Townsite	88	51	none	no	no	N	Y	Low
0403700838	5241022022	Bandini	84	63	none	yes	no	N	N	Priority 1
0403705644	6059014003	NS	84	89	none	no	no	N	N	Priority 3
0403706182	8029012014	NS	84	97	none	no	no	N	N	Priority 3
0403714370	6137018013	NS	84	95	none	no	no	N	N	Priority 3
0403714418	6132019046	Rosecrans	84	89	none	yes	yes	N	N	Priority 1
0403714592	6125007030	Rosecrans, South	84	67	none	no	no	N	N	Low
0403718922	8129013038	Whittier	84	99	none	no	no	N	N	Priority 3
0403717759	7409012009	Torrance	81	56	none	yes	yes	N	N	Priority 3
0403717772	7409011031	Torrance	81	56	none	yes	yes	N	N	Priority 3
0403718483	7407027027	Torrance	81	54	none	UN	UN	N	N	Priority 3
0403718484	7407027036	Torrance	81	54	none	UN	UN	N	N	Priority 3
0403700042	4073024001	Alondra	80	73	none	no	no	N	N	Low
0403700801	4070016004	Alondra	80	63	none	yes	yes	N	N	Priority 1
0403700804	4070012030	Alondra	80	84	none	yes	no	N	N	Priority 1
0403702080	4073017012	Alondra	80	44	none	yes	yes	N	N	Low
0403705602	6077008021	Howard Townsite	80	79	none	no	no	N	N	Priority 1
0403707374	6078018004	Howard Townsite	80	94	none	no	no	N	N	Priority 3
0403707375	6078008024	Howard Townsite	80	74	none	yes	yes	N	N	Priority 1
0403707635	6089014029	Howard Townsite	80	14	none	yes	yes	N	Y	Low
0403708665	8040020024	Leffingwell	80	50	none	yes	yes	N	N	Priority 3
0403713804	4224004900	Playa Del Rey	78	61	none	no	no	N	N	Low
0403705149	6077017028	NS	77	94	none	no	no	N	N	Priority 3

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403705340	8262002024	NS	77	87	none	no	no	N	N	Priority 3
0403705600	6077022009	NS	77	79	Yes	yes	no	N	N	Priority 1
0403705757	8745006013	NS	77	69	none	UN	UN	N	N	Priority 3
0403705758	8745007017	NS	77	69	none	no	no	N	N	Low
0403705832	6137014012	NS	77	93	none	no	no	N	N	Priority 3
0403705963	8176023030	NS	77	95	none	no	no	N	N	Priority 3
0403706149	8026028037	NS	77	95	none	yes	no	N	N	Priority 1
0403706152	8465018015	NS	77	84	none	no	no	N	N	Low
0403706166	6077017015	NS	77	100	none	no	no	N	N	Priority 3
0403706751	7318010025	Dominguez	77	36	none	yes	yes	N	N	Low
0403706752	7318022030	Dominguez	77	36	none	no	yes	N	N	Low
0403706767	7318022029	Dominguez	77	36	none	no	no	N	N	Low
0403706778	7318022030	Dominguez	77	36	none	no	no	N	N	Low
0403706801	7318010270	Dominguez	77	73	none	UN	yes	N	N	Priority 1
0403706803	7318010270	Dominguez	77	69	none	UN	yes	N	N	Priority 3
0403706804	7318010027	Dominguez	77	73	none	yes	yes	N	N	Priority 1
0403706805	7318022012	Dominguez	77	36	none	yes	yes	N	N	Low
0403707301	7318023028	Dominguez	77	21	none	yes	yes	N	Y	Low
0403707302	7318010026	Dominguez	77	17	none	yes	yes	N	N	Low
0403707303	7318010025	Dominguez	77	17	none	yes	yes	N	N	Low
0403707546	7318023050	Dominguez	77	35	none	yes	yes	N	N	Low
0403707552	7318022012	Dominguez	77	72	none	UN	yes	N	N	Priority 1
0403714493	6131018010	Rosecrans	77	57	none	yes	yes	N	N	Priority 1
0403714986	6131018032	Rosecrans	77	88	none	yes	yes	N	N	Priority 1
0403715031	6131014025	Rosecrans	77	94	none	UN	UN	N	N	Priority 1

* APN/AIN shows the parcel that the well is located within or, for those wells located within street ROWs, the closest parcel APN/AIN.
UN=unknown, NS= Not Specified

3.4 Idle Wells

The CalGEM database of wells also includes idle wells. Idle wells are those wells that have historically not been recorded as having been plugged and abandoned and are not currently operating and producing oil/gas. Many idle wells are associated with a producing field and for a number of reasons have not produced oil/gas recently but are managed by an operator. However, some idle wells may have just been left and potentially buried by a previous operator, and not properly abandoned. Wells that have not been properly plugged and abandoned, and are not being actively managed, can present a potential risk to the public or environment if they are associated with reservoirs that have some potential for gas production.

CalGEM has an Idle Well Management Program (IWMP) to address this potential concern. An idle well is defined by CalGEM as a well that has not been used for two years or more and has not yet been properly plugged and abandoned. Reporting shows there are approximately 35,000 wells in California categorized as idle. Idle wells that have been idle for more than 8 years are considered Long Term Idle Wells (LTIW).

CalGEM regulations require idle wells to be tested and, if necessary, repaired, or permanently plugged and abandoned. However, there are many idle wells that are not part of a management program since in some cases the operator no longer exists. The CalGEM IWMP program provides incentives to operators to abandon long-idle wells, as well as providing funding for CalGEM to

contract to abandon wells themselves and paid for as part of fees deposited into the Hazardous and Idle-Deserted Well Abatement Fund.

Idle wells in the CalGEM IWMP database shows a total of 622 idle wells located in the unincorporated areas of Los Angeles County (note this is different than the number listed in Section 3.2 as the IWMP database is from a different date).

The idle wells in the unincorporated area of Los Angeles County in the CalGEM database were prioritized based on their potential impact to public health and safety related to the potential for leakage of gas to the surface. Wells were prioritized based on the following characteristics:

- Years the well has been idle;
- Well location and census block population density and ranking;
- Reservoir characteristics and ranking; and
- Inclusion of the well in an active IWMP that includes testing of the well.

Each of these along with the prioritization method are discussed below.

3.4.1 Idle Well Years Idle

Table 3.15 shows the idle wells categorized by the years the well has been idle. Generally, the longer a well has been idle, the greater the probability of the well not being in a condition that would prevent the passage of gas to the surface and also increases the probability that the well was idled in a manner that increases the public safety risks. Note that many wells are not considered long-term idle wells and are probably part of an actively managed oil field. However, there are some wells that have been idle for more than 100 years.

Table 3.15 Idle Wells in the Los Angeles County Incorporated Area, by Years Idle

Years Idle	Number	"Years Idle" Rank
not LTIW (<8 years)	244	0
Idle 8 - 19 years	166	1
Idle 20 – 39 years	126	2
Idle 40 – 59 years	59	3
Idle 60 – 79 years	4	4
Idle 80 – 99 years	12	5
Idle >= 100 years	11	6
Total wells	**622**	

Source: CalGEM IWMP database 1/2020.
Notes: Idle wells defined by CalGEM as a well that has not been used for two years or more and has not yet been "plugged and abandoned" per CalGEM requirements. Long Term Idle Wells (LTIW) are those wells idle for more than 8 years.

3.4.2 Idle Well Reservoir Characteristics

Table 3.16 shows the idle wells categorized by the reservoir in which they are located. As discussed in sections above related to abandoned wells, a reservoir that has not historically generated gas or has very low pressures would produce a lower risk for leakage of gas to the surface. Note that most of the idle wells are located in higher ranking reservoirs.

Table 3.16 Idle Wells in the Los Angeles County Incorporated Area, by Reservoir Ranking

Reservoir Rank	Number
Less Than 4 ranking	40
4-6 ranking	160
6-8 ranking	142
8-10 ranking	280
Total wells	**622**

Source: CalGEM May 2019.
Notes: Reservoir ranking is defined in previous sections.

3.4.3 Idle Well Population Density

Table 3.17 shows the idle wells categorized by the density of the population of the area in which the idle well is located. Highly urban areas with high population densities increase the risk of a leaking well impacting a receptor. A well located in a rural area with no populations nearby does not present as much risk. Note that most of the idle wells are located in rural, low density areas in north County areas.

Table 3.17 Idle Wells in the Los Angeles County Incorporated Area, by Population Density

Population Density	Number	Population Density Rank
PPSM = 0 - 999	305	0
PPSM = 1,000 – 1,999	24	1
PPSM = 2,000 – 3,999	21	2
PPSM = 4,000 – 5,999	13	3
PPSM = 6,000 – 7,999	12	4
PPSM = 8,000 – 9,999	9	5
PPSM = 10,000 – 11,999	5	6
PPSM = 12,000 – 13,999	1	7
PPSM = 14,000 – 15,999	9	8
PPSM = 16,000 – 17,999	0	9
PPSM greater than 18,000	1	10
Total wells	**622**	

Source: CalGEM May 2019.
Notes: Population density is defined by the census block group that the idle well is located within and is persons per square mile (PPSM).

3.4.4 Idle Well Management Program Wells

Information was obtained from CalGEM on the highest priority wells that are also a part of an IWMP and therefore are subject to regular testing and maintenance. These idle wells would present less risk because they are regularly tested and maintained. A total of 24 of the highest ranking 75 wells are currently part of an IWMP and are tested regularly.

3.4.5 Idle Well Ranking

The ranking system for idle wells is based on the reservoir rank and the "years idle" rank. These two ranks are then combined with the population density rank and whether the wells are part of an IWMP. The following approach was used:

Idle Well Rank = (Reservoir Rank + Years Idle Rank) x Population Density Rank

If the well is part of an IWMP, then it was assigned a rank of zero. This ranking scheme allows for the elimination of wells that are located within low density areas, as the ranking for population densities lower than 1,000 persons per square mile (ppsm) equals zero, and wells that are actively being tested and managed as part of an IWMP.

Table 3.18 shows the results of the ranking. Figure 3-11 below shows the location of the wells and their associated rankings. Most of the wells are ranked low as they are located in low population density areas. However, there are 35 wells which are ranked above 20 (higher priority) and these are listed in Table 3.19.

Table 3.18 Idle Wells in the Los Angeles County Incorporated Area, by Reservoir Ranking

Idle Well Rank	Number
Rating Less Than 20	587
Rating 20-39	15
Rating 40-59	11
Rating 60-79	6
Rating >= 80	3
Total wells	**622**

Source: CalGEM May 2019.
Notes: Ranking scheme is defined as rank = (Reservoir Rank + Years Idle Rank) x Population Density Rank. Wells part of an IWMP are ranked = 0.

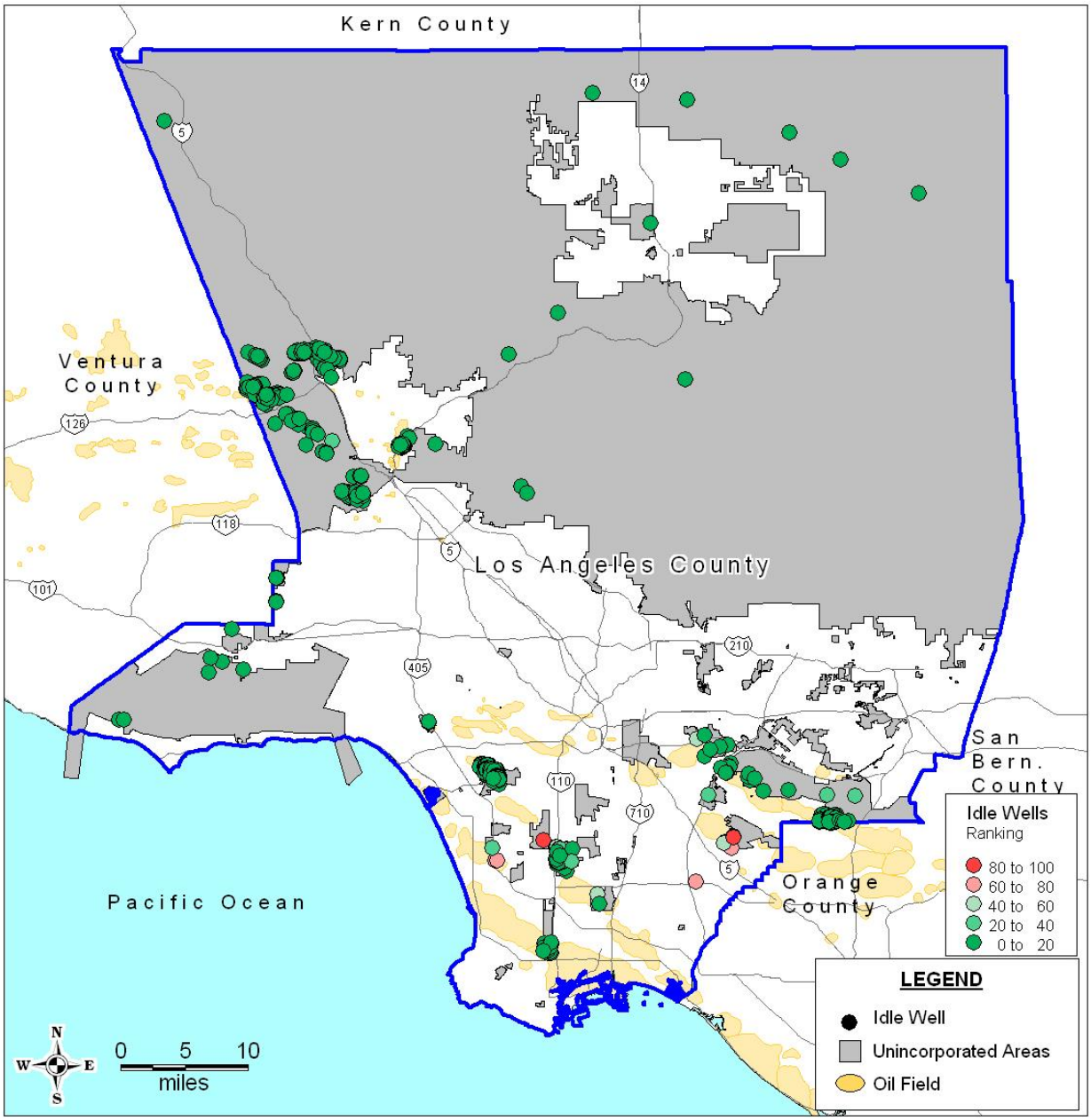
Table 3.19 Highest Ranked Idle Wells

Well API	Idle Years	Reservoir Rank	Population Density, ppsm	IWMP?	Ranking
0403705142	91	5	12,074	No	70
0403705199	18	5	10,479	No	36
0403705223	18	5	14,379	No	48
0403705224	18	5	14,767	No	48
0403705440	79	5	7,701	No	36
0403705461	76	5	4,719	No	27

Table 3.19 Highest Ranked Idle Wells

Well API	Idle Years	Reservoir Rank	Population Density, ppsm	IWMP?	Ranking
0403705466	76	5	8,556	No	45
0403705525	14	5	7,545	No	24
0403705555	90	5	10,449	No	60
0403705557	86	5	11,511	No	60
0403705820	14	5	7,325	No	24
0403705844	14	5	14,379	No	48
0403705845	14	5	14,379	No	48
0403705953	97	5	2,898	No	20
0403706131	10	5	15,056	No	48
0403706132	10	5	15,056	No	48
0403706180	109	5	14,328	No	88
0403706181	109	5	14,328	No	88
0403706744	41	8	7,686	No	44
0403707634	75	5	21,803	No	90
0403708606	14	7	14,392	No	64
0403708607	86	7	10,142	No	72
0403712029	14	6	5,980	No	21
0403712816	29	5	6,494	No	28
0403713573	14	8	10,479	No	54
0403713584	14	8	8,919	No	45
0403713588	92	8	9,196	No	65
0403714385	14	8	9,196	No	45
0403714989	2	8	4,817	No	24
0403716951	8	7	5,043	No	24
0403717641	7	7	8,791	No	35
0403717644	1	7	7,618	No	28
0403718001	11	7	7,618	No	32
0403726385	100	5	4,755	No	33
0403726877	11	9	2,812	No	20

Figure 3-11 Idle Wells Ranking



Source: CalGEM May 2019.

3.5 Well Inspection Protocol

The Strike Team field inspection of priority wells has been delayed by the Covid pandemic and the associated State and local stay at home/lockdown orders. In preparation for future inspection efforts, the priority wells were reviewed for available data and the well inspection protocol sheets were completed for the items not requiring a field visit to document. In addition, this process was also completed for the highest ranking idle wells. Data compiled for these wells include the following:

- Well identification (name, API number, CalGEM well status;
- Well history (original spud date, blowout history, abandonment or idle date)
- Well site property assessor parcel number;
- Nearest address;
- Nearest residence;
- Nearest school;
- Nearby sensitive receptors;
- List of other wells or oil and gas infrastructure in the area; and
- Maps and or aerial imagery.

Figures 3-12 through 3-16 provide examples of the data and maps collected well for an inspection protocol sheet for Well "Gray 1" in advance of the future field inspection. Inspection sheets for all the high priority abandoned and idle wells are included in Appendix F and G, respectively.

Leaking abandoned or idle wells may be difficult to identify. The inspection protocol will utilize a handheld RKI GX6000 air quality monitors as well as a FLIR camera, both of which will help to identify any leaks in the area of the abandoned/idle well. A FLIR camera allows for visualizing leaking methane plumes and allows for surveying a wide area instantly and easily. The handheld monitor allows for identifying exact concentrations and compositions of leakages if they are identified.

The site inspection protocol will involve the following activities:

- Interviewing neighbors;
- Attempting to locate well identifiers;
- Surveying the area with FLIR camera and recording video of the survey;
- Surveying the area with a handheld air monitor and recording any contaminants;
- Recording pictures of the area; and
- Recording GIS data of the locations.

Figure 3-12 Example - Abandoned Well Inspection Protocol Sheet

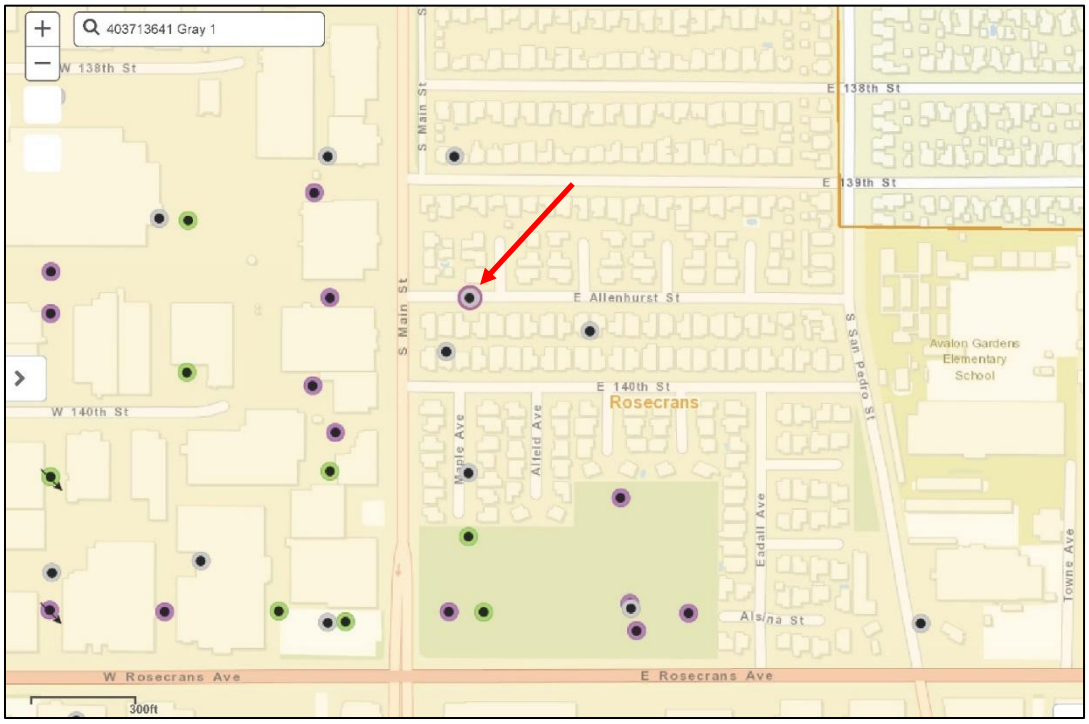
LA County Oil and Gas Facility Compliance Review Project
Abandoned/Idle Well Inspection Protocol

CalGEM Records Review Summary			
Well API	403713641	Original Spud Date	9/16/1925
Well Risk Ranking	121	Blowout History?	None
Well Name	Gray 1	Gas or Gas Production?	UN
Abandonment Date	1/27/1954	Well Type? Producer or Injector	Oil & Gas
Years Since Abandonment	66	Well Finder Status	Plugged
CalGEM Location Data?	200' East of Main Street		
• Attach CalGEM Maps • Attach Other Agency Records			
Well Location Detail			
APN	3131010004		
Property Contact Information			
Nearest Address	116 East Allenhurst Street, Los Angeles, CA 90061		
Nearest Cross Street(s)	East Allenhurst and South Main Street		
Land Use Type	Residential		
Nearest Residence	116 East Allenhurst Street (~50 feet)		
Nearest School	Avalon Gardens Elementary School (~1,200 feet)		
Other Sensitive Receptor	Residences		
Wells in Area? Type of Well?	403714431 (Idle) 403710651 (plugged) 403714488 (plugged)		
Active Oil and Gas Equip?	No		
• Attach Location Map from WellSTAR • Attach Google Earth Map • Attach Google Earth Image • Attach Site Photographs			
Well Inspection			
Inspection Date		Inspectors	
Is Well Visible?			
Surface Description			
Surrounding Area Land Use			
Any Signage?			
Fencing?			
Cone system?			
Notes			

Air Quality/Odor Monitoring					
Location	FLIR Camera		RKI GSX - 6000		
	CH4	VOC	CH4	VOC	H2S

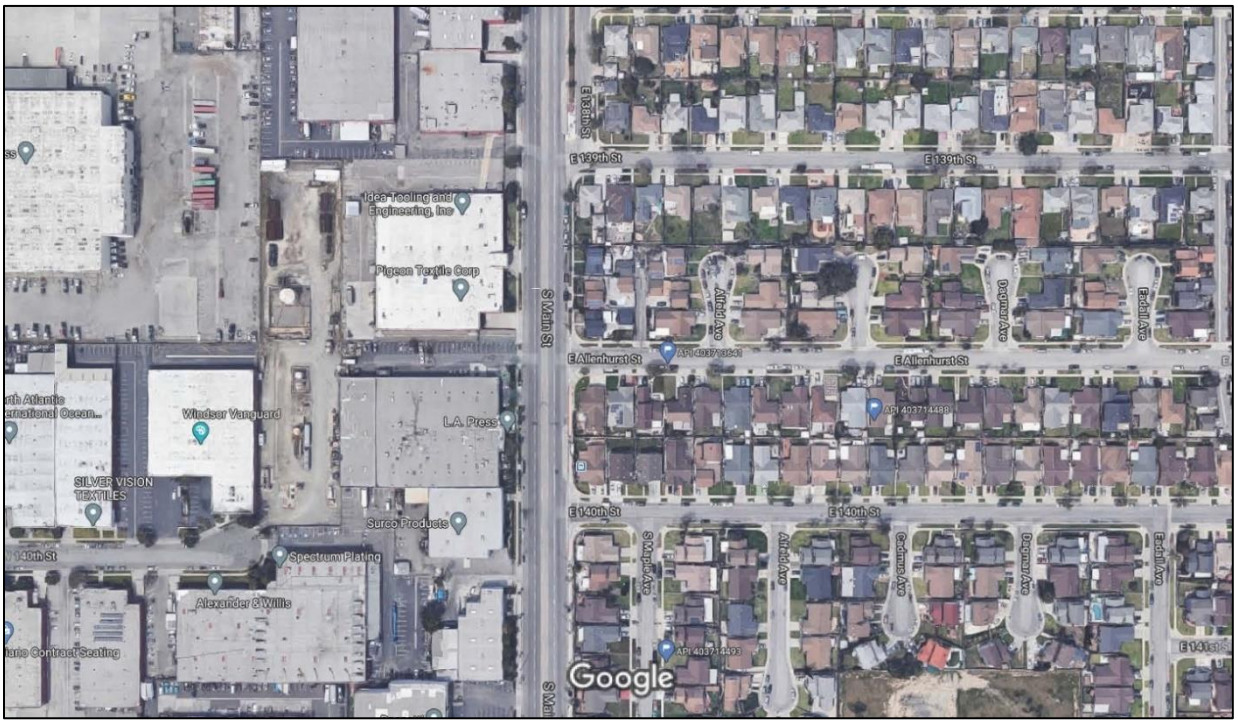
Neighborhood Interviews	
Name/Contact Info	Comment(s)

Figure 3-13 Example CalGEM Well Finder/Star Map for Well Gray 1



Source: CalGEM Well Finder January 2021.

Figure 3-14 Example Google Aerial Overview for Well Inspection Protocol Sheet



Source: Google Earth January 2021

Figure 3-15 Example Google Aerial Street for Well Inspection Protocol Sheet

Source: Google Earth January 2021

Figure 3-16 Example Google Street View for Well Inspection Protocol Sheet

Source: Google January 2021

3.6 Case Studies - Wells

As the Strike Team conducted the research, data collection, analysis, and other tasks to prepare the reports to conduct the Strike Team project, certain events occurred that are applicable to the subject matter and warrant review. These incidents provide recent and real life examples of some of the challenges that arise from addressing past oil and gas activities and present the opportunity for a "lessons learned" type of review. Two recent events involving the development of properties with past oil and gas development are presented below; one related to identifying and abandoning a well and the other related to well abandonments and debris remaining from an older oil development project.

3.6.1 Marina Del Rey Well Incident

When a well reaches the end of its productive life, or if it fails to find economic quantities of oil or gas, the well operator is required by regulators to remove all equipment and plug the well to prevent leaks. Usually, cement is pumped into the well to fill at least the top and bottom portions of the well and any parts where oil, gas, or water may leak into or out of the well. This generally prevents contamination of groundwater and leaks at the surface. However, a number of wells abandoned over the last 100 plus years in the unincorporated area of the County of Los Angeles were not abandoned to today's technological standards and have subsequently been re-abandoned. In some cases, wells are found at the site of a new construction project and the developer is tasked with the proper re-abandonment of the well even if no operator of record exists for that well. Throughout the region, some wells' locations are still unknown, unaccounted for, or their records do not exist.

In the Marina del Rey case, a land developer, MDR Hotels LLC., leased property from Los Angeles County on the Marina del Rey waterfront to build a hotel. The project involves constructing a six-story Residence Inn and five-story Courtyard Marriot (288 rooms with waterfront restaurant and amenities) on the site as part of a redevelopment Project. As part of the work, MDR Hotels was required by CalGEM to re-abandon the well "DOW RGC" 10 on the property to improve the long-term safety of surface development, protect shallow fresh water, and to re-abandon the well to current standards. The 1930s era well was originally abandoned and plugged in the 1950s. CalGEM issued a permit in June 2018 to MDR Hotels to re-abandon the well.

On January 11, 2019 during plugging operations, pressure built within the well casing which caused an uncontrolled release of fluids and gas spraying into the air. The material is believed to have included natural gas (mainly methane), heavy abandonment mud, and water. To address immediate health and safety concerns, CalGEM issued an emergency order to put into place precautions to protect health, safety, and property including testing protocols and twenty-four hour a day monitoring. The order also required that the operator prepare a report detailing what caused the blow out and emissions.

When the incident was first reported, the information provided to regulators, including DPH, was that the leak was quickly contained, and first responders reported that there was no continued release of methane. On January 18, 2019 CalGEM notified local authorities that they would be issuing an emergency order to the operator. In addition, DPH asked CalGEM to require the development of a Community Health, Safety and Notification Plan (Safety Plan) and requested that monitoring data be submitted for DPH review as it was generated. The Safety Plan was

completed by the operator with the assistance of DPH, CalGEM, Los Angeles County Fire, and the Los Angeles County Department of Beaches and Harbors on February 22, 2019 (see Appendix B).

In the interim, first responders onsite reported to DPH that there were no measurable levels of natural gas in the air. Officials from CalGEM and Los Angeles County Fire Department Health Hazardous Materials Division were on site monitoring operations. Figure 3-17 shows an area map and Figure 3-18 shows the location of the well under abandonment and the adjacent proximity to residential areas.

Figure 3-17 Marina del Rey Well Area Map

Source: Incident Action Plan CA-LAC-011239 January 29, 2019.

Figure 3-18 Marina del Rey Well

Source: CalGEM January 18, 2019 Information Report.

This buried idle and improperly abandoned well is considered a typical case study of wells that can be found in the unincorporated area during construction and development activities. Note that the well, "DOW RGC" 10, was scored as a seven on the well risk prioritization scale (See Section 3.3.7). The well abandonment was completed on April 4th, 2019; however, because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, contractors were unable to complete the cement plugs below the depth of approximately 1,500 ft., as required by the permit approved by CalGEM. The final root cause analysis for this well re-abandonment was completed on June 7th, 2019 by Exponent at the request of CalGEM; however, the document was not released to DRP until September 19th, 2019.

The findings of the root cause analysis performed were as follows:

- Insufficient integrity of the old, circa 1931, casing strings in the well allowed inflow of gas into the wellbore and beneath old cement plugs through possible corrosion holes in production casing and non-plugged manmade cuts or perforations and led to lost mud circulation problems.
- Insufficient barriers placed during previous abandonments of the well, allowed shallow gas to enter the wellbore and led to lost mud circulation problems.
- The original operators, The Ohio Oil Company and Dow Chemical Company, did not adequately characterize the shallow gas formations in the region of the well, which caused a blowout in a previous abandonment of the well in 1956.
- Lost circulation problems and lost mud while drilling through and below cement plugs at about 786-887 ft. The loss of circulation led to the decision to reduce mud weight.
- Reducing the mud weight from 9.0 pounds per gallon (ppg) to 8.4 ppg in the days before the blowout.

Other findings were as follows:

- The CWS rig supervisor, rig operator, and a rig hand who worked on the Dow RGC 10 re-abandonment operations during the period October 23, 2018 through January 13, 2019 had no evidence of, or had expired, well control course certifications. In one case the certification had expired as early as July 21, 2013.
- The Dow RGC 10 re-abandonment operations presented significant well control challenges involving shallow gas pockets and kicks, and lost circulation of drilling mud. It is most likely that gas entered and mud exited the wellbore through very old casing strings (circa 1931), which likely experienced significant corrosion and which were not well cemented.
- InterAct and CWS brought the well under control shortly after the blowout January 11th about ten minutes after the blowout began and killed the well on or about January 15, 2019. Because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, InterAct and CWS were unable to complete the cement plugs below the depth of approximately 1,500 feet, as required by the permit approved by CalGEM. The final abandonment included more cement plugs than were required under the original permit.

The lessons learned at this well re-abandonment are applicable to a number of other wells that may need to be re-abandoned in the area in the future. The Playa del Rey oil field is located onshore of the Santa Monica Bay, primarily within and surrounding Marina del Rey. The field was discovered in 1929 and a total of 280 wells were drilled and plugged and abandoned. All these wells are in close proximity to residences and the harbor. It is not surprising that 19 of the high priority wells identified for further investigation by the Strike Team are located in the Marina del Rey area.

Some of the lessons learned and recommendations arising from Exponent's review of the plugging and abandonment effort include:

- Consideration should be given to the use of a snubbing unit or stripping operations, and a drill string internal blowout preventer (IBOP) or check valve, for future Playa del Rey re-abandonment operations. The history of surface broaches and gas kicks during the 2018-2019 well re-abandonment operations, and the historical blowouts in the Dow RGC 10 and other wells in the area suggest that the use of an IBOP or check valve could have been beneficial. In particular, these considerations may be appropriate for drilling through old cement plugs, beneath which gas may accumulate through old corroded casing. The use of an IBOP or check valve as a contingency component of the BOPE system could have reduced the risk of gas flow up the drill pipe and likely could have prevented the blowout on January 11, 2019.
- Re-abandonment of old wells may seem rather straightforward, but as has been demonstrated in the Playa del Rey oilfield both historically and in contemporary time, well control due to the presence of shallow gas formation is challenging. The Operator should plan well control contingencies for shallow gas in this region, since there is a history of blowouts involving shallow wells. Old wells, such as the Dow RGC 10 spudded in 1931, in which casing and cement integrity is suspect, should be carefully examined for risk versus reward for determining if re-entry is truly warranted.
- The use of lost circulation materials as a means of plugging casing holes or leaks should be carefully considered. In most situations, it may be more efficacious and prudent to take the time to perform squeeze cementing operations. Squeeze cementing operations are not

without risks. If a squeeze cementing protocol was established to "seal" annular flow paths, then drilling up the cement could lead to sidetracking operations. Drilling hard cement with weight on bit could cause the bit to mill corroded casing and formation easier than hard cement.

- During operations in which lost returns and gas kicks are occurring, weighting up the drilling mud should be the first priority to prevent gas influxes.
- Characterize shallow gas sands in the Playa del Rey Field, which have caused well control issues and blowouts in the past and again recently. It is recommended that a new well be drilled at a suitable location and depth in the Playa del Rey field area, in which a complete logging program should be performed, focusing on geological characterization. Also, production testing should be performed to investigate the extent and pressure of shallow natural gas formations.
- It is recommended that a study be performed to gather information on geological logging and wellbore abandonment configurations of all 279 Playa del Rey oil wells, at least for those wells for which such information exists. CalGEM data shows that all 279 wells are currently plugged and abandoned, as indicated by a "P" status in CalGEM online records.

The County notes here that downhole operations are under the jurisdiction of CalGEM and that CalGEM staff have reviewed the Exponent Report.

3.6.2 Bridge Point Gardena Project Mercaptan Release

On Thursday, September 10, 2020, at 11:20 a.m., during clean up and remediation activities at a development site, a two-gallon container of mercaptan (a chemical used to odorize natural gas) was spilled. The spill resulted in a natural gas odor permeating the immediate area and areas downwind to the East of the project site. County firefighters responded and as a precautionary measure nearby residents were asked to remain indoors until the odor dissipated. Mercaptan is not a fire hazard but does cause significant odor issues when released to the environment. The container of mercaptan was a remnant of the past oil and gas development on the property and was subsequently cleaned up and removed for offsite disposal.

The project site, in the unincorporated area of Compton (APN 6131018031 and 6131018032, involves the construction of two buildings to be used as warehouses. The project site includes the eight oil wells as listed in Table 3.20 below.

Table 3.20 Bridge Point Gardena Project Site Wells

Well API	Well Name	Pre-Project CalGEM Well Status	Post-Project Well Status
0403714986	PadelFord 1	Plugged	Projected for completion 8/21
0403714987	PadelFord 2	Idle	Projected for completion 8/21
0403714988	PadelFord 3	Idle	Projected for completion 3/15/21
0403714989	PadelFord 4	Idle	Projected for completion 8/21
0403714990	PadelFord 5	Idle	Projected for completion 8/21
0403714501	Chandler 1	Active	Projected for completion 3/15/21
0403714494	Chandler 3	Idle	Projected for completion 3/15/21
0403714495	Chandler 4	Active	Plugged and abandoned

Source: CalGEM Well Finder January 2021, Bridge Point Gardena.

All the wells are slated to be plugged and abandoned, or re-plugged and abandoned, during the cleanup and remediation of the oil and gas infrastructure at the project site. Figure 3-19 provides a Google Earth map of the project site along with the locations of the wells.

Figure 3-19 Bridge Point Gardena Project Aerial Map

Source: Google Earth January 2021, CalGEM Well Finder January 2021

Multiple regulatory agencies including LA County Department of Public Health, Department of Regional Planning, LA County Supervisors Office, LA County Fire, LA County Fire Health Hazardous Materials Division and the South Coast Air Quality Management District responded to the mercaptan spill. The Department of Public Health further recommended that the developer prepare and submit a Community Health, Safety, and Notification Plan. The purpose of the plan is to inform the regulatory agencies and the public of the following:

- Days, work times, and duration of the project;
- Emergency contact information;
- Strategies for protecting the community of possible hazards; and,
- Contact information for the public agencies overseeing the work.

The developer, Bridge Point Gardena, submitted the plan in October 2020 which included the following to minimize environmental impact and disruption to the surrounding residential neighborhood:

- Word schedule in days, time of day and expected duration;
- Emergency contact numbers;
- Worksite hazards and monitoring protocol;
- Dust control and monitoring;
- Noise control and monitoring;
- Odor control and air emissions monitoring;
- Light control and monitoring; and,
- Community notifications.

Members of the Strike Team reviewed the project site, details of the mercaptan spill, and reviewed and provided comments on the Community Health, Safety, and Notification Plan. During this process, several comments and recommendations were developed about the development of sites that contain past oil wells and or associated oil well infrastructure. Specific recommendations with respect to County permitting and project review for project sites with past oil and gas infrastructure (O&G Site Projects) include:

- Review, analyze, and strengthen County Department (Public Health, Public Works, Regional Planning) current oversight and monitoring for O&G Site Projects in coordination with CalGEM regulations;
- Require Community Health, Safety, and Notification Plans for O&G Site Projects;
- Review which County Department (Public Health, Public Works, Regional Planning) is best suited to review, approve, and provide monitoring of Community Health, Safety, and Notification Plan requirements;
- Implement a process whereby "by right" projects are checked for oil wells to ensure applicable projects are subject to a Community Health, Safety, and Notification Plan and monitoring;
- Require public noticing for "by right" O&G Site Projects to ensure the surrounding neighborhoods of these projects has access to project information and the Community Health, Safety, and Notification Plan;
- Develop a GIS layer for Regional Planning to include all existing oil wells independent of their current CalGEM status;
- Develop a comprehensive list of regulatory agency requirements for the plugging and abandonment of oil wells and disposition of associated hazardous wastes;
- Generate a chronological list/flow chart of the requirements noted above to ensure all applicable agencies are notified when an oil well is found;
- Revise the ministerial permitting process, including modification to the permit application and GIS review, to include review for existing oil wells on project sites; and,

Revise the discretionary permitting process, including modification to the permit application and GIS review, to include review for existing oil wells on project sites.

3.7 Land Use Regulation Special Projects Team

The Department of Regional Planning is currently reviewing existing oil well discretionary entitlements issued between the 1940's and 1970's. Discretionary permits issued during this period had no expiration dates and offered limited opportunities for oversight. The primary goal of this effort is verification of operator compliance with permit conditions via in-depth research and site visits, along with appropriate enforcement actions.

3.8 Next Steps

This analysis for wells provides an overview of the abandoned and idle wells located in the unincorporated areas of Los Angeles County as well as presenting proposed factors that are used to prioritize the abandoned and idle wells. Historical document reviews were completed on all of the high priority wells and some of the wells were eliminated based on the historical searches, including those wells abandoned recently or recently leak tested. Additional work that will be performed will include the following:

1. Conduct site inspections of high priority wells.
2. Provide recommendations on potential public and environmental health and safety concerns of high priority wells.

4.0 Oil and Gas Pipelines

Initial Project Staff work on oil and gas pipelines consisted of a meeting with a member of the Advisory Panel (Matt Rezvani), review of pipeline inspection regulations, interactions with the Office of the State Fire Marshall to obtain detailed pipeline data, and review of the National Pipeline Mapping System (NPMS) data.

4.1 Advisory Panel Member Matt Rezvani Meeting

Project Staff met with Mr. Rezvani on October 25, 2018 at the County DRP offices. Mr. Rezvani was involved with drafting of the California Pipeline Safety Act as well as some California oil spill legislation and is an asset and resource to the Strike Team. The discussion included an overview of the Elder California Pipeline Safety Act of 1981 which authorized the State Fire Marshal to exercise exclusive safety, regulatory, and enforcement authority over intrastate hazardous liquid pipelines and implement the Federal Hazardous Liquid Pipeline Safety Act. Components of the legislation provide for annual inspections and testing of hazardous liquid pipelines as discussed in detail in Section 4.2 below. Mr. Rezvani also provided input and direction to Project Staff on obtaining pipeline data, the fact that regulatory agencies have staffing challenges with regards to pipeline oversight, that the State has a significant number of abandoned pipelines, and the fact that many utility transmission pipelines in the State were built long ago and are now in or adjacent to new residential development.

4.2 Pipeline Inspection Regulations

Pipeline regulations that dictate maintenance and testing requirements are based on State and Federal regulations for pipeline safety. The discussion below provides the basis for the State's regulations and the Federal guidance that is promulgated within those regulations.

4.2.1 State Regulations - California Pipeline Safety Act of 1981

This Act grants regulatory jurisdiction to the State Fire Marshal for the safety of all intrastate (i.e., within state) hazardous liquid pipelines and all interstate (i.e., between states) pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the governing rules for interstate pipelines to be the Federal Hazardous Liquid Pipeline Safety Act and Federal pipeline safety regulations. Recent amendments require pipelines to include leak prevention and cathodic protection (i.e., the application of an electrical charge to a pipeline to prevent corrosion) systems as reviewed and approved by the State Fire Marshal. All new pipelines must also be designed to accommodate passage of instrumented inspection devices (smart pigs) through the pipeline.

State of California Government Code Parts 51010 through 51018 provide specific safety requirements including periodic hydrostatic testing of pipelines, specific accuracy requirements on leak rate determination, hydrostatic testing by state-certified independent pipeline testing firms, pipeline leak detection, and reporting of all leaks. Specific testing requirements of various intrastate pipelines are as follows:

Under Section 51012.3(a)(3), pipelines must meet cathodic protection requirements in accordance with Section 195.414 of Title 49 of the Code of Federal Regulations. Section 195.416 requires also that each operator shall, at intervals not exceeding 15 months, but at least once each calendar year, conduct tests on each buried, in contact with the ground, or submerged pipeline facility in its pipeline system that is under cathodic protection to determine whether the protection is adequate. Each operator shall, at intervals not exceeding 2 ½ months, but at least six times each calendar year, inspect each of its cathodic protection rectifiers. Each operator shall, at intervals not exceeding 5 years, electrically inspect the bare pipe in its pipeline system that is not cathodically protected and must study leak records for that pipe to determine if additional protection is needed.

Pipelines built after 1990 are required to be piggable (accommodate the passage of instrumented internal inspection devices) (Section 51013).

Section 51013.5 of the Public Safety Code requires pipeline testing as follows:

- Pipelines without automatic pressure relief devices shall be hydrostatically tested annually;
- Pipelines over 10 years of age and not provided with effective cathodic protection shall be hydrostatically tested every three years, except for those on the State Fire Marshal's list of higher risk pipelines, which shall be hydrostatically tested annually;
- Pipeline over 10 years of age and provided with effective cathodic protection shall be hydrostatically tested every five years, except for those on the State Fire Marshal's list of higher risk pipelines which shall be hydrostatically tested every two years;
- Piping within a refined products bulk loading facility served by a pipeline shall be tested hydrostatically at 125 percent of maximum allowable operating pressure utilizing the product ordinarily transported in that piping if that piping is operated at a stress level of 20 percent or less of the specified minimum yield strength of the pipe. The frequency for pressure testing these pipelines shall be every five years for those pipelines with effective cathodic protection and every three years for those pipelines without effective cathodic protection. If that piping is observable, visual inspection may be the method of testing;
- Test methods other than the hydrostatic tests required above, including inspection by instrumented internal inspection devices, may be approved by the State Fire Marshal on an individual basis. If the State Fire Marshal approves an alternative to a pressure test in an individual case, the State Fire Marshal may require that the alternative test be given more frequently than the testing frequencies specified above;
- The test pressure for each pressure test conducted must be maintained throughout the part of the system being tested for at least 4 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure and, in the case of a pipeline that is not visually inspected for leakage during test, for at least an additional 4 continuous hours at a pressure equal to 110 percent, or more, of the maximum operating pressure; and,
- When hydrostatic testing is required by Section 51013.5, the test results shall be certified by an independent testing firm or person who is selected from a list, provided by the State Fire Marshal, of independent testing firms or persons approved annually by the State Fire Marshal.

Section 51055.1 provides that commencing January 1, 2017, the State Fire Marshal, or an officer or employee authorized by the State Fire Marshal, shall annually inspect all intrastate pipelines and operators of intrastate pipelines under the jurisdiction of the State Fire Marshal to ensure compliance with applicable laws and regulations. Per the State Fire Marshal Guidelines each inspection shall contain the following:

- Evaluation of the risks to each intrastate hazardous liquid pipeline based upon the operator history, integrity testing results, preventative and mitigative measures, construction activities, leak history, and compliance history;
- An annual inspection of each operator of an intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016; and,
- An annual inspection of each intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016.

Each operator of an intrastate hazardous liquid pipeline shall complete and submit to the Office of the State Fire Marshal Form PSD-101 for each intrastate hazardous liquid pipeline no later than July 1st annually.

4.2.2 CalGEM Regulations

CalGEM has regulations that typically apply to smaller flowlines, pipelines within oil fields, gathering lines, production lines or injection lines typically within the administrative boundaries of an oil and gas field. New regulations for certain pipelines associated with California oil and gas production (Assembly Bill 1420) became effective on October 1, 2018. The regulations now require as follows:

- Operators shall visually inspect all aboveground pipelines for leaks and corrosion at least once a year;
- Operators shall inspect all active gas pipelines in sensitive areas (buildings within 300 feet of an active pipeline, areas determined to be a significant threat from a leak, or a pipeline with a chronic leak history) that are 10 or more years old for leaks or other defects at least once a year, or at a frequency approved by CalGEM's State Oil and Gas Supervisor and listed in the operator's Pipeline Management Plan. The operator shall conduct the inspection in accordance with applicable regulatory standards or, in the absence thereof, an accepted industry standard that is specified by the operator and listed in the Pipeline Management Plan;
- CalGEM may order such tests or inspections deemed necessary to establish the reliability of any pipeline system. Repair, replacement, or cathodic protection may be required;
- Operators shall conduct pressure testing using: (A) The guidelines recommended by industry standards, such as the American Petroleum Institute, American Society of Mechanical Engineers for oil or gas pipelines; or (B) The method approved by the State Fire Marshal, Pipeline Safety Division for liquid pipelines or U.S. Department of

Transportation, Pipeline and Hazardous Materials Safety Administration for gas pipelines; on any pipeline that has had a leak resulting in the release of a fluid in a quantity that triggers reporting of the release under any regulatory, statutory, or other legal requirement. The pipeline shall not be returned to service unless the pressure testing has been successfully completed. Test results shall be provided to the CalGEM for review within seven days following the test;

- The operator shall perform periodic mechanical integrity testing on all active environmentally sensitive pipelines that are gathering lines, all urban pipelines over 4" in diameter, and all active gas pipelines in sensitive areas. The mechanical integrity testing shall be conducted every two years, or at an alternative frequency approved by CalGEM based on demonstrated wall thickness and remaining service life over a period of at least two years. The testing frequencies shall be specified in the operator's Pipeline Management Plan. Pipelines less than 10 years old are exempt from the two-year testing requirements of this subdivision. These tests shall be performed to ensure the pipeline integrity by using at least one of the following methods: Subject to review and approval by CalGEM, the operator shall identify effective mechanical integrity testing methods based on pipeline type and use. The mechanical integrity testing methodology for compliance with this subdivision shall be specified in the operator's Pipeline Management Plan and shall include at least one of the following: (1) Nondestructive testing using ultrasonic or other techniques approved by CalGEM, to determine wall thickness; (2) Pressure testing consistent with CSFM regulations; (3) Internal inspection devices such as a smart pig, as approved by CalGEM; Any other method of ensuring the integrity of a pipeline that is approved by the State Oil and Gas Supervisor that ensures mechanical integrity so as to protect life, health, property and natural resources; and,
- Copies of mechanical integrity test results shall be maintained in a local office of the operator for ten years and made available to the CalGEM, upon request. The operator shall assess all test results to determine continued safe operations and that risks identified in the Pipeline Management Plan are adequately addressed. The operator shall repair and retest or remove from service any pipeline that fails the mechanical integrity test. CalGEM shall be promptly notified in writing by the operator of any pipeline taken out of service due to a test failure.

4.2.3 California Public Utility Commission Regulations

The California Public Utilities Commission (CPUC) regulations on pipelines are considered to not supersede the Federal Pipeline Safety Regulations but are supplements to the Federal Regulations. The Regulations provide minimum requirements for the design, construction, quality of materials, locations, testing, operations and maintenance of facilities used in the gathering, transmission and distribution of gas and in liquefied natural gas facilities to safeguard life or limb, health, property and public welfare and to provide that adequate service will be maintained by gas operators under the jurisdiction of the CPUC.

For CPUC lines the following requirements apply: At least 60 days prior to the construction of a new pipeline, reconstruction, or reconditioning of an existing pipeline, a report shall be filed with

the CPUC setting forth the proposed route and general specifications for such pipeline. The specifications shall include but not be limited to the following items:

- Description and purpose of the proposed pipeline;
- Specifications covering the pipe selected for installation, route map segregating incorporated areas, class locations and design factors, and terrain profile sketches indicating maximum and minimum elevations for each test section of pipeline;
- Maximum allowable operating pressure for which the line is being constructed;
- Test medium and pressure to be used during strength testing; and,
- Protection of pipeline from hazards and external corrosion.

For distribution and transmission systems the following regulations apply for leakage surveys and procedures:

- A gas leak survey, using leak detecting equipment, must be conducted in business districts and in the vicinity of schools, hospitals, and churches, including tests of the atmosphere in gas, electric, telephone, sewer, and water system manholes, at cracks in pavement, and sidewalks, and at other locations providing an opportunity for finding gas leaks, at intervals not exceeding 15 months, but at least once each calendar year; and,
- A gas leakage survey of transmission pipelines, using leak detecting equipment must be conducted at least twice each year and at intervals not exceeding 7 ½ months.

4.2.4 Federal Regulations

Some hazardous liquid pipelines are under the jurisdiction of the Department of Transportation (DOT) and must follow the regulations in 49 CFR Part 195, Transportation of Hazardous Liquids by Pipeline, as authorized by the Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. 2004). Other applicable Federal requirements are contained in 40 CFR Parts 109, 110, 112, 113, and 114, pertaining to the need for Oil Spill Prevention Control & Countermeasures (SPCC) Plans; 40 CFR Parts 109– 114 promulgated in response to the Oil Pollution Act of 1990.

Part 195.30 incorporates many of the applicable national safety standards of the:

- American Petroleum Institute (API);
- American Society of Mechanical Engineers (ASME);
- American National Standards Institute (ANSI); and,
- American Society for Testing and Materials (ASTM).

Part 195.50 requires reporting of accidents by telephone and in writing for:

- Explosion or fire not intentionally set by the operator;

- Spills of five gallons or more or five barrels if confined to company property and cleaned up promptly;
- Daily loss of five barrels a day to the atmosphere;
- Death or injury necessitating hospitalization; or
- Estimated property damage, including cleanup costs, greater than $50,000.

Reporting is to the National Response Center (NRC) at 800-424-8802. The NRC is a part of the federally established National Response System and staffed 24 hours a day by the U.S. Coast Guard. It is the designated federal point of contact for reporting all oil, chemical, radiological, biological and etiological discharges into the environment, anywhere in the United States and its territories. The NRC also takes maritime reports of suspicious activity and security breaches within the waters of the United States and its territories.

The Part 195.100 series includes design requirements for the temperature environment, variations in pressure, internal design pressure for pipe specifications, external pressure and external loads, new and used pipe, valves, fittings, and flanges.

The Part 195.200 series provides construction requirements for standards such as compliance, inspections, welding, siting and routing, bending, welding and welders, inspection and nondestructive testing of welds, external corrosion and cathodic protection, installing in-ditch and covering, clearances and crossings, valves, pumping, breakout tanks, and construction records.

The Part 195.300 series prescribes minimum requirements for hydrostatic testing, compliance dates, test pressures and duration, test medium, and records.

The Part 195.400 series specifies minimum requirements for operating and maintaining steel pipeline systems, including:

- Correction of unsafe conditions within a reasonable time;
- Procedural manual for operations, maintenance, and emergencies;
- Training;
- Maps;
- Maximum operating pressure;
- Communication system;
- Cathodic protection system;
- External and internal corrosion control;
- Valve maintenance;
- Pipeline repairs;
- Overpressure safety devices;
- Firefighting equipment; and,

- Public education program for hazardous liquid pipeline emergencies and reporting.

Part 195.452 addresses Pipeline Integrity Management Plans (IMP) in High Consequence Areas for Hazardous Liquid Operators which were existing on or after May 29, 2001. IMPs specify regulations to assess, evaluate, repair and validate, through comprehensive analysis, the integrity of hazardous liquid pipeline segments that, in the event of a leak or failure, could affect populated areas, areas unusually sensitive to environmental damage, and commercially navigable waterways. Section h.4 of 49 CFR 195.452 specifies repair criteria for pipelines based on smart pig results. These require that immediate repairs shall be conducted for the following conditions:

- Metal loss greater than 80% of nominal wall regardless of dimensions;
- Predicted burst pressure less than the established maximum operating pressure;
- A dent located on the top of the pipeline that has any indication of metal loss, cracking or a stress riser; and,
- A dent located on the top of the pipeline with a depth greater than 6% of the nominal pipe diameter.

An operator must schedule evaluation and remediation of the following conditions within 60 days for the following conditions:

- All the items listed above for the immediate repair period;
- A dent located on the top of the pipeline with a depth greater than 3% of the pipeline diameter (or 0.250 inches in depth for a pipeline diameter less than 12”); and,
- A dent located on the bottom of the pipeline that has any indication of metal loss, cracking or a stress riser.

An operator must schedule evaluation and remediation of the following conditions within 180 days for the following conditions:

- All the items listed above for the 60 day and immediate repair periods;
- A dent with a depth greater than 2% of the pipeline's diameter that affects pipe curvature at a girth weld or a longitudinal seam weld (or 0.250 inches in depth for a pipeline diameter less than 12”);
- A dent located on the top of the pipeline with a depth greater than 2% of the pipeline's diameter (or 0.250 inches in depth for a pipeline diameter less than 12” (NPS 12));
- A dent located on the bottom of the pipeline with a depth greater than 6% of the pipeline's diameter;
- An area of general corrosion with a predicted metal loss greater than 50% of nominal wall;

- Predicted metal loss greater than 50% of nominal wall that is located at a crossing of another pipeline, or is in an area with widespread circumferential corrosion, or is in an area that could affect a girth weld;
- A potential crack indication that when excavated is determined to be a crack;
- Corrosion of or along a longitudinal seam weld; and,
- A gouge or groove greater than 12.5% of nominal wall.

4.3 State Fire Marshall Data Request

The State Fire Marshal provides regulatory and enforcement authority over intrastate hazardous liquid pipelines and implements the Federal Hazardous Liquid Pipeline Safety Act. State Fire Marshall data relevant to the Project include geographic information files (GIS or Shapefiles), pipeline inspection data, and pipeline operator data submittal (PSD-101) forms. Data requests and discussion with the State Fire Marshall commenced in September 2018. Correspondence is summarized below.

- 9/19/2018 – Project Staff meeting request sent to CalFire.
- 11/6/2018 – Response received from CalFire stating the Public Records Act (PRA) process is required for CalFire information.
- 11/7/18 – Project Staff clarification correspondence sent to CalFire.
- 11/8/18 – Project Staff sent PRA request with requested data detail sent to CalFire.
- 11/15/18 – Request for conference call received from CalFire.
- 11/19/18 – Request from CalFire for additional time to address PRA request.
- 11/20/18 – Conference call with Project Staff and CalFire on data request.
- 11/30/18 – Background detail on data requested received from CalFire, no data received.
- 12/3/18 – Request and notice that the PRA data request time limit expired sent to CalFire.
- 12/10/18 – Project Staff request for follow-up on PRA data extension request sent to CalFire.
- 12/10/18 – Response but no data received from CalFire.
- 12/11/18 – Clarification about limiting scope of data request to unincorporated County sent to CalFire.
- 12/13/18 – CalFire response for more time on data request scope received.
- 1/30/19 – Telecon with Project Staff and CalFire on PRA request.
- 2/5/19 – Project Staff request for first subset of pipeline data sent to CalFire.
- 2/8/19 – Response received from CalFire stating first set of pipeline data will be provided middle March 2019.
- 4/15/19 – Project Staff received a first set of pipeline data from CalFire.
- 6/25/19 – Project Staff request for a second subset of pipeline data sent to CalFire.
- 8/8/19 – Project Staff received correspondence from CalFire stating a second set of pipeline data is available.

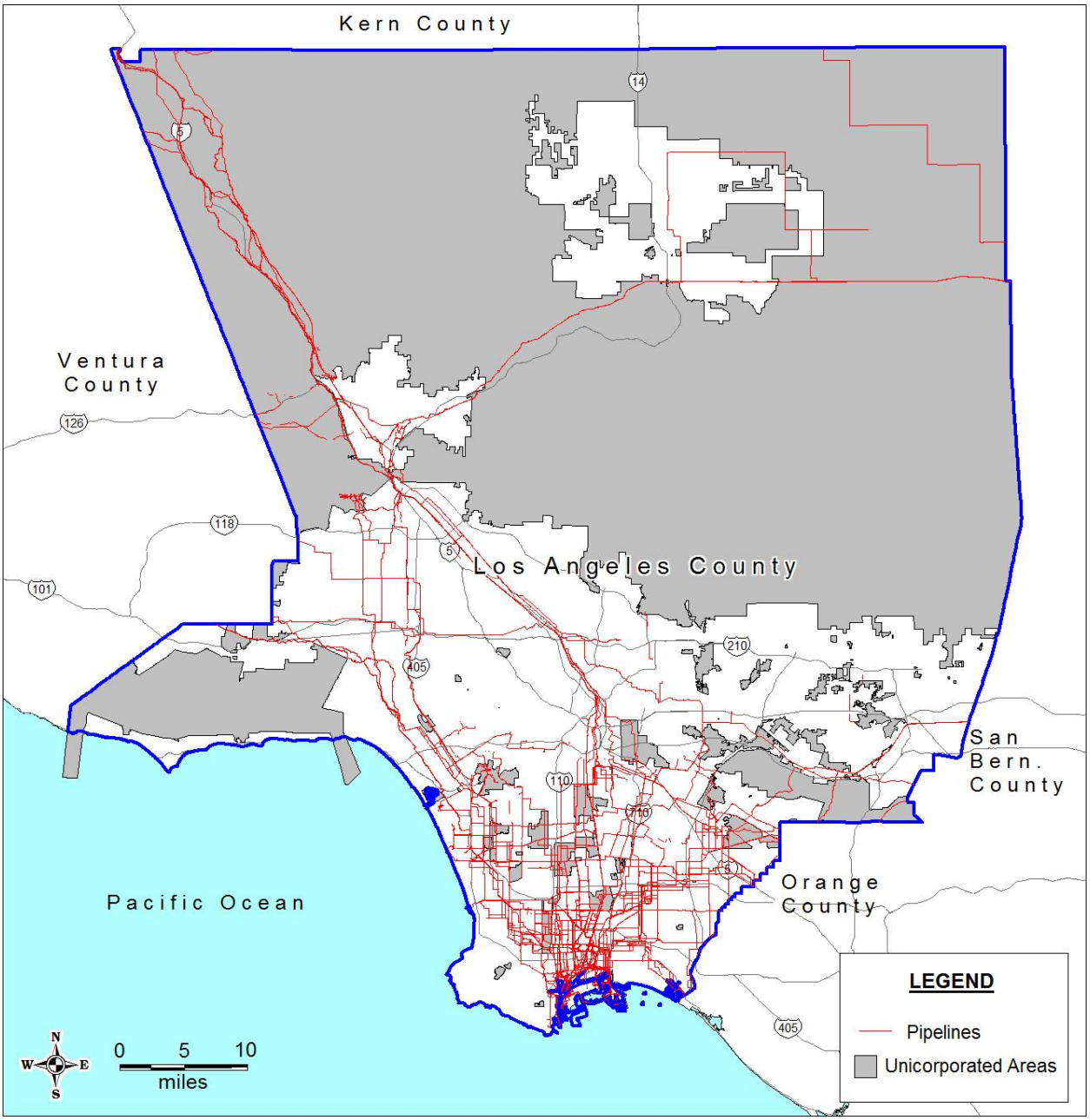
- 8/2/19 – Telecon with Project Staff and CalFire on PRA request.
- 10/19- Project staff received PSD-101 annual report submittals for pipelines twelve inches and greater.
- 8/20 – Project staff received PSD-101 annual report submittals for pipelines between eight and twelve inches in diameter.

As noted above, an initial set of PSD-101 Form data was received for 12 inch and larger pipelines. The PSD-101 forms contain current key information on pipeline specifications, pipeline commodities, integrity testing, hydrostatic pressure testing, leak detection system, and corrosion control. This set of data has been reviewed and is discussed in Section 4.5 below. Project Staff continues to work with the State Fire Marshall to obtain additional PSD-101 reports, and other applicable data, in support of the Strike Team Phase II project.

4.4 NPMS Pipeline Data

The National Pipeline Mapping System (NPMS) is a Geographic Information System (GIS) data set that contains the location and attributes of hazardous liquid and gas pipelines, liquified natural gas (LNG) plants, and tank farms. Data is required to be reviewed by operators annually and must be re-submitted if any of the data has changed. Some NPMS data is available to the public and additional specific data is available to government agencies. A data set was obtained in November 2018 for Los Angeles County containing a mapping and pipeline data set and was reviewed and mapped for the unincorporated County. A general map of the pipelines from the NPMS data is shown in Figure 4-1. Note that detailed locations for pipelines are not presented in this report for homeland security and safety reasons.

Figure 4-1 Los Angeles County NPMS Pipelines



Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Based on the NPMS data there are 1,400 hazardous liquid and gas pipelines managed by 20 different operators located in the unincorporated areas of Los Angeles County. For Los Angeles County as a whole, the NPMS data lists 4,342 pipelines with 42 operators. Table 4.1 lists the pipeline operators and number of pipelines for each in the unincorporated LA County. The database provides the status of the pipelines as "in service", "idle", "abandoned", or "retired" as follows:

- In Service – currently transports hazardous liquids or natural gas;
- Idle – pipeline is maintained such that it may be brought back into service;
- Abandoned – pipeline is permanently removed from service; and,
- Retired – removed from service and no longer maintained but not permanently abandoned.

Pipelines in Table 4.1 below identified as abandoned by the operator are identified as permanently removed from service in the NPMS database. The 1,031 pipelines in service, idle, or retired in the unincorporated LA County have an identified designated operator. Table 4.2 provides the number of pipelines for each category of pipeline.

Table 4.1 Unincorporated LA County Hazardous Liquid and Gas Pipeline and Operators

Pipeline Operator	Number of Pipelines
Southern California Gas Company	811
Abandoned	369
Chevron Pipeline Company	64
Crimson Pipeline L.P.	28
Plains Pipeline L.P.	24
Shell Pipeline CO., L.P.	14
Torrance Basin Pipeline Company LLC	14
Phillips 66 Pipeline LLC	11
Torrance Valley Pipeline Company LLC	11
SFPP, LP	10
Plains Marketing, L.P.	9
Torrance Pipeline Company LLC	8
Breitburn Management Company, LLC	7
Tesoro SoCal Pipeline Company LLC	7
Paramount Petroleum Corp	5
City of Vernon	2
DOD Defense Energy Support Center	2
West Coast Terminal Pipeline (WCTP)	2
Air Products and Chemicals Inc	1
CalNev Pipeline CO.	1
Total	**1,400**
Total less Abandoned	**1,031**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Table 4.2 Unincorporated LA County Pipelines by Service Status

Service Category	Number of Pipelines
In Service	935
Idle	79
Retired	17
Permanently Abandoned	369
Total	**1,400**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Pipelines by commodity and size are shown, less the permanently abandoned pipelines, in Tables 4.3 and 4.4. The NPMS data set lists 3,190 miles of hazardous liquid and gas pipelines in LA County with approximately 656 miles of those pipelines in the unincorporated LA County areas. It should be noted these totals do not include lengths for So Cal Gas pipelines as this data was not included in the NPMS data set. Table 4.3 provides the number of miles associated with each commodity type.

Table 4.3 Unincorporated LA County Pipelines by Commodity Type

Commodity	Number of Pipelines	Miles of Pipeline[1]
Crude Oil	147	202.6
Empty Gas	0	0
Empty Liquid	0	0
Fuel Grade Ethanol	0	0.0
Hydrogen Gas	1	1.0
Liquefied Petroleum Gas	0	0.0
Natural Gas[1]	821	221.1
Other Gas	0	0.0
Product (Non-Highly Volatile Liquid)	62	91.5
Totals	**1031**	**656.5**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1. National Pipeline Mapping System (NPMS) data set did not contain mileage data for So Cal Gas pipelines.

Table 4.4 Unincorporated LA County Pipelines by Diameter

Pipeline Diameter (Inches)	Number of Pipelines
20 to 24	20
18 to <20	0
16 to <18	23
14 to <16	11
12 to<14	23
10 to <12	21
8 to <10	36
6 to <8	33
4 to <6	34
Less than 4	8
No Data1	822
Total	1031

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1 The majority of these pipelines (811) are SoCal Gas Company pipelines with no size detail in data set.

4.5 California State Fire Marshall (CSFM) Pipeline Data

Annual pipeline operator reports (CSFM Form PS-101 California Intrastate Pipeline Operator Reports) contain data and validated inspection results from the previous calendar year for each pipeline under the CSFM jurisdiction. The annual PSD-101 reporting requirement began in 2017 under Senate Bill (SB) 295 (Government Code §51015.1(a) and Title 19, California Code of Regulations, Chapter 14, Article 2). SB 295 mandated the CSFM adopt regulations and conduct annual inspections to reduce the potential for jurisdictional hazardous liquid pipeline accidents in California. Note that the pipeline data received does not include pipeline location data or GIS digital files as the CSFM does not release that type of information for homeland security reasons.

Project staff received PS-101 reports in October 2019 for pipelines with diameters twelve inches and greater located in unincorporated LA County. In August 2020, PS-101 data for pipelines with diameters between eight and twelve inches was received from the CSFM. The data in the PS-101 reports is organized by CSFM inspection units, also known as inspection modules, which are assigned by the CSFM. A single pipeline in the CSFM data set may have many inspection units and therefore a direct comparison between the NPMS and the CSFM data sets is not possible. Review of the initial set of PS-101 reports confirms pipeline operators are conducting integrity testing as required and as summarized in Table 4.5 below.

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0206	24	Crude Oil	In Line	11/14/2017	11/14/2022	6/30/1997
1069	24	Crude Oil	No Data	3/19/2013	3/19/2018	11/16/1999
0026	20	Refined Products	In Line	2/18/2016	2/18/2021	6/29/2010
0454	20	Refined Products	In Line	2/11/2015	2/20/2020	5/14/1992
0987	20	Crude Oil	In Line	4/24/2019	4/24/2019	Multiple

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0988	20	Crude Oil	In Line	12/18/2017	12/18/2018	11/22/1998
1176	20	Crude Oil	No Data	No Data	3/29/2022	3/29/2017
0100	16	Refined Products	In Line	5/31/2017	5/31/2020	8/17/1983
0104	16	Crude Oil	No Data	12/2/2014	12/2/2019	1/25/2000
0233	16	Crude Oil	In Line	5/19/2015	5/17/2020	9/16/1988
0233	16	Crude Oil	In Line	6/11/2009	6/3/2019	1992
0266	16	Refined Products	No Data	4/29/2016	4/26/2021	No Data
0390	16	Crude Oil	No Data	7/18/2016	7/18/2001	9/23/2003
0800	16	Crude Oil	No Data	7/12/2016	7/12/2021	No Data
1062	16	Crude Oil	No Data	6/4/2016	6/4/2018	10/30/2003
1102	16	Crude Oil	No Data	12/9/2014	12/9/2018	1/24/2011
1103	16	Crude Oil	No Data	12/9/2018	12/9/2018	1/24/2011
1104	16	Crude Oil	No Data	12/9/2014	12/9/2014	1/25/2000
1266	16	Crude Oil	In Line	8/13/2017	2/11/2019	1/17/1999
0125	14	Crude Oil	No Data	10/17/2015	1/17/2020	3/10/2016
1034	14	Crude Oil	No Data	No Data	No Data	6/17/2009
1323	14	Crude Oil	No Data	8/9/2016	8/9/2021	10/19/2014
1324	14	Crude Oil	In Line	1/24/2017	1/24/2019	8/9/2015
192	12.75	Crude Oil	In Line	2/21/2013	2/20/2018	1993
0042	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/3/2014
0127	12	Refined Products	In Line	4/20/2016	4/20/2019	4/22/2008
0455	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/31/94
0735	12	Refined Products	No Data	5/24/2016	5/24/2021	10/10/2001
1224	12	Refined Products	In Line	5/24/2016	5/24/2021	10/10/2001
0201	10.75	Refined Products	In Line	5/11/2016	5/10/2021	10/13/2016
0166	10	Refined Products	No Data	No Data	12/21/2022	12/21/2017
0339	10	Crude Oil	In Line	1/30/2015	1/30/2020	1/3/2009
0334	10	Crude Oil	In Line	7/19/2015	7/19/2020	No Data
0065	10	Nitrogen	Other	5/12/2009	No Data	No Data
0450	10	Crude Oil	In Line	3/20/2017	3/20/2022	2/11/1994
0458	8-10	Crude Oil	In Line	2/3/2015	2/3/2020	12/7/199
0696	8-10	Jet Fuel	In Line	8/11/2015	8/11/220	No Data
0204	8.68	Crude Oil	Other	No Data	No Data	6/3/2004
0200	8.68	Crude Oil	In Line	6/29/2017	6/24/2019	1/29/20106
0193	8.63	Refined Products	In Line	2/24/2010	No Data	4/4/2014
0027	8	Refined Products	In Line	5/15/2019	5/15/2024	10/21/2014
0030	8	Refined Products	In Line	8/5/2015	8/5/2015	9/18/2014
0033	8	Refined Products	In Line	8/18/2018	8/18/2018	7/17/2013
0041	8	Crude Oil	No Data	No Data	No Data	No Data
0703	8	Crude Oil	No Data	No Data	No Data	No Data
0177	8	Crude Oil	No Data	No Data	No Data	No Data
0862	8	Crude Oil	No Data	No Data	No Data	No Data

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0383	8	Crude Oil	No Data	No Data	No Data	No Data
0335	8	Refined Products	In Line	6/2/2017	6/2/2022	1/1/2003
0336	8	Jet Fuel	In Line	4/15/2015	4/15/2020	12/2/1992
0457	8	Refined Products	In Line	3/16/2015	8/27/2019	6/21/2000

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5 below.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

As shown in Table 4.5 above, in line testing is the most common method for integrity testing of a hazardous material pipeline. In-line Inspection (ILI) involves the evaluation of pipes and pipelines using "smart pigs" (both tethered and non-tethered) that utilize non-destructive examination techniques to detect and size internal damage. ILI measures and records irregularities in pipelines including corrosion, cracks, deformations, or other defects. Smart pigs are inserted into the pipeline and are pushed along by the flowing product. Hydrostatic testing involves filling the pipe system with a liquid, usually water, which may be dyed to aid in visual leak detection, and pressurization of the line to the specified test pressure. The U.S. Department of Transportation Pipeline & Hazardous Materials Safety Administration requires that hydrostatic testing of hazardous liquid pipelines to at least 125% of the maximum operating pressure (MOP), for at least 4 continuous hours, and an additional 4 hours at a pressure of at least 110% of MOP if the piping is not visible.

Other data derived from the initial set of PSD-101 Annual Reports includes the following as listed in Table 4.6:

- High Consequence Areas. If the pipeline inspection unit sections have the potential to impact a high consequence area (HCA). The U.S. Department of Transportation on-line glossary defines an HCA as *"A location that is specially defined in pipeline safety regulations as an area where pipeline releases could have greater consequences to health and safety or the environment. For oil pipelines, HCAs include high population areas, other population areas, commercially navigable waterways and areas unusually sensitive to environmental damage";*
- Corrosion Protection. The type of corrosion protection (cathodic protection) used on the pipeline inspection unit. Impressed current systems are used on every line in the initial PS-101 data set;
- Leak Detection Systems. If a Computational Pipeline Monitoring (CPM) or Supervisory Control and Data Acquisition (SCADA) system for leak detection is used. Of the inspection unit data sets with information for this category, most pipeline sections with this data utilized a SCADA system. Other pipeline leak detection methods included mass balance and volume balance/line pressure deviation;
- Corrosion Inhibitor Use; and,
- Pipeline Coatings Use.

Table 4.6 CSFM Pipeline Additional Data – PSD-101 2018/2019 Reporting Years

CSFM Line ID	HCA	Corrosion Protection	Leak Detection System	SCADA System	Corrosion Inhibitor	Pipeline Coatings
0206	Yes	Yes	No	Yes	No	Yes
1069	Yes	Yes	No	Yes	Yes	Yes
0026	Yes	Yes	Yes	Yes	Yes	Yes
0454	Yes	Yes	Yes	Yes	No	Yes
0987	Yes	Yes	No Data	Yes	Yes	Yes
0988	Yes	Yes	Yes	Yes	Yes	Yes
1176	Yes	Yes	No	Yes	No	Yes
0100	Yes	Yes	Yes	Yes	No	Yes
0104	Yes	Yes	Yes	Yes	No	Yes
0233	Yes	Yes	No	Yes	No	Yes
0233	Yes	Yes	No	Yes	No	Yes
0266	Yes	Yes	No	Yes	No	Yes
0390	Yes	Yes	Yes	Yes	No	Yes
0800	Yes	Yes	Yes	Yes	No	Yes
1062	Yes	Yes	No	Yes	No	Yes
1102	Yes	Yes	Yes	Yes	Yes	Yes
1103	Yes	Yes	Yes	Yes	Yes	Yes
1104	Yes	Yes	Yes	Yes	Yes	Yes
1266	Yes	Yes	Yes	Yes	Yes	Yes
0125	Yes	Yes	Yes	Yes	No	Yes
1034	No	Yes	Yes	Yes	Yes	No
1323	Yes	Yes	Yes	Yes	Yes	Yes
1324	Yes	Yes	Yes	Yes	Yes	Yes
192	Yes	Yes	No	Yes	No	Yes
0042	Yes	Yes	Yes	Yes	No	Yes
0127	Yes	Yes	No Data	Yes	No	Yes
0455	Yes	Yes	Yes	Yes	No	Yes
0735	Yes	Yes	No Data	No Data	No	No
1224	Yes	Yes	Yes	Yes	No	Yes
0201	Yes	Yes	Yes	Yes	No	Yes
0166	Yes	Yes	No	Yes	No	Yes
0339	Yes	Yes	Yes	Yes	Yes	Yes
0334	Yes	Yes	Yes	Yes	No	Yes
0065	Yes	No Data	No Data	No Data	No Data	Yes
0450	Yes	Yes	No Data	Yes	No	Yes
0458	Yes	Yes	Yes	Yes	No	Yes
0696	Yes	Yes	No	Yes	No	Yes
0204	Yes	Yes	No	No	No	Yes
0200	Yes	Yes	Yes	Yes	Yes	Yes
0193	Yes	Yes	Yes	Yes	No	Yes
0027	Yes	Yes	Yes	Yes	No	Yes
0030	Yes	Yes	Yes	Yes	No	Yes

Table 4.6 CSFM Pipeline Additional Data – PSD-101 2018/2019 Reporting Years

CSFM Line ID	HCA	Corrosion Protection	Leak Detection System	SCADA System	Corrosion Inhibitor	Pipeline Coatings
0033	Yes	Yes	Yes	Yes	No	Yes
0041	Yes	No Data	No Data	No Data	No Data	Yes
0703	No Data	No Data	No Data	No Data	No Data	No
0177	No	No Data	No Data	No Data	No Data	Yes
0862	No Data	No Data	No Data	No Data	No Data	No
0383	No Data	No Data	No Data	No Data	No Data	No
0335	Yes	Yes	Yes	Yes	No	Yes
0336	Yes	Yes	Yes	Yes	No	Yes
0457	Yes	Yes	Yes	Yes	No	Yes

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

The data in Table 4.6 is presented to provide pertinent information on pipelines available from the PSD-101 database. The data documents the preventative measures for corrosion monitoring and leak detection for those pipelines. A pipeline that is not undergoing cathodic protection, or that has a substantial amount of corrosion is more likely to leak than other pipelines that do not. Similarly, if a pipeline has a leak detection system is place, it is more likely to identify a problem shortly after it has occurred and, in that fashion, prevent further damage.

4.5.5 High Priority Pipelines

Review of the inspection date data in Table 4.5 indicates a number of pipelines with last inspection dates older than five years (2020 baseline year) or with no data submitted for last inspection date on the PS-101 forms. These pipelines merit follow up review to determine the cause of the lack of recent inspection data; 17 pipelines in the data set meet this criterion (identified in bold font in Table 4.5).

In addition to dated or missing inspection data, the factors outlined in Table 4.6 along with the contents of the pipeline were used to guide the Strike Team in determining pipelines that may warrant further review. One additional descriptor that can be factored in the analysis of risk for pipelines is the operating pressure, however, review of the PS-101 data set indicated the maximum operating pressure for the pipelines ranged from 275 to 1440 pounds per square inch (psi). Therefore, as most of the subject pipelines operate at significant pressure, operating pressure was not used as a screening factor in scoring the pipeline data set for further review.

Pipelines were ranked for further review by assigning a point to each factor that is deficient in Table 4.6 with an additional point for larger sized pipelines and pipelines containing product. Priority is based on the following information (a point for each item):

- Is the pipeline located in a High Consequence Area (HCA)?;
- Does the pipeline utilize corrosion protection?;
- Does the pipeline have a leak detection system?:

- Does the pipeline have a SCADA system?;
- Does the pipeline use corrosion inhibitor?,
- Is the pipeline coated?;
- Pipeline size; and
- Pipeline contents.

In addition to the items in Table 4.6, large pipelines contain larger volumes and therefore have the potential to spill greater amounts of hazardous materials; pipelines 14 inches and larger were assigned an additional point in the ranking system. Pipeline contents were also used in the ranking as the consequences of a crude oil spill on public safety are generally lower than a release of gasoline or jet fuel, or other refined petroleum products, since refined petroleum products can produce flammable vapor clouds more readily. Therefore, pipelines containing products other than crude oil were given an additional point in the scoring system with the exception of the single pipeline in the data set containing nitrogen. Results, with potential scores ranging from zero to eight, by pipeline, are presented in Table 4.7.

Table 4.7 CSFM Priority Pipelines – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Priority Score		CSFM Line ID	Priority Score		CSFM Line ID	Priority Score
206	4		1104	2		450	3
1069	3		1266	2		458	3
26	3		125	3		**696**	5
454	4		1034	2		**204**	4
987	3		1323	2		200	1
988	2		1324	2		193	3
1176	4		192	3		27	3
100	4		42	2		30	3
104	3		**127**	4		33	3
233 a	4		455	2		**41**	5
233 b	4		**735**	6		**703**	6
266	5		1224	3		**177**	4
390	3		201	3		**862**	6
800	3		**166**	4		**383**	6
1062	4		339	1		335	3
1102	2		334	2		336	3
1103	2		**65**	6		457	3

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5.

As Table 4.7 above indicates, 19 pipelines (identified in bold font) scored 4 or more on the ranking system due to not operating with certain integrity testing, maintenance, or mitigation measures or no data was available on the PS-101 forms. These 19 pipelines, along with the 17 identified in Table 4.5, warrant further follow up with the CSFM to determine the applicability of additional operating requirements or to obtain the missing data.

4.6 Case Study - Pipelines

As discussed in Section 3.6, certain events occurred during the Strike Team project that are applicable to the subject matter and warrant review. These incidents provide recent and real life examples of some of the challenges that arise from addressing past oil and gas activities and present the opportunity for a "lessons learned" type of review. A recent event involving a leaking gas pipeline is presented below.

4.6.1 Signal Hill Gas Explosion

On November 5, 2020 a gas explosion occurred at a residence on Ohio Avenue in Signal Hill. The cause of the gas explosion was determined to be a leak from an eight inch abandoned orphan wet gas pipeline. The gas from the leaking pipeline entered the home through the wall space of the home and was ignited by a hot water heater pilot light. Subsequent to the incident, a Health and Safety Plan was prepared pursuant to the direction of the County Fire Department Health Hazardous Materials Division and the County Public Health Department. The Health and Safety Plan documented that six previous environmental assessments and investigations have been completed for the Hilltop area of Signal Hill where the explosion occurred including several for the development of the existing residential homes. The Health and Safety Plan also includes a review of the previous site assessment data and provides the following conclusions:

- The site area has contaminated soil with high concentrations of volatile organic compounds and methane;
- The contaminated soil at the site does not appear to be impacted from crude oil or tank bottoms; and,
- A methane assessment or soil vapor assessment was not done prior to the development of the residential homes.

Air monitoring was conducted at the site by the City of Signal Hill and County Public Health at interior residential locations and exterior locations near 2100 Ohio Avenue and 2749 East 21st Street. Signal Hill Petroleum and the City of Signal Hill excavated and removed the leaking pipeline and installed a passive ventilation pipe system to mitigate any potential gas issues. Based on the air monitoring results and the installation of the vent system, the County Fire Department Health Hazardous Materials Division determined the incident mitigated and completed on January 25, 2021.

4.7 Next Steps

This analysis for pipelines provides a general overview of the data from the NPMS database and an initial set of CSFM PS-101 annual pipeline reports for hazardous liquid and gas pipelines located in the unincorporated areas of Los Angeles County. Additional work on pipelines that will be performed includes the following:

1. Work with the State Fire Marshall to obtain the omitted inspection data from the PS-101 forms.

2. Work with the State Fire Marshal on the pipelines designated as high priority to determine if additional integrity testing, maintenance, or mitigation measures are applicable and feasible.
3. Research the November 5, 2020 gas pipeline explosion by working with the City of Signal Hill and the State Fire Marshal to research the abandoned orphan pipeline to determine how the pipeline contained gas and why the residential development in the area did not address potential methane gas hazards.
4. Provide recommendations on potential public and environmental health and safety concerns of oil and gas pipelines.

5.0 Oil and Gas Storage Facilities

Oil and gas storage facilities can present risk to the community through accidental releases of materials and routine air emissions of toxic pollutants. Oil and gas storage facilities are facilities that are not included in the oil production category (which includes wells and produced crude oil and gas storage). The category of oil and gas facilities includes a large range of facility types that could store flammable, toxic or explosive materials that could cause risks to the public if released. Long-term carcinogenic or chronic impacts, such as health impacts caused by air emissions or groundwater contamination, are not addressed in this report.

5.1 Facility Listings in TRI

Oil and gas storage facilities were examined utilizing the EPA Toxic Release Inventory (TRI) data, which includes information in the industry type, the amount of chemicals stored onsite and the facility information in addition to toxic material release inventories. This information was compiled for Los Angeles County and the unincorporated areas for petroleum facilities, chemical facilities and for petroleum bulk storage facility industry types in order to encompass all potential oil and gas storage locations.

5.2 Facility Listings in CERS

The California Environmental Reporting System (CERS) is a database system that is utilized by facility and first responders in California to enter data about their facilities and allow for a lookup of a facilities hazardous materials inventory. The DRP gained access to the CERS system as a regulator-responder and was able to look up specific facilities to determine their current hazardous material storage status. Details in the CERS system includes the facility location, owner information, contact information and a hazardous materials inventory summary. The TRI facilities were queried to determine the status in the CERS system, and the CERS system was also reviewed for the unincorporated areas for additional facilities that may not have been listed in the TRI database. This allowed for the addition of additional facilities to the TRI data and to refine the hazardous material quantities in the TRI data.

The CERS system classifies materials at facilities into the following areas: flammable liquids, flammable gasses, flammable solids, toxic gasses, other toxic substances, oxidizers, corrosives, explosives, others.

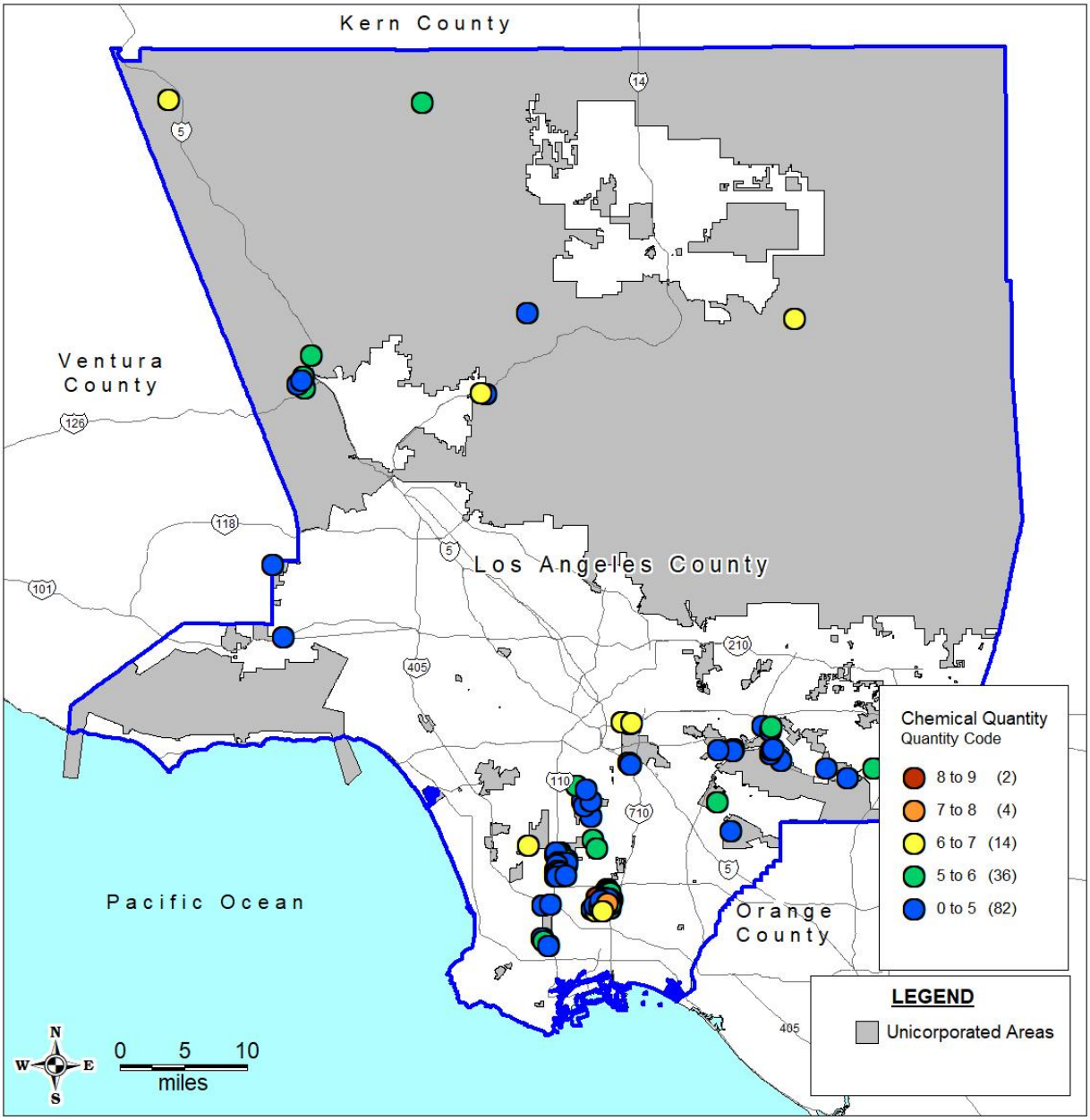
Table 5.1 shows the listing of the facilities with the largest inventories. Figure 5-1 shows the location of potential oil and gas facilities in the unincorporated areas of Los Angeles County.

Table 5.1 Facilities with the Largest Quantity of Chemicals

Facility Name	City	Materials
Pacific Terminals - Dominguez Hills Pump Station	Compton	Flammable Combustible Liquids
Phillips 66 Los Angeles Terminal	Los Angeles	Flammable Combustible Liquids Other
General Petroleum	Rancho Dominguez	Other
Torrance Valley Pipeline Company LLC - Newhall Station	Valencia	Flammable Combustible Liquids
Alflex Corp Distribution Center	Rancho Dominguez	UN
American Racing Equipment Inc	Rancho Dominguez	UN
American Racing Custom Wheels	Rancho Dominguez	UN
Interplastic Corp	Hawthorne	Flammable Combustible Liquids Other
National Cement Co	Lebec	Other
Clean Harbors	Rancho Dominguez	Other
LA DWP Castiac Power Plant	Castaic	Other
Universal Studios LLC	Universal City	Other
Plaskolite West LLC	Compton	Flammable Combustible Liquids
Apple Plastics Inc	Rancho Dominguez	Other
Holliday Rock-Palmdale	Littlerock	Other
Valencia Water Reclamation Plant	Valencia	Other
A&A Ready Mixed Concrete Inc	Gardena	Other
A&A Ready Mixed Concrete Inc	Gardena	Flammable Combustible Liquids Other
Salon Centric	Valencia	Flammable Combustible Liquids Other
Crossfield Products Corp	Rancho Dominguez	Other

Source: TRI Database with over 1 million pounds for industry codes 324 Petroleum & Coal Products, 325 Chemicals, and 4247 Petroleum and Petroleum Products Merchant Wholesalers plus CERS data. UN = unknown

Figure 5-1 Potential Oil and Gas Storage Facilities



Notes: Chemical quantities are designated as: 5=greater than 100,000 pounds; 6=greater than 1 million pounds; 7= greater than 10 million pounds; 8 greater than 100 million pounds and 9=greater than 1 billion pounds.
Figure based on EPA Toxic Release Inventory data.

5.3 Facilities and Census Data

The facility locations were correlated with census data to identify those facilities that are in populated areas. Figure 5-2 shows the facilities and the census data population densities. Table 5.1 shows the number of facilities located in different population density areas. Facilities that are located within 500 feet of higher density areas are also classified as being associated with those higher density census blocks.

Figure 5-2 Potential Oil and Gas Storage Facilities and Census Data

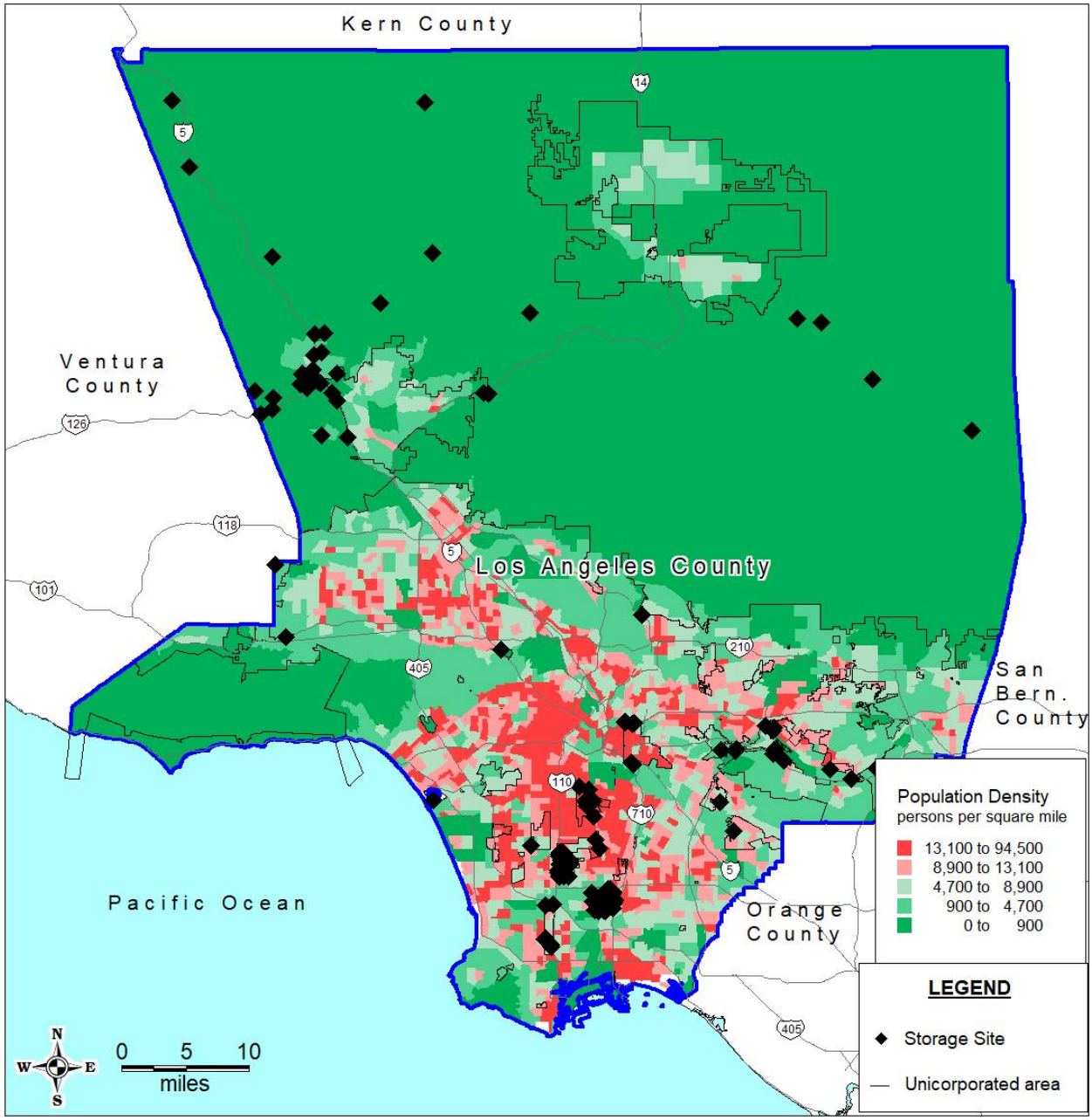


Figure based on EPA Toxic Release Inventory, CERS data and 2010 U.S. Census Bureau data.

Table 5.2 Facilities and Census Data Population Densities

Population Density	Number of Facilities	Density Rank
Less than 1,000 persons/square mile	86	0
More than 1,000 persons/square mile	91	2
More than 5,000 persons/square mile	43	4
More than 10,000 persons/square mile	27	6
More than 15,000 persons/square mile	16	8

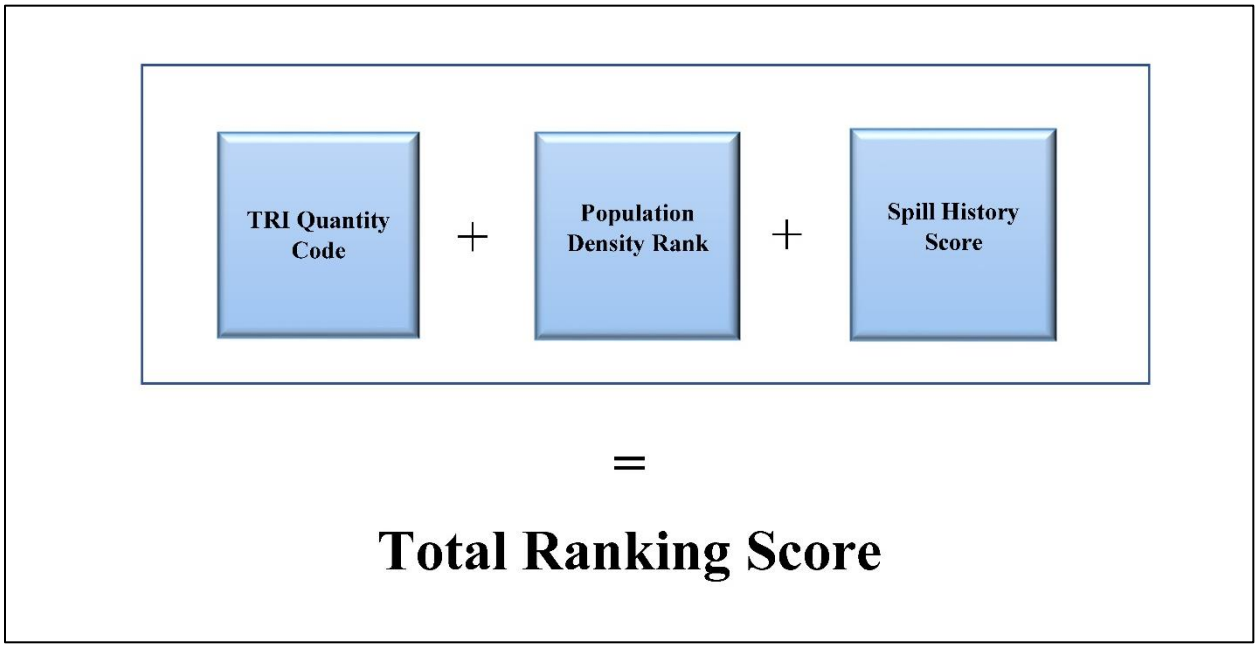
5.4 Facilities by Spill History

The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA) and California law require responsible parties to report hazardous material releases if certain criteria is met. The California Office of Emergency Services (OES) maintains a database of spills in California. While this spill database does not generally maintain GIS reference information or facility name, address matching was reviewed for spills over the last 5 years. Of the facilities identified from the TRI and CERS systems, 17 facilities experienced spills in the last 5 years.

5.5 Facilities Ranking

Based on the materials quantity and the census tract population density, the facilities were ranked by adding together the quantity code, the census tract population density rank as shown in Table 5.2 and a score if there has been a spill in the last 5 years (0 for none, 5 for maybe and 10 for yes). The highest ranked facilities will therefore have a high quantity of materials located in high population density areas and have a history of some spills. These facilities are those that, because of the amount of materials stored, may present a higher frequency of releases of materials. If releases were to occur, due to the higher population densities, the probability of affecting the public would be higher. In addition, if there is a history of spills, then this also is an indication of the potential for a higher frequency of release of materials to the environment. A low-ranking facility would have less materials located in low population density areas and not have a spill history. A ranking schematic is shown in Figure 5-3.

Figure 5-3 Facility Ranking Schematic



The ranking for the top facilities is shown in Table 5.3.

Table 5.3 Facilities Ranking: Top Facilities

Facility Name	Facility Rank Score
BOWMAN PLATING CO INC	23
HONOR RANCHO	21
LEKOS DYE & FINISHING INC	21
PRECISION SPECIALTY METALS INC	20
GEORGE INDUSTRIES	20
AMERICAN POLYSTYRENE CORP	18
INTERPLASTIC CORP	18
PACIFIC SINTERED METALS	17
RYDER TRUCK RENTAL #0569	17
LA DWP CASTIAC POWER PLANT	16
CROSSFIELD PRODUCTS CORP	16

5.6 Facility Materials Classifications

The initial review of potential facilities utilizes the EPA TRI database and an initial review of the CERS database. More detailed information was obtained from the fire department on each of the top 40-50 ranked facilities in terms of the specific chemicals stored at each site, the population density in which the facility is located and the history of spills. The chemicals at these facilities where then screened related to the EPA list of lists (40 CFR Part 302 and Table 302.4), the

California Code of Regulations (Appendix A to Section 5189 - List of Acutely Hazardous Chemicals, Toxics and Reactive) and the EPA ATF listing of Explosive Chemicals.

In addition, for some facilities the more detailed Fire Department submission information was reviewed to determine the extent to which materials are stored in large quantities or dispersed throughout the facility, and if storage locations on a large property are located close to nearby public receptors. A review of the detailed Universal Studios facility fire department submissions, for example, including maps and details on the specific materials storage type (such as paint in many small paint cans as opposed to one single inventory), allowed for a better determination of the risk levels. In the case of Universal Studios, although the total inventory was high (as indicated in Table 5.1), the risk was determined to be low and they were eliminated from the ranking process.

Table 5.4 lists the details on the facilities that rank the highest.

Of the facilities with detailed information, there were 10 facilities that stored acutely hazardous materials and 9 facilities that stored explosive materials. Note that the facilities with the largest inventories do not necessarily have any acutely hazardous materials, such as the Pacific Terminal in Compton, or the Phillips 66 Terminal in Los Angeles, or the Interplastic Corp facility in Hawthorne, none of which store acutely hazardous materials. These facilities have large inventories (over 10 million pounds of materials at each facility) of flammable materials and could cause large fires with resulting smoke and thereby resulting in impacts, but do not maintain inventories of acutely hazardous materials that could be released and cause impacts to nearby neighborhoods.

Table 5.4 Facilities Detailed Inventory Data

Facility Name	City	Total Inventory, pounds	Top Materials	Acute Materials	Explosive Materials
A&A Ready Mixed Concrete INC	Gardena	47,951	sika, lehigh portland cement	None	None
A2Z Plating	Los Angeles	3,329	oils, antifreeze	None	None
Aerospace Dynamics INTL INC	Valencia	473,387	coolant, oils, propane	None	None
B & C Plating CO	Los Angeles	102,382	zinc, nickle metal plating, metal bisulfides	None	None
Bowman Plating Co Inc	Compton	407,333	sulfuric acid, chromic acid, sodium hydroxide, rioline 909, nitric acid, deoxidizer lnc, nitric acid, anodal m3-1, alodine 1200, sodium dichromate, sodium bicarbonate	Nitric Acid, Hydrofluoric Acid	None
Caltrans-Altadena	Altadena	337,778	sealant, asphalt, diesel fuel	None	None
Crossfield Products CORP	Rancho Dominguez	726,206	silicon dioxide, calcium carbonate, silica sand, pigment, vinyl acetate monomer, sodium hydroxide, aluminum calcium silicate, portland cement, magnesium oxide	Formaldehyde, ammonia	None
Fralock	Valencia	385,102	nitrogen, isopropanol	None	None
General Carbon CO	Los Angeles	59,840	petroleum residues	None	None
General Petroleum	Rancho Dominguez	10,688,324	various oils	None	None
George Industries INC	Los Angeles	719,117	sulfuric acid, nitric acid, phosphoric acid, sodium hyroxide solution, propane, nickel acetate	Nitric Acid	Acetone
Honor Rancho - West Energy Operating LLC	Castaic	834,227	alkyl-1-3-propylene-diamine acetate, aliphatic petroleum distillate 90%, methanol, phosphonate salts, methanol, light aromatic naphtha	None	None
Independent Ink INC	Gardena	31,422	solvents	Nitric Acid	Nitrocellulose
Interplastic Corp Thermoset Resins	Hawthorne	13,273,709	liquid nitrogen, styrene monomer, terephthalic acid (ta-22), diethylene glycol, maleic anhydride molten, 2mpd glycol, maleic anhydride molten, propylene glycol, dicyclopentadiene, acetone	None	None
LA DWP Castaic Power Plant	Castaic	1,365,877	distillates (petroleum - naphthenic), distillate (petroleum), hydrotreated light paraffinic, toluene, crystalline silica	None	Acetone
Maxima Enterprises INC	Harbor City	73,715	sulfuric acid, sodium hydroxide, hydrochloric acid	Hydrochloric acid	Acetone, 2-Propanone
Old Country Millwork INC	Los Angeles	148,248	paint, acetylene, chromic oxide	none	Acetone
Pacific Sintered Metals	Los Angeles	217,737	iron, copper, magnesium aluminum silicate, isopropyl, hydroxyalky methacrylate, acetone, alkanes, calcium bis(dinonylnaphthalenesulphonate), silica, crystalline	Chlorine	Acetone
Pacific Terminals	Compton	1,158,276,502	crude oil demulsifier, batteries	none	none
Phillips 66 Los Angeles Terminal	Los Angeles	47,748,691	gasoline, ethanol, diesel	none	none
Power Magnetics	Gardena	236,101	iron, copper, acetylene, argon	none	none

Table 5.4 Facilities Detailed Inventory Data

Facility Name	City	Total Inventory, pounds	Top Materials	Acute Materials	Explosive Materials
Precision Specialty Metals	Los Angeles	1,084,273	hydrofluoric acid, nickel, acrylamide, hydrotreated light paraffinic distillate, sodium hydroxide	Nitric Acid, Hydrofluoric Acid	None
Prime Wheel Corp	Harbor City	3,760	buffing compounds	none	Acetone
Quaker City	Whittier	1,022,680	sulfuric acid, nitric acid	Nitric acid, hydrogen peroxide, hydrochloric acid	Acetone
Silvestri California	Los Angeles	7,244	propane, styrene resin, acetylene	none	Acetone
Sinclair Printing Co	Los Angeles	3,740	press wash, coatings	none	none
Torrance Valley Pipeline	Valencia	11,626,634	crude oil	none	none
V & M Aerospace LLC	Los Angeles	1,149,400	sulfuric acid, hydrofluoric acid, nitric acid	Nitric acid, hydrochloric acid, muriatic acid	none
Weck Laborators Inc	Hacienda Heights	105,437	argon, hydrogen sulfide, ammonia	Hydrogen sulfide, ammonia	none

5.7 Next Steps

The initial review of potential oil and gas storage facilities utilizes the EPA TRI database to review those facilities that could be oil and gas storage facilities based on the industrial codes, and a comparison of the facility locations to the census data. Additional facilities and a refinement of the TRI data was implemented based on a DRP review of the CERS data and additional reviews of the OES spills databases. Additional details will be gathered including the following:

1. Review applicability of including underground natural gas storage facilities such as the Aliso Canyon, Playa del Rey, Montebello, and Honor Ranch storage facilities.
2. Provide recommendations on storage facilities.

6.0 Well Drilling and Well Maintenance Chemical Use

One of the Phase I Strike Team findings concerned the use of chemicals for well drilling, maintenance, and workover activities. These materials are not typically included in hazardous materials business plans because they are specific to each well activity, are only brought onsite as required and are not stored onsite. SCAQMD Rule 1148.2 requires reporting of all chemical use for oil or gas drilling, well completion, or well reworks for onshore wells located in the SCAQMD. Additional information required by Rule 1148.2 includes:

- Name and contact information of well owner and operator;
- Well name and API number;
- Well location;
- Nearest and type of sensitive receptor within 1,500 feet;
- Project schedule;
- Equipment data; and,
- Volumes and types of dry and fluid materials used.

Chemical specific data for each product used in a well drilling fluid, well rework fluid, or well completion fluid required by Rule 1148.2 includes:

- Identity and purpose;
- Total mass in pounds;
- CAS (Chemical Abstract Service Number);
- Mass of each chemical ingredient;
- Air toxic designation;
- Supplier data; and,
- Trade secret protection if applicable.

6.1 Well Activity

Data for the calendar years 2016 through June 2019 provided information on the type of well work activities and associated chemical use for wells subject to Rule 1148.2. Table 6.1 lists Rule 1148.2 well activity events for the 2016 through June 2019 time period for the entire Los Angeles County. As shown in Table 6.1, most of the chemical use reported was associated with maintenance acidizing, gravel packing, and well drilling. Maintenance acidizing is not defined in Rule 1148.2, however, most well operators use the term to describe a near-wellbore treatment to remove scale formation that can plug up well perforations. Definitions for these well activities can differ from agency to agency and no comprehensive single source is available. Table 6.2 lists the commonly used definitions and agency source used by the oil and gas industry. No hydraulic fracturing projects were reported in the Rule 1148.2 database for all of Los Angeles County in the time period 2016 to June 2019. Most of the well report locations were in the cities of Long Beach, Los Angeles, and Wilmington as listed in Table 6-3.

Due to the small sample size of well activity in the unincorporated LA County area and to present a general idea of the types and amounts of chemicals used for well work activities in the Los Angeles basin, the data set presented in this section of the report is for the entire Los Angeles County. Figures 6.1 through 6.3 map where these well activities occurred with unincorporated LA County shown in gray.

Table 6.1 2018 Rule 1148.2 Well Activity LA County

Rule 1148.2 Data 2016 through June 2019	
Well Activity Type	**Number**
Well Drilling	98
Matrix Acidizing	0
Hydraulic Fracturing	0
Gravel Packing	149
Maintenance Acidizing	515
Acid Fracturing	3
Other	2
Total	**767**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Table 6.2 Well Activity Definitions

Type	Definition	Source
Acid Fracturing	A well stimulation treatment that, in whole or in part, includes the pressurized injection of acid into an underground geologic formation in order to fracture the formation, thereby causing or enhancing, for the purposes of this division, the production of oil or gas from a well.	SB4
Acid Matrix Stimulation	An acid treatment conducted at pressures lower than the applied pressure necessary to fracture the underground geologic formation.	SB4
Acidizing	A treatment of the wellbore or reservoir formation with an acid to either clean out scale, damage, or other debris in the well, or react with the soluble substances in the formation to improve permeability and enhance production of oil and gas	SCAQMD Rule 1148.2
Gravel Packing	A method that uses water and additives to place sand and gravel near the wellbore itself with the objective of limiting entry of formation sands and fine-grained material into the wellbore	
Hydraulic Fracturing	A technique used in stimulating a formation or zone that involves the pressurized injection of hydraulic fracturing fluid, which is a carrier fluid mixed with chemical additives, and typically a proppant, into an underground geologic formation in order to fracture the formation, thereby causing or enhancing the production of oil or gas from a well	SCAQMD Rule 1148.2
Maintenance Acidizing	Commonly used by industry to describe the use of acid for well bore de-scaling maintenance activities.	Oil and Gas Industry

Source: SB4 Well Stimulation Regulations, SCAQMD Rule 1148.2, oil and gas industry staff.

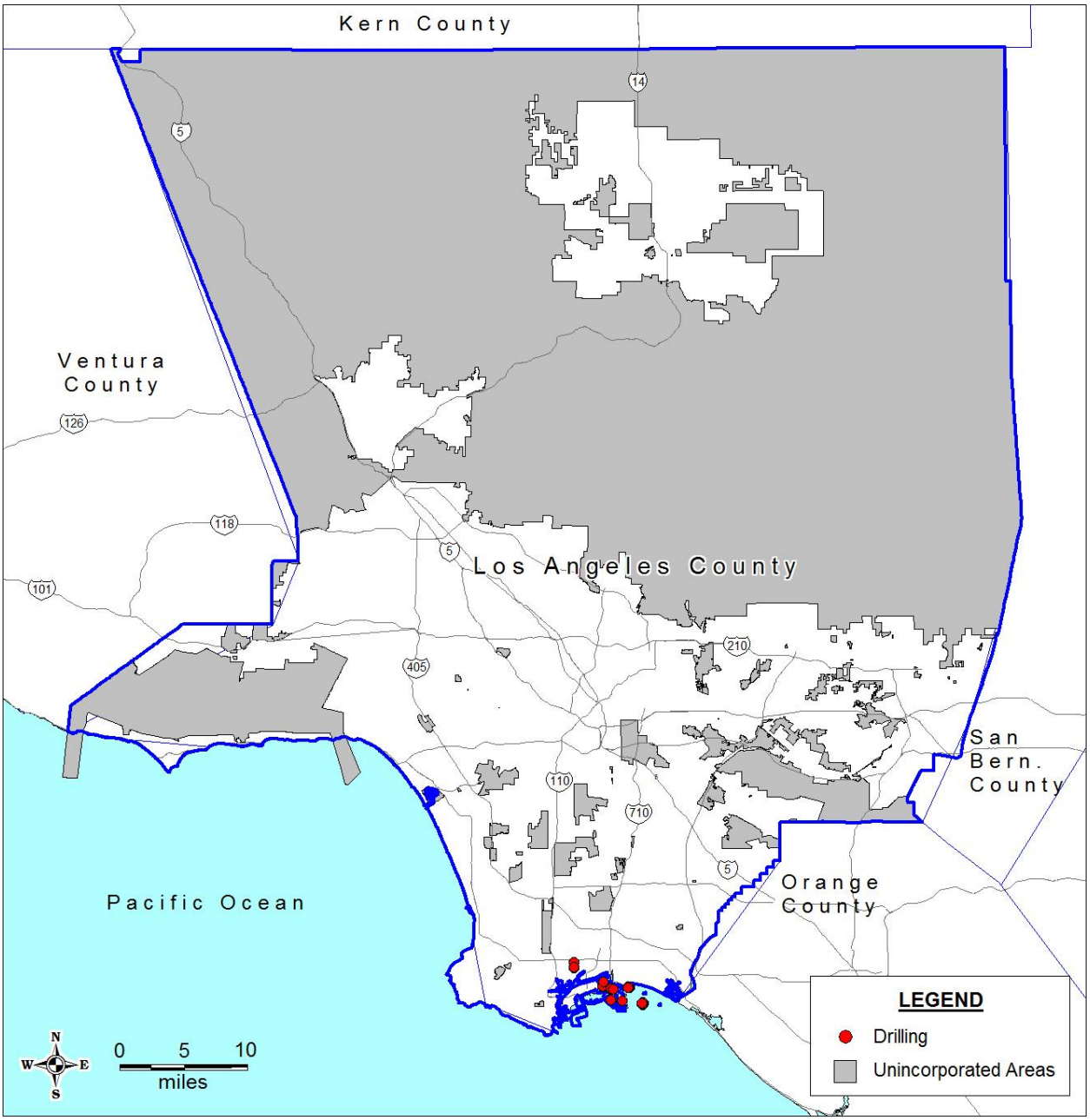
Table 6.3 Rule 1148.2 Well Drilling, Maintenance, and Workover Activities by City

Rule 1148.2 Data 2016 through June 2019	
City/Community	**Number of Well Activity Events**
Long Beach	635
Los Angeles and Unincorporated Los Angeles	54
Wilmington	40
Signal Hill	12
Carson	8
None identified	6
Montebello	3
Santa Fe Springs	3
Castaic	2
Harbor City	1
La Habra Heights	1
Northridge	1
Valencia	1
Total	**767**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

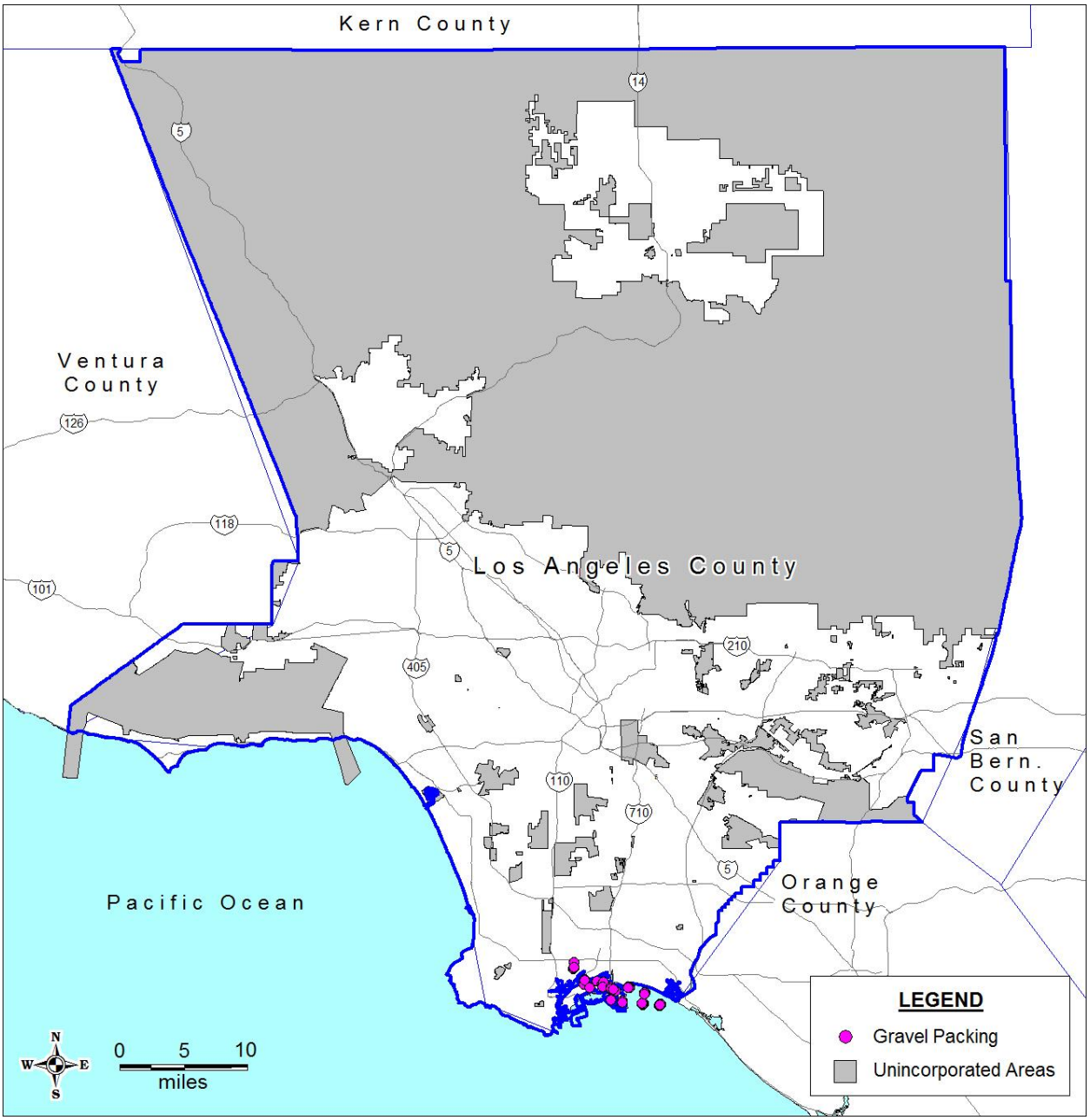
Figures 6-1 through 6-3 show the locations of the well activities listed in Table 6-1 above.

Figure 6-1 Rule 1148.2 Well Drilling Locations



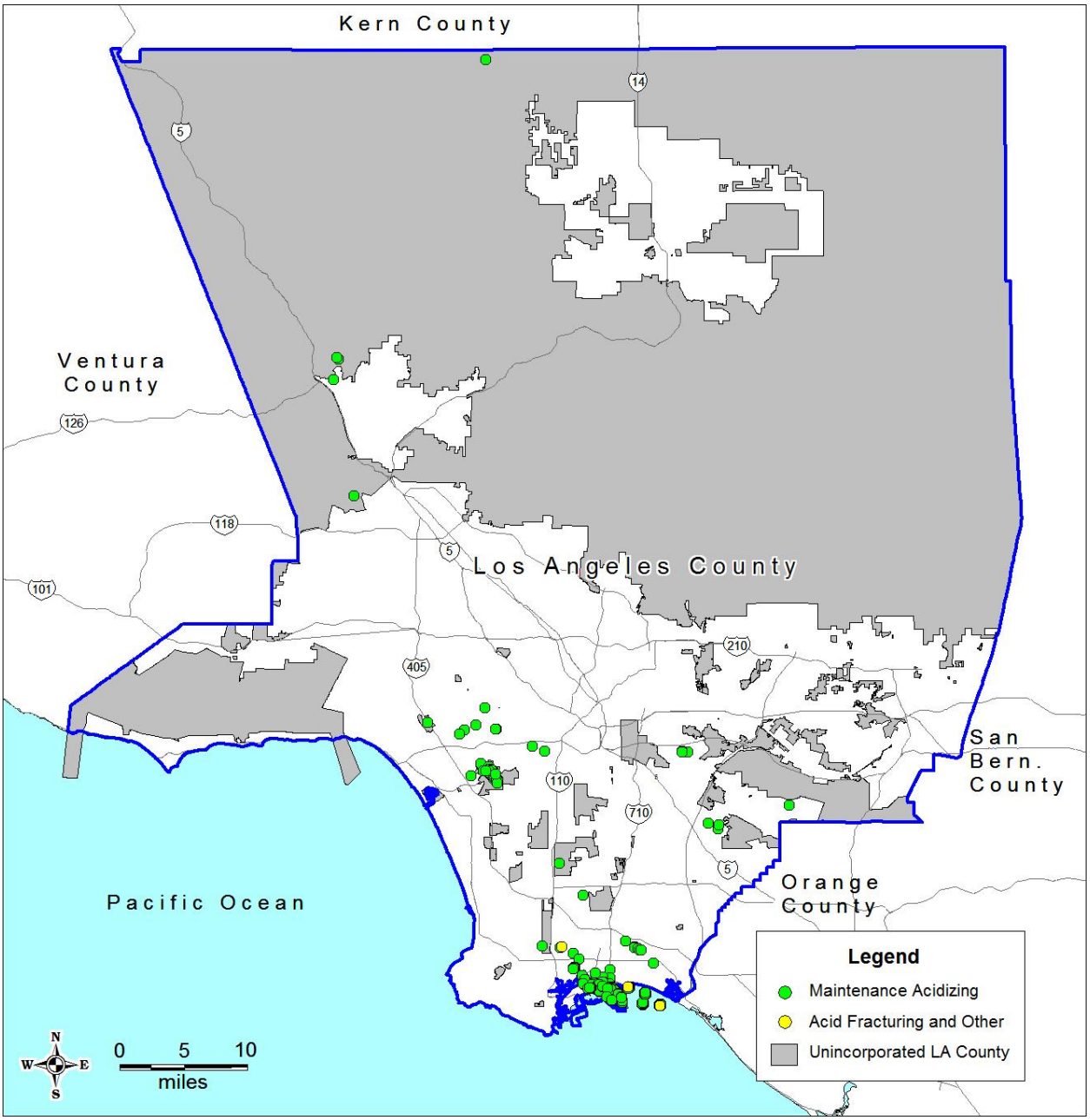
Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-2 Rule 1148.2 Gravel Packing Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-3 Rule 1148.2 Well Maintenance Acidizing, Acid Fracturing and Other Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

6.2 Well Fluid and Chemical Use

Rule 1148.2 provides quantities, total fluid, and chemical specific data for each product used in a well drilling fluid, well maintenance fluid, or well completion fluid. Table 6.4 lists the average fluid use for each well activity type reported for the 2016 through June 2019 time period. It is important to note the fluid use numbers include water and the Rule 1148.2 database reports total fluid use and does not break out individual types of materials by volumes of fluids.

Table 6.4 Rule 1148.2 Total Fluid Use by Well Activity

Rule 1148.2 Data 2016 through June 2019	
Well Activity Type	**Average Fluid Use Including Water (Gallons)**
Well Drilling	58,950
Gravel Packing	11,575
Maintenance Acidizing	32,600
Acid Fracturing	16,256
Other	47,880

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Review of the chemical use for the well activities in the 2016 through June 2019 Rule 1148.2 data set lists 224 different chemicals. The Rule 1148.2 database includes chemical use calculated by mass, in pounds. It is important to note that the values shown indicate the amount of material or chemical used down hole for each well activity and do not represent calculations for materials released into the atmosphere. Tables 6.5 through 6.9 identify the top 25 materials and the average amount, in pounds, used for each well activity in the 2016 to June 2019 data set. As listed in Table 6.1 above, matrix acidizing and hydraulic fracturing were not conducted during the 2016 through June 2019 reporting period. Note for well activities with less than 25 different material use types, all materials use types are listed. Appendix B provides a complete list of all the material and chemical types with CAS numbers for Los Angeles County for the Rule 1148.2 data set years 2016 through June 2019.

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	393,495
BARITE	7727437	38,211
PORTLAND CEMENT	65997151	36,500
POTASSIUM CHLORIDE	7447407	31,115
CALCIUM CHLORIDE	10043524	23,361
CALCIUM CARBONATE	471341	14,747
CRYSTALLINE SILICA	14808607	14,186
SODIUM CHLORIDE	7647145	8,215
SILICA, CRYSTALLINE, QUARTZ	14808607	4,898
GYPSUM	13397245	4,661
SAPONITE	1319411	4,054
AMORPHOUS SILICA	7631869	3,226

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
QUARTZ (SILICA)	14808607	2,658
MAGNESIUM OXIDE	1309484	2,600
CALCIUM OXIDE	1305788	2,514
SULFONATE	0	2,490
MICA	12001262	2,333
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	2,330
ANIONIC ACRYLAMIDE COPOLYMER	0	1,924
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	1,889
MAGNESIUM	7439954	1,341
AMORPHOUS SILICA FUME	69012642	1,124
ALUMINUM OXIDE	1344281	981
SODIUM CARBONATE	497198	911
CARBONIC ACID CALCIUM SALT (1:1)	471341	863

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 98 well drilling jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.6 Rule 1148.2 Average Material Use by Well Activity-Gravel Packing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	39,633
POTASSIUM CHLORIDE	7447407	7,679
CRYSTALLINE SILICA	14808607	6,953
CALCIUM CHLORIDE	10043524	1,880
SODIUM CHLORIDE	7647145	867
MAGNESIUM	7439954	113
HYDROXYETHYL CELLULOSE	9004620	106
QUARTZ (SILICA)	14808607	105
ACETIC ACID, SODIUM SALT (1:1)	127093	9
CELLULOSE	9004346	2

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 98 gravel packing jobs.

Table 6.7 Rule 1148.2 Average Material Use by Well Activity-Maintenance Acidizing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	131,673
HYDROCHLORIC ACID	7647010	2,149
BARITE	7727437	1,728

Table 6.7 Rule 1148.2 Average Material Use by Well Activity-Maintenance Acidizing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
AMMONIUM CHLORIDE	12125029	1,107
PORTLAND CEMENT	65997151	1,028
POTASSIUM CHLORIDE	7447407	891
HYDROGEN CHLORIDE	7647010	775
XYLENE	1330207	536
CRYSTALLINE SILICA	14808607	380
CALCIUM CHLORIDE	10043524	344
SODIUM CHLORIDE	7647145	289
HYDROFLUORIC ACID	7664393	256
ACETIC ACID	64197	240
SILICA, CRYSTALLINE, QUARTZ	14808607	189
ETHYLBENZENE	100414	144
GYPSUM	13397245	137
CITRIC ACID	77929	135
METHANOL	67561	117
MICA	12001262	92
AMORPHOUS SILICA	7631869	91
SULFONATE	0	88
SAPONITE	1319411	77
CALCIUM OXIDE	1305788	73
MAGNESIUM OXIDE	1309484	69
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	69

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 515 maintenance acidizing jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.8 Rule 1148.2 Average Material Use by Well Activity-Acid Fracturing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	410,916
BARITE	7727437	91,434
PORTLAND CEMENT	65997151	72,216
POTASSIUM CHLORIDE	7447407	43,619
CRYSTALLINE SILICA	14808607	18,248
SILICA, CRYSTALLINE, QUARTZ	14808607	9,760
GYPSUM	13397245	9,629
CALCIUM OXIDE	1305788	5,079
SAPONITE	1319411	4,917
MICA	12001262	4,872
AMORPHOUS SILICA FUME	69012642	4,818

Table 6.8 Rule 1148.2 Average Material Use by Well Activity-Acid Fracturing

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	4,814
MAGNESIUM OXIDE	1309484	4,814
SULFONATE	0	4,167
ANIONIC ACRYLAMIDE COPOLYMER	0	3,183
AMORPHOUS SILICA	7631869	2,985
HYDROCHLORIC ACID	7647010	2,761
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	2,500
SODIUM CHLORIDE	7647145	2,302
AMMONIUM CHLORIDE	12125029	1,810
ALUMINUM OXIDE	1344281	1,569
DISODIUM METASILICATE	6834920	1,555
LIGNITE	1415936	1,502
SODIUM CARBONATE	497198	1,217
BENTONITE	1302789	1,048

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 3 acid fracturing jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.9 Rule 1148.2 Average Material Use by Well Activity-Other

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	44,250
BENTONITE	1302789	21,138
SULFURIC ACID, BARIUM SALT (1:1)	7727437	5,000
QUARTZ (SILICA)	14808607	3,598
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	875
ANIONIC POLYACRYLAMIDE	9003058	581
CARBONIC ACID SODIUM SALT (1:2)	497198	550
SODIUM BICARBONATE	144558	543
XANTHAN GUM	11138662	500
OIL, HYDROTREATED LIGHT NAPTHENIC DISTILLATE	64742478	291
SODIUM POLYACRYLATE	9003047	123
COMPOUND SYNTHETIC DIESTERS	8029398	78
SULFURIC ACID, IRON(2+) SALT (1:1), MONOHYDRATE	17375416	18
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-ISODECYL-.OMEGA.-HYDROXY-, PHOSPHATE, POTASSIUM SALT	68071170	14

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 2 other category well jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

6.3 Acute Materials

The SCAQMD Rule 1148.2 database materials used for the well drilling fluid, well maintenance fluid, or well completion fluid activities were reviewed for acute or explosive materials. Acutely toxic chemicals are those substances that pose significant adverse health effects for immediate or short-term exposures. The route of exposure that may cause adverse effects are inhalation, absorption (through skin, eyes, or mucous membranes), or ingestion, depending on the chemical. Chemicals such as hydrofluoric or hydrochloric acid become acutely toxic only at certain concentrations. Table 6.10 identifies the acute or explosive chemicals in the SCAQMD Rule 1148.2 data base in this report. Note that most materials in the SCAQMD database do not pose an acute health risk to the public.

Table 6.10 Rule 1148.2 Acute Materials

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Notes
Acute Materials		
FORMALDEHYDE	50000	(>37%) formaldehyde solution
ETHYLENE OXIDE	75218	Pure or gaseous form
PEROXYACETIC ACID	79210	(concentration > 60% Acetic Acid; also called Peracetic Acid)
HYDROCHLORIC ACID	7647010	Anhydrous
HYDROFLUORIC ACID	7664393	Anhydrous
AMMONIA	7664417	Ammonia solutions (> 44% ammonia by weight) or anhydrous
HYDROGEN PEROXIDE	7722841	(52% by weight or greater)
Explosive Materials		
ACETONE	67641	Pure form, flammable
TRIETHYLENE GLYCOL	112276	Pure form, flammable

Sources: SCAQMD Rule 1148.2 Chemical Reporting Database; Federal EPA and ATF listings, Title 8, Division 1, Chapter 4. Division of Industrial Safety Subchapter 7. General Industry Safety Orders Group 16. Control of Hazardous Substances Article 109. Hazardous Substances and Processes, Appendix A to Section 5189 - List of Acutely Hazardous Chemicals, Toxics and Reactives (Mandatory).
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

6.4 Next Steps

This review of chemicals used for well drilling, maintenance, and workover activities consisted of an initial evaluation of the SCAQMD Rule 1148.2 database. Additional review and analysis of the Rule 1148.2 will continue along with the following:

1. Provide recommendations on potential public and environmental health and safety concerns of subject well activities and chemicals.

7.0 Conclusion

This report was completed pursuant to the Board's March 2016 Motion and September 2018 action continuing the Strike Team's efforts. The research, database development, and mapping in this report, along with the forthcoming field inspection efforts, provide the Strike Team staff with applicable tools to complete the Project. The final report, due September 29, 2021, will include additional analysis, the results of the field work, and the recommendations for the wells, storage facilities, pipelines, and hazardous chemicals reviewed for the Project.

Appendix A

Strike Team Advisory Panel Phase II Report 1 Input Summary

Appendix B

Community Health Safety and Notification Plan Marina Del Rey Well Abandonment

Appendix C

SCAQMD Rule 1148.2 Chemical List

Appendix D

Detailed High Priority Well Maps

Appendix E

Draft Abandoned/Idle Well Inspection Protocol

Appendix F

Abandoned Well Inspection Sheets

(43 High Priority Abandoned Wells)

Appendix G

Idle Well Inspection Sheets

(35 High Priority Idle Wells)

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

April 22, 2021

TO: Supervisor Hilda L. Solis, Chair
Supervisor Holly J. Mitchell
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

FROM: Alex Garcia, Supervisor AG.
Zoning Enforcement Special Projects

ADVISORY PANEL REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

The Board also requested that a five-member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team to assess the team's findings and recommendations and to provide a report to the Board on this assessment no later than 30 days after the Strike Team's report is submitted to the Board. The appointed Advisory Panel members are:

- First District Board Office appointee – Julia May
- Second District Board Office appointee – Andrew Weissman
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani
- Fifth District Board Office appointee – R. Rex Parris

The Advisory Panel meeting was held on April 20, 2021 to discuss the Advisory Panel's assessment of the Strike Team's report. The Advisory Panel members who participated in the meeting were:

- First District Board Office appointee – Julia May
- Third District Board Office appointee – Timothy O'Connor
- Fourth District Board Office appointee – Matt Rezvani

This submittal includes the Advisory Panel's assessment of the Strike Team's ninth biannual report, including written comments from Advisory Panel members appointed by the First and Third Supervisorial Districts. The Advisory Panel report can be accessed on DRP's web page at planning.lacounty.gov/oil-gas/strike.

The next Oil and Gas Strike Team report to the Board is due on September 29, 2021, and the Advisory Panel report will follow no later than 30 days after that date. Should you have any questions about this report, please contact Ai-Viet Huynh, Zoning Enforcement Special Projects section, at ahuynh@planning.lacounty.gov.

AG:ah

Attachment: planning.lacounty.gov/assets/upl/project/oil-gas_advisory-panel_20210422-report.pdf

c: Executive Office, Board of Supervisors
Chief Executive Office
County Counsel
Department of Public Works
Department of Public Health
Fire Department

FIRST DISTRICT
ADVISORY PANEL MEMBER
JULIA MAY
COMMENTS

Date: 4/13/2021

From: Julia E. May, First District Repres., LA County Oil & Gas Strike Team Advisory Committee

To: Ai-Viet Huynh, Regional Planner, Advisory Committee Members, and Board of Supervisors, Los Angeles County Oil & Gas Strike Team

Re: **Comments on Oil and Gas Assessment Project Phase II – Report 4,** March 21, 2021, (Report # 9 in full series), County of Los Angeles, regarding Abandoned & Orphaned Wells, Pipelines, Oil & Gas Storage, and Hazardous Materials use

The following are my preliminary comments, which may be supplemented by discussion during the upcoming O&G Strike Team Advisory Committee planned for April 20th, 2021.

1. **Once again, a great deal of important documentation on specific hazards has been carried out through this latest report, despite the very hard year of 2020** (for wells – hazards related to pressure, H2S presence, community characteristics, age, production and accident history, abandonment, idling, etc., as well as hazards from pipelines, oil and gas storage, and chemical use). Over time, this site-specific information has added substantially to the body of evidence regarding hazards from oil and gas operations in unincorporated parts of the County, much of which was previously very hard-to-access information buried in hard copy files, or entirely missing. In addition, the severe challenges of 2020 hampered Strike Team efforts, including in-person inspection (among other more extreme burdens of the year). It is important to acknowledge barriers as well as important progress as we look forward to better times.

2. **However, the overall Strike Team process which began in 2016, has been too slow-moving in reaching the point of action, to reduce and eliminate Oil and Gas hazards that continue to threaten local, regional, and planetary health and safety.** Low-income and communities of color are disproportionately impacted by Oil and Gas operations and associated well-to-wheel impacts of fossil fuels, including toxic emissions, smog-forming chemicals, odors, greenhouse gases, hazardous chemical transport, and climate impacts. These dangers cannot be treated separately, as if they exist in a vacuum. Last year brought home the immediate and severe dangers of climate change, during the out-of-control wildfires and other fossil-fueled disasters. Latinx, Black, Indigenous, other people of color are hardest hit. The body of evidence documenting these racial inequities and widespread health and environmental hazards is extensive; I will not try to repeat them in this short memo.

3. **At the same time, the pandemic highlighted options to accelerate clean energy, and some fossil fuel operations have even closed.** This begs the question – will the Strike Team move beyond evaluation only of separate components of hazards in oil and gas operations? The times have moved beyond that--even the oil industry is discussing phaseout. I urge that the Strike Team broaden the discussion to include the much-needed fossil fuel phaseout and Just Transition.

4. **Los Angeles County adopted a sustainability plan and goals, including "A fossil-free LA County", which states: "By eliminating fossil fuels, we are seeking to mitigate global climate change and its impacts throughout the region."**[1] Similarly, the Strike Team should include this goal and begin evaluating how to carry this out.

[1] ***Our County, Los Angeles Countywide Sustainability Plan,*** August, 2019, **Goal 7: A fossil fuel-free LA County,** p. 104, https://ourcountyla.lacounty.gov/wp-content/uploads/2019/07/OurCounty-Final-Plan.pdf

5. **Disadvantaged communities of color in the region and statewide, are clamoring for phaseout of drilling in California. It is time for the Strike Team to also begin to evaluate how to phase out Oil and Gas operations, not just incrementally mitigate impacts.** This is also consistent with the State of California's climate goals, and with the County's sustainability and Environmental Justice goals.

6. The County Sustainability Plan's Goal #1 is to establish: **"Resilient and healthy community environments where residents thrive in place. The County will protect low-income communities and communities of color from pollution, reduce health and economic inequities, and support more resilient and inclusive communities."** Fossil fuel operations are inherently at odds with this goal; phaseout plans need to be developed as soon as possible.

7. **My past comments, and those of my fellow Advisory Committee Members have not been fully addressed.**

8. **One example – In past comments, I documented pipeline spills in Wilmington which caused severe odors and health hazards through quantities of crude oil spilled directly onto residential streets.** Pipelines cross between unincorporated and incorporated areas, so those spills are relevant to unincorporated areas. It would be useful to include documentation of the Wilmington pipeline spills and reasons for the rupture in the next report, as well as identifying whether these risks are present in unincorporated areas.

9. **Earthquake risks increase all the hazards identified –** these need to be evaluated and updated.

10. **Thank you to Matt Rezvani, fellow Advisory Committee member, for providing expertise on pipelines and other matters to the team**.

Thank you to the County staff and consultants, the Advisory Committee Members, and the County Board of Supervisors for consideration and extensive work to eliminate these widespread hazards.

Julia E. May, First District Representative, Advisory Committee, LA County Oil & Gas Strike Team (Senior Scientist, Communities for a Better Environment, CBE, julia@cbecal.org)

Date: **4/21/2021** *Supplemental Comment on Report #9*

From: Julia E. May, First District Repres., LA County Oil & Gas Strike Team Advisory Committee

To: Ai-Viet Huynh, Regional Planner, Advisory Committee Members, and Board of Supervisors, Los Angeles County Oil & Gas Strike Team

Re: **PART 2 - Comments on Oil and Gas Assessment Project Phase II – Report 4, March 21, 2021,** (Report # 9 in full series), County of Los Angeles, regarding Abandoned & Orphaned Wells, Pipelines, Oil & Gas Storage, and Hazardous Materials use

These are to supplement my written comments of 4/13/2021, and to memorialize some of the points brought up by fellow Advisory Committee members, myself, the consultant, and staff, in the useful discussion yesterday.

1. **Regarding the potential for oil and gas operation phaseout, consistent with the County Sustainability plan, several helpful steps were discussed yesterday:**
    a. **In the next report, it would be helpful to list new policies developed since the Strike Team process began** which impact this process (including phaseout, the County Sustainability plan goals, and perhaps other policies).
    b. **Identifying Oil and Gas operations which are out of compliance with existing regulatory requirements or which are idled operations, would be useful information to consider as part of phaseout, in order to eliminate potential hazards and harmonize with fossil-free goals.** This may include non-compliance related to fees, record-keeping, inspection, safety, leaks, odors, chemical usage, and other requirements, and may include idled operations that are generally in compliance (but out of use). These could represent one body of candidates for permanent closure. For example, long-idled pipelines and drilling operations, many which have been idle for years or decades, represent hazards over time that should be eliminated, and are especially incompatible with residential communities. Seismic risks in the region continually increase these risks, and this is especially problematic in already pollution-burdened communities of color. **This can be in addition to evaluation of phaseout of other priority hazardous operations, as additional steps in the broader fossil fuel phaseout plan.**
2. **Pipeline sulfur content (e.g. H2S and others) would be useful information to have for individual pipelines,** since this can drastically increase corrosion. Although the County doesn't presently have this data, discussion indicated that industry may have some of this information available (e.g. Kinder Morgan).
3. **Considering the Wilmington pipeline ruptures which resulted in residential streets being covered by highly odorous crude oil, sickening people,** would be useful. (See my April 2019 comments.) The causes would help evaluation of rupture risks in unincorporated areas, especially since pipelines cross jurisdictions. The consultant provided a helpful commitment to follow-up.
4. **It will be important to have extended review time on the next draft Strike Team report, especially since this is expected to be the final report, with final recommendations.** Inspections had to be postponed due to the pandemic, so some information won't be available until this next draft. The Advisory Committee could also be invited to participate directly in the final Strike Team meeting, before the final Advisory Committee meeting.

Thank you again for all the hard work developing the body of data and analysis.

-- Julia E. May, First District Representative, Advisory Committee, LA County Oil & Gas Strike Team
(Senior Scientist, Communities for a Better Environment, CBE, julia@cbecal.org)

THIRD DISTRICT
ADVISORY PANEL MEMBER
TIMOTHY O'CONNOR
COMMENTS

April 21, 2021

Ai-Viet Huynh
Regional Planner, Los Angeles County
By EMAIL: AHuynh@planning.lacounty.gov

Subject: Comments from Tim O'Connor (3rd District Rep., LA County Oil & Gas Strike Team Advisory Committee) on the March 21, 2021 Oil and Gas Assessment Project Phase II Report, (Report # 9)

Dear Ms. Huynh and members of the LA County Oil & Gas Strike team,

Please accept these comments on the March 21, 2021 Oil and Gas Assessment Project Phase II Report, (Report # 9). I submit these comments in my personal capacity as the 3rd District Representative on the Advisory Committee. Although these comments are my own, they are formed by years of experience working on oil and gas issues in California for my present employer the Environmental Defense Fund, and in prior experience before that.

As a high level observation, I commend the Strike Team and the professional services firm MRS for its continued examination of the public health, safety and environmental issues facing oil and gas production in Los Angeles County. The multi-year examination has resulted in significant amounts of data and observations, and will no doubt lead to important recommendations that can shape the course of oil and gas production, transmission and storage in the region forever. As the region grapples with the continued need to reduce climate pollution, improve air quality, reduce community exposure to toxic materials, protect water quality, and support economic growth, the findings and recommendations of this effort can serve as a basis for the future of oil and gas within that paradigm.

Given the level of investment that has gone into this effort over the last 4 years, it is clear that the deliberations that go into the final report should not follow that same form and substance as has been used for the prior eight.

In particular, as has been noted in the past, while the Advisory Panel is afforded the opportunity to comment on the report, that opportunity generally takes the form of an add-on comment after the report has been developed and finalized by the consultant MRS, and not in the deliberative or development phase. Accordingly, it is unclear whether and to what extent the input from the Advisory Panel will be incorporated, if at all, into the findings and recommendations for policies and actions of the final report. As a result, as was raised in the April 20, 2020 meeting, I recommend the Advisory Panel be afforded the ability to have all members attend the Strike Team meeting to discuss the final report in an open and public forum, and to engage in a deliberative process with the members of the Strike Team.

In addition to ensuring effective participation by the Advisory Panel in the development of the final report's conclusions and recommendations, I also recommend the next three months include an examination of the changed circumstances that have occurred in the Los Angeles region as it relates to oil and gas production, and incorporate observations about those changes into the final report and

recommendations. In particular, the final report should include an examination of the scope and precedent of recent actions of both Culver City (moratorium and phase out of oil and gas production) and Los Angeles City (moratorium on new drilling) and evaluate whether the Strike Team report should incorporate similar actions into its recommendations. Making sure final report catalogues major changes in science and policy in the region since the initiation of the Strike Team process is important to ensuring a robust final product that leads to an effective decision-making process.

As it relates to the content of Report # 9, once again I commend the team for an excellent job. In addition, prior to the final report being issued, I offer the following comments.

- As it relates to oil and gas idle and abandoned wells, it is unfortunate that the inspection data could not be collected for high priority wells prior to the development of the March 2021 report. Since the next report will be the final, it is important that the Strike Team and Advisory Panel be afforded the opportunity to see the data from the inspections prior to the final report and recommendations being written. In short, the Strike team spent significant effort to develop a prioritization matrix for well identification and inspection, and the results of that process should be incorporated into the final report in a deliberative manner. Those inspections, which will be done on the wells that are the most susceptible to leakage and human health exposure are the culmination of an important process that can shape policy going forward. Accordingly, I respectfully request MRS proactively release the data as soon as it is available, and before the development of the report recommendations.

- As it relates to pipeline inspections, while the report and presentation make it clear that MRS evaluated pipelines based on a range of factors, it appears that the status of pipeline compliance with requirements to maintain their franchise agreements (payment and renewal) was not part of the review. Whether a pipeline operator maintains basic upkeep of its ability to operate its pipelines in compliance with contractual obligations and easements should be considered a core indicia of the focus and attention it pays to its obligations to protect the public health, safety and the environment in other contexts – such as through inspection and maintenance. As a result, I recommend the review of pipelines be expanded to include review of this material prior to final conclusions being made.

Thank you for considering these points.

Sincerely,

Tim O'Connor
3rd District Representative, Los Angeles Oil and Gas Strike Team Advisory Panel

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

September 29, 2021

TO: Supervisor Hilda L. Solis, Chair
Supervisor Holly J. Mitchell
Supervisor Sheila Kuehl
Supervisor Janice Hahn
Supervisor Kathryn Barger

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

UPDATE REPORT ON BOARD MOTION REGARDING THE OIL AND GAS STRIKE TEAM FOR UNINCORPORATED LOS ANGELES COUNTY (MARCH 29, 2016 – AGENDA ITEM NO. 12)

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Director of Public Health, and Director of Public Works to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider. The Board also requested that a five-member Advisory Panel be established, comprised of one appointee from each Supervisor with an expertise in oil and gas exploration and production, to work in conjunction with the Strike Team to assess the team's findings and recommendations.

In accordance with the Board's motion, the Strike Team is submitting the tenth and final update report to the Board for the oil and gas subject areas within the unincorporated Los Angeles County listed below. This report is the fifth of five update reports for the Phase II effort. The report and the appendices below can be accessed on the Department's web page at planning.lacounty.gov/oil-gas/strike.

- Orphaned and Abandoned Oil and Gas Wells
- Oil and Gas Pipelines

- Oil and Gas Storage Facilities
- Hazardous Chemicals

Typically, within 30 days of submitting a Strike Team report, a report with the Advisory Panel's assessment of the Strike Team's report is also submitted to the Board. The Advisory Panel's comments are then addressed in the next Strike Team report. Given that this is the Strike Team's final report and no subsequent reports will be submitted, a joint Strike Team/Advisory Panel public meeting was held on September 15, 2021 to discuss the tenth and final update to the report, the Advisory Panel's assessment of the report, and to hear public comment. At this meeting the Strike Team passed a motion directing staff to address the Advisory Panel's comments in this report and to file this report with the Board.

Should you have any questions about this report, please contact Diana Gonzalez, Zoning Enforcement Special Projects, at dgonzalez@planning.lacounty.gov or (213) 974-6483.

AJB:JS:AG:dg

Attachment:
planning.lacounty.gov/assets/upl/project/oil-gas_20210901-report10.pdf

c: Executive Office, Board of Supervisors
County Counsel
Department of Public Works
Department of Public Health
Fire Department

S_09/29/2021_LUR_L_OILANDGAS

Oil and Gas Assessment Project

Phase II – Report Number 5

County of Los Angeles

September 2021

Prepared for:
County of Los Angeles

Prepared by:
MRS Environmental (MRS)

Los Angeles Oil and Gas Strike Team

Bi-Annual Report Number Ten

FINAL REPORT

Table of Contents

Executive Summary

On March 29, 2016, the Los Angeles County Board of Supervisors (Board) passed a motion instructing the Director of Regional Planning, in coordination with the Fire Chief, Interim Director of the Department of Public Health, and Director of the Department of Public Works, to convene a Strike Team to assess the conditions, regulatory compliance and potential public health and safety risk associated with existing oil and gas facilities in unincorporated Los Angeles County (unincorporated County), excluding that area of the Inglewood Oil Field that is regulated under the Baldwin Hills Community Standards District. The Board instructed the Strike Team to report back on a biannual basis with a summary of its findings and any recommendations on legislative and regulatory positions that the Board should consider.

Phase I of the project was completed in September 2017 and provided an assessment of oil and gas facilities in unincorporated Los Angeles County with the following tasks:

- Verifying and updating an existing inventory of oil and gas facilities;
- Conducting site visits and compliance review of the oil and gas facilities;
- Developing a public health assessment screening tool; and,
- Researching the regulatory frameworks of other jurisdictions with similar oil and gas infrastructure.

The results of the Phase I efforts are detailed in biannual reports dated October 2016, March 2017, and September 2017 and concluded that additional investigation into oil and gas facilities was warranted.

On September 4, 2018, the Board approved contractual consulting services to continue the efforts of the Strike Team related to oil and gas facilities. This report is the fifth and final biannual report to be provided to the Board during the current 36-month long Strike Team Phase II effort. Under Phase II the Strike Team is tasked with researching and investigating the following oil and gas elements:

- Abandoned and orphan wells;
- Storage facilities;
- Pipelines; and,
- Hazardous chemicals.

This report provides additional data obtained to date and presents prioritization screening for a large number of wells, pipelines, chemicals, and facilities reviewed under this analysis. This final report also summarizes the collection and analysis of the data and presents recommendations for public safety and environmental improvements to the regulation and operation of the facilities analyzed in this Project. This final report concludes and closes the Strike Team effort pursuant to the Board motions on March 29, 2016 and September 4, 2018. Recommendations are summarized in Table ES.1 and Section 1.3 and detailed in the applicable sections of the Strike Team reports.

Table ES.1 Summary of Strike Team Recommendations

Strike Team Report	Recommendation
Oil and Gas Well Inventory	• Zoning study of oil and gas regulations
Phase I Oil and Gas Facility Compliance Review Existing Active Wells	• Update the County Zoning Code • Evaluate additional oil and gas facilities • Review of other oil and gas industrial uses • Interview community members • Review environmental review procedures
Phase II Oil and Gas Assessment Project	• Adopt procedures for DRP staff review of oil and gas projects • Adopt requirements for applicants of oil and gas projects • Adopt development standards for oil and gas projects; • High priority well monitoring • Provide additional review of idle wells in coordination with other agencies • County access to Pipeline operator records • Adopt Requirements for pipeline installation and use • Adopt Requirements for the inspection, monitoring, testing and maintenance of pipelines • Require a Hazardous Materials Business Plan and AQMD 1148.2 databases Review for toxic and explosive materials • Require a Transportation Risk Management and Prevention Program (TRMPP)

1.0 Background

This is the tenth report to update the Board on the Strike Team's efforts. The two board actions are summarized below. Consistent with the Phase I reports, the Phase II reports are cumulative in the analysis: the findings of each Phase II report are incorporated into forthcoming reports as information is collected and the analysis updated.

1.1 Board Motion Regarding Proactive Planning and Enforcement of Oil and Gas Facilities Operating in Unincorporated Los Angeles County

On March 29, 2016, the Los Angeles County Board of Supervisors passed a motion to:

- Convene a Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County;
- Review Los Angeles County Title 22: Zoning Code to ensure that oil and gas facilities may no longer operate by right in the unincorporated portion of the County and to ensure that regulations reflect best practices and current mitigation measures and technologies, minimize environmental impacts and protect sensitive uses and populations;
- Coordinate with cities throughout the County that are interested in collaborating on the development of regulatory requirements and protocols for monitoring and evaluating their local oil and gas facilities;
- Create an Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess the biannual reports of the Strike Team; and,
- Ensure that County Planning and Code Enforcement services are not negatively impacted.

1.2 Board Action Regarding Continued Strike Team Efforts Regarding Oil and Gas Facilities Operating in Unincorporated Los Angeles County (Phase II)

The results of the work completed under Phase I concluded that additional investigation was merited related to oil and gas facilities in the unincorporated County. Therefore, on September 4, 2018, the Los Angeles County Board of Supervisors approved contractual consulting services to continue assisting the efforts of the Strike Team on oil and gas facilities with focus on the following tasks:

- Continue the work of the Strike Team consisting of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief to assess and report on a biannual basis the conditions, regulatory compliance and potential public health and safety risks associated with existing oil and gas facilities in unincorporated Los Angeles County for the following:
    - Identify, assess, and prioritize orphaned and abandoned oil and gas wells in the unincorporated County;

- Identify, assess, and inventory oil and gas pipelines within oil and gas fields, common carrier pipelines outside of oil fields and utility pipelines within the unincorporated County;
- Identify and assess oil and gas storage facilities in the unincorporated County; and,
- Review chemicals at oil and gas facilities not identified in Hazardous Materials Business Plans.

- Continue the coordination and corroboration with the Advisory Panel consisting of independent experts in oil and gas exploration and production as appointed by the Board of Supervisors to assess and to provide written comments on the biannual reports.

1.3 Previous Reports

1.3.1 Los Angeles County Oil and Gas Well Inventory

On July 28, 2015, the Board directed the Department of Regional Planning (DRP), in consultation with the Department of Public Health (DPH), to develop a detailed inventory of all oil fields and the associated level of environmental monitoring of all oil wells currently operating within the unincorporated areas of the County of Los Angeles. MRS Environmental, a consulting firm with expertise in the oil and gas industry, along with County DRP Staff prepared the Los Angeles County Oil and Gas Well Inventory report dated December 2015. The Oil and Gas Well Inventory report identifies facility and well locations and includes a review of local, State, and Federal regulatory requirements for the drilling and operating of oil and gas wells. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/well).

1.3.1.1 Recommendations

Based on the findings of the Oil and Gas Well Inventory Report, the Strike Team staff recommended that the DRP conduct a zoning study to review oil and gas well regulations against current regulatory standards to protect the health, safety, and welfare of surrounding communities. Further, the recommendation directed DRP to determine if updated standard conditions and/or amendments to Title 22 are needed; and evaluate the appropriateness of "by-right" use of oil and gas wells within Title 22.

1.3.2 Los Angeles County Oil and Gas Compliance Reports (Phase I)

As noted above, the Oil and Gas Facility Compliance Review Project reports completed under the Strike Team Phase I efforts were submitted to the Board in October 2016, March 2017, and September 2017. The reports included inspection checklists, a well inspection protocol, results from facility inspections and a screening public health assessment for 12 facilities and 557 oil and gas wells. The report also included review and recommendations for further review on legislative positions, regulatory positions, legal positions, and other facilities that may benefit the County by undergoing a similar review. The report is available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike).

1.3.2.1 Recommendations

The Phase I Strike Team reports concluded with the following recommendations:

- Update the County Zoning Code for oil and gas operations;
- Oil and gas facilities in nearby jurisdictions outside the County be evaluated;
- Review of other industrial uses related to the oil and gas industry;
- Interview community members in neighborhoods near oil and gas operations; and,
- Review environmental review procedures to identify improvements for the permitting of oil and gas projects and inter-departmental and inter-agency coordination on same.

1.3.3 Los Angeles County Oil and Gas Compliance Reports (Phase II)

The initial Phase II Oil and Gas Facility Compliance Review Project report was submitted to the Board in March 2019 with subsequent reports completed in September 2019, June 2020, and March 2021. Note that the June 2020 report was delayed from March 2020 and an additional report scheduled for September 2020 was not completed due to the COVID-19 pandemic. The research, database development, and mapping in the first four reports provided the Strike Team Phase II data on the issue areas and provided staff with applicable tools to continue forward with the Project as reflected in this fifth and final report. The reports are available on the County Department of Regional Planning web site (http://planning.lacounty.gov/oil-gas/strike). Input from the Strike Team Advisory Panel on the previous reports are summarized in Appendix A.

1.3.3.1 Recommendations

The Phase II Strike Team reports recommendations are detailed in this report and summarized below:

- Adopt a list of recommended procedures for DRP staff review of oil and gas projects;
- Adopt a list of recommended requirements for applicants of oil and gas projects;
- Adopt a list of recommended development standards for oil and gas projects;
- Recommendation that high priority well monitoring continue and be expanded to additional wells in the County;
- Further review of idle wells in coordination with other agencies;
- Recommendation that pipeline operators provide copies of the State Fire Marshall Pipeline Annual Reports to the County for review;
- Adopt a list of recommended requirements for pipeline installation and use;
- Adopt a list of recommended requirements for the inspection, monitoring, testing and maintenance of pipelines;
- Coordinate with the Fire Department and the Hazardous Materials Business Plan and AQMD 1148.2 database to better understand the use and quantities of certain chemicals; and,
- Recommendation that a Transportation Risk Management and Prevention Program (TRMPP) be required for the temporary use of chemicals in well drilling and well completion activities.

1.4 Phase II Project Scope

As listed in Section 1.2 above, the Phase II scope includes review and assessment of orphaned and abandoned wells, oil and gas pipelines, oil and gas storage facilities, and chemicals not identified in Hazardous Materials Business Plans. Tasks also include a review of regulatory agency databases and permits, site visits, evaluation and prioritization of public health and safety risk, and recommendations for further action. The scope does not include a review of down-hole compliance issues (well testing and conditions of well bores below the surface of the ground) or ambient air monitoring such as the installation of toxic air pollutant monitoring stations.

1.5 County Departments and Their Roles

County Departments involved in the Strike Team include the following:

- Regional Planning;
- Public Health;
- Public Works;
- Fire; and
- County Counsel.

The role of each of these is discussed below.

1.5.1 Department of Regional Planning (DRP)

The DRP is the lead County agency for this compliance review effort. DRP is responsible for the following components and tasks:

- The Director or her designee to attend Strike Team public meetings;
- Project management;
- Hire and manage the consultant assisting the County;
- Coordinate and facilitate staff meetings;
- Coordinate and staff Advisory Panel and Strike Team meetings;
- Research and collection of regulatory mapping, infrastructure, and inspection data;
- Coordinate information exchange between all involved agencies;
- Develop an unincorporated County orphan and abandoned well database;
- Develop an unincorporated County pipeline database;
- Develop an unincorporated County chemical database;
- Attend the field site visits;
- Prepare field site findings; and
- Prepare biannual reports.

1.5.2 Department of Public Health (DPH)

The DPH's role on the Strike Team includes:

- The Director or her designee to attend Strike Team public meetings;
- Research and collection of DPH issues, complaints, and enforcement actions;
- Attend staff meetings;

- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.3 Department of Public Works (DPW)

The DPW's role on the Strike Team includes:

- The Director or his designee to attend Strike Team public meetings;
- Research and collection of DPW permits;
- Research and collection of DPW issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.4 County Fire Department (Fire)

The Fire Department's Fire Prevention Bureau/Petroleum Chemical Unit and the Health Hazardous Materials Division roles on the Strike Team includes:

- The Fire Chief or his designee to attend Strike Team public meetings;
- Research and collection of fire prevention permits;
- Research and collection of Certified Unified Program Agency-CUPA permits (hazardous materials, hazardous waste, above ground petroleum storage, and California Accidental Release Prevention Program-CalARP);
- Research and collection of fire issues, complaints, and enforcement actions;
- Attend staff meetings;
- Review and comment on Project documentation;
- Attend the field site visits; and
- Review and comment on draft reports.

1.5.5 County Counsel

County Counsel provides the following assistance to the Strike Team:

- Review of contract for consultant assisting the County;
- Review and comment on Project documentation;
- Attend staff meetings;
- Attend Advisory Panel and Strike Team meetings;
- Advise County on legal positions as necessary; and
- Review and comment on draft reports.

1.5.6 Strike Team Members

The Strike Team consists of the Director of Regional Planning, the Director of Public Health, the Director of Public Works, and the Fire Chief, or their designees. The Strike Team reviews the reports provided by Project Staff, holds public meetings to discuss the reports, and decides to submit the reports to the Board of Supervisors.

1.5.7 Project Staff

The Project Staff consists of staff from DRP, DPH, DPW, Fire, and MRS Environmental, Inc, the consultant assisting the County with the Project. In addition, staff from the California Geologic Energy Management Division (CalGEM) formerly known as the California Department of Conservation's Division of Oil, Gas and Geothermal Resources (DOGGR), the South Coast Air Quality Management District (SCAQMD), and Los Angeles Regional Water Quality Control Board (LARWQCB) have volunteered to assist the County in this effort.

1.5.8 Strike Team Advisory Panel

The Advisory Panel consists of five members. Each member was appointed by a Board District Office. The Advisory Panel members are issue area experts in oil and gas, environmental, and/or health issues. The Advisory Panel's role in the Project is to review, comment, and provide written input on the Project reports. The Advisory Panel consists of the following members listed below.

- Julia May (1st District)
- Formerly, Andrew Weissman (2nd District)
- As of June 2021, John Fleming (2nd District)
- Tim O'Connor (3rd District)
- Matt Rezvani (4th District)
- R. Rex Parris (5th District)

2.0 Progress Update

This report is the fifth and final report for the Strike Team Phase II effort; this section provides a summary of the Project activities completed through September 2021. Tasks completed include expanded and updated analysis for the following:

- Three Project Staff meetings;
- Coordination and correspondence with CalGEM (formerly DOGGR) on data request on orphan and abandoned wells;
- Review of the CalGEM WellSTAR database for orphan, abandoned, and idle wells;
- Update of unincorporated County orphan and abandoned well database and associated mapping;
- Development of an idle well data base and associated mapping;
- Coordination and correspondence with the Office of the State Fire Marshall on data request for pipeline mapping, pipeline operator data submittal forms (PSD-101) and pipeline inspection data;
- Review of Pipeline and Hazardous Materials Safety Administration National Pipeline Mapping System (NPMS) database;
- Development of unincorporated County pipeline (NPMS) database and associated mapping;
- Continued review of sources of data for oil and gas storage facilities;
- Review of South Coast Air Quality Management District (SCAQMD) Rule 1148.2 database for oil and gas drilling, well completion, and well rework chemical use;
- Refinement of the risk prioritization method for abandoned wells;
- Detailed mapping of abandoned wells;
- Updating the abandoned and idle well site inspection checklist;
- Continued review of an additional sets of California State Fire Marshal (CSFM) PSD-101 Pipeline Operator Annual reports;
- Continued review and update of the EPA Toxic Release Inventory data base on chemical use;
- Continued review of the California Environmental Reporting System (CERS) data base on chemical use;
- Development of a risk prioritization method for idle wells;
- Mapping of the high priority idle wells;
- Development of a risk prioritization method for pipelines;
- Update through June 2021 of the South Coast Air Quality Management District (SCAQMD) Rule 1148.2 database for oil and gas drilling, well completion, and well rework chemical use;
- Addition of case studies of select recent well and pipeline incidents;
- Addition of a discussion on the underground gas storage facilities;
- Field inspection of abandoned and idle wells; and
- Development of findings and recommendations for this final report.

2.1 Chronology of Project Meetings

2.1.1 Project Staff Meetings

Five Project Staff meetings have occurred with the first, the initial kick off meeting for the Project Staff, occurring on Thursday October 25, 2018. The meetings are attended by representatives from DRP, DPH, DPW, Fire, CalGEM, and RWQCB. Staff from MRS Environmental also attended. The meetings are summarized below.

- Project Staff Kick Off Meeting - October 25, 2018.
    - Introduction of Project Staff – Staff from each participating County agency, CalGEM and MRS Environmental were introduced, and contact information was distributed.
    - Purpose of the Project – The Board motion was discussed along with primary Project tasks.
    - Timeline for first report – The first report would be issued as a draft in March 2019.
    - Roles and responsibilities and regulatory authority – Project goals and agency responsibilities were discussed with each department or agency providing input on the process.
- Project Staff Meeting Report 1 - March 11, 2019
    - Project Staff met to review and comment on the first draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB. Comments were received from DPH.
- Project Staff Meeting Report 2 – September 17, 2019.
    - Project Staff met to review and comment on the second draft report. The meeting was attended by staff from DRP, DPH, DPW, Fire, and RWQCB. Comments were received from DPH.
- Project Staff Meeting Report 3 – March 11, 2020.
    - Project Staff met to review and comment on the third draft report. Comments were received from DRP, DPH, DPW, and CalGEM.
- Project Staff Meeting Report 4 – March 3, 2021.
    - Project Staff met to review and comment on the fourth draft report. Comments were received from DRP, DPH, Fire, and SCAQMD.

2.1.2 Strike Team Meetings

The Strike Team met on March 21, 2019, at the Regional Planning Commission (RPC) Hearing Room where the DRP and MRS Environmental provided a presentation to the Strike Team on the findings of the first report. Subsequently, members of the Strike Team asked questions on the Strike Team efforts and findings and provided comments on the Report. The DPH provided comments on the need to ensure that wells near people are assigned a higher ranking in the

prioritization process to identify those abandoned wells with the potential to leak and impact the public health and safety of nearby communities. No public comments were provided at the meeting.

The second report was discussed by the Strike Team at a meeting held on September 24, 2019, at the RPC Hearing Room. No public comments were provided at the meeting.

The Strike Team met on June 1, 2020, originally scheduled for March 25, 2020 and postponed due to COVID-19, virtually via a Zoom meeting to discuss the third report. No public comments were received at the meeting. The Strike Team was also scheduled to meet September 2020, however, that meeting was cancelled due to COVID-19.

The Strike Team discussed the fourth report on March 24, 2021, with a virtual Zoom meeting. No public comments were received at the meeting.

The final report was discussed in a joint meeting of the Strike Team and the Advisory Panel on September 15, 2021.

2.1.3 Strike Team Advisory Panel Meetings

The Strike Team Advisory Panel met on April 22, 2019 with Advisory Panel members Timothy O'Connor and Matt Rezvani in attendance and Julia May via teleconference. The first report was discussed, and Advisory Panel comments were submitted to the Board on April 25, 2019.

The Advisory Panel discussed the second report at an October 21, 2019 meeting. Advisory Panel members Timothy O'Connor and Matt Rezvani attended with Julia May participating via teleconference. The Panel discussed and provided comments on the second report, those comments were subsequently forwarded to the Board.

The third report was discussed by the Advisory Panel in a virtual Zoom meeting dated June 30, 2020. The Panel, with members Andrew Weissman, Matt Rezvani, and Tim O'Conner attending, discussed the report but did not provide any comments. The October 2020 Advisory Panel meeting was cancelled due to COVID-19.

The Advisory Panel discussed the fourth report in a virtual Zoom meeting on April 20, 2021. Panel members Matt Rezvani, Tim O'Conner and Julia May attended with comments provided by Julia May.

3.0 Orphan and Abandoned Wells

Project Staff has continued coordination and correspondence with CalGEM on orphan and abandoned wells, provided review and input regarding the re-abandonment of Well DOW RGC-10, and developed a database of orphan and abandoned wells in the unincorporated County. Discussion on the status of this effort is provided in the following sections.

3.1 CalGEM Data Request

Staff from CalGEM (formerly DOGGR) attended the Kickoff meeting on October 25, 2018 and provided Project Staff with an overview to the WellSTAR project which updates and revises the WellFinder database, and input on CalGEM recent efforts on idle and abandoned wells. CalGEM's expertise and data are key components to the orphan and abandon well issue. Project Staff correspondence with CalGEM for additional input is listed below.

- 9/19/2018 – Project Staff correspondence including meeting request sent to CalGEM.
- 12/11/2018 – Project Staff correspondence and including meeting request sent to CalGEM.
- 1/14/2019 – Project Staff meeting request sent to CalGEM.
- 1/15/19 –Response received from CalGEM detailing CalGEM Central and Southern Section coordination efforts on Project Staff request.
- 5/8/19 – Project staff met with CalGEM via teleconference on the WellSTAR database status and abandoned well issues.
- 5/24/19 - CalGEM provided the County with additional information covering the following requests:
    - An excel spreadsheet containing updated well list for Los Angeles County. A data column with abandonment dates for wells that have been plugged and abandoned will be provided separately.
    - An excel spreadsheet containing the orphan well list for Los Angeles County as of May 23, 2019. Currently there are no "declared" orphan wells within Los Angeles County. However, CalGEM is currently evaluating approximately 1,272 potential orphan/deserted wells within the County.
    - An excel spreadsheet listing the LA County wells abandoned by the State.
- On July 2, 2019, CalGEM provided DRP with an excel spreadsheet with water level data from idle wells within the Los Angeles County.
- February 20, 2020, CalGEM provided a response to a PRA for information on the 128 high priority wells including historical documents and plugging and abandonment information.

3.2 CalGEM Database and Abandoned Well Preliminary Prioritization

The CalGEM database of wells as provided by CalGEM in May 2019 was utilized to develop a prioritization scheme based on several different criteria. The prioritization scheme is utilized to identify those abandoned wells that are most likely to leak and, if they do leak, of impacting the public health and safety of nearby communities. This prioritization scheme was consulted with and ratified by CalGEM on a call conducted April 7, 2020 with CalGEM, DRP and MRS Environmental. The CalGEM data base is available to the public via the Well Finder online mapping application.

For many older wells the exact location of abandoned wells is only an estimate in the CalGEM database as illustrated by the Marina del Rey incident well location which was not found at the database location but was offset by 70-80 feet from the database location. However, the approximate location of the abandoned wells and other information in the CalGEM database such as the well location relative to other active wells and information on the field in which the wells are located allows for a prioritization scheme to be developed. In addition, the approximate location of the well along with the population density as estimated by historical census data allows for an understanding of potential impact if a well leaks or blowouts relative to populations.

The abandoned wells were prioritized based on their potential impact to public health and safety related to the potential for leakage of gas or other hazardous substances to the surface. Wells were prioritized based on the following characteristics:

- Well status (plugged or unknown);
- Well location and census block population density;
- Historical well type;
- Well location within 500 feet of an active injector well;
- Age of well by spud date (date on which well drilling commenced);
- Well located in an oil and gas field by field age;
- Reservoir characteristics;
- The location of the well relative to the Cal EnviroScreen 3.0 analysis; and
- The location of the well relative to the Los Angeles County methane zones and proximity to landfill methane areas.

Each of these along with the prioritization method are discussed below.

3.2.1 Well Status

Figure 3-1 shows the location of all plugged and abandoned wells in the unincorporated areas of the County of Los Angeles as of the May 2019 CalGEM database. The CalGEM database includes 4,443 total wells in the unincorporated areas, with the characteristics shown in Table 3.1.

Table 3.1 Wells in the Los Angeles County Unincorporated Area

Category	Number
Active wells[1]	1,046
Canceled wells (well application cancelled)[2]	18
Idle wells[3]	637
Permitted (recent or currently being drilled)[4]	5
Plugged & Abandoned wells[5]	2,731
Unknown wells (not classified by CalGEM)[6]	6
Total wells	**4,443**

Source: CalGEM May 2019.

1. Active wells are well that are currently producing oil and/or gas.
2. Cancelled wells are wells that were planned to be drilled and received permits but were not drilled.
3. Idle wells defined by CalGEM as a well that has not been used for two years or more and has not yet been "plugged and abandoned" per CalGEM requirements. This could include an idle well that is actively managed as part of an Idle Well Management Program, or an idle well that is buried and no longer accessible or maintained.
4. New wells are wells that are recent or are currently being drilled and are currently only located at Sentinel Peak Resources Inglewood and at Matrix Sansinena oil fields.
5. Plugged and abandoned wells are wells that have undergone a plugging and abandonment procedure according to CalGEM procedures at the time of the plugging and abandonment.
6. Unknown wells are wells whose status is not known and are currently only located at Sentinel Peak Resources Inglewood and at Browning-Ferris Industries of California, Inc.

Note: an orphan well is a well that has no party responsible for it, leaving the State to plug it if needed.

3.2.2 Abandoned Well Location and Census Block Population Density

Well locations were overlaid with the census data by census block to identify wells that are located near high density areas. The focus of this effort is on the possible effects on human populations and not on other possible environmental degradation (e.g., Significant Ecological Areas). Wells that are in low population density areas do not provide as high a priority since a leak would have a lower probability of impacting the public. Many abandoned wells are in sparsely populated areas and those wells are not as high a priority as the abandoned wells located in more densely populated areas. Figure 3-2 shows the location of the abandoned wells relative to the census population density. Table 3.2 shows the number of abandoned wells by location relative to the census population density.

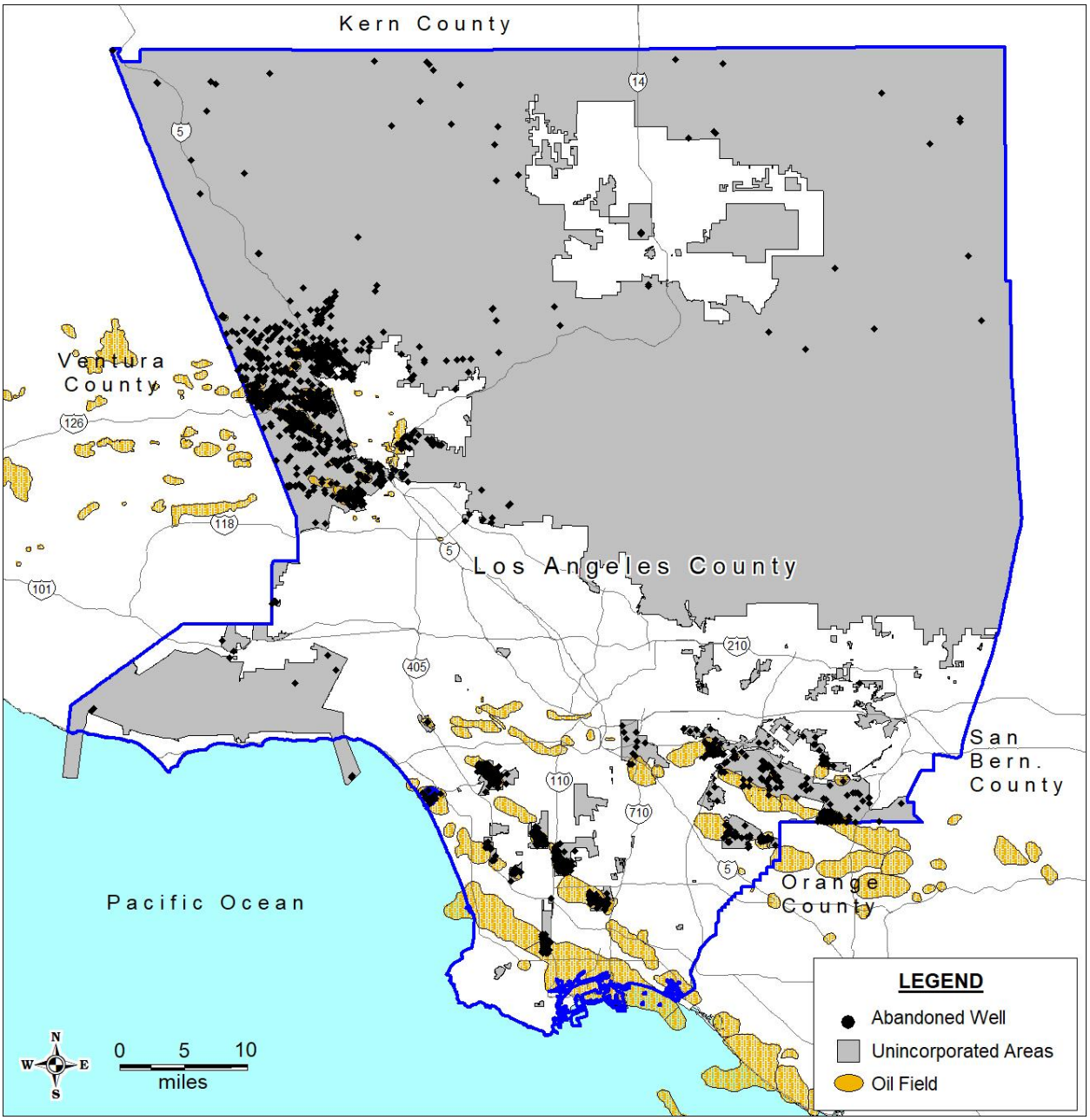
Table 3.2 Abandoned Wells by Population Density

Population Density	Number	Number Percent	Cumulative*	Cumulative Percent*
Between zero and 900 persons per square mile	2163	79%	2731	100%
Between 900 and 4,699 persons per square mile	285	10%	568	21%
Between 4,700 and 8,899 persons per square mile	110	4%	283	10%
Between 8,900 and 13,099 persons per square mile	99	4%	173	6%
More than 13,099 persons per square mile	74	3%	74	3%

Source: CalGEM May 2019.

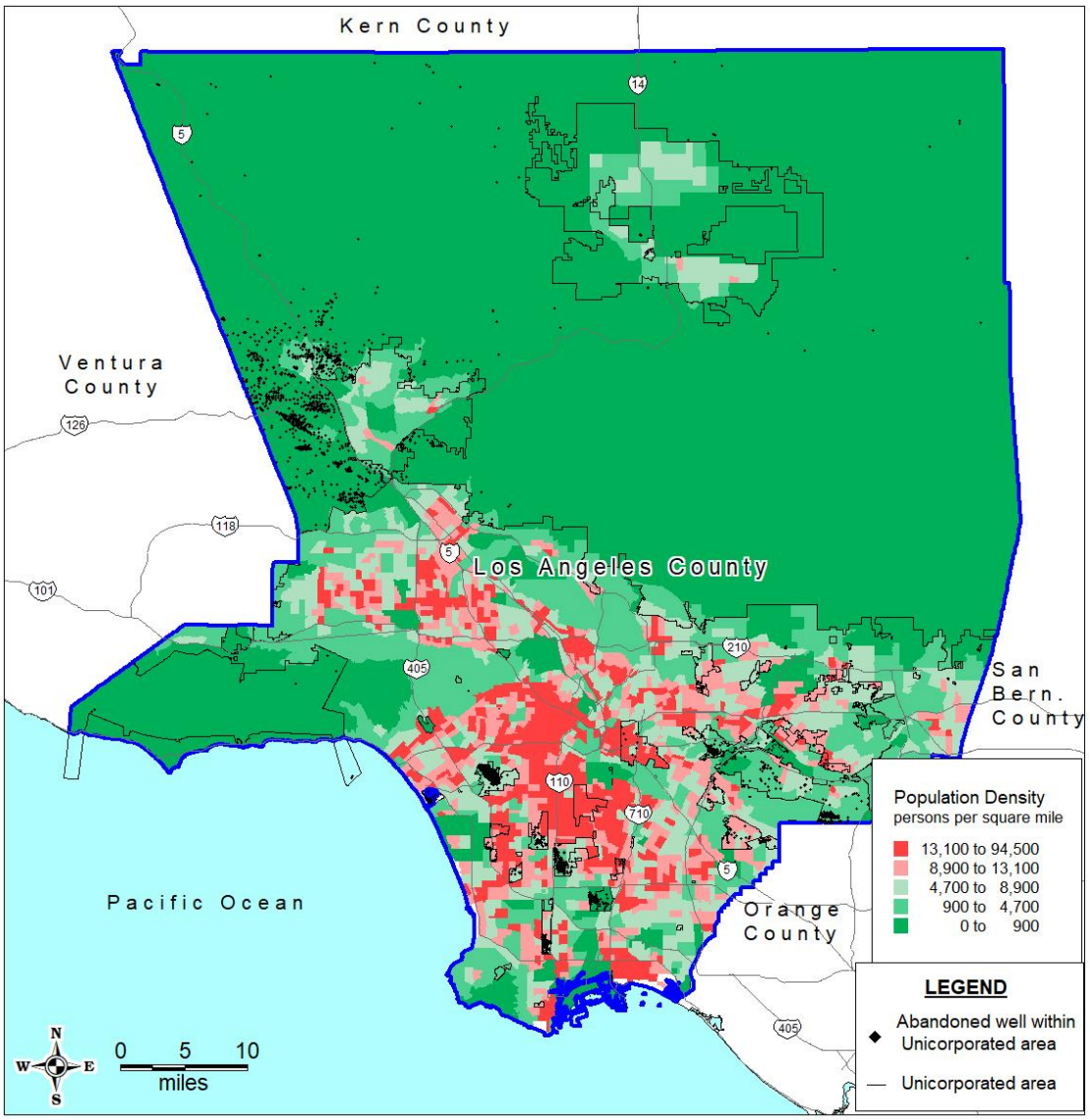
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-1 Plugged, Abandoned and Unknown Wells



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-2 Abandoned Wells and Census Block Population Density



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.3 Abandoned Well Type

Wells are classified by the type of well including oil and gas, gas storage, water source, etc. Wells that resulted in dry holes, for example, would present a lower priority than wells that were historically used for oil and gas production or multiple uses, although dry-hole wells could still present a risk if gas was encountered during the drilling process. A dry hole is commonly defined

as a well that is drilled but does not produce enough oil or gas to be a commercial success. Table 3.3 shows the number of abandoned wells by type in the unincorporated areas.

Table 3.3 Abandoned Wells by Type

Well Type	Number	Percent
Core Hole	9	0.3%
Dry Hole	636	23.3%
Gas	5	0.2%
Gas Storage	27	1.0%
Injection	157	5.7%
Multiple use	101	3.7%
Oil and Gas	1,793	65.7%
Water Source	3	0.1%
TOTAL	2,731	100 %

Source: CalGEM May 2019.

3.2.4 Well Location and Active Injector Well

The abandoned well location in relation to active injector wells gives rise to the potential for leakage from a well due to the increased reservoir pressures near the injection wells. Figure 3-3 shows the location of abandoned wells that are located within 500 feet of an active injection well and located within the unincorporated parts of the County. About 354 plugged and abandoned wells are located within 500 feet of an active injector well.

3.2.5 Well Age by Spud Date

Older wells increase the likelihood that abandonment was not performed to as high a standard as the current requirements. Although the date the well was started is not the same as the date the well was abandoned, it does provide some indication of the potential for lower quality abandonments which would increase the probability of the well leaking and affecting public health. Information on the abandonment date of the wells is not located in the CalGEM database and is an issue that is incorporated once the wells are initially prioritized, which then involved the review of historical paper files associated with each high priority well. Information initially obtained from CalGEM only listed wells that have been abandoned since 2004 and does not include wells that were abandoned before that date.

The CalGEM database only lists the spud date (e.g., the date drilling was started) for a limited number of wells. For abandoned wells only about 8 percent have spud date information in the CalGEM database for wells located in the unincorporated areas. These wells, as a function of age, are shown in Figure 3-4 and listed in Table 3.4.

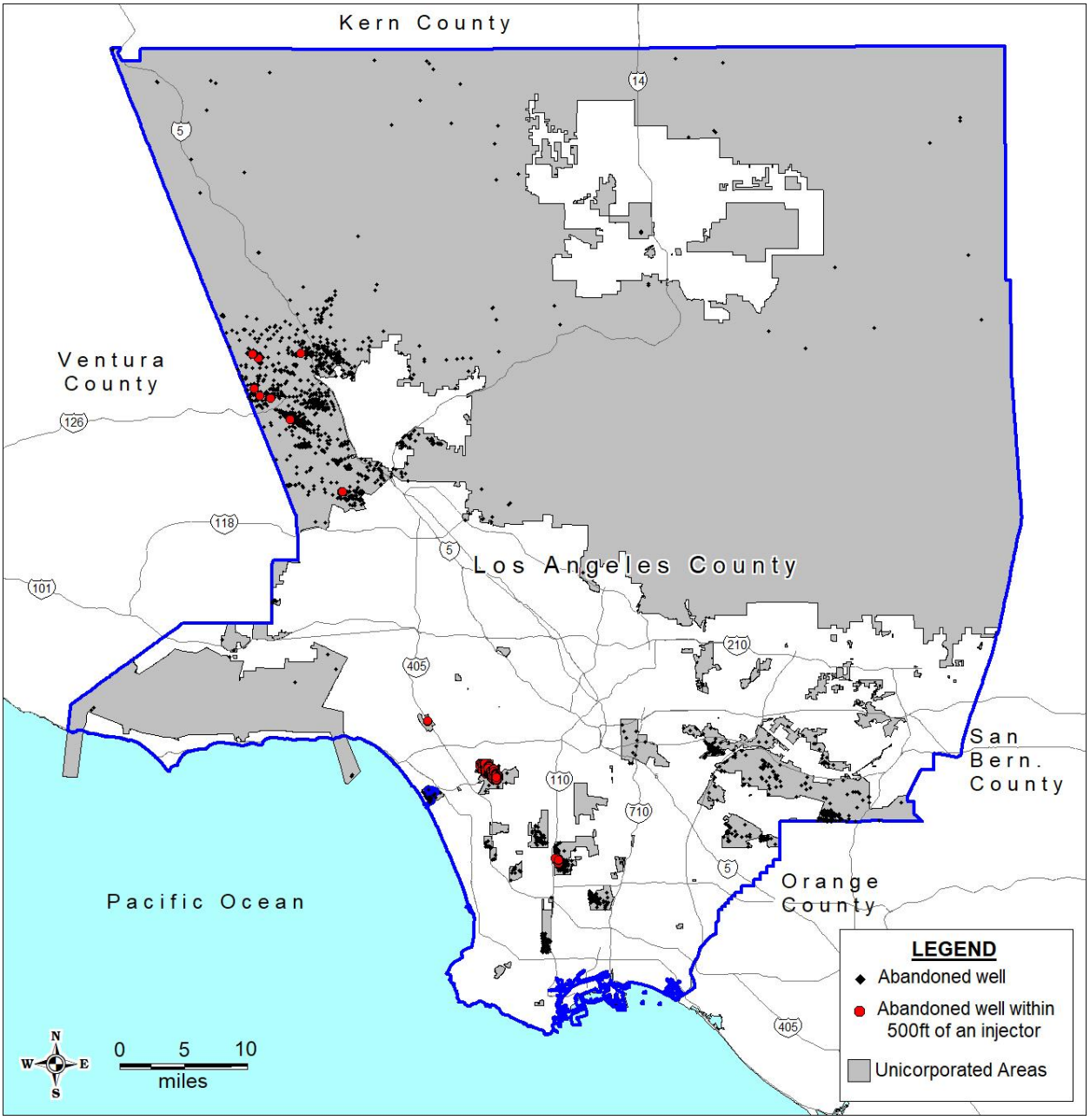
Table 3.4 Abandoned Wells by Spud Date Age

Well Spud Date Age, Years	Number	Percentage of Total	Cumulative*	Cumulative Percent*
Between zero and 25 years	6	3%	225	100%
Between 25 and 34 Years	8	4%	218	97%
Between 35 and 44 Years	19	8%	210	93%
Between 45 and 54 Years	8	4%	191	85%
Between 55 and 64 Years	32	14%	183	81%
Between 65 and 74 Years	105	47%	151	67%
Between 75 and 84 Years	36	16%	46	20%
More than 85 Years	5	2%	10	4%

Source: CalGEM May 2019.

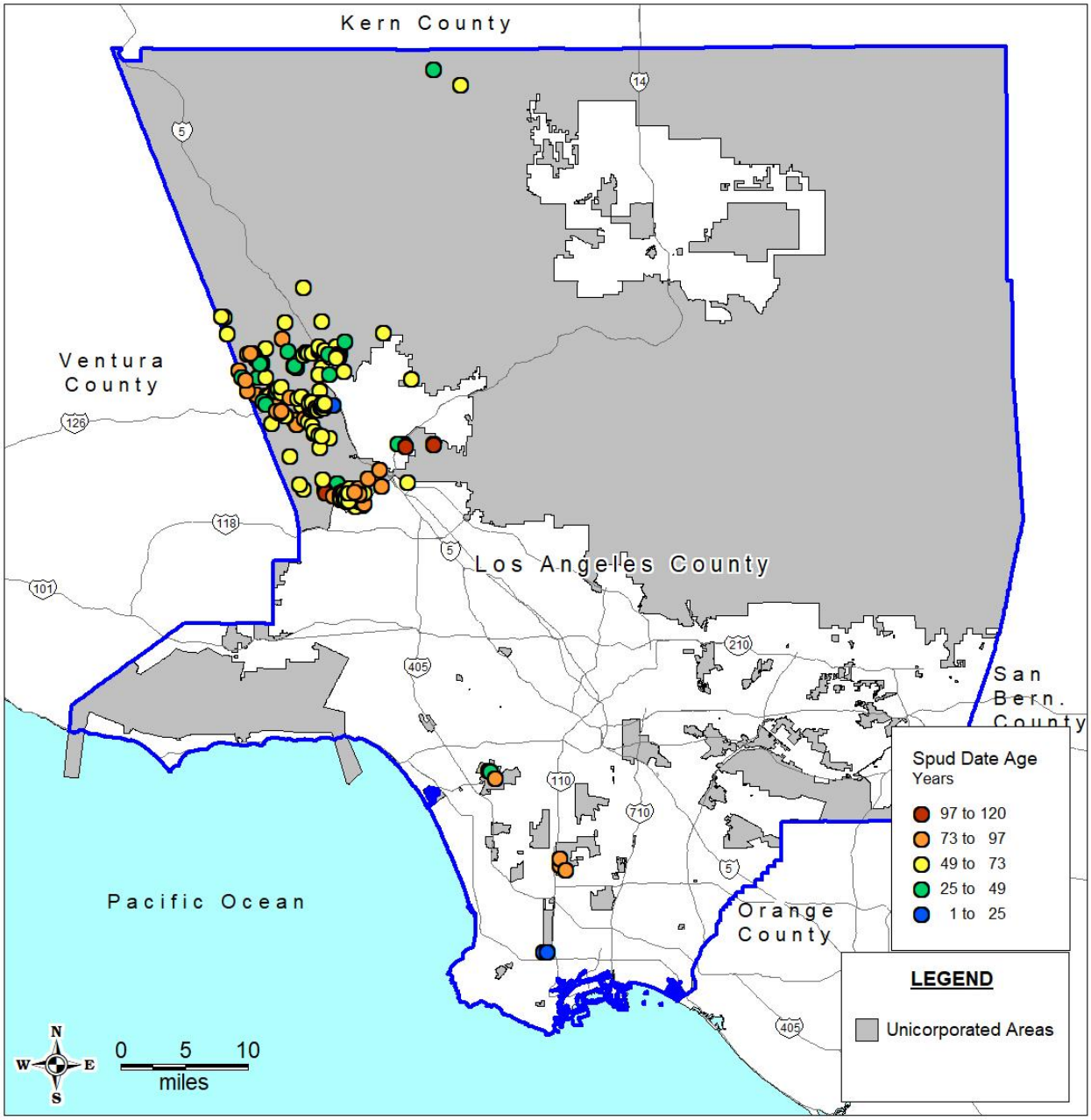
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-3 Wells Located within 500 feet of an Active Injector Well



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Figure 3-4 Wells by Years from Spud Date



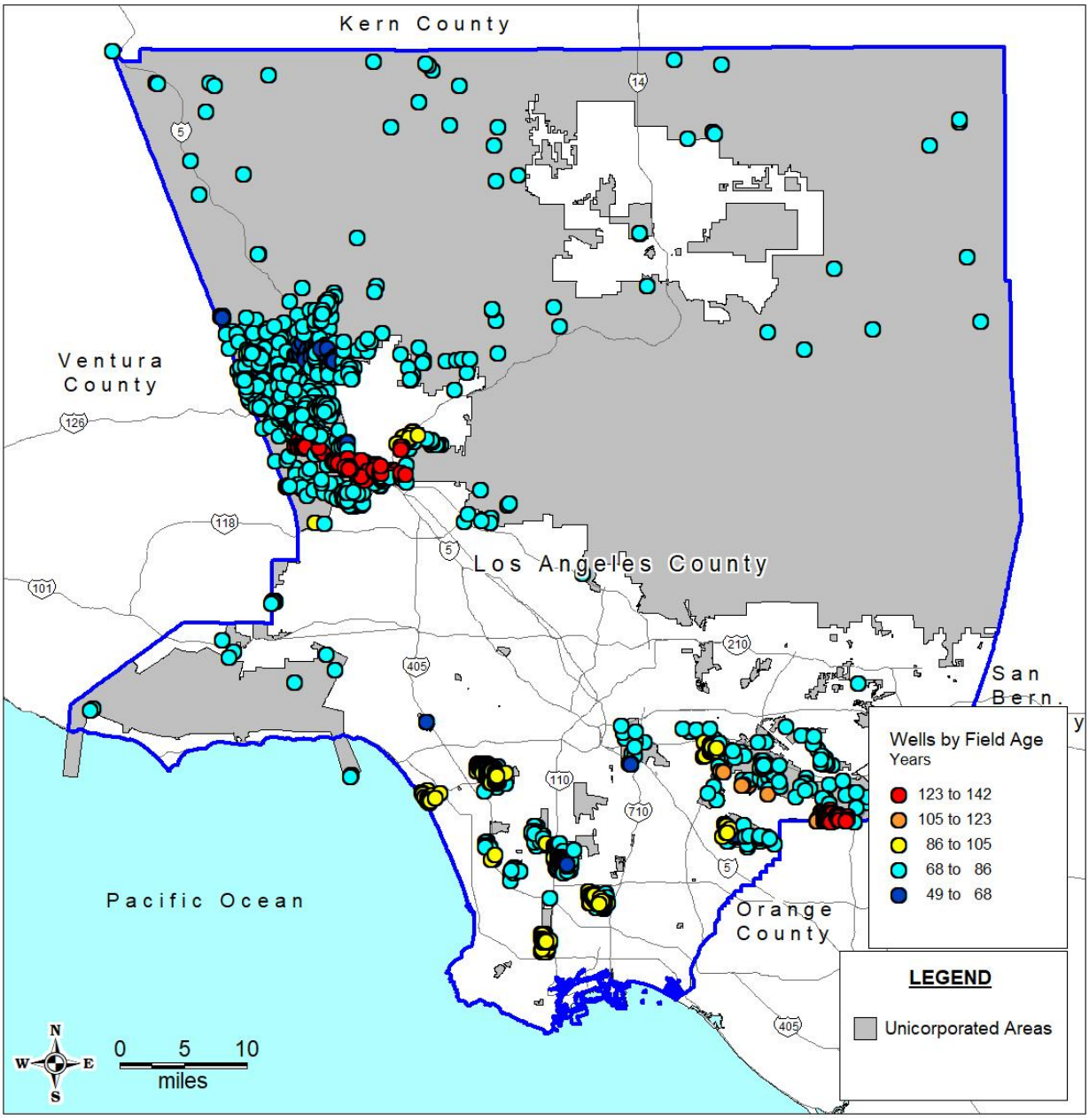
Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.6 Abandoned Wells by Field Age

There are 46 oil fields located in the unincorporated area of Los Angeles County with the earliest field discovered in 1876 (CalGEM Oil and Gas Fields Volume 2). Fields are shown in Figure 3-5 and listed in Appendix D.

Abandoned wells located in older fields may have a higher probability of having older abandonment dates. As mentioned above, the CalGEM database does not have abandonment date, and this is an issue that was researched further after the prioritizations was applied (see section below). Field age is based on the oldest discovery date for all the reservoir pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Figure 3-6 and Table 3.5 show the wells by field age with each map dot representing one well and the age of the field in which the well is located.

Figure 3-5 Wells by Field Age



Source: CalGEM May 2019.NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

Table 3.5 Wells by Field Age

Well Field Age, Years	Number	Percent of Total	Cumulative*	Cumulative Percent*
After 1969 (0 - 50 years)	5	0.2%	2731	100.0%
Prior to 1969 (51- 75 years)	393	14.4%	2726	99.8%
Prior to 1944 (76 - 100 years)	1846	67.6%	2333	85.4%
Prior to 1919 (101-124 years)	133	4.9%	487	17.8%
Prior to 1894 (more than 125 years)	354	13.0%	354	13.0%

Source: CalGEM May 2019.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

3.2.7 Abandoned Wells by Reservoir Characteristics

The fields in which the wells are located were ranked by several different characteristics that could contribute to increased risk of abandoned well leakage. Field information was developed from pools identified in the CalGEM California Oil and Gas Fields Volume II (CalGEM 1991). Issues that could contribute to increased risk of well leakage would include the following:

- High Gas Oil Ratio (GOR);
- Older Fields;
- Shallow reservoirs;
- High API gravity of the produced oil;
- High sulfur content of the crude oil; and
- High pressure gradients (psi per linear foot of well depth).

Each of these field characteristics were assigned points from zero to two based on the scoring matrix shown in Table 3.6. Fields were then ranked based on the sum total of the scores with a maximum ranking of 12 points. Fields with a higher rank score may have a higher probability of having abandoned wells that produce greater well leakage risk.

Table 3.6 Field Rank Scoring Matrix

Field Score			
Characteristic	**Score of 0 points**	**Score of 1 point**	**Score of 2 points**
GOR	Less than 100	Between 100-1000	Greater than 1000
Initial Production Date	After 1950	1930 - 1950	Before 1930
Depth	Greater than 5000 ft	Between 1000 - 5000 ft	Less than 1000 ft
API[1]	Less than 20	Between 20 - 30	Greater than 30
Sulfur/H_2S[2]	Less than 0.5 %	Between 0.5 - 1.5 %	Greater than 1.5
PSI/ft	Less than 1.0 psi/ft	between 1 - 2 psi/ft	Greater than 2.0 psi/ft

Source: CalGEM May 2019.
1 – American Petroleum Institute gravity of oil relative to water, higher numbers are associated with lighter oil.

2 – Only Torrance and Brea-Olinda fields have the potential for H2S, as per CalGEM Publication M10. These two fields were given the highest rating for sulfur. All other fields were based on crude sulfur content which is not necessarily indicative of H_2S levels but may indicate some elevated level of odor or hazard.

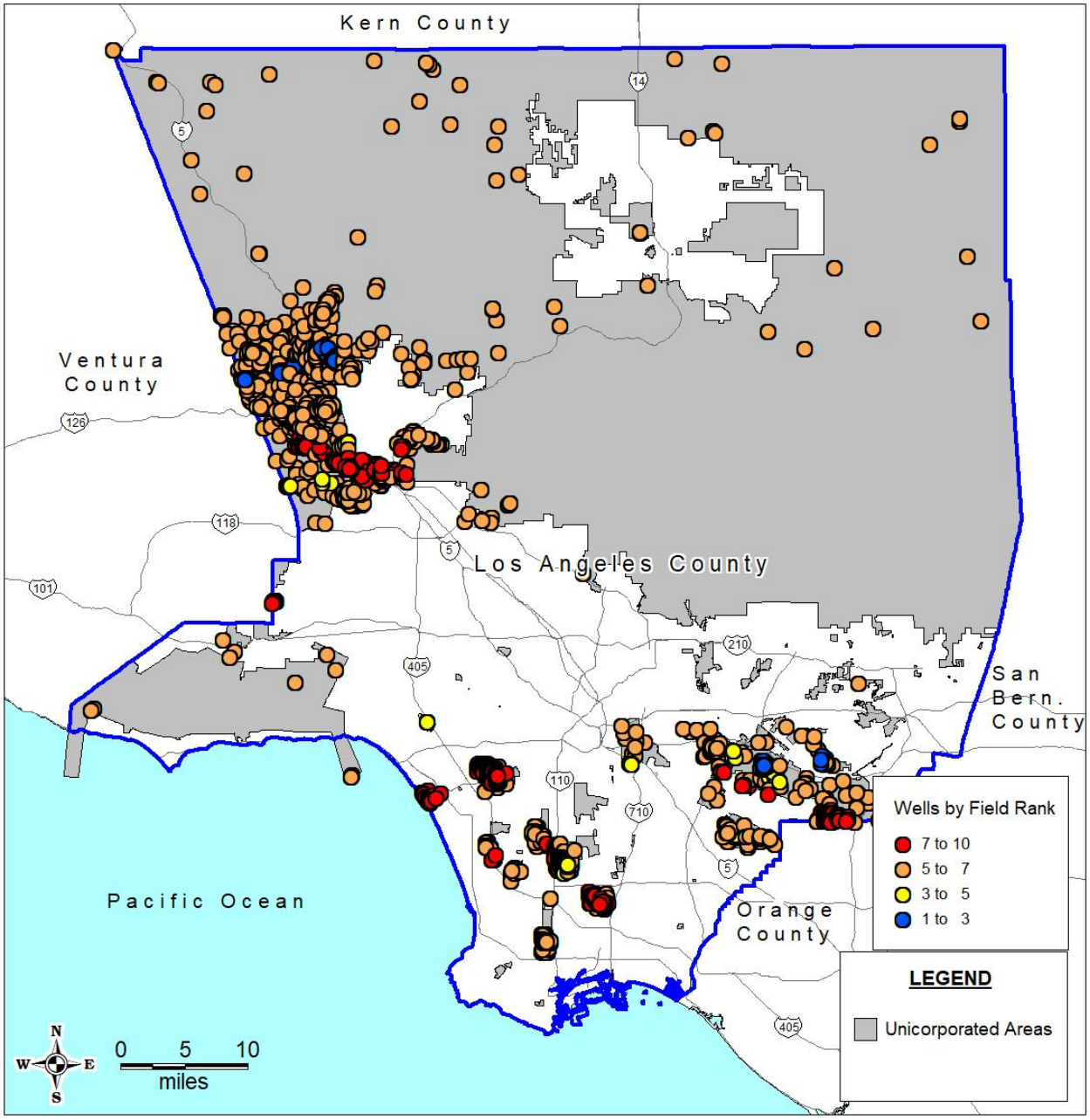
Figure 3-6 and Table 3.7 shows the wells based on the field rankings discussed above. Note that the Marina Del Rey field discussed in Section 3.2 above received a score of seven on the above matrix.

Table 3.7 Wells Based on Field Ranking

Well Field Rank	Number of Abandoned Wells	Percentage	Cumulative*	Cumulative Percent*
1	55	2%	2731	100%
2	52	2%	2676	98%
3	21	1%	2624	96%
4	61	2%	2603	95%
5	704	26%	2542	93%
6	487	18%	1838	67%
7	119	4%	1351	49%
8	278	10%	1232	45%
9	592	22%	954	35%
10	362	13%	362	13%
TOTAL	2,731	100%	-	-

Source: CalGEM May 2019.
Note: Maximum score is 12, no wells ranked scored 11 or 12.
Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-6 Wells by Field Rank



Source: CalGEM May 2019.
NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.2.8 Abandoned Wells by EnviroScreen Score

In January 2017, the Office of Environmental Health Hazard Assessment (OEHHA), on behalf of the California Environmental Protection Agency (CalEPA), released Version 3.0 of the California Communities Environmental Health Screening Tool (CalEnviroScreen). CalEnviroScreen version 3.0 identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. The tool ranks each of the state's 8,000 census tracts using data on 20 indicators of pollution, environmental quality, and socioeconomic and public health conditions. SB 535 requires CalEPA to identify disadvantaged communities based on geographic, socioeconomic, public health and environmental hazard criteria, and the CalEnviroScreen tool is utilized to allow for this requirement. Environmental exposures and effects examined as part of the CalEnviroScreen model include:

- Ozone concentrations in air.
- PM 2.5 concentrations in air.
- Diesel particulate matter emissions.
- Drinking water contaminants.
- Use of certain high-hazard, high volatility pesticides.
- Toxic releases from facilities.
- Traffic density.
- Drinking water quality.
- Cleanup sites.
- Groundwater threats.
- Hazardous and solid waste facilities/generators.
- Impaired water bodies.

Sensitive population and socioeconomic factors addressed include:

- Asthma rates.
- Cardiovascular disease rates.
- Low birth rate frequency.
- Education attainment.
- Housing burden.
- Linguistic isolation.
- Poverty.
- Unemployment.

Plugged and abandoned wells were classified based on the CalEnviroScreen percentile score for each census tract. The results are shown in Table 3.8 and Figure 3-7.

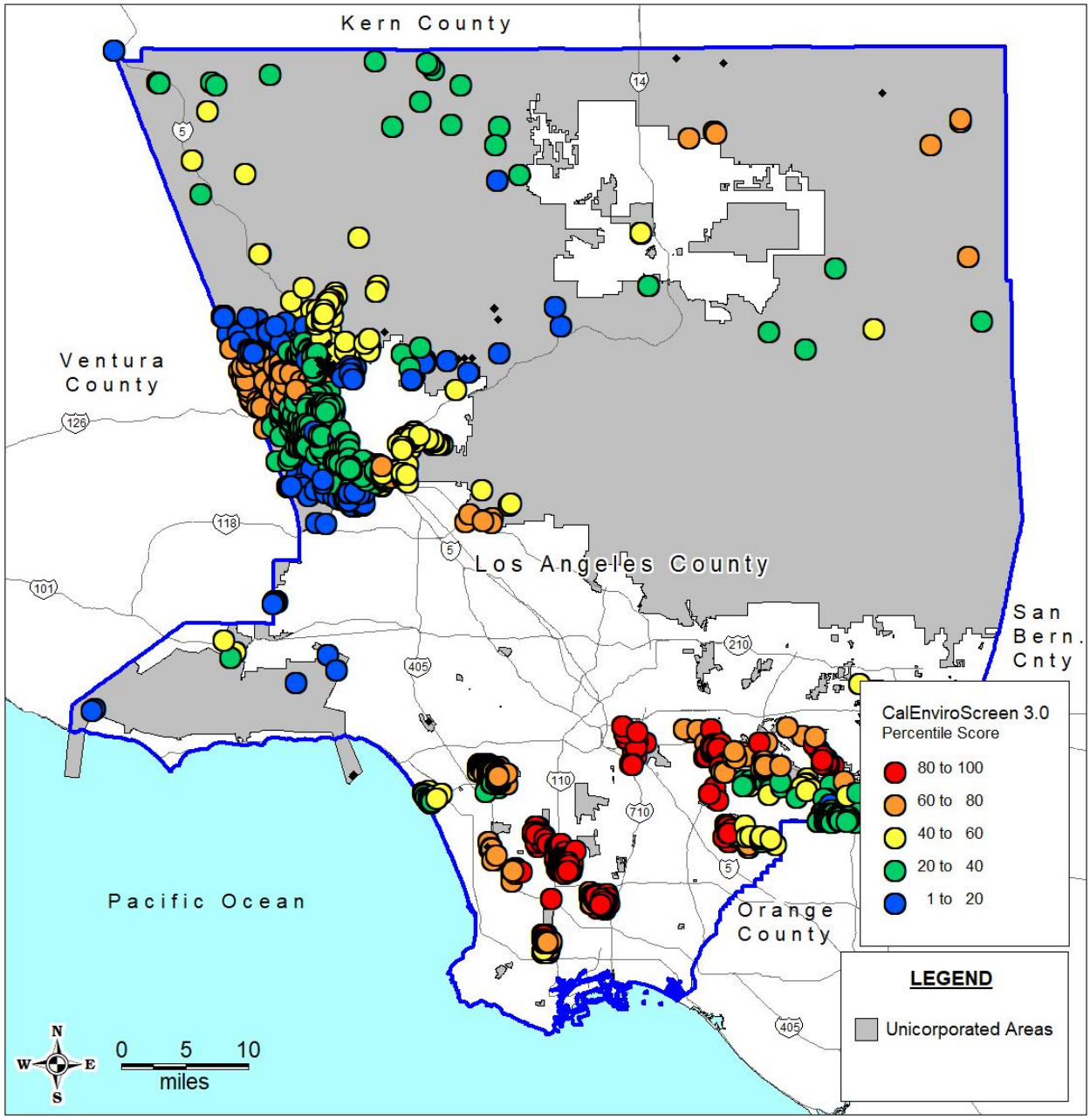
Table 3.8 Wells Based on CalEnviroscreen 3.0 Percentile

CalEnviroscreen 3.0 Percentile	Number	Number Percent	Cumulative*	Cumulative Percent*
More than 90%	345	13%	345	12.6%
Between 81 and 90%	130	5%	475	17.4%
Between 71 and 80%	175	6%	650	23.8%
Between 61 and 70%	614	22%	1264	46.3%
Between 51 and 60%	66	2%	1330	48.7%
Between zero and 50%	1401	51%	2731	100.0%

Source: CalGEM May 2019. CalEPA 2018.

Note: * Data presented to show the total number of wells more than the minimum level in that category: i.e., defines the number of wells that might need to be included in a high priority listing if that minimum threshold were selected. In the cumulative category, the number of wells does not sum to the total well count because some wells are included in multiple categories.

Figure 3-7 Wells by CalEnviroscreen 3.0 Percentile



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3.2.9 Abandoned Wells by Methane Zone

The County of Los Angeles Building Code prohibits the issuance of building permits for new buildings, enclosed structures, additions, or conversions of a building or structure to habitable or occupiable space in the presence of an unmitigated potential gas hazard. Potential gas hazards exist within 1,000 feet of fill sites containing decomposable materials (Building Code Section 110.3),

within 300 feet of nearby oil and gas wells (Building Code Section 110.4), and on contaminated soils (Building Code Section 110.5). Twenty-two plugged and abandoned wells were identified that are within 1,000 feet of a designated methane zone.

3.2.10 Abandoned Wells Prioritization

A prioritization scheme was developed based on the above factors to prioritize the plugged and abandoned wells for further, more detailed examination. Further examination included review of documents related to abandonment activities, such as blowouts and loss-of-well control history, that required detailed, historical records reviews. See the section below for a summary of the results of this detailed review. As the review of detailed records is time consuming, the prioritization scheme is used to filter the thousands of wells in the CalGEM database to those of the highest priority to conduct a detailed document review and in-field testing and examinations.

The prioritization scheme goal is to identify those wells that have the highest probability of leaking to the surface and combine that with the potential for impacts to the community. This is a similar approach used to develop the Enviroscreen scores by OEHHA. Although a well might have a high potential for leakage, if it is in an area designated by census data as having very low or no populations, then it would not be classified as a high priority well. Table 3.9 shows the prioritization scheme.

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
Location Near injectors	0 - 5 points	0 points not near an injector 5 points if near an injector
Spud Data age	0 - 5 points	Less than 45 years old = 0 points 45 – 55 years = 1 point 55 – 65 years = 2 points 65 – 75 years = 3 points 75 – 85 years = 4 points > 85 years = 5 points No data= 3 points
Field Ranking	0 - 10 points	Field ranking of zero = zero points Field ranking = points Field ranking of 10 or more = 10 points
Methane zone	0 - 5 points	Not near a methane zone = zero points Near a methane zone = 5 points
Enviroscore	0 - 5 points	Below 50% = zero points 50 – 60% = 1 point 60 – 70% = 2 points 70 – 80% = 3 points 80 – 100% = 4 points Score of 100 = 5 points

Table 3.9 Well Prioritization Scheme

Factor	Ranking Score	Score Distribution
Census data	0-10 points	0 population = zero points Units in persons per square mile 0 – 2,000 = 1 point 2,000 – 4,000 = 2 points 4,000 – 6,000 = 3 points 6,000 – 8,000 = 4 points 8,000 - 10,000 = 5 points 10,000 – 12,000= 6 points 12,000 – 14,000 = 7 points 14,000 – 16,000 = 8 points 16,000 – 18,000 = 9 points More than 18,000 = 10 points

Source: CalGEM May 2019. CalEPA 2018.

The prioritization scheme is conducted by summing the points associated with factors that could increase the probability for a well to be leaking (location near injectors, spud date age, field ranking and methane zone) and then multiply that score by the sum of the census and the Enviroscreen scores. See Figure 3-8 for a schematic of the approach.

In total, the priority ranking produced scores ranging from zero to 143, with 128 wells ranking a score of above 75 and therefore classifying as a "higher priority well". Figure 3-9 shows the location of the higher priority wells. Note that the higher priority wells are generally located in the southern County areas in the areas with higher population density. Table 3.10 shows the number of higher priority wells by Planning District and by Supervisor District.

Appendix A shows details of the areas with the higher priority wells.

Table 3.10 Ranked Abandoned Wells by Districts

District	Number of Higher Priority Wells (Ranking 75 and above)
Planning District	
Westside Planning Area	19
East San Gabriel Valley Planning Area	8
Metro Planning Area	38
Gateway Planning Area	40
South Bay Planning Area	23
Supervisor District	
District 1	12
District 2	78
District 4	38

Note: Districts not shown have no high-ranking wells.
Note: Planning Districts from LA County General Plan November 2014.

Figure 3-8 Wells Prioritization Schematic

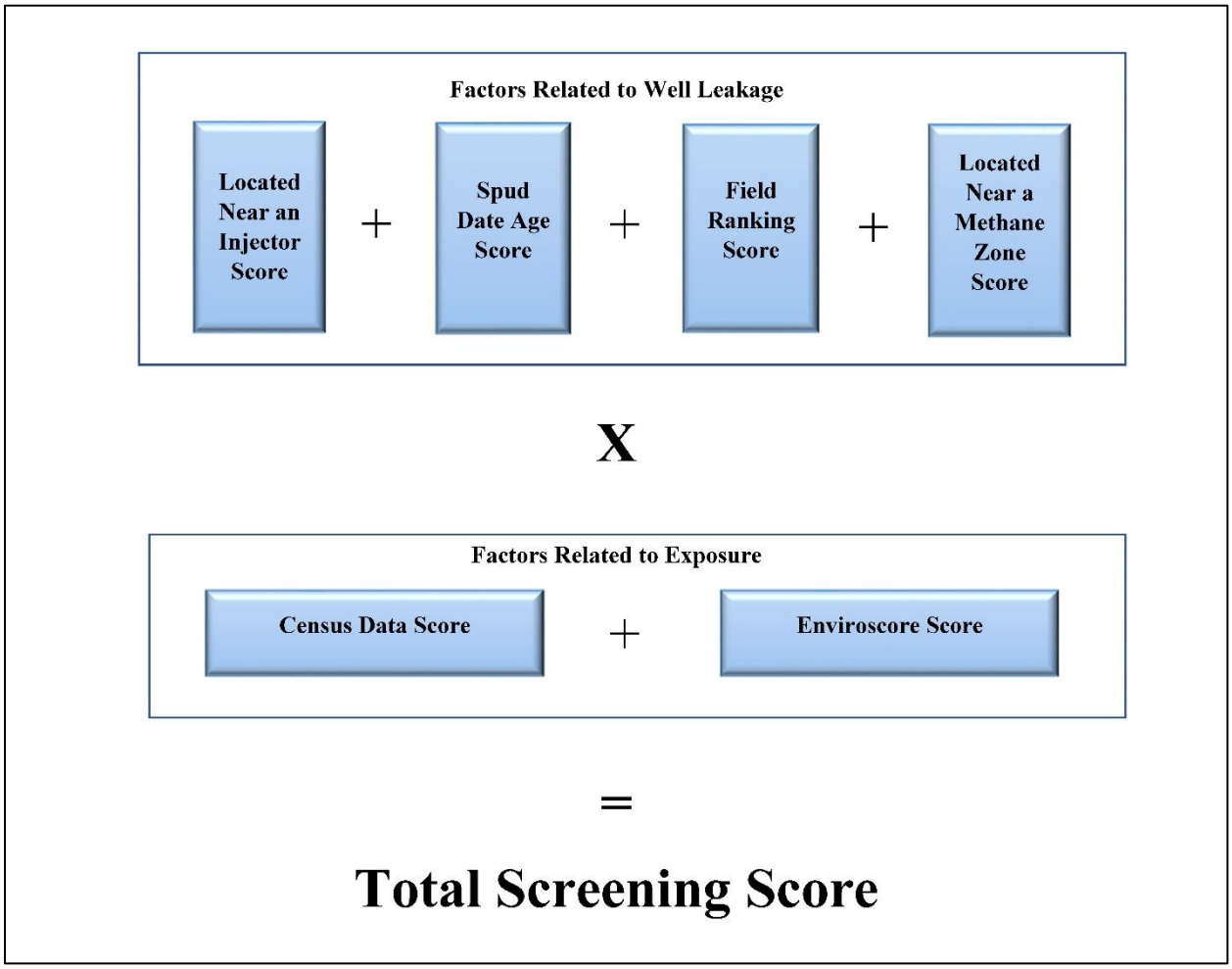
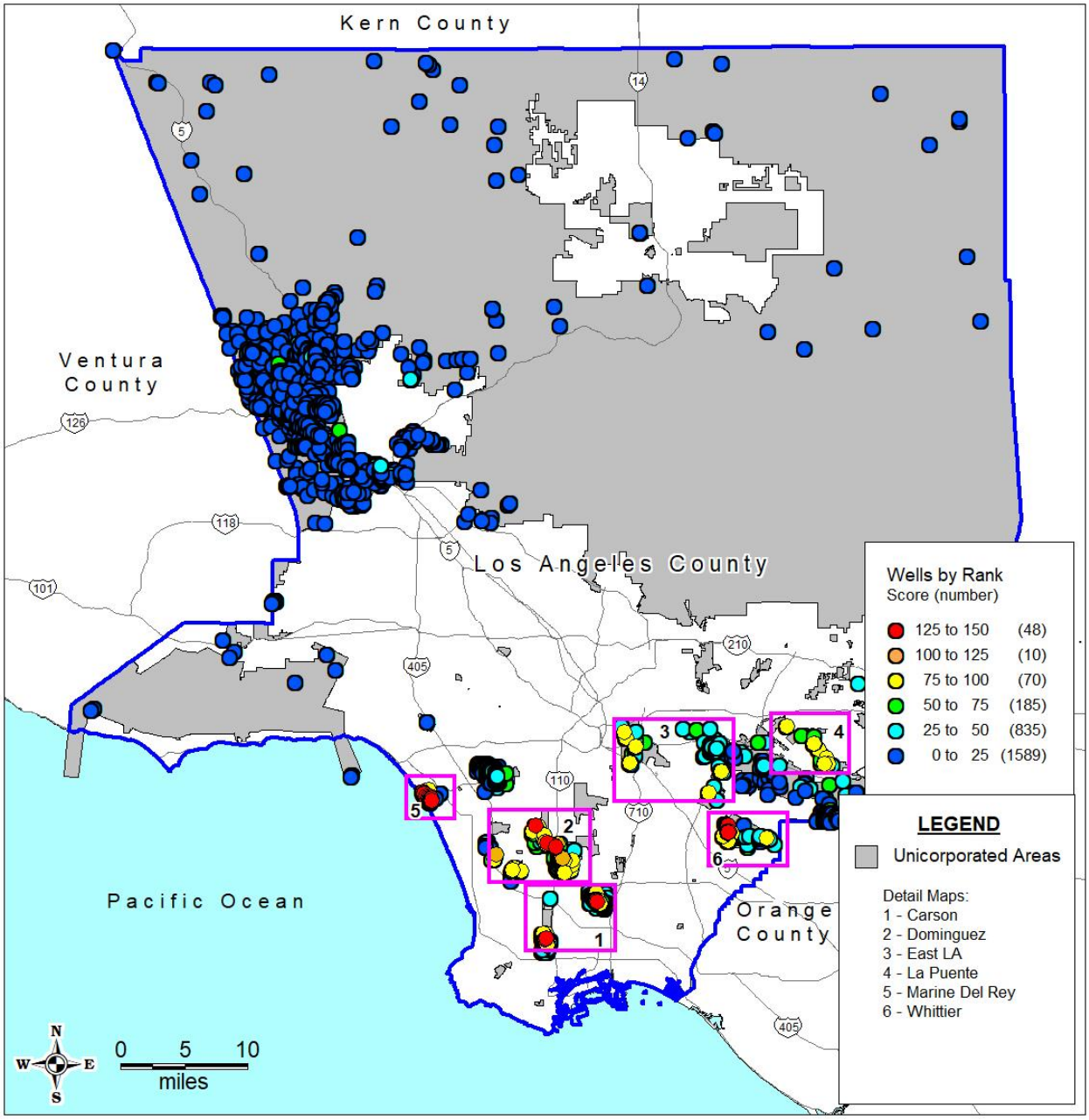


Figure 3-9 Wells by Ranking Score



NOTE: The Inglewood Oil Field is included for reference purposes only and is not a part of the Strike Team effort. For more information on the County's regulatory framework for the Inglewood Oil Field, please visit the website at planning.lacounty.gov/baldwinhills.

3.3 Detailed Review of Higher Priority Wells

The wells designated as higher priority were then reviewed in detail by obtaining the detailed files from CalGEM for each of the higher priority wells and reviewing the well records for the following items:

- Abandonment date.
- Blowouts or loss of well control occurrence.
- Any gas pressure encountered during drilling or gas production.
- Any crude oil encountered during drilling or any crude production history.
- Any gas encounter at depths less than 1,000 feet.
- Any recent leak testing conducted (in the last 20 years).

These factors were utilized to estimate the risks of well leakage of the higher priority wells. The results of this review are shown in the sections below. Note that any well, even a recently abandoned well to the most recent CalGEM standards, can still leak. The purpose of this exercise is to identify those wells that are at the highest risk of leaking - those wells abandoned when standards were lower; those wells that had gas present or caused problems during drilling; and those wells that have not been recently leak tested.

3.3.1 Abandonment Age

All of the well records had information on the abandonment procedures and abandonment date. The oldest well abandonment date was 1917 or over 100 years since abandonment. The years since abandonment are shown in the Table 3.11 below for the higher priority wells.

Table 3.11 Year Since Abandonment

Years since Abandonment	Number of Abandoned Wells
Less than 50 years	37
50 to 75 years	49
75 to 100 years	40
More than 100 years	2

Note: For high priority wells only.

CalGEM requirements related to abandonment have evolved over the years. Generally, wells abandoned prior to 1950s may have required a surface plug (cement poured into the hole) of generally 10 feet in thickness from the surface generally with some installation of cement "plugs" installed across and above the producing reservoir. Wells abandoned between 1950s and 1970s would have required thicker surface plugs, maybe 25 feet. Wells abandoned since the 1980 would have required surface plugs of 25 feet and cement plugs across all oil/gas reservoirs. Current abandonment requirements include 25 feet of a surface plug, cement plugs 100 feet across all producing reservoirs and a 100 to 200-foot cement plug across all groundwater zones and muds placed in all remaining spaces (CCR 1723).

3.3.2 Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, would potentially exhibit a higher potential for leakage as gas located in the reservoir would be required to produce leakage at the surface. A well that did not exhibit any gas flow or pressures could still, subsequent to the well abandonment, become pressurized due to a shift in the formation geology or some other process, but would exhibit a significantly lower potential for gas leakage. Wells with gas history, no gas history, or wells not having any record and are therefore unknown are shown in Table 3.12 (along with other issues discussed below).

Table 3.12 High Priority Well Characteristics

Issue Area		Number of Abandoned Wells
Gas History	With gas history	62
	No gas history	33
	No records of gas history	33
Crude History	With crude history	67
	No crude history	43
	No records of crude history	18
Shallow Gas History	Yes	1
	No	127
Blowout History	Yes	4
	No	124
Recent Leak Test	Yes	11
	No	117

Note: For higher priority wells only. Note two wells did not have any data.

3.3.3 Crude History

Wells that have a history of producing crude oil or showed periods of time during the well drilling process that crude oil was produced, would potentially exhibit a higher potential for gas also being produced and therefore resulting in leakage of gas in the future. Wells with crude history, wells that have a record of no crude history, and the wells not having any record and are therefore unknown are shown in Table 3.12.

3.3.4 Shallow Gas History

Wells that have a history of producing gas or showed periods of time during the well drilling process that "blew" gas, or flowed gas, as well as having the gas zone be close to the surface, could potentially exhibit a higher potential for leakage as gas would have a shorter distance to reach the surface. Wells with shallow gas history are shown in Table 3.12.

3.3.5 Blowout History

Wells that have a history of producing gas in sufficient quantities from unstable formations to produce a blowout, or an uncontrolled release of the gas to the environment, could potentially exhibit a higher potential for leakage. Wells with blowout history are shown in Table 3.12.

3.3.6 Recent Leak Testing History

Wells that were recently excavated and leak tested and repaired to prevent leakage within the last 20 years, through the requirements associated with development, such as building structures in close proximity, would most likely have a lower propensity for leakage at this time since they were recently tested. It was assumed that all wells that were leak tested, if a leak was found, were repaired as per CalGEM requirements. Wells that were recently leak tested are shown in Table 3.12.

3.3.7 Abandoned Wells Refined Prioritization

Through the examination of the detailed well records from CalGEM for all the higher priority wells, some additional prioritization was developed. This prioritization was based on the propensity for an abandoned well to leak. The date of the abandonment influences the propensity for a well leaking as wells that were abandoned before 1970s would have less stringent abandonment procedures. Wells that exhibited some gas or some gas/oil presence in the reservoir also would have a higher propensity for leakage than a well which had not exhibited any hydrocarbons in the reservoir area during drilling. Wells, even if poorly abandoned, if they have no access to hydrocarbon, would not leak hydrocarbons. This does not mean that wells that exhibited no oil or gas could not change and shift over time as the geology changes, but that they would present a lower likelihood and frequency of leakage.

In addition, wells that exhibited shallow gas presence, meaning that the gas areas of the reservoirs were located close to the surface, could also present a greater propensity for leakage due to the short path lengths needed to reach the surface. And wells that had any history of a blowout would present a higher propensity for leakage due to the higher pressures and unstable nature of the reservoirs.

However, wells that have been recently leak tested (in the last 20 years) were assumed to present a lower risk for leakage.

The higher priority wells were segregated into Priority 1, Priority 2 and Priority 3 categories to define those which should be field-inspected first (Priority 1).

Wells classified as Priority 1 wells would be those wells meeting the following criteria:

- Abandoned more than 50 years ago with both gas and crude oil history.
- Abandoned more than 50 years ago with only gas history (no crude history).
- Any well with shallow gas.
- Any well that had a blowout history.

The wells classified a "Priority 2" including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking of over 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking of over 100.

The wells classified a "Priority 3" including the following:

- Abandoned more than 75 years ago regardless of gas or crude history with a ranking below 100.
- Abandoned more than 50 years ago with unknown gas or crude records with a ranking below 100.

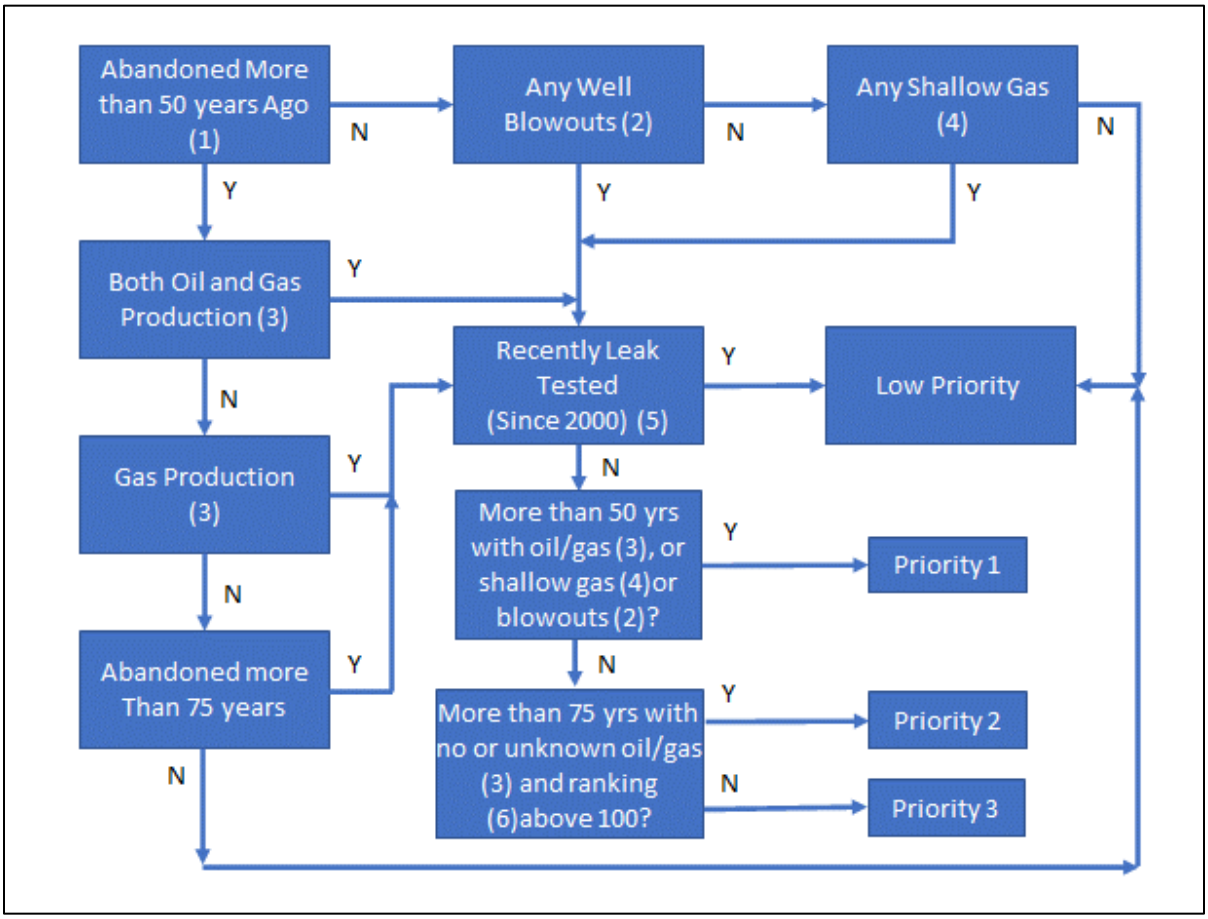
The wells breakdown is shown below. A flow chart of the well priority classification is shown in Figure 3-10.

Table 3.13 Wells Prioritization and Classification

Years	Number of Abandoned Wells	Number Percent	Cumulative	Cumulative Percent
Priority 1 inspection	43	34%	43	34%
Priority 2 inspection	13	10%	56	44%
Priority 3 inspection	25	20%	81	63%
Low priority for inspection	47	37%	128	100%

Note: For high priority wells only

Figure 3-10 Well Inspection Prioritization Flowchart



Notes: numbers correlate with the table below.

Detailed maps of high priority wells and the priority classifications are shown in Attachment D. Table 3.14 lists the highest-ranking wells and their corresponding classifications. A Draft Abandoned Well Inspection Protocol was developed for the field inspections and is included as Appendix E. Appendix F contains the inspection sheets for each well, including all the available historical data from CalGEM, and the mapped locations.

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403723481	6059009024	Howard Townsite	143	26	none	yes	yes	N	N	Low
0403723499	6059009024	Howard Townsite	143	27	none	yes	yes	N	N	Low
0403723558	6059009024	Howard Townsite	143	27	none	yes	no	N	N	Low
0403714401	6089012023	Rosecrans	140	71	none	yes	yes	N	N	Priority 1
0403714457	6132019038	Rosecrans	140	91	none	yes	yes	N	N	Priority 1
0403714461	6132019034	Rosecrans	140	94	none	yes	yes	N	N	Priority 1
0403706750	7318010025	Dominguez	132	94	none	UN	yes	N	N	Priority 1
0403706802	7318010025	Dominguez	132	93	none	yes	yes	N	N	Priority 1

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403706918	7318010025	Dominguez	132	103	none	no	no	N	N	Priority 2
0403707304	7318010025	Dominguez	132	17	none	yes	yes	N	N	Low
0403707306	7318010025	Dominguez	132	19	none	UN	yes	N	Y	Low
0403707547	7318010025	Dominguez	132	66	none	yes	yes	N	N	Priority 1
0403723487	6059009024	Howard Townsite	132	27	none	yes	yes	N	N	Low
0403713797	4224002900	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713798	4224002900	Playa Del Rey	130	2	Yes	yes	no	N	N	Low
0403713802	4224005910	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713805	4224005903	Playa Del Rey	130	9	none	yes	yes	N	N	Low
0403713806	4224005903	Playa Del Rey	130	9	none	UN	yes	N	N	Low
0403713807	4224001904	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713808	4224001904	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713809	4224002900	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713810	4224002900	Playa Del Rey	130	61	none	UN	yes	N	N	Priority 2
0403713811	4224002900	Playa Del Rey	130	61	none	yes	yes	N	Y	Low
0403713812	4224002900	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 1
0403713813	4224002900	Playa Del Rey	130	61	none	UN	yes	N	N	Priority 2
0403713815	4224002900	Playa Del Rey	130	61	none	UN	UN	N	N	Priority 2
0403713816	4224001904	Playa Del Rey	130	61	none	yes	yes	N	N	Priority 2
0403714011	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714012	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714013	4224001904	Playa Del Rey	130	51	none	yes	yes	N	N	Priority 2
0403714015	4224001800	Playa Del Rey	130	8	none	yes	yes	N	N	Low
0403709003	8011010021	Santa Fe Springs	126	64	none	yes	yes	N	N	Priority 1
0403713572	6132019019	Rosecrans	126	93	Yes	yes	UN	N	N	Priority 1
0403714838	8011011003	Santa Fe Springs	126	79	none	UN	yes	N	N	Priority 1
0403714842	8011009059	Santa Fe Springs	126	24	none	no	no	N	Y	Low
0403715037	6132019013	Rosecrans	126	66	Yes	yes	UN	N	N	Priority 1
0403715764	8011009011	Santa Fe Springs	126	26	none	UN	UN	N	N	Low
0403716093	8011009059	Santa Fe Springs	126	26	none	UN	UN	N	Y	Low
0403716370	8157026019	Santa Fe Springs	126	93	none	no	yes	N	N	Priority 2
0403716371	8157026011	Santa Fe Springs	126	89	none	no	no	N	N	Priority 2
0403716372	8029016005	Santa Fe Springs	126	73	none	UN	UN	N	N	Priority 1
0403716435	8011009059	Santa Fe Springs	126	26	none	UN	yes	N	Y	Low
0403716700	8029016022	Santa Fe Springs	126	94	none	yes	yes	N	N	Priority 1
0403716701	8011009932	Santa Fe Springs	126	26	none	UN	yes	N	Y	Low
0403716706	8011009934	Santa Fe Springs	126	26	none	yes	UN	N	Y	Low
0403718469	7407031223	Torrance	126	82	none	UN	yes	N	N	Priority 1
0403718471	7407031223	Torrance	126	82	none	yes	yes	N	N	Priority 1
0403718485	7407031066	Torrance	126	38	none	UN	yes	N	N	Low
0403707305	7318010025	Dominguez	121	16	none	yes	yes	N	N	Low
0403710651	6131016047	Rosecrans	121	16	none	yes	yes	N	N	Low

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403713641	6131010004	Rosecrans	121	66	none	UN	yes	N	N	Priority 1
0403714488	6131016013	Rosecrans	121	88	none	yes	yes	N	N	Priority 1
0403714982	6131009045	Rosecrans	121	88	none	yes	yes	N	N	Priority 1
0403707642	6089003006	Howard Townsite	112	95	none	yes	no	N	N	Priority 1
0403705329	6132032001	NS	110	77	none	yes	no	Y	N	Priority 1
0403708628	4147004014	Lawndale	110	74	none	no	no	N	N	Low
0403708589	4147021018	Lawndale	100	91	none	no	no	N	N	Priority 3
0403708594	4147023005	Lawndale	100	89	none	yes	yes	N	Y	Low
0403706757	7318008026	Dominguez	99	86	none	UN	UN	N	N	Priority 3
0403716883	7344018023	Torrance	99	74	none	UN	UN	N	N	Priority 1
0403717819	7344020024	Torrance	99	5	none	UN	yes	N	N	Low
0403718486	7407018044	Torrance	99	46	none	UN	yes	N	N	Priority 3
0403718487	7407018051	Torrance	99	46	none	UN	yes	N	N	Priority 3
0403718488	7407015088	Torrance	99	32	none	UN	UN	N	N	Low
0403725134	7407018045	Torrance	99	33	none	no	no	N	N	Low
0403705152	5232027021	NS	98	74	none	no	no	N	N	Low
0403705166	8728009007	NS	98	66	none	no	no	N	N	Low
0403705171	8728008002	NS	98	66	none	no	no	N	N	Low
0403705596	8028007003	NS	98	95	none	no	no	N	N	Priority 3
0403706039	5236020026	NS	98	90	none	no	no	N	N	Priority 3
0403706135	5231010018	NS	98	101	none	yes	no	N	N	Priority 1
0403705167	8728013033	NS	91	71	none	UN	yes	N	N	Priority 3
0403705170	8728020013	NS	91	66	none	no	no	N	N	Low
0403705736	6139026013	NS	91	63	none	yes	no	N	N	Priority 1
0403715519	8026004009	Santa Fe Springs	90	96	none	UN	UN	N	N	Priority 3
0403718472	7407023028	Torrance	90	54	none	yes	yes	N	N	Priority 3
0403700802	4073014013	Alondra	88	44	none	yes	yes	N	N	Low
0403700803	4070015003	Alondra	88	72	none	yes	no	N	N	Priority 1
0403707638	6079004901	Howard Townsite	88	55	none	yes	no	N	N	Priority 1
0403707650	6079004901	Howard Townsite	88	95	none	UN	UN	N	N	Priority 1
0403720682	6079005015	Howard Townsite	88	51	none	no	no	N	Y	Low
0403700838	5241022022	Bandini	84	63	none	yes	no	N	N	Priority 1
0403705644	6059014003	NS	84	89	none	no	no	N	N	Priority 3
0403706182	8029012014	NS	84	97	none	no	no	N	N	Priority 3
0403714370	6137018013	NS	84	95	none	no	no	N	N	Priority 3
0403714418	6132019046	Rosecrans	84	89	none	yes	yes	N	N	Priority 1
0403714592	6125007030	Rosecrans, South	84	67	none	no	no	N	N	Low
0403718922	8129013038	Whittier	84	99	none	no	no	N	N	Priority 3
0403717759	7409012009	Torrance	81	56	none	yes	yes	N	N	Priority 3
0403717772	7409011031	Torrance	81	56	none	yes	yes	N	N	Priority 3
0403718483	7407027027	Torrance	81	54	none	UN	UN	N	N	Priority 3
0403718484	7407027036	Torrance	81	54	none	UN	UN	N	N	Priority 3
0403700042	4073024001	Alondra	80	73	none	no	no	N	N	Low
0403700801	4070016004	Alondra	80	63	none	yes	yes	N	N	Priority 1
0403700804	4070012030	Alondra	80	84	none	yes	no	N	N	Priority 1
0403702080	4073017012	Alondra	80	44	none	yes	yes	N	N	Low
0403705602	6077008021	Howard Townsite	80	79	none	no	no	N	N	Priority 1
0403707374	6078018004	Howard Townsite	80	94	none	no	no	N	N	Priority 3
0403707375	6078008024	Howard Townsite	80	74	none	yes	yes	N	N	Priority 1
0403707635	6089014029	Howard Townsite	80	14	none	yes	yes	N	Y	Low
0403708665	8040020024	Leffingwell	80	50	none	yes	yes	N	N	Priority 3
0403713804	4224004900	Playa Del Rey	78	61	none	no	no	N	N	Low
0403705149	6077017028	NS	77	94	none	no	no	N	N	Priority 3
0403705340	8262002024	NS	77	87	none	no	no	N	N	Priority 3

Table 3.14 Highest Ranking Wells

Well API	Well APN/ AIN*	Field	Rank (6)	Abandoned Age, years (1)	Blowouts? (2)	Any gas? (3)	Any oil? (3)	Any gas at <1000' (4)	Recent Leak Test? (5)	Priority Class
0403705600	6077022009	NS	77	79	Yes	yes	no	N	N	Priority 1
0403705757	8745006013	NS	77	69	none	UN	UN	N	N	Priority 3
0403705758	8745007017	NS	77	69	none	no	no	N	N	Low
0403705832	6137014012	NS	77	93	none	no	no	N	N	Priority 3
0403705963	8176023030	NS	77	95	none	no	no	N	N	Priority 3
0403706149	8026028037	NS	77	95	none	yes	no	N	N	Priority 1
0403706152	8465018015	NS	77	84	none	no	no	N	N	Low
0403706166	6077017015	NS	77	100	none	no	no	N	N	Priority 3
0403706751	7318010025	Dominguez	77	36	none	yes	yes	N	N	Low
0403706752	7318022030	Dominguez	77	36	none	no	yes	N	N	Low
0403706767	7318022029	Dominguez	77	36	none	no	no	N	N	Low
0403706778	7318022030	Dominguez	77	36	none	no	no	N	N	Low
0403706801	7318010270	Dominguez	77	73	none	UN	yes	N	N	Priority 1
0403706803	7318010270	Dominguez	77	69	none	UN	yes	N	N	Priority 3
0403706804	7318010027	Dominguez	77	73	none	yes	yes	N	N	Priority 1
0403706805	7318022012	Dominguez	77	36	none	yes	yes	N	N	Low
0403707301	7318023028	Dominguez	77	21	none	yes	yes	N	Y	Low
0403707302	7318010026	Dominguez	77	17	none	yes	yes	N	N	Low
0403707303	7318010025	Dominguez	77	17	none	yes	yes	N	N	Low
0403707546	7318023050	Dominguez	77	35	none	yes	yes	N	N	Low
0403707552	7318022012	Dominguez	77	72	none	UN	yes	N	N	Priority 1
0403714493	6131018010	Rosecrans	77	57	none	yes	yes	N	N	Priority 1
0403714986	6131018032	Rosecrans	77	88	none	yes	yes	N	N	Priority 1
0403715031	6131014025	Rosecrans	77	94	none	UN	UN	N	N	Priority 1

* APN/AIN shows the parcel that the well is located within or, for those wells located within street ROWs, the closest parcel APN/AIN.
UN=unknown, NS= Not Specified

3.4 Idle Wells

The CalGEM database of wells also includes idle wells. Idle wells are those wells that have historically not been recorded as having been plugged and abandoned and are not currently operating and producing oil/gas. Many idle wells are associated with a producing field and for a number of reasons have not produced oil/gas recently but are managed by an operator. However, some idle wells may have just been left and potentially buried by a previous operator, and not properly abandoned. Wells that have not been properly plugged and abandoned, and are not being actively managed, can present a potential risk to the public or environment if they are associated with reservoirs that have some potential for gas production.

CalGEM has an Idle Well Management Program (IWMP) to address this potential concern. An idle well is defined by CalGEM as a well that has not been used for two years or more and has not yet been properly plugged and abandoned. Reporting shows there are approximately 35,000 wells in California categorized as idle. Idle wells that have been idle for more than 8 years are considered Long Term Idle Wells (LTIW).

CalGEM regulations require idle wells to be tested including a fluid level test and casing pressure test and, if necessary, repaired, or permanently plugged and abandoned. However, there are many idle wells that are not part of a management program since in some cases the operator no longer exists. The CalGEM IWMP program provides incentives to operators to abandon long-idle wells, as well as providing funding for CalGEM to contract to abandon wells themselves and paid for as part of fees deposited into the Hazardous and Idle-Deserted Well Abatement Fund.

Idle wells in the CalGEM IWMP database shows a total of 622 idle wells located in the unincorporated areas of Los Angeles County (note this is different than the number listed in Section 3.2 as the IWMP database is from a different date).

The idle wells in the unincorporated area of Los Angeles County in the CalGEM database were prioritized based on their potential impact to public health and safety related to the potential for leakage of gas to the surface. Wells were prioritized based on the following characteristics:

- Years the well has been idle;
- Well location and census block population density and ranking;
- Reservoir characteristics and ranking; and
- Inclusion of the well in an active IWMP that includes testing of the well.

Each of these along with the prioritization method are discussed below.

3.4.1 Idle Well Years Idle

Table 3.15 shows the idle wells categorized by the years the well has been idle. Generally, the longer a well has been idle, the greater the probability of the well not being in a condition that would prevent the passage of gas to the surface and also increases the probability that the well was idled in a manner that increases the public safety risks. Note that many wells are not considered long-term idle wells and are probably part of an actively managed oil field. However, there are some wells that have been idle for more than 100 years.

Table 3.15 Idle Wells in the Los Angeles County Incorporated Area, by Years Idle

Years Idle	Number	"Years Idle" Rank
not LTIW (<8 years)	244	0
Idle 8 - 19 years	166	1
Idle 20 – 39 years	126	2
Idle 40 – 59 years	59	3
Idle 60 – 79 years	4	4
Idle 80 – 99 years	12	5
Idle >= 100 years	11	6
Total wells	**622**	

Source: CalGEM IWMP database 1/2020.
Notes: Idle wells defined by CalGEM as a well that has not been used for two years or more and has not yet been "plugged and abandoned" per CalGEM requirements. Long Term Idle Wells (LTIW) are those wells idle for more than 8 years.

3.4.2 Idle Well Reservoir Characteristics

Table 3.16 shows the idle wells categorized by the reservoir in which they are located. As discussed in sections above related to abandoned wells, a reservoir that has not historically generated gas or

has very low pressures would produce a lower risk for leakage of gas to the surface. Note that most of the idle wells are located in higher ranking reservoirs.

Table 3.16 Idle Wells in the Los Angeles County Incorporated Area, by Reservoir Ranking

Reservoir Rank	Number
Less Than 4 ranking	40
4-6 ranking	160
6-8 ranking	142
8-10 ranking	280
Total wells	**622**

Source: CalGEM May 2019.
Notes: Reservoir ranking is defined in previous sections.

3.4.3 Idle Well Population Density

Table 3.17 shows the idle wells categorized by the density of the population of the area in which the idle well is located. Highly urban areas with high population densities increase the risk of a leaking well impacting a receptor. A well located in a rural area with no populations nearby does not present as much risk. Note that most of the idle wells are located in rural, low density areas in north County areas.

Table 3.17 Idle Wells in the Los Angeles County Incorporated Area, by Population Density

Population Density	Number	Population Density Rank
PPSM = 0 - 999	305	0
PPSM = 1,000 – 1,999	24	1
PPSM = 2,000 – 3,999	21	2
PPSM = 4,000 – 5,999	13	3
PPSM = 6,000 – 7,999	12	4
PPSM = 8,000 – 9,999	9	5
PPSM = 10,000 – 11,999	5	6
PPSM = 12,000 – 13,999	1	7
PPSM = 14,000 – 15,999	9	8
PPSM = 16,000 – 17,999	0	9
PPSM greater than 18,000	1	10
Total wells	**622**	

Source: CalGEM May 2019.
Notes: Population density is defined by the census block group that the idle well is located within and is persons per square mile (PPSM).

3.4.4 Idle Well Management Program Wells

Information was obtained from CalGEM on the highest priority wells that are also a part of an IWMP and therefore are subject to regular testing and maintenance. These idle wells would present

less risk because they are regularly tested and maintained. A total of 24 of the highest ranking 75 wells are currently part of an IWMP and are tested regularly.

3.4.5 Idle Well Ranking

The ranking system for idle wells is based on the reservoir rank and the "years idle" rank. These two ranks are then combined with the population density rank and whether the wells are part of an IWMP. The following approach was used:

Idle Well Rank = (Reservoir Rank + Years Idle Rank) x Population Density Rank

This ranking scheme allows for a lower ranking for wells that are located in low population density areas, which would generally produce lower impacts if a well is found to be leaking. In addition, this ranking scheme takes into account wells that are part of the IWMP and are actively being tested and managed and therefore would have a lower probability of leaking.

Table 3.18 shows the results of the ranking. Figure 3-11 below shows the location of the wells and their associated rankings. Most of the wells are ranked low as they are located in low population density areas. However, there are 35 wells which are ranked above 20 (higher priority) and these are listed in Table 3.19.

Table 3.18 Idle Wells in the Los Angeles County Incorporated Area, by Reservoir Ranking

Idle Well Rank	Number
Rating Less Than 20	587
Rating 20-39	15
Rating 40-59	11
Rating 60-79	6
Rating >= 80	3
Total wells	**622**

Source: CalGEM May 2019.
Notes: Ranking scheme is defined as rank = (Reservoir Rank + Years Idle Rank) x Population Density Rank. Wells part of an IWMP are ranked = 0.

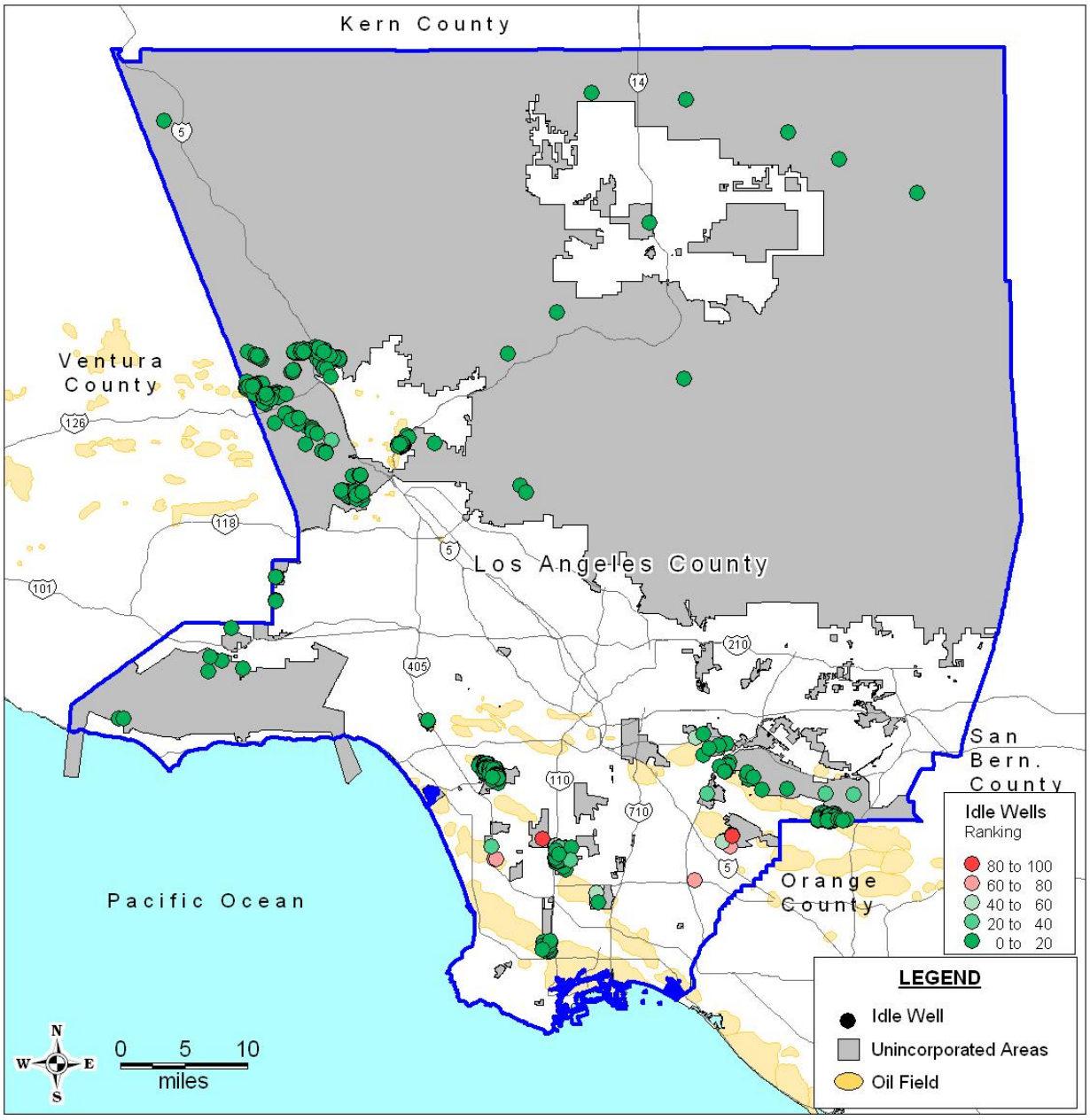
Table 3.19 Highest Ranked Idle Wells

Well API	Idle Years	Reservoir Rank	Population Density, ppsm	IWMP?	Ranking
0403705142	91	5	12,074	No	70
0403705199	18	5	10,479	No	36
0403705223	18	5	14,379	No	48
0403705224	18	5	14,767	No	48
0403705440	79	5	7,701	No	36
0403705461	76	5	4,719	No	27
0403705466	76	5	8,556	No	45
0403705525	14	5	7,545	No	24
0403705555	90	5	10,449	No	60
0403705557	86	5	11,511	No	60

Table 3.19 Highest Ranked Idle Wells

Well API	Idle Years	Reservoir Rank	Population Density, ppsm	IWMP?	Ranking
0403705820	14	5	7,325	No	24
0403705844	14	5	14,379	No	48
0403705845	14	5	14,379	No	48
0403705953	97	5	2,898	No	20
0403706131	10	5	15,056	No	48
0403706132	10	5	15,056	No	48
0403706180	109	5	14,328	No	88
0403706181	109	5	14,328	No	88
0403706744	41	8	7,686	No	44
0403707634	75	5	21,803	No	90
0403708606	14	7	14,392	No	64
0403708607	86	7	10,142	No	72
0403712029	14	6	5,980	No	21
0403712816	29	5	6,494	No	28
0403713573	14	8	10,479	No	54
0403713584	14	8	8,919	No	45
0403713588	92	8	9,196	No	65
0403714385	14	8	9,196	No	45
0403714989	2	8	4,817	No	24
0403716951	8	7	5,043	No	24
0403717641	7	7	8,791	No	35
0403717644	1	7	7,618	No	28
0403718001	11	7	7,618	No	32
0403726385	100	5	4,755	No	33
0403726877	11	9	2,812	No	20

Figure 3-11 Idle Wells Ranking



Source: CalGEM May 2019.

3.5 Well Inspection Protocol

The Strike Team field inspection of priority wells was delayed by the COVID-19 pandemic and the associated State and local stay at home/lockdown orders. During this period, in preparation for the inspection efforts, the priority wells were reviewed for available data and the well inspection protocol sheets were completed for the items not requiring a field visit to document. In addition, this process was also completed for the highest ranking idle wells. Data compiled for these wells include the following:

- Well identification (name, API number, CalGEM well status;
- Well history (original spud date, blowout history, abandonment or idle date)
- Well site property assessor parcel number;
- Nearest address;
- Nearest residence;
- Nearest school;
- Nearby sensitive receptors;
- List of other wells or oil and gas infrastructure in the area; and
- Maps and or aerial imagery.

Figures 3-12 through 3-16 provide an example of the inspection protocol sheet and maps developed for the field inspections. Inspection sheets for all the high priority abandoned and idle wells are included in Appendix F and G, respectively.

Leaking abandoned or idle wells can be difficult to identify as there may not be any above the ground infrastructure remaining. The inspection protocol utilized a handheld RKI GX6000 air quality monitor as well as a FLIR camera, both of which will help to identify any leaks in the area of the abandoned/idle well. A FLIR camera allows for visualizing leaking methane plumes and allows for surveying a wide area instantly and easily. The handheld monitor allows for identifying exact concentrations and compositions of leakages if they are identified. See discussion on inspections below.

The site inspection protocol involves the following activities:

- Interviewing neighbors;
- Attempting to locate well identifiers;
- Surveying the area with FLIR camera and recording video of the survey;
- Surveying the area with a handheld air monitor and recording any contaminants;
- Recording pictures of the area; and
- Recording GIS data of the locations.

Figure 3-12 Example - Abandoned Well Inspection Protocol Sheet

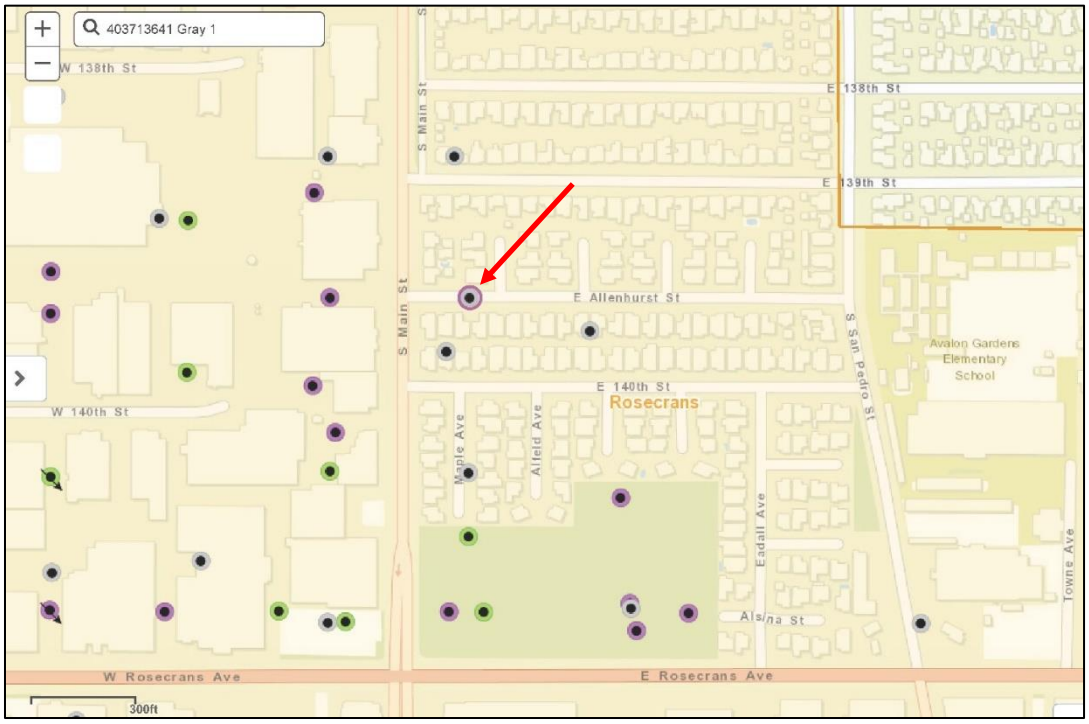
LA County Oil and Gas Facility Compliance Review Project
Abandoned/Idle Well Inspection Protocol

CalGEM Records Review Summary			
Well API	403713641	Original Spud Date	9/16/1925
Well Risk Ranking	121	Blowout History?	None
Well Name	Gray 1	Gas or Gas Production?	UN
Abandonment Date	1/27/1954	Well Type? Producer or Injector	Oil & Gas
Years Since Abandonment	66	Well Finder Status	Plugged
CalGEM Location Data?	200' East of Main Street		
• Attach CalGEM Maps • Attach Other Agency Records			
Well Location Detail			
APN	3131010004		
Property Contact Information			
Nearest Address	116 East Allenhurst Street, Los Angeles, CA 90061		
Nearest Cross Street(s)	East Allenhurst and South Main Street		
Land Use Type	Residential		
Nearest Residence	116 East Allenhurst Street (~50 feet)		
Nearest School	Avalon Gardens Elementary School (~1,200 feet)		
Other Sensitive Receptor	Residences		
Wells in Area? Type of Well?	403714431 (Idle) 403710651 (plugged) 403714488 (plugged)		
Active Oil and Gas Equip?	No		
• Attach Location Map from WellSTAR • Attach Google Earth Map • Attach Google Earth Image • Attach Site Photographs			
Well Inspection			
Inspection Date		Inspectors	
Is Well Visible?			
Surface Description			
Surrounding Area Land Use			
Any Signage?			
Fencing?			
Cone system?			
Notes			

Air Quality/Odor Monitoring					
Location	FLIR Camera		RKI GSX - 6000		
	CH4	VOC	CH4	VOC	H2S

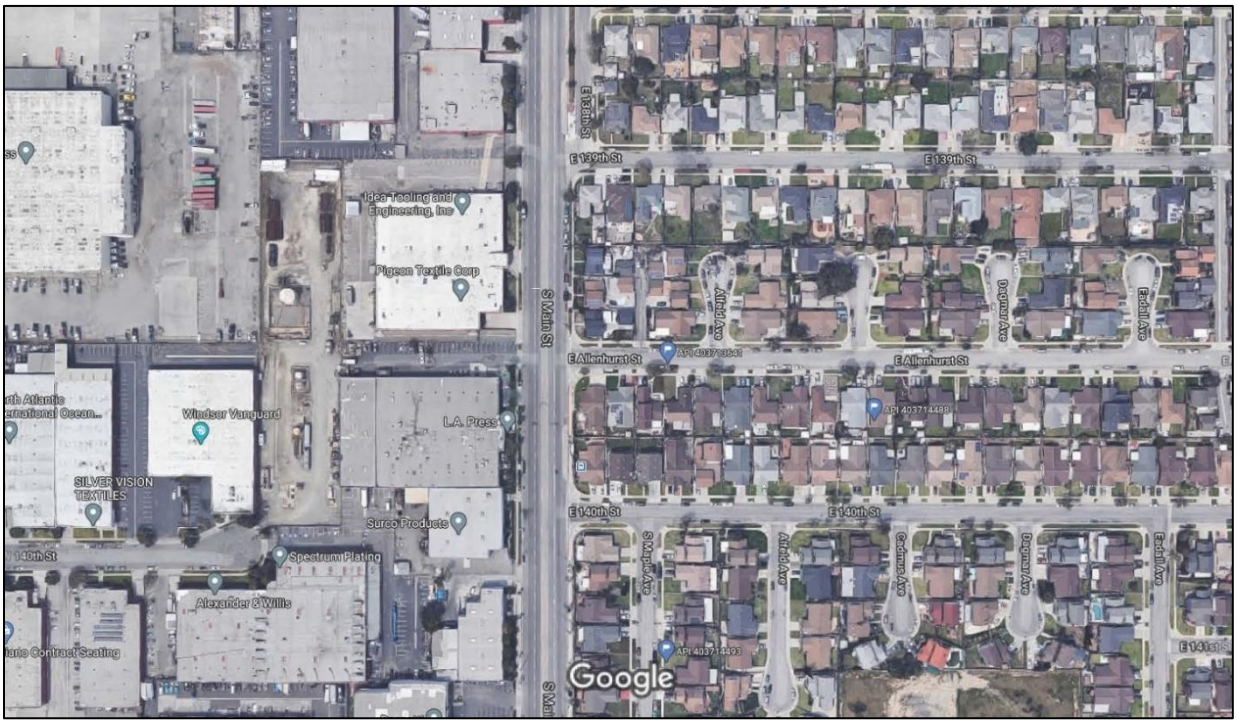
Neighborhood Interviews	
Name/Contact Info	Comment(s)

Figure 3-13 Example CalGEM Well Finder/Star Map for Well Gray 1



Source: CalGEM Well Finder January 2021.

Figure 3-14 Example Google Aerial Overview for Well Inspection Protocol Sheet



Source: Google Earth January 2021

Figure 3-15 Example Google Aerial Street for Well Inspection Protocol Sheet

Source: Google Earth January 2021

Figure 3-16 Example Google Street View for Well Inspection Protocol Sheet

Source: Google January 2021

3.6 Well Inspections

In-field inspections of the high priority abandoned, and idle wells were completed over three days from June 15 through June 17, 2021. The purpose of the in-field inspections was to identify if any of the wells may be leaking to the surface at the time of the in-field inspection through the use of gas-detection monitors; to interview residents in the area around the wells to determine if any well-related issues had been observed; and to identify if the wells could be positively identified at the locations designated in the CalGEM databases.

The inspection effort utilized the locations of the wells based on the information in the CalGEM database as a starting point for surveying the area with gas detection monitors as well as discussing with residents if any issues have been experienced. Because the locations of the wells in the CalGEM database are sometimes inaccurate, an area encompassing multiple parcels, ranging from 50-150 feet from the CalGEM identified well location, was surveyed. In general, most wells were expected to be buried and inaccessible.

Three different well types were identified and mapped, including the highest priority abandoned wells (priority 1), high priority idle wells and lower priority abandoned wells (priorities 2 and 3) that were located in the vicinity of the high priority wells.

3.6.1 Well Inspection Team

The inspection team consisted of staff from the Strike Team participating agencies along with staff from MRS Environmental. The inspection team members are listed in Table 3.20 below.

Table 3.20 Inspection Team

Name	Agency
Diana Gonzalez	County Department of Regional Planning
Edgar De La Torre	County Department of Regional Planning
Alex Garcia	County Department of Regional Planning
Ed Gerlits	County Department of Public Works
Evenor Masis	County Department of Public Health
Nicholas Beliajev	County Fire Department
Celina Chang	California Geologic Energy Management Division (CalGEM)
Adam Tavasolian	South Coast Air Quality Management District (SCAQMD)
Adam Taing	Regional Water Quality Control Waterboard (RWQCB)
Greg Chittick	MRS Environmental
Dean Dusette	MRS Environmental
Nicole Trezza	MRS Environmental

Note: Not all inspection team members attended all three days of the inspection program.

3.6.2 Well Inspection Public Outreach

The inspection team used three basic questions as a guide when talking with the public during a visit to a well location to try to ascertain if neighbors were aware of wells in the area or if they had witnessed any evidence of the presence of wells in the area:

- Are you aware of any oil and gas infrastructure in your neighborhood?
- Have you noticed any oil/gas odors in your neighborhood?
- Have you dug up any vertical pipes or other similar structures in your yard?

These three questions formed the basic discussion with members of the public; however, they were encouraged to provide any other input or concerns about having an abandoned or idle well in their neighborhood. The inspection team included staff fluent in Spanish. An information flyer was also used during the inspection as additional outreach to the public that included Department of Regional Planning contact information for those wishing to provide any follow up information. The flyer, which was also provided in Spanish on the reverse side, is included below in Figure 3-17.

Figure 3-17 Abandoned and Idle Well Research Neighborhood Outreach Fact Sheet

County of Los Angeles Oil & Gas Strike Team Project

Abandoned and Idle Well Research Neighborhood Outreach Fact Sheet

What: A Multi-Agency Task Force researching and reviewing abandoned and idle oil and gas wells in the unincorporated County

Who: Representatives from the following agencies:

- Los Angeles County Department of Regional Planning
- Los Angeles County Department of Public Health
- Los Angeles County Department of Public Works
- Los Angeles County Fire Department
- California Department of Conservation Geologic Energy Management Division
- South Coast Air Quality Management District
- California Regional Water Quality Control Board

Activity: We will be conducting the following to check and document any potential issues with past oil and gas well operations including:

- Looking for any above ground evidence of past oil and gas infrastructure
- Mapping of any oil and gas infrastructure
- Photographing oil and gas infrastructure
- Air quality and odor monitoring
- Interviewing interested residents for any oil and gas issues:
  1. Are you aware of any oil and gas infrastructure in your neighborhood?
  2. Have you noticed any oil/gas odors in your neighborhood?
  3. Have you dug up any vertical pipes or other similar structures in your yard?

Important to note that we are not responding to a leak, spill or other current problem with the old wells in your neighborhood, rather, we are proactively researching and checking for potential issues with past oil and gas activity

Public Input: Your comments and concerns are important to us!

- Please provide input on the three questions listed above
- Please feel free to provide any other concerns or comments you may have
- Note that any contact information you may provide will be kept private

Thank you for your time!

For more information, please contact Ai-Viet Huynh or Diana Gonzalez from the County of Los Angeles Department of Regional Planning at 213-974-6483.

3.6.3 Gas Monitoring

The inspection effort included monitoring for gas/odors/vapors utilizing three different gas monitors as listed in Table 3.21 below.

Table 3.21 Air Quality Monitoring Instrumentation

Monitoring Device	Gas Detection		Agency
RKI GX-6000 Multi Gas Monitor	Methane	Oxygen	MRS Environmental
	Hydrogen Sulfide	Carbon Monoxide	
	VOCs		
FLIR GFX 320 Optimal Gas Imaging Camera	Methanol	Methane	SCAQMD CalGEM (2 Cameras)
	Benzene	Ethane	
	Propylene	Ethanol	
	Pentane	1-Pentene	
	Isoprene	Butane	
	Ethylbenzene	MEK	
	Toluene	Propane	
	Octane	Heptane	
	MIBK	Xylene	
	Ethylene	Hexane	
Thermoscientific Toxic Vapor Analyzer 2020 Flame Ionization Detection (FID)	Organic Vapors	Inorganic Vapors	SCAQMD
	VOCs		

Notes: Monitoring completed June 15 through June 17, 2021.
Instrumentation calibrated at factory, pursuant to factory specifications, or daily as applicable
GX-6000 detection ranges; Methane 0-100% LEL, Hydrogen Sulfide 0-100 ppm, VOcs 0-6,000 ppb.
Thermoscientific TVA detection range; 1.0-50,000 ppm methane.
LEL= lower explosive limit, ppm = parts per million.

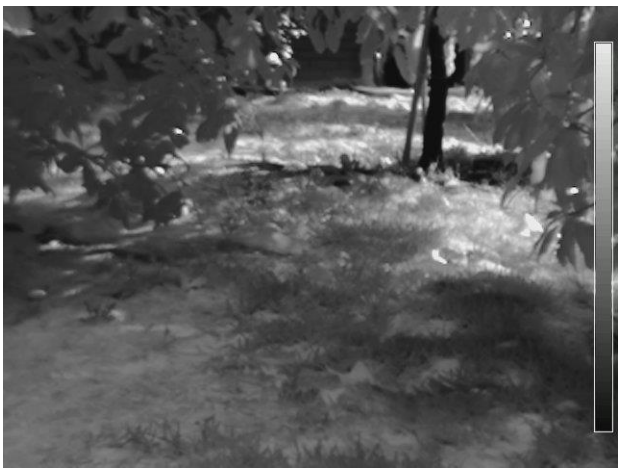
The gas/odor/vapor monitoring effort included the following procedures at each well site with the aim of detecting any emissions from potentially leaking wells, as applicable to each location:

- Using the detection instruments at the recorded location of the well;
- Using the detection instruments in a grid pattern across the area surrounding the recorded well location;
- Using the detection instruments in cracks or gaps in concrete, brick, or asphalt surfaces;
- Using the detection instruments in vents on sides of homes or buildings;
- Using the detection instruments in access spaces under mobile or raised floor homes;
- Using the detection instruments on any object that protruded from the ground (such as an old sprinkler pipe) that may serve as a conduit for gasses from potentially leaking wells; and
- Using the detection instruments in locations as requested by the public during interviews.

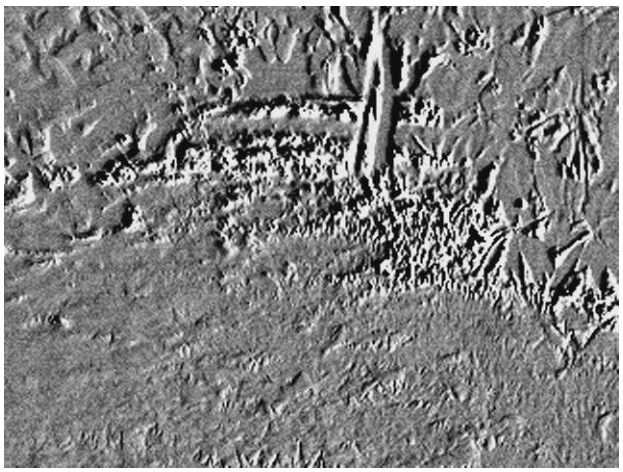
The gas monitoring was completed by SCAQMD, CalGEM, and MRS Environmental staff properly trained with the operation and calibration of the applicable gas monitors.

The FLIR cameras allow for identification of leaks through visual examinations using a camera. They are very effective for scanning a wide area and identifying leak locations and the FLIR cameras substantially increased the effectiveness of the inspection effort. Two cameras were utilized to help ensure effective surveys of the area. Example FLIR camera results are shown in Figure 3-18 (for survey and high-resolution modes).

Figure 3-18 Examples of FLIR Camera Monitoring



Yard in survey mode



Yard in high-resolution mode

3.6.4 Well Inspection Procedure

Each inspection was unique as access at each location varied, and the number of members of the public available to interface with the inspection team ranged from several to none. The basic inspection approach is listed below:

- Initial assessment and area photographs;
- Approach residences located in the vicinity of the well location and engage the public when available and request access to backyard or other locations, if needed, depending on the well location in the CalGEM database;
- Introduce project team to the residents, if applicable;
- Explain project to the residents, if applicable, and explain abandoned and idle wells, and potential issues (infrastructure, leaks);
- Discuss with residences the three questions identified in Section 3.6.2 above;
- Allow for residences to discuss any other issues they may have questions or concerns regarding past oil and gas activities in their neighborhood;

- Perform gas monitoring as listed above and survey the area in the vicinity of the well location, as in the CalGEM database; and
- Complete the field data sheets for each well inspected (Appendices F and G).

3.6.5 Well Inspection Results

Table 3.21 below provides a summary of the overall results of the inspections including totals for the number of residences the Strike Team interfaced with during the field work. A summary describing the location description for the well locations is provided as Table 3.22.

Table 3.22 Abandoned and Idle Well Inspection Results Summary

Inspection Item	High Priority	Idle	Totals
Number of Wells Inspected	43	34	77
Above Ground Well Infrastructure Located	1	5	6
Total Number Members of the Public Interviewed	50	33	83
Wells with a Single Member of the Public Interviewed	25	16	41
Wells with Multiple Members of the Public Interviewed	10	8	18
Wells with No Members of the Public Interviewed	8	10	18
Wells with elevated Gas/Odor/Vapor Monitoring Levels Identified	0	0	0

Table 3.23 Abandoned and Idle Well Inspection Location Summary

Location Categories	High Priority	Idle	Totals
Residential Dwelling	5	2	7
Residential Front Yard	7	9	16
Residential Back Yard	10	5	15
Residential Side Yard	1	3	4
Mobile Home	4	1	5
Street	6	3	9
Parking Lot	4	2	6
Parking Structure	2	0	2
Dirt Lot	0	5	5
Paved Lot – Industrial	2	1	3
Paved Lot – Commercial	1	1	2
Current Oil Field	0	1	1
Past Oil Field	1	1	2

As shown in Table 3.21 above, most well locations allowed for the Strike Team to interface with a member of the public, either a residence with the well identified as potentially being on the property, or a neighbor of the property. The discussions with the public included the three primary questions listed above in Section 3.6.2 and other questions or concerns regarding past oil and gas development the residents noted. Interactions with the public were very positive with results of the discussions including:

- Many residents appreciated the County effort to check their backyard or other area with the gas monitors for leaks;
- No members of the public reported chronic or repeated odor or air quality issues that may have been associated with oil and gas operations;
- Most residents were not aware of previous oil and gas operations in their neighborhood;
- Many residents kept a copy of the Neighborhood Fact Sheet for future reference should they have a concern about past oil and gas operations; and
- One resident noted that he did dig up a well in his backyard as was identified by the CalGEM database (see below).

As noted in Table 3.21 above, no vapors, gases or odors were detected during the inspections at any of the well locations. One site contained a slight VOC reading as detected by the SCAQMD Toxic Vapor analyzer; however, the readings were too low to be considered significant. The location did not register a reading on either of the two other gas monitoring devices.

Table 3.22 provides location data for the well sites. Note that many locations are shown in maps to be located in residential locations in the front yard, back yard, or under the dwelling itself. One well, on the non-high priority abandoned well list, was located by a resident in his back yard at the CalGEM mapped location. Although not on the highest priority list, the Strike Team spoke with the homeowner who discovered the well head during a home improvement project. The homeowner indicated that they have worked with County Fire to have the well leak checked and the site properly backfilled pursuant to Count Fire approvals. As noted in Table 3.21 four other well locations were confirmed as mapped in the CalGEM data base with above the ground infrastructure as follows:

- Two wells at the Padelford site currently undergoing plugging and abandonment and site remediation activities;
- One well at the Inglewood Oil Field; and,
- One well with a cone vent system.

Updated well inspection field sheets are included in Appendices F and G.

Pictures of inspection activities are shown in Figure 3-19 below.

Figure 3-19 Inspection Activities

Abandoned well vent cone

Monitoring with Thermoscientific Monitor

Use of Thermoscientific and RKI Monitors

Use of FLIR Camera

3.6.6 Well Inspections Limitations

As with any inspection and investigation, there are limitations to the methodology. Although no evidence of well leakage was found during the site visits, the potential for leaks cannot be ruled out for several reasons as detailed below:

- Very few wells were visible or identifiable, due to the fact that most wells were buried. Therefore, it is not possible to confirm the validity of the database for most wells and whether crews were situated at the precise well locations when readings were obtained. Surface equipment was identified for five wells, and these were located in the exact location as the CalGEM database, thereby indicating a certain degree of confidence in the locations of the non-visible wells. In addition, by examining a large number of wells (77 wells), and areas within 100 feet of the well database location, if possible, the probability of having some of the wells in the area where readings were taken was increased.
- Without knowing the precise location of the well and using a boring-type soil vapor test for leakage at a known exact well site (a more sensitive test), lower leakage levels cannot be ruled out. The use of FLIR cameras generally only accounts for higher leakage rates. Wells that are leaking at lower levels most likely would not be detected. This limitation was partially addressed by also utilizing hand-held vapor detectors, which can detect a much lower level of leakage, and by examining confined areas, where gasses could accumulate. However, hand-held detectors cannot scan a large area and some lower level leaks would be hard to identify.
- Leakage from wells can fluctuate and might not have shown up at the exact time of the site visit. The site visits are a snap-shot and long-term occasional monitoring of higher priority wells is recommended.
- Longer-term and more sensitive methods, such as soil vapor sampling or static chamber testing, might have produced different results given a known exact location of buried wells. However, determining the exact location of buried wells is complicated and potentially very invasive. Many wells in the database are reportedly located in residential yards and under buildings, making definitive confirmation of exact location difficult. These methods were beyond the scope of the project.

The report does not provide general conclusions regarding the overall safety or integrity of the County-wide subsurface well infrastructure based on the site visits. Some wells in the study may be leaking subsurface, however, they were not identified due to not knowing the actual exact well location or the leakage rate was lower than the detection capabilities. The project also cannot make any conclusions on future risks based on the site visits.

Additionally, conversations with residents occurred on a convenience basis with residents who happened to be home at the day and time of the site visit, and no extensive, long-term attempt to survey all residents at or in the vicinity of wells was performed. Although none of the residents the Strike Team members spoke with reported odors, most were unaware of the existence of the wells and might not associate odors with oil and gas infrastructure.

The goals of the in-field study were to identify potentially high leaking wells that could produce vapor concentrations that could produce flammable or toxic health risks. By utilizing multiple detection techniques, examining numerous well's locations, confirming some of the well locations through surface equipment, the general goals of confirming the lack of immediate health risk for a snap-shot view of some the high priority wells was achieved.

3.7 Case Studies - Wells

As the Strike Team conducted the research, data collection, analysis, and other tasks to prepare the reports to conduct the Strike Team project, certain events occurred that are applicable to the subject matter and warrant review. These incidents provide recent and real-life examples of some of the challenges that arise from addressing past oil and gas activities and present the opportunity for a "lessons learned" type of review. Two recent events involving the development of properties with past oil and gas development are presented below: one related to identifying and abandoning a well and the other related to well abandonments and debris remaining from an older oil development project.

3.7.1 Marina Del Rey Well Incident

When a well reaches the end of its productive life, or if it fails to find economic quantities of oil or gas, the well operator is required by regulators to remove all equipment and plug the well to prevent leaks. Usually, cement is pumped into the well to fill at least the top and bottom portions of the well and any parts where oil, gas, or water may leak into or out of the well. This generally prevents contamination of groundwater and leaks at the surface. However, a number of wells abandoned over the last 100 plus years in the unincorporated area of the County of Los Angeles were not abandoned to today's technological standards and have subsequently been re-abandoned. In some cases, wells are found at the site of a new construction project and the developer is tasked with the proper re-abandonment of the well even if no operator of record exists for that well. Throughout the region, some wells' locations are still unknown, unaccounted for, or their records do not exist.

In the Marina del Rey case, a land developer, MDR Hotels LLC., leased property from Los Angeles County on the Marina del Rey waterfront to build a hotel. The project involves constructing a six-story Residence Inn and five-story Courtyard Marriot (288 rooms with waterfront restaurant and amenities) on the site as part of a redevelopment Project. As part of the work, MDR Hotels was required by CalGEM to re-abandon the well "DOW RGC" 10 on the property to improve the long-term safety of surface development, protect shallow fresh water, and to re-abandon the well to current standards. The 1930s era well was originally abandoned and plugged in the 1950s. CalGEM issued a permit in June 2018 to MDR Hotels to re-abandon the well.

On January 11, 2019 during plugging operations, pressure built within the well casing which caused an uncontrolled release of fluids and gas spraying into the air. The material is believed to have included natural gas (mainly methane), heavy abandonment mud, and water. To address immediate health and safety concerns, CalGEM issued an emergency order to put into place precautions to protect health, safety, and property including testing protocols and twenty-four hour

a day monitoring. The order also required that the operator prepare a report detailing what caused the blow out and emissions.

When the incident was first reported, the information provided to regulators, including DPH, was that the leak was quickly contained, and first responders reported that there was no continued release of methane. On January 18, 2019 CalGEM notified local authorities that they would be issuing an emergency order to the operator. In addition, DPH asked CalGEM to require the development of a Community Health, Safety and Notification Plan (Safety Plan) and requested that monitoring data be submitted for DPH review as it was generated. The Safety Plan was completed by the operator with the assistance of DPH, CalGEM, Los Angeles County Fire, and the Los Angeles County Department of Beaches and Harbors on February 22, 2019 (see Appendix B).

In the interim, first responders onsite reported to DPH that there were no measurable levels of natural gas in the air. Officials from CalGEM and Los Angeles County Fire Department Health Hazardous Materials Division were on site monitoring operations. Figure 3-17 shows an area map and Figure 3-18 shows the location of the well under abandonment and the adjacent proximity to residential areas.

Figure 3-20 Marina del Rey Well Area Map

Source: Incident Action Plan CA-LAC-011239 January 29, 2019.

Figure 3-21 Marina del Rey Well

Source: CalGEM January 18, 2019 Information Report.

This buried idle and improperly abandoned well is considered a typical case study of wells that can be found in the unincorporated area during construction and development activities. Note that the well, "DOW RGC" 10, was scored as a seven on the well risk prioritization scale (See Section 3.3.7). The well abandonment was completed on April 4th, 2019; however, because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, contractors were unable to complete the cement plugs below the depth of approximately 1,500 ft., as required by the permit approved by CalGEM. The final root cause analysis for this well re-abandonment was completed on June 7th, 2019 by Exponent at the request of CalGEM; however, the document was not released to DRP until September 19th, 2019.

The findings of the root cause analysis performed were as follows:

- Insufficient integrity of the old, circa 1931, casing strings in the well allowed inflow of gas into the wellbore and beneath old cement plugs through possible corrosion holes in production casing and non-plugged manmade cuts or perforations and led to lost mud circulation problems.
- Insufficient barriers placed during previous abandonments of the well, allowed shallow gas to enter the wellbore and led to lost mud circulation problems.
- The original operators, The Ohio Oil Company and Dow Chemical Company, did not adequately characterize the shallow gas formations in the region of the well, which caused a blowout in a previous abandonment of the well in 1956.
- Lost circulation problems and lost mud while drilling through and below cement plugs at about 786-887 ft. The loss of circulation led to the decision to reduce mud weight.
- Reducing the mud weight from 9.0 pounds per gallon (ppg) to 8.4 ppg in the days before the blowout.

Other findings were as follows:

- The CWS rig supervisor, rig operator, and a rig hand who worked on the Dow RGC 10 re-abandonment operations during the period October 23, 2018 through January 13, 2019 had no evidence of, or had expired, well control course certifications. In one case the certification had expired as early as July 21, 2013.
- The Dow RGC 10 re-abandonment operations presented significant well control challenges involving shallow gas pockets and kicks, and lost circulation of drilling mud. It is most likely that gas entered and mud exited the wellbore through very old casing strings (circa 1931), which likely experienced significant corrosion and which were not well cemented.
- InterAct and CWS brought the well under control shortly after the blowout January 11th about ten minutes after the blowout began and killed the well on or about January 15, 2019. Because drill collars and a drill bit became irretrievably stuck in the wellbore when drilling a cement plug, InterAct and CWS were unable to complete the cement plugs below the depth of approximately 1,500 feet, as required by the permit approved by CalGEM. The final abandonment included more cement plugs than were required under the original permit.

The lessons learned at this well re-abandonment are applicable to a number of other wells that may need to be re-abandoned in the area in the future. The Playa del Rey oil field is located onshore of the Santa Monica Bay, primarily within and surrounding Marina del Rey. The field was discovered in 1929 and a total of 280 wells were drilled and plugged and abandoned. All these wells are in close proximity to residences and the harbor. It is not surprising that 19 of the high priority wells identified for further investigation by the Strike Team are located in the Marina del Rey area.

Some of the lessons learned and recommendations arising from Exponent's review of the plugging and abandonment effort include:

- Consideration should be given to the use of a snubbing unit or stripping operations, and a drill string internal blowout preventer (IBOP) or check valve, for future Playa del Rey re-abandonment operations. The history of surface broaches and gas kicks during the 2018-2019 well re-abandonment operations, and the historical blowouts in the Dow RGC 10 and other wells in the area suggest that the use of an IBOP or check valve could have been beneficial. In particular, these considerations may be appropriate for drilling through old cement plugs, beneath which gas may accumulate through old corroded casing. The use of an IBOP or check valve as a contingency component of the BOPE system could have reduced the risk of gas flow up the drill pipe and likely could have prevented the blowout on January 11, 2019.
- Re-abandonment of old wells may seem rather straightforward, but as has been demonstrated in the Playa del Rey oilfield both historically and in contemporary time, well control due to the presence of shallow gas formation is challenging. The Operator should plan well control contingencies for shallow gas in this region, since there is a history of blowouts involving shallow wells. Old wells, such as the Dow RGC 10 spudded in 1931, in which casing and cement integrity is suspect, should be carefully examined for risk versus reward for determining if re-entry is truly warranted.
- The use of lost circulation materials as a means of plugging casing holes or leaks should be carefully considered. In most situations, it may be more efficacious and prudent to take the time to perform squeeze cementing operations. Squeeze cementing operations are not

without risks. If a squeeze cementing protocol was established to "seal" annular flow paths, then drilling up the cement could lead to sidetracking operations. Drilling hard cement with weight on bit could cause the bit to mill corroded casing and formation easier than hard cement.

- During operations in which lost returns and gas kicks are occurring, weighting up the drilling mud should be the first priority to prevent gas influxes.
- Characterize shallow gas sands in the Playa del Rey Field, which have caused well control issues and blowouts in the past and again recently. It is recommended that a new well be drilled at a suitable location and depth in the Playa del Rey field area, in which a complete logging program should be performed, focusing on geological characterization. Also, production testing should be performed to investigate the extent and pressure of shallow natural gas formations.
- It is recommended that a study be performed to gather information on geological logging and wellbore abandonment configurations of all 279 Playa del Rey oil wells, at least for those wells for which such information exists. CalGEM data shows that all 279 wells are currently plugged and abandoned, as indicated by a "P" status in CalGEM online records.

The County notes here that downhole operations are under the jurisdiction of CalGEM and that CalGEM staff have reviewed the Exponent Report.

3.7.2 Bridge Point Gardena Project Mercaptan Release

On Thursday, September 10, 2020, at 11:20 a.m., during clean up and remediation activities at a development site, a two-gallon container of mercaptan (a chemical used to odorize natural gas) was spilled. The spill resulted in a natural gas odor permeating the immediate area and areas downwind to the East of the project site. County firefighters responded and as a precautionary measure nearby residents were asked to remain indoors until the odor dissipated. Mercaptan is not a fire hazard but does cause significant odor issues when released to the environment. The container of mercaptan was a remnant of the past oil and gas development on the property and was subsequently cleaned up and removed for offsite disposal.

The project site, in the unincorporated area of Compton (APN 6131018031 and 6131018032, involves the construction of two buildings to be used as warehouses. The project site includes the eight oil wells as listed in Table 3.20 below.

Table 3.24 Bridge Point Gardena Project Site Wells

Well API	Well Name	Pre-Project CalGEM Well Status	Post-Project Well Status (as of 9/2021)
0403714986	PadelFord 1	Plugged	Permit issued but work has not started
0403714987	PadelFord 2	Idle	Plugged and abandoned
0403714988	PadelFord 3	Idle	Plugged and abandoned
0403714989	PadelFord 4	Idle	Abandonment in progress
0403714990	PadelFord 5	Idle	Permit issued but work has not started
0403714501	Chandler 1	Active	Plugged and abandoned
0403714494	Chandler 3	Idle	Plugged and abandoned

Well API	Well Name	Pre-Project CalGEM Well Status	Post-Project Well Status (as of 9/2021)
0403714495	Chandler 4	Active	Plugged and abandoned

Source: CalGEM Well Finder January 2021, Bridge Point Gardena.

All the wells are slated to be plugged and abandoned, or re-plugged and abandoned, during the cleanup and remediation of the oil and gas infrastructure at the project site. Figure 3-19 provides a Google Earth map of the project site along with the locations of the wells.

Figure 3-22 Bridge Point Gardena Project Aerial Map

Source: Google Earth January 2021, CalGEM Well Finder January 2021

Multiple regulatory agencies including LA County Department of Public Health, Department of Regional Planning, LA County Supervisors Office, LA County Fire, LA County Fire Health Hazardous Materials Division and the South Coast Air Quality Management District responded to the mercaptan spill. The Department of Public Health further recommended that the developer prepare and submit a Community Health, Safety, and Notification Plan. The purpose of the plan is to inform the public of the following:

- Days, work times, and duration of the project;
- Emergency contact information;
- Strategies for protecting the community of possible hazards; and,
- Contact information for the public agencies overseeing the work.

The developer, Bridge Point Gardena, submitted the plan in October 2020 which included the following to minimize environmental impact and disruption to the surrounding residential neighborhood:

- Work schedule in days, time of day and expected duration;
- Emergency contact numbers;
- Worksite hazards and monitoring protocol;
- Dust control and monitoring;
- Noise control and monitoring;
- Odor control and air emissions monitoring;
- Light control and monitoring; and,
- Community notifications.

Members of the Strike Team reviewed the project site, details of the mercaptan spill, and reviewed and provided comments on the Community Health, Safety, and Notification Plan. During this process, several comments and recommendations were developed about the development of sites that contain past oil wells and or associated oil well infrastructure. Specific recommendations with respect to County permitting and project review for project sites with past oil and gas infrastructure (O&G Site Projects) include:

- Review, analyze, and strengthen County Department (Public Health, Public Works, Regional Planning) current oversight and monitoring for O&G Site Projects in coordination with CalGEM regulations;
- Require Community Health, Safety, and Notification Plans for O&G Site Projects;
- Review which County Department (Public Health, Public Works, Regional Planning) is best suited to review, approve, and provide monitoring of Community Health, Safety, and Notification Plan requirements;
- Implement a process whereby "by right" projects are checked for oil wells to ensure applicable projects are subject to a Community Health, Safety, and Notification Plan and monitoring;
- Require public noticing for "by right" O&G Site Projects to ensure the surrounding neighborhoods of these projects has access to project information and the Community Health, Safety, and Notification Plan;
- Develop a GIS layer for Regional Planning to include all existing oil wells independent of their current CalGEM status;
- Develop a comprehensive list of regulatory agency requirements for the plugging and abandonment of oil wells and disposition of associated hazardous wastes and protection of health and safety for nearby communities during well-plugging activities;
- Generate a chronological list/flow chart of the requirements noted above to ensure all applicable agencies are notified when an oil well is found;

- Revise the ministerial permitting process, including modification to the permit application and GIS review, to include review for existing oil wells on project sites; and,
- Revise the discretionary permitting process, including modification to the permit application and GIS review, to include review for existing oil wells on project sites.

3.7.3 West Hills Site – Canoga Park

Although not visited by the Strike Team, the Board requested that we include this case study in the report. Canoga Park Oil Field in the County of Los Angeles is located approximately ½ mile west of the entrance of El Escorpión Park at 24415-24425 Vanowen St, West Hills, CA 91307. Canoga Park Oil Field contains a total of 11 wells, but only six wells are physically visible at the surface: Knapp 3 (Frank Knapp), Knapp 1, Knapp 1-A, Knapp 4-1, Knapp 6, and Lucky Star 1. The remaining wells are believed to be buried.

On February 25, 2021, CalGEM issued a Notice of Noncompliance to Shinnecock Enterprises, Inc., the current owner of the parcels located at APNs 2031-015-002, 2031-015-003, and 2031-015-011 at the Canoga Park Oil Field. CalGEM observed that at least two of the idle or abandoned wells at the Canoga Park Oil Field are leaking hydrocarbons to the surface which poses a potential threat to groundwater and hazard to public health, safety, and the environment. CalGEM requested that the following remedial actions be taken as soon as possible:

- Install fencing around each wellhead or group of visible wells to prevent public access, in accordance with California Code of Regulations, title 14, section 1778.; and
- Clear vegetation around each wellhead or group of wellheads to reduce fire risk.

On June 3, 2021, a CalGEM Engineering Geologist conducted a field site visit to the Canoga Park Oil Field.

Dense vegetation up to six feet tall covers the well site and remains unchanged since a CalGEM visit in December 2019. The access road to the wells is poorly maintained and narrows to as little as two feet due to a partial washout prior to 2002, making vehicle passage impossible. Photos were taken of each well head and the same area was scanned with a Forward Looking Infrared (FLIR) camera. The FLIR camera detected no gas from any wellhead at the site, and each wellhead is completely accessible without any fencing or enclosure of any kind.

- Knapp 3 (Frank Knapp) (API # 037-00494) is filled with visible hydrocarbons to the surface, and some bubbles can be seen on that same hydrocarbon surface. Despite the presence of bubbles in this well, the FLIR camera showed no gas. A large stain around the wellhead is visible and appears larger than during the CalGEM visit in 2019.
- Knapp 1-A (API # 037-01162) appears unchanged from the CalGEM visit in 2019.
- Knapp 1 (API # 037-01161), located further afield, appears similar to the CalGEM visit in 2019. Much of the vegetation right at the wellhead has been removed revealing some visible staining at the base of the riser.
- Much further afield is Knapp 6 (API # 037-01166), which has a much larger and visible casing at the surface. A stranded rabbit was found inside the well approximately five feet down. A technician was dispatched to the Oil Field following a call to Los Angeles Animal

Control. The technician was guided to the well and was able to free the rabbit, releasing the animal nearby.

- Knapp 4-1 (API # 037-01160) had a pup-joint riser during the CalGEM visit in 2019, but that riser is now detached and laying on the nearby hillside. Knapp 4-1 appeared to have some fluid visible within the casing. The casing sits at the bottom of a small excavation which has now partially filled in.
- Lucky Star 1 (API # 037-01167) remains largely unchanged from 2019. The casing is buried under cement and other debris on the site, but the cellar and cement pad remain.

The wells do not appear to have an active operator. CalGEM is investigating the ownership of the mineral rights and to ascertain a responsible party. Once this is done, CalGEM will issue an order to plug and abandon the wells.

Table 3.25 Idle or Abandoned Canoga Park Oil Field Wells Located on the Properties

Well API	Well Name	Well Status
037-00494	Knapp 3 (Frank Knapp)	Visible (leaking)
037-01161	Knapp 1	Visible (leaking)
037-01162	Knapp 1-A	Visible
037-01168	Knapp 2 (McCarthy)	Not visible
037-01163	Knapp 3	Not visible
037-01164	Knapp 4	Not visible
037-01160	Knapp 4-1	Visible
037-01165	Knapp 5	Not visible
037-01166	Knapp 6	Visible
037-01167	Lucky Star 1	Visible
037-01169	Lunnon 1	Not visible

3.8 Existing Discretionary Permits

The Department of Regional Planning is currently reviewing existing oil well discretionary entitlements issued between the 1940s and 1970s. Discretionary permits issued during this period had no expiration dates and offered limited opportunities for oversight. There are seven existing Regional Planning discretionary entitlements that cover approximately 300 oil wells in the unincorporated LA County area. The primary goal of this effort is verification of operator compliance with permit conditions via in-depth research and site visits, along with appropriate enforcement actions.

3.9 Recommendations

3.9.1 Procedures for Development Review in Areas where Oil and Gas Activities Have Previously Occurred

Based on the findings of the Strike Team in looking at the number of abandoned and idle wells in the unincorporated areas, it is necessary to adopt a set of procedures to be used by planning staff when encountering development applications in areas where previous oil and gas development activities have occurred. The Procedures below are recommended for review by the DRP and adopted internally as part of the application review efforts. In addition, the procedures provide guidance to future developers on what needs to be done when encountering oil and gas wells in property slated for development.

3.9.1.1 General Procedures for Staff

These procedures are provided as recommendations for staff to consider when reviewing development project where oil and gas development may have occurred.

1. Develop a GIS layer to include all existing oil wells and gas (regardless of their status) for GIS Net. Flag identified priority wells in DRP systems for case intake purposes. For new development on properties where a priority well exists, ensure coordination with CalGEM and other applicable agencies for builder/property owner to address any well issues.
2. Collect all requirements from all agencies involved in projects that have jurisdiction on oil and gas activities.
3. Use the comprehensive list to incorporate in existing permitting workflows to ensure all agencies are notified when an oil and gas well is found, or where wells are likely to be present at the site of a development project.
4. Ensure that the discretionary permit circulation process with other agencies include the agencies involved that regulate oil and gas wells/chemical storage and develop a protocol to halt the permitting process if a requirement is missing.
5. Revise the ministerial process to include verification of existing oil and gas wells on project sites (modifying application and verifying GIS layer) and develop a vetting process that includes verifying if an oil and gas well exists and compliance confirmation from all respective agencies that all oil well requirements are met.
6. These procedures and this guidance are not intended to take the place of any CalGEM required procedures.
7. Provide information on existing and proposed easements that may interfere with future well abandonment.

3.9.1.2 General Procedure for Developers

This would be applicable to developers who have identified wells in their property where future development would occur. These efforts would have to be undertaken as part of the application process and the project due diligence.

1. All previously abandoned wells in the property shall be tested for gas leakage and visually inspected for oil leakage in accordance to CalGEM requirements. Wells would have to be tested prior to any approval for development to determine if the well is leaking and to determine if the well needs to be reabandoned prior to the new development occurring.
2. Leaking Well. A well shall be considered leaking if the meter reading is greater than 50 parts per million (ppm) as observed by CalGEM or other specifications as delineated by CalGEM. If wells are found to be leaking, to the well shall be abandoned to current CalGEM well abandonment standards.

The following recommendations are applicable when wells are known to exist or are suspected to exist on a property that is slated for development. These requirements are recommended to be submitted by developers when they are applying for their permits to DRP. The requirements below are to be part of the application process and required prior to issuing permits.

PROVIDE A SITE PLAN

1. Well location / Identification
2. Property boundaries
3. Proposed and Existing Structures
4. Proposed roads and streets
5. Plot all existing and proposed oil field facilities that will operate after completion of development, if applicable
6. Provide Close Proximity Specifications Drawing– Indicating the ability to have vehicle and/or rig access to the well (provide actual dimensions).

PROVIDE A WELL SURVEY

1. Licensed Surveyor – stamped and signed
2. All active, idle and abandoned wells shown
3. Provide Close Proximity Specifications Drawing– - Vehicle and / or rig access to the well, provide actual dimensions
4. NAD 83 well location or equivalent

CONDUCT A LEAK TEST

1. CalGEM complete oil well files for each oil well to be leak tested should be provided to the leak test contractor responsible for testing the oil wells. Leak tests typically need to be observed and approved by CalGEM.

2. Leak tests should be observed by the County or CalGEM personnel
3. The leak test should include sampling with a portable gas detector testing and a soap bubble test.
4. The leak test shall be completed utilizing a portable gas detector approved in advance by CalGEM.
5. Following a successful leak test, a metal top plate should be welded by a licensed welder in the presence of CALGEM (per CALGEM requirements).
6. Site Restoration. Following all testing and inspection, the test area should be returned to its previous state and fencing may be required around the area or the entire site.
7. A Leak Test Report should be submitted to the County including the following:
    a. Test and visual documentation with photos, including name and contact information of CalGEM or County personnel observing.
    b. Photos of the well head should include all visible casing and the plate to be tack-welded onto the casing.
    c. Photos and/or videos showing the monitor and the soap bubble test.
    d. The plate or cap to be tack welded onto the casing should identify the API number of the well, the name of the well and the date the well was last entered.
    e. Indicate the equipment used in leak testing, such as a GT-43 gas detection meter or equivalent along with calibration data.
    f. The testing firm name, qualifications, certification and/or license information.
    g. Any CalGEM correspondence and documentation, including a Construction Site Well Inspection report or other letters.

INSTALL VENT RISERS AND CONES

Vent risers and vent cones shall be installed prior to completing site grading activities. Vent cones shall have a minimum 4 ft diameter cone extending 2 ft minimum above the abandoned well cap and backfilled with 3/4 in. gravel and shall allow for leak testing the well at the surface. Vents shall include a rain guard to prevent water intrusion. Provide drawings showing the vent cone design to the County as part of plan submission.

3.9.2 Recommended Development Standards

In addition to the above, it is recommended that the County adopt a series of development standards specifically designed to address development in areas where oil and gas activities have previously occurred. These development standards can be included in the oil and gas ordinance currently under preparation by the County.

The following development standards shall be applied to all redevelopment projects within the footprint of where previous oil or gas development has occurred, including any building permit involving a current or former oil or gas site:

1. Any demolition, abandonment, re-abandonment, or restoration shall be adequately monitored by the appropriate County agency, funded by the permittee or operator, to ensure compliance with those conditions designed to mitigate anticipated significant adverse effects on the environment and to provide recommendations in instances where effects were not anticipated or mitigated by the conditions imposed on the permit or entitlement. Pre-restoration and post-restoration surveys of sensitive biological resources shall be employed as appropriate to measure compliance.
2. The site shall be assessed for all previously unidentified contamination. The permittee shall ensure that any discovery of contamination shall be reported to the appropriate County agency and the Los Angeles County Fire Department.
3. The permittee shall obtain all necessary permit approvals, including revisions to an entitlement or the demolition, abandonment, re-abandonment and restoration permit, if any are required, in order to remediate the contamination.
4. The permittee shall be responsible for any cost to remediate the contamination on the site. This section is not intended to limit the permittee or operator's rights under the law to seek compensation from parties who have contributed to contamination of the site.
5. The permittee shall ensure that appropriate notification has been recorded with the County Recorder to describe the presence and location of any contamination left in place under the authority of the Los Angeles County Fire Department.
6. All abandoned or re-abandoned wells shall be leak tested subject to the following requirements:
    a. All abandoned wells located within an oil and gas site must be tested for gas leakage and visually inspected for oil leakage. The operator shall apply for a CalGEM inspection permit to witness the well testing. The leak test shall be completed utilizing a gas detection meter approved in advance by the County and shall be conducted by a State licensed geotechnical or civil engineer or a State registered environmental assessor, class II, or a designee of the County.
    b. The permittee shall prepare and submit a methane assessment report for each tested well prepared per the City of Los Angeles Department of Building and Safety "Site Testing Standards for Methane" (P/BC 2014-101), as may be amended. Following satisfactory test results as per the City of Los Angeles Department of Building and Safety standards (City of Los Angeles standards for methane are used because they are more comprehensive than current methane standards by the County), a well vent and vent cone shall be installed to the satisfaction of the appropriate County agency and in compliance with the recommendations contained in the methane assessment report.
    c. The submitted methane assessment report shall be prepared by a State licensed geotechnical or civil engineer. A well shall be considered leaking if the leak test report indicates the meter read is greater than level II as defined by the City of Los Angeles Department of Building and Safety "Site Testing Standards for Methane," which is set at one thousand (1,000) parts per million. (City of Los Angeles standards for methane are used because they are more comprehensive than current methane standards by the County).

d. An approved methane assessment report is valid for twenty-four (24) months from approval by the appropriate County agency. If an abandonment permit has not been issued by this time, retesting shall be required. Following all testing and inspection, the test area shall be returned to its previous state to the satisfaction of the appropriate County agency.
e. If there has not been any change to the well (no additional drilling or plugging efforts have occurred), no leak test is required if a valid methane assessment report, accepted by the appropriate County agency and showing no leaks in excess of the leak limit, has been completed for an abandoned or re-abandoned well within the prior twenty-four (24) months.

7. Prior to any development or redevelopment of a current or former oil or gas site, or prior to abandoning or re-abandoning any well, the operator shall:
    a. Obtain permit(s) and abandon all idled wells and provide a certificate of compliance to show that the wells and/or sites are abandoned consistent with standards recommended or required by CalGEM to the satisfaction of the County. Permits shall not be required if the idled well is scheduled to produce oil or natural gas, or to be used for injection, as part of the development or redevelopment of a former oil or gas site and if said production or injection occurs within five (5) years of issuance of a permit.
    b. Obtain permit(s) to re-abandon all previously abandoned wells that do not meet standards recommended or required by CalGEM for abandonment in effect at the time of re-abandonment and provide a certificate of compliance that the wells and/or sites are re-abandoned consistent with current conditions and standards recommended or required by CalGEM to the satisfaction of the appropriate County agency.
    c. In lieu of subsections (7a) and (7b) of this Section, obtain a deferral covenant from the appropriate County agency requiring abandonment or re-abandonment to standards recommended or required by CalGEM, or equivalent standards as determined by the County, at a specific time or upon the occurrence of a future event. The deferral covenant shall be approved as to form by County Counsel, contain a provision to indemnify and hold harmless the County for damages related to wells not abandoned or re-abandoned consistent with standards recommended or required by CalGEM, and shall be recorded by the operator with the County Clerk prior to approval.

3.9.3 High Priority Wells Monitoring

As detailed in the Report, 128 wells were identified as high priority wells, and 43 of those wells were visited by the Strike Team to ascertain whether those highest priority wells presented any ongoing danger to the health and safety of the community or to the environment. In addition, 35 idle wells were also inspected as part of the Strike Team efforts. Although the Strike Team was unable to find any evidence of leaking wells during the inspections, this does not necessarily mean that those wells are not leaking, nor that they will not leak in the future. The prioritization scheme developed by the Strike Team and ratified by CalGEM proved to be a useful tool in prioritizing wells that could potentially leak. In addition, it is recommended that high priority wells (both plugged and abandoned; and idle wells) continue to be monitored by CalGEM or the County to

ensure that, if leaks are detected, those wells can be prioritized for plugging and abandonment to today's standards. It is recommended that all high priority wells are revisited every 3 to 5 years. In addition, it is recommended that those wells that were not inspected as part of this effort be inspected in the future to ascertain their status. It is also recommended that the County work with an expert consultant to continue monitoring wells within the timelines established above.

3.9.4 Idle Wells

As noted above, idle wells present a unique challenge because there are idle wells that are not part of an Idle Well Management Program and are labeled as idle by CalGEM as a default when no additional information is known about the status of the well. Idle wells are those wells that have historically not been recorded as having been plugged and abandoned and are not currently operating and producing oil/gas. Some idle wells may have just been left and potentially buried by a previous operator, and not properly abandoned. Wells that have not been properly plugged and abandoned, and are not being actively managed, can present a potential risk to the public or environment if they are associated with reservoirs that have some potential for gas production. As a result, the Strike Team is recommending that the Board requests that CalGEM conduct an audit of wells that are labeled idle in their database and determine a path forward for ensuring that those wells do not constitute a potential source of emissions and public health or environmental impacts. Long term idle wells should be prioritized for evaluation and proper plugging and abandonment as appropriate.

4.0 Oil and Gas Pipelines

Initial Project Staff work on oil and gas pipelines consisted of a meeting with a member of the Advisory Panel (Matt Rezvani), review of pipeline inspection regulations, interactions with the Office of the State Fire Marshall to obtain detailed pipeline data, and review of the National Pipeline Mapping System (NPMS) data.

4.1 Advisory Panel Member Matt Rezvani Meeting

Project Staff met with Mr. Rezvani on October 25, 2018 at the County DRP offices. Mr. Rezvani was involved with drafting of the California Pipeline Safety Act as well as some California oil spill legislation and is an asset and resource to the Strike Team. The discussion included an overview of the Elder California Pipeline Safety Act of 1981 which authorized the State Fire Marshal to exercise exclusive safety, regulatory, and enforcement authority over intrastate hazardous liquid pipelines and implement the Federal Hazardous Liquid Pipeline Safety Act. Components of the legislation provide for annual inspections and testing of hazardous liquid pipelines as discussed in detail in Section 4.2 below. Mr. Rezvani also provided input and direction to Project Staff on obtaining pipeline data, the fact that regulatory agencies have staffing challenges with regards to pipeline oversight, that the State has a significant number of abandoned pipelines, and the fact that many utility transmission pipelines in the State were built long ago and are now in or adjacent to new residential development.

4.2 Pipeline Inspection Regulations

Pipeline regulations that dictate maintenance and testing requirements are based on State and Federal regulations for pipeline safety. The discussion below provides the basis for the State's regulations and the Federal guidance that is promulgated within those regulations.

4.2.1 State Regulations - California Pipeline Safety Act of 1981

This Act grants regulatory jurisdiction to the State Fire Marshal for the safety of all intrastate (i.e., within state) hazardous liquid pipelines and all interstate (i.e., between states) pipelines used for the transportation of hazardous or highly volatile liquid substances. The law establishes the governing rules for interstate pipelines to be the Federal Hazardous Liquid Pipeline Safety Act and Federal pipeline safety regulations. Recent amendments require pipelines to include leak prevention and cathodic protection (i.e., the application of an electrical charge to a pipeline to prevent corrosion) systems as reviewed and approved by the State Fire Marshal. All new pipelines must also be designed to accommodate passage of instrumented inspection devices (smart pigs) through the pipeline.

State of California Government Code Parts 51010 through 51018 provide specific safety requirements including periodic hydrostatic testing of pipelines, specific accuracy requirements on leak rate determination, hydrostatic testing by state-certified independent pipeline testing firms, pipeline leak detection, and reporting of all leaks. Specific testing requirements of various intrastate pipelines are as follows:

Under Section 51012.3(a)(3), pipelines must meet cathodic protection requirements in accordance with Section 195.414 of Title 49 of the Code of Federal Regulations. Section 195.416 requires also that each operator shall, at intervals not exceeding 15 months, but at least once each calendar year,

conduct tests on each buried, in contact with the ground, or submerged pipeline facility in its pipeline system that is under cathodic protection to determine whether the protection is adequate. Each operator shall, at intervals not exceeding 2 ½ months, but at least six times each calendar year, inspect each of its cathodic protection rectifiers. Each operator shall, at intervals not exceeding 5 years, electrically inspect the bare pipe in its pipeline system that is not cathodically protected and must study leak records for that pipe to determine if additional protection is needed.

Pipelines built after 1990 are required to be piggable (accommodate the passage of instrumented internal inspection devices) (Section 51013).

Section 51013.5 of the Public Safety Code requires pipeline testing as follows:

- Pipelines without automatic pressure relief devices shall be hydrostatically tested annually;
- Pipelines over 10 years of age and not provided with effective cathodic protection shall be hydrostatically tested every three years, except for those on the State Fire Marshal's list of higher risk pipelines, which shall be hydrostatically tested annually;
- Pipeline over 10 years of age and provided with effective cathodic protection shall be hydrostatically tested every five years, except for those on the State Fire Marshal's list of higher risk pipelines which shall be hydrostatically tested every two years;
- Piping within a refined products bulk loading facility served by a pipeline shall be tested hydrostatically at 125 percent of maximum allowable operating pressure utilizing the product ordinarily transported in that piping if that piping is operated at a stress level of 20 percent or less of the specified minimum yield strength of the pipe. The frequency for pressure testing these pipelines shall be every five years for those pipelines with effective cathodic protection and every three years for those pipelines without effective cathodic protection. If that piping is observable, visual inspection may be the method of testing;
- Test methods other than the hydrostatic tests required above, including inspection by instrumented internal inspection devices, may be approved by the State Fire Marshal on an individual basis. If the State Fire Marshal approves an alternative to a pressure test in an individual case, the State Fire Marshal may require that the alternative test be given more frequently than the testing frequencies specified above;
- The test pressure for each pressure test conducted must be maintained throughout the part of the system being tested for at least 4 continuous hours at a pressure equal to 125 percent, or more, of the maximum operating pressure and, in the case of a pipeline that is not visually inspected for leakage during test, for at least an additional 4 continuous hours at a pressure equal to 110 percent, or more, of the maximum operating pressure; and,
- When hydrostatic testing is required by Section 51013.5, the test results shall be certified by an independent testing firm or person who is selected from a list, provided by the State Fire Marshal, of independent testing firms or persons approved annually by the State Fire Marshal.

Section 51055.1 provides that commencing January 1, 2017, the State Fire Marshal, or an officer or employee authorized by the State Fire Marshal, shall annually inspect all intrastate pipelines and operators of intrastate pipelines under the jurisdiction of the State Fire Marshal to ensure

compliance with applicable laws and regulations. Per the State Fire Marshal Guidelines each inspection shall contain the following:

- Evaluation of the risks to each intrastate hazardous liquid pipeline based upon the operator history, integrity testing results, preventative and mitigative measures, construction activities, leak history, and compliance history;
- An annual inspection of each operator of an intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016; and,
- An annual inspection of each intrastate hazardous liquid pipeline in accordance with California State Fire Marshal Annual Inspection Procedures dated July 1, 2016.

Each operator of an intrastate hazardous liquid pipeline shall complete and submit to the Office of the State Fire Marshal Form PSD-101 for each intrastate hazardous liquid pipeline no later than July 1st annually.

4.2.2 CalGEM Regulations

CalGEM has regulations that typically apply to smaller flowlines, pipelines within oil fields, gathering lines, production lines or injection lines typically within the administrative boundaries of an oil and gas field. New regulations for certain pipelines associated with California oil and gas production (Assembly Bill 1420) became effective on October 1, 2018. The regulations now require as follows:

- Operators shall visually inspect all aboveground pipelines for leaks and corrosion at least once a year;
- Operators shall inspect all active gas pipelines in sensitive areas (buildings within 300 feet of an active pipeline, areas determined to be a significant threat from a leak, or a pipeline with a chronic leak history) that are 10 or more years old for leaks or other defects at least once a year, or at a frequency approved by CalGEM's State Oil and Gas Supervisor and listed in the operator's Pipeline Management Plan. The operator shall conduct the inspection in accordance with applicable regulatory standards or, in the absence thereof, an accepted industry standard that is specified by the operator and listed in the Pipeline Management Plan;
- CalGEM may order such tests or inspections deemed necessary to establish the reliability of any pipeline system. Repair, replacement, or cathodic protection may be required;
- Operators shall conduct pressure testing using: (A) The guidelines recommended by industry standards, such as the American Petroleum Institute, American Society of Mechanical Engineers for oil or gas pipelines; or (B) The method approved by the State Fire Marshal, Pipeline Safety Division for liquid pipelines or U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration for gas pipelines; on any pipeline that has had a leak resulting in the release of a fluid in a quantity that triggers reporting of the release under any regulatory, statutory, or other legal requirement. The pipeline shall not be returned to service unless the pressure testing has been

successfully completed. Test results shall be provided to the CalGEM for review within seven days following the test;

- The operator shall perform periodic mechanical integrity testing on all active environmentally sensitive pipelines that are gathering lines, all urban pipelines over 4" in diameter, and all active gas pipelines in sensitive areas. The mechanical integrity testing shall be conducted every two years, or at an alternative frequency approved by CalGEM based on demonstrated wall thickness and remaining service life over a period of at least two years. The testing frequencies shall be specified in the operator's Pipeline Management Plan. Pipelines less than 10 years old are exempt from the two-year testing requirements of this subdivision. These tests shall be performed to ensure the pipeline integrity by using at least one of the following methods: Subject to review and approval by CalGEM, the operator shall identify effective mechanical integrity testing methods based on pipeline type and use. The mechanical integrity testing methodology for compliance with this subdivision shall be specified in the operator's Pipeline Management Plan and shall include at least one of the following: (1) Nondestructive testing using ultrasonic or other techniques approved by CalGEM, to determine wall thickness; (2) Pressure testing consistent with CSFM regulations; (3) Internal inspection devices such as a smart pig, as approved by CalGEM; Any other method of ensuring the integrity of a pipeline that is approved by the State Oil and Gas Supervisor that ensures mechanical integrity so as to protect life, health, property and natural resources; and,
- Copies of mechanical integrity test results shall be maintained in a local office of the operator for ten years and made available to the CalGEM, upon request. The operator shall assess all test results to determine continued safe operations and that risks identified in the Pipeline Management Plan are adequately addressed. The operator shall repair and retest or remove from service any pipeline that fails the mechanical integrity test. CalGEM shall be promptly notified in writing by the operator of any pipeline taken out of service due to a test failure.

4.2.3 California Public Utility Commission Regulations

The California Public Utilities Commission (CPUC) regulations on pipelines are considered to not supersede the Federal Pipeline Safety Regulations but are supplements to the Federal Regulations. The Regulations provide minimum requirements for the design, construction, quality of materials, locations, testing, operations and maintenance of facilities used in the gathering, transmission and distribution of gas and in liquefied natural gas facilities to safeguard life or limb, health, property and public welfare and to provide that adequate service will be maintained by gas operators under the jurisdiction of the CPUC.

For CPUC lines the following requirements apply: At least 60 days prior to the construction of a new pipeline, reconstruction, or reconditioning of an existing pipeline, a report shall be filed with the CPUC setting forth the proposed route and general specifications for such pipeline. The specifications shall include but not be limited to the following items:

- Description and purpose of the proposed pipeline;

- Specifications covering the pipe selected for installation, route map segregating incorporated areas, class locations and design factors, and terrain profile sketches indicating maximum and minimum elevations for each test section of pipeline;
- Maximum allowable operating pressure for which the line is being constructed;
- Test medium and pressure to be used during strength testing; and,
- Protection of pipeline from hazards and external corrosion.

For distribution and transmission systems the following regulations apply for leakage surveys and procedures:

- A gas leak survey, using leak detecting equipment, must be conducted in business districts and in the vicinity of schools, hospitals, and churches, including tests of the atmosphere in gas, electric, telephone, sewer, and water system manholes, at cracks in pavement, and sidewalks, and at other locations providing an opportunity for finding gas leaks, at intervals not exceeding 15 months, but at least once each calendar year; and,
- A gas leakage survey of transmission pipelines, using leak detecting equipment must be conducted at least twice each year and at intervals not exceeding 7 ½ months.

4.2.4 Federal Regulations

Some hazardous liquid pipelines are under the jurisdiction of the Department of Transportation (DOT) and must follow the regulations in 49 CFR Part 195, Transportation of Hazardous Liquids by Pipeline, as authorized by the Hazardous Liquid Pipeline Safety Act of 1979 (49 U.S.C. 2004). Other applicable Federal requirements are contained in 40 CFR Parts 109, 110, 112, 113, and 114, pertaining to the need for Oil Spill Prevention Control & Countermeasures (SPCC) Plans; 40 CFR Parts 109– 114 promulgated in response to the Oil Pollution Act of 1990.

Part 195.30 incorporates many of the applicable national safety standards of the:

- American Petroleum Institute (API);
- American Society of Mechanical Engineers (ASME);
- American National Standards Institute (ANSI); and,
- American Society for Testing and Materials (ASTM).

Part 195.50 requires reporting of accidents by telephone and in writing for:

- Explosion or fire not intentionally set by the operator;
- Spills of five gallons or more or five barrels if confined to company property and cleaned up promptly;
- Daily loss of five barrels a day to the atmosphere;

- Death or injury necessitating hospitalization; or
- Estimated property damage, including cleanup costs, greater than $50,000.

Reporting is to the National Response Center (NRC) at 800-424-8802. The NRC is a part of the federally established National Response System and staffed 24 hours a day by the U.S. Coast Guard. It is the designated federal point of contact for reporting all oil, chemical, radiological, biological and etiological discharges into the environment, anywhere in the United States and its territories. The NRC also takes maritime reports of suspicious activity and security breaches within the waters of the United States and its territories.

The Part 195.100 series includes design requirements for the temperature environment, variations in pressure, internal design pressure for pipe specifications, external pressure and external loads, new and used pipe, valves, fittings, and flanges.

The Part 195.200 series provides construction requirements for standards such as compliance, inspections, welding, siting and routing, bending, welding and welders, inspection and nondestructive testing of welds, external corrosion and cathodic protection, installing in-ditch and covering, clearances and crossings, valves, pumping, breakout tanks, and construction records.

The Part 195.300 series prescribes minimum requirements for hydrostatic testing, compliance dates, test pressures and duration, test medium, and records.

The Part 195.400 series specifies minimum requirements for operating and maintaining steel pipeline systems, including:

- Correction of unsafe conditions within a reasonable time;
- Procedural manual for operations, maintenance, and emergencies;
- Training;
- Maps;
- Maximum operating pressure;
- Communication system;
- Cathodic protection system;
- External and internal corrosion control;
- Valve maintenance;
- Pipeline repairs;
- Overpressure safety devices;
- Firefighting equipment; and,
- Public education program for hazardous liquid pipeline emergencies and reporting.

Part 195.452 addresses Pipeline Integrity Management Plans (IMP) in High Consequence Areas for Hazardous Liquid Operators which were existing on or after May 29, 2001. IMPs specify regulations to assess, evaluate, repair and validate, through comprehensive analysis, the integrity of hazardous liquid pipeline segments that, in the event of a leak or failure, could affect populated areas, areas unusually sensitive to environmental damage, and commercially navigable waterways. Section h.4 of 49 CFR 195.452 specifies repair criteria for pipelines based on smart pig results. These require that immediate repairs shall be conducted for the following conditions:

- Metal loss greater than 80% of nominal wall regardless of dimensions;
- Predicted burst pressure less than the established maximum operating pressure;
- A dent located on the top of the pipeline that has any indication of metal loss, cracking or a stress riser; and,
- A dent located on the top of the pipeline with a depth greater than 6% of the nominal pipe diameter.

An operator must schedule evaluation and remediation of the following conditions within 60 days for the following conditions:

- All the items listed above for the immediate repair period;
- A dent located on the top of the pipeline with a depth greater than 3% of the pipeline diameter (or 0.250 inches in depth for a pipeline diameter less than 12”); and,
- A dent located on the bottom of the pipeline that has any indication of metal loss, cracking or a stress riser.

An operator must schedule evaluation and remediation of the following conditions within 180 days for the following conditions:

- All the items listed above for the 60 day and immediate repair periods;
- A dent with a depth greater than 2% of the pipeline's diameter that affects pipe curvature at a girth weld or a longitudinal seam weld (or 0.250 inches in depth for a pipeline diameter less than 12”);
- A dent located on the top of the pipeline with a depth greater than 2% of the pipeline's diameter (or 0.250 inches in depth for a pipeline diameter less than 12” (NPS 12));
- A dent located on the bottom of the pipeline with a depth greater than 6% of the pipeline's diameter;
- An area of general corrosion with a predicted metal loss greater than 50% of nominal wall;
- Predicted metal loss greater than 50% of nominal wall that is located at a crossing of another pipeline, or is in an area with widespread circumferential corrosion, or is in an area that could affect a girth weld;
- A potential crack indication that when excavated is determined to be a crack;
- Corrosion of or along a longitudinal seam weld; and,

- A gouge or groove greater than 12.5% of nominal wall.

4.3 State Fire Marshall Data Request

The State Fire Marshal provides regulatory and enforcement authority over intrastate hazardous liquid pipelines and implements the Federal Hazardous Liquid Pipeline Safety Act. State Fire Marshall data relevant to the Project include geographic information files (GIS or Shapefiles), pipeline inspection data, and pipeline operator data submittal (PSD-101) forms. Data requests and discussion with the State Fire Marshall commenced in September 2018. Correspondence is summarized below.

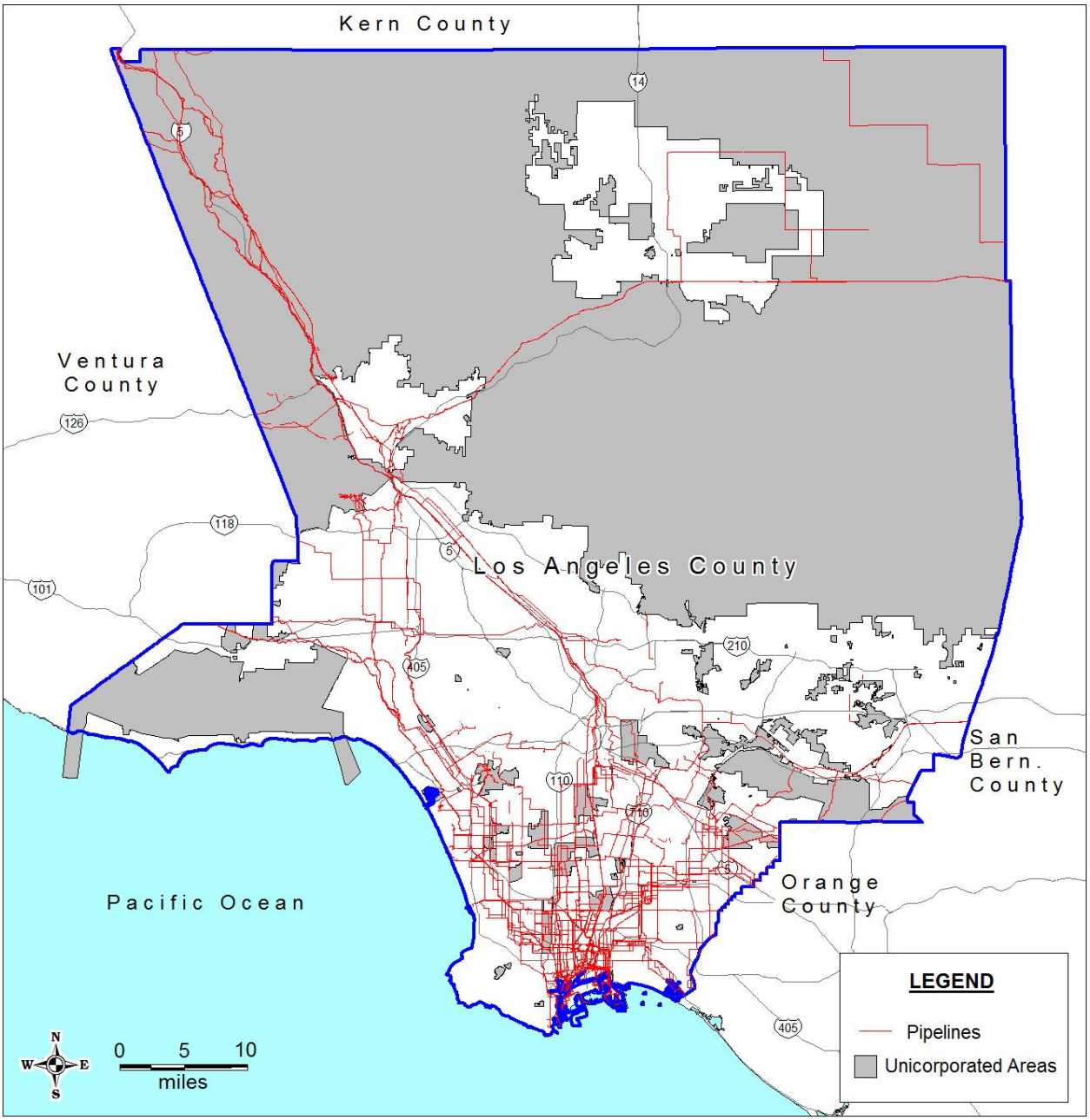
- 9/19/2018 – Project Staff meeting request sent to CalFire.
- 11/6/2018 – Response received from CalFire stating the Public Records Act (PRA) process is required for CalFire information.
- 11/7/18 – Project Staff clarification correspondence sent to CalFire.
- 11/8/18 – Project Staff sent PRA request with requested data detail sent to CalFire.
- 11/15/18 – Request for conference call received from CalFire.
- 11/19/18 – Request from CalFire for additional time to address PRA request.
- 11/20/18 – Conference call with Project Staff and CalFire on data request.
- 11/30/18 – Background detail on data requested received from CalFire, no data received.
- 12/3/18 – Request and notice that the PRA data request time limit expired sent to CalFire.
- 12/10/18 – Project Staff request for follow-up on PRA data extension request sent to CalFire.
- 12/10/18 – Response but no data received from CalFire.
- 12/11/18 – Clarification about limiting scope of data request to unincorporated County sent to CalFire.
- 12/13/18 – CalFire response for more time on data request scope received.
- 1/30/19 – Telecon with Project Staff and CalFire on PRA request.
- 2/5/19 – Project Staff request for first subset of pipeline data sent to CalFire.
- 2/8/19 – Response received from CalFire stating first set of pipeline data will be provided middle March 2019.
- 4/15/19 – Project Staff received a first set of pipeline data from CalFire.
- 6/25/19 – Project Staff request for a second subset of pipeline data sent to CalFire.
- 8/8/19 – Project Staff received correspondence from CalFire stating a second set of pipeline data is available.
- 8/2/19 – Telecon with Project Staff and CalFire on PRA request.
- 10/23/19- Project staff received PSD-101 annual report submittals for pipelines twelve inches and greater.
- 8/19/20 – Project staff received PSD-101 annual report submittals for pipelines between eight and twelve inches in diameter.

The PSD-101 forms contain current key information on pipeline specifications, pipeline commodities, integrity testing, hydrostatic pressure testing, leak detection system, and corrosion control. This set of data has been reviewed and is discussed in Section 4.5 below.

4.4 NPMS Pipeline Data

The National Pipeline Mapping System (NPMS) is a Geographic Information System (GIS) data set that contains the location and attributes of hazardous liquid and gas pipelines, liquified natural gas (LNG) plants, and tank farms. Data is required to be reviewed by operators annually and must be re-submitted if any of the data has changed. Some NPMS data is available to the public and additional specific data is available to government agencies. A data set was obtained in November 2018 for Los Angeles County containing a mapping and pipeline data set and was reviewed and mapped for the unincorporated County. A general map of the pipelines from the NPMS data is shown in Figure 4-1. Note that detailed locations for pipelines are not presented in this report for homeland security and safety reasons.

Figure 4-1 Los Angeles County NPMS Pipelines



Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Based on the NPMS data there are 1,400 hazardous liquid and gas pipelines managed by 20 different operators located in the unincorporated areas of Los Angeles County. For Los Angeles County as a whole, the NPMS data lists 4,342 pipelines with 42 operators. Table 4.1 lists the pipeline operators and number of pipelines for each in the unincorporated LA County. The database provides the status of the pipelines as "in service", "idle", "abandoned", or "retired" as follows:

- In Service – currently transports hazardous liquids or natural gas;
- Idle – pipeline is maintained such that it may be brought back into service;
- Abandoned – pipeline is permanently removed from service; and,
- Retired – removed from service and no longer maintained but not permanently abandoned.

Pipelines in Table 4.1 below identified as abandoned by the operator are identified as permanently removed from service in the NPMS database. The 1,031 pipelines in service, idle, or retired in the unincorporated LA County have an identified designated operator. Table 4.2 provides the number of pipelines for each category of pipeline.

Table 4.1 Unincorporated LA County Hazardous Liquid and Gas Pipeline and Operators

Pipeline Operator	Number of Pipelines
Southern California Gas Company	811
Abandoned	369
Chevron Pipeline Company	64
Crimson Pipeline L.P.	28
Plains Pipeline L.P.	24
Shell Pipeline CO., L.P.	14
Torrance Basin Pipeline Company LLC	14
Phillips 66 Pipeline LLC	11
Torrance Valley Pipeline Company LLC	11
SFPP, LP	10
Plains Marketing, L.P.	9
Torrance Pipeline Company LLC	8
Breitburn Management Company, LLC	7
Tesoro SoCal Pipeline Company LLC	7
Paramount Petroleum Corp	5
City of Vernon	2
DOD Defense Energy Support Center	2
West Coast Terminal Pipeline (WCTP)	2
Air Products and Chemicals Inc	1
CalNev Pipeline CO.	1
Total	**1,400**
Total less Abandoned	**1,031**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Table 4.2 Unincorporated LA County Pipelines by Service Status

Service Category	Number of Pipelines
In Service	935
Idle	79
Retired	17
Permanently Abandoned	369
Total	**1,400**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.

Pipelines by commodity and size are shown, less the permanently abandoned pipelines, in Tables 4.3 and 4.4. The NPMS data set lists 3,190 miles of hazardous liquid and gas pipelines in LA County with approximately 656 miles of those pipelines in the unincorporated LA County areas. It should be noted these totals do not include lengths for So Cal Gas pipelines as this data was not included in the NPMS data set. Table 4.3 provides the number of miles associated with each commodity type.

Table 4.3 Unincorporated LA County Pipelines by Commodity Type

Commodity	Number of Pipelines	Miles of Pipeline[1]
Crude Oil	147	202.6
Empty Gas	0	0
Empty Liquid	0	0
Fuel Grade Ethanol	0	0.0
Hydrogen Gas	1	1.0
Liquefied Petroleum Gas	0	0.0
Natural Gas[1]	821	221.1
Other Gas	0	0.0
Product (Non-Highly Volatile Liquid)	62	91.5
Totals	**1031**	**656.5**

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1. National Pipeline Mapping System (NPMS) data set did not contain mileage data for So Cal Gas pipelines.

Table 4.4 Unincorporated LA County Pipelines by Diameter

Pipeline Diameter (Inches)	Number of Pipelines
20 to 24	20
18 to <20	0
16 to <18	23
14 to <16	11
12 to<14	23
10 to <12	21
8 to <10	36
6 to <8	33
4 to <6	34
Less than 4	8
No Data1	822
Total	1031

Source: National Pipeline Mapping System (NPMS) Los Angeles County November 2018.
1 The majority of these pipelines (811) are SoCal Gas Company pipelines with no size detail in data set.

4.5 California State Fire Marshall (CSFM) Pipeline Data

Annual pipeline operator reports (CSFM Form PS-101 California Intrastate Pipeline Operator Reports) contain data and validated inspection results from the previous calendar year for each pipeline under the CSFM jurisdiction. The annual PSD-101 reporting requirement began in 2017 under Senate Bill (SB) 295 (Government Code §51015.1(a) and Title 19, California Code of Regulations, Chapter 14, Article 2). SB 295 mandated the CSFM adopt regulations and conduct annual inspections to reduce the potential for jurisdictional hazardous liquid pipeline accidents in California. Note that the pipeline data received does not include pipeline location data or GIS digital files as the CSFM does not release that type of information for homeland security reasons.

Project staff received PS-101 reports in October 2019 for pipelines with diameters twelve inches and greater located in unincorporated LA County. In August 2020, PS-101 data for pipelines with diameters between eight and twelve inches was received from the CSFM. The data in the PS-101 reports is organized by CSFM inspection units, also known as inspection modules, which are assigned by the CSFM. A single pipeline in the CSFM data set may have many inspection units and therefore a direct comparison between the NPMS and the CSFM data sets is not possible. Review of the initial set of PS-101 reports confirms pipeline operators are conducting integrity testing as required and as summarized in Table 4.5 below.

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0206	24	Crude Oil	In Line	11/14/2017	11/14/2022	6/30/1997
1069	24	Crude Oil	No Data	3/19/2013	3/19/2018	11/16/1999
0026	20	Refined Products	In Line	2/18/2016	2/18/2021	6/29/2010
0454	20	Refined Products	In Line	2/11/2015	2/20/2020	5/14/1992
0987	20	Crude Oil	In Line	4/24/2019	4/24/2019	Multiple
0988	20	Crude Oil	In Line	12/18/2017	12/18/2018	11/22/1998

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
1176	20	Crude Oil	No Data	No Data	3/29/2022	3/29/2017
0100	16	Refined Products	In Line	5/31/2017	5/31/2020	8/17/1983
0104	16	Crude Oil	No Data	12/2/2014	12/2/2019	1/25/2000
0233	16	Crude Oil	In Line	5/19/2015	5/17/2020	9/16/1988
0233	16	Crude Oil	In Line	6/11/2009	6/3/2019	1992
0266	16	Refined Products	No Data	4/29/2016	4/26/2021	No Data
0390	16	Crude Oil	No Data	7/18/2016	7/18/2001	9/23/2003
0800	16	Crude Oil	No Data	7/12/2016	7/12/2021	No Data
1062	16	Crude Oil	No Data	6/4/2016	6/4/2018	10/30/2003
1102	16	Crude Oil	No Data	12/9/2014	12/9/2018	1/24/2011
1103	16	Crude Oil	No Data	12/9/2018	12/9/2018	1/24/2011
1104	16	Crude Oil	No Data	12/9/2014	12/9/2014	1/25/2000
1266	16	Crude Oil	In Line	8/13/2017	2/11/2019	1/17/1999
0125	14	Crude Oil	No Data	10/17/2015	1/17/2020	3/10/2016
1034	14	Crude Oil	No Data	No Data	No Data	6/17/2009
1323	14	Crude Oil	No Data	8/9/2016	8/9/2021	10/19/2014
1324	14	Crude Oil	In Line	1/24/2017	1/24/2019	8/9/2015
192	12.75	Crude Oil	In Line	2/21/2013	2/20/2018	1993
0042	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/3/2014
0127	12	Refined Products	In Line	4/20/2016	4/20/2019	4/22/2008
0455	12	Crude Oil	In Line	4/20/2015	4/20/2020	6/31/94
0735	12	Refined Products	No Data	5/24/2016	5/24/2021	10/10/2001
1224	12	Refined Products	In Line	5/24/2016	5/24/2021	10/10/2001
0201	10.75	Refined Products	In Line	5/11/2016	5/10/2021	10/13/2016
0166	10	Refined Products	No Data	No Data	12/21/2022	12/21/2017
0339	10	Crude Oil	In Line	1/30/2015	1/30/2020	1/3/2009
0334	10	Crude Oil	In Line	7/19/2015	7/19/2020	No Data
0065	10	Nitrogen	Other	5/12/2009	No Data	No Data
0450	10	Crude Oil	In Line	3/20/2017	3/20/2022	2/11/1994
0458	8-10	Crude Oil	In Line	2/3/2015	2/3/2020	12/7/199
0696	8-10	Jet Fuel	In Line	8/11/2015	8/11/220	No Data
0204	8.68	Crude Oil	Other	No Data	No Data	6/3/2004
0200	8.68	Crude Oil	In Line	6/29/2017	6/24/2019	1/29/20106
0193	8.63	Refined Products	In Line	2/24/2010	No Data	4/4/2014
0027	8	Refined Products	In Line	5/15/2019	5/15/2024	10/21/2014
0030	8	Refined Products	In Line	8/5/2015	8/5/2015	9/18/2014
0033	8	Refined Products	In Line	8/18/2018	8/18/2018	7/17/2013
0041	8	Crude Oil	No Data	No Data	No Data	No Data
0703	8	Crude Oil	No Data	No Data	No Data	No Data
0177	8	Crude Oil	No Data	No Data	No Data	No Data
0862	8	Crude Oil	No Data	No Data	No Data	No Data
0383	8	Crude Oil	No Data	No Data	No Data	No Data

Table 4.5 CSFM Pipeline Inspection Summary – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Diameter Inches	Product[1]	Inspection Type	Last Inspection	Next Inspection	Last Hydrostatic Test
0335	8	Refined Products	In Line	6/2/2017	6/2/2022	1/1/2003
0336	8	Jet Fuel	In Line	4/15/2015	4/15/2020	12/2/1992
0457	8	Refined Products	In Line	3/16/2015	8/27/2019	6/21/2000

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5 below.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

As shown in Table 4.5 above, in line testing is the most common method for integrity testing of a hazardous material pipeline. In-line Inspection (ILI) involves the evaluation of pipes and pipelines using "smart pigs" (both tethered and non-tethered) that utilize non-destructive examination techniques to detect and size internal damage. ILI measures and records irregularities in pipelines including corrosion, cracks, deformations, or other defects. Smart pigs are inserted into the pipeline and are pushed along by the flowing product. Hydrostatic testing involves filling the pipe system with a liquid, usually water, which may be dyed to aid in visual leak detection, and pressurization of the line to the specified test pressure. The U.S. Department of Transportation Pipeline & Hazardous Materials Safety Administration requires that hydrostatic testing of hazardous liquid pipelines to at least 125% of the maximum operating pressure (MOP), for at least 4 continuous hours, and an additional 4 hours at a pressure of at least 110% of MOP if the piping is not visible.

Other data derived from the initial set of PSD-101 Annual Reports includes the following as listed in Table 4.6:

- High Consequence Areas. If the pipeline inspection unit sections have the potential to impact a high consequence area (HCA). The U.S. Department of Transportation on-line glossary defines an HCA as *"A location that is specially defined in pipeline safety regulations as an area where pipeline releases could have greater consequences to health and safety or the environment. For oil pipelines, HCAs include high population areas, other population areas, commercially navigable waterways and areas unusually sensitive to environmental damage";*
- Corrosion Protection. The type of corrosion protection (cathodic protection) used on the pipeline inspection unit. Impressed current systems are used on every line in the initial PS-101 data set;
- Leak Detection Systems. If a Computational Pipeline Monitoring (CPM) or Supervisory Control and Data Acquisition (SCADA) system for leak detection is used. Of the inspection unit data sets with information for this category, most pipeline sections with this data utilized a SCADA system. Other pipeline leak detection methods included mass balance and volume balance/line pressure deviation;
- Corrosion Inhibitor Use; and,
- Pipeline Coatings Use.

Table 4.6 CSFM Pipeline Additional Data – PSD-101 2018/2019 Reporting Years

CSFM Line ID	HCA	Corrosion Protection	Leak Detection System	SCADA System	Corrosion Inhibitor	Pipeline Coatings
0206	Yes	Yes	No	Yes	No	Yes
1069	Yes	Yes	No	Yes	Yes	Yes
0026	Yes	Yes	Yes	Yes	Yes	Yes
0454	Yes	Yes	Yes	Yes	No	Yes
0987	Yes	Yes	No Data	Yes	Yes	Yes
0988	Yes	Yes	Yes	Yes	Yes	Yes
1176	Yes	Yes	No	Yes	No	Yes
0100	Yes	Yes	Yes	Yes	No	Yes
0104	Yes	Yes	Yes	Yes	No	Yes
0233	Yes	Yes	No	Yes	No	Yes
0233	Yes	Yes	No	Yes	No	Yes
0266	Yes	Yes	No	Yes	No	Yes
0390	Yes	Yes	Yes	Yes	No	Yes
0800	Yes	Yes	Yes	Yes	No	Yes
1062	Yes	Yes	No	Yes	No	Yes
1102	Yes	Yes	Yes	Yes	Yes	Yes
1103	Yes	Yes	Yes	Yes	Yes	Yes
1104	Yes	Yes	Yes	Yes	Yes	Yes
1266	Yes	Yes	Yes	Yes	Yes	Yes
0125	Yes	Yes	Yes	Yes	No	Yes
1034	No	Yes	Yes	Yes	Yes	No
1323	Yes	Yes	Yes	Yes	Yes	Yes
1324	Yes	Yes	Yes	Yes	Yes	Yes
192	Yes	Yes	No	Yes	No	Yes
0042	Yes	Yes	Yes	Yes	No	Yes
0127	Yes	Yes	No Data	Yes	No	Yes
0455	Yes	Yes	Yes	Yes	No	Yes
0735	Yes	Yes	No Data	No Data	No	No
1224	Yes	Yes	Yes	Yes	No	Yes
0201	Yes	Yes	Yes	Yes	No	Yes
0166	Yes	Yes	No	Yes	No	Yes
0339	Yes	Yes	Yes	Yes	Yes	Yes
0334	Yes	Yes	Yes	Yes	No	Yes
0065	Yes	No Data	No Data	No Data	No Data	Yes
0450	Yes	Yes	No Data	Yes	No	Yes
0458	Yes	Yes	Yes	Yes	No	Yes
0696	Yes	Yes	No	Yes	No	Yes
0204	Yes	Yes	No	No	No	Yes
0200	Yes	Yes	Yes	Yes	Yes	Yes
0193	Yes	Yes	Yes	Yes	No	Yes
0027	Yes	Yes	Yes	Yes	No	Yes
0030	Yes	Yes	Yes	Yes	No	Yes

Table 4.6 CSFM Pipeline Additional Data – PSD-101 2018/2019 Reporting Years

CSFM Line ID	HCA	Corrosion Protection	Leak Detection System	SCADA System	Corrosion Inhibitor	Pipeline Coatings
0033	Yes	Yes	Yes	Yes	No	Yes
0041	Yes	No Data	No Data	No Data	No Data	Yes
0703	No Data	No Data	No Data	No Data	No Data	No
0177	No	No Data	No Data	No Data	No Data	Yes
0862	No Data	No Data	No Data	No Data	No Data	No
0383	No Data	No Data	No Data	No Data	No Data	No
0335	Yes	Yes	Yes	Yes	No	Yes
0336	Yes	Yes	Yes	Yes	No	Yes
0457	Yes	Yes	Yes	Yes	No	Yes

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5.
1 Refined products include gasoline, diesel, jet fuel, or other refined petroleum product.

The data in Table 4.6 is presented to provide pertinent information on pipelines available from the PSD-101 database. The data documents the preventative measures for corrosion monitoring and leak detection for those pipelines. A pipeline that is not undergoing cathodic protection, or that has a substantial amount of corrosion is more likely to leak than other pipelines that do not. Similarly, if a pipeline has a leak detection system is place, it is more likely to identify a problem shortly after it has occurred and, in that fashion, prevent further damage.

4.5.5 High Priority Pipelines

Review of the inspection date data in Table 4.5 indicates a number of pipelines with last inspection dates older than five years (2020 baseline year) or with no data submitted for last inspection date on the PS-101 forms. These pipelines merit follow up review to determine the cause of the lack of recent inspection data; 17 pipelines in the data set meet this criterion (identified in bold font in Table 4.5).

In addition to dated or missing inspection data, the factors outlined in Table 4.6 along with the contents of the pipeline were used to guide the Strike Team in determining pipelines that may warrant further review. One additional descriptor that can be factored in the analysis of risk for pipelines is the operating pressure, however, review of the PS-101 data set indicated the maximum operating pressure for the pipelines ranged from 275 to 1440 pounds per square inch (psi). Therefore, as most of the subject pipelines operate at significant pressure, operating pressure was not used as a screening factor in scoring the pipeline data set for further review.

Pipelines were ranked for further review by assigning a point to each factor that is deficient in Table 4.6 with an additional point for larger sized pipelines and pipelines containing product. Priority is based on the following information (a point for each item that answers a "No"):

- Is the pipeline located outside of a High Consequence Area (HCA)?
- Does the pipeline utilize corrosion protection?
- Does the pipeline have a leak detection system?

- Does the pipeline have a SCADA system?
- Does the pipeline use corrosion inhibitor?
- Is the pipeline coated?
- Pipeline size; and
- Pipeline contents.

In addition to the items in Table 4.6, large pipelines contain larger volumes and therefore have the potential to spill greater amounts of hazardous materials; pipelines 14 inches and larger were assigned an additional point in the ranking system. Pipeline contents were also used in the ranking as the consequences of a crude oil spill on public safety are generally lower than a release of gasoline or jet fuel, or other refined petroleum products, since refined petroleum products can produce flammable vapor clouds more readily. Therefore, pipelines containing products other than crude oil were given an additional point in the scoring system with the exception of the single pipeline in the data set containing nitrogen. Results, with potential scores ranging from zero to eight with higher scores representing a higher potential risk, by pipeline, are presented in Table 4.7.

Table 4.7 CSFM Priority Pipelines – PSD-101 2018/2019 Reporting Years

CSFM Line ID	Priority Score		CSFM Line ID	Priority Score		CSFM Line ID	Priority Score
206	4		1104	2		450	3
1069	3		1266	2		458	3
26	3		125	3		**696**	5
454	4		1034	2		**204**	4
987	3		1323	2		200	1
988	2		1324	2		193	3
1176	4		192	3		27	3
100	4		42	2		30	3
104	3		**127**	4		33	3
233 a	4		455	2		**41**	5
233 b	4		**735**	6		**703**	6
266	5		1224	3		**177**	4
390	3		201	3		**862**	6
800	3		**166**	4		**383**	6
1062	4		339	1		335	3
1102	2		334	2		336	3
1103	2		**65**	6		457	3

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).
Bold face type font = high priority designation, see Section 4.5.5.

As Table 4.7 above indicates, 19 pipelines (identified in bold font) scored 4 or more on the ranking system due to not operating with certain integrity testing, maintenance, or mitigation measures or no data was available on the PS-101 forms. These 19 pipelines, along with the 17 identified in Table 4.5 resulted in the 28 total pipelines shown in Table 4.8 below (eight pipelines were flagged

in both priority categories). These pipelines warrant further follow up with the CSFM to determine the applicability of additional operating requirements or to obtain the missing data. However, the CSFM has determined that further follow up on these pipelines is outside the scope of the Public Records Act, therefore no further research on these pipelines was conducted (see Recommendations Section below).

Table 4.8 CSFM Priority Pipelines – PSD-101 2018/2019 Reporting Years

CSFM Line ID	CSFM Line ID	CSFM Line ID
41	206	1034
65	233	1062
100	266	1069
104	383	1102
127	450	1104
166	454	1176
177	696	233 a
192	703	233 b
193	735	
204	862	

Source: CSFM PS-101 Annual Reports (report year 2018 for pipelines 12" and greater, report year 2019 other).

4.6 Case Study - Pipelines

As discussed in Section 3.6, certain events occurred during the Strike Team project that are applicable to the subject matter and warrant review. These incidents provide recent and real life examples of some of the challenges that arise from addressing past oil and gas activities and present the opportunity for a "lessons learned" type of review. A recent event involving a leaking gas pipeline is presented below.

4.6.1 Signal Hill Gas Explosion

On November 5, 2020 a gas explosion occurred at a residence on Ohio Avenue in Signal Hill. The cause of the gas explosion was determined to be a leak from an eight inch abandoned orphan wet gas pipeline. The gas from the leaking pipeline entered the home through the wall space of the home and was ignited by a hot water heater pilot light. Subsequent to the incident, a Health and Safety Plan was prepared pursuant to the direction of the County Fire Department Health Hazardous Materials Division and the County Public Health Department. The Health and Safety Plan documented that six previous environmental assessments and investigations have been completed for the Hilltop area of Signal Hill where the explosion occurred including several for the development of the existing residential homes. The Health and Safety Plan also includes a review of the previous site assessment data and provides the following conclusions:

- The site area has contaminated soil with high concentrations of volatile organic compounds and methane;
- The contaminated soil at the site does not appear to be impacted from crude oil or tank bottoms; and,

- A methane assessment or soil vapor assessment was not done prior to the development of the residential homes.

Air monitoring was conducted at the site by the City of Signal Hill and County Public Health at interior residential locations and exterior locations near 2100 Ohio Avenue and 2749 East 21st Street. Signal Hill Petroleum and the City of Signal Hill excavated and removed the leaking pipeline and installed a passive ventilation pipe system to mitigate any potential gas issues. Based on the air monitoring results and the installation of the vent system, the County Fire Department Health Hazardous Materials Division determined the incident mitigated and completed on January 25, 2021.

4.6.2 Wilmington Pipeline Oil Spill

On Monday, March 17, 2014, approximately 1,200 gallons of crude oil seeped out of an underground pipeline onto a residential street in the City of Wilmington, California. Officials suspected that a magnitude-4.4 earthquake in Westwood as a possible cause. Hazmat units with the Los Angeles County Fire Department responded to reports of oil flowing through cracks in the asphalt on the 1200 north block of Neptune Avenue at 7:00 p.m., according to fire officials.

Phillips 66 inherited the involved pipeline through its $7 billion purchase of refiner Tosco Corp. in 2001. As part of the deal, Phillips took over Tosco's Wilmington oil refinery and its associated pipelines. In California, intrastate oil and liquid fuel pipelines are regulated by the California Fire Marshal's pipeline safety division. Phillips 66 said the pipeline had been classified as "idle". However, California pipeline law and federal regulations from the Pipeline and Hazardous Materials Safety Administration (PHMSA) only recognize pipelines as "active" or "abandoned". In a later statement, Phillips 66 described the damaged pipeline as being "out of service" and that it was being maintained "in compliance with [federal] requirements for this type of pipeline", yet it never qualified for that designation despite being withdrawn from service in 1998.

California pipeline regulations require out-of-service pipelines to be cleaned out and refilled with water or inert gas. However, Phillips 66 owned the pipeline for 13 years and never verified that the 10-inch, three-mile connector pipeline was emptied of oil or sealed off properly.

The pipe that leaked was estimated at about seven feet below the ground. Crews reportedly drilled small holes in the street to get a better look at the seepage in the neighborhood, which is adjacent to the Wilmington Oil Field – one of the largest oil fields in the continental United States – and near several refineries. It was determined that oil did not leak into the groundwater or local water source.

According to the Los Angeles Police Department, the seeping oil did not pose a threat to the public. Despite odor complaints, authorities received no medical calls, and tests showed no health hazards. Local residents were notified of the incident and were allowed access to and from their homes, but the street was otherwise closed. Phillips 66's crews steam cleaned the street and repairs were completed in a week.

4.6.3 City of Downey Gas Leak

On Thursday, April 22, 2021, at 10:30 a.m., a natural gas leak was reported at the corner of Stewart and Gray Road and Rives Avenue in the City of Downey, California, according to the Southern California Gas Company (SoCalGas). SoCalGas determined that a third-party contractor cut a gas main in a residential area. Downey's fire and police departments arrived at Stewart and Gray Road and Rives Avenue at 10:32 a.m. SoGalGas responded shortly after and worked with first responders to stop the flow of gas from the severed six-inch main line, while a stream of water from a firehose prevented any possible flames from igniting. There were no immediate reports of damage or an explosion.

At 3 p.m., SoCalGas estimated it would take four hours to cap the leak. At about 8:30 p.m., the Downey Fire Department estimated repairs would take another eight hours. Police secured the area and road closures were in place on Stewart and Gray Road from Paramount Boulevard to Rives Avenue. A 300-foot evacuation zone was set up around the leak. Approximately 40 households were affected by the evacuation orders. No injuries were reported, and shelter was provided for those evacuated.

An emergency alert was issued to cellphones about 12:35 p.m., notifying L.A. County residents to avoid the area. The City of Downey was testing a new emergency notification system that was intended to notify the residents of Downey but inadvertently notified the entire county, resulting in unnecessary alarm and calls to the authorities by concerned citizens throughout the region.

Residents were advised to close windows and doors, run an air purifier, and avoid going outside. SoCalGas reminded residents and business owners to call 811 before digging in a garden or at a construction site to avoid possible injury or damage to hidden utility lines.

4.7 Recommendations

As detailed above, obtaining information for the State Fire Marshall's office was problematic and required multiple specific PRA requests. Even after information was received, the information appeared incomplete, and the Strike Team was unable to ascertain the status of some of the pipelines reviewed. In some cases the inspection records were not up to date as required by the regulations, which mandate yearly inspections. The following recommendations are designed to ensure that the County is able to track the inspection records for the pipelines within the unincorporated areas.

4.7.1 Requirement for Pipeline Inspection Records

As noted above, it is important for the County to have up to date inspection records for pipelines within the County. To that end, the County should require that pipeline inspection records be provided by operators as part of permits, franchise agreement or as part of the new oil and gas ordinance currently being prepared by the County.

Requirements should be as follows:

Operators should provide the appropriate County agency with the exact location, size, description and date of installation of all existing or proposed pipelines, mains, transmission lines, laterals,

and service pipes that are equal to or greater than three inches in diameter, and all valves within the County unincorporated areas.

Pipeline Inspections and Test Results. An Operator shall test all pipelines yearly as required by the State Fire Marshal or other state or federal agency with jurisdiction over the pipeline or by any applicable law and must make available for inspection by the Public Works Department the results of all pipeline inspections and pipeline tests that are required by the State Fire Marshal and by all applicable laws within sixty (60) days of the inspections.

4.7.2 Standards for Pipelines

In addition, the County should consider requirements for pipelines within the oil and gas ordinance to include language as follows:

The operator shall comply with the following provisions related to pipelines throughout operation of an oil or gas site:

4.7.2.1 Pipeline Installations and Use

A. Pipelines shall be used to transport oil and gas off-site to promote traffic safety and air quality, unless it can be demonstrated to the satisfaction of the appropriate County agency that a pipeline is infeasible.

B. The use of a pipeline for transporting crude oil or gas may be a condition of approval for expansion of existing facilities or construction of new facilities unless it can be demonstrated to the satisfaction of the appropriate County agency that a pipeline is infeasible.

C. New pipeline corridors shall be consolidated with existing pipeline or electrical transmission corridors where feasible, unless there are overriding technical constraints or significant social, aesthetic, environmental or economic reasons not to do so, as approved by the Petroleum Administrator.

D. New pipelines shall be routed to avoid residential, recreational areas, and schools if possible. Pipeline routing through recreational, commercial or special use zones shall be done in a manner that minimizes the impacts of potential spills by considering spill volumes, durations, and projected spill paths. New pipeline segments shall be equipped with automatic shutoff valves, or suitable alternatives approved by the appropriate County agency, so that each segment will be isolated in the event of a break.

E. Upon completion of any new pipeline construction, the site shall be restored to the approximate previous grade and condition. All sites previously covered with vegetation shall be reseeded with the same or recovered with the previously removed vegetative materials and shall include other measures as deemed necessary to prevent erosion until the vegetation can become established, and to promote visual and environmental quality, unless there are approved development plans for the site, in which case re-vegetation would not be necessary.

F. Gas from wells shall be piped to centralized collection and processing facilities, rather than being flared, to preserve energy resources and air quality, and to reduce fire hazards and light sources, unless the AQMD approves the flaring of gas during the temporary operation of a well. Oil shall also be piped to centralized collection and processing facilities, in order to minimize land use conflicts and environmental degradation, and to promote visual quality.

4.7.2.2 Pipeline Inspection, Monitoring, Testing and Maintenance

A. Operators shall visually inspect all aboveground pipelines for leaks and corrosion on a monthly basis.

B. The operator shall install a leak detection system for all offsite DOT regulated oil and gas pipelines. The leak detection system for oil shall include pressure and flow meters, flow balancing, supervisor control and data acquisition system, and a computer alarm and communication system in the event of a suspected leak. The leak detection system for gas pipelines shall include pressure sensors.

C. Pipeline abandonment procedures shall be submitted to the appropriate County agency for review and approval prior to any pipeline abandonment.

D. Copies of pipeline integrity test results required by any statute or regulation shall be maintained in a local office of the operator and posted online on the same website that provides the monitoring results for five years and shall also made available to the appropriate County agency, upon request. The appropriate County agency shall be promptly notified in writing by the operator of any pipeline taken out of service due to a test failure.

5.0 Oil and Gas Storage Facilities

Oil and gas storage facilities can present risk to the community through accidental releases of materials and routine air emissions of toxic pollutants. Oil and gas storage facilities are facilities that are not included in the oil production category (which includes wells and produced crude oil and gas storage). The category of oil and gas facilities includes a large range of facility types that could store flammable, toxic or explosive materials that could cause risks to the public if released. Long-term carcinogenic or chronic impacts, such as health impacts caused by air emissions or groundwater contamination, are not addressed in this report.

5.1 Facility Listings in TRI

Oil and gas storage facilities were examined utilizing the EPA Toxic Release Inventory (TRI) data, which includes information in the industry type, the amount of chemicals stored onsite and the facility information in addition to toxic material release inventories. This information was compiled for Los Angeles County and the unincorporated areas for petroleum facilities, chemical facilities and for petroleum bulk storage facility industry types in order to encompass all potential oil and gas storage locations.

5.2 Facility Listings in CERS

The California Environmental Reporting System (CERS) is a database system that is utilized by facility and first responders in California to enter data about their facilities and allow for a lookup of a facilities hazardous materials inventory. The CERS database system also includes a facilities Hazardous Materials Business Plan (HMBP). The DRP gained access to the CERS system as a regulator-responder and was able to look up specific facilities to determine their current hazardous material storage status. Details in the CERS system includes the facility location, owner information, contact information and a hazardous materials inventory summary. The TRI facilities were queried to determine the status in the CERS system, and the CERS system was also reviewed for the unincorporated areas for additional facilities that may not have been listed in the TRI database. This allowed for the addition of additional facilities to the TRI data and to refine the hazardous material quantities in the TRI data.

The CERS system classifies materials at facilities into the following areas: flammable liquids, flammable gasses, flammable solids, toxic gasses, other toxic substances, oxidizers, corrosives, explosives, others.

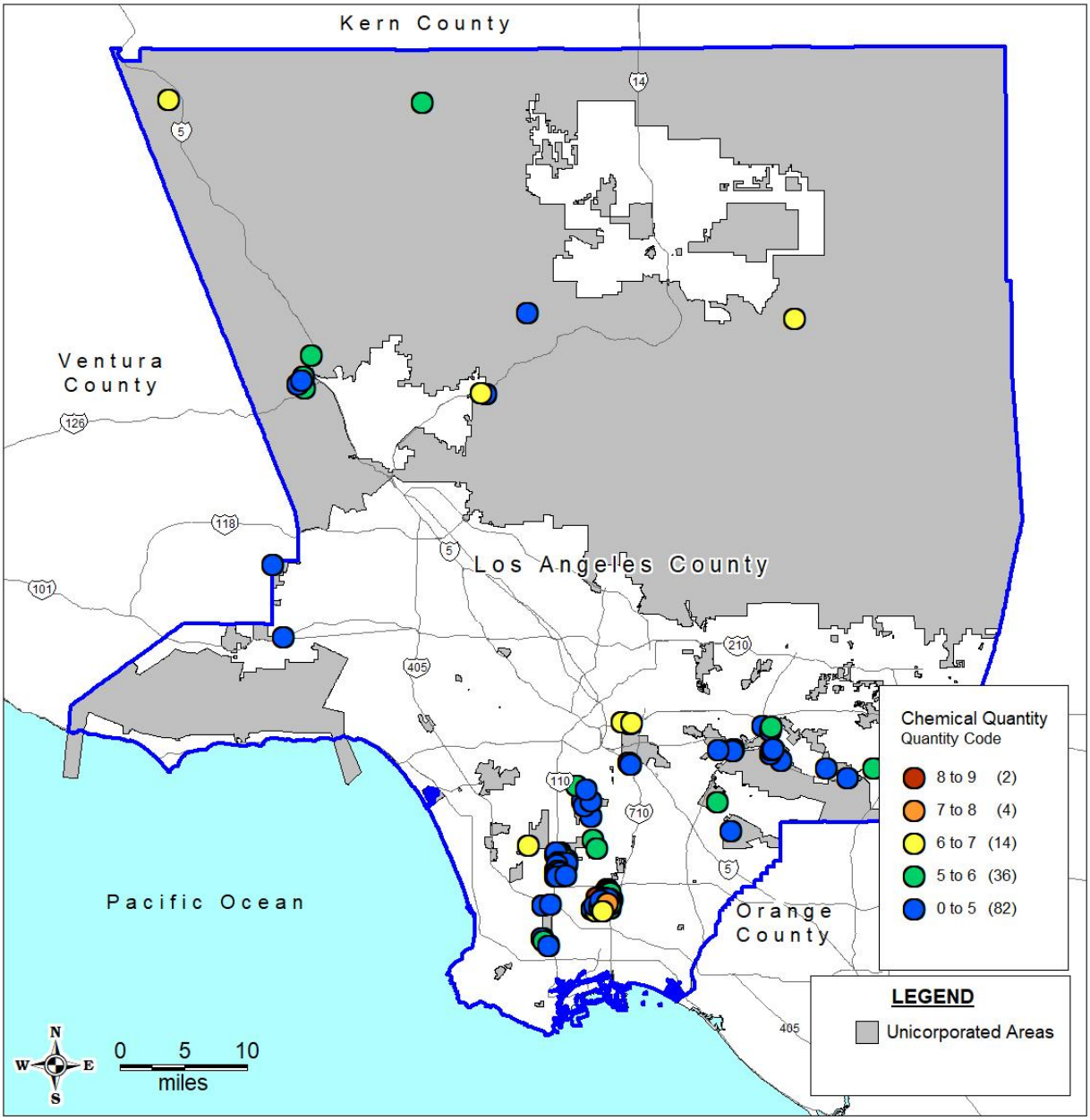
Table 5.1 shows the listing of the facilities with the largest inventories. Figure 5-1 shows the location of potential oil and gas facilities in the unincorporated areas of Los Angeles County.

Table 5.1 Facilities with the Largest Quantity of Chemicals

Facility Name	City	Materials
Pacific Terminals - Dominguez Hills Pump Station	Compton	Flammable Combustible Liquids
Phillips 66 Los Angeles Terminal	Los Angeles	Flammable Combustible Liquids Other
General Petroleum	Rancho Dominguez	Other
Torrance Valley Pipeline Company LLC - Newhall Station	Valencia	Flammable Combustible Liquids
Alflex Corp Distribution Center	Rancho Dominguez	UN
American Racing Equipment Inc	Rancho Dominguez	UN
American Racing Custom Wheels	Rancho Dominguez	UN
Interplastic Corp	Hawthorne	Flammable Combustible Liquids Other
National Cement Co	Lebec	Other
Clean Harbors	Rancho Dominguez	Other
LA DWP Castiac Power Plant	Castaic	Other
Universal Studios LLC	Universal City	Other
Plaskolite West LLC	Compton	Flammable Combustible Liquids
Apple Plastics Inc	Rancho Dominguez	Other
Holliday Rock-Palmdale	Littlerock	Other
Valencia Water Reclamation Plant	Valencia	Other
A&A Ready Mixed Concrete Inc	Gardena	Other
A&A Ready Mixed Concrete Inc	Gardena	Flammable Combustible Liquids Other
Salon Centric	Valencia	Flammable Combustible Liquids Other
Crossfield Products Corp	Rancho Dominguez	Other

Source: TRI Database with over 1 million pounds for industry codes 324 Petroleum & Coal Products, 325 Chemicals, and 4247 Petroleum and Petroleum Products Merchant Wholesalers plus CERS data. UN = unknown

Figure 5-1 Potential Oil and Gas Storage Facilities



Notes: Chemical quantities are designated as: 5=greater than 100,000 pounds; 6=greater than 1 million pounds; 7= greater than 10 million pounds; 8 greater than 100 million pounds and 9=greater than 1 billion pounds.
Figure based on EPA Toxic Release Inventory data.

5.3 Facilities and Census Data

The facility locations were correlated with census data to identify those facilities that are in populated areas. Figure 5-2 shows the facilities and the census data population densities. Table 5.1 shows the number of facilities located in different population density areas. Facilities that are located within 500 feet of higher density areas are also classified as being associated with those higher density census blocks.

Figure 5-2 Potential Oil and Gas Storage Facilities and Census Data

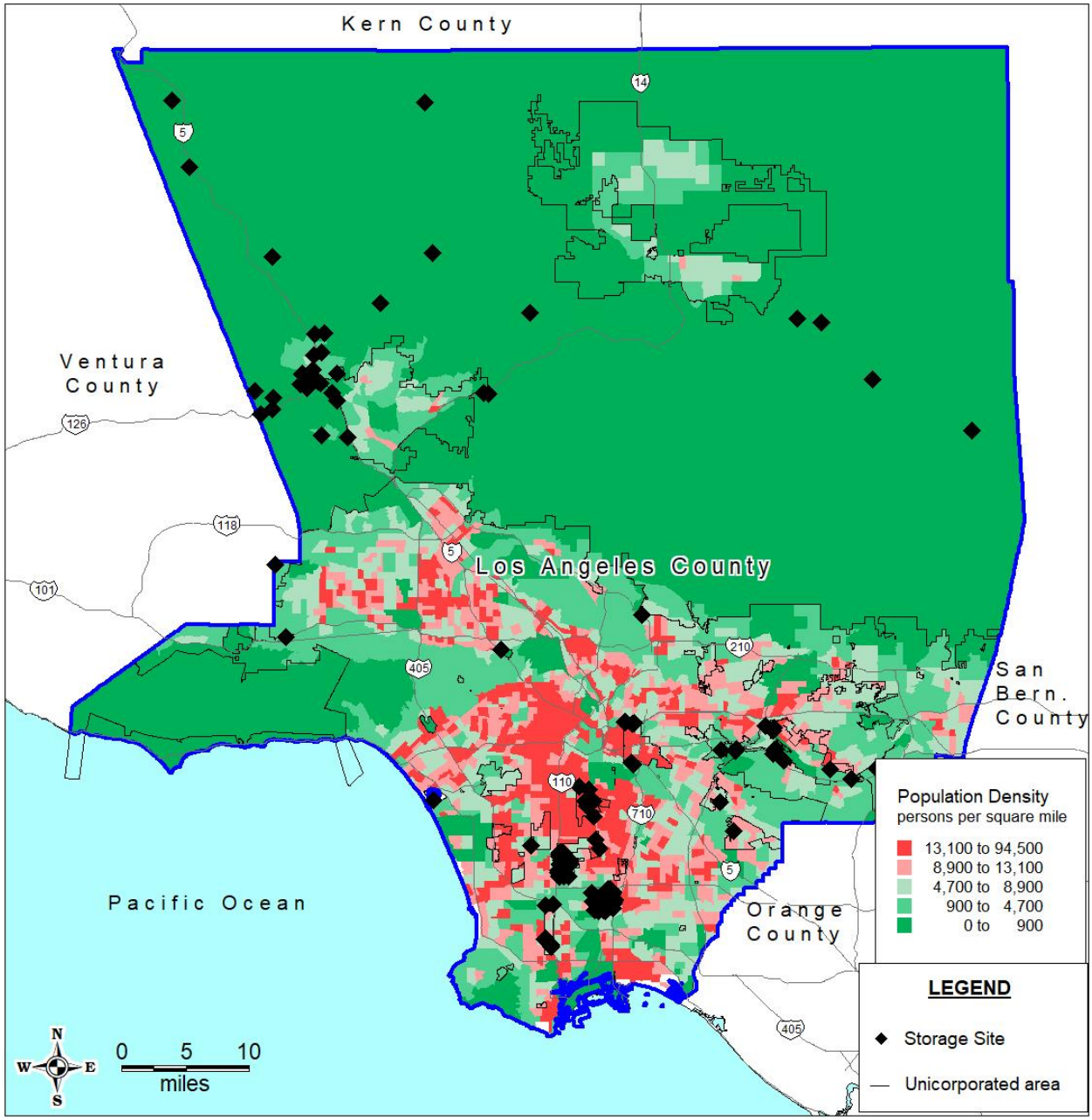


Figure based on EPA Toxic Release Inventory, CERS data and 2010 U.S. Census Bureau data.

Table 5.2 Facilities and Census Data Population Densities

Population Density	Number of Facilities	Density Rank
Less than 1,000 persons/square mile	86	0
More than 1,000 persons/square mile	91	2
More than 5,000 persons/square mile	43	4
More than 10,000 persons/square mile	27	6
More than 15,000 persons/square mile	16	8

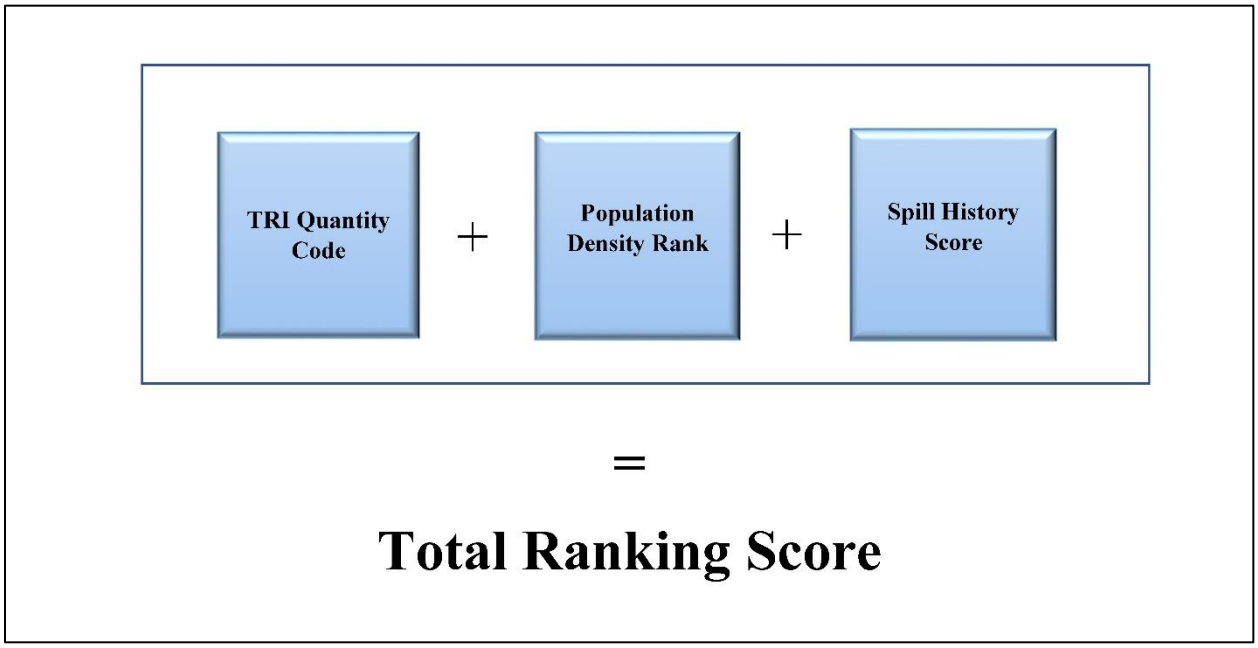
5.4 Facilities by Spill History

The Comprehensive Environmental Response, Compensations, and Liability Act (CERCLA), Emergency Planning and Community Right-to-Know Act (EPCRA) and California law require responsible parties to report hazardous material releases if certain criteria are met. The California Office of Emergency Services (OES) maintains a database of spills in California. While this spill database does not generally maintain GIS reference information or facility name, address matching was reviewed for spills over the last 5 years. Of the facilities identified from the TRI and CERS systems, 17 facilities experienced spills in the last 5 years.

5.5 Facilities Ranking

Based on the materials quantity and the census tract population density, the facilities were ranked by adding together the quantity code, the census tract population density rank as shown in Table 5.2 and a score if there has been a spill in the last 5 years (0 for none, 5 for maybe and 10 for yes). The highest ranked facilities will therefore have a high quantity of materials located in high population density areas and have a history of some spills. These facilities are those that, because of the amount of materials stored, may present a higher frequency of releases of materials. If releases were to occur, due to the higher population densities, the probability of affecting the public would be higher. In addition, if there is a history of spills, then this also is an indication of the potential for a higher frequency of release of materials to the environment. A low-ranking facility would have less materials located in low population density areas and not have a spill history. A ranking schematic is shown in Figure 5-3.

Figure 5-3 Facility Ranking Schematic



The ranking for the top facilities is shown in Table 5.3.

Table 5.3 Facilities Ranking: Top Facilities

Facility Name	Facility Rank Score
BOWMAN PLATING CO INC	23
HONOR RANCHO	21
LEKOS DYE & FINISHING INC	21
PRECISION SPECIALTY METALS INC	20
GEORGE INDUSTRIES	20
AMERICAN POLYSTYRENE CORP	18
INTERPLASTIC CORP	18
PACIFIC SINTERED METALS	17
RYDER TRUCK RENTAL #0569	17
LA DWP CASTIAC POWER PLANT	16
CROSSFIELD PRODUCTS CORP	16

5.6 Facility Materials Classifications

The initial review of potential facilities utilizes the EPA TRI database and an initial review of the CERS database. More detailed information was obtained from the fire department on each of the top 40-50 ranked facilities in terms of the specific chemicals stored at each site, the population density in which the facility is located and the history of spills. The chemicals at these facilities where then screened related to the EPA list of lists (40 CFR Part 302 and Table 302.4), the

California Code of Regulations (Appendix A to Section 5189 - List of Acutely Hazardous Chemicals, Toxics and Reactive) and the EPA ATF listing of Explosive Chemicals.

In addition, for some facilities the more detailed Fire Department submission information was reviewed to determine the extent to which materials are stored in large quantities or dispersed throughout the facility, and if storage locations on a large property are located close to nearby public receptors. A review of the detailed Universal Studios facility fire department submissions, for example, including maps and details on the specific materials storage type (such as paint in many small paint cans as opposed to one single inventory), allowed for a better determination of the risk levels. In the case of Universal Studios, although the total inventory was high (as indicated in Table 5.1), the risk was determined to be low and they were eliminated from the ranking process.

Table 5.4 lists the details on the facilities that rank the highest.

Of the facilities with detailed information, there were 10 facilities that stored acutely hazardous materials and 9 facilities that stored explosive materials. Note that the facilities with the largest inventories do not necessarily have any acutely hazardous materials, such as the Pacific Terminal in Compton, or the Phillips 66 Terminal in Los Angeles, or the Interplastic Corp facility in Hawthorne, none of which store acutely hazardous materials. These facilities have large inventories (over 10 million pounds of materials at each facility) of flammable materials and could cause large fires with resulting smoke and thereby resulting in impacts, but do not maintain inventories of acutely hazardous materials that could be released and cause impacts to nearby neighborhoods.

Table 5.4 Facilities Detailed Inventory Data

Facility Name	City	Total Inventory, pounds	Top Materials	Acute Materials	Explosive Materials
A&A Ready Mixed Concrete INC	Gardena	47,951	sika, lehigh portland cement	None	None
A2Z Plating	Los Angeles	3,329	oils, antifreeze	None	None
Aerospace Dynamics INTL INC	Valencia	473,387	coolant, oils, propane	None	None
B & C Plating CO	Los Angeles	102,382	zinc, nickle metal plating, metal bisulfides	None	None
Bowman Plating Co Inc	Compton	407,333	sulfuric acid, chromic acid, sodium hydroxide, rioline 909, nitric acid, deoxidizer lnc, nitric acid, anodal m3-1, alodine 1200, sodium dichromate, sodium bicarbonate	Nitric Acid, Hydrofluoric Acid	None
Caltrans-Altadena	Altadena	337,778	sealant, asphalt, diesel fuel	None	None
Crossfield Products CORP	Rancho Dominguez	726,206	silicon dioxide, calcium carbonate, silica sand, pigment, vinyl acetate monomer, sodium hydroxide, aluminum calcium silicate, portland cement, magnesium oxide	Formaldehyde, ammonia	None
Fralock	Valencia	385,102	nitrogen, isopropanol	None	None
General Carbon CO	Los Angeles	59,840	petroleum residues	None	None
General Petroleum	Rancho Dominguez	10,688,324	various oils	None	None
George Industries INC	Los Angeles	719,117	sulfuric acid, nitric acid, phosphoric acid, sodium hyroxide solution, propane, nickel acetate	Nitric Acid	Acetone
Honor Rancho - West Energy Operating LLC	Castaic	834,227	alkyl-1-3-propylene-diamine acetate, aliphatic petroleum distillate 90%, methanol, phosphonate salts, methanol, light aromatic naphtha	None	None
Independent Ink INC	Gardena	31,422	solvents	Nitric Acid	Nitrocellulose
Interplastic Corp Thermoset Resins	Hawthorne	13,273,709	liquid nitrogen, styrene monomer, terephthalic acid (ta-22), diethylene glycol, maleic anhydride molten, 2mpd glycol, maleic anhydride molten, propylene glycol, dicyclopentadiene, acetone	None	None
LA DWP Castaic Power Plant	Castaic	1,365,877	distillates (petroleum - naphthenic), distillate (petroleum), hydrotreated light paraffinic, toluene, crystalline silica	None	Acetone
Maxima Enterprises INC	Harbor City	73,715	sulfuric acid, sodium hydroxide, hydrochloric acid	Hydrochloric acid	Acetone, 2-Propanone
Old Country Millwork INC	Los Angeles	148,248	paint, acetylene, chromic oxide	none	Acetone
Pacific Sintered Metals	Los Angeles	217,737	iron, copper, magnesium aluminum silicate, isopropyl, hydroxyalky methacrylate, acetone, alkanes, calcium bis(dinonylnaphthalenesulphonate), silica, crystalline	Chlorine	Acetone
Pacific Terminals	Compton	1,158,276,502	crude oil demulsifier, batteries	none	none
Phillips 66 Los Angeles Terminal	Los Angeles	47,748,691	gasoline, ethanol, diesel	none	none
Power Magnetics	Gardena	236,101	iron, copper, acetylene, argon	none	none

Table 5.4 Facilities Detailed Inventory Data

Facility Name	City	Total Inventory, pounds	Top Materials	Acute Materials	Explosive Materials
Precision Specialty Metals	Los Angeles	1,084,273	hydrofluoric acid, nickel, acrylamide, hydrotreated light paraffinic distillate, sodium hydroxide	Nitric Acid, Hydrofluoric Acid	None
Prime Wheel Corp	Harbor City	3,760	buffing compounds	none	Acetone
Quaker City	Whittier	1,022,680	sulfuric acid, nitric acid	Nitric acid, hydrogen peroxide, hydrochloric acid	Acetone
Silvestri California	Los Angeles	7,244	propane, styrene resin, acetylene	none	Acetone
Sinclair Printing Co	Los Angeles	3,740	press wash, coatings	none	none
Torrance Valley Pipeline	Valencia	11,626,634	crude oil	none	none
V & M Aerospace LLC	Los Angeles	1,149,400	sulfuric acid, hydrofluoric acid, nitric acid	Nitric acid, hydrochloric acid, muriatic acid	none
Weck Laborators Inc	Hacienda Heights	105,437	argon, hydrogen sulfide, ammonia	Hydrogen sulfide, ammonia	none

5.7 Underground Gas Storage Facilities

SoCalGas owns and operates the Aliso Canyon Underground Natural Gas Storage Facility located at 12801 Tampa Avenue, Northridge, California. The Aliso Canyon Facility is adjacent to the community of Porter Ranch. The Facility is the largest natural gas storage field in California and one of the largest in the United States. In addition, SoCalGas also operates an underground storage facility in Playa Vista and in Honor Ranch within the County of Los Angeles. A fourth underground storage facility in Montebello has been permanently shut down. This discussion describes the methane release at Aliso Canyon and the remedies that have been undertaken to prevent future releases at Aliso Canyon and at other gas storage facilities in the County.

On October 23, 2015, SoCalGas discovered a natural gas leak at natural gas storage well SS-25 located at the Aliso Canyon Facility. Initial efforts to stop the leak were unsuccessful. On February 11, 2016, SoCalGas, in coordination with third-party contractors, successfully intercepted well SS-25 with a relief well and stopped the flow of natural gas through the well.

On February 18, 2016, the California Department of Conservation, Division of Oil, Gas & Geothermal Resources ("DOGGR" and now CalGEM) confirmed that well SS-25 had been permanently sealed. After February 18, 2016, various State agencies reported that ambient air quality in the vicinity of the Facility had returned to pre-Incident levels.

During the Incident, nearby residents complained of odors and physiological symptoms such as nausea, vomiting, dizziness, nosebleeds, and headaches. From November 2015 through June 2016, SoCalGas implemented, pursuant to a directive of the Los Angeles County Department of Public Health, a motion brought by the Los Angeles City Attorney, and order of the court, a temporary relocation program for residents in and around Porter Ranch. Residents could choose whether to participate in the temporary relocation program. Over 8,000 households and two schools temporarily relocated as part of the temporary relocation program. The temporary relocation program ended, based upon the position of County officials that it was safe for relocated residents to return home and a requirement that SoCalGas provide interior residential cleaning pursuant to a protocol established by the Department of Public Health for relocated residents who chose to schedule it prior to returning home.

During the temporary relocation program, SoCalGas was required to arrange for the delivery and/or installation of more than 38,000 certified air filtration systems in homes, schools and businesses in and around Porter Ranch at SoCalGas' expense. Prior to the termination of the relocation program, SoCalGas also was required to have over 1,700 homes in Porter Ranch professionally cleaned at SoCalGas' expense. SoCalGas arranged to have the exteriors of more than 1,200 homes and almost 1,000 vehicles cleaned as a result of complaints of brown spots that were alleged to have been associated with the release.

At DOGGR (now CalGEM) direction, SoCalGas conducted an assessment of the design, construction, operation and maintenance of the surface facilities, underground storage wells and reservoir at the Aliso Canyon Facility. SoCalGas implemented a comprehensive safety review at the Facility, pursuant to a March 4, 2016 DOGGR Emergency Order, developed in consultation with the National Laboratories, to verify the mechanical integrity of each well to be returned to service at the Aliso Canyon Facility. The safety review included: (1) noise and temperature logs; (2) casing inspection logs; (3) cement bond logs; (4) multi-arm caliper inspections; and (5) pressure tests. As part of this process, SoCalGas upgraded all operating wells at the Aliso Canyon

Facility with new tubing and packers to flow natural gas solely through the inner tubing, providing a dual barrier of protection to mitigate the potential for an uncontrolled release of natural gas from a well.

SoCalGas also developed and implemented a comprehensive program for monitoring, testing and inspection of the underground storage wells and above-ground facilities at the that includes: (1) additional well patrols; (2) additional scanning of each well using infrared thermal imaging cameras; (3) accelerated leak repairs; (4) enhanced employee and contractor training; and (5) pressure monitors within each operating gas storage well at the Facility to detect pressure anomalies in real time.

CalGEM and CPUC required SoCalGas to complete a comprehensive safety review of all wells at Aliso Canyon. On the first and third Friday of every month, SoCalGas provides CalGEM with an updated well inspection report.

As of March 10, 2020:

- 114 (or 100 percent) of the active wells at Aliso Canyon have completed the first phase of required tests;
- Number of wells with all tests completed – 66
- Number of wells plugged and abandoned – 21
- Number of wells in the process of abandonment – 27

On September 13, 2016, SoCalGas and the Los Angeles County District Attorney entered into an agreement to resolve all criminal allegations brought by the District Attorney's office against SoCalGas relating to the Incident. Pursuant to that settlement, SoCalGas (1) installed and is operating a fence line methane monitoring system at the Facility that provides near real-time and continuous methane monitoring information on a publicly-accessible website: (https://sem.secmcs.com/MethaneMonitoring/); (2) revised and enhanced reporting policies regarding releases or threatened releases of hazardous materials to the Office of Emergency Services, and the applicable Certified Unified Program Agency; and (3) trained employees responsible for leak detection or reporting at all Los Angeles County natural gas storage facilities (Aliso Canyon, Playa del Rey, and Honor Rancho) regarding proper notification procedures in the event of a leak or suspected leak. SoCalGas also agreed, as part of that settlement, to comply with the requirements of DOGGR Emergency Order 1109 and the comprehensive safety review by installing Real-Time Pressure Monitors at each natural gas storage well in operation at the Facility.

On February 25, 2019, the Los Angeles Superior Court approved a settlement agreement with the Los Angeles City Attorney’s Office, the County of Los Angeles, the California Office of the Attorney General, and the California Air Resources Board to resolve all outstanding claims by those government bodies against the company related to the leak. Under that settlement, SoCalGas has contributed $34.1 million to establish the Aliso Canyon Methane Emissions Mitigation Fund to support a portfolio of projects that capture methane from dairy farms and convert that energy into renewable gas for use in transportation, sufficient to mitigate methane emissions from the leak.

As part of the South Coast Air Quality Management District's ("SCAQMD") January 28, 2016 Order for Abatement, SoCalGas implemented enhanced community and agency notification and

reporting procedures related to releases from the Facility. These enhanced notification procedures include when and how SoCalGas will provide notice to specified recipients in the event of a reportable release, as well as associated training, recordkeeping and plan review requirements.

SoCalGas also performed a comprehensive well assessment program at each of its other underground natural gas storage facilities (Playa del Rey, Honor Rancho, and Goleta) to verify the mechanical integrity of each well, including: (1) noise and temperature logs; (2) casing inspection logs; (3) cement bond logs; (4) multi-arm caliper inspections; and (5) pressure tests. SoCalGas was expected to complete this well assessment program at the Playa del Rey, Honor Rancho, and Goleta facilities by the first quarter of 2020. SoCalGas is upgrading all operating wells at its other underground natural gas storage facilities (Playa del Rey, Honor Rancho, and Goleta) with new tubing and packers and flowing natural gas solely through the inner tubing, providing a dual barrier of protection to mitigate the potential for an uncontrolled release of natural gas from a well.

SoCalGas also developed and implemented a comprehensive program for monitoring, testing and inspection of the underground storage wells and above-ground facilities at its other underground natural gas storage facilities (Playa del Rey, Honor Rancho, and Goleta) that includes: (1) additional well patrols; (2) accelerated leak repairs; (3) enhanced employee and contractor training; and (4) pressure monitors within each operating gas storage well at each of its other underground natural gas storage facilities to detect pressure anomalies in real time.

Pursuant to a June 28, 2001, CPUC decision, SoCalGas has ceased using its Montebello facility as an underground natural gas storage facility and has been in the process of disposing of the assets which comprise the Montebello natural gas storage field. At SoCalGas' request, on December 9, 2016, DOGGR rescinded its approval of gas injections into the Montebello facility effective December 31, 2016.

In addition, since the Aliso Canyon release, the State has adopted a number of bills to address issues related to the leak. Among them were requirements for mitigation for the methane leak and effects on greenhouse gasses and climate change; payment of fines and mitigation funds; the development of new regulations by DOGGR (CalGEM) addressing underground storage facilities and the reinjection wells used for that purpose.

In May of 2019, Blade Energy Partners published a report detailing its analysis of the 2015 natural gas leak at SoCalGas' Aliso Canyon Storage Facility. The investigation was conducted at the direction of the California Public Utilities Commission and DOGGR (CalGEM). The report concluded that a rupture in the outer casing of the well occurred on the morning of October 23, 2015, followed hours later by a complete separation of the casing. According to the report, microbial induced corrosion caused the metal in the outer casing to thin, which led to the rupture. Blade also determined that SoCalGas' current practices and new state regulations address most, if not all, of the causes identified in the report.

SoCalGas formed an Aliso Canyon Community Advisory Council (CAC) that consists of residents, business owners, and community leaders from various constituencies from faith-based organizations, the Los Angeles Police Department, the Los Angeles Fire Department, and other stakeholders. SoCalGas proactively updates the Aliso Canyon CAC members on relevant information regarding the facility. SoCalGas also instituted a community notification system for Aliso Canyon where individuals can sign up to be notified of Air Quality and/or Community Notifications.

5.8 Recommendations

Oil and gas facilities chemical inventories are currently overseen primarily by the Fire Department and the HMBP program. The database of chemicals and inventories in the HMBP were utilized in this analysis to identify facilities that could cause potential impacts to the public. The Fire Department conducts inspections every three years of all facilities in order to ensure compliance with the HMBP program. While some material inventories may not be accounted for in the HMBP program, such as temporary storage and transportation (see Section 6.0), the HMBP is generally comprehensive. Continued efforts on the part of the County could include the identification of acutely hazardous or explosive materials and increased scrutiny of facilities handling acutely hazardous or explosive materials potential impacts on the public, for both long-term or temporary storge of acute or explosive materials.

5.8.1 HMBP Data Base

Coordinate with the Fire Department and the HMBP and AQMD 1148.2 database to identify facilities handling acutely hazardous or explosive materials, either on a long-term or temporary basis, in proximity to receptors and conduct periodic inspections, along with the Fire Department HMBP inspection program or as part of an inspection requirement associated with drilling activities, of these facilities to ensure compliance with permit or other materials handling practices and ensure minimizing potential impacts to neighboring public areas.

6.0 Well Drilling and Well Maintenance Chemical Use

One of the Phase I Strike Team findings concerned the use of chemicals for well drilling, maintenance, and workover activities. These materials are not typically included in hazardous materials business plans because they are specific to each well activity, are only brought onsite as required and are not stored onsite. SCAQMD Rule 1148.2 requires reporting of all chemical use for oil or gas drilling, well completion, or well reworks for onshore wells located in the SCAQMD. Examination of this database provides insight into the materials used associated with well drilling activities and if any of these materials present potential hazards to the public. Additional information required by Rule 1148.2 includes:

- Name and contact information of well owner and operator;
- Well name and API number;
- Well location;
- Nearest and type of sensitive receptor within 1,500 feet;
- Project schedule;
- Equipment data; and,
- Volumes and types of dry and fluid materials used.

Chemical specific data for each product used in a well drilling fluid, well rework fluid, or well completion fluid required by Rule 1148.2 includes:

- Identity and purpose;
- Total mass in pounds;
- CAS (Chemical Abstract Service Number);
- Mass of each chemical ingredient;
- Air toxic designation;
- Supplier data; and,
- Trade secret protection if applicable.

6.1 Well Activity

Data from the South Coast AQMD for the period 2016 through July 2021 provided information on the type of well work activities and associated chemical use for wells subject to Rule 1148.2. Table 6.1 lists Rule 1148.2 well activity events for the 2016 through July 2021 time period for the entire Los Angeles County. As shown in Table 6.1, most of the chemical use reported was associated with maintenance acidizing, gravel packing, and well drilling. Maintenance acidizing is not defined in Rule 1148.2, however, most well operators use the term to describe a near-wellbore treatment to remove scale formation that can plug up well perforations. Definitions for these well activities can differ from agency to agency and no comprehensive single source is available. Table 6.2 lists the commonly used definitions and agency source used by the oil and gas industry. No hydraulic fracturing projects were reported in the Rule 1148.2 database for all of Los Angeles County in the time period 2016 to July 2021. Most of the well report locations were in the cities of Long Beach, Los Angeles, and Wilmington as listed in Table 6-3.

Due to the small sample size of well activity in the unincorporated LA County area and to present a general idea of the types and amounts of chemicals used for well work activities in the Los Angeles basin, the data set presented in this section of the report is for the entire Los Angeles

County. Figures 6.1 through 6.3 map where these well activities occurred with unincorporated LA County shown in gray.

Table 6.1 2018 Rule 1148.2 Well Activity LA County

Rule 1148.2 Data 2016 through July 2021	
Well Activity Type	**Number**
Well Drilling	121
Matrix Acidizing	1
Hydraulic Fracturing	0
Gravel Packing	175
Maintenance Acidizing	747
Acid Fracturing	3
Other	2
Total	**1,049**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Table 6.2 Well Activity Definitions

Type	Definition	Source
Acid Fracturing	A well stimulation treatment that, in whole or in part, includes the pressurized injection of acid into an underground geologic formation in order to fracture the formation, thereby causing or enhancing, for the purposes of this division, the production of oil or gas from a well.	SB4
Acid Matrix Stimulation	An acid treatment conducted at pressures lower than the applied pressure necessary to fracture the underground geologic formation.	SB4
Acidizing	A treatment of the wellbore or reservoir formation with an acid to either clean out scale, damage, or other debris in the well, or react with the soluble substances in the formation to improve permeability and enhance production of oil and gas	SCAQMD Rule 1148.2
Gravel Packing	A method that uses water and additives to place sand and gravel near the wellbore itself with the objective of limiting entry of formation sands and fine-grained material into the wellbore	
Hydraulic Fracturing	A technique used in stimulating a formation or zone that involves the pressurized injection of hydraulic fracturing fluid, which is a carrier fluid mixed with chemical additives, and typically a proppant, into an underground geologic formation in order to fracture the formation, thereby causing or enhancing the production of oil or gas from a well	SCAQMD Rule 1148.2
Maintenance Acidizing	Commonly used by industry to describe the use of acid for well bore de-scaling maintenance activities.	Oil and Gas Industry

Source: SB4 Well Stimulation Regulations, SCAQMD Rule 1148.2, oil and gas industry staff.

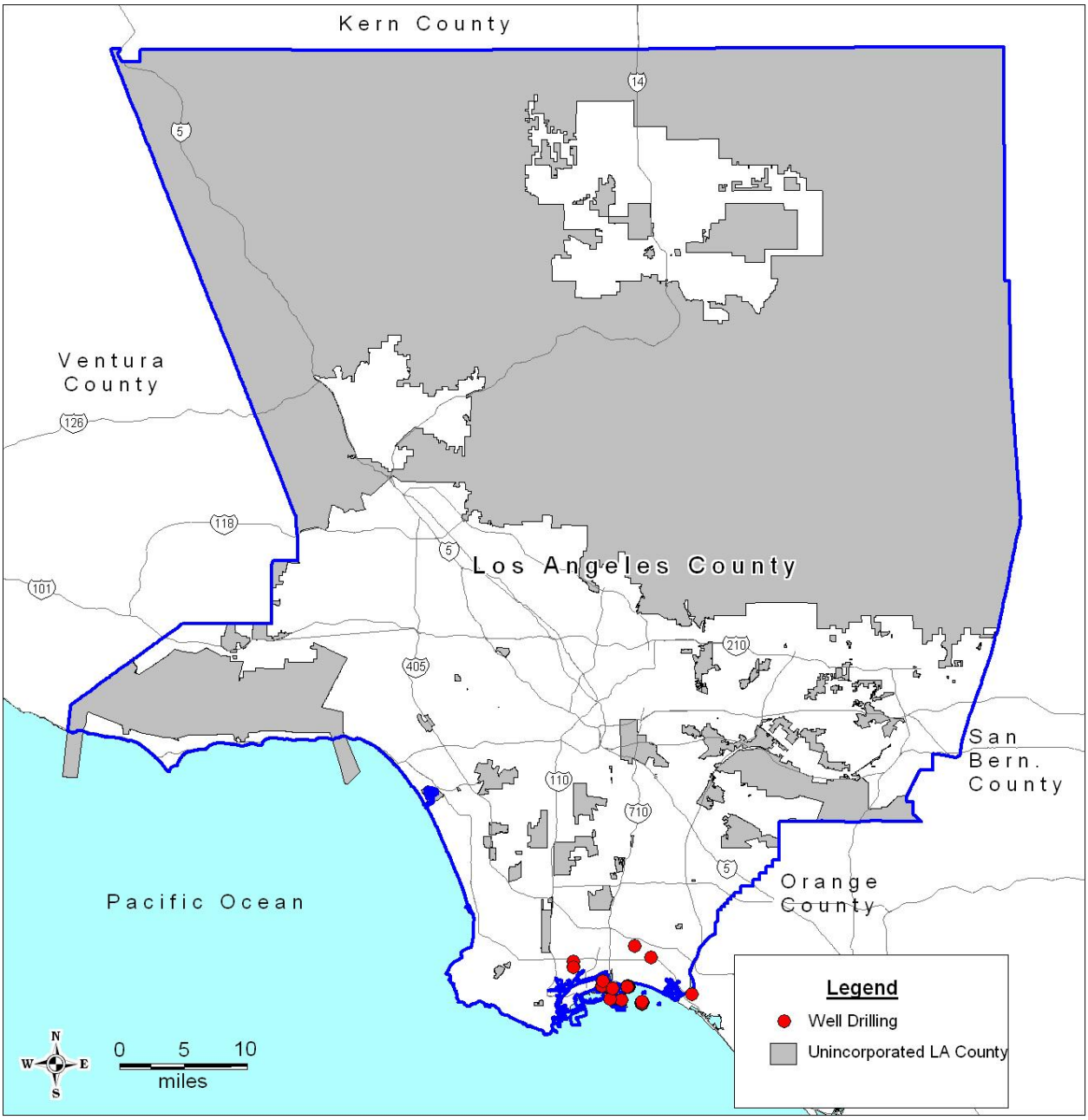
Table 6.3 Rule 1148.2 Well Drilling, Maintenance, and Workover Activities by City

Rule 1148.2 Data 2016 through July 2021	
City/Community	**Number of Well Activity Events**
Brea	5
Carson	8
Castaic	2
Fullerton	2
Harbor City	1
Huntington Beach	21
La Habra Heights	1
Long Beach	826
Los Angeles and Unincorporated Los Angeles	99
Montebello	3
None identified	6
Northridge	5
Santa Fe Springs	3
Seal Beach	1
Signal Hill	15
Valencia	1
West Los Angeles	1
Wilmington	49
Total	**1,049**

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

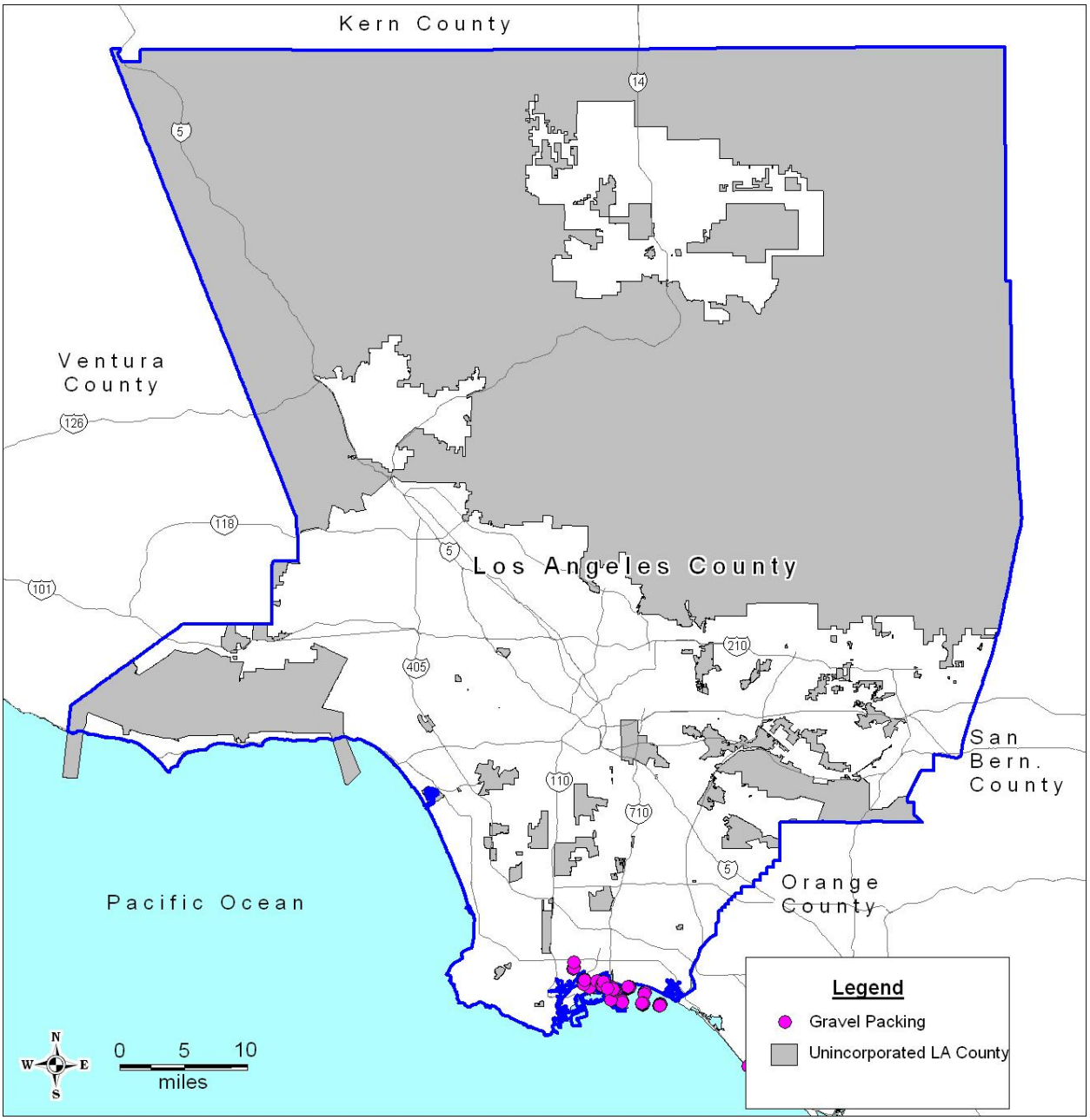
Figures 6-1 through 6-3 show the locations of the well activities listed in Table 6-1 above.

Figure 6-1 Rule 1148.2 Well Drilling Locations



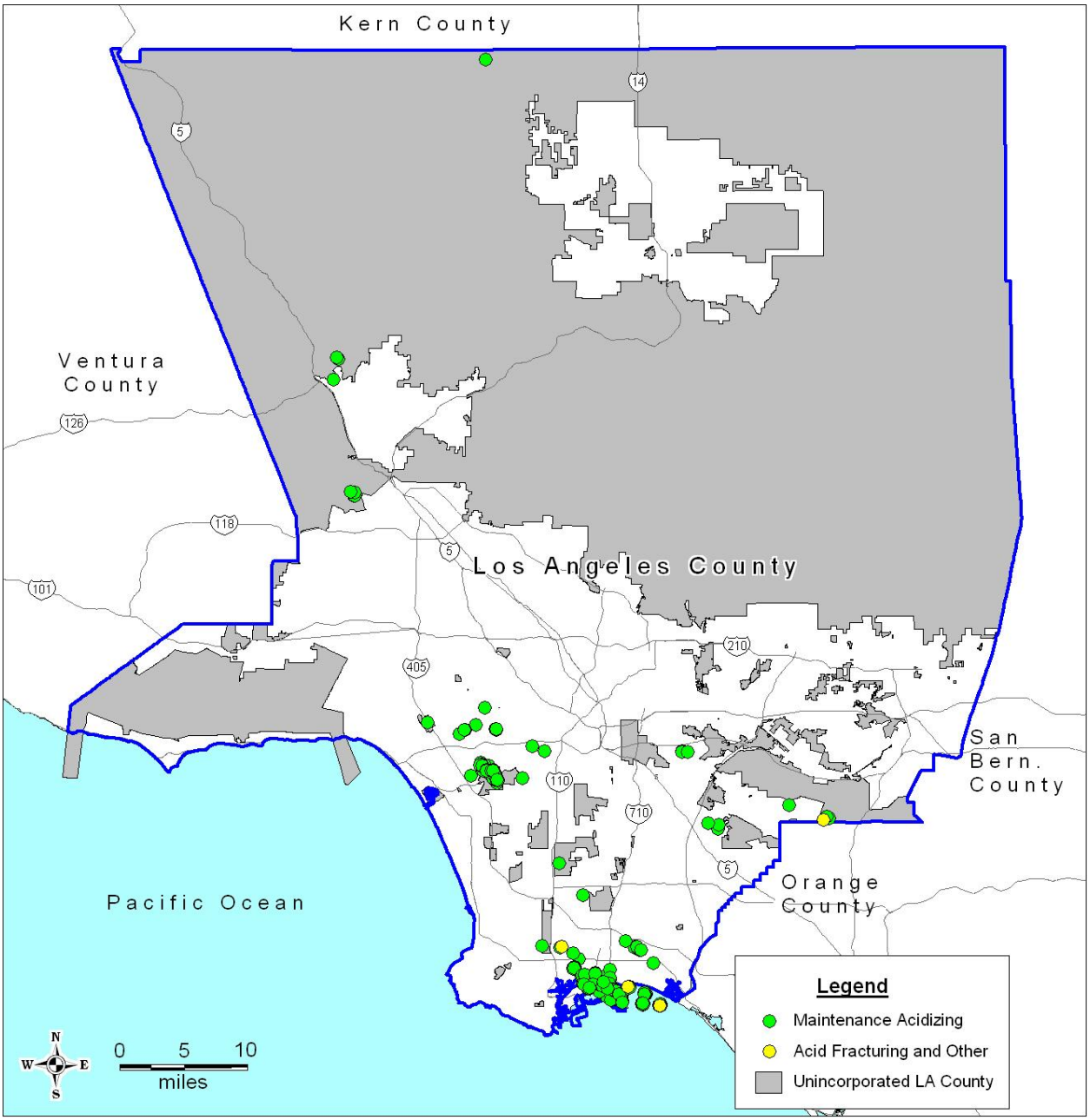
Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-2 Rule 1148.2 Gravel Packing Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

Figure 6-3 Rule 1148.2 Well Maintenance Acidizing, Acid Fracturing and Other Locations



Source: SCAQMD Rule 1148.2 Chemical Database for 2016 through June 2019.

6.2 Well Fluid and Chemical Use

Rule 1148.2 provides quantities, total fluid, and chemical specific data for each product used in a well drilling fluid, well maintenance fluid, or well completion fluid. Table 6.4 lists the average fluid use for each well activity type reported for the 2016 through July 2021 time period. It is important to note the fluid use numbers include water and the Rule 1148.2 database reports total fluid use and does not break out individual types of materials by volumes of fluids.

Table 6.4 Rule 1148.2 Total Fluid Use by Well Activity

Rule 1148.2 Data 2016 through July 2021	
Well Activity Type	**Average Fluid Use Including Water (Gallons) per Well**
Well Drilling	60,848
Gravel Packing	11,249
Maintenance Acidizing	29,084
Acid Fracturing	16,256
Other	47,880

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.

Review of the chemical use for the well activities in the 2016 through July 2021 Rule 1148.2 data set lists 224 different chemicals. The Rule 1148.2 database includes chemical use calculated by mass, in pounds. It is important to note that the values shown indicate the amount of material or chemical used down hole for each well activity and do not represent calculations for materials released into the atmosphere. Tables 6.5 through 6.9 identify the top 25 materials and the average amount, in pounds, used for each well activity in the 2016 to July 2021 data set. As listed in Table 6.1 above, hydraulic fracturing was not conducted during the 2016 through July 2021 reporting period. Note for well activities with less than 25 different material use types, all materials use types are listed. Appendix B provides a complete list of all the material and chemical types with CAS numbers for Los Angeles County for the Rule 1148.2 data set years 2016 through July 2021.

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	108,606
PORTLAND CEMENT	65997151	16,261
POTASSIUM CHLORIDE	7447407	13,144
QUARTZ (SILICA)	14808607	12,792
BARITE	7727437	11,273
BARITE (BA(SO4))	13462867	4,165
CALCIUM CARBONATE	471341	3,014
CARBONIC ACID CALCIUM SALT (1:1)	471341	3,014
SODIUM CHLORIDE	7647145	2,522
SAPONITE	1319411	1,746
OIL, HYDRO LIGHT NAPH DIST	64742536	1,276
POLYANIONIC CELLULOSE	9004324	1,069

Table 6.5 Rule 1148.2 Average Material Use by Well Activity- Well Drilling

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
MICA-GROUP MINERALS	12001262	854
SODIUM CARBONATE	497198	533
GYPSUM	13397245	434
FUMED SILICA	69012642	400
AMORPHOUS SILICA	7631869	312
SODIUM BICARBONATE	144558	301
CELLULOSE	9004346	276
MAGNESIUM OXIDE	1309484	269
XANTHAN GUM	11138662	255
STEARIC ACID	57114	235
CALCIUM OXIDE	1305788	232
TALL OIL	8002264	227
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	217

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 121 well drilling jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.6 Rule 1148.2 Average Material Use by Well Activity-Gravel Packing

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	244,125
BARITE	7727437	22,467
SULFURIC ACID, BARIUM SALT (1:1)	7727437	22,467
PORTLAND CEMENT	65997151	20,336
POTASSIUM CHLORIDE	7447407	20,273
QUARTZ (SILICA)	14808607	15,901
CALCIUM CHLORIDE	10043524	14,279
CALCIUM CARBONATE	471341	7,329
SODIUM CHLORIDE	7647145	4,937
GYPSUM	13397245	2,665
AMORPHOUS SILICA	7631869	1,859
SAPONITE	1319411	1,692
MAGNESIUM OXIDE	1309484	1,460
CALCIUM OXIDE	1305788	1,438
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	1,333
MICA-GROUP MINERALS	12001262	1,198
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	932
MAGNESIUM	7439954	823
FUMED SILICA	69012642	643
ALUMINUM OXIDE	1344281	565

Table 6.6 Rule 1148.2 Average Material Use by Well Activity-Gravel Packing

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
CARBONIC ACID SODIUM SALT (1:2)	497198	487
SODIUM CARBONATE	497198	487
SODIUM BICARBONATE	144558	406
DISODIUM METASILICATE	6834920	395
BENTONITE	1302789	343

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 175 gravel packing jobs.

Table 6.7 Rule 1148.2 Average Material Use by Well Activity-Maintenance Acidizing

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	135,326
HYDROCHLORIC ACID	7647010	2,921
HYDROGEN CHLORIDE	7647010	2,921
AMMONIUM CHLORIDE	12125029	1,067
XYLENE	1330207	662
SODIUM CHLORIDE	7647145	331
POTASSIUM CHLORIDE	7447407	306
ACETIC ACID	64197	275
HYDROFLUORIC ACID	7664393	265
CALCIUM CHLORIDE	10043524	261
ETHYLBENZENE	100414	190
2-HYDROXY-1,2,3-PROPANETRICARBOXYLIC ACID	77929	174
CITRIC ACID	77929	174
METHANOL	67561	128
PORTLAND CEMENT	65997151	85
2-BUTOXY ETHANOL	111762	80
ETHYLENE GLYCOL MONOBUTYL ETHER	111762	80
BARITE	7727437	73
BARITE , QUARTZ, CRYSTALLINE SILICA	14808607	57
QUARTZ (SILICA)	14808607	57
NONYLPHENOL ETHOXYLATE	127087870	48
AROMATIC PETROLEUM DISTILLATES	64742945	37
CITRUS TERPENES	94266474	35
CALCIUM CARBONATE	471341	30
BIOBASED TERPENE EXTRACTIVES	68956569	27

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 747 maintenance acidizing jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.8 Rule 1148.2 Average Material Use by Well Activity-Acid Fracturing

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	410,916
BARITE	7727437	91,434
PORTLAND CEMENT	65997151	72,216
POTASSIUM CHLORIDE	7447407	43,619
CRYSTALLINE SILICA	14808607	18,248
SILICA, CRYSTALLINE, QUARTZ	14808607	9,760
GYPSUM	13397245	9,629
CALCIUM OXIDE	1305788	5,079
SAPONITE	1319411	4,917
MICA	12001262	4,872
AMORPHOUS SILICA FUME	69012642	4,818
CALCIUM DERIVATIVE (CALCIUM CARBONATE)	1317653	4,814
MAGNESIUM OXIDE	1309484	4,814
SULFONATE	0	4,167
ANIONIC ACRYLAMIDE COPOLYMER	0	3,183
AMORPHOUS SILICA	7631869	2,985
HYDROCHLORIC ACID	7647010	2,761
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	2,500
SODIUM CHLORIDE	7647145	2,302
AMMONIUM CHLORIDE	12125029	1,810
ALUMINUM OXIDE	1344281	1,569
DISODIUM METASILICATE	6834920	1,555
LIGNITE	1415936	1,502
SODIUM CARBONATE	497198	1,217
BENTONITE	1302789	1,048

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 3 acid fracturing jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

Table 6.9 Rule 1148.2 Average Material Use by Well Activity-Other

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
WATER	7732185	44,250
BENTONITE	1302789	21,138
SULFURIC ACID, BARIUM SALT (1:1)	7727437	5,000
QUARTZ (SILICA)	14808607	3,598
CARBOXYMETHYLCELLULOSE SODIUM SALT	9004324	875
ANIONIC POLYACRYLAMIDE	9003058	581
CARBONIC ACID SODIUM SALT (1:2)	497198	550

Table 6.9 Rule 1148.2 Average Material Use by Well Activity-Other

Rule 1148.2 Data 2016 through July 2021		
Chemical Name	CAS Number	Amount (Pounds)
SODIUM BICARBONATE	144558	543
XANTHAN GUM	11138662	500
OIL, HYDROTREATED LIGHT NAPTHENIC DISTILLATE	64742478	291
SODIUM POLYACRYLATE	9003047	123
COMPOUND SYNTHETIC DIESTERS	8029398	78
SULFURIC ACID, IRON(2+) SALT (1:1), MONOHYDRATE	17375416	18
POLY(OXY-1,2-ETHANEDIYL), .ALPHA.-ISODECYL-.OMEGA.-HYDROXY-, PHOSPHATE, POTASSIUM SALT	68071170	14

Source: SCAQMD Rule 1148.2 Chemical Reporting Database.
Chemical amount listed is average per well activity based on 2 other category well jobs.
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

6.3 Acute Materials

The SCAQMD Rule 1148.2 database materials used for the well drilling fluid, well maintenance fluid, or well completion fluid activities were reviewed for acute or explosive materials. Acutely toxic chemicals are those substances that pose significant adverse health effects for immediate or short-term exposures. The route of exposure that may cause adverse effects are inhalation, absorption (through skin, eyes, or mucous membranes), or ingestion, depending on the chemical. Chemicals such as hydrofluoric or hydrochloric acid become acutely toxic only at certain concentrations. Table 6.10 identifies the acute or explosive chemicals in the SCAQMD Rule 1148.2 data base in this report. Note that most materials in the SCAQMD database do not pose an acute health risk to the public.

Table 6.10 Rule 1148.2 Acute Materials

Rule 1148.2 Data 2016 through June 2019		
Chemical Name	CAS Number	Notes
Acute Materials		
FORMALDEHYDE	50000	(>37%) formaldehyde solution
ETHYLENE OXIDE	75218	Pure or gaseous form
PEROXYACETIC ACID	79210	(concentration > 60% Acetic Acid; also called Peracetic Acid)
HYDROCHLORIC ACID	7647010	Anhydrous
HYDROFLUORIC ACID	7664393	Anhydrous
AMMONIA	7664417	Ammonia solutions (> 44% ammonia by weight) or anhydrous
HYDROGEN PEROXIDE	7722841	(52% by weight or greater)
Explosive Materials		
ACETONE	67641	Pure form, flammable
TRIETHYLENE GLYCOL	112276	Pure form, flammable

Sources: SCAQMD Rule 1148.2 Chemical Reporting Database; Federal EPA and ATF listings, Title 8, Division 1, Chapter 4. Division of Industrial Safety Subchapter 7. General Industry Safety Orders Group 16. Control of Hazardous Substances Article 109. Hazardous Substances and Processes, Appendix A to Section 5189 - List of Acutely Hazardous Chemicals, Toxics and Reactives (Mandatory).
Note certain chemicals identified with multiple or no CAS number, data based on SCAQMD Rule 1148.2 data base.

6.4 Recommendations

As noted above, transportation of hazardous materials for the purpose of drilling oil and gas wells is not covered under the Fire Department requirements for HMBPs.

6.4.1 Transportation Risk Management and Prevention Program (TRMPP)

The Strike Team recommends adoption of a Transportation Risk Management and Prevention Program (TRMPP) to address the lack of regulations for the transportation of hazardous materials as noted above. The requirement would consist of the following:

If the transportation routes of any product from oil and gas development in the County passes through or adjacent to any sensitive zoning such as residential, excluding designated truck routes, the operator shall prepare and maintain a Transportation Risk Management and Prevention Program which shall be provided to the County upon request. The TRMPP may contain the following components including, but not limited to:

A. Provisions for conducting comprehensive audits of carriers biennially to assure satisfactory safety records, driver hiring practices, driver training programs, programs to control drug and alcohol abuse, safety incentive programs, satisfactory vehicle inspection and maintenance procedures, and emergency notification capabilities. The operator shall submit to the County any audits that were conducted each calendar year.

B. Provisions for allowing only carriers which receive a satisfactory rating under the above audit process to transport oil and gas.

C. Truck loading procedures for ensuring that the loading rack operator and the truck driver both conduct, and document in writing, a visual inspection of the truck before loading and procedures to specify actions to be taken when problems are found during the visual inspection.

7.0 Conclusion

This final report was completed pursuant to the Board's March 2016 Motion and September 2018 action and concludes the Strike Team's efforts pursuant to those directives. The research, data collection, database development, mapping, field inspections, and analysis in this report document the Strike Team's research and investigation of the following oil and gas elements:

- Abandoned and orphan wells;
- Storage facilities;
- Pipelines; and,
- Hazardous chemicals.

The analysis of the data in this report allowed for the development of the recommendations for public safety and environmental improvements to the regulations contained in this report. In addition, it is recommended that for all the proposed recommendations in this Report, the County departments involved have some follow-up coordination to determine how some of the recommendations in this Report will be implemented. The appropriate County agencies should reconvene to create an implementation plan for the recommendations provided.

The Strike Team acknowledges the assistance from the following agencies in completing the final report:

- South Coast Air Quality Management District;
- Regional Water Quality Control Board; and
- California Geologic Energy Management Division (CalGEM).

Appendix A

Strike Team Advisory Panel Phase II Input Summary

Appendix B

Community Health Safety and Notification Plan Marina Del Rey Well Abandonment

Appendix C

SCAQMD Rule 1148.2 Chemical List

Appendix D

Detailed High Priority Well Maps

Appendix E

Draft Abandoned/Idle Well Inspection Protocol

Appendix F

Well Inspection Sheets