COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

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GAIL FARBER, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

July 13, 2010

ADOPTED
BOARD OF SUPERVISORS
COUNTY OF LOS ANGELES
#34 JULY 13, 2010
Sachi A. Hamai
SACHI A. HAMAI
EXECUTIVE OFFICER

The Honorable Board of Supervisors
County of Los Angeles
383 Kenneth Hahn Hall of Administration
500 West Temple Street
Los Angeles, California 90012

Dear Supervisors:

TUJUNGA WASH ECOSYSTEM RESTORATION PROJECT
PROJECT PARTNERSHIP AGREEMENT
(SUPERVISORIAL DISTRICT 3)
(3 VOTES)

SUBJECT

This action is to authorize the Chief Engineer of the Los Angeles County Flood Control District or her designee to execute a project partnership agreement with the U.S. Army Corps of Engineers for the implementation of the Tujunga Wash Ecosystem Restoration Project.

IT IS RECOMMENDED THAT YOUR BOARD ACTING AS THE GOVERNING BODY OF THE LOS ANGELES COUNTY FLOOD CONTROL DISTRICT:

1. Consider the Finding of No Significant Impact by the U.S. Army Corps of Engineers, dated May 14, 2009, for the Tujunga Wash Ecosystem Restoration Project; determine that the document adequately addresses the environmental impacts of the proposed project; find that this action also reflects the independent judgment of the Los Angeles County Flood Control District; find that your Board has complied with the requirements of the California Environmental Quality Act and adopt by reference the Finding of No Significant Impact.

2. Authorize the Chief Engineer of the Los Angeles County Flood Control District or her designee to execute a project partnership agreement with the U.S. Army Corps of Engineers providing for the Los Angeles County Flood Control District to contribute 25 percent of the ecosystem restoration cost for the project, currently estimated to be $1,099,000, and 50 percent of the recreational costs, currently estimated to be $65,100, to fund a portion of the design and construction of the Tujunga Wash Ecosystem Restoration Project, and to operate and maintain the project after its completion.

3. Authorize the Chief Engineer of the Los Angeles County Flood Control District or her designee to encumber an additional $85,900 for unforeseen project costs.

PURPOSE/JUSTIFICATION OF RECOMMENDED ACTION

The Tujunga Wash Ecosystem Restoration Project (Project) consists of an ecosystem restoration component – a meandering stream along the west bank of the Tujunga Wash Channel and a recreational component – a 12-foot-wide trail incorporated along the east bank of the channel. In addition, native/riparian vegetation will be planted on both sides of the channel.

The purpose of the recommended actions is to consider the Finding of No Significant Impact determination by the U.S. Army Corps of Engineers (Corps) for the Project and to authorize the Chief Engineer of the Los Angeles County Flood Control District (LACFCD) or her designee to execute, on behalf of the LACFCD, a project partnership agreement (PPA), substantially similar to the enclosed, with the Corps.

The main purpose of the PPA, formerly known as the Project Cooperative Agreement, is to establish a legally binding document between the Corps and the LACFCD that delineates both the Corps and the LACFCD responsibilities and the cost-sharing requirements necessary for the Corps to undertake the construction of the project, which will have multiple objectives in the areas of water conservation, water quality, recreational enhancements, and ecosystem restoration.

On July 15, 2008, the LACFCD provided a Letter of Interest to the Corps to request the continuation of an environmental restoration study for the Tujunga Wash pursuant to the Environmental Restoration Program under the provisions of Section 1135 of the Water Resources Development Act of 1986. As a result, the study continued, and the subject project was deemed feasible.

The Project will constitute Phase II of the overall Tujunga Wash environmental restoration effort and will extend the restoration from Vanowen Street to Sherman Way north of Phase I, which was completed on November 7, 2007, and included the implementation of a naturalized stream with native habitat along the Tujunga Wash between Oxnard and Vanowen Streets.

Implementation of Strategic Plan Goals

The Countywide Strategic Plan directs the provision of Operational Effectiveness (Goal 1) and Community and Municipal Services (Goal 3) by developing partnerships to effectively leverage our resources and using a collaborative effort to implement the Project. The Project will have multiple benefits for the residents by creating improvements in the areas of water conservation, water quality, recreation, and ecosystem restoration.

FISCAL IMPACT/FINANCING

There will be no impact to the County General Fund. The current planned Project is estimated at a total cost of $4,525,000. The LACFCD will fund 25 percent of the cost of the ecosystem restoration component, estimated to be $1,099,000, and 50 percent of the recreational component, estimated to be $65,100. An additional $85,900 is being requested as a contingency for final and unforeseen Project costs. The remainder of the Project will be funded by the Corps.

Funding for this Project is included in the Fiscal Year 2010-11 adopted Flood Control District Fund Budget.

FACTS AND PROVISIONS/LEGAL REQUIREMENTS

The enclosed PPA has been reviewed and approved as to form by County Counsel.

ENVIRONMENTAL DOCUMENTATION

The Corps has prepared the enclosed Environmental Assessment for the Project and has made a Finding of No Significant Impact determination dated May 14, 2009, also enclosed.

IMPACT ON CURRENT SERVICES (OR PROJECTS)

There will be no negative impact on current services.

Approval of the recommended actions will benefit the LACFCD by providing a means of collaborating with the Corps to share intentions, goals, and plans concerning ecosystem restoration efforts along the Los Angeles River.

CONCLUSION

Please return one adopted copy of this letter to the Department of Public Works, Watershed Management Division.

Respectfully submitted,

Gail Farber

GAIL FARBER
Director

GF:GH:jtz

c: Chief Executive Office
County Counsel
Executive Office

PROJECT PARTNERSHIP AGREEMENT
BETWEEN
THE DEPARTMENT OF THE ARMY
AND
LOS ANGELES FLOOD CONTROL DISTRICT
FOR
DESIGN AND CONSTRUCTION
OF THE
TUJUNGA WASH ECOSYSTEM RESTORATION PROJECT

THIS AGREEMENT is entered into this _____ day of _____, ____, by and between the Department of the Army (hereinafter the "Government"), represented by the Los Angeles District Corps of Engineers and the Los Angeles County Flood Control District (hereinafter the "Non-Federal Sponsor"), represented by the Director of the Los Angeles County Department of Public Works.

WITNESSETH, THAT:

WHEREAS, construction of the Tujunga Wash flood control channel (hereinafter the "*Existing Project*", as defined in Article I.A. of this Agreement) at the Tujunga Wash channel of the Los Angeles River Drainage System, Los Angeles, California was completed by the Secretary of the Army in 1959**.**

WHEREAS, the construction or operation of the *Existing Project* has contributed to the degradation of the quality of the environment;

WHEREAS, design and construction of the Tujunga Wash Ecosystem Restoration project (hereinafter the "*Project*", as defined in Article I.B. of this Agreement) at the Tujunga Wash flood control channel of the Los Angeles River drainage system, Los Angeles, California was approved by the South Pacific Division Commander, Janice Dombi, on June 30, 2009 pursuant to the authority contained in Section 1135(c) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2309a; hereinafter "Section 1135");

WHEREAS, Section 4 of the Flood Control Act of 1944, Public Law 78-534, as amended (16 U.S.C. 460d) and the Federal Water Project Recreation Act of 1965, Public Law 89-72, as amended (16 U.S.C. 460l-12 *et seq*.) provide authority to include recreation as a *Project* purpose;

WHEREAS, performance of *monitoring* (as defined in Article I.V. of this Agreement) was approved as part of the *Project*;

WHEREAS, Section 1135 provides that not to exceed $40,000,000 in Federal funds are authorized to be appropriated annually to carry out projects for the purpose of: (1) making such modifications in the structures and operations of water resources projects constructed by the Secretary of the Army which the Secretary determines will improve

the quality of the environment, or (2) undertaking measures for restoration of environmental quality when the Secretary determines that construction or operation of a water resources project has contributed to the degradation of the quality of the environment; and not more than $5,000,000 in Federal funds may be expended on any single modification or measure carried out or undertaken pursuant to Section 1135;

WHEREAS, the Government and the Non-Federal Sponsor desire to enter into a Project Partnership Agreement (hereinafter the "Agreement") for design and construction of the *Project*;

WHEREAS, Section 1135 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2309a) and Section 103 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213) specify the cost-sharing requirements applicable to the *Project*;

WHEREAS, the Government and Non-Federal Sponsor have the full authority and capability to perform as hereinafter set forth and intend to cooperate in cost-sharing and financing of the *Project* in accordance with the terms of this Agreement; and

WHEREAS, the Government and the Non-Federal Sponsor, in connection with this Agreement, desire to foster a partnering strategy and a working relationship between the Government and the Non-Federal Sponsor through a mutually developed formal strategy of commitment and communication embodied herein, which creates an environment where trust and teamwork prevent disputes, foster a cooperative bond between the Government and the Non-Federal Sponsor, and facilitate the successful implementation of the *Project*.

NOW, THEREFORE, the Government and the Non-Federal Sponsor agree as follows:

ARTICLE I - DEFINITIONS

A. The term "*Existing Project*" shall mean Tujunga Wash flood control channel, as authorized by the Water Resources Development Act of 1990, P.L. 101-640, Sec. 101. for flood control.

B. The term "*Project*" shall mean the *ecosystem restoration features* and the *recreation features* as generally described in the Tujunga Wash Ecosystem Restoration Project Detailed Project Report, dated June 2009 and approved by the South Pacific Division Commander, Janice Dombi, on June 30, 2009.

C. The term "*ecosystem restoration features*" shall mean construction of a meandering stream along the west bank of the Tujunga Wash channel and the planting of native riparian vegetation along the meandering stream as generally described in the Tujunga Wash Ecosystem Restoration Detailed Project Report, dated June 2009, and approved by the South Pacific Division Commander, Janice Dombi on June 30, 2009.

D. The term "*recreation features*" shall mean recreational opportunities created by public utilization of a 12 foot wide maintenance road along the East bank that could be used for biking, running and bird watching as generally described in the Tujunga Wash Ecosystem Restoration Detailed Project Report dated June 2009, and approved by South Pacific Division Commander, Janice Dombi, on June 30, 2009.

E. The term "*total project costs*" shall mean the sum of all costs incurred by the Non-Federal Sponsor and the Government in accordance with the terms of this Agreement directly related to design and construction of the *Project* and the *pre-Agreement planning and design costs* incurred by the Government. Subject to the provisions of this Agreement, the term shall include, but is not necessarily limited to: the Government's *pre-Agreement planning and design costs* and the Government's design costs incurred after the effective date of this Agreement; the Government's costs of preparation of environmental compliance documentation in accordance with Article II.A.2. of this Agreement; the Government's engineering and design costs during construction; the Non-Federal Sponsor's and the Government's costs of investigations to identify the existence and extent of hazardous substances in accordance with Article XIV.A. of this Agreement; the Government's costs of historic preservation activities in accordance with Article XVII.A. and**:** Article XVII.B.1. of this Agreement; the Government's actual construction costs; the Government's costs of *monitoring* in accordance with Article II.K. and Article II.L. of this Agreement; the Government's supervision and administration costs; the Non-Federal Sponsor's and the Government's costs of participation in the Project Coordination Team in accordance with Article V of this Agreement; the Government's costs of contract dispute settlements or awards; any costs for operation, maintenance, repair, rehabilitation, or replacement of the *Project*; any costs of *betterments* under Article II.J.2. of this Agreement; any costs of dispute resolution under Article VII of this Agreement; the Government's costs for data recovery activities associated with historic preservation in accordance with Article XVII.B.2. and Article XVII.B.3. of this Agreement; or the Non-Federal Sponsor's costs of negotiating this Agreement.

F. The term "*total ecosystem restoration costs*" shall mean that portion of *total project costs* allocated to the *ecosystem restoration features.*

G. The term "*total recreation costs*" shall mean that portion of *total project costs* allocated to the *recreation features.*

H. The term "*period of design and construction*" shall mean the time from the effective date of this Agreement to the date that construction and *monitoring* of the *Project* are complete, as determined by the Government, or the date that this Agreement is terminated in accordance with Article XIII or Article XIV.C. of this Agreement, whichever is earlier.

I. The term "*financial obligations for design and construction*" shall mean the financial obligations of the Government that result or would result in costs that are or would be included in *total project costs* except for obligations pertaining to the provision of lands,

easements, and rights-of-way, the performance of *relocations*, and the construction of improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material.

J. The term "*non-Federal proportionate share*" shall mean the ratio of Non-Federal Sponsor's total contribution of funds required by Article II.C.2., Article II.D.2., Article II.D.4., and Article II.E.2.of this Agreement to *financial obligations for design and construction*, as projected by the Government.

K. The term "*highway*" shall mean any highway, roadway, street, or way, including any bridge thereof, that is owned by a public entity.

L. The term "*relocation*" shall mean providing a functionally equivalent facility to the owner of a utility, cemetery, *highway*, railroad, or public facility when such action is authorized in accordance with applicable legal principles of just compensation. Providing a functionally equivalent facility may take the form of alteration, lowering, raising, or replacement and attendant demolition of the affected facility or part thereof.

M. The term "*functional portion of the Project*" shall mean a portion of the *Project* for which construction has been completed and that can function independently, as determined by the U.S. Army Engineer, Los Angeles District (hereinafter the "District Engineer") in writing, although the remainder of the *Project* is not complete.

N. The term "*betterment*" shall mean a difference in the design or construction of an element of the *Project* that results from the application of standards that the Government determines exceed those that the Government would otherwise apply to the design or construction of that element. The term does not include any design or construction for features not included in the *Project* as defined in paragraph B. of this Article.

O. The term "*Federal program funds*" shall mean funds provided by a Federal agency, other than the Department of the Army, plus any non-Federal contribution required as a matching share therefore.

P. The term "*Section 1135 Project Limit*" shall mean the $5,000,000 statutory limitation on the Government's financial participation in the planning, design, and construction of the *Project* as specified in Section 1135 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2309a).

Q. The term "*Section 1135 Annual Program Limit*" shall mean the statutory limitation on the Government's annual appropriations for planning, design, and construction of all projects implemented pursuant to Section 1135 of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2309a). As of the effective date of this Agreement, such limitation is $40,000,000.

R. The term "*fiscal year*" shall mean one year beginning on October 1 and ending on September 30.

S. The term "*fiscal year of the Non-Federal Sponsor*" shall mean one year beginning on July 1st and ending on June 30th.

T. The term "*pre-Agreement planning and design costs*" shall mean all costs that were incurred by the Government prior to the effective date of this Agreement for planning and design of the *Project*.

U. The term "*monitoring*" shall mean activities, including the collection and analysis of data, that are necessary to determine if predicted outputs of the *ecosystem restoration features* are being achieved.

ARTICLE II - OBLIGATIONS OF THE GOVERNMENT AND THE NON-FEDERAL SPONSOR

A. The Government, subject to receiving funds appropriated by the Congress of the United States (hereinafter the "Congress") and using those funds and funds provided by the Non-Federal Sponsor, expeditiously shall design and construct the *Project*, applying those procedures usually applied to Federal projects, in accordance with Federal laws, regulations, and policies.

1. The Government shall not issue the solicitation for the first contract for design of the *Project* or commence design of the *Project* using the Government's own forces until the Non-Federal Sponsor has confirmed in writing its willingness to proceed with the *Project*.

2. The Government shall develop and coordinate as required, an Environmental Assessment and Finding of No Significant Impact or an Environmental Impact Statement and Record of Decision, as necessary, to inform the public regarding the environmental impacts of the *Project* in accordance with the National Environmental Policy Act of 1969 (42 U.S.C. 4321–4347; hereinafter "NEPA"). However, the Government shall not issue the solicitation for the first construction contract for the *Project* or commence construction of the *Project* using the Government's own forces until all applicable environmental laws and regulations have been complied with, including, but not limited to NEPA and Section 401 of the Federal Water Pollution Control Act (33 U.S.C. 1341).

3. The Government shall afford the Non-Federal Sponsor the opportunity to review and comment on the solicitations for all contracts, including relevant plans and specifications, prior to the Government's issuance of such solicitations. To the extent possible, the Government shall afford the Non-Federal Sponsor the opportunity to review and comment on all proposed contract modifications, including change orders. In any instance where providing the Non-Federal Sponsor with notification of a contract modification is not possible prior to execution of the contract modification, the Government shall provide such notification in writing at the earliest date possible. To the extent possible,

the Government also shall afford the Non-Federal Sponsor the opportunity to review and comment on all contract claims prior to resolution thereof. The Government shall consider in good faith the comments of the Non-Federal Sponsor, but the contents of solicitations, award of contracts or commencement of design or construction using the Government's own forces, execution of contract modifications, resolution of contract claims, and performance of all work on the *Project* shall be exclusively within the control of the Government.

4. At the time the District Engineer furnishes the contractor with the Government's Written Notice of Acceptance of Completed Work for each contract awarded by the Government for the *Project*, the District Engineer shall furnish a copy thereof to the Non-Federal Sponsor.

5. Notwithstanding paragraph A.3. of this Article, if the award of any contract for design, construction, or *monitoring* of the *Project*, or continuation of design, construction, or *monitoring* of the *Project* using the Government's own forces, would result in *total project costs* exceeding $5,000,000 the Government and the Non-Federal Sponsor agree to defer award of that contract, award of all remaining contracts for design, construction, or *monitoring* of the *Project*, and continuation of design, construction, or *monitoring* of the *Project* using the Government's own forces until such time as the Government and the Non-Federal Sponsor agree in writing to proceed with further contract awards for the *Project* or the continuation of design, construction, or *monitoring* of the *Project* using the Government's own forces, but in no event shall the award of contracts or the continuation of design, construction, or *monitoring* of the *Project* using the Government's own forces be deferred for more than three years. Notwithstanding this general provision for deferral, in the event the Assistant Secretary of the Army (Civil Works) makes a written determination that the award of such contract or contracts or continuation of design, construction, or *monitoring* of the *Project* using the Government's own forces must proceed in order to comply with law or to protect human life or property from imminent and substantial harm, the Government, after consultation with the Non-Federal Sponsor, may award a contract or contracts, or continue with design, construction, or *monitoring* of the *Project* using the Government's own forces.

B. The Government shall allocate *total project costs* between *total ecosystem restoration costs* and *total recreation costs*.

C. Currently under negotiation.

D. Currently under negotiation.

E. Notwithstanding any other provision of this Agreement, Federal financial participation in the *Project* is limited by the following provisions of this paragraph.

1. In the event the Government projects that the amount of Federal funds the Government will make available to the *Project* through the then-current *fiscal year*, or

the amount of Federal funds the Government will make available for the *Project* through the upcoming *fiscal year*, is not sufficient to meet the Federal share of *total project costs* and the Federal share of costs for data recovery activities associated with historic preservation in accordance with Article XVII.B.2. and Article XVII.B.3. of this Agreement that the Government projects to be incurred through the then-current or upcoming *fiscal year*, as applicable, the Government shall notify the Non-Federal Sponsor in writing of such insufficiency of funds and of the date the Government projects that the Federal funds that will have been made available to the *Project* will be exhausted. Upon the exhaustion of Federal funds made available by the Government to the *Project*, future performance under this Agreement shall be suspended and the parties shall proceed in accordance with Article XIII.B. of this Agreement.

2. Currently under negotiation.

3. If the Government determines that the total amount of Federal funds provided by Congress for all projects implemented pursuant to Section 1135 has reached the *Section 1135 Annual Program Limit*, and the Government projects that the Federal funds the Government will make available to the *Project* within the *Section 1135 Annual Program Limit* will not be sufficient to meet the Federal share of *total project costs* and the Federal share of costs for data recovery activities associated with historic preservation in accordance with Article XVII.B.2. and Article XVII.B.3. of this Agreement, the Government shall notify the Non-Federal Sponsor in writing of such insufficiency of funds and of the date the Government projects that the Federal funds that will have been made available to the *Project* will be exhausted. Upon the exhaustion of Federal funds made available by the Government to the *Project* within the *Section 1135 Annual Program Limit*, future performance under this Agreement shall be suspended and the parties shall proceed in accordance with Article XIII.B. of this Agreement.

4. As of the effective date of this Agreement, $3,000,000 of Federal funds is currently projected to be available for the *Project*. The Government makes no commitment to request Congress to provide additional Federal funds for the *Project*. Further, the Government's financial participation in the *Project* is limited to the Federal funds that the Government makes available to the *Project*.

F. When the District Engineer determines that, except for *monitoring*, the entire *Project*, or a *functional portion of the Project*, is complete, the District Engineer shall so notify the Non-Federal Sponsor in writing and furnish the Non-Federal Sponsor with a final Operation, Maintenance, Repair, Rehabilitation, and Replacement Manual (hereinafter the "OMRR&R Manual") or, if the final OMRR&R Manual is not available, an interim OMRR&R Manual for the entire *Project* or such completed portion. Upon such notification, the Government also shall furnish to the Non-Federal Sponsor a copy of all final as-built drawings for the entire *Project* or such completed portion if such drawings are available. Not later than 6 months after such notification by the Government that the entire *Project* is complete, the Government shall furnish the Non-Federal Sponsor with the final OMRR&R Manual and all final as-built drawings for the entire *Project*. In the event the final OMRR&R Manual or all final as-built drawings for

the entire *Project* cannot be completed within the 6 month period, the Government shall provide written notice to the Non-Federal Sponsor, and the Government and the Non-Federal Sponsor shall negotiate an acceptable completion date for furnishing such documents. Further, after completion of all contracts for the *Project*, copies of all of the Government's Written Notices of Acceptance of Completed Work for all contracts for the *Project* that have not been provided previously shall be provided to the Non-Federal Sponsor.

G. Upon notification from the District Engineer in accordance with paragraph F. of this Article, the Non-Federal Sponsor shall operate, maintain, repair, rehabilitate, and replace the entire *Project*, or the *functional portion of the Project* as the case may be, in accordance with Article VIII of this Agreement.

H. Upon the District Engineer's determination that, except for *monitoring*, the entire *Project* is complete, the Government shall conduct an interim accounting, in accordance with Article VI.C. of this Agreement, and furnish the results to the Non-Federal Sponsor. Further, upon conclusion of the *period of design and construction* the Government shall amend the interim accounting to complete the final accounting, in accordance with Article VI.C. of this Agreement, and furnish the results to the Non-Federal Sponsor.

I. Currently under negotiation.

J. The Non-Federal Sponsor may request the Government to perform or provide, on behalf of the Non-Federal Sponsor, one or more of the services (hereinafter the "additional work") described in this paragraph. Such requests shall be in writing and shall describe the additional work requested to be performed or provided. If in its sole discretion the Government elects to perform or provide the requested additional work or any portion thereof, it shall so notify the Non-Federal Sponsor in a writing that sets forth any applicable terms and conditions, which must be consistent with this Agreement. In the event of conflict between such a writing and this Agreement, this Agreement shall control. The Non-Federal Sponsor shall be solely responsible for all costs of the additional work performed or provided by the Government under this paragraph and shall pay all such costs in accordance with Article VI.D. of this Agreement.

1. Acquisition of lands, easements, and rights-of-way; performance of *relocations*; or construction of improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material for the *Project*. Notwithstanding acquisition of lands, easements, and rights-of-way, performance of *relocations*, or construction of improvements by the Government, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for any costs of cleanup and response in accordance with Article XIV.C. of this Agreement.

2. Inclusion of *betterments* in the design or construction of the *Project*. In the event the Government elects to include any such *betterments*, the Government shall

allocate the costs of the *Project* features that include *betterments* between *total project costs* and the costs of the *betterments*.

K. Prior to completion of construction of the *ecosystem restoration features*, the Government, in consultation with the Non-Federal Sponsor and, as appropriate, other concerned agencies, shall finalize the plan for *monitoring* of the *ecosystem restoration features*. The *monitoring* plan shall describe the specific parameters to be monitored; how these parameters relate to achieving the desired outcomes; methods for measuring those parameters; frequency and duration of *monitoring* of the *ecosystem restoration features*; criteria for measuring the success of the *ecosystem restoration features*; preparation and distribution of *monitoring* reports and other coordination requirements; and estimated *monitoring* costs. As of the effective date of this Agreement, the costs of *monitoring* for the *ecosystem restoration features* are estimated to be $52,000 annually.

L. Upon providing notification to the Non-Federal Sponsor that the *ecosystem restoration features* are complete in accordance with paragraph F. of this Article, the Government shall perform *monitoring* of the *ecosystem restoration features* in accordance with the *monitoring* plan for a period of one year from the date of such notification. The Government's performance of *monitoring* shall be concurrent with the Non-Federal Sponsor's performance of operation, maintenance, repair, rehabilitation, and replacement for the completed *ecosystem restoration features*. The *monitoring* of the *ecosystem restoration features* by the Government shall end prior to the expiration of such one year period upon the occurrence of either of the following events: (1) the award of the next contract for *monitoring* of the *ecosystem restoration features*, or continuation of *monitoring* of the *ecosystem restoration features* using the Government's own forces, would result in the costs incurred for *monitoring* of the *ecosystem restoration features* exceeding 1 percent of the amount equal to *total ecosystem restoration costs* minus the costs for *monitoring* of the *ecosystem restoration features*; or (2) the District Engineer determines that continued *monitoring* of the *ecosystem restoration features* is not necessary.

M. The Non-Federal Sponsor shall prevent obstructions or encroachments on the *Project* (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on *Project* lands, easements, and rights-of-way or the addition of facilities which might reduce the outputs produced by the *ecosystem restoration features*, hinder operation and maintenance of the *Project*, or interfere with the *Project's* proper function.

N. The Non-Federal Sponsor shall not use the *ecosystem restoration features*, or the lands, easements, and rights-of-way required pursuant to Article III of this Agreement for such features, as a wetlands bank or mitigation credit for any other project.

O. The Non-Federal Sponsor shall keep the *recreation features*, and access roads, parking areas, and other associated public use facilities, open and available to all on equal terms.

ARTICLE III - LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS, DISPOSAL AREA IMPROVEMENTS, AND COMPLIANCE WITH PUBLIC LAW 91-646, AS AMENDED

A. The Government, after consultation with the Non-Federal Sponsor, shall determine the lands, easements, and rights-of-way required for construction, operation, and maintenance of the *Project*, including those required for *relocations*, the borrowing of material, and the disposal of dredged or excavated material. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of the lands, easements, and rights-of-way that the Government determines the Non-Federal Sponsor must provide, respectively, for the *ecosystem restoration features* and for the *recreation features*, in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with acquisition of such lands, easements, and rights-of-way. Prior to the issuance of the solicitation for each Government contract for construction of the *Project*, or prior to the Government initiating construction of a portion of the *Project* using the Government's own forces, the Non-Federal Sponsor shall acquire all lands, easements, and rights-of-way the Government determines the Non-Federal Sponsor must provide for that work and shall provide the Government with authorization for entry thereto. Furthermore, prior to the end of the *period of design and construction*, the Non-Federal Sponsor shall acquire all lands, easements, and rights-of-way required for construction, operation, and maintenance of the *Project*, as set forth in such descriptions, and shall provide the Government with authorization for entry thereto. The Non-Federal Sponsor shall ensure that lands, easements, and rights-of-way that the Government determines to be required for the *Project* and that were provided by the Non-Federal Sponsor are retained in public ownership for uses compatible with the authorized purposes of the *Project*.

B. The Government, after consultation with the Non-Federal Sponsor, shall determine the *relocations* necessary for construction, operation, and maintenance of the *Project*, including those necessary to enable the borrowing of material or the disposal of dredged or excavated material. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of such *relocations* that are necessary, respectively, for the *ecosystem restoration features* and for the *recreation features* in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with such *relocations*. Prior to the issuance of the solicitation for each Government contract for construction of the *Project*, or prior to the Government initiating construction of a portion of the *Project* using the Government's own forces, the Non-Federal Sponsor shall prepare or ensure the preparation of plans and specifications for, and perform or ensure the performance of, all *relocations* the Government determines to be necessary for that work. Furthermore, prior to the end of the *period of design and construction*, the Non-Federal Sponsor shall perform or ensure performance of all *relocations* as set forth in such descriptions.

C. The Government, after consultation with the Non-Federal Sponsor, shall determine the improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material associated with construction, operation, and maintenance of the *Project*. Such improvements may include, but are not necessarily limited to, retaining dikes, wasteweirs, bulkheads, embankments, monitoring features, stilling basins, and de-watering pumps and pipes. The Government in a timely manner shall provide the Non-Federal Sponsor with general written descriptions, including maps as appropriate, of such improvements that are required, respectively, for the *ecosystem restoration features* and for the *recreation features* in detail sufficient to enable the Non-Federal Sponsor to fulfill its obligations under this paragraph, and shall provide the Non-Federal Sponsor with a written notice to proceed with construction of such improvements. Prior to the issuance of the solicitation for each Government contract for construction of the *Project*, or prior to the Government initiating construction of a portion of the *Project* using the Government's own forces, the Non-Federal Sponsor shall prepare plans and specifications for all improvements the Government determines to be required for the disposal of dredged or excavated material under that contract, submit such plans and specifications to the Government for approval, and provide such improvements in accordance with the approved plans and specifications. Furthermore, prior to the end of the *period of design and construction*, the Non-Federal Sponsor shall provide all improvements set forth in such descriptions.

D. The Non-Federal Sponsor shall comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the *Project*, including those required for *relocations*, the borrowing of material, or the disposal of dredged or excavated material, and shall inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

ARTICLE IV - CREDIT FOR VALUE OF LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS, AND DISPOSAL AREA IMPROVEMENTS

A. Except as provided otherwise in this Article, the Government shall include in *total project costs* and afford credit toward the Non-Federal Sponsor's share of *total ecosystem restoration costs* for the value of the lands, easements, and rights-of-way that the Non-Federal Sponsor must provide pursuant to Article III.A. of this Agreement for the *ecosystem restoration features*; for the value of the *relocations* that the Non-Federal Sponsor must perform or for which it must ensure performance pursuant to Article III.B. of this Agreement for the *ecosystem restoration features*; and for the value of the improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that the Non-Federal Sponsor must provide pursuant to Article III.C. of this Agreement for the *ecosystem restoration features*. The Government also shall include in *total project costs* and afford credit toward the Non-Federal Sponsor's share of *total recreation costs* for the value of the lands, easements, and rights-of-way that the Non-

Federal Sponsor must provide pursuant to Article III.A. of this Agreement for the *recreation features*; for the value of the *relocations* that the Non-Federal Sponsor must perform or for which it must ensure performance pursuant to Article III.B. of this Agreement for the *recreation features*; and for the value of the improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that the Non-Federal Sponsor must provide pursuant to Article III.C. of this Agreement for the *recreation features*. However, no amount shall be included in *total project costs*, no credit shall be afforded, and no reimbursement shall be provided for the value of any lands, easements, rights-of-way, *relocations*, or improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that have been provided previously as an item of cooperation for another Federal project, including the *Existing Project*. In addition, no amount shall be included in *total project costs*, no credit shall be afforded, and no reimbursement shall be provided for the value of lands, easements, rights-of-way, *relocations*, or improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material that were acquired or performed using *Federal program funds* unless the Federal agency providing the Federal portion of such funds verifies in writing that affording credit for the value of such items is expressly authorized by Federal law. Finally, no amount shall be included in *total project costs*, no credit shall be afforded pursuant to this Article, and no reimbursement shall be provided to the Non-Federal Sponsor, for any value of lands, easements, rights-of-way, *relocations*, or improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material determined by the Government to be required or necessary for the *ecosystem restoration features* that exceeds 25 percent of *total ecosystem restoration costs*.

B. The Non-Federal Sponsor in a timely manner shall provide the Government with such documents as are sufficient to enable the Government to determine the value of any contribution provided pursuant to Article III.A., Article III.B., or Article III.C. of this Agreement. Upon receipt of such documents, the Government in a timely manner shall determine the value of such contributions for the purpose of including such value in *total project costs* and for determining the amount of credit to be afforded or reimbursement to be provided in accordance with the provisions of this Agreement.

C. For the purposes of determining the value to be included in *total project costs* and the amount of credit to be afforded or reimbursement to be provided in accordance with this Agreement and except as otherwise provided in paragraph G. of this Article, the value of lands, easements, and rights-of-way, including those required for *relocations*, the borrowing of material, and the disposal of dredged or excavated material, shall be the fair market value of the real property interests, plus certain incidental costs of acquiring those interests, as determined in accordance with the provisions of this paragraph.

1. Date of Valuation. The fair market value of lands, easements, or rights-of-way owned by the Non-Federal Sponsor on the effective date of this Agreement shall be the fair market value of such real property interests as of the date the Non-Federal Sponsor provides the Government with authorization for entry thereto. The fair market value of lands, easements, or rights-of-way acquired by the Non-Federal Sponsor after the effective

date of this Agreement shall be the fair market value of such real property interests at the time the interests are acquired.

2. General Valuation Procedure. Except as provided in paragraph C.3. or paragraph C.5. of this Article, the fair market value of lands, easements, or rights-of-way shall be determined in accordance with the provisions of this paragraph.

a. The Non-Federal Sponsor shall obtain, for each real property interest, an appraisal that is prepared by a qualified appraiser who is acceptable to the Non-Federal Sponsor and the Government. The Non-Federal Sponsor shall provide the Government with the appraisal no later than 6 months after the Non-Federal Sponsor provides the Government with an authorization for entry for such real property interest. The appraisal must be prepared in accordance with the applicable rules of just compensation, as specified by the Government. The fair market value shall be the amount set forth in the Non-Federal Sponsor's appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal Sponsor's appraisal, the Non-Federal Sponsor may obtain a second appraisal, and the fair market value shall be the amount set forth in the Non-Federal Sponsor's second appraisal, if such appraisal is approved by the Government. In the event the Government does not approve the Non-Federal Sponsor's second appraisal, the Non-Federal Sponsor chooses not to obtain a second appraisal, or the Non-Federal Sponsor does not provide the first appraisal as required in this paragraph, the Government shall obtain an appraisal, and the fair market value shall be the amount set forth in the Government's appraisal, if such appraisal is approved by the Non-Federal Sponsor. In the event the Non-Federal Sponsor does not approve the Government's appraisal, the Government, after consultation with the Non-Federal Sponsor, shall consider the Government's and the Non-Federal Sponsor's appraisals and determine an amount based thereon, which shall be deemed to be the fair market value.

b. Where the amount paid or proposed to be paid by the Non-Federal Sponsor for the real property interest exceeds the amount determined pursuant to paragraph C.2.a. of this Article, the Government, at the request of the Non-Federal Sponsor, shall consider all factors relevant to determining fair market value and, in its sole discretion, after consultation with the Non-Federal Sponsor, may approve in writing an amount greater than the amount determined pursuant to paragraph C.2.a. of this Article, but not to exceed the amount actually paid or proposed to be paid. If the Government approves such an amount, the fair market value shall be the lesser of the approved amount or the amount paid by the Non-Federal Sponsor, but no less than the amount determined pursuant to paragraph C.2.a. of this Article.

3. Eminent Domain Valuation Procedure. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted after the effective date of this Agreement, the Non-Federal Sponsor, prior to instituting such proceedings, shall submit to the Government notification in writing of its intent to institute such proceedings and an appraisal of the specific real property interests to be acquired in such proceedings. The

Government shall have 60 calendar days after receipt of such a notice and appraisal within which to review the appraisal, if not previously approved by the Government in writing.

a. If the Government previously has approved the appraisal in writing, or if the Government provides written approval of, or takes no action on, the appraisal within such 60 day period, the Non-Federal Sponsor shall use the amount set forth in such appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

b. If the Government provides written disapproval of the appraisal, including the reasons for disapproval, within such 60 day period, the Government and the Non-Federal Sponsor shall consult in good faith to promptly resolve the issues or areas of disagreement that are identified in the Government's written disapproval. If, after such good faith consultation, the Government and the Non-Federal Sponsor agree as to an appropriate amount, then the Non-Federal Sponsor shall use that amount as the estimate of just compensation for the purpose of instituting the eminent domain proceeding. If, after such good faith consultation, the Government and the Non-Federal Sponsor cannot agree as to an appropriate amount, then the Non-Federal Sponsor may use the amount set forth in its appraisal as the estimate of just compensation for the purpose of instituting the eminent domain proceeding.

c. For lands, easements, or rights-of-way acquired by eminent domain proceedings instituted in accordance with paragraph C.3. of this Article, fair market value shall be either the amount of the court award for the real property interests taken, to the extent the Government determined such interests are required for construction, operation, and maintenance of the *Project*, or the amount of any stipulated settlement or portion thereof that the Government approves in writing.

4. Incidental Costs. For lands, easements, or rights-of-way acquired by the Non-Federal Sponsor within a five year period preceding the effective date of this Agreement, or at any time after the effective date of this Agreement, the value of the interest shall include the documented incidental costs of acquiring the interest, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs. In the event the Government modifies its determination made pursuant to Article III.A. of this Agreement, the Government shall afford credit for the documented incidental costs associated with preparing to acquire the lands, easements, or rights-of-way identified in the original determination, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs. Such incidental costs shall include, but not necessarily be limited to, closing and title costs, appraisal costs, survey costs, attorney's fees, plat maps, mapping costs, actual amounts expended for payment of any relocation assistance benefits provided in accordance with Article III.D. of this Agreement, and other payments by the Non-Federal Sponsor for items that are generally recognized as compensable, and required to be paid, by applicable state law due to the acquisition of a real property interest in accordance with Article III of this Agreement. The value of the interests provided by the Non-Federal

Sponsor in accordance with Article III.A. of this Agreement also shall include the documented costs of obtaining appraisals pursuant to paragraph C.2. of this Article, as determined by the Government, and subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs.

5. Waiver of Appraisal. Except as required by paragraph C.3. of this Article, the Government may waive the requirement for an appraisal pursuant to this paragraph if it determines that an appraisal is unnecessary because the valuation is uncomplicated and that the estimated fair market value of the real property interest is $10,000 or less based upon a review of available data. In such event, the Government and the Non-Federal Sponsor must agree in writing to the value of such real property interest in an amount not in excess of $10,000.

D. After consultation with the Non-Federal Sponsor, the Government shall determine the value of *relocations* in accordance with the provisions of this paragraph.

1. For a *relocation* other than a *highway*, the value shall be only that portion of *relocation* costs that the Government determines is necessary to provide a functionally equivalent facility, reduced by depreciation, as applicable, and by the salvage value of any removed items.

2. For a *relocation* of a *highway*, the value shall be only that portion of *relocation* costs that would be necessary to accomplish the *relocation* in accordance with the design standard that the State of California would apply under similar conditions of geography and traffic load, reduced by the salvage value of any removed items.

3. *Relocation* costs shall include, but not necessarily be limited to, actual costs of performing the *relocation*; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with performance of the *relocation*, as determined by the Government. *Relocation* costs shall not include any costs due to *betterments*, as determined by the Government, nor any additional cost of using new material when suitable used material is available. *Relocation* costs shall be subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs.

E. The value of the improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material shall be the costs of the improvements, as determined by the Government, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs. Such costs shall include, but not necessarily be limited to, actual costs of providing the improvements; planning, engineering and design costs; supervision and administration costs; and documented incidental costs associated with providing the improvements, but shall not include any costs due to *betterments*, as determined by the Government.

F. Any credit afforded or reimbursement provided under the terms of this Agreement for the value of *relocations*, or improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material, performed within the *Project* boundaries is subject to satisfactory compliance with applicable Federal labor laws covering non-Federal construction, including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)). Notwithstanding any other provision of this Agreement, credit or reimbursement may be withheld, in whole or in part, as a result of the Non-Federal Sponsor's failure to comply with its obligations under these laws.

G. Where the Government, on behalf of the Non-Federal Sponsor pursuant to Article II.J.1. of this Agreement, acquires lands, easements, or rights-of-way, performs *relocations*, or constructs improvements required on lands, easements, or rights-of-way to enable the disposal of dredged or excavated material, the value to be included in *total project costs* and the amount of credit to be afforded or the amount of reimbursement provided in accordance with this Agreement shall be the costs of such work performed or provided by the Government that are paid by the Non-Federal Sponsor in accordance with Article VI.D. of this Agreement. In addition, the value to be included in *total project costs* and the amount of such credit to be afforded or the amount of reimbursement provided in accordance with this Agreement shall include the documented costs incurred by the Non-Federal Sponsor in accordance with the terms and conditions agreed upon in writing pursuant to Article II.J.1. of this Agreement subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs.

ARTICLE V - PROJECT COORDINATION TEAM

A. To provide for consistent and effective communication, the Non-Federal Sponsor and the Government, not later than 30 calendar days after the effective date of this Agreement, shall appoint named senior representatives to a Project Coordination Team. Thereafter, the Project Coordination Team shall meet regularly until the end of the *period of design and construction*. The Government's Project Manager and a counterpart named by the Non-Federal Sponsor shall co-chair the Project Coordination Team.

B. The Government's Project Manager and the Non-Federal Sponsor's counterpart shall keep the Project Coordination Team informed of the progress of design and construction and of significant pending issues and actions, and shall seek the views of the Project Coordination Team on matters that the Project Coordination Team generally oversees.

C. Until the end of the *period of design and construction*, the Project Coordination Team shall generally oversee the *Project*, including matters related to: design; completion of

all necessary environmental coordination and documentation; plans and specifications; scheduling; real property and *relocation* requirements; real property acquisition; contract awards and modifications; contract costs; the application of and compliance with 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)) for *relocations* and improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material; the investigations to identify the existence and extent of hazardous substances in accordance with Article XIV.A. of this Agreement; historic preservation activities in accordance with Article XVII of this Agreement; the Government's cost projections; final inspection of the entire *Project* or *functional portions of the Project*; preparation of the proposed OMRR&R Manual; finalization of the *monitoring* plan; performance of *monitoring*; anticipated requirements and needed capabilities for performance of operation, maintenance, repair, rehabilitation, and replacement of the *Project* including issuance of permits; and other matters related to the *Project*. This oversight of the *Project* shall be consistent with a project management plan developed by the Government after consultation with the Non-Federal Sponsor.

D. The Project Coordination Team may make recommendations to the District Engineer on matters related to the *Project* that the Project Coordination Team generally oversees, including suggestions to avoid potential sources of dispute. The Government in good faith shall consider the recommendations of the Project Coordination Team. The Government, having the legal authority and responsibility for design and construction of the *Project*, has the discretion to accept or reject, in whole or in part, the Project Coordination Team's recommendations.

E. The Non-Federal Sponsor's costs of participation in the Project Coordination Team shall be included in *total project costs* and shared in accordance with the provisions of this Agreement, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs. The Government's costs of participation in the Project Coordination Team shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

ARTICLE VI - METHOD OF PAYMENT

A. In accordance with the provisions of this paragraph, the Government shall maintain current records and provide to the Non-Federal Sponsor current projections of costs, financial obligations, contributions provided by the parties, and the value included in *total project costs* for lands, easements, rights-of-way, *relocations*, and improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material determined in accordance with Article IV of this

1. Currently under negotiation.

2. By three months after the signature date of this agreement and by each quarterly anniversary thereof until the conclusion of the *period of design and construction* and resolution of all relevant claims and appeals, the Government shall provide the Non-Federal Sponsor with a report setting forth all contributions provided to date and the current projections of the following: *total project costs*; *total ecosystem restoration costs*; the Non-Federal Sponsor's total contribution of funds required by Article II.C.2. of this Agreement; *total recreation costs*; the Non-Federal Sponsor's total contribution of funds required by Article II.D.2. and Article II.D.4. of this Agreement; the Non-Federal Sponsor's contribution of funds required by Article II.E.2. of this Agreement; the *non-Federal proportionate share*; the Non-Federal Sponsor's total contribution of funds required by Article XVII.B.3. of this Agreement; the value included in *total project costs* for lands, easements, rights-of-way, *relocations*, and improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material determined in accordance with Article IV of this Agreement; and the Government's total financial obligations for additional work incurred and the Non-Federal Sponsor's contribution of funds for such costs required by Article II.J. of this Agreement.

B. The Non-Federal Sponsor shall provide the contributions of funds required by Article II.C.2., **(1)** Article II.D.2., Article II.D.4., -Article II.E.2., and Article XVII.B.3. of this Agreement in accordance with the provisions of this paragraph.

1. Not less than 60 calendar days prior to the scheduled date for issuance of the solicitation for the first contract for design of the *Project* or commencement of design of the *Project* using the Government's own forces, the Government shall notify the Non-Federal Sponsor in writing of such scheduled date and the funds the Government determines to be required from the Non-Federal Sponsor to meet its projected share under Article II.C.2., Article II.D.2., Article II.D.4., Article II.E.2., and Article XVII.B.3. of this Agreement. Not later than such scheduled date, the Non-Federal Sponsor shall provide the Government with the full amount of such required funds by delivering a check payable to "FAO, USAED, SPL & EROC " to the District Engineer, or verifying to the satisfaction of the Government that the Non-Federal Sponsor has deposited such required funds in an escrow or other account acceptable to the Government, with interest accruing to the Non-Federal Sponsor, or by presenting the Government with an irrevocable letter of credit acceptable to the Government for such required funds, or by providing an Electronic Funds Transfer of such required funds in accordance with procedures established by the Government.

2. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover: (a) the *non-Federal proportionate share* of *financial obligations for design and construction* incurred prior to the commencement of the *period of design and construction*; (b) the *non-Federal proportionate share* of *financial obligations for design and construction* as *financial obligations for design and construction* are incurred; and (c) the Non-Federal Sponsor's share of financial obligations for data recovery activities associated with historic preservation pursuant to **(1)** Article XVII.B.3. of this Agreement as those financial

obligations are incurred. If at any time the Government determines that additional funds will be needed from the Non-Federal Sponsor to cover the Non-Federal Sponsor's share of such financial obligations, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required and provide an explanation of why additional funds are required. Within **60** calendar days from receipt of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional required funds through any of the payment mechanisms specified in paragraph B.1. of this Article.

C. Upon the District Engineer's determination that, except for *monitoring*, the entire *Project* is complete and all relevant claims and appeals and eminent domain proceedings have been resolved, the Government shall conduct an interim accounting and furnish the results to the Non-Federal Sponsor. Further, upon conclusion of the *period of design and construction* and resolution of all relevant claims and appeals**:** and eminent domain proceedings, the Government shall amend the interim accounting to complete the final accounting and furnish the results to the Non-Federal Sponsor. If outstanding relevant claims and appeals or eminent domain proceedings prevent a final accounting from being conducted in a timely manner, the Government shall conduct an interim accounting or amend the previous interim accounting, as applicable, and furnish the Non-Federal Sponsor with written notice of the results of such interim or amended interim accounting, as applicable. Once all outstanding relevant claims and appeals and eminent domain proceedings are resolved, the Government shall complete the final accounting and furnish the Non-Federal Sponsor with written notice of the results of such final accounting. The interim or final accounting, as applicable, shall determine *total project costs*, *total ecosystem restoration costs*, *total recreation costs*, and the costs of any data recovery activities associated with historic preservation. In addition, for each set of costs, the interim or final accounting, as applicable, shall determine each party's required share thereof, and each party's total contributions thereto as of the date of such accounting.

1. Should the interim or final accounting, as applicable, show that the Non-Federal Sponsor's total required shares of *total ecosystem restoration costs*, *total recreation costs*, and the costs of any data recovery activities associated with historic preservation exceed the Non-Federal Sponsor's total contributions provided thereto, the Non-Federal Sponsor, no later than 90 calendar days after receipt of written notice from the Government, shall make a payment to the Government in an amount equal to the difference by delivering a check payable to "FAO, USAED, SPL, & EROC" an Electronic Funds Transfer in accordance with procedures established by the Government.

2. Should the interim or final accounting, as applicable, show that the total contributions provided by the Non-Federal Sponsor for *total ecosystem restoration costs*, *total recreation costs*, and the costs of any data recovery activities associated with historic preservation exceed the Non-Federal Sponsor's total required shares thereof, the Government, subject to the availability of funds and as limited by the *Section 1135 Project Limit* and the *Section 1135 Annual Program Limit*, shall refund or reimburse the excess amount to the Non-Federal Sponsor within 90 calendar days of the date of completion of such accounting. In the event the Non-Federal Sponsor is due a refund or reimbursement

and funds are not available to refund or reimburse the excess amount to the Non-Federal Sponsor, the Government shall seek such appropriations as are necessary to make the refund or reimbursement.

D. The Non-Federal Sponsor shall provide the contribution of funds required by Article II.J. of this Agreement for additional work in accordance with the provisions of this paragraph.

1. Not less than 60 calendar days prior to the scheduled date for the first financial obligation for additional work, the Government shall notify the Non-Federal Sponsor in writing of such scheduled date and of the full amount of funds the Government determines to be required from the Non-Federal Sponsor to cover the costs of the additional work. No later than 30 calendar days prior to the Government incurring any financial obligation for additional work, the Non-Federal Sponsor shall provide the Government with the full amount of the funds required to cover the costs of such additional work through any of the payment mechanisms specified in paragraph B.1. of this Article.

2. The Government shall draw from the funds provided by the Non-Federal Sponsor such sums as the Government deems necessary to cover the Government's financial obligations for such additional work as they are incurred. If at any time the Government determines that the Non-Federal Sponsor must provide additional funds to pay for such additional work, the Government shall notify the Non-Federal Sponsor in writing of the additional funds required and provide an explanation of why additional funds are required. Within 30 calendar days from receipt of such notice, the Non-Federal Sponsor shall provide the Government with the full amount of such additional required funds through any of the payment mechanisms specified in paragraph B.1. of this Article.

3. At the time the Government conducts the interim or final accounting, as applicable, the Government shall conduct an accounting of the Government's financial obligations incurred for additional work and furnish the Non-Federal Sponsor with written notice of the results of such accounting. If outstanding relevant claims and appeals or eminent domain proceedings prevent a final accounting of such financial obligations for additional work from being conducted in a timely manner, the Government shall conduct an interim accounting of such financial obligations for additional work and furnish the Non-Federal Sponsor with written notice of the results of such interim accounting. Once all outstanding relevant claims and appeals and eminent domain proceedings are resolved, the Government shall amend the interim accounting of such financial obligations for additional work to complete the final accounting of such financial obligations for additional work and furnish the Non-Federal Sponsor with written notice of the results of such final accounting. Such interim or final accounting, as applicable, shall determine the Government's total financial obligations for additional work and the Non-Federal Sponsor's contribution of funds provided thereto as of the date of such accounting.

a. Should the interim or final accounting, as applicable, show that the Government's total financial obligations for additional work exceed the total contribution of funds provided by the Non-Federal Sponsor for such additional work, the Non-Federal Sponsor, no later than 90 calendar days after receipt of written notice from the Government, shall make a payment to the Government in an amount equal to the difference by delivering a check payable to "FAO, USAED, SPL & EROC" to the District Engineer or by providing an Electronic Funds Transfer in accordance with procedures established by the Government.

b. Should the interim or final accounting, as applicable, show that the total contribution of funds provided by the Non-Federal Sponsor for additional work exceeds the Government's total financial obligations for such additional work, the Government, subject to the availability of funds, shall refund the excess amount to the Non-Federal Sponsor within 90 calendar days of the date of completion of such accounting. In the event the Non-Federal Sponsor is due a refund and funds are not available to refund the excess amount to the Non-Federal Sponsor, the Government shall seek such appropriations as are necessary to make the refund.

ARTICLE VII - DISPUTE RESOLUTION

As a condition precedent to a party bringing any suit for breach of this Agreement, that party must first notify the other party in writing of the nature of the purported breach and seek in good faith to resolve the dispute through negotiation. If the parties cannot resolve the dispute through negotiation, they may agree to a mutually acceptable method of non-binding alternative dispute resolution with a qualified third party acceptable to both parties. Each party shall pay an equal share of any costs for the services provided by such a third party as such costs are incurred. The existence of a dispute shall not excuse the parties from performance pursuant to this Agreement.

ARTICLE VIII - OPERATION, MAINTENANCE, REPAIR, REHABILITATION, AND REPLACEMENT (OMRR&R)

A. Upon receipt of the notification from the District Engineer in accordance with Article II.F. of this Agreement and for so long as the *Project* remains authorized, the Non-Federal Sponsor, pursuant to Article II.G. of this Agreement, shall operate, maintain, repair, rehabilitate, and replace the entire *Project* or *functional portion of the Project*, at no cost to the Government. The Non-Federal Sponsor shall conduct its operation, maintenance, repair, rehabilitation, and replacement responsibilities in a manner compatible with the *Project's* authorized purposes and in accordance with applicable Federal and State laws as provided in Article XI of this Agreement and specific directions prescribed by the Government in the interim or final OMRR&R Manual and any subsequent amendments thereto.

B. The Non-Federal Sponsor hereby gives the Government a right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor now or hereafter owns or controls for access to the *Project* for the purpose of inspection and, if necessary, for the purpose of completing, operating, maintaining, repairing, rehabilitating, or replacing the *Project*. If an inspection shows that the Non-Federal Sponsor for any reason is failing to perform its obligations under this Agreement, the Government shall send a written notice describing the non-performance to the Non-Federal Sponsor. If, after 30 calendar days from receipt of such written notice by the Government, the Non-Federal Sponsor continues to fail to perform, then the Government shall have the right to enter, at reasonable times and in a reasonable manner, upon property that the Non-Federal Sponsor now or hereafter owns or controls for the purpose of completing, operating, maintaining, repairing, rehabilitating, or replacing the *Project*. No completion, operation, maintenance, repair, rehabilitation, or replacement by the Government shall relieve the Non-Federal Sponsor of responsibility to meet the Non-Federal Sponsor's obligations as set forth in this Agreement, or to preclude the Government from pursuing any other remedy at law or equity to ensure faithful performance pursuant to this Agreement.

ARTICLE IX – HOLD AND SAVE

The Non-Federal Sponsor shall hold and save the Government free from all damages arising from design, construction, monitoring, operation, maintenance, repair, rehabilitation, and replacement of the *Project* and any *betterments*, except for damages due to the fault or negligence of the Government or its contractors.

ARTICLE X - MAINTENANCE OF RECORDS AND AUDIT

A. Not later than 60 calendar days after the effective date of this Agreement, the Government and the Non-Federal Sponsor shall develop procedures for keeping books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to this Agreement. These procedures shall incorporate, and apply as appropriate, the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 C.F.R. Section 33.20. The Government and the Non-Federal Sponsor shall maintain such books, records, documents, or other evidence in accordance with these procedures and for a minimum of three years after completion of the accounting for which such books, records, documents, or other evidence were required. To the extent permitted under applicable Federal laws and regulations, the Government and the Non-Federal Sponsor shall each allow the other to inspect such books, records, documents, or other evidence.

B. In accordance with 32 C.F.R. Section 33.26, the Non-Federal Sponsor is responsible for complying with the Single Audit Act Amendments of 1996 (31 U.S.C. 7501-7507), as implemented by Office of Management and Budget (OMB) Circular No. A-133 and Department of Defense Directive 7600.10. Upon request of the Non-Federal Sponsor and to the extent permitted under applicable Federal laws and regulations, the Government

shall provide to the Non-Federal Sponsor and independent auditors any information necessary to enable an audit of the Non-Federal Sponsor's activities under this Agreement. The costs of any non-Federal audits performed in accordance with this paragraph shall be allocated in accordance with the provisions of OMB Circulars A-87 and A-133, and such costs as are allocated to the *Project* shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

C. In accordance with 31 U.S.C. 7503, the Government may conduct audits in addition to any audit that the Non-Federal Sponsor is required to conduct under the Single Audit Act Amendments of 1996. Any such Government audits shall be conducted in accordance with Government Auditing Standards and the cost principles in OMB Circular No. A-87 and other applicable cost principles and regulations. The costs of Government audits performed in accordance with this paragraph shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

ARTICLE XI - FEDERAL AND STATE LAWS

In the exercise of their respective rights and obligations under this Agreement, the Non-Federal Sponsor and the Government shall comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141-3148 and 40 U.S.C. 3701-3708 (revising, codifying and enacting without substantive change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq*.), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq*.), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c)).

ARTICLE XII - RELATIONSHIP OF PARTIES

A. In the exercise of their respective rights and obligations under this Agreement, the Government and the Non-Federal Sponsor each act in an independent capacity, and neither is to be considered the officer, agent, or employee of the other.

B. In the exercise of its rights and obligations under this Agreement, neither party shall provide, without the consent of the other party, any contractor with a release that waives or purports to waive any rights the other party may have to seek relief or redress against that contractor either pursuant to any cause of action that the other party may have or for violation of any law.

ARTICLE XIII - TERMINATION OR SUSPENSION

A. If at any time the Non-Federal Sponsor fails to fulfill its obligations under this Agreement, the Assistant Secretary of the Army (Civil Works) shall terminate this Agreement or suspend future performance under this Agreement unless he determines that continuation of work on the *Project* is in the interest of the United States or is necessary in order to satisfy agreements with any other non-Federal interests in connection with the *Project.*

B. In the event future performance under this Agreement is suspended pursuant to Article II.E. of this Agreement, such suspension shall remain in effect until such time that the Government notifies the Non-Federal Sponsor in writing that sufficient Federal funds are available to meet the Federal share of *total project costs* and the Federal share of costs for data recovery activities associated with historic preservation in accordance with Article XVII.B.2. and Article XVII.B.3. of this Agreement the Government projects to be incurred through the then-current or upcoming *fiscal year*, or the Government or the Non-Federal Sponsor elects to terminate this Agreement.

C. In the event that the Government and the Non-Federal Sponsor determine to suspend future performance under this Agreement in accordance with Article XIV.C. of this Agreement, such suspension shall remain in effect until the Government and the Non-Federal Sponsor agree to proceed or to terminate this Agreement. In the event that the Government suspends future performance under this Agreement in accordance with Article XIV.C. of this Agreement due to failure to reach agreement with the Non-Federal Sponsor on whether to proceed or to terminate this Agreement, or the failure of the Non-Federal Sponsor to provide funds to pay for cleanup and response costs or to otherwise discharge the Non-Federal Sponsor's responsibilities under Article XIV.C. of this Agreement, such suspension shall remain in effect until: 1) the Government and Non-Federal Sponsor reach agreement on how to proceed or to terminate this Agreement; 2) the Non-Federal Sponsor provides funds necessary to pay for cleanup and response costs and otherwise discharges its responsibilities under Article XIV.C. of this Agreement; 3) the Government continues work on the *Project*; or 4) the Government terminates this Agreement in accordance with the provisions of Article XIV.C. of this Agreement.

D. If after completion of the design portion of the *Project* the parties mutually agree in writing not to proceed with construction of the *Project*, the parties shall conclude their activities relating to the *Project* and conduct an accounting in accordance with Article VI.C. of this Agreement.

E. In the event that this Agreement is terminated pursuant to this Article or Article XIV.C. of this Agreement, both parties shall conclude their activities relating to the *Project* and conduct an accounting in accordance with Article VI.C. of this Agreement. To provide for this eventuality, the Government may reserve a percentage of total Federal funds made available for the *Project* and an equal percentage of the total funds contributed by the Non-Federal Sponsor in accordance with Article II.C.2., Article II.D.2., Article II.D.4., Article II.E.2., and Article XVII.B.3. of this Agreement as a contingency to pay

costs of termination, including any costs of resolution of contract claims and contract modifications.

F. Any termination of this Agreement or suspension of future performance under this Agreement in accordance with this Article or Article II.E. or Article XIV.C. of this Agreement shall not relieve the parties of liability for any obligation previously incurred. Any delinquent payment owed by the Non-Federal Sponsor shall be charged interest at a rate, to be determined by the Secretary of the Treasury, equal to 150 per centum of the average bond equivalent rate of the 13 week Treasury bills auctioned immediately prior to the date on which such payment became delinquent, or auctioned immediately prior to the beginning of each additional 3 month period if the period of delinquency exceeds 3 months.

ARTICLE XIV - HAZARDOUS SUBSTANCES

A. After execution of this Agreement and upon direction by the District Engineer, the Non-Federal Sponsor shall perform, or ensure performance of, any investigations for hazardous substances that the Government or the Non-Federal Sponsor determines to be necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (42 U.S.C. 9601-9675; hereinafter "CERCLA"), that may exist in, on, or under lands, easements, and rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for construction, operation, and maintenance of the *Project*. However, for lands, easements, and rights-of-way that the Government determines to be subject to the navigation servitude, only the Government shall perform such investigations unless the District Engineer provides the Non-Federal Sponsor with prior specific written direction, in which case the Non-Federal Sponsor shall perform such investigations in accordance with such written direction.

1. All actual costs incurred by the Non-Federal Sponsor for such investigations for hazardous substances shall be included in *total project costs* and shared in accordance with the provisions of this Agreement, subject to an audit in accordance with Article X.C. of this Agreement to determine reasonableness, allocability, and allowability of such costs.

2. All actual costs incurred by the Government for such investigations for hazardous substances shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

B. In the event it is discovered through any investigation for hazardous substances or other means that hazardous substances regulated under CERCLA exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for construction, operation, and maintenance of the *Project*, the Non-Federal Sponsor and the Government, in addition to providing any other notice required by applicable law, shall provide prompt written notice to each other, and the

Non-Federal Sponsor shall not proceed with the acquisition of the real property interests until the parties agree that the Non-Federal Sponsor should proceed.

C. The Government and the Non-Federal Sponsor shall determine whether to initiate construction of the *Project*, or, if already in construction, whether to continue with construction of the *Project*, suspend future performance under this Agreement, or terminate this Agreement for the convenience of the Government, in any case where hazardous substances regulated under CERCLA are found to exist in, on, or under any lands, easements, or rights-of-way that the Government determines, pursuant to Article III of this Agreement, to be required for construction, operation, and maintenance of the *Project*. Should the Government and the Non-Federal Sponsor determine to initiate or continue with construction of the *Project* after considering any liability that may arise under CERCLA, the Non-Federal Sponsor shall be responsible, as between the Government and the Non-Federal Sponsor, for the costs of cleanup and response, including the costs of any studies and investigations necessary to determine an appropriate response to the contamination. Such costs shall not be considered a part of *total project costs*. In the event the Non-Federal Sponsor does not reach agreement with the Government on whether to proceed or to terminate this Agreement under this paragraph, or fails to provide any funds necessary to pay for cleanup and response costs or to otherwise discharge the Non-Federal Sponsor's responsibilities under this paragraph upon direction by the Government, the Government, in its sole discretion, may either terminate this Agreement for the convenience of the Government, suspend future performance under this Agreement, or continue work on the *Project*.

D. The Non-Federal Sponsor and the Government shall consult with each other in accordance with Article V of this Agreement in an effort to ensure that responsible parties bear any necessary cleanup and response costs as defined in CERCLA. Any decision made pursuant to paragraph C. of this Article shall not relieve any third party from any liability that may arise under CERCLA.

E. As between the Government and the Non-Federal Sponsor, the Non-Federal Sponsor shall be considered the operator of the *Project* for purposes of CERCLA liability. To the maximum extent practicable, the Non-Federal Sponsor shall operate, maintain, repair, rehabilitate, and replace the *Project* in a manner that will not cause liability to arise under CERCLA.

ARTICLE XV - NOTICES

A. Any notice, request, demand, or other communication required or permitted to be given under this Agreement shall be deemed to have been duly given if in writing and delivered personally or sent by telegram or mailed by first-class, registered, or certified mail, as follows:

If to the Non-Federal Sponsor: Los Angeles County Flood Control District
Department of Public Works
Alhambra, CA

If to the Government: U.S. Army Corps of Engineers
CESPL-PM-C
915 Wilshire Blvd
Los Angeles, CA 90017

B. A party may change the address to which such communications are to be directed by giving written notice to the other party in the manner provided in this Article.

C. Any notice, request, demand, or other communication made pursuant to this Article shall be deemed to have been received by the addressee at the earlier of such time as it is actually received or seven calendar days after it is mailed.

ARTICLE XVI - CONFIDENTIALITY

To the extent permitted by the laws governing each party, the parties agree to maintain the confidentiality of exchanged information when requested to do so by the providing party.

ARTICLE XVII - HISTORIC PRESERVATION

A. The Government, as it determines necessary for the *Project*, shall perform any identification, survey, or evaluation of historic properties. Any costs incurred by the Government for such work shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

B. The Government, as it determines necessary for the *Project*, shall perform or ensure the performance of any mitigation activities or actions for historic properties or that are otherwise associated with historic preservation including data recovery activities.

1. Any costs incurred by the Government for such mitigation activities, except for data recovery activities associated with historic preservation, shall be included in *total project costs* and shared in accordance with the provisions of this Agreement.

2. As specified in Section 7(a) of Public Law 86-523, as amended by Public Law 93-291 (16 U.S.C. 469c(a)), the costs of data recovery activities associated with historic preservation shall be borne entirely by the Government and shall not be included in *total project costs*, up to the statutory limit of one percent of the *Section 1135 Project Limit*.

3. The Government shall not incur costs for data recovery activities associated with historic preservation that exceed the statutory one percent limit specified in paragraph B.2. of this Article unless and until the Assistant Secretary of the Army (Civil Works) has waived that limit and the Secretary of the Interior has concurred in the waiver

in accordance with Section 208(3) of Public Law 96-515, as amended (16 U.S.C. 469c-2(3)).

a. Currently under negotiation.

b. Currently under negotiation.

C. If, during its performance of *relocations* or construction of improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material in accordance with Article III of this Agreement, the Non-Federal Sponsor discovers historic properties or other cultural resources that have not been evaluated by the Government pursuant to this Article, the Non-Federal Sponsor shall provide prompt written notice to the Government of such discovery. The Non-Federal Sponsor shall not proceed with performance of the *relocation* or construction of the improvement that is related to such discovery until the Government provides written notice to the Non-Federal Sponsor that it should proceed with such work.

D. If, during its performance of *relocations*, construction of improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material in accordance with Article III of this Agreement, or performance of the *non-Federal work*, the Non-Federal Sponsor discovers historic properties or other cultural resources that have not been evaluated in accordance with this Article, the Non-Federal Sponsor shall provide prompt written notice to the Government of such discovery. The Non-Federal Sponsor shall not proceed with performance of the *relocation*, construction of the improvement, or performance of the *non-Federal work* that is related to such discovery until the Government provides written notice to the Non-Federal Sponsor that it should proceed with such work.

ARTICLE XVIII - THIRD PARTY RIGHTS, BENEFITS, OR LIABILITIES

Nothing in this Agreement is intended, nor may be construed, to create any rights, confer any benefits, or relieve any liability, of any kind whatsoever in any third person not party to this Agreement.

ARTICLE XIX - NON-LIABILITY OF OFFICERS AND EMPLOYEES

No officer, agent, consultant, or employee of the Non-Federal Sponsor, nor any officer, agent, consultant, or employee of the Government, may be charged personally, or held liable, under the terms or provisions of this Agreement because of any breach, attempted breach, or alleged breach thereof, except as provided in Section 912(b) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (42 U.S.C. 1962d-5b note), or other applicable law.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement, which shall become effective upon the date it is signed by the District Engineer.

DEPARTMENT OF THE ARMY	LOS ANGELES FLOOD CONTROL DISTRICT
BY: _____ **[TYPED NAME]** **[TITLE IN FULL]**	BY: _____ **[TYPED NAME]** Director of the Los Angeles County Department of Public Works
DATE: _____	DATE: _____

CERTIFICATE OF AUTHORITY

I, _____, do hereby certify that I am the principal legal officer of the **[FULL NAME OF NON-FEDERAL SPONSOR]**, that the **[FULL NAME OF NON-FEDERAL SPONSOR]** is a legally constituted public body with full authority and legal capability to perform the terms of the Agreement between the Department of the Army and the **[FULL NAME OF NON-FEDERAL SPONSOR]** in connection with the **[FULL NAME OF "PROJECT"]**, and to pay damages, if necessary, in the event of the failure to perform in accordance with the terms of this Agreement and that the persons who have executed this Agreement on behalf of the **[FULL NAME OF NON-FEDERAL SPONSOR]** have acted within their statutory authority.

IN WITNESS WHEREOF, I have made and executed this certification this _____ day of _____ 20___.

[SIGNATURE]
[TYPED NAME]
[TITLE IN FULL]

CERTIFICATION REGARDING LOBBYING

The undersigned certifies, to the best of his or her knowledge and belief that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

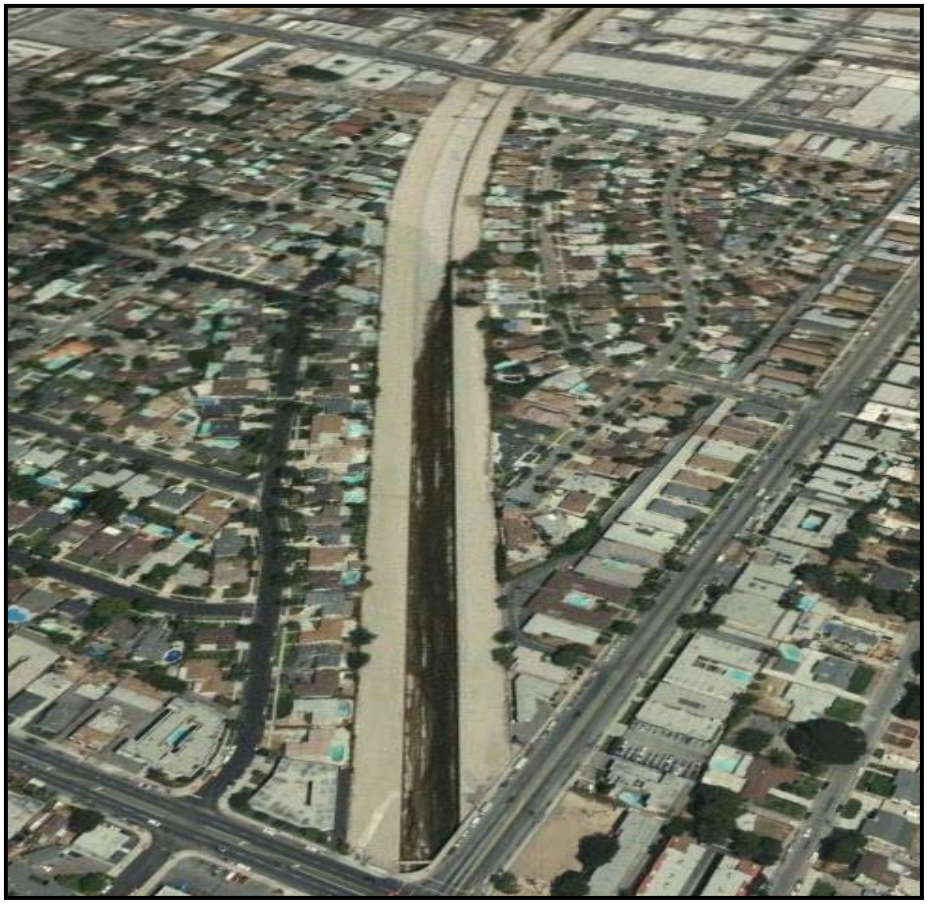
[SIGNATURE OF PPA SIGNATORY]
[TYPED NAME]
[TITLE IN FULL]

DATE: _____

US Army Corps of Engineers

FINAL INTEGRATED DETAILED PROJECT REPORT & ENVIRONMENTAL ASSESSMENT

Tujunga Wash Section 1135 Ecosystem Restoration Project



U.S. Army Corps of Engineers
Los Angeles District
Los Angeles, California

MAY 2009

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FINAL
FINDING OF NO SIGNIFICANT IMPACT (FONSI)
FOR THE
INTEGRATED DETAILED PROJECT REPORT (DPR)
AND ENVIRONMENTAL ASSESSEMENT (EA)
TUJUNGA WASH SECTION 1135
ECOSYSTEM RESTORATION PROJECT
LOS ANGELES COUNTY, CALIFORNIA

I have reviewed the attached integrated Final Detailed Project Report (DPR) and Environmental Assessment (EA) for the Tujunga Wash Section 1135 Ecosystem Restoration Project. A Notice of Exemption was prepared by the local sponsor, the Los Angeles County Department of Public Works (County), to comply with the California Environmental Quality Act (CEQA). The project is located in Los Angeles County, California.

This is an Integrated Report which is prepared in compliance with the National Environmental Policy Act (NEPA), and all applicable environmental regulations including ER 200-2-2, U.S. Army Corps of Engineers Policy and Procedures for Implementing NEPA. The DPR is prepared in accordance with guidance of ER-1105-2-100, Appendix E and F, and other applicable USACE guidelines to implement Ecosystem Restoration. This Integrated Report is referred to as a DPR and it includes the following: descriptions of existing environmental resources; development and description of alternatives; real estate analysis; hydrology and hydraulics analysis; environmental laws, regulations, and required permits; environmental impacts; environmental benefits and cost evaluation; correspondence; and an operation and maintenance plan.

The authority of the proposed project is under Section 1135 of the Water Resources Development Act (WRDA) of 1986 as amended, (P.L. 99-662). Tujunga Wash is a rectangular channel constructed between 1950 and 1952 by the Corps of Engineers to convey flood flows and controlled releases from Hansen Dam to the Tujunga Wash confluence with the Los Angeles River. The Tujunga Wash channel reach is part of the Los Angeles County Drainage Area (LACDA).

The nine acre area proposed for restoration includes two strips of land that are 65-feet wide and approximately 3000 feet long located on both sides of the Tujunga Wash channel between Sherman Way and Vanowen Street. The proposed restoration project would connect to two constructed restoration areas: 1) the County's restoration project, which is 6,000 feet long, located between Vanowen Street and Oxnard Street and 2) the Corps' existing Tujunga Greenbelt project, which is 4,200 feet long, located between Oxnard Street and Chandler Boulevard. With the addition of these two projects, the total length of the riparian habitat corridor would increase to 13,200 feet. The subject lands are owned by Los Angeles County and are both located downstream of the 1135 project.

The habitat along this portion of the channel has been substantially degraded due to modifications of the natural stream into a man made flood control channel. The opportunity

exists to restore and increase habitat along the banks of the flood control channel by establishing native/riparian vegetation. For the vegetation to become successful, a meandering stream parallel to the channel would be constructed on the west bank and would receive water from the eastern branch of the South Pacoima Wash via gravity feed pipeline; no water would be removed from Tujunga Wash. In addition, the proposed project would provide passive recreational and educational opportunities. By implementation of the recommended plan, the habitat value would be increased from 0.00 to 7.09 Habitat Units (HUs).

The primary purpose of the proposed project is to establish a riparian corridor and its associated wildlife habitat along Tujunga Wash. Based on the project objectives, environmental analysis, biological output and costs, two (2) viable alternatives in addition to the No Action alternative have been evaluated for ecosystem restoration. The recommended alternative consists of a meandering stream on the west bank of the Tujunga Wash Channel that connects to the County's downstream restoration project. Due to urbanization, riparian habitat is becoming scarce in southern California; restoration of degraded habitat is highly valuable.

No Federally threatened or endangered species are located in the project area. Coordination with the U.S. Fish and Wildlife Service (USFWS) has been performed and they provided a Final Coordination Act Report (CAR) in compliance with the Coordination Act. The Draft and Final CAR evaluates four alternatives, but the DPR evaluates three alternatives. This discrepancy occurred because USFWS prepared the Draft and Final CAR prior to preparation of the Draft DPR. Further refinement was made by combining two of the alternatives identified in the CAR to reduce redundancy and to generate greater output in HUs. The Corps then coordinated with USFWS regarding the refinements and number of alternatives evaluated in the Draft DPR. USFWS stated there is no need to provide a revised CAR because combining the two alternatives in the CAR created greater benefits for the ecosystem. Both the Corps and USFWS agreed on this decision.

The proposed project would not result in any discharge of material into waters of the United States; therefore, it is not subject to Section 404 of the Clean Water Act.

Both Phase I and Phase II Environmental Site Assessments were conducted in the project area. It was determined that no Hazardous, Toxic, or Radioactive Waste exist within the project area.

This project complies with Section 106 of the National Historic Preservation Act (36 CFR 800).

The project would result in minimal, short-term impacts on air, noise and traffic. Environmental commitments identified in the DPR would be implemented during construction to minimize the temporary impacts to environmental resources. The restored area would be maintained by the local sponsor in perpetuity.

The proposed project construction is scheduled to commence by spring 2010 and be completed by the winter of 2011. However, due to funding or weather constraints, the project construction might be delayed beyond the second quarter of 2011.

The ecosystem restoration project would have a measurable positive effect by increasing the habitat value to benefit wildlife habitat and migratory bird species. I have concluded that an Environmental Impact Statement (EIS) is not required for the proposed project. I conclude that the environmental restoration of Tujunga Wash, as proposed, is in the public interest.

Date: 5/14/09

Thomas H. Magness
COL, US Army
District Commander

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EXECUTIVE SUMMARY

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EXECUTIVE SUMMARY

This Integrated Report is a combined report that includes both a Detailed Project Report (DPR) and Environmental Assessment (EA). This Report is referred to as a DPR in this document. The DPR evaluates potential restoration alternatives, and provides the process for selecting the optimal alternative for the restoration of the Tujunga Wash Ecosystem Restoration Project. The EA evaluates the potential environmental impacts and benefits to the ecosystem associated with the proposed Tujunga Wash Ecosystem Restoration.

The proposed project is located within the San Fernando Valley, Los Angeles County, California. The Tujunga Wash channel study reach is part of the Los Angeles County Drainage Area (LACDA) and extends for a total distance of 3000-ft between Sherman Way to the north and Vanowen Street to the south. The Los Angeles County Department of Public Works (County) is the Local Sponsor for this project and owns the right of way easements. This document is written in compliance with the National Environmental Policy Act (NEPA), applicable environmental regulations, ER-200-2, Corps policies to implement NEPA, Appendix E and F of ER 1105-2-100 and other applicable Corps policies to implement ecosystem restoration projects.

Authority

Study of the proposed project and its alternatives falls under the authority of Section 1135 of the Water Resources Development Act (WRDA) of 1986, PL 99-662, as amended, which states that "the Secretary of the Army is authorized to carry out a program for the purpose of making modifications in the structures and operations of water resources projects constructed by the Secretary which the Secretary determines: (1) are feasible and consistent with the authorized purposes; and, (2) will improve the quality of the environment in the public interest." Under Section 1135, the Federal share shall not exceed more than $5 million and the Local Sponsor's share equals 25% of the total project costs.

Purpose and Need

The purpose of the proposed project is to restore degraded habitat along the Tujunga Wash, increase habitat value, provide nesting opportunities for migratory birds and establish a corridor for wildlife movement that extends 3000 feet between Vanowen Street to the South and Sherman Way to the north, in Los Angeles, California. The total area proposed for restoration includes strips of land 65 feet wide and 3,000 feet long on both sides of the flood control channel, for a total of 9 acres. The proposed restoration project would connect to two constructed restoration areas: 1) the County's restoration project, which is 6,000 feet long, located between Vanowen Street and Oxnard Street and 2) the Corps' existing Tujunga Greenbelt project, which is 4,200 feet long, located between Oxnard Street and Chandler Boulevard. With the addition of these two projects, the total length of the riparian habitat corridor would increase to 13,200 feet. The subject lands are owned by Los Angeles County and are both located downstream of the 1135

project. In addition, the proposed project would provide passive recreational and educational opportunities and uses along the channel reach.

Plan Formulation

Plan formulation is the process of identifying specific ways to achieve planning objectives while working within project constraints to solve problems and realize opportunities. The Corps employs a six-step planning process, pursuant to ER 1105-2-100 (Water Resources Council, 1983) on water resource development projects which is composed of the following elements:

Step 1 – Identify problems and opportunities
Step 2 - Inventory and forecast conditions
Step 3 – Formulate alternative plans
Step 4 – Evaluate alternative plans
Step 5 – Compare alternative plans
Step 6 – Select a plan

Project Alternatives

Two alternatives based on the project objectives, including the No Action Alternative, have been identified for the Tujunga Wash Ecosystem Restoration Project. The following process has been taken into consideration in development of the alternatives. See details in Section 3 of the DPR.

- Opportunity
- Objectives
- Constraints

Opportunities

- To increase habitat quantity and restore habitat quality, function and connectivity;
- To illustrate the potential for channel-adjacent ecosystem restoration in an intensively developed urban area;
- To provide opportunity for wildlife movement and nesting opportunities for migratory bird species;
- Provide passive recreational elements such as recreational trails and viewing areas of wildlife habitat and bird species.

Objectives

- To improve opportunities for migratory birds and wildlife movement by connecting the Corps 1135 Project (3,000 feet-long) to the Local Sponsor's downstream restoration project (6000 feet-long) and the Tujunga Greenbelt Project (4,200 feet-long), thus increasing the habitat corridor to 13,200 feet in total length.

- To improve recreational opportunities through the provision of incidental, passive recreation alongside the new riparian corridor;
- To provide for educational opportunities to observe wildlife and naturalized ecosystems in conjunction with the development of streamside habitat;
- To ensure that the capacity of the existing flood control system is not reduced while maximizing the potential for ecosystem restoration along the banks.

Constraints (see details in Section 3)

- **Authority limitations:** Section 1135 of the Water Resources Development Act (WRDA) limits the Federal contribution to the project to $5,0000,000 or less. In addition, the Local contribution to the project is 25% of the Federal cost ($1,250,000) for a total project cost limit of $6,250,000.

- **Limited land**: Restoration opportunities are limited to the banks of the project area as no land is available to expand the channel capacity. Therefore, flow conveyance within the concrete channel cannot be modified or removed. Due to urbanization, limited land is available for restoration purposes.

- **Water collection methods:** The water source for the proposed project collects urban run-off from the Pacoima Wash South Channel (South Channel) and into the project area. Collecting water from within the Tujunga Wash Channel may be cost prohibitive and may exceed authority limits. Installation of certain hard structures (additional pipelines, intake gates, pump stations, etc) may be cost prohibitive and may exceed authority limits.

- **Maintaining flood protection level along constructed flood control channel.** The proposed restoration project must not adversely affect the flood control capacity of the flood control channel

See details in Section 3 related to opportunities, objectives, constraints, management measures and development of alternatives. The alternatives have been developed in coordination with the local sponsor, resource agencies (U.S. Fish and Wildlife Service [USFWS], California Department of Fish and Game [CDFG], California Regional Water Quality Control Board [RWQCB]), and interested environmental groups such as the Mountains Recreation and Conservation Authority (MRCA). The alternatives represent management measures (or groups of measures) identified in Section 3.3 of this DPR. Details of the Alternatives and Project Description are provided in Section 3.4 of this DPR. Brief descriptions of the alternatives are provided in the following paragraphs.

Alternative 1: No Project

Under this alternative the channel frontage would not be restored. The current existing habitat would continue to support no opportunities for wildlife movement or nesting and would remain as a concrete channel offering extremely limited ecological value.

Alternative 2 (Recommended Plan/National Ecosystem Restoration [NER] Plan): Restoration of native/riparian vegetation on East & West bank with West bank meandering stream connecting to County downstream restoration project

Alternative 2 involves construction of a meandering stream along the west bank and planting native/riparian vegetation along the meandering stream. The project also includes incidental recreational opportunities by utilization of a 12-foot wide maintenance road along the East bank that could be used for biking, running and bird watching. The West bank would contain a maintenance road as well but would only be used for maintenance purposes and would not be accessible to the public so that the restoration area would remain undisturbed. Construction of the meandering stream and the maintenance roads will cover approximately 2.7 acres of land. Native/riparian vegetation would be planted within the remaining 7.30 acres of land within the project area. On the west bank, about 3.48 acres would be restored which consists of 0.13 acres aquatic emergent wetland, 0.42 acres cottonwood, 0.17 acres sycamore, 1.75 acres alluvial fan scrub, and 1.13 acres meadow. The east bank covers approximately 3.82 acres and planting would consist of 0.42 acres cottonwood, 0.17 sycamore, 1.75 acres alluvial fan, 1.48 acres meadow. By implementing this alternative total 7.09 HUs would be generated. See details in Section 3 and Appendix B1.

The Incremental Cost Analysis (ICA) was performed to identify the plan that would provide the most ecosystem restoration benefits with the least cost. This alternative provides the greatest level of habitat value and improvement of habitat along Tujunga Wash. Alternative 2 also provides a positive cost/benefit ratio for the incidental recreational opportunities. The ICA revealed that Alternative 2 is the NER plan/best buy plan. It restores habitat quality and provides the best value compared to Alternative 3. Alternative 2 is more beneficial to the ecosystem because it provides higher HUs and connects to another restoration area constructed by the local sponsor.

Alternative 2 is the Recommended Alternative which meets the project purpose and objectives. By implementation of this alternative the habitat value will increase from 0.00 to 7.09. About 51% of habitat would consist of riparian vegetation. The west bank's meandering stream, which encompasses 0.34 acres and is 2500 feet long, would benefit wildlife and migratory birds by increasing potential habitat along the Tujunga Wash channel. It would also be valuable to the urban areas where open space is limited. Implementation of Alternative 2 provides structural and functional diversity and increased opportunity for passive recreational uses and environmental education purposes. The Local Sponsor supports the Recommended Alternative and it is similar in nature to their restoration area downstream of the proposed project area.

The estimated cost for construction of the recommended plan is $3.8 million. Estimated annual Operations and Maintenance costs for the Recommended Plan are approximately $52,000, which is about 2% of the restoration costs. The Local sponsor was part of the team during plan formulation. They have constructed a 6000 foot long restoration project along Tujunga Wash, which is downstream of the proposed project. The local sponsor has committed to maintaining this project in perpetuity.

Alternative 3: Restoration of native/riparian vegetation on each bank with a junction structure to connect the downstream end of the west meandering stream to the existing channel wall.

Alternative 3 involves the same construction methods that are included in Alternative 2 but the stream releases its flows back into the Tujunga Wash before Sherman Way instead of connecting to the County's restoration area.

When subtracting the maintenance roads (1.36 acres) and single naturalized stream (0.34 acres) from the total of 9 project acres, the remaining 7.30 acres of land would be restored with native/riparian habitat. Approximately 3.48 acres would be restored on the west bank which consists of 0.013 acres aquatic emergent wetland, 0.21 acres cottonwood, 0.085 acres sycamore, 1.75 acres alluvial fan, and 1.42 acres meadow. Approximately 3.82 acres on the east bank would consist of 0.21 acres cottonwood, 0.085 sycamore, 1.75 acres alluvial fan, and 1.77 acres meadow. By implementing this alternative total 5.59 HUs would be generated.

Operation and Maintenance

For the first year after construction is completed, the Corps shall perform operation and maintenance of the project to ensure the success criteria of the project. The Local Sponsor shall also perform operation and maintenance of the project for functions that the Corps is not equipped for. After the 1 year period, the Local Sponsor would assume all long-term project operations, maintenance, repairs, replacements, and rehabilitation costs following completion of construction and establishment of monitoring activities. They will ensure that restored vegetation is maintained in perpetuity. The estimated annual operations and maintenance costs total approximately $52,000.

The operation and maintenance schedule would vary by season and necessity and should include, but not be limited to the following activities: 1) removal of debris from access paths and the stream; 2) annual assessment and removal of invasive and exotic species within the project area; replacing dead native plants, and 3) maintenance of recreational features and fencing. The shrub and grass species were specifically selected because they are native to the region and are expected to grow with minimal maintenance.

Organization of the DPR

Section 1 consists of information on the project's study authority, background, purpose and need. Section 2 provides information on the project's location and general features, and provides a description of the existing conditions of the environmental resources. Section 3 describes the Plan Formulation process, restoration measures, objectives, constraints and opportunities considered in creating project alternatives. It also provides a detailed description of the two viable alternatives and the No Action Alternative. Section 4 describes the Incremental Cost Analyses to determine the National Ecosystem Restoration Plan (NER). Section 5 presents further expanded detail on the features of the recommended plan, including grading design, planting and maintenance information. Section 6 describes the environmental and cumulative impacts on each resource. Section 7 provides the environmental commitments for each resource.

Section 8 describes the project schedule and costs. Section 9 provides information regarding local sponsor and Federal views and coordination efforts. Section 10 lists the conclusions and recommendations of the parties involved in the project. Section 11 contains the list of preparers and reviewers. Section 12 provides the DPR's references.

Conclusion

The local sponsor has provided a Letter of Intent to initiate ecosystem restoration along Tujunga Wash. The proposed project would connect to their restoration project, which is about 6000-feet in length. Currently, the project area is highly disturbed and does not support any native habitat. Implementation of the project would provide opportunity to restore the degraded habitat by planting riparian/native vegetation and increase the habitat value from 0 to 7.09 HUs. Alternative 2 is the NER and Recommended Plan based on the Incremental Cost Analysis and HEP Analysis. It will provide benefits to wildlife movement, migratory bird species and connectivity to the local sponsor's restoration area. Alternative 3 will generate approximately 5.6 HUs. The project provides incidental recreational opportunity to the residents of San Fernando Valley.

The project would not result in significant impacts on environmental resources including but not limited to air, water, noise, traffic, land use, etc. Environmental commitments are incorporated into the DPR to minimize construction related short-term impacts to environmental resources. As per coordination with the Regulatory Division, for future maintenance, a Section 404 permit under the Clean Water Act is not required because the future maintenance would not result in fill/discharge of material into Waters of the United States. The Corps has submitted a request for a 401 Water Quality Certification Permit from the Regional Water Quality Control Board. The implementation of the proposed project would not result in any growth inducing impacts because it has been identified as open land in the County/Cities General Plan and Policies.

Federal construction costs (including contingency) for Alternative 2 and 3 are $3,359,814 and $3,362,341 respectively. The total costs of the project (Federal and Non-Federal) for the preferred alternative (Alternative 2) including report preparation is $4,523,120.

The proposed project has been coordinated with the resources agencies including the USFWS, CDFG, RWQCB and interested environmental groups. The local sponsor, resource agencies, and interested environmental groups are very highly supportive of this project.

SECTION 1

INTRODUCTION

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SECTION 1 – INTRODUCTION

This is an Integrated Report written in compliance with Corps policy/regulations for preparation of feasibility reports per ER-1105-2-100, implementation of Ecosystem Restoration for Section 1135 (Appendix E and F and other Corps regulations), the National Environmental Policy Act (NEPA), the California Environmental Quality Act (CEQA) and other applicable environmental regulations. To minimize duplication of information and provide consistency, the feasibility report combines the Detailed Project Report (DPR) and Environmental Assessment (EA) into one report. This combined Integrated Report is referred to as a DPR in this document.

The Corps is the Lead Agency for the project. The project would be implemented in cooperation with the Los Angles County Department of Public Works, the local sponsor. The DPR discusses plan formulation undertaken to develop feasible alternatives and also assesses the potential environmental impacts associated with implementation of the proposed project and its alternatives (Code of Federal Regulations (CFR) Title 40, Chapter V: Council on Environmental Quality (CEQ), Section 1501.4(b)).

1.1 Location

The Tujunga Watershed is the largest sub-watershed of the Los Angeles River Watershed. It encompasses 225 square miles in north-central Los Angeles County, California. The site is located in the eastern San Fernando Valley (a part of the incorporated body of the City of Los Angeles), Los Angeles County, California. The proposed project reach extends from Vanowen Street north to Sherman Way, a distance of approximately 3,000 feet and approximately 65 feet on both sides of the Tujunga Wash flood control channel (See Figure 1-1 below).

The purpose of the project is to restore degraded habitat along a 3000 foot long part of the Tujunga Wash, increase the habitat value by planting native/riparian type of vegetation, increase opportunity for wildlife movement, and provide nesting areas for migratory birds and other sensitive species located in the vicinity of the project area. Wildlife corridor connectivity can be further expanded by connecting to the Local Sponsor's 6000 foot long restoration project and the Corps' existing 4,200 foot long Tujunga Greenbelt Project downstream of the Federal project (See Figure 1-2 below and Photograph 5 in Appendix A). Figure 1-3 below shows the water source for the proposed project (South Pacoima Wash Channel), the inlet connection location, as well as the staging areas.

1.1.1 Historic Background

The Tujunga Wash originates in the San Gabriel Mountains to the immediate north and passes through the study area before its confluence with the Los Angeles River. The Wash is formed upstream by the confluence of the Big Tujunga River and the Little Tujunga River, and is joined immediately downstream of the study area by the Pacoima Wash. The Tujunga Wash is the major tributary of the Los Angeles River system in the upper Los Angeles River basin. The

Tujunga Wash, once downstream of Hansen Dam, traverses through a heavily urbanized environment.

Historically, the Tujunga Wash, as it flowed through the eastern San Fernando Valley, was a braided stream course (see Photographs 1 and 2 in Appendix A). It was a major source of stream deposition and alluvial deposits in the region. The Tujunga Wash consisted of three primary channels. Streams flowing in a southerly direction were primarily carrying the discharge of only the larger flood flows. The natural channel was converted into the flood control channel and natural native vegetation was damaged during construction of the Hollywood Freeway and other intensive urban development. Thus the natural streams and vegetation were destroyed.

The channel is a rectangular box structure for its entire length from Hansen Dam to the Los Angeles River confluence (see Photographs 6 through 13 in Appendix A). The Tujunga Wash has the widest right-of-way (sixty-five feet average width, on each side of the channel bank) of any tributary channel system in the entire Los Angeles County Drainage Basin (LACDA) system. This right-of-way is owned in its entirety by the Los Angeles County Flood Control District, which is represented by the Los Angeles County Department of Public Works (LACDPW), which operates the LACDA system in conjunction with the U.S. Army Corps of Engineers (Corps). Both sides of the channel currently lack any type of vegetation (the cover photo of this document shows a typical view of the channel and right-of-way.

Figure 1. Regional view of the proposed Tujunga Wash project (U.S. Geological Survey 2003 true color aerial imagery).

Figure 1-1 – Project Location Map

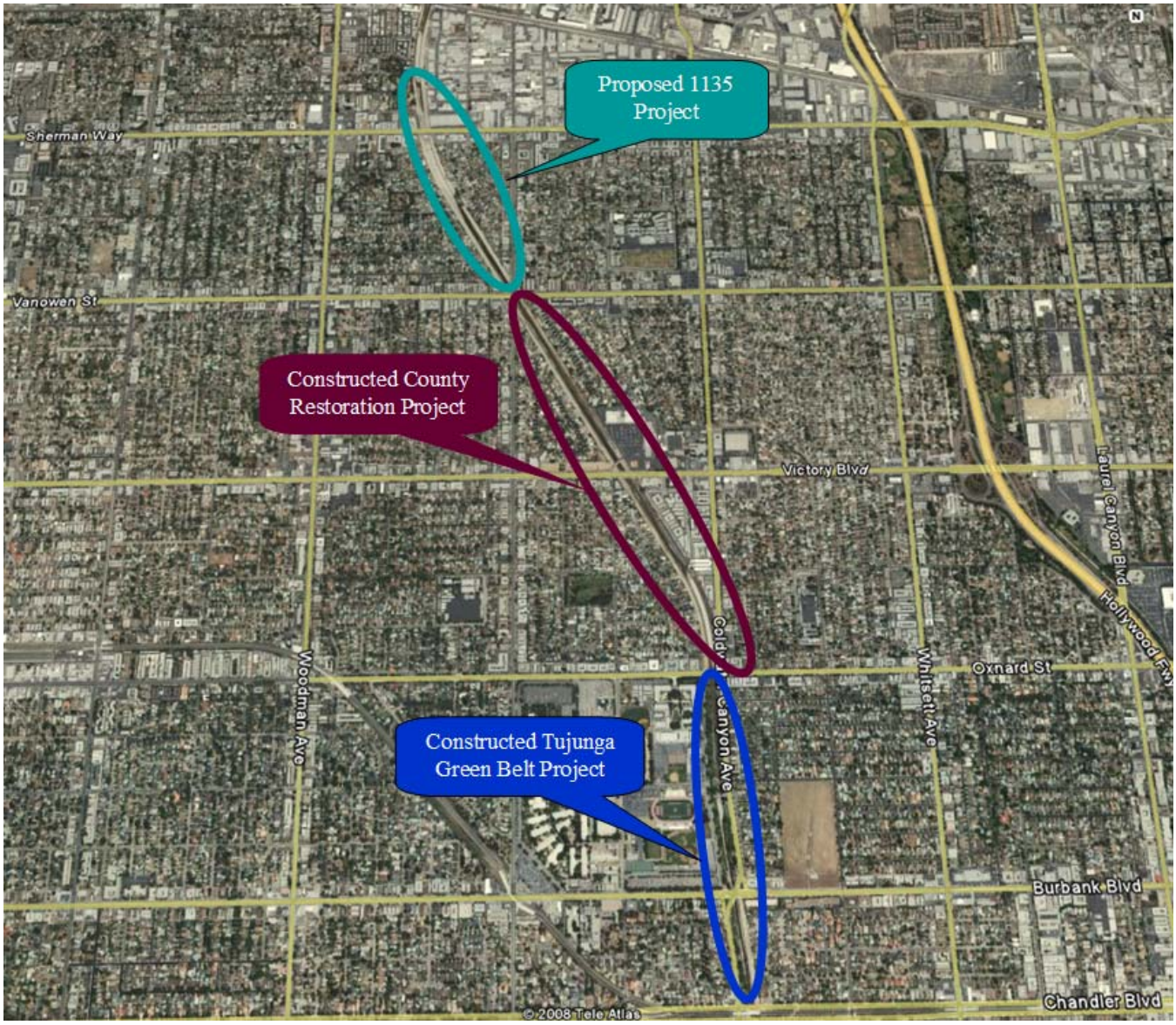

Figure 1-2 – Project Area Map

Figure 1-3 - Project Water Source, Inlet Connection and Staging Areas

1.2 Study Authority

The Corps of Engineers (Corps) has the authority, provided under Section 1135 of the Water Resources Development Act (WRDA) of 1986, as amended, to carry out project modification for improvement of the environment, if it is determined that the project is in the public interest and is cost effective. This Integrated DPR/EA is prepared under the authority of Section 1135 of WRDA 1986, as cited above. The Federal costs to carryout such modifications shall not exceed $5,000,000.00 without specific authorization by Congress. The objective of the Section 1135 project is to restore degraded ecosystem structures, functions, and dynamic processes to a less degraded condition. In accordance with the provisions of the Section 1135 program, the Los Angeles County Department of Public Works (County) requested that the Corps initiate a study of restoration opportunities along a limited segment of the Tujunga Wash which is a reach of

channel which is totally denuded of vegetation. The County is the local sponsor for the proposed project. The County's Letter of Intent is located in Appendix H.

1.3 Purpose and Scope

The goal of the proposed restoration project, as conveyed in the local sponsor's Letter of Intent, is to establish a riparian ecosystem along a constructed stream channel that also functions as an operating flood control system. Without the project, the Tujunga Wash would remain as a concrete channel offering extremely limited ecological value and habitat quality. The Corps has a national objective for ecosystem restoration in response to legislation and administrative policy. This objective is to contribute to the nation's ecosystem stability through ecosystem restoration, with contributions measured by changes in the amounts and values of habitat. The specific purpose of this DPR is to evaluate feasible alternatives for the restoration of riparian habitat along a 3,000 foot corridor of the Tujunga Wash to increase the value of habitat supporting wildlife movement and provide nesting opportunities to migratory birds. Specifically the DPR provides:

- A discussion on impact analyses, results and conclusions, including those developed in the Preliminary Restoration Plan (PRP);
- An examination of a range of alternative plans to restore environmental habitats within the study area, including potential costs and habitat benefits associated with each of these plans;
- Determination of the restoration plan that maximizes net habitat benefits based on cost, benefits, and environmental impacts of the identified alternative plans, as well as the assurance that the project is in compliance with applicable statutes, executive orders, and policies, and in accordance with current budgetary priorities;
- A sound and documented basis for decision makers at all levels to implement the recommended restoration plan and determine Federal interest; and
- An environmental review in compliance with the National Environmental Protection Act (NEPA), the California Environmental Quality Act (CEQA) and applicable environmental regulations and applicable Corps policy to implement ecosystem restoration planning.

Riparian habitat has declined significantly throughout the southwestern United States and many of these plant communities have disappeared completely. Riparian ecosystems are dependent on perennial, ephemeral, or intermittent surface or near sub-surface water. Owing to the natural scarcity of this resource and its vulnerability, riparian habitats are particularly valuable, playing a critical role in the life cycles of innumerable plant and animal species. The proposed environmental restoration effort would help to re-establish some of the historic habitat functions and values associated with riparian systems in southern California and in the San Fernando Valley region.

1.4 Previously Prepared Documents

The Tujunga Wash Greenbelt and Mural Project - 1976
This report and project was prepared and built by the Corps of Engineers, Los Angeles District, in 1976. The project is a linear suburban park that consisted of landscaped parkways, bicycle and hiking paths along an approximate 1-mile reach of the Tujunga Wash channel, between Oxnard Street and Chandler Boulevard in the City of Van Nuys, Los Angeles County. Along ¼ mile of the channel walls is a mural that was painted by artists from the "Human Efforts at Vitalizing Youth" State Program.

The State of the Tujunga: An Assessment of the Tujunga/Pacoima Watershed - 2006
This report was prepared by The River Project which was a collaboration of a number of individuals, agencies and organizations. The report was to give the public as accurate an assessment of the current functional conditions of the watershed as the available data and information can define.

1.4.1 Project Partnership Agreement

The local sponsor, the Los Angeles County Department of Public Works, has provided a Letter of Intent, dated July 15, 2008 (see Appendix H) to proceed with the design and construction of the Tujunga Wash Ecosystem Restoration project. USACE and the LADPW will jointly complete and sign a Project Partnership Agreement (PPA) based on the *MODEL PROJECT COOPERATION AGREEMENT FOR SECTION 1135 - CONTINUING AUTHORITY PROJECT MODIFICATIONS FOR IMPROVEMENT OF THE ENVIRONMENT AND RECREATION*.

The PPA, formerly known as a Project Cooperation Agreement, is a legally binding agreement between the Federal government and a non-Federal sponsor (state, municipal government, flood control district, etc.) that recites items of local cooperation and the cost sharing requirements necessary for the Federal Government to undertake water resources projects.

1.4.2 Items of Local Cooperation

Federal implementation of the recommended project would be subject to the non-Federal sponsor agreeing to comply with applicable Federal laws and policies, including but not limited to:

a. Provide 25 percent of total ecosystem restoration costs as further specified below:

1) Provide 25 percent of design costs allocated by the Government to ecosystem restoration in accordance with the terms of a design agreement entered into prior to commencement of design work for the ecosystem restoration features;

2) Provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs allocated by the Government to ecosystem restoration;

3) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all

improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the ecosystem restoration features;

4) Provide, during construction, any additional funds necessary to make its total contribution for ecosystem restoration equal to 25 percent of total ecosystem restoration costs;

b. Provide 50 percent of total recreation costs as further specified below:

1) Provide 25 percent of design costs allocated by the Government to recreation in accordance with the terms of a design agreement entered into prior to commencement of design work for the recreation features;

2) Provide, during the first year of construction, any additional funds necessary to pay the full non-Federal share of design costs allocated by the Government to recreation;

3) Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the recreation features;

4) Provide, during construction, any additional funds necessary to make its total contribution for recreation equal to 50 percent of total recreation costs;

c. Provide, during construction, 100 percent of the total recreation costs that exceed an amount equal to 10 percent of the Federal share of total ecosystem restoration costs;

d. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefore, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;

e. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the outputs produced by the ecosystem restoration features, hinder operation and maintenance of the project, or interfere with the project’s proper function;

f. Shall not use the ecosystem restoration features or lands, easements, and rights-of-way required for such features as a wetlands bank or mitigation credit for any other project;

g. Keep the recreation features, and access roads, parking areas, and other associated public use facilities, open and available to all on equal terms;

h. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. 4601-4655), and the Uniform Regulations contained in 49 CFR Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;

i. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;

j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the non-Federal sponsor owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;

k. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;

l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (CFR) Section 33.20;

m. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. 3141- 3148 and 40 U.S.C. 3701 – 3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. 276a *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. 327 *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. 276c *et seq.*);

n. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. 9601-9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the non-Federal sponsor with prior specific written direction, in which case the non-Federal sponsor shall perform such investigations in accordance with such written direction;

o. Assume, as between the Federal Government and the non-Federal sponsor, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

p. Agree, as between the Federal Government and the non-Federal sponsor, that the non-Federal sponsor shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA; and

q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. 1962d-5b), and Section 103(j) of the Water Resources Development Act of 1986, Public Law 99-662, as amended (33 U.S.C. 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

SECTION 2

EXISTING CONDITIONS

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SECTION 2 – EXISTING CONDITIONS

The following sections provide a summary of the existing conditions of the study area by resource type.

2.1 SOILS AND GEOLOGY

Soils exploration including soil classification and laboratory testing was performed for the Tujunga Wash Improvements and are summarized in the following reports by the Los Angeles District U. S. Army Corps of Engineers.

- Definitive Project Report Tujunga Wash Channel Improvement Los Angeles River to Hansen Dam dated August 1944.
- Analysis of Design on Tujunga Wash Channel Improvement Los Angeles River to Hansen Dam Los Angeles River to Magnolia Blvd dated March 1948
- Analysis of Design on Tujunga Wash Channel Improvement Los Angeles River to Hansen Dam Magnolia Blvd to Vanowen St dated April 1949
- Analysis of Design on Tujunga Wash Channel Improvement Los Angeles River to Hansen Dam Vanowen St to Beachy Ave dated May 1950

These reports indicate that the soils within the Tujunga Wash 1135 Ecosystem Restoration Project are alluvial soils consisting of gravelly sands and sandy gravels with less than 5 percent passing the number 200 sieve (strainer/sifter). Material finer than the 75-µm (No. 200) sieve can be separated from larger particles much more efficiently and completely by wet sieving than through the use of dry sieving. Therefore, when accurate determinations of material finer than 75 µm in fine or coarse aggregate are desired, this test method is used on the sample prior to dry sieving

The downstream end of the Tujunga Wash 1135 Ecosystem Restoration Project seems to be the boundary between the coarse soils which exist below Hansen Dam and the fine grain soils which exist above the Los Angeles River along the Tujunga Wash Channel. It is recommended that soils with 15 up to 30 percent passing the number 200 sieve be imported for the proposed project and to act as a liner for the water features. If a borrow site for importing new soil is needed, a supplemental environmental documentation will be prepared and will be coordinated with the project restoration biologist. There are no borrow sources within the project boundary.

The mountains and hills surrounding the San Fernando Valley are part of the Transverse Ranges geomorphic province. The nearby Santa Monica Mountains are composed mainly of Cretaceous to Miocene sedimentary and volcanic rocks. The San Fernando Valley overlies a basin filled with both Tertiary marine and non-marine sedimentary rock and recent alluvium. The Basin is as much as 14,000 feet deep. The recent deposits in the southern part of the valley and in the

vicinity of the project area include alluvium composed primarily of clay, silt, and sand weathered from the sedimentary rocks exposed on the north flank of the Santa Monica Mountains.

2.1.1 Soil Associations

Underlying the alluvium in the project area are shales and sandstones. The depth to these units varies from surface exposures located south of Ventura Boulevard, to more than 400 feet in depth along Vanowen Street, approximately one mile north of the project area. Several water wells have been drilled in the vicinity in which the bedrock was penetrated at depths of several hundred feet. There are no exposures of bedrock in the project area.

2.1.2 Geology and Physiography

The project area is located in a seismically active region. Since 1971, two major earthquakes have occurred nearby. The first event, a Magnitude (M) 6.4, occurred in February 1971 near the City of San Fernando, about 5 miles north of the project area. The second event, an M 6.7 (the Northridge earthquake) occurred in January 1994. This earthquake epicenter was approximately 5 miles from the project site. The project area, according to web-posted records of the California Division of Mines & Geology, is entirely within a liquefaction hazard zone usually due to near-surface saturated sediments and seismic potential.

The project area consists of mainly recent, young and old Alluvial Fan deposits and recent, young and old Alluvium deposits. Figure 2.1-1 indicates those deposits by the light to dark yellow colors highlighted in the circled area.

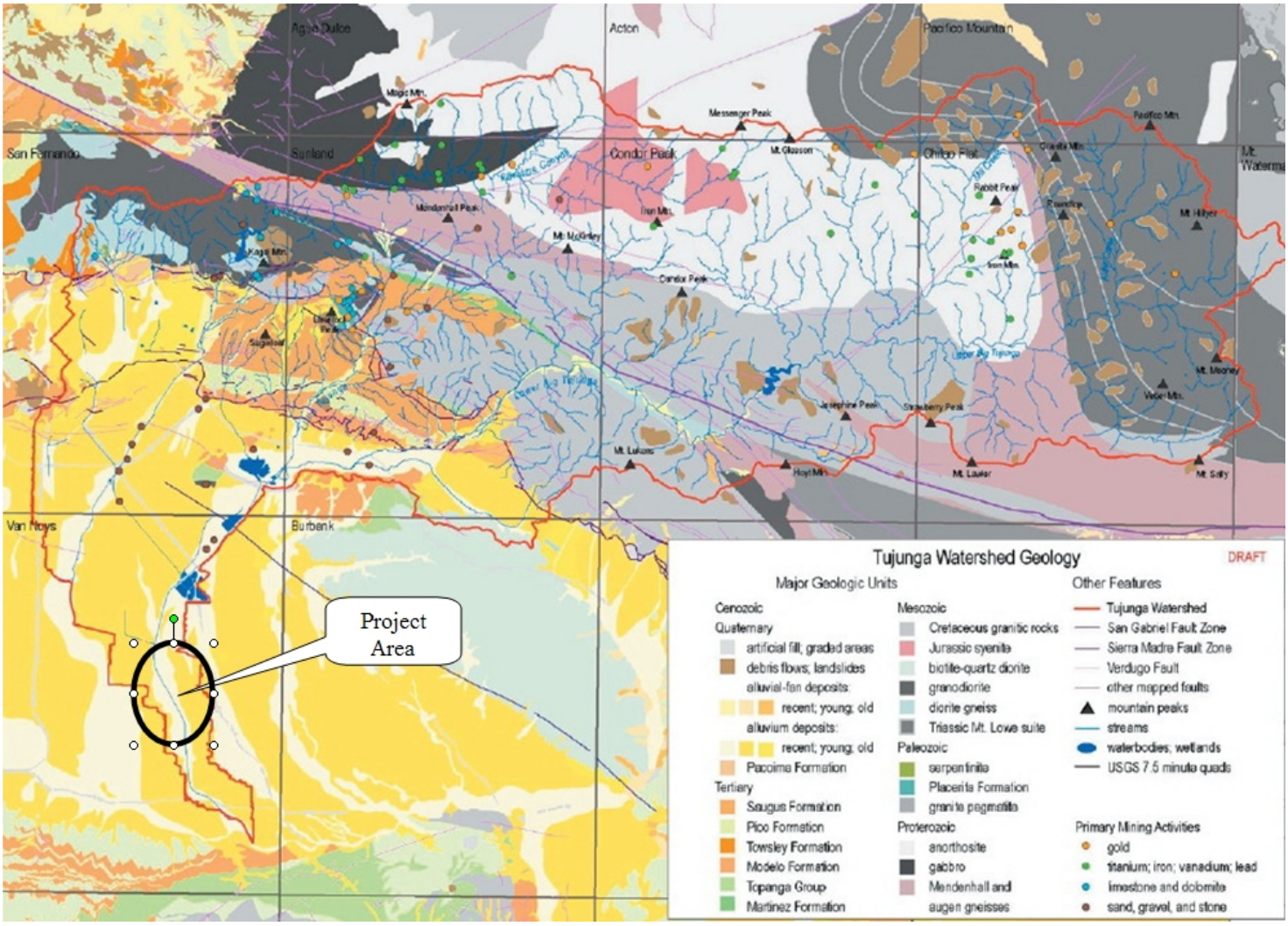
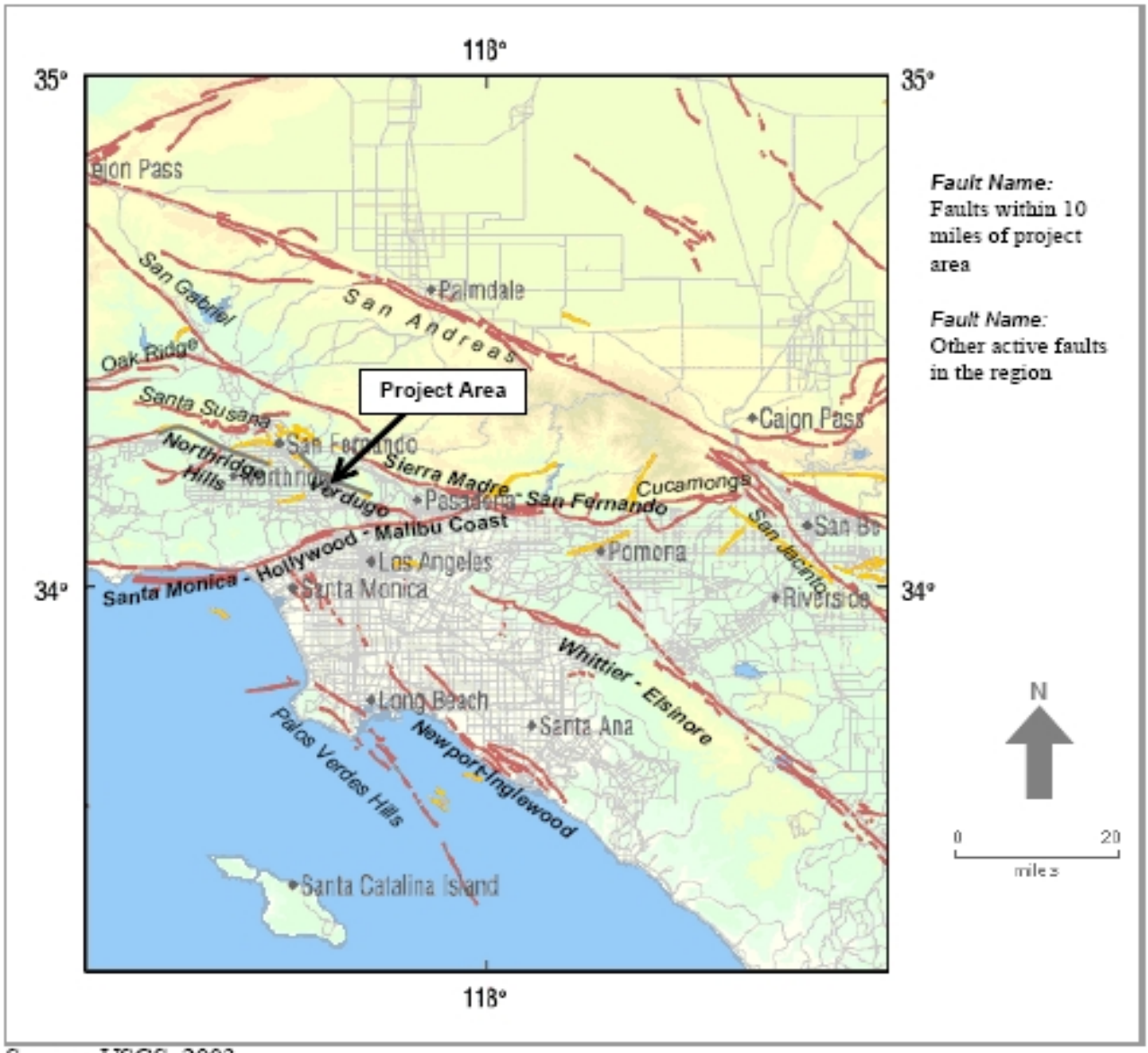


Figure 2.1-1 Tujunga Watershed Geology

2.1.3 Faults

Active faults located within 10 miles of the project area are Verdugo, Sierra Madre-San Fernando, Santa Monica-Hollywood-Malibu Coast, Whittier-Elsinore, Newport-Inglewood, and Northridge Hills (Figure 2.1-2). The Verdugo Fault is the only fault that intersects the project area. In addition, the Oak Ridge Fault, which is thought to be associated with the 1994 Northridge earthquake, is located outside of the 10-mile range but may be of concern for the project area (Figure 2.1-2). Table 2.1-1 lists the faults of concern for the project area, the distances from the project area, and the maximum credible earthquake Magnitude associated with each fault.

Figure 2.1-2 Regional Fault Map



Source: USGS, 2003.

Table 2.2-1 Faults of Concern for the Project Area

Fault Name	Distance to Fault (miles)		Maximum Credible Magnitude
	North End of Project	South End of Project	
Verdugo	<1	2	6.7
Sierra Madre-San Fernando	2	6	7.5
Santa Monica-Hollywood-Malibu Coast	11	6	7.5
Whittier-Elsinore	15	10	7.5
Newport-Inglewood	14	9	7.0
Northridge Hills	5	8	6.5
Oak Ridge	22	26	7.2

Source: LACDPW, 1995.

2.2 WATER RESOURCES

2.2.1 Hydraulics and Hydrology

Tujunga Wash flows from the western end of the San Gabriel Mountains, flowing through the range in an east/west direction (due to the San Gabriel fault) to the control structure of Hansen Dam, and then in a southerly direction through the eastern San Fernando Valley all the way to its confluence with the Los Angeles River. It is the primary drainage system for the western half of the San Gabriel Mountains. Elevations of the upper watershed range from approximately 1200 feet to 7200 feet. Due to tectonic activity, the western San Gabriel Mountains have one of the most rapid rates of uplift in the region, and are thereby defined with very steep escarpments. Physical weathering of the soils in the range is very rapid and, when combined with local fire ecology, major sedimentation has historically been the result. This was especially notable following 1975 Big Tujunga Fire.

The Wash is joined by two major tributaries at Hansen Dam: Lopez Canyon Wash and Little Tujunga Canyon Wash; still further downstream it is joined by another major tributary, Pacoima Canyon Wash. As mentioned earlier, Tujunga Wash is the major tributary of the upper Los Angeles River watershed.

Average daily flow in the Tujunga Wash at USGS gauge (11097000) is about 23 cfs. For the period May-October, the average daily flow is about 19 cfs and period June-October the average daily flow is only about 6 cfs. Tujunga Wash has a channel capacity of 29,000 cfs. The channel is rectangular with concrete sides and invert. The bottom width is seventy feet and its depth varies from twelve to thirteen and a half feet. The design velocity is 35-40 feet per second.

LACDPW diverts water from Tujunga Wash to the Hansen Spreading Grounds about two tenths of a mile downstream from Hansen Dam. The long-term average infiltration rate is about 100 cfs. LACDPW also diverts water from Tujunga Wash to the Tujunga Spreading Grounds further downstream. The long-term infiltration rate at this location is about 120 cfs. Additionally, LACDPW diverts water from Lopez Dam to the Lopez Spreading Grounds and from Pacoima Wash into the Pacoima Spreading Grounds. An ongoing study by the Corps and LACDPW is evaluating the potential to operate Hansen Dam for water conservation purposes. This would also benefit the spreading operations.

2.2.2 Surface Water

The Tujunga Wash between Hansen Dam and its confluence with the Los Angeles River is included under the State of California's Clean Water Act section 303(d) list for ammonia, copper, bacteria (high coliform count), odors, scum, and trash (California Environmental Protection Agency 2002). Data presented by The River Project (2006) also indicated potentially elevated levels of cadmium. Sources of ammonia include human and animal wastes, commercial fertilizers, and landfill leachate. Bacteria sources include human and animal wastes, leaky septic tanks or sewer lines, and decaying organic trash deposited in the water. Sources of copper, cadmium, and other metals include a variety of industrial sources and auto-related uses. Large

quantities of trash and solid waste are generated in urban areas like Los Angeles, some of which blow across the landscape or wash off surfaces into waterways.

Runoff from the watershed is characterized by high flood peaks of short duration that result from high-intensity rainfall on the watershed. Flood hydrographs are typically of less than 12 hours duration and are usually less than 48 hours duration. Inflow rates drop rapidly between storms, and inflow during the dry summer season is usually less than 10 cfs. Long-term average inflow to Hansen Dam for the 1946 through 1988 period is 27,450 acre-feet per year (see Table 5 in Appendix C – H&H Report).

In general, precipitation is required as a prerequisite for the occurrence of large floods from this watershed. Loss rates may decrease to as low as 0.15 inch per hour by the end of a major storm.

The watershed is heavily urbanized, and available open space is extremely limited. The only opportunities for storm runoff detention, infiltration, or storage are to modify low-impact and low-density areas such as parks, sport fields, large parking lots, and public streets. There are two sources of surface runoff. One is the South Channel of the Pacoima Wash outlet into the Tujunga Wash and second is the Tujunga Wash.

2.2.3 Groundwater

The proposed project area overlies the eastern portion of the San Fernando Groundwater Basin (SFB). The SFB covers an area of 112,000 acres, and is estimated to have a total groundwater storage capacity of approximately 3,200,000 acre-feet. It is an unconfined aquifer (i.e., the groundwater is not separated from the ground surface by an impenetrable geological boundary) composed of alluvial deposits. The SFB is bounded on the northwest and west by the Santa Susana Mountains and the Simi Hills and on the south by the Santa Monica Mountains. The general direction of groundwater flow is from the north and west to the southeast.

Hydrogeologically, the site lies within the eastern portion of the San Fernando Hydrologic Subarea of the San Fernando Valley Groundwater Basin (SWRB, 1962). The alluvial deposits extend to approximately 800 feet below ground surface (bgs) in this area and are generally very permeable. However, based on grain size analyses, the soil permeability was estimated to range from low to moderate values.

The SFB is a significant source of drinking water for the region. The SFB is an adjudicated groundwater basin (i. e., the rights to extract groundwater from the SFB have been allocated to various users by court). Ground water levels in the project area range from over 250 feet bgs to 100 feet bgs. Distance from the ground surface to the water table increases from north to south.

2.3 BIOLOGICAL RESOURCES

2.3.1 WILDLIFE HABITATS

Tujunga wash is located in the San Fernando Valley, Los Angeles County, California. The wash conveys water from Hansen Dam to the LA River which drains to the Pacific Ocean. The

Tujunga Wash channel reach that is the subject of this study is part of the Los Angeles County Drainage Area (LACDA) and extends between Vanowen Street and Sherman for a total distance of 3000-ft. Agriculture and development have severely altered the natural state of the system and currently there are no existing habitat that would support riparian species or allow a passageway for their movements.

2.3.1.1 Vegetation

Historically, the Tujunga wash and surrounding area was vegetated by alluvial fan scrub. This vegetation type is found in the broad, gently-sloping alluvial fans where rivers exit the mountains along the entire southern face of the San Gabriel Mountains. The Tujunga fan is an enormous landform that begins as a boulder and cobble floodplain within Big Tujunga Canyon and extends across the eastern San Fernando Valley. Wash vegetation (alluvial fan scrub) is dependent upon natural disturbance to regenerate and sustain the plant community. Typically dry large washes intermittently flood, causing scour of the terrain while that removes existing vegetation. These areas are then recolonized by young recruits while on the rest of the fan, mature vegetation develops gradually into complex habitat.

The alluvial fan scrub vegetation community is allied with and combines plant associations from riparian, coastal sage, chaparral, woodland, and desert communities. Alluvial fan scrub contains more mesic, evergreen species in comparison to the drought deciduous species found in coastal sage scrub. Assemblages may also include small, woodland riparian species such as California sycamore (*Platanus racemosa*) and mulefat (*Baccharis salicifolia*) (Hanes et al 1989). Other plants characteristic of alluvial fan scrub include Chaparral Yucca (*Yucca whipplei*) scalebroom (*Lepidospartum squamatum*) white sage (*Salvia apiana*), mulefat (*Baccharis salicifolia*), California buckwheat (*Eriogonum fasciculatum*), Coast Goldenbush (*Isocoma menziesii)*, mugwort (*Artemisia sp.*), California juniper (*Juniperus californica*), cholla and prickly pear (*Opuntia* spp.). Threatened and Endangered Species (TES) include endangered San Fernando Valley spineflower (*Chorizanthe parryi)*, slender-horned spineflower (*Dodecahema leptoceras)*, and Nevin's barberry (*Mahonia nevinii*), many-stemmed dudleya (*Dudleya multicaulis*), and Davidson's bush mallow (*Malacothamnus davidsonii*) (Hegelson 1993; Woods 2000; CDFG 2006). Currently this vegetation types exists primarily in San Bernardino County with small isolated patches in Los Angeles County. The California Natural Diversity Data Base designated this habitat type a high priority for preservation in 1987, however no Federal program currently exists for its conservation (Hanes et al 1989).

2.3.1.2 Fauna

Because the present communities are highly disturbed, most of the faunal species present are introduced generalist species. These include mammals such as the raccoon (*Procyon lotor*), opossum (*Diadelphis virginiana*), coyote (*Canis latrans*), striped skunks (*Mephitis mephitis*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), roof rats (*Rattus rattus*), and fox squirrels (*Sciurus niger*). Generalist bird species include the northern mockingbird (*Mimus polyglottus*), Mourning Dove (*Zenaida macroura*), rock dove or pigeon (*Columba livia*), American Crow (*Corvus brachyrhynchos*), House Finch (*Carpodacus mexicanus*), Black Phoebe (*Sayornis nigricans*), Anna's Hummingbird (*Calypte anna*), Sharp-shinned Hawk (*Accipter*

striatus velox), Cooper's Hawk *(Accipiter cooperii*), Red-tailed Hawk (*Buteo jamaicensis*), Peregrine falcon (*Falco peregrinus*) and Turkey Vulture (*Cathartes aura*).

2.3.1.3 Existing Habitats

The project site consists of a concrete lined flood control channel with a 65-foot right of way along each side of the channel. The right of way separates private properties from the flood control channel. Chain-link fencing lines the right of way on both sides. The right of way is compacted dirt which is mostly devoid of plant life. Any vegetation near these perennial water channels are non-native grasses or landscaped areas that are typically heavily managed for community safety purposes. Plant species present are ruderal or exotic, such as black mustard (*Brassica nigra*) and redstem filaree (*Erodium cicutarium*). Some partially native plantings exist in small landscaped patches which are not large enough to support viable populations of native fauna.

The project site is 4.7 miles downstream from Hansen dam and 3.1 miles northeast of Sepulveda basin. These areas contain functioning riparian systems with species that may take advantage of a newly constructed wetland area for migratory or residential purposes.

2.3.2 ENDANGERED AND THREATENED SPECIES

2.3.2.1 Federal

A total of 13 Federally protected species have the potential to occur in the Tujunga Wash watershed area. This list includes 3 amphibians, 2 fish, 5 birds and 3 plants. Nine of those species are listed as endangered and 4 as threatened. Information pertaining to species identified by the USFWS as well as all other Federally protected species, is included in Table 2.3-1 below. The Coordination Act Report that was prepared by the USFWS and finalized in 2007 determined there to be no sensitive species or habitats within the project site, though the project area may provide stopover habitat for migratory birds.

2.3.2.2 State

The California Department of Fish and Game (CDFG) maintains lists of threatened and endangered species in California. This list includes flora and fauna whose occurrence in California is or may be in jeopardy, or with known or perceived threats or population declines. These species are not necessarily the same as those protected by the Federal government under the ESA. None of the State listed species are known to occur within the project area. A list of those species can be found in Table 2.3.2-1.

Table 2.3-1 Federal and State Listed Species in the Los Angeles County area

	Federally listed species with historical distributions within the Tujunga wash basin		
Taxon	Scientific Name	Common Name	Federal Status
Amphibians	*Bufo californicus*	Arroyo toad	Endangered
	Rana aurora draytoniii	California red-legged frog	Threatened
	Rana muscosa	Mountain yellow-legged frog	Endangered
Fish	*Catostomus santaanae*	Santa Ana sucker	Threatened
	Gasterosteus aculeatus williamsonii	Unarmored threespined stickleback	Endangered
Birds	*Gymnogyps californianus*	California condor	Endangered
	Haliaeetus leucocephalus	Bald eagle	Threatened
	Empidonax trailii extimus	Southwestern willow flycatcher	Endangered
	Polioptila californica californica	Coastal California gnatcatcher	Threatened
	Vireo belii pusillus	Least Bell's vireo	Endangered
Plants	*Berbis nevinii*	Nevin's barberry	Endangered
	Dodecahema leptoceras	Slender-horned spineflower	Endangered
	Orcutta californica	California Orcutt grass	Endangered

	State listed species with historical distributions within the Tujunga wash basin		
Taxon	Scientific Name	Common Name	State Status
Fish	*Gasterosteus aculeatus williamsonii*	Unarmored threespined stickleback	Endangered
Birds	*Gymnogyps californianus*	California condor	Endangered
	Haliaeetus leucocephalus	Bald eagle	Endangered
	Falco peregrinus	Peregrine falcon	Endangered
	Coccyzus americanus occidentale	Western yellow-billed cuckoo	Endangered
	Empidonax trailii extimus	Southwestern willow flycatcher	Endangered
	Vireo belii pusillus	Least Bell's vireo	Endangered
Plants	*Berbis nevinii*	Nevin's barberry	Endangered
	Chorizanthe parryi fernandina	San Fernando Valley spineflower	Endangered
	Dodecahema leptoceras	Slender-horned spineflower	Endangered
	Orcutta californica	California Orcutt grass	Endangered

2.3.2.3 Critical Habitat

Along with protecting the individual species, the ESA also calls for the conservation of what is termed Critical Habitat – the areas of land, water, and air space that an endangerd species needs for survival. Critical habitat also includes food source, breeding sites, cover or shelter, and sufficient habitat area to provide for normal population growth and behavior. One of the primary threats to many species is the destruction or modification of essential habitat by uncontrolled land and water development.

Alluvial fan scrub and Coastal sage scrub were once one of the most extensive habitats in southern California. It is now one of the most threatened due to urban encroachment. The vegetation is adapted to the dry, warm summers and cool wet winters of southern California's Mediterranean climate. About 100 species, including many threatened and endangered species,

are endemic to coastal sage scrub. The project site is not within designated critical habitat for any of the species listed in Table 2.3-1.

2.4 LAND USE, AESTHETIC AND RECREATIONAL RESOURCES

This section identifies and describes existing and planned land uses within the Tujunga Wash project area. The information presented in this section was compiled from general plans, approved and proposed land use development plans, aerial photographs, site reconnaissance, and communications with local officials.

2.4.1 Land Use

The study area is located in the central portion of the Tujunga Watershed and is on land owned by the City of Los Angeles, Department of Public Works. The study area consists of a linear concrete lined flood control channel that has been influenced by urbanization. The project area is void of most vegetation along the flood control channel. As shown in the land use map below, the dominant land uses in the project area are: high-density single family; low-rise apartments, condos, and townhouses; and manufacturing, assembly, and industrial services.

A predominantly single-family residential land use in the large block (between Sherman Way and Vanowen; between Woodman and Fulton) and is modified only by the apartment buildings which characterize the strip along Fulton and Vanowen. More apartment complexes are found on Woodman interspersed with a few retail establishments and only one single family dwelling. Sherman Way is zoned for commercial uses and is dominated by small business including restaurants, auto body shops, paint and flooring stores with no residential use represented along one of the central valley's main commercial and commuting thoroughfares. Also noteworthy are three convalescent home facilities (Evergreen Chateau; Country Villa; Valley Palms) on Sherman Way between Fulton and Woodman. These are within the orbit of Kaiser Permanente, Panorama City Medical Center facility less than 2 miles away at the corner of Woodman and Roscoe. A bit farther, but within 3 miles (west) of the project site, is Van Nuys Hospital – previously called Valley Presbyterian Hospital – at 15220 Vanowen at Sepulveda Boulevard.

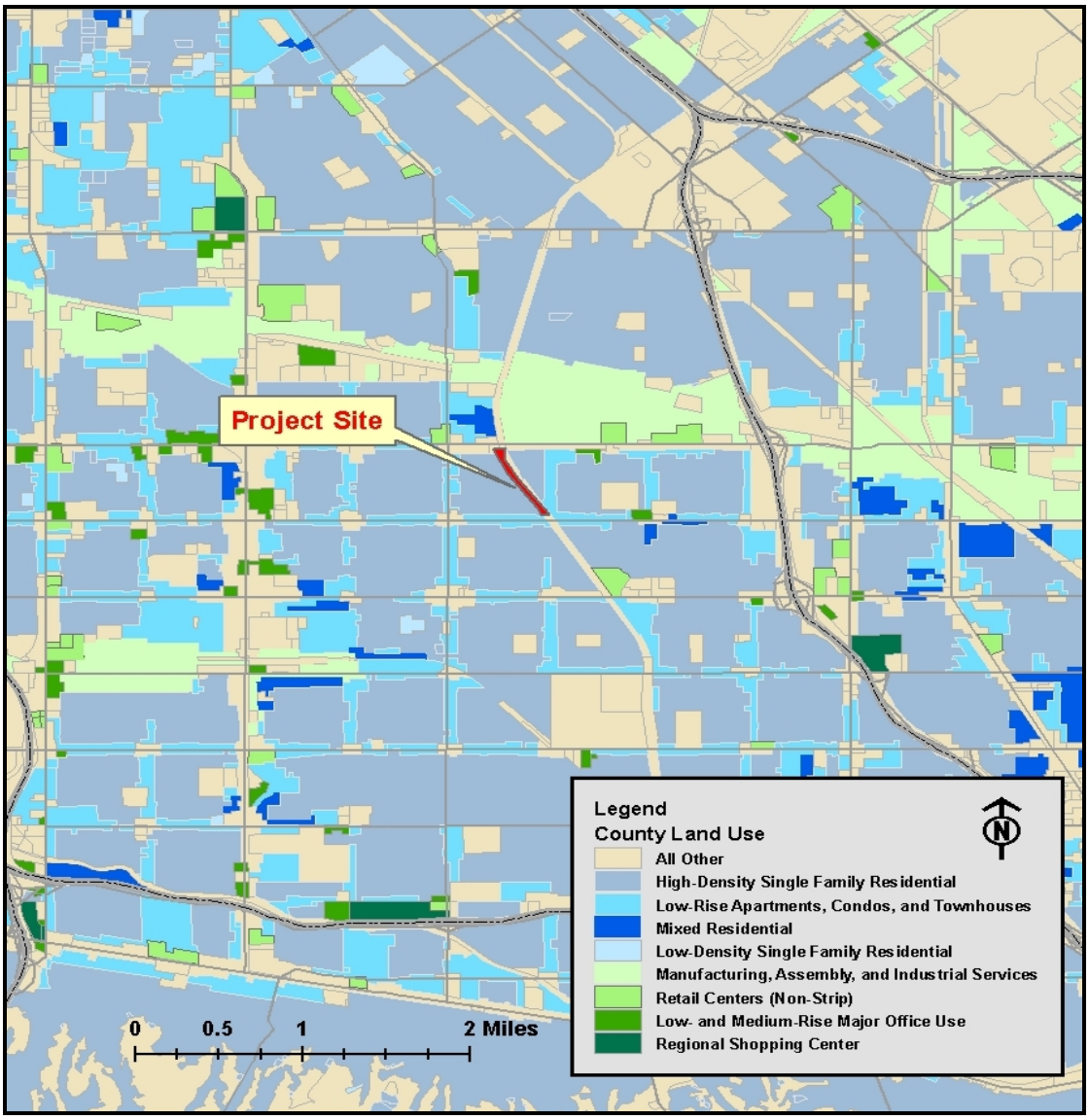


Figure 2.4-1: Project Area Land Use
Source: Southern California Association of Governments (SCAG), 2007. Figure best viewed in color.

2.4.2 Aesthetics

The backdrop (one or more miles) from the study area extending from the southeast to the southwest includes the Santa Monica Mountains and Hollywood Hills, the west side of the San Fernando Valley. These long range views include a mixture of residential development in the hills, and residential, commercial, agricultural and recreational uses in the flat areas.

The foreground features of the surrounding area include the Los Angeles River, Sepulveda Dam Recreation Area/Anthony C. Beilenson Park (including Lake Balboa, parking, recreational facilities and open space) to the south, Sherman Way Boulevard to the north and Vanowen Street to the south both bordered by urban land uses (commercial and residential). The only vegetative aesthetics present are those of the surrounding residential neighborhoods.

Passive and active recreation facilities present are in the general area, including trails in the nearby Verdugo Mountains and San Gabriel Mountains (Angeles National Forest), and extensive opportunities in the Hansen Dam Flood Control Basin. Although the flood control function of the basin is operated by the Corps, the recreation facilities are operated by the City of Los Angeles Recreation and Parks Department under a lease with the Corps. In addition, there are recreation opportunities in the Sun Valley Park and passive recreation along the Tujunga Wash Greenbelt, both also managed by the City Recreation and Parks Department.

A variety of land uses occur immediately adjacent to the Tujunga Wash. Along the upper portion of the watershed, located 9 miles northwest, and protected by, Angeles National Forest, native vegetation is predominant. This consists of riparian species in the canyon bottom, chaparral on many hillside slopes, and coniferous species at the higher altitudes. The Wash then passes through, or adjacent to, various communities of the City of Los Angeles within the eastern San Fernando Valley, including Tujunga, Sunland, Sun Valley, Pacoima, Arleta, Panorama City, North Hollywood, Valley Glen and Studio City. The upper Sun Valley area has been converted to large sand and gravel mining extraction pits. Further downstream, urban land uses predominate, such as industrial, residential and commercial. Some of the gravel pits, once depleted, have been used as landfill sites.

2.4.3 Recreation

County Level Recreation

More than half of the upper watershed lies within the Angeles National Forest (ANF), a very sparsely populated region in which the natural community has retained a significant presence. The ANF receives more visitors than any other US National Forest. Forest recreation sites located within the Tujunga Watershed are heavily used, extremely popular weekend destinations for local residents.

City Level Recreation

The City of Los Angeles has approximately 15,620 acres of parkland under the jurisdiction of the Department of Recreation and Parks. This number includes all park acreage and open space (Small/Pocket Parks, Neighborhood Parks, Community Parks, Regional Parks, Beaches, Canyons, etc.) in the Department's inventory. Overall, there is approximately 4.23 acres of parkland per 1,000 residents.

However, it should be noted that the City has a standard of 4.00 acres of Neighborhood & Community parkland per 1,000 residents, per the City's Public Recreation Plan. Considering just these more local resources, there are approximately 0.76 acres of parkland per 1,000 residents. According to the Department of Recreation and Parks, this standard is a more accurate reflection of the recreational resources available in each community.

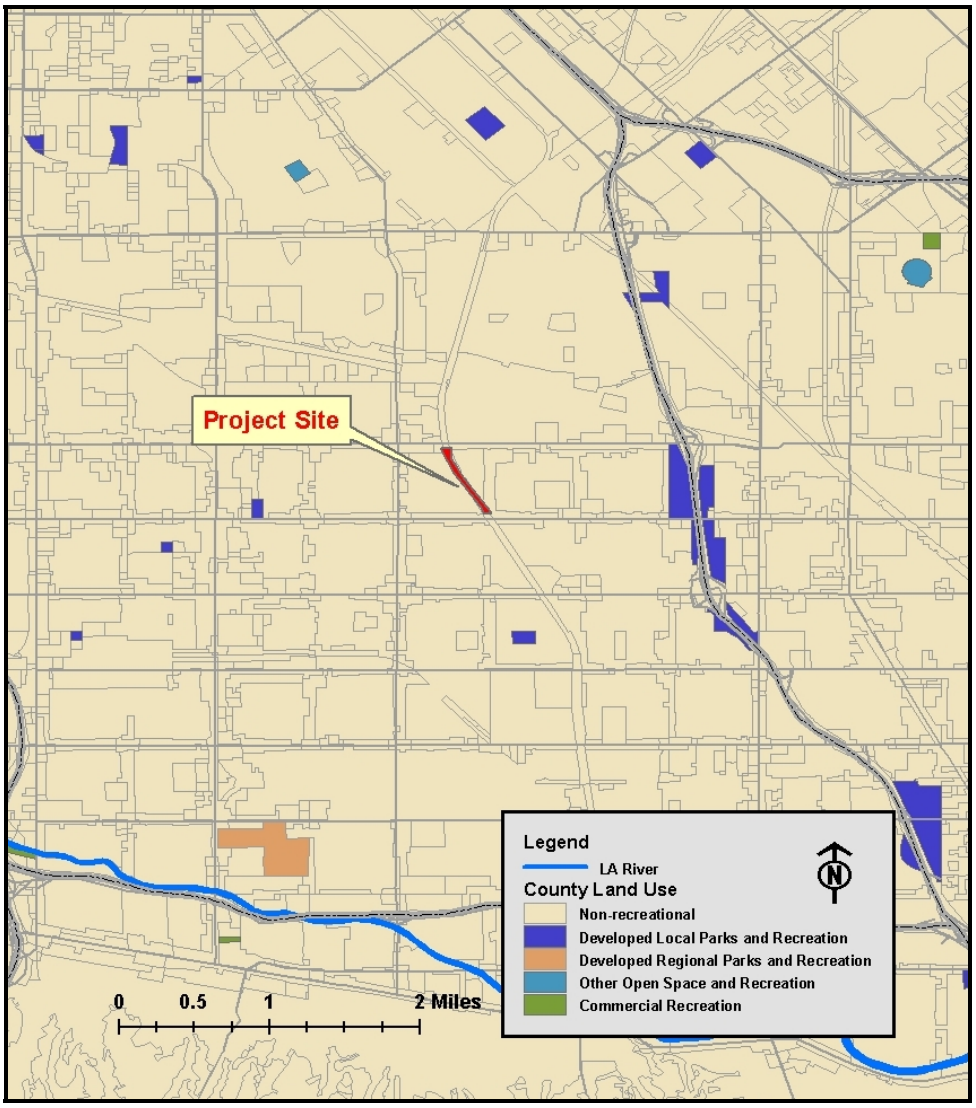


Figure 2.4-2: Project Area Land Use, Recreation Resources
Source: Southern California Association of Governments (SCAG), 2007. Figure best viewed in color.

Given that the recreation features considered at the project site are passive in nature and of a small scale, the recreation market for the project area is assumed to be relatively small in geography. The vast proportion of users is expected to be local residents. For local parks, the City of Los Angeles typically considers the market area as a two mile radius of the park location. The following recreation and parks facilities are located within a two mile radius of the project location:

- Strathern Park-North - 8.62 acre Community Park located north of Strathern Street and west of Whitsett Avenue.
- Strathern Park West / Strathern Greenbelt - 12.70 acre community park located at 12541 Saticoy Street.
- Valley Glen Community Park (formerly Erwin Community Park, as shown in the map below) - 5.72 acre neighborhood park located at Erwin Street and Ethel Avenue.
- Hartland Mini Park - 0.12 acre pocket park located at Woodman Avenue and Hartland Street.

- Kittridge Mini Park - 0.12 acre pocket park located at Kittridge Street and Greenbelt Avenue.
- Valley Plaza Recreation Center - 64.41 acre Community Park located at 12240 Archwood Street.
- Van Nuys Recreation Center - 3.92 acre Neighborhood Park located at 14301 Vanowen Street.

The recreation areas listed above comprise approximately 95 acres of local parkland. Given the density of the population in this area, it is estimated that most of the areas that are within a 2-mile radius of the project site have in their market area less than one acre of parkland per thousand residents – less than one-quarter of the recommended parkland recommended by the City.

2.5 CULTURAL RESOURCES

For Federal undertakings, the action must demonstrate compliance with the National Historic Preservation Act (NHPA), Public Law 89-665; 16 U.S.C. 470-470m, as amended, 16 U.S.C. 460b, 470l-470n, and 36 CFR 800, as amended (August 5, 2004). Cultural resources are identified using two principal methods. Before starting a project, a records and literature search is conducted at repositories of archeological site records. The search may show that an archeological or historical survey has been conducted in the project area and that cultural resources have been identified. That information may be enough to proceed with the significance evaluation stage of the project. If no previous survey has been done, or if a previous survey was either out of date or inadequate, a pedestrian survey of the ground surface within the proposed project boundaries may be conducted. Subsurface testing may also be performed if deemed appropriate by the cultural resources professional.

After a cultural resource(s) has been identified during a survey or record and literature search the Federal agency overseeing the undertaking proceeds to determine whether the cultural resource is eligible for listing in the National Register of Historic Places (National Register). Section 106 of the National Historic Preservation Act mandates this process. The Federal Regulation that guides the process is found at 36 CFR 800.

For a cultural resource to be determined eligible for listing in the National Register it has to meet certain criteria. The resource has to be either minimally 50 years old or exhibit exceptional importance. After meeting the age requirement, cultural resources are evaluated according to four criteria: a, b, c, and d. The National Register criteria for evaluation as defined in 36 CFR 60.4 are:

The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and

(a) that are associated with events that have made a significant contribution to the broad patterns of our history; or
(b) that are associated with the lives of persons significant in our past; or

(c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
(d) that have yielded, or may be likely to yield, information important in prehistory or history.

After a cultural resource has been determined eligible for inclusion in the National Register it is accorded the same level of protection as a property that is included. It then becomes formally known as a "historic property" regardless of age.

For the purpose of identification of existing cultural resources for this project, the project Area of Potential Effect (APE) is limited to an area within ½ mile of each of the channels.

Local prehistory and history are briefly summarized here in order to provide a context for further discussion of the known archaeological and historical remains within the project area.

2.5.1 Cultural and Ethnographic Background

2.5.1.1 Prehistory

Traditionally, southern California was thought to have been ignored by the first settlers of the western hemisphere. Recent research along the coast and on the Channel Islands, however, indicates that this model is probably in error (Altschul and Grenda 2002; Grenda, Doolittle and Altschul 1998; Erlandson 1994; Erlandson and Colton 1991). There is little doubt that coastal southern California was settled by 8000 B.P. Chronologies have been developed for various regions of coastal southern California by, among others, Wallace (1955, 1978), Warren (1968), King (1981); Koerper and Drover (1983), and Altschul et al. (1992).

Four horizons or periods have been identified, the earliest being The Millingstone (ca. 8450 – 2950 B.P.), during which the population practiced a mixed hunter-gatherer subsistence strategy. The Intermediate (ca. 2950 – 950 B.P.), was characterized by a shift away from primarily gathering to a more maritime subsistence. It is during this time that the mortar and pestle were introduced, and acorn processing began. In the Late Prehistoric (ca. 950-100 B.P.), the village became the center of a territory from which resources were gathered. By ca. 500 B.P., the ancestors of the Native Americans to become known as the Gabrieliño are believed to have migrated into the area, displacing or absorbing the people inhabiting the area.

2.5.1.2 Protohistoric and Early Historical Periods

The line between the Late and protohistoric periods is admittedly an arbitrary one. Protohistory is defined as beginning with European contact in A.D. 1542 and proceeding through the establishment of the Mission San Gabriel in 1771, when direct and recurrent contact began between the local Gabrieliño and the Spanish (Lightfoot and Simmons 1998:140). The early historic period (also known as the Mission period) follows, dating from 1771 until secularization in 1834.

2.5.1.3 Historic Period

The broad sequence of events for the historical period (A.D. 1771-1941) in coastal southern California has become well established through repetition in published sources. As native Californian life ways slipped more and more into the past, the future became the domain of Hispanic settlers newly arrived from Mexico. Just 10 years after the founding of the Mission San Gabriel, the settlement named Pueblo de Nuestra Señora la Rena de Los Angeles was begun on the plain near what became known as the Los Angeles River.

By 1835 the population of Los Angeles had grown to 1,650. Los Angeles was declared a city and was the newly established capital of Alta California, replacing Monterey. War was declared on Mexico by the United States in 1846. The Republic of Mexico signed the Treaty of Guadalupe Hidalgo in 1848, brining about the official end to the Mexican-American War (1846-1848), and the territory of Alta California was ceded to the United States.

The great influx of Americans and Europeans after discovery of gold in California quickly overshadowed many of the Spanish and Mexican cultural traditions and eliminated much of the remaining vestiges of Native American culture.

2.5.2 Records and Literature Search

A records and literature search was conducted by Corps of Engineers' Staff Archeologist at the South Central Coastal Information Center, California State University, Fullerton. This involved a review of archeological resources maps plotted on the San Fernando and Sunland, CA 7.5-minute USGS topographic maps, historic topographic maps, and historical register lists. Historical registers consulted include the *National Register of Historic Places* (2006), the *California State Historic Resources Inventory* (2006), the *California Points of Historical Interests* (2006), and the *California Historical Landmarks* (2006).

The records and literature search also included a review of pertinent survey reports on file at the US Army Corps of Engineers Los Angeles District Office. The reports consulted include: Cottrell et al. 1985, Demcak 1979, and Martz 1977, Greenwood and Associates 1994, Brock et al. 1993, Becker 1999, and Wuellner and Wahoff 2005. These reports indicate that no cultural resources have been recorded within the project's Area of Potential Effect (APE). Finally, the results of the records and literature search indicate that there are no previously recorded historic properties within 1 mile of the project's APE.

2.5.3 Native American Concerns

Section 106 of the National Historic Preservation Act requires consultation with Native Americans to determine their interests in Federal projects. A search at the California Native American Heritage Commission (NAHC) determined that no sacred sites are recorded within the project area. The NAHC provided a list of Native American contacts that should be notified about this project. Copies of the public draft of this document will be sent to representatives of the Gabrieliño/Tongva people for review and comment.

2.6 AIR QUALITY

The Project area is located within the South Coast Air Basin (SCAB), which encompasses all of Orange County, most of Los Angeles and Riverside Counties, and the western portion of San Bernardino County. Air quality in the project area is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is responsible for achieving air quality goals within the South Coast Air Basin.

2.6.1 Climate

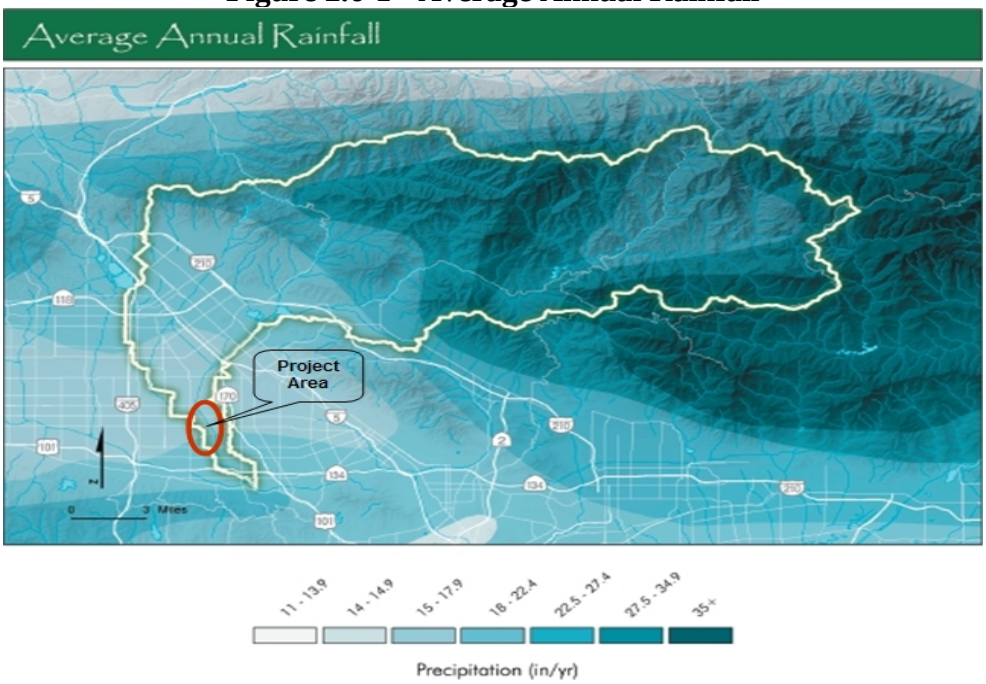
The Tujunga Watershed is located in Southern California which is known for its Mediterranean climate. This distinction relates to the mild winters and warm summers with little annual precipitation of 15"-20" per year. The climate is moderated by the Pacific Ocean such that temperatures during the summer are not too hot (76ºF avg) and temperatures during the winter are not too cold (53ºF) as shown in Table 2.6-1. In summer, the subtropical high pressure belts drift north to the northern hemisphere inhibiting the formation of clouds, thereby limiting precipitation. From November through March, precipitation-bearing, low-pressure depressions move southerly from the north towards the equator resulting in precipitation within Southern California. In autumn and winter, the area is subjected to Santa Ana winds, which are winds that blow from the inland areas towards the Pacific Ocean. These forceful winds bring hot temperatures and low humidity often spreading brush fires that endanger wildlife, property, and human life. Information on the Tujunga Watershed climate obtained from the California Climate Data Archive website (Calclim) is summarized in Table 2.6-1. The nearest stations with available climate data are Tujunga, Pacoima Dam, and Big Tujunga Dam. At Tujunga, the average daily temperature ranges from 53ºF in December to about 76ºF in July. At the Pacoima Dam weather station, February is the wettest month with an average rainfall of 4.99 inches between 1971 and 2000. The driest month is July with an average rainfall during the same period of 0.04 inches. At the Big Tujunga Dam weather station, January is the month with the most rainfall with an average rainfall of 5.58 inches between 1949 and 2005. The driest month is July with an average rainfall of 0.04 inches. The data reveals that precipitation is higher in the mountain areas (Big Tujunga Dam station compared to the other two stations). This is likely due to the orographic effects of the mountains that cause cooling of the air as it rises over the mountains resulting in increased precipitation (Table 2.6-1 and Figure 2.6-1).

Table 2.6-1 Project Area Climate

Station	Average Daily Temperature (°F)	Precipitation (inches)	
		Annual Total	Average Monthly Total
Tujunga [1]	53 (Dec) - 76 (Jul)	19.39	0.00 (Jul) - 4.71 (Feb)
Pacoima Dam [1]	Not Available	20.77	0.04 (Jul) - 4.99 (Feb)
Big Tujunga Dam [2]	Not Available	25.62	0.04 (Jul) - 5.58 (Dec)

(1) Period of Record: 1971 – 2000
(2) Period of Record: 1949 – 2005
Source: California Climate Data Archive

Figure 2.6-1 Average Annual Rainfall



El Niño is one of the most widely publicized weather patterns in Southern California. El Niño is characterized by an increase in the sea temperatures in the tropical water of the eastern and central Pacific Ocean. The warm water influences the storm patterns globally, bringing heavy rain storms to the coastal regions of the Pacific. Southern California is one of the regions being continuously impacted by El Niño events, which bring warmer than normal winters and severe rain storms. These warm and wet events occur on an irregular cycle, ranging from 2 to 7 years and each cycles lasts from 6 months to 4 years. The last El Niño event occurred during the 2002-2003 period and the last strong El Niño event occurred during the 1997-1998 period.

The La Niña event is the counterpart of the El Niño event with opposite characteristics of El Niño. La Niña is characterized by unusually cold ocean temperatures in the tropical Pacific Ocean. Its impact is generally less significant than El Niño. In Southern California, La Niña generally brings cooler and drier winter seasons. These two extreme phases of the climate cycle are often referred to collectively as the El Niño/Southern Oscillation (ENSO).

2.6.2 Air Quality Standards and Attainment Status

The United States Environmental Protection Agency (USEPA), California Air Resources Board (CARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the Project are provided in Table 2.6-2.

Table 2.6-2. National and California Ambient Air Quality Standards			
Pollutant	**Averaging Time**	**California Standards**	**National Standards**
Ozone (O_3)	1-hour	0.09 ppm	—
	8-hour	0.070 ppm	0.08 ppm
Respirable particulate matter (PM_{10})	24-hour	50 $\mu g/m^3$	150 $\mu g/m^3$
	Annual mean	20 $\mu g/m^3$	—
Fine particulate matter ($PM_{2.5}$)	24-hour	—	35 $\mu g/m^3$
	Annual mean	12 $\mu g/m^3$	15 $\mu g/m^3$
Carbon monoxide (CO)	1-hour	20 ppm	35 pm
	8-hour	9.0 ppm	9.0 ppm
Nitrogen dioxide (NO_2)	1-hour	0.25 ppm [a]	—
	Annual mean	— [a]	0.053 ppm
Sulfur dioxide (SO_2)	1-hour	0.25 ppm	—
	24-hour	0.04 ppm	0.14 ppm
	Annual mean	—	0.03 ppm

Source: CARB Ambient Air Quality Standards Table, 2007. Primary national standards are shown.

Notes: ppm=parts per million; $\mu g/m^3$= micrograms per cubic meter; "—" = no standard

a – California is in the process of changing the 1-hour NO_2 standard to 0.18 ppm and adding an annual NO_2 standard of 0.030 ppm.

The proposed Project area is located within the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Table 2.6-3 summarizes the Federal and State attainment status of criteria pollutants for the Project area based on the NAAQS and CAAQS, respectively.

Table 2.6-3. Attainment Status for the South Coast Air Basin

Pollutant	Federal	State
Ozone – 1 Hour	N/A	Extreme Nonattainment
Ozone – 8 Hour	Severe-17 Nonattainment	Not Available[a]
CO	Nonattainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment
PM10	Nonattainment	Nonattainment
PM2.5	Nonattainment	Nonattainment

Source: CARB 2007b, USEPA 2007

2.6.3 Ambient Air Quality

The Tujunga Wash project area lies within the South Coast Air Basin (SCAB). Air quality is evaluated by measuring ambient concentrations of pollutants that are known to have deleterious effects. The degree of air quality degradation is then compared to ambient air quality standards (AAQS), such as the California and National Ambient Air Quality Standards (CAAQS and NAAQS, respectively). In general, the CAAQS are more stringent than the corresponding NAAQS. Air pollutant levels within the SCAB, either regionally or at least in parts of the air basin, regularly exceed the CAAQS and NAAQS for ozone (O_3), carbon monoxide (CO), and inhalable particulates (PM_{10}). Currently, the SCAB is in non-attainment with regard to both the CAAQS and NAAQS for O_3, CO, nitrogen oxides (NOx), and fine particulate matter (PM_{10}). Table 2.6-4 lists the current CAAQS and NAAQS for each pollutant, and provides the maximum

air quality concentration recorded for each pollutant at the East San Fernando Valley and Central Los Angeles monitoring stations (monitoring stations located in the vicinity of the study area) during the period of 2004 through 2006.

Table 2.6-4 Ambient Air Quality Summaries

Pollutant	Averaging Time	2004	2005	2006
Ozone (O_3)	1-hour	0.110 ppm	0.121 ppm	0.108 ppm
	8-hour	0.091 ppm	0.098 ppm	0.079 ppm
Respirable particulate matter (PM_{10})	24-hour	74 $\mu g/m^3$	65 $\mu g/m^3$	na
	Annual Average	34.1 $\mu g/m^3$	28.2 $\mu g/m^3$	na
Fine particulate matter ($PM_{2.5}$)	24-hour	58.9 $\mu g/m^3$	54.7 $\mu g/m^3$	na
	Annual Average	16.8 $\mu g/m^3$	14.7 $\mu g/m^3$	na
Carbon monoxide (CO)	1-hour	5 ppm	4 ppm	na
	8-hour	4.1 ppm	3.3 ppm	2.9 ppm
Nitrogen dioxide (NO_2)	1-hour	0.12 ppm	0.09 ppm	0.09 ppm
	Annual Average	0.0199 ppm	0.0211 ppm	0.019 ppm
Sulfur dioxide (SO_2)	1-hour	0.02 ppm	0.02 ppm	na
	24-hour	0.015 ppm	0.011 ppm	0.003 ppm
	Annual Average	0.003 ppm	0.003 ppm	0.001 ppm

Sources: SCAQMD 2004, 2005, 2006
na = Not available.

This table shows that carbon monoxide, nitrogen dioxide, and sulfur dioxide concentrations near the project site are all well below both Federal and State standards. The current Federal designation of nonattainment for carbon monoxide in the SCAB is based on south-central Los Angeles exceedances and the SCAB will be redesignated as an attainment/maintenance area when SCAQMD provides USEPA with a request for redesignation and a carbon monoxide maintenance area plan.

The proposed Project is within SCAQMD jurisdiction. The SCAQMD is responsible for planning, implementing, and enforcing Federal and State ambient standards within the South Coast Air Basin. The regulations of this agency are primarily focused on stationary sources; therefore, most of the local agency regulations are not relevant to this Project. However, portable engines used during construction that are larger than 50 horsepower and that are not registered under the CARB Portable Equipment Registration Program would need to be obtain permits from the SCAQMD.

SCAQMD has visible emissions, nuisance, and fugitive dust regulations with which the Project's construction will need to comply. The specific regulations are as follows:

SCAQMD Rule 401 – Visible Emissions

SCAQMD Rule 402 – Nuisance

SCAQMD Rule 403 – Fugitive Dust

These rules limit the visible dust emissions from the project construction sites, prohibit emissions that can cause a public nuisance, and require the prevention and reduction of fugitive dust emissions. One or more measures are required by the Fugitive Dust rules reduce fugitive dust emissions from specific dust causing activities. These measures may include adding freeboard to haul vehicles, covering loose material on haul vehicles, watering, using chemical stabilizers and/or ceasing all activities (such as during periods of high winds).

CEQA allows for the significance criteria established by the applicable air quality management or air pollution control district to be used to assess impacts of a project on air quality. The SCAQMD has established regional thresholds of significance for construction activities as shown below in Table 2.6-5.

Table 2.6-5. SCAQMD Air Quality Regional Thresholds

Criteria Pollutant	Construction Emissions lbs/day
Carbon Monoxide (CO)	550
Oxides of Nitrogen (NOx)	100
Particulate Matter (PM10)	150
Fine Particulate Matter (PM2.5)	55
Oxides of Sulfur (SOx)	150
Volatile Organic Compounds (VOC)	75

Source: SCAQMD 2007.

In addition to the thresholds provided in Table 2.6-6, the SCAQMD provides additional relevant localized significance thresholds (LSTs) for toxic air contaminants (TACs), odors, and ambient air quality.

Table 2.6-6. Localized Significant Thresholds for the South Coast AQMD

Criteria Pollutant	Toxic Air Contaminants (TACs) and Odor Thresholds
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
	Ambient Air Quality for Criteria Pollutants [a]
NO2 1-Hour Average Annual Average	Project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (State) 0.053 ppm (Federal)
PM10 24-Hour Average	 10.4 μg/m^3 (recommended for construction) [b] 2.5 μg/m^3 (operation)
PM2.5 24-hour average	 10.4 μg/m^3 (construction)[b] & 2.5 μg/m^3 (operation)
CO 1-Hour Average 8-Hour Average	Project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (State) 9.0 ppm (State/Federal)

Source: SCAQMD 2007.

Notes: lbs/day = pounds per day; ppm = parts per million; ug/m^3 = micrograms per cubic meter; ≥ greater than or equal to

a. Ambient air quality threshold for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.

b. Ambient air quality threshold based on SCAQMD Rule 403.

Note that ozone is not included in Tables 2.6-5 or 2.6-6. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants, specifically oxides of nitrogen (NOx) and hydrocarbons (VOCs). Therefore, it cannot be directly regulated.

2.6.4 Green House Gases (GHG)

Carbon Dioxide (CO_2) Equivalent

Carbon Dioxide Equivalent is a metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential (GWP). Carbon dioxide equivalents are commonly expressed as "million metric tons of carbon dioxide equivalents (MMTCO2Eq)." The carbon dioxide equivalent for a gas is derived by multiplying the tons of the gas by the associated GWP. The use of carbon equivalents (MMTCE) is declining. Below is the formula for calculating the emissions:

MMTCO2Eq = (million metric tons of a gas) * (GWP of the gas)

Table 2.6-7 SCAB General Conformity Thresholds

NOx and VOC	PM10	CO and PM2.5 and SO_2	CO_2 Equivalent
25 tons/year	70 tons/year	100 tons/year	7000 tons/year

In addition to regional and local significance criteria, the General Conformity Rule applicability emission thresholds shown in Table 2.6-7 would apply to those areas in nonattainment of the NAAQS. Per Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990, the Army Corps of Engineers must make a determination of whether the proposed Project (i.e., Proposed Action) "conforms" with the State Implementation Plan (SIP). However, if the total direct and indirect emissions from the proposed Project are below the General Conformity Rule *de minimis* emission thresholds, the proposed Project would be exempt from performing a comprehensive Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP.

2.7 NOISE

The project area is highly urbanized and includes industrial commercial and residential land uses. The channel itself is flanked by low-density predominantly single-family residential backyards with no open spaces (parks, vacant lots) except for the channel right-of-way itself. At both northern and southern ends of the project the major thoroughfares (Vanowen and Sherman Way) are zoned for commercial/light industrial land uses which include several multi-unit residential complexes along with retail establishments and light industries such as auto repair and furniture fabrication. These commercial strips abut the residential lands along the channel. No schools, hospitals or child care facilities are found adjacent to the project footprint, although three convalescent care facilities are located within one block west of the channel on Sherman Way. A child care facility on Woodman is perhaps the most sensitive receptor within a block in any direction of the project area.

Noise is commonly defined as "unwanted sound". Sound is quantified by measuring the energy in pressure waves in the air. Because of the wide range of sound energy that is audible to humans, sound levels are expressed on a logarithmic scale of "decibels" (abbreviated as dB), in which a change of 10 units on the decibel scale reflects an increase of then times the sound energy and roughly translates to a doubling of perceived loudness. The human ear does not respond uniformly to sounds at all frequencies, being less sensitive to low and high frequencies than to medium frequencies, which correspond with human speech. In response to this, the A-weighted noise level (or scale) has been developed. The A-weighted scale corresponds better with people's subjective judgment of sound levels than does the traditional decibel scale. The A-weighted sound level is called the "noise level" referenced in dBA. Noise is measured on a logarithmic scale; a doubling of sound energy results in a 3-dBA increase in noise levels. However, changes in noise levels of less than 3 dBA are not typically noticeable by the human ear. Changes from 3 to 5 dBA may be noticed by some individuals who are extremely sensitive to changes in noise. A 5.0 dBA increase is readily noticeable, while the human ear perceives a 10dBA increase in sound level to be a doubling of sound.

Noise sources are classified in two forms: (1) point sources, such as stationary equipment or a water reclamation plant, or individual motor vehicles; and (2) line sources, such as a roadway with a large number of point sources (such as motor vehicles). Sound generated by a point source typically diminishes (attenuates) at a rate of 6.0 dBA for each doubling of distance from the source to the receptor at acoustically "hard" sites and 7.5 dB at acoustically "soft" sites. For example, a 60-dBA-noise level measured at 50 feet from a point source at an acoustically hard site would be 54 dBA at 100 feet from the source and 48 dBA at 200 feet from the source. Sound generated by a line source typically attenuates at a rate of 3.0 dBA and 4.5dBA per doubling of distance from the source to the receptor for hard and soft sites, respectively.

Community decibel levels are reported in different ways. The two most common reporting mechanisms used in environmental analysis of community noise levels are the Community Equivalent Noise Level (dBA, CNEL) and the Equivalent Noise Level (dBA, Leq). The CNEL is a 24-hour weighted noise average, which assigns a five-decibel penalty to the noise levels (adds five decibels to the measured noise level before computing the noise average) between the hours of 7:00 p.m. and 10:00 p.m. And a 10-decibel penalty from 10:00 p.m. to 7:00 a.m. These penalties are intended to account for a greater sensitivity to noise, which occurs during quiet evening hours and overnight hours when people sleep. The CNEL is therefore most appropriate for analysis of projects which are anticipated to generate substantial noise during nighttime and overnight hours, such as supermarkets, which experience predawn deliveries of goods (as associated heavy truck noise and loading/unloading noise), other 24-hour retail uses, and certain industrial uses. Similar to the CNEL, the Leq, is also a type of noise average, but the Leq does not assign a penalty or weighting to record noise levels as the CNEL does. Rather, the Leq represents the average of the fluctuating noise levels recorded in any given time period, usually one hour, or Leq (h).

2.7.1 Sensitive Receptors

Residential and non-residential sensitive receptors (e.g., schools, health care facilities, etc.), identified near the study area, are listed in Table 2.7-1. This table includes all sensitive receptors

within the vicinity of the study area. The sensitive receptors closest to the project area are residences flanking both sides of the project flood control channel.

Table 2.7-1 Sensitive Receptors Near the Tujunga Wash 1135 Project Area

#	Sensitive Receptor	Jurisdiction	Location Description
1	Country Villa Woodman Health Care	City of Los.Angeles.	13524 Sherman Way, intersection with Allott
2	Valley Palms Care Center	City of Los Angeles	13400 Sherman Way
3	Evergreen Chateau	City of Los Angeles	13350 Sherman Way, intersection with Varna
4	Pre-school	City of Los Angeles	On Woodman

2.7.2 Noise Environment in Project Area

Within the study area, the primary noise sources include vehicular traffic and aircraft overflight serving Van Nuys and Bob Hope Burbank Airport (formerly Burbank, Glendale, and Pasadena) Airports. Secondary noise sources include activities associated within the recreational area (e.g., maintenance machinery, playground activities, roller blades/bike traffic, domesticated pets, and human to human interactions).

Federal Standards

There are no Federal noise standards that directly regulate environmental noise from construction. However, it should be noted that the USEPA has developed guidelines on recommended maximum noise levels to protect public health and welfare (USEPA, 1974). With regard to noise exposure and workers, the Occupational Safety and Health Administration (OSHA) regulations safeguard the hearing of workers exposed to occupational noise. Refer to 29 CFR Section 1910.95 (Code of Federal Regulations) for a list of permissible noise exposures.

State Standards

The California Office of Safety and Health Administration (Cal/OSHA) also regulates employee noise exposure, as mandated by Title 8 of the California Code of Regulations, Group 15, Article 105 §§ 5095-5100. Cal/OSHA stipulates the same requirements as Federal OSHA (above). Additionally, a Hearing Conservation Program must be instituted when employees are exposed to noise levels of an 8-hour time weighted average at or greater than 85 dBA. California Government Code (§65030 et seq.) requires each local government entity to implement a noise element as part of their general plan.

Local Standards

The City of Los Angeles has adopted several noise ordinances to protect human health from adverse noise levels. According to the noise ordinance in Section 112.04 of the Los Angeles Municipal Code, "no person shall operate or cause to be operated any machinery, equipment, or other mechanical devices in such a manner as to create any noise which would cause the noise level on the premises of any other occupied property to exceed the ambient noise level by more than 5 dBA" (City of Los Angeles, 1982). Section 112.05 also states that construction and industrial machinery shall not exceed a maximum of 75 decibels, A – weighted (dBA), at a distance of fifty feet (15.25 meters), except where compliance is technically infeasible. In addition, Section 41.40 of the Municipal Code specifies that construction activities shall not disturb occupied residential sleeping quarters between 9 P.M. and 7 A.M. See Table 2.7-2 CNEL Levels Chart below.

Table 2.7-2 CNEL Levels

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE – L_{dn} or CNEL (db)													
	50		55		60		65		70		75		80	
Residential – Low Density Single Family, Duplex, Mobile Home														
Residential - Multi-Family														
Transient Lodging - Motel. Hotel														
Schools, Libraries, Churches, Hospitals, Nursing Homes														

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE – L_{dn} or CNEL (db)													
	50		55		60		65		70		75			80
Auditorium, Concert Hall, Amphitheaters														
Sports Arena, Outdoor Spectator Sports														
Playgrounds, Neighborhood Parks														
Golf Courses, Riding Stables, Water Recreation, Cemeteries														
OFFICE BUILDINGS, BUSINESS COMMERCIAL AND PROFESSIONAL														
Industrial, Manufacturing, Utilities, Agriculture														

LAND USE CATEGORY	COMMUNITY NOISE EXPOSURE – L_{dn} or CNEL (db)	
	50 55 60 65 70 75 80	
	Normally Acceptable	Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable	New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design.
	Normally Unacceptable	New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirement must be made and needed noise insulation features included in the design.
	Clearly Unacceptable	New construction or development generally should not be undertaken.

2.8 HAZARDOUS MATERIAL

A Phase I Environmental Site Assessment (ESA) was performed by the Los Angeles County Department of Public Works in 2002 as an evaluation of the environmental risks that could impact the project area. The work was based on an electronic search of more than 80 environmental databases, generated by [Environmental Data Resources, July 2000.] Results of this effort indicate that there is, overall, little risk associated with groundwater contamination due to HAZMAT sites.

A Phase II ESA was also performed by the Geotechnical and Materials Engineering Division (GMED) for the Tujunga Wash Project in February 2004. The objective of the ESA was to perform a subsurface investigation to evaluate the presence of any chemical contaminants in conjunction with a geotechnical investigation. It was determined that no special handling would be anticipated for the subsurface soils that will be encountered during construction for the subject project. Based on the information presented, there are no environmental concerns that would preclude the proposed design and construction of the project.

2.8.1 National Priorities List (NPL)

NPL Sites are authorized under Section 105(a)(8)(b) of the CERCLA, also known as the Superfund law; therefore, NPL sites are listed as Superfund sites. This list is updated annually by the USEPA based on various releases or threatened releases throughout the nation. The list criteria are based on risk to public health, welfare, and the environment, taking into account a

variety of factors including the extent of population at risk, hazard potential, the potential for contamination of drinking water supplied, and threats to ambient air. There are no NPL sites (or Superfund sites) within the data search study area.

2.8.2 Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)

The CERCLIS List contains sites that are either proposed for or on the NPL and sites that are in the screening and assessment phase for possible inclusion on the NPL. The information on each site includes a history of all pre-remedial, remedial, removal, community relation activities or events at the site, financial funding information for the events, and unrestricted enforcement activities.

2.8.3 CalSites

The California Environmental Protection Agency's (CalEPA) Department of Toxic Substances Control (DTSC) maintains an automated database (CalSites), which contains information on properties or sites where an unauthorized release of hazardous substance(s) has occurred and that site investigation and cleanup are necessary.

Within the project area, there are neither nearby sites that appear on the NPL nor is there a listing of sites that are or were under consideration for the NPL. No areas of potential impact have been identified under CalSites or the Resource Conservation and Recovery Act (RCRA) database.

2.9 SOCIOECONOMICS

In a general sense, the term socioeconomic is defined as the basic social and economic attributes associated with the human environment, particularly population, employment, personal income, and housing. Socioeconomic information is provided for baseline and predicted future population, employment, income, and housing conditions.

2.9.1 Income & Employment

The project area generally suffers from high unemployment and relatively high poverty rates. The highest poverty rates occur in high-density areas of Panorama City, North Hills, North Hollywood, and Pacoima. As can be seen in Table 2.9-1 below, according to the latest comprehensive census data, the project area is significantly poorer than greater Los Angeles City.

Table 2.9-1: Selected Economic Indicators

Category	Local Census Area*	City of Los Angeles
Median Household Income	$33,000	$40,876
Unemployment Rate	9.7%	9.6%
Percentage of Population at or Below Poverty Level	25%	21%
Source: City of Los Angeles Planning Department, Demographics Research Unit, July 2006. Income not adjusted for inflation. *Census Tracts 120000-123999, 124000-128999.		

Within the general project area[1], the industries employing the most people are Management and Professional Trades (27%), Sales and Office Work (26%), Services (17%), and Manufacturing and Transportation (16%).

2.9.2 Income and Housing

The study area is located within the city of Los Angeles, and is part of the Tujunga Watershed. According to the Tujunga Watershed Project (TWP), approximately 525,000 people currently live within the 204 square mile watershed. Most of the population in the watershed lives within communities that are part of the City of Los Angeles. These include the communities of Pacoima, Arleta, Sylmar, Sunland, Tujunga, Panorama City, Van Nuys, North Hollywood, Valley Glen, Valley Village, and Studio City. The population residing within the watershed is roughly 62% Latino, with 32% of the population under the age of seventeen, and 19% living at or below the poverty line.

As shown in the land use map in Table 2.4-1 in Section 2.4, the dominant land uses in the project area are: high-density single family; low-rise apartments, condos, and townhouses; and manufacturing, assembly, and industrial services. As a note, this figure, as well as others in this Economic Appendix, is best viewed in color.

Table 2.9-2 includes population and housing data for several of the communities in the Tujunga watershed. Three of the communities listed have a population density significantly higher – as much as 60% higher – than broader Los Angeles, which is part of the nation's most densely populated metropolitan area. According to the TWP, the highest population densities within the watershed occur in the central part of the lower watershed, in the communities of Panorama City, North Hills, and North Hollywood. Within a two mile radius of the project site (a circle of approximately twelve square miles), it is estimated that there are between 70,000 and 90,000 residents.[2]

[1] Defined as including census tracts 120000-123999 & 124000-128999

Table 2.9-2: Study Area Population & Housing (2006)

	Los Angeles	Arleta-Pacoima	Sylmar	Sunland-Tujunga	Van Nuys	North Hollywood/ Valley Village
Square Miles	484.3	10.5	12.8	21.9	12.9	10.6
Population	3,974,000	104,800	77,400	62,500	169,100	148,200
Annual Pop. Growth Rate	1.1%	1.0%	1.7%	1.0%	1.0%	1.3%
Pop. Density	8,000	9,901	5,961	2,762	13,031	13,500
Total Housing Units	1,372,500	21,600	19,100	20,300	57,800	52,941
Housing Unit Density	2,794	2,098	1,494	946	4,581	4,978

Source: Los Angeles City Planning Department / Demographics Research Unit & Graphic Services Section - Data Effective October 2006. Population and housing density in units per square mile.

Population forecasts for Los Angeles County indicate a slow rate of growth through 2050 as compared to the surrounding counties. The total population of Los Angeles County is expected to increase by around 15% by this time, as compared to 25%, 80%, and 150% for the counties of Orange, San Bernardino, and Riverside, respectively. The already high housing and population density in Los Angeles County and the relatively high real estate prices are expected to be contributing factors to the slow rate of future population growth.

2.10 TRAFFIC

The volume of traffic that would be generated was estimated for the site as well as associated impacts on the surrounding network. Based on the traffic data and projections in the Congestion Management Program for Los Angeles County, the general traffic volume growth factors for the San Fernando Valley area indicate that there would be approximately a five percent growth in traffic volumes over the next 10 years.

Table 2.10-1 Existing Conditions on Freeway Network

Freeway/Segment	Number of Lanes	Average Daily Traffic Volume	Peak Hour Traffic Volume
Golden State Freeway (I-5)			
At Burbank Boulevard	8	190,000	14,000
At Osborne Street	12	270,000	20,000
Hollywood Freeway (SR 170)			
At Sherman Way	8	160,000	13,000
Foothill Freeway (I-210)			
At Sunland Boulevard	8	95,000	10,000
Ronald Reagan Freeway (SR 118)			
West of I-210	8	89,000	9,000
Ventura Freeway (SR 134)			
At Cahuenga Boulevard	8	219,000	17,000
Ventura Freeway (US 101)			
At Coldwater Canyon Avenue	10	291,000	20,000

Source: Caltrans and 2002 Los Angeles County Congestion Management Program, MTA.

Seven major highways/freeways cross the watershed: Interstate 5 passes from the south-east to the north-west through the lower watershed; Interstate 210 runs parallel east to west along the foothills of the San Gabriel Mountains; State Highway 118 begins at the 210 Freeway in Pacoima and heads westward toward Simi Valley; U.S. 101 crosses briefly through the lower watershed; State Highway 170 runs south along lower watershed's eastern border, and State

Highway 2 runs along the southern and eastern portion of the upper watershed within the Angeles National Forest and is the main artery through the Forest's territory. These roadways cover approximately 33 miles within the watershed.

Sherman Way, which borders the northern limits of the project area, is classified as a "major" arterial in the San Fernando Valley and carries an average daily traffic volume of 44,000-70,000. Vanowen Street, which borders the southern limits of the project area, is termed a "secondary" arterial and has an average daily traffic load of 24,000-33,000 (Table 2.10-2 below).

Table 2.10-2 Characteristics of Major East-West Valley Arterials

Arterial	Classification	Average Daily Traffic	Location of Lowest Volume	Location of Highest Volume
Sherman Way	Major	44,000 - 70,000	East of Canoga Avenue	East of Firmament Avenue
Vanowen Street	Secondary	24,000 - 33,000	West of Laurel Canyon Boulevard	East of Reseda Boulevard

Source: City of Los Angeles Department of Transportation, Electronic Traffic Count Database (1994-1996),

2.11 UTILITIES

The project area consists mainly of dirt and minimal vegetation, but some existing utilities do lie in the project area. A list of nearby and on site utilities are listed below:

Water. The City of Los Angeles Department of Water and Power (LADWP) is the water provider for the project area. LADWP owned water lines are located within street rights-of-way throughout the project area. Additionally, the Metropolitan Water District (MWD) East Valley Feeder water line extends in a northwest-southeast direction through the watershed. The 48-inch pipeline extends north along San Fernando Road and west along Interstate 5 to the north of the project site. The main water line is not within the project area.

Sewer and Wastewater Treatment Systems. Sewer service is provided by the City of Los Angeles Department of Public Works (DPW). Sewer lines are located within street rights-of – way throughout the neighborhood but none are located within the project area.

Electricity. LADWP also provides electric service to the east valley region. There are several power poles along the outermost east and west limits of the project area that run behind the residential property walls.

Natural Gas. The Southern California Gas Company provides gas service to the project area. A medium pressure system is located within street right-of-way throughout the project areas.

Telephone and Cable. Telephone service is provided to the project area by SBC /AT&T. Underground and above ground (land) telephone lines are located around and throughout the project area. Cable television service is provided to the area by the Comcast and Adelphia providers.

Oil. Three companies have placed service pipelines along road and rail lines which are no more than two miles north of the project site.

Rail Signal Cables. Southern California Regional Rail Authority (SCRRA) maintains railroad signal cables and conduits within its rail rights-of-way (e.g., Metrolink's Antelope Valley Line and Ventura County Line) which are all north of the project area.

SECTION 3

PLAN FORMULATION

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SECTION 3 – PLAN FORMULATION

This Section provides discussion on developing management measures, viable alternatives, and selecting the National Economic Restoration Plan (NER). Project alternatives are developed using USACE guideline 1105-2-100, objectives, constraints, opportunity and environmental factors.

Plan formulation is the process of identifying specific ways to achieve planning objectives while working within project constraints to solve problems and realize opportunities. The Corps employs a six-step planning process, pursuant to ER 1105-2-100 (Water Resources Council, 1983) on water resource development projects which is composed of the following elements:

Step 1 – Identify problems and opportunities
Step 2 - Inventory and forecast conditions
Step 3 – Formulate alternative plans
Step 4 – Evaluate alternative plans
Step 5 – Compare alternative plans
Step 6 – Select a plan

Section 2 of the DPR provides existing condition within the project area. If the project is not implemented, continual degradation of the biological resources would occur. Problems and Opportunities are provided briefly in the following paragraphs.

3.1 PROBLEMS AND OPPORTUNITIES

Urbanization and past flood control modifications have degraded the ecological structure and function of the natural aquatic, wetland, and riparian components in the Tujunga Wash.

3.1.1 Problems

- Habitat along the Tujunga Wash is fragmented due to past flood control modifications and dense urbanization separating and/or bordering the right-of-way areas.

- Dense urbanization has taken place along the project reach thus providing limited space to expand for ecosystem restoration.

- Construction of the flood control channel has resulted in the loss of native vegetation along the project reach due to maintenance activities required for the Tujunga Wash.

- The right-of-way area consists of an undeveloped riparian zone thus providing very little opportunity for wildlife or habitat to fully establish.

3.1.2 Opportunities

Project opportunities are solutions to the problems stated above.

- To increase habitat quantity and restore habitat quality, function and connectivity;
- To illustrate the potential for channel-adjacent ecosystem restoration in an intensively developed urban area;
- To provide opportunity for wildlife movement and nesting opportunities for migratory bird species;
- Provide passive recreational elements such as recreational trails and viewing areas of wildlife habitat and bird species.

3.2 OBJECTIVES

Planning objectives are statements of the study purpose. They are more specific than the Federal and non-Federal objectives and reflect the problems and opportunities in the Tujunga Wash watershed. Planning objectives represent desired positive changes in the without-project future conditions. All of the planning objectives pertain to the Tujunga Wash over this study's period of analysis, which is a 50-year period following the completion of construction. The planning objective for this study is to restore the ecological structure and function of aquatic, wetland and riparian habitats along the Tujunga Wash.

- To improve opportunities for migratory birds and wildlife movement by connecting the Corps 1135 Project (3,000 feet-long) to the Local Sponsor's downstream restoration project (6000 feet-long) and the Tujunga Greenbelt Project (4,200 feet-long), thus increasing the habitat corridor to 13,200 feet in total length.
- To improve recreation opportunities through the provision of incidental, passive recreation alongside the new riparian corridor;
- To provide for educational opportunities to observe wildlife and naturalized ecosystems in conjunction with the development of streamside habitat;
- To ensure that the capacity of the existing flood control system is not reduced while maximizing the potential for ecosystem restoration within the channel and banks;

3.2.1 Constraints

- **Authority limitations:** Section 1135 of the Water Resources Development Act (WRDA) limits the Federal contribution to the project to $5,0000,000 or less. In addition, the Local contribution to the project is 25% of the Federal cost ($1,250,000) for a total project cost limit of $6,250,000. The purpose of this Continuing Authority Program (CAP) is to implement projects that are relatively small in scope, therefore, must consist of fairly small projects focused in the immediate project area.
- **Limited land**: Natural habitat in the Los Angeles River system is extremely limited and fragmented, as are open space and recreational opportunities for a city of this size and population. Restoration opportunities are limited to the banks of the project area as no

- **Water collection methods:** The water source for the proposed project collects urban run-off from the South Channel and into the project area. Collecting water from within the Tujunga Wash Channel may be cost prohibitive and may exceed authority limits. Installation of certain hard structures (additional pipelines, intake gates, pump stations, etc) may be cost prohibitive and may exceed authority limits.

- **Maintaining flood protection level along constructed flood control channel:** The proposed restoration project must not adversely affect the flood control capacity of the flood control channel

3.3 ENVIRONMENTAL RESTORATION MEASURES

A management measure is a feature or activity at a site that addresses one or more of the restoration objectives. Potential restoration measures for the Tujunga Wash 1135 project were developed based on the identified opportunities and constraints listed above, the results of public involvement efforts. A wide variety of measures were considered, some of which were found to be infeasible due to technical, economic, or environmental constraints. Each measure was examined and a determination made on whether it should be retained in the formulation of alternative plans.

3.3.1 Restoration Management Measures

Good opportunities exist for ecosystem restoration in the immediate area along the Tujunga Wash channel. The proposed project land is owned by the Los Angeles County Department of Public Works. Each Management Measure is briefly described in following paragraphs.

Management Measure 1: Establish native/riparian vegetation along both banks

Planting of riparian/native vegetation includes western sycamore (*Platanus racemosa*), black willow (*Salix goodlingii),* red willow, arroyo willow (*Salix lasiolepis),* Fremont cottonwood (*Populus fremontii*), White alder (*Alnus rhombifolia*), and other native species along both sides of the flood control channel. These species would provide sustainable habitat for local wildlife, nesting opportunities for migratory birds, and provide important incidental benefits as well. In addition a potential benefit to Federally listed species such as least Bell's vireo may occur as these species may begin to use the restored area, which is located upstream of the project area at Hansen Dam. Hansen Dam plays an important role in relation to the proposed project because there is an existing vireo community established there and it may provide wildlife connectivity between the proposed project and Hansen Dam. Benefit to all these species would be extremely valuable in a densely urbanized area.

Management measure 1 was selected because restoring the east and west banks of the flood control channel into living habitats capable of sustaining significant local wildlife would provide important incidental benefits. One of those benefits would be providing connectivity for

migratory bird species between the Los Angeles River, the County's restoration project, the Corps project and Hansen Dam. Another benefit would be increasing the total length of the habitat corridor to a total of 13,200 feet long [(Corps 1135 project = 3000 feet long) + (County project = 6000 feet long) + (Corps' Greenway Belt = 4200 feet long)].

Management Measure 2: Construct a meandering naturalized stream of water on the west and/or east bank which will provide a water source to sustain the habitat's year-round existence.

A meandering stream(s) on the west and or/east bank of the Tujunga wash would be constructed between Sherman Way and Vanowen Street. Urban runoff that is collected into the South Channel and/or within the Tujunga Wash would be routed to the meandering channel(s) via a low-flow intercept line upstream, through a pump station or an intake structure to provide a water source for the planted vegetation.

Management measure 2 was selected because this measure would provide the means to sustain the plant community in addition to rainfall and reclaimed runoff. It would help prevent further degradation of the site while the meandering channel would help improve water quality by percolation and groundwater recharge. There is an existing restoration project area constructed by the County downstream of the Federal project that has an existing meandering stream. Creating the meandering stream would continue that feature for an additional 3000 feet thus providing continuity between the two projects. Flows from the Federal project could also connect downstream to the County's restoration project thus utilizing the additional water instead of being discharged back into the Tujunga Wash.

After alternative formulation, it was determined that only a low flow intercept line would be feasible and a pump station or intake structure would not be feasible due to the following:

1) Installation of a pump station would be cost prohibitive and would exceed authority limits.
2) A pipeline to feed both streams would be technically infeasible because it would not achieve enough hydraulic head to feed both streams.
3) Additional real estate, bridge crossings and a railroad crossing would be needed in order to construct a pipeline long enough to feed the gravity flow pipeline and would exceed authority limits.

Management Measure 3: Remove the concrete bank and channel bottom of the flood control channel and restore the entire channel to a natural channel and restore vegetation along the side slopes and channel banks.

This measure would involve removing all the concrete banks from the flood control channel and restoring the channel back to its natural environment. Vegetation would be planted along the slopes and within the channel to establish aquatic and riparian habitat, help prevent slope erosion and improve water quality via percolation for groundwater recharge.

Measure 3 was eliminated because it violated the project constraint of maintaining flood protection. The channel walls and concrete lining will not be demolished to create an all natural vegetated channel. Reasons to eliminate this measure for not being feasible are the following:

1) The proposed project is a part of the LACDA system. The flood control channel was constructed to provide 100-year flood protection.
2) Flows from the concrete to the natural channel back to concrete channel may destroy the integrity of the channel walls by undercutting or scouring along the concrete side channels or channel bottom during natural flows or flood storms.
3) The rectangular concrete channel is designed to convey the 100-year flood. Design of a or the establishment of a natural channel in this short reach would require extensive redesign of the project area in order to convey the 100-year flood, the costs of which would exceed $5 million Federal for the 1135 project.

Management Measure 4: Provide passive recreation and associated incidental educational benefits to residential neighborhoods within walking distance of the Tujunga Wash.

Measure 4 is designed to use the east side maintenance road as a multipurpose recreational trail, which can be used by the residents for walking, jogging, bicycling and to provide educational opportunities to educate on the benefit of environmental resources, which are rare in an urban environment.

Measure 4 was selected to contribute to the alleviation of the park shortage in this east San Fernando Valley neighborhood while providing opportunities for personal health and fitness by means of walking, and expanding environmental understanding and appreciation of the local distinctive ecological conditions.

3.4 ALTERNATIVES

3.4.1 Development of Alternatives

Viable alternatives have been developed by combining various management measures which would provide a desirable habitat value. By implementation of those alternatives, the ecosystem would benefit as well as sensitive species and wildlife. A detailed description of each viable alternative, including the No Action Alternative, is described in Section 3.7. Existing environmental conditions and input provided by the Project Delivery Team (PDT) members from the various discipline have been taken into consideration, including but not limited to hydraulics and hydrology, engineering, economics, cost estimating, and environmental. Management measures were formulated to develop alternatives during the plan formulation phase. The alternatives have been developed in coordination with the resource agencies and PDT members.

3.4.2 Alternative 1 – No Action

The U.S. Army Corps of Engineers is required to consider the option of “No Action” as one of the alternatives in order to comply with the requirements of the National Environmental Policy Act (NEPA). The alternative of no action assumes that no project would be implemented by

either the Corps or by local interests to achieve the designated planning objectives. The proposed project area would not be restored and it would not provide opportunity benefits for wildlife movement or nesting opportunities for migratory bird species, both of which are valuable in densely populated areas.

Natural habitat in the Los Angeles River system is extremely limited and fragmented, as are open space and recreational opportunities for a city of this size and population. Urban development and flood control infrastructures have degraded the Tujunga channel corridor. Therefore, if "No Action" is taken, a substantial opportunity to implement ecosystem restoration in along the channel and within the watershed will be lost.

3.4.3 Alternative 2 (NER/Recommended Plan) – West bank stream connecting to County downstream project

Alternative 2 consists of the following features:

- Construction of meandering stream along west bank (0.34 acres);
- Planting native/riparian vegetation along constructed stream on west bank (3.48 acres);
- Planting native/riparian vegetation along east bank (3.82 acres)
- Improvement of water quality via settling ponds and groundwater recharge;
- Incidental recreational opportunities by utilization of existing 12 foot wide maintenance roads on both sides of the channel, but only the east bank will be accessible to public. (0.68 acres each, 1.36 acres total);
- Stream would receive surface water collected at the Pacoima Wash Diversion South Channel (South Channel) approximately 900 feet north of Sherman Way, which receives surface water released from Lopez Dam;
- No water would be removed from or placed into Tujunga Wash;
- 12 foot maintenance road would act as buffer between channel wall and restoration area.

The restoration plan consists of planting approximately 7.30 acres of riparian vegetation establishing a cottonwood willow riparian corridor, alluvial fan sage scrub, and habitat found within the project area or within the region. Two habitat types have been chosen for this alternative is southern cottonwood-willow riparian and the southern sycamore riparian woodland type of habitat which originally characterized this area. These would provide resting habitat and cover so that the linear planted vegetation could function as a wildlife corridor within the urbanized region.

By subtracting the maintenance roads (1.36 acres) and single naturalized stream (0.34 acres) from the total of 9 project acres, the remaining 7.30 acres of land would be restored with native riparian vegetation. By implementing this alternative total 7.09 HUs would be generated. The habitat densities are the same for each alternative, but the total number of trees, shrubs and herbaceous plants, or biomass, changes proportionately with the acreage of each habitat. Appendix E-2 shows the detailed restoration design for the habitats in the project area. Table 3.4-1 below provides the proposed plant species acreages associated with restoration for Alternative 2. Figure 3.4-1 gives a visual description of the recommended plan's project location and connection points.

Table 3.4-1 Alternative 2 Acreages for Each Plant Species on East and West Banks

Alternative 2	West Terrace	East Terrace	Total
Aquatic/Emergent	0.013	0	0.013
Cottonwood-willow	0.42	0.42	0.84
Sycamore riparian	0.17	0.17	0.34
Alluvial fan sage scrub	1.75	1.75	3.5
Meadow	1.13	1.48	2.61
Vegetation Subtotal	***3.48***	***3.82***	***7.3***
Maintenance Road	0.68	0.68	1.36
Meandering Stream	0.34	0	0.34
Total	***4.5***	***4.5***	***9***

Figure 3.4-1 Alternative 2

The goal of the proposed project is to provide benefits to wildlife and to provide a net increase to habitat value and quality. The vegetation proposed in the plan would be similar to native plants and animal species found in the natural communities adjacent to the area. Selected native species would help to improve conditions that would facilitate the occurrence of soil development, nutrient cycling, plant succession, and promote wildlife movement. By using appropriate native species occurring regionally, vegetation establishment would require little or no long term maintenance.

A meandering stream would be constructed along the west bank of the Tujunga Wash, riparian vegetation would be planted along the meandering stream and upland vegetation would be planted in a buffer area. The stream would be excavated and the planting area would be graded to achieve a natural topography. Along with planting of riparian, upland vegetation and settling ponds would be created to support year round native habitats especially to benefit migratory waterfowl. The east bank's restored area would be fenced to minimize disturbance by pedestrian trails users. Interpretive nodes would be constructed at elevated decks to educate park users and avoid impacts to sensitive habitat zones.

3.4.3.1 Meandering Stream on West Bank

The purpose of the meandering stream is to help establish and sustain the riparian and upland habitat in the restoration area by providing a source of water for those plant species as well as for migratory birds and wildlife. The meandering stream would include five (5) settling ponds, occupying 0.34 acres of the total 9 project acres and be constructed along the west bank of the Tujunga Wash between Vanowen Street and Sherman Way. The constructed steam would be approximately 3000 feet long, have an average width of five (5) feet and an average depth of approximately two (2) feet. The channel slope would be about 2:1. The stream slope and bottom would have a clay layer bottom and be designed to look like a natural stream. Water would be diverted from the South Channel, which captures releases from Lopez Dam. This stream would be perennial throughout the year to provide a water source for sustainability of the habitat. Plants would initially be irrigated to help establish the riparian habitat. The local sponsor would maintain the restored area in perpetuity.

During construction of the project, the method of open cut trenching will be used to install the 18-inch diameter HDPE bypass pipeline, including the section of pipe crossing Sherman Way. Cast-in-place method will be used to install the drop down intake structure and concrete headwalls. To convey water from the north side of Sherman Way to the headwork for the meandering channel, a portion of the 18-inch diameter HDPE underground pipeline would cross Sherman Way. This portion of pipeline has a length of approximate 315 feet long, and it has a grade of 0.00312.

Water captured upstream would be engineered by a gravity flow pipeline connecting to the South Channel to feed the meandering stream. A clay liner would be used to line the stream to allow water to flow downstream and minimize water percolation. Settling ponds within the stream would be configured to allow more opportunity for more naturalized plant materials.

The primary objective of this restoration would be to convert disturbed area nonnative portions of the Tujunga Wash to native, functional riparian habitat. The restored riparian habitat would improve water quality, increase wildlife habitat, and recreational functions and values.

Water quality functions and values would include the following: groundwater recharge, nutrient removal/transformation, sediment stabilization and flood flow retention. The groundwater would be recharged by having the vegetated riparian corridor slow down and hold water flows, allowing water to infiltrate the substrate and recharge the groundwater table. The nutrient removal/transformation and sediment stabilization would be possible due to the settling ponds that would be constructed within the meandering stream to collect the nutrients and sediment. Flood flow retention would be achieved due to the combination of the first three functions along with discharging the material into the County's downstream restoration project instead of back into the Tujunga Wash.

3.4.3.2 West Bank Maintenance Road

The 12 foot wide maintenance road on the West bank would not be used for incidental recreational purposes in order to minimize disturbance to the restoration area. The maintenance roads would be made of decomposed granite. Each maintenance roads would be 0.68 acres. The total acreages for both east and west maintenance roads would be 1.36 acres. The maintenance road would also act as a buffer between the channel wall and restoration area.

3.4.3.3 East Bank Recreational Trail

The formulation of the recreational features is based on the educational and social potential afforded by the restoration project. The justification for Federal participation in recreational features as part of the recommended plan is defined in Policy Guideline Letter No. 59, Recreation Development for Ecosystem Restoration Projects.

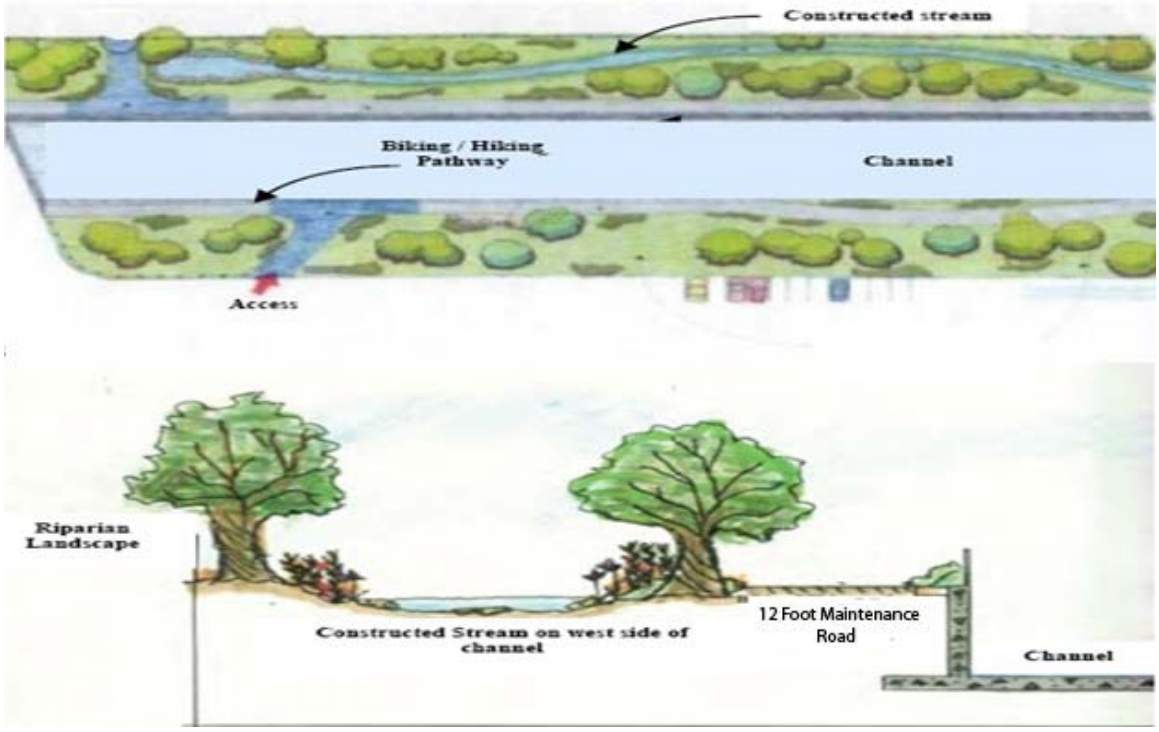
The formulation of recreational features was conducted within the following framework;

- are totally ancillary; i.e., project was not formulated solely for recreation;
- take advantage of the project's recreation potential;
- are not vendible;
- would not exist without the project.

A maintenance road on the East bank would be used as a multipurpose trail system with numerous benches, water fountains and off-street parking areas as well as informational interpretive nodes would be placed along both perimeters of the project area. The trail would be bordered with markers and plantings that would help delineate the interface between park users and habitat areas. The maintenance road would also act as a buffer between the channel wall and restoration area. Interpretive nodes and signage would be located at strategic locations along this trail system to educate visitors regarding the composition of each habitat and its associated wildlife. The signage would also provide an opportunity to display historical data on the Tujunga Wash ecosystem and its restoration, as well as the benefits the new habitat would produce, and to instruct visitors to avoid sensitive habitat zones. Subjects that would enhance a visitor's experience including detailed habitat and wildlife descriptions, and projected benefits of

the project would be featured on large permanent signs. To increase the quality of native vegetation and wildlife habitat refuge, these trails would not enter into all portions of the habitat areas. Figure 3.4-2 below shows a preliminary cross section and aerial view of the proposed project.

Figure 3.4-2 Conceptual Recreational Design



3.4.3.4 West Bank Restoration

The proposed restoration area would extend from Vanowen Street to Sherman Way. Planting would occur within the proposed restoration area which would develop into an environmental corridor. An environmental corridor would be constructed adjacent to the meandering stream/channel and parallel to the service road. Prior to planting vegetation, the area would be graded and additional topsoil, if needed, would be applied and temporary irrigation lines would be installed. Riparian vegetation would be composed of plants which are native to the project area. The main plant species that would be planted which include western sycamore (*Plantanus racemosa*); black willow (*Salix gooddingii*); arroyo willow (*Salix lasiolepis*); red willow *(Salix laevigata);* Fremont cottonwood (*populus fremontii*); and White alder (*Alnus rhombifolia*). When trees reach a height of over 30 feet, they would provide a close canopy cover. The shrub understory vegetation can be restored including mule fat (*Baccharis salicifolia*), and California rose (*Rosa californica*). The following paragraph describes details on each vegetation type.

3.4.3.4.1 Southern Cottonwood Willow Riparian Habitat

Southern cottonwood willow riparian habitat has high wildlife value because the vegetation is multi-layered, is used by many birds, and provides breeding and foraging habitat and cover for many wildlife species. Because the southern cottonwood willow riparian vegetation in the project area is rare, fragmented, and disturbed by the human intrusion in its current condition, existing habitat has low function and value. About 1 acre of Southern cottonwood willow riparian habitat would be planted.

3.4.3.4.2 Southern Willow Scrub

Southern willow scrub is a dense, broad-leaved, winter deciduous riparian thicket dominated by several species of willows (*Salix spp.)* in association with mulefat (*Baccharis salicifolia*). This is an early seral community (i.e., the vegetation structure and composition is in a successional state that may change over time). Arroyo willow (*Salix lasiolepis*), Goodding's black willow (*S. gooddingii*), red willow (*S. laevigata*), narrow-leaved willow (*S. exigua*), and mulefat (*Baccharis salicifolia*) all occur along Tujunga Wash. Planting of Southern Willow Scrub would be about 0.84 acres, and provide support to sensitive species.

Functioning wildlife habitat would also result from restoration of the wetland and riparian corridor along both sides of the Tujunga Wash and would establish a wildlife corridor connecting to Hansen Dam and Tujunga Wash Watershed. The restored area would provide opportunity for nesting, foraging, and perching habitat for migratory birds, and potentially threatened and endangered species such as least Bell's vireo (v*ireo Bellii pusillus*) and southwestern willow flycatcher (*Empidonax traillii*). Additional wildlife benefits would include establishment of a contiguous vegetated corridor along the river and restoration of foraging and cover habitat for numerous wildlife species. The restoration of this habitat would also increase the amount of sensitive vegetation communities in the watershed. The increase would include southern willow/mulefat scrub and southern cottonwood willow riparian forest.

3.4.3.4.3 Southern Sycamore Riparian Woodland

Southern sycamore riparian scrub is a low elevation riparian community. Consisting of broadleaved, winter deciduous species, this community often lines the path of rivers and streams where water can be found at the soil surface. Southern sycamore woodland is considered a mid-successional community. It re-established rapidly after floods but is not well adapted to fire. Common plant species include the California sycamore (*Platanus racemosa*), the Poplar *(Populous fremontii*) and blackberry (*Rubus ursinus*). This highly stratified community supports a multitude of bird species including the red-tailed hawk (*Buteo jamaicensis*), and downey (*Picoides pubescens*) and Nuttall's (*Picoides nuttallii*) woodpeckers as well as amphibians such as the pacific tree frog (*Hylla regilla*), and slender salamander (*Batrachoseps attenuatus*). Once common throughout the foothills of California southern sycamore woodland is threatened by development and fugal disease.

3.4.3.4.4 Alluvial Fan Sage Scrub

Alluvial fan sage scrub is limited to alluvial fans and flood plains of southern California. Closely allied with coastal sage scrub and chaparral, this community is adapted to fire as well as periodic flooding. Soils are highly permeable, consisting of rocky sand and boulders. Many of the plants that make up this community are drought deciduous. The most active period of growth occurs during the cool, wet winter months. Representative plants include scale-broom (*Lepidospartum squamatum*), California sage (*Artemisia californica*), Californis buckwheat (*Eriogonum fasciculatum*) and brittlebush (*Encelia californica*). Animals that utilize this community include the federally listed California gnatcatcher (Polioptila californica) and the orange-throated whiptail (Aspidoscelis hyperythra beldingi). Alluvial fan sage scrub is considered rare and threatened. It is estimated that up to 90% of this community type has been destroyed by urban development, sand mining or flood control projects.

3.4.3.4.5 Aquatic and Emergent Wetland

While not a considered community type itself, aquatic emergent wetland describes the type of plants found in a wetland community. Emergent wetland plants can be found lining lakes and slow moving streams where water is readily available. These plants do best in open canopy areas and are often the first to colonize after a disturbance. Examples of emergent wetland plants include cattails (*Typha sp*.), sedges (*Scirpus, sp*) and rushes (*Juncus sp*).

3.4.3.5 East Bank Restoration

The proposed restoration area would extend from Vanowen Street to Sherman Way. Planting would occur within the proposed restoration area which would develop into an environmental corridor. Prior to planting vegetation, the area would be graded and if necessary, topsoil would be applied as well as installation of temporary irrigation lines. Signs would be posted to minimize damage or human interference to the restored area. Riparian vegetation would be composed of plants which are native to the project area and develop well near streams. The main plant species that would be planted would include western sycamore (*Plantanus racemosa*); black willow (*Salix gooddingii*); arroyo willow (*Salix lasiolepis*); red willow *(Salix laevigata);* Fremont cottonwood (*populus fremontii*); and White alder (*Alnus rhombifolia*). When trees reach a height of over 30 feet, they would provide a close canopy cover. The shrub understory vegetation can be restored includes mule fat (*Baccharis salicifolia*), and California rose (*Rosa californica*).

The restoration plan consists of planting approximately 7 acres of riparian vegetation establishing a cottonwood willow riparian corridor, southern willow scrub, and habitat found within the project area or within the region. Two habitat types have been chosen for this alternative is southern cottonwood-willow riparian and the southern sycamore riparian woodland type of habitat which originally characterized this area. These would provide resting habitat and cover so that the linear planted vegetation could function as a wildlife corridor within the urbanized region.

3.4.3.5.1 Southern Cottonwood Willow Riparian Habitat

See Section 3.4.3.4.1 above for details.

3.4.3.5.2 Southern Willow Scrub

See Section 3.4.3.4.2 above for details.

3.4.3.5.3 Southern Sycamore Riparian Woodland

See Section 3.4.3.4.3 above for details.

3.4.3.5.4 Alluvial Fan Sage Scrub

See Section 3.4.3.4.4 above for details.

3.4.3.5.5 Aquatic and Emergent Wetland

See Section 3.4.3.4.5 above for details.

3.4.3.6 Outlet Connection/Discharge

All flows would be connected to the downstream County project by connecting the meandering stream into the County's gravity-fed pipeline, which lies underneath the Corps project, to allow further use of the water for the restoration of habitat downstream. This benefit would increase the habitat corridor to a total of 9000 feet long when adding the County's 6000 feet long restoration project and the Corps' 3000 feet long restoration project.

3.4.3.7 Staging Areas & Disposal Sites

Possible staging areas include the area within the existing right-of-way located west and east of Tujunga Wash and north of Sherman Way. See Figure 3.4-3 below.

A total of 3,230 cy will be excavated for construction of the streams and ponds. Approximately 2,584 cy or 80% of material would remain on-site, be distributed within the site, and reshaped and contoured. Approximately 640 cy or 20% of material would be hauled offsite. The Corps shall provide the contractor with potential disposal sites, but ultimately the excavated 646 cy becomes the property of the contractor. The nearest disposal locations within 30 miles of the project area are listed below in Table 3.4-2.

Figure 3.4-3 Staging Areas

Table 3.4-2 Landfills Within the Project Area

Facility Name	Address	Permitted Tonnage[1]	Estimated Closure Date[2]
Bradley Landfill	9081 Tujunga Ave. Sun Valley	10,000 tons/day	1/1/2007
Strathern Inert Landfill	8230 Tujunga Ave. Sun Valley	2,700 tons/day	4/5/2021
Calmat Inert Landfill	9436 Glenoaks Blvd. Sun Valley	500 tons/day	1/1/2026

Source: 1 City of Los Angeles, 2003.
2 California Integrated Waste Management Board, 2003.

3.4.3.8 Equipment and Construction Schedule

Table 3.4-3 below lists the number of equipment that would be needed for construction of the proposed project. The duration of each equipment and construction activity are listed below as well.

Table 3.4-3 Equipment and Construction Schedule for Alternatives 2 and 3

	ALTERNATIVE /TREATMENT	CREW COMPOSITION										SCHEDULE				
		Dozer (each)	Loader (each)	Brush Chippers (each)	Low-Boy Trucks (each)	10-ton Compactor (each)	Hydroseeding Truck (each)	Hwy Trucks (15CY dump body) Fleet	Scraper (11 cy) (each)	Hyd Excvtr	Grader	Acitivity Duration (working days)	Mob/Demob, Set-up, Delays, etc (days)	Total Working Days	Project Duration (Months)	Rounded Project Duration (Months)
1	Mob/Demob/Set-up				10							2	1	3	0.14	0.50
2	Clear and Grub		1	1				10				2		2	0.09	0.50
3	Surfacing / Paving	2	2			2		10				15		15	0.69	1.00
4	Seeding / Amendments / Fertlz		1				1	3				15	1	16	0.74	1.00
5	Planting		1					2				15	1	16	0.74	1.00
6a	Excavation (Stream / Ponds) w/l site	1							2			5		5	0.23	0.50
6b	Excavation (Stream / Ponds) Haul away	1	1					2				5		5	0.23	0.50
6c	Excavation (Stream / Ponds) Trim/Grade/E	1									1	5		5	0.23	0.50
7	18" HDPE Pipe		1					2		1		15		15	0.69	1.00
8	Clay Layer, 6" lining of pond and stream	1	1			1		2			1	3		3	0.14	0.50
	Total Working Days													85	3.91	4.00
	NOTES.															
	1. The schedules assume 5 days/week and 8 hrs/day.															
	2. The months under the PROJECT DURATION column is based on calendar days (21.75 working days/month).															
	3. The calendar months under the PROJECT DURATION column are rounded up.															

3.4.4 Alternative 3 – West bank stream connecting to Tujunga Wash channel wall

Alternative 3 consists of the following features:

- Construction of meandering stream along west bank (0.34 acres)
- Planting native/riparian vegetation along constructed stream on west bank (3.48 acres)
- Planting native/riparian vegetation along east bank (3.82 acres)
- Improvement of water quality via settling ponds and groundwater recharge
- Incidental recreational opportunities by utilization of existing 12 foot wide maintenance roads, one on each bank. (0.68 acres each, 1.36 acres total)
- Stream would receive water from Pacoima Wash Diversion South Channel (South Channel) approximately 900 feet north of Sherman Way, which receives surface water released from Lopez Dam.
- No water would be removed from or placed into Tujunga Wash;
- 12 foot maintenance road would act as buffer between channel wall and restoration area.

Similar to Alternative 2, Alternative 3 would involve the construction of a meandering stream along the west bank of the Tujunga Wash, having riparian vegetation planted along the meandering stream and upland type vegetation planted in a buffer area. The east bank would have similar vegetation planted. The west bank's restored area would be fenced to minimize disturbance by pedestrian trails users. Interpretive nodes would be constructed at elevated decks to educate visitors and avoid impacts to sensitive habitat zones. The project also includes incidental recreational opportunities by utilization of the existing 12 foot wide maintenance road on the east bank. The stream would receive water from the South Channel which is approximately 900 feet north of Sherman Way, which receives surface waters released from Lopez Dam. Once water reaches the end of the project, the water would be conveyed back into the Tujunga Wash. Table 3.4-4 shows the acreages of the plant species in the project area. Figure 3.4-3 gives a visual description of the project's location and connection points for Alternative 3.

Table 3.4-4 Alternative 3 Acreages for Each Plant Species on East and West Banks

Alternative 3	West Bank	East Bank	Total
Aquatic/Emergent	0.013	0	0.013
Cottonwood-willow	0.21	0.21	0.42
Sycamore riparian	0.085	0.085	0.17
Alluvial fan sage scrub	1.75	1.75	3.5
Meadow	1.42	1.78	3.2
Vegetation Subtotal	*3.48*	*3.82*	*7.3*
Maintenance Road	0.68	0.68	1.36
Meandering Stream	0.34	0	0.34
Total	***4.50***	***4.50***	***9.0***

Figure 3.4-4 Alternative 3

This alternative provides the least level of habitat quality improvement to the Tujunga Wash, while also providing a good cost/benefit ratio for the incidental recreational opportunities.

Although achieving Alternative 3 requires the greatest amount of earth disturbing activity during construction, the impacts associated with this construction are considered temporary in nature.

3.4.4.1 Meandering Stream on West Bank

The description for the meandering channel for Alternative 3 is the same as that above in Alternative 2.

3.4.4.2 West Bank Maintenance Road

The description for the maintenance road/recreational trail for Alternative 3 is the same as the above in Alternative 2.

3.4.4.3 East Bank Recreational Trail

The description for the maintenance road/recreational trail for Alternative 3 is the same as the above in Alternative 2.

3.4.4.4 West Bank Restoration

The description and plantings for the west bank restoration is similar to that of Alternative 2, but because of the discharge back into the Tujunga Wash, certain vegetation types (Southern Cottonwood-Willow Riparian Forest and Alluvial Fan Sage Scrub) would not be as abundant as those in Alternative 2. The habitat units of the species planted in Alternative 3 (5.59 habitat units) would be less than those in Alternative 2 (7.09 habitat units). The meandering stream would no longer connect to the County's restoration project downstream and would instead connect back to the Tujunga Wash channel wall and discharge flows there.

3.4.4.5 East Bank Restoration

The description and plantings for the east bank restoration is similar to that of Alternative 2, but because of the discharge back into the Tujunga Wash, certain vegetation types would not be as abundant as those in Alternative 2. The habitat units of the species planted in Alternative 3 (5.59 habitat units) would be less than those in Alternative 2 (7.09 habitat units). The meandering stream would no longer connect to the County's restoration project downstream and would instead connect back to the Tujunga Wash channel wall and discharge flows there.

3.4.4.6 Outlet Connection/Discharge

A junction structure at the downstream end of the west bank meandering channel would be constructed to salvage residual channel flow back to the Tujunga Wash. No water would be used towards the downstream County restoration project.

3.4.4.7 Staging Areas & Disposal Sites

The description for the staging areas and disposal sites for Alternative 3 are the same as those above in Alternative 2.

3.4.4.8 Equipment & Construction Schedule

The description for the equipment and construction schedule for Alternative 3 are the same as those above in Alternative 2. See Table 3.4-3.

3.4.5 Monitoring and Maintenance

Plan and Specifications would be reviewed by the Environmental Resources Branch (ERB) team to ensure that the type, quantity and quality of species are consistent with the DPR. The ERB team would participate in the pre-construction meeting and provide a copy of the DPR, a brief summary of environmental commitments, and the species list to be planted to the construction contractor. A qualified biologist and/or environmental coordinator shall monitor the project construction to ensure that the vegetation is planted according to the DPR design. In addition, other environmental resources including but not limited to water, air, noise, traffic, etc., would be monitored and conditions identified in any permits would be followed during construction.

After completion of the initial planting, the construction contractor would be responsible to maintain the restoration area for the first year. The biologist shall monitor the growth of the plant species, their success and weeding of the non-native species. If some of the plants do not survive, the biologist shall provide instructions to the construction contractor to replant the dead plants. The Corps would monitor and maintain the restoration area for 1 year and ensure that the success criteria identified in the DPR is achieved. In addition to the Corps' one year monitoring and maintenance, the Local Sponsor shall concurrently conduct additional monitoring and maintenance that are not part of the Corps' function.

Minimal site maintenance is anticipated for the Tujunga Wash Restoration project. No manipulation of the Tujunga Wash water level would be necessary as part of the site maintenance or management. The construction contractor would conduct an initial 1-year program for the removal of invasive, non-native vegetation. Following the 1 year monitoring and maintenance of vegetation by the Corps, the project would be transferred to the Local Sponsor and they would be responsible for removal of any new exotic vegetation that appears during the project life. The presence of undesirable non-native plant species would be assessed annually and identified plant species would be removed by hand. Care would be taken not to disrupt or remove native plants; therefore, maintenance personnel would be trained to differentiate between native and non-native species. All invasive plant control would occur before seeds set, to the maximum extent possible.

During the plant establishment, the newly installed fences would be temporarily closed to the public to protect newly planted vegetation from pedestrian damage. Therefore, the temporary fence closure would be removed after plants are established but only for the east bank, the west bank would only be accessible to maintenance crews. During this establishment phase, the

project site would be checked periodically for damage and repaired when appropriate. Following construction and the 1 year establishment of vegetation, the Local Sponsor would be responsible for periodic replacement, watering, and general care of vegetation plantings.

Following the construction and establishment periods, the Corps would utilize the CRAM (California Rapid Assessment Method) technique for long-term habitat assessments to determine the post project success of the restoration effort. The Corps and Local Sponsor would evaluate the success of the stream, vegetation plantings, and exotic vegetation removal.

Annual inspections would need to be performed for minor, moderate and major erosion damage would need to be conducted after each storm event with rainfall magnitudes of anywhere from two to fifty year return frequency and above. Details related to maintenance and monitoring is provided in Section 8.0, Environmental Commitments.

3.4.5.1 USFWS (U.S. Fish and Wildlife Service) Coordination Act Report (CAR) Recommendations

The USFWS recommended the following 7 suggestions to incorporate into the project. They are listed below with justifications of why they can or cannot be incorporated into the project.

1. *Maintain a water quality analysis of water diverted from South Pacoima Wash.*

The Corps does not have the authority for creating water quality programs for other agency conveyance systems but has designed a semi-permeable lining for the meandering stream and settling ponds to allow percolation into the groundwater.

2. *Develop a long term management and monitoring plan for the Tujunga Wash Project.*

Long term management and monitoring plans are not allowed for CAP Projects. See ER 1105-2-100, paragraphs 3-5b(8) E-30i, where F-21a. and b. provided below states:

a. Monitoring to be performed after physical construction is complete is rarely appropriate for CAP.
b. Adaptive management will not be performed and will not be a cost shared item in CAP projects.

3. *Reduce human and domestic pet intrusion to as large a section of the riparian habitat as possible.*

The main restoration area is going to be off limits to the public by a chain link barrier.

4. *Institute a feral cat control program for the project site and surrounding residential neighborhoods.*

This project is an ecosystem restoration project. The feral cat program is not a function of the Corps. Once the Local Sponsors obtains control of the site and if they find a lot of feral cats, then they may consider whether they want to install and maintain the feral cat control program.

5. *As part of the biological monitoring program, report the presence of any Federal or California listed species to the Service and Department.*

Maintenance and monitoring will be performed by the Corps for the first year after construction and will report any listed species within that 1 year period. After the first year, the County will take over and implement the biological monitoring program. The County shall notify the Service and Department if any listed species are found during their maintenance and monitoring periods.

6. *Institute BMPs during construction activities to minimize any on site and downstream disturbances.*

Best Management Practices (BMPs) are always included in the Storm Water Pollution Prevention Plan (SWPPP) that the Construction Contractor is required to produce and have on site with them at all times. The Construction Contractor is required to implement those BMPs at all construction sites.

7. *Promote and prioritize future habitat restoration and greenway projects in this local area that will link directly to the proposed site.*

The Local Sponsor shall be the one to promote future greenway projects and has been with the two projects downstream. This project is already a stepping stone for future Channel Revitalization Project (i.e. the Los Angeles River Revitalization Project).

3.4.6 Habitat Values for Alternatives 2 and 3

Tables 3.4-5 to 3.4-7 provides quantity and habitat values of the planted vegetation. The modified HEP analysis revealed that 7.09 habitat units would be achieved by implementing alternative 2 versus the 5.59 habitat units for alternative 3. A modified HEP analysis is presented in Appendix B-1 and a summary of habitat values have been provided in Table 3.4-5. Criteria for monitoring and evaluating the success of the habitat are provided in the Environmental Commitments Section 8.0. Appendix E-2 shows spatial distribution of the habitat within the project area

Table 3.4-5: Total habitat units by plant community type over time

Habitat Type	Timeframe	Habitat Output		
		Alt. 1	Alt. 2	Alt. 3
Aquatic and Emergent Wetland	T=1	0.0	0.005	0.006
	T=5	0.0	0.009	0.009
	T=50	0.0	0.013	0.014
Southern Cottonwood-Willow Riparian Forest	T=1	0.0	0.97	0.52
	T=5	0.0	1.54	1.13
	T=50	0.0	2.1	1.13
Southern Sycamore Riparian Woodland	T=1	0.0	0.04	0.21
	T=5	0.0	0.62	0.30
	T=50	0.0	0.74	0.40
Alluvial Fan Sage Scrub	T=1	0.0	3.03	2.61
	T=5	0.0	6.18	5.31
	T=50	0.0	6.01	5.16
Total T=1		0.0	4.05	3.34
Total T=5		0.0	8.35	6.74
Total T=50		0.0	8.86	6.69
Average Annual HUs		0.0	7.09	5.59

Table 3.4-6: Total habitat units across all plant community types created by alternatives 2 and 3 over time periods T1, T5 and T50.

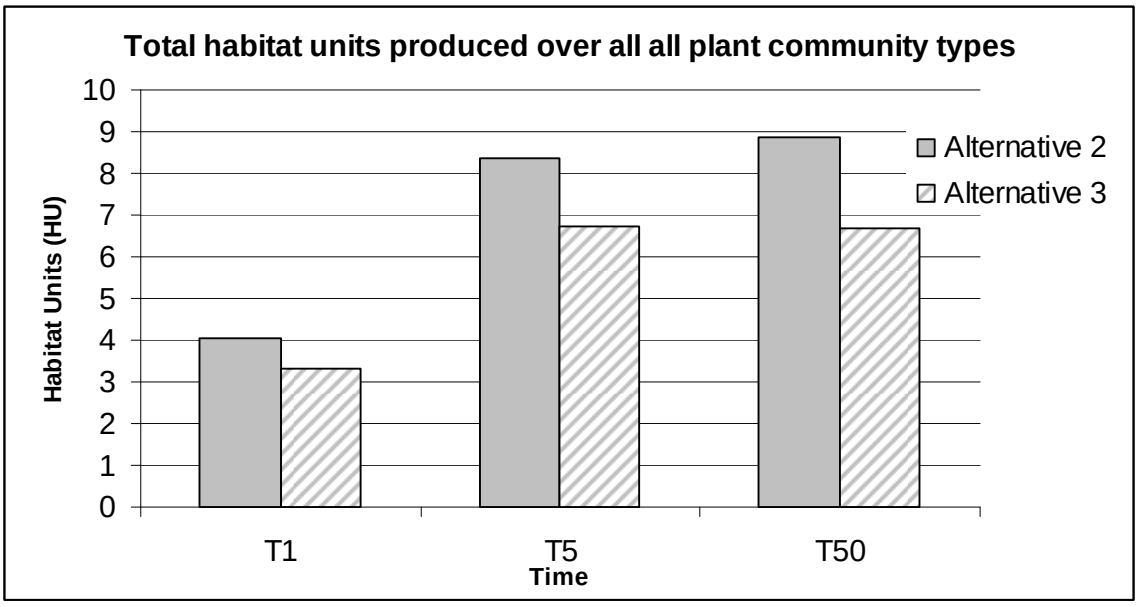
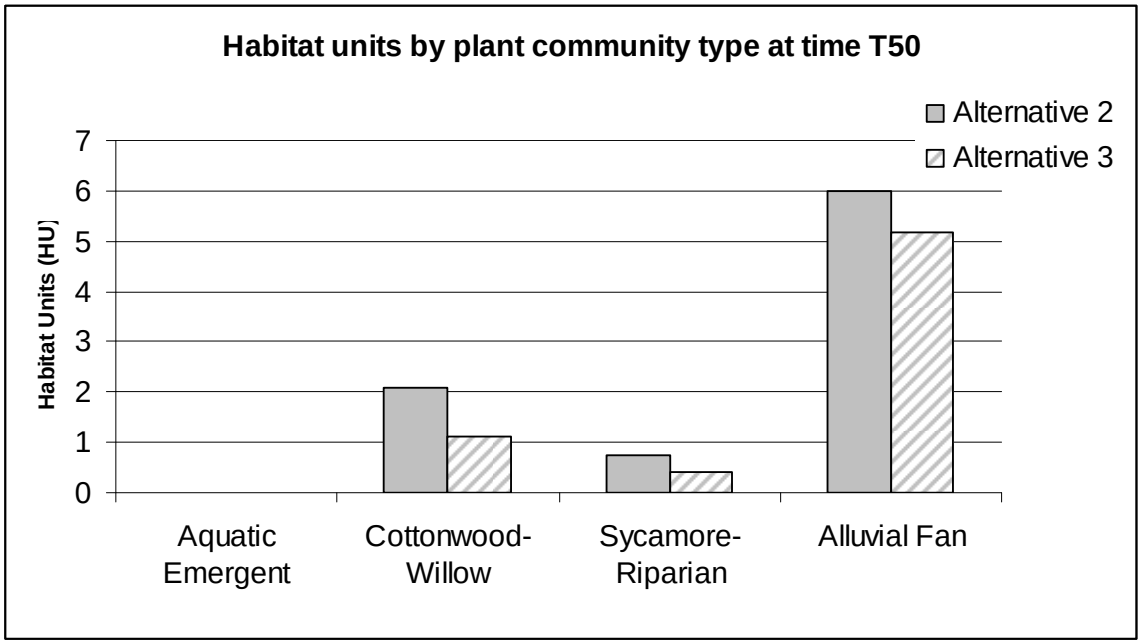


Table 3.4-7: Habitat units created by alternatives 2 and 3 at time T30 in four different plant communities.



SECTION 4

INCREMENTAL COST ANALYSIS

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SECTION 4 – INCREMENTAL COST ANALYSIS

4.1 Cost Analysis

USACE policy dictates the maximum amount (as a percentage of project costs) that can be allocated to recreation features associated with a project that has ecosystem restoration as a primary purpose. ER 1105-2-100 states the following: "*…for recreation associated with ecosystem restoration, the Federal cost of ecosystem restoration plus the Federal cost of recreation may not exceed by more than 10 percent the Federal cost of the ecosystem restoration project without prior approval of the ASA(CW).*"

The following tables show the costs for the two action alternatives – with restoration features and recreation features separated out. These costs are separated in order to enable the separate analysis of these two project components. The restoration features of the two alternatives will be compared in a cost-effectiveness analysis, while a benefit-cost analysis will be conducted to determine whether the construction of the recreation features is justified according to USACE policy.

Table 4.1-1 shows that the limit on the Federal investment in the recreation components for each alternative is approximately $308,000. While the restoration features of the project are cost-shared 75% Federal/25% Non-Federal, the cost of recreation features are shared equally between the Federal government and the local sponsor.

Table 4.1-1: Restoration First Costs

	Alternative 2	Alternative 3
First Cost – Restoration*	$4,104,285	$4,108,218
Federal Share at 75%	$3,078,214	$3,081,163
10% of Federal Share	$307,821	$308,116

** Restoration First Cost includes the NPV of Future Monitoring over 5 years of $54,438*

Table 4.1-2 shows the costs of the recreation component of each alternative, and shows that the percentage of cost represented by the recreation components are for both alternatives below the 10% ceiling. Adding the recreation features increases the cost to the Federal government by just over two percent. This is calculated as the quotient of a) the First Cost – 50% Corps ($65,048) of the recreation features as shown in Table 4.1-1, and b) the Federal Share at 75% of the restoration features ($3.08 million) as shown in Table 4.1-2. Again, the intent of this result is to show that the cost of the recreation features is within the allowable limit per USACE policy. The subsequent Recreation Analysis will estimate the economic value to the public of the recreation features of the alternatives, and will include a comparison of the benefits to the costs.

Table 4.1-2: Cost Analysis for Recreation Features

	Alternative 2	Alternative 3
First Cost - Recreation	$130,096	$130,096
IDC	$1,234	$1,234
Gross Investment	$131,330	$131,330
Annual Cost*	$6,785	$6,785
O&M	NA	NA
Total Annual Cost - Recreation	$6,785	$6,785
First Cost - 50% Corps	$65,048	$65,048
Percent of Recreation to Restoration - Corps	2.1%	2.1%
Total First Cost - Restoration and Recreation	$4,234,381	$4,238,314
Annualized* Total First Cost - Restoration and Recreation	$218,641	$218,844
*Annualized at 4.625%		

4.2 Recommended Plan Selection

The Economist's role in the determination of the contribution of a particular project to the Environmental Quality account is to help characterize and rank the cost-effectiveness (CE) of the various alternatives that are part of a particular study. That is, each alternative can generally be a combination of measures, the sum of which has a particular level of habitat value and a particular monetary cost associated with it. A cost effectiveness analysis is simply a way of finding, for a given level of habitat output, those combinations of non-exclusive restoration measures that provide the best value. Once the cost-effective alternatives, or plans, have been identified, the Economist performs an incremental cost analysis (ICA), which helps decision-makers understand the added cost at each additional level of habitat output. From USACE guidance:

> "Cost-effectiveness analysis shall be used to identify the least cost solution for each level of environmental output considered. Incremental cost analysis compares the additional costs to the additional outputs of an alternative."

The first step is to identify those plans that are inefficient in production, and to remove them from further consideration. A plan is defined as inefficient (or not cost-effective) when another plan provides the same or greater level of output for less cost. Table 4.1-3 shows the three alternatives for the Tujunga Wash Ecosystem Restoration. As the table below shows, over the 50-year period of analysis, in the absence of a federal project the project area is expected to have zero habitat value. Alternative 2 would create just over seven AAHUs, while Alternative 3 would create just less than six AAHUs. Details on the procedure to determine the AAHU for each alternative can be found in Appendix D.

Table 4.1-3: Average Annual Habitat Units, 2008-2057

Alternative	Output (AAHUs)
No Action	0
2	7.09
3	5.59

The following tables show the total first cost for the restoration features (including Interest During Construction – IDC) for each of the alternatives, as well as the total annualized cost. The costs were annualized at 4.875% over a period of fifty years. The two action alternatives have the same operation and maintenance (O&M) cost.

Table 4.1-4: Total First Cost of Alternatives - Restoration

Alternative	First Cost	Interest During Construction	Total Investment Cost
No Action	NA	NA	NA
2	$4,104,285	$85,148	$4,189,432
3	$4,108,218	$85,230	$4,193,448

Table 4.1-5: Total Annual Cost of Alternatives - Restoration

Alternative	Annualized Investment Cost*	Annualized O&M	Total Annual Cost
No Action	0	NA	0
2	$216,300	$51,700	$268,000
3	$216,500	$51,700	$268,200
*Includes IDC; amortized at 4.625%			

Since Alternative 2 provides the most habitat units and is also the alternative with the lowest total cost, no additional cost-effective analysis is needed to identify the optimal plan. Also, because Alternative 3 is shown to be cost-ineffective, and since there are only two action alternatives, no incremental cost analysis is needed to identify the optimal plan. The alternatives are mutually exclusive and not combinable. Alternative 2 provides just over seven average annual habitat units at an annual cost of around $268,000, or just under $38,000 per habitat unit.

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SECTION 5

RECOMMENDED RESTORATION PLAN

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SECTION 5 – RECOMMENDED RESTORATION PLAN

The Recommended Restoration Plan consists of the following features:

- Construction of meandering stream along west bank (0.34 acres)
- Planting native/riparian vegetation along constructed stream on west bank (3.48 acres)
- Planting native/riparian vegetation along east bank (3.82 acres)
- Improvement of water quality via settling ponds and groundwater recharge
- Incidental recreational opportunities by utilization of existing 12 foot wide maintenance roads, one on each bank, but only east bank will be accessible to public. (0.68 acres each, 1.36 acres total)
- Stream would receive water from the South Pacoima Wash Diversion Channel (South Channel) approximately 900 feet north of Sherman Way, which receives surface water released from Lopez Dam.
- No water would be removed from or placed into Tujunga Wash.

Alternative 2 is the NER plan identified in Section 4, or the Recommended Restoration Plan, which includes selected measures, a HEP analysis and an Incremental Cost Analysis. The HEP analysis indicated that Alternative 2 would generate 7.09 HUs compared to the 5.59 HUs for Alternative 3 (see Appendix B-1). An Incremental Cost Analysis revealed that Alternative 2 is the National Ecosystem Restoration (NER) Plan (see Section 4.0 and appendix F for details). Therefore, Alternative 2 is the NER as well as Recommended Plan. The Local Sponsors input was received during plan formulation, and they recognize that Alternative 2 is the Recommended Plan. The general description and habitat values of the Alternative 2/Recommonded Plan is provided In Section 3. Component details are provided in the following paragraphs.

5.1 Project Components

The Recommended Restoration Plan involves construction of a meandering stream along the west bank and planting native/riparian vegetation along the constructed stream. The stream would receive water from the eastern branch of the South Channel which is approximately 900 feet north of Sherman Way, which also receives surface water released from Lopez Dam (See Figure 5.8-1 for South Channel and Inlet locations). This would help to support the native/riparian plant communities which would be planted along the manmade stream's edges. The stream would be connected to the County's restoration project on the west bank downstream of the project area. The east bank would also be planted with native/riparian vegetation but would not contain a stream. Establishment of an environmental corridor would improve water quality by allowing functions such as groundwater recharge, nutrient removal/transformation, sediment stabilization and flood flow retention. The project includes incidental recreational opportunities by utilization of the existing 12 foot wide maintenance road on the east bank. The east bank's maintenance road would provide incidental recreational opportunities. The west bank's maintenance road would not be open to public access in order to help the restoration area thrive. The west bank maintenance road would only be utilized for emergency access.

5.2 Restoration Benefits and Accomplishments

In Southern California, restoration of small areas is very important because resources are limited in an urban setting. Restoring the proposed project area along Tujunga Wash, which is 3,000 feet long (9 acres), is very significant because it generates a link to two other similar restoration projects downstream and would also serve as a landing area for migratory birds between Hansen Dam, Sepulveda Dam and the Los Angeles River. The County has completed a restoration area downstream of the project area, which is approximately about 6,000 feet long (18 acres). In addition, the Tujunga Wash Greenbelt was constructed by the Corps downstream of the County's project in 1976 and is approximately 4,200 feet long (10 acres). Those three projects combined increases the total restoration corridor to 13,200 feet in length (37 acres). Thus, restoration of the proposed project area is very valuable. Land value is very high in Southern California; therefore, it seems that restoration costs are higher compared to the rest of the nation.

Of the nine acres of the Recommended Restoration Plan, the meandering stream and maintenance road would consist of 1.70 acres of land while the planted native/riparian types of vegetation would consist of the remaining 7.30 acres land. On the west bank, about 3.48 acres would be restored which consists of 0.013 acres aquatic emergent wetland, 0.42 acres cottonwood, 0.17 acres sycamore, 1.75 acres alluvial fan scrub, and 1.13 acres meadow. The east bank would restore about 3.82 acres and planting would consist of 0.42 acres cottonwood, 0.17 sycamore, 1.75 acres alluvial fan, 1.48 acres meadow. As shown in Table 3.5-1, Alternative 2 would achieve a total of 7.09 HUs.

5.3 Recreation Components

Plans to create recreational opportunities along the east bank of the Tujunga Wash include planting drought tolerant native plant communities. This bank will be open to the public with a trail, wildlife observation areas and interpretive signage. The recreational trail would be 12 feet wide consisting of decomposed granite. See Appendix F-2 for locations of the proposed recreational features within the study area.

The Local Sponsor and local community support the incorporation of the described recreational features into the recommended restoration plan. The proposed recreational features are compatible with the recommended restoration project and would serve the surrounding neighborhoods and region by providing non-consumptive recreational opportunities. The recreational features would not detract from the goals of the restoration plan. These features would function primarily for recreational purposes and cost shared 50 percent (with a maximum up to 10% of the total Federal restoration costs).

Economic justification is based on evaluation of competing facilities, existing and expected future use with and without the project, and unfulfilled demand. Applying the appropriate participation rates to the population of potential users, the access would be used to capacity from the time it becomes available to the public through the period of analysis.

According to the Unit Day Value (UDV) methodology, with visitation at 19,700 users per year, at a UDV corresponding to $5.52, both Alternatives 2 and 3 would have an annual recreation value of $108,823, which is calculated as the product of the annual visitation and the UDV.

Table 5.3-1: Total Annual Value of Recreation - UDV Method

Alternative	UDV Points Assigned	UDV (Per Visit)	Expected Annual Visits	Total Annual Value
No Action	NA	NA	NA	NA
2	31	$5.52	19,700	$108,823
3	31	$5.52	19,700	$108,823

For recreation elements of a project, the economic value (Total Annual Value) is synonymous with the "benefits" of creating the recreation opportunity. The action alternatives have the same recreation features, and thus the benefits and costs associated with the recreation features are equivalent. Table 5.3-2 below shows that for each alternative the recreation benefits of the project far outweigh the cost of constructing these features. The benefit to cost ratio is 16, and the net benefits of constructing the features is approximately $102,038. The result of a benefit to cost ratio greater than one (net benefits) from the construction of the recreation features is very robust, and holds as long as annual visitation is greater than 1,229 (which is less than ten percent of the expected annual visits according to the standards applied in this study).

Table 5.3-2: Benefit-Cost Analysis - Recreation Features

Alternative	Total Annual Value (Benefits) of Recreation	Total Annual Cost – Recreation Features	B/C	Total Annual Net Benefits
No Action	NA	NA	NA	NA
2	$108,823	$6,785	16	$102,038
3	$108,823	$6,785	16	$102,038

5.4 Design and Implementation Costs

The economic cost of the Recommended Plan includes estimates for construction, engineering and design, supervision and administration, and lands and damages, with allowances for contingencies. Using current material, equipment, and labor costs typical for work of this nature in the Los Angeles vicinity, the Corps developed cost data. A summary of the cost associated with completing the Recommended Restoration Plan is presented in Table 5.4-1 below. These costs include land acquisition, general construction, post project monitoring, S&A and contingency, and OMRR&R costs. The S&A and contingency is equal to 6.7% of the total construction cost. Annual OMRR&R is based on a 50-year project life and was also included in the ICA. A six month (21 days per month) construction period for this project was assumed for the purpose of determining the total investment. A detailed presentation of the project costs is included in the Appendix F-4: MCASES Report. The estimate of first costs is based on 2007 prices. Table 5.4-2 below breaks down the Plan Cost Apportionment for the entire project.

Table 5.4-1 Summary of Implementation and O&M Costs by Alternative

SUMMARY SHEET Tujunga Wash Ecosystem Restoration FEASIBILITY REPORT		1 OCT 07 PRICE LEVEL				
CODE OF ACCTS	DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY 2007	CONTING PERCENT	FOOT NOTES
Tujunga Wash Ecosystem Restoration - Alt 2						
Junction Structure @ existing 36" RCP Bypass Line						
01.	LANDS & DAMAGES	0	0	0	0%	
02.	Relocation (Utilities)					
09.	Tujunga Wash					
09.01.	Tujunga Wash Ecosystem Restoration					
09.01.01.	Mob, Demob and Preparatory Work	106,990	26,748	133,738	25%	
09.01.02.	Traffic Control	5,740	1,435	7,175	25%	
09.01.03.	Landscape	2,070,266	517,567	2,587,833	25%	
09.01.04.	Stream, Ponds and Bypass Line	350,861	87,715	438,576	25%	
14.	Recreational Features	104,083	26,021	130,104	25%	
	Total Construction Cost:	**2,637,940**	**659,485**	**3,297,425**		
30.	PLANNING, ENG, & DESIGN	329,743	0	329,743	0%	Assume 10% of cost w/ contng.
31.	CONSTRUCTION MANAGEMENT	220,927	0	220,927	0%	Assume 6.7% of cost w/ conting.
	TOTAL COSTS:	**3,198,610**	**659,485**	**3,848,095**		

Tujunga Wash Ecosystem Restoration - Alt 3						
Junction Structure to existing channel wall of Tujunga Wash						
01.	LANDS & DAMAGES	0	0	0	0%	
02.	Relocation (Utilities)					
09.	Tujunga Wash					
09.01.	Tujunga Wash Ecosystem Restoration					
09.01.01.	Mob, Demob and Preparatory Work	106,990	26,748	133,738	25%	
09.01.02.	Traffic Control	5,740	1,435	7,175	25%	
09.01.03.	Landscape	2,070,266	517,567	2,587,833	25%	
09.01.04.	Stream, Ponds and Junction Structure	353,555	88,389	441,944	25%	
14.	Recreational Features	104,083	26,021	130,104	25%	
	Total Construction Cost:	**2,640,634**	**660,159**	**3,300,793**		
30.	PLANNING, ENG, & DESIGN	330,079	0	330,079	0%	Assume 10% of cost w/ contng.
31.	CONSTRUCTION MANAGEMENT	221,153	0	221,153	0%	Assume 6.7% of cost w/ conting.
	TOTAL COSTS:	**3,201,866**	**660,159**	**3,852,025**		

O&M Tujunga Wash Ecosystem Restoration - Alt 2 and 3						
O&M is linked to landscape for the most part. Work involves checking that the irrigation system is working properly and keeping the weeds out of the channel. On occassions some road resurfacing may be required. In short, current designs call for a low maintenance schedule.						
09.	Yearly Operation and Maintenance	51,757	0	51,757	0%	2% of landscape cost

Table 5.4-2 Plan Cost Apportionment

PLAN COST APPORTIONMENT - TUJUNGA WASH (Alternative 2)				
Cost Item		**Federal Cost**	**Non-Federal Cost**	**Total Cost**
FEASIBILITY PHASE				
Initial 100% Federal Feasibility Cost		$675,025	$0	$675,025
	% of Total Cost-shared cost	75%	25%	
	Total Feasibility Phase Cost	**$506,269**	**$168,756**	**$675,025**
DESIGN AND IMPLEMENTATION PHASE				
.30	Planning, Engineering and Design	$247,307	$82,436	$329,743
.31	Construction Management	$165,695	$55,232	$220,927
	% of Total Cost-shared cost	75%	25%	
	Total Design and Implementation Cost	**$413,003**	**$137,668**	**$550,670**
CONSTRUCTION PHASE				
Cost-Share Costs				
.01	Lands and Damages	$0	$0	$0
.02	Relocation	$0	$0	$0
.09	Tujunga Wash	$2,375,491	$791,830	$3,167,321
	% of Total Cost-shared cost	75%	25%	
.14	Recreational Features	$65,052	$65,052	$130,104
	% of Total Cost-shared cost	50%	50%	
	Sponsor in-kind services	$0	$0	$0
	Cash contributions	$0	$0	$0
	Total Construction Phase Cost	**$2,440,543**	**$856,882**	**$3,297,425**
	TOTAL PROJECT COST	**$3,359,814**	**$1,163,306**	**$4,523,120**

PLAN COST APPORTIONMENT - TUJUNGA WASH (Alternative 3)				
Cost Item		**Federal Cost**	**Non-Federal Cost**	**Total Cost**
FEASIBILITY PHASE				
Initial 100% Federal Feasibility Cost		$675,025	$0	$675,025
	% of Total Cost-shared cost	75%	25%	
	Total Feasibility Phase Cost	**$506,269**	**$168,756**	**$675,025**

DESIGN AND IMPLEMENTATION PHASE				
.30	Planning, Engineering and Design	$247,307	$82,436	$330,079
.31	Construction Management	$165,695	$55,232	$221,153
	% of Total Cost-shared cost	75%	25%	
	Total Design and Implementation Cost	**$413,003**	**$137,668**	**$551,232**

	CONSTRUCTION PHASE			
Cost-Share Feasibility Costs				
.01	Lands and Damages	$0	$0	$0
.02	Relocation	$0	$0	$0
.09	Tujunga Wash	$2,378,017	$792,672	$3,170,689
	% of Total Cost-shared cost	75%	25%	
.14	Recreational Features	$65,052	$65,052	$130,104
	% of Total Cost-shared cost	50%	50%	
	Sponsor in-kind services	$0	$0	$0
	Cash contributions	$0	$0	$0
	Total Construction Phase Costs	**$2,443,070**	**$857,725**	**$3,300,795**
	TOTAL PROJECT COST	**$3,362,341**	**$1,164,149**	**$4,527,052**

5.5 Real Estate Considerations

This project takes place on the banks of the Tujunga Wash. The Tujunga Wash was built in the 1950's by the Corps of Engineers as part of the Los Angeles County Drainage Area (LACDA) project under the Flood Control Act of 1936 as amended in 1937, 1941 and 1950. According to the current LACDA Operations and Maintenance Manual, this section of the Tujunga wash was completed on 29 November 1951 and the operation and maintenance responsibility was transferred to the Los Angeles County Flood Control District in December 1951.

The local sponsor owns several parcels in and around the Tujunga Wash in fee. Because this section of the Tujunga Wash was previously transferred to the County for O&M and is now owned by the local sponsor, there are no LERRD credits aside from the administrative costs that can be claimed for this project. The project will take place in five parcels that extend from 1,200 feet above Sherman Way down to Vanowen Street. All five parcels are owned by the sponsor. Table 5.5-1 below shows the LERRD costs associated with the project area.

Table 5.5-1 LERRD Costs for Alternatives 2 and 3

Plan	Lands (LERRD's)
Non-Federal Sponsor owned Land, Easement & Right-of-way	
Fee (9.09 acres)	$0
Contingency 10%	$0
Lands, Easements & Right-of-way to be acquired by Non-Federal Sponsor	$0
Relocations Facility/Utility	No Relocations Identified
Relocations PL 91-646	$0
Non-Federal Administrative Cost	$0
Federal Administrative Cost	$0
LERRD's Total	$0
Total Real Estate Cost Rounded	$0

There are no Public Law 91-646 relocations to consider within the proposed project area. A land acquisition schedule has not been required for this project. Currently the sponsor does not need to acquire any land because the sponsor has fee ownership over the five parcels needed for the project. No facility/utility relocations have been identified. An intake structure and a power pole are located on the west bank of the project area but will not need to be relocated. The project will be built around these structures.

5.6 Monitoring Considerations

Plan and Specifications would be reviewed by the Environmental Resources Branch (ERB) team to ensure that the type, quantity and quality of species are consistent with the DPR. The ERB team would participate in the pre-construction meeting and provide a copy of the DPR, a brief summary of environmental commitments, and the species list to be planted to the construction contractor. A qualified biologist and/or environmental coordinator shall monitor the project construction to ensure that the vegetation is planted according to the DPR design. In addition, other environmental resources including but not limited to water, air, noise, traffic, etc., would be monitored and conditions identified in any permits would be followed during construction.

After completion of the initial planting, the construction contractor would be responsible to maintain the restoration area for the first year. The Corps biologist shall monitor the growth of the plant species, their success and weeding of the non-native species. If some of the plants do not survive, the biologist shall provide instructions to the construction contractor to replant the dead plants. The Corps construction contractor would monitor and maintain the restoration area for 1 year and ensure that the success criteria identified in the DPR is achieved. In addition to the Corps' one year monitoring and maintenance, the Local Sponsor shall concurrently conduct additional monitoring and maintenance that are not part of the Corps' function.

Minimal site maintenance is anticipated for the Tujunga Wash Restoration project. No manipulation of the Tujunga Wash water level would be necessary as part of the site maintenance or management. The construction contractor would conduct an initial 1 year program for the removal of invasive, non-native vegetation. Following the 1 year monitoring and maintenance of vegetation by the Corps, the project would be transferred to the Local Sponsor and they would be responsible for removal of any new exotic vegetation that appears during the project life. The presence of undesirable non-native plant species would be assessed annually and identified plant species would be removed by hand. Care would be taken not to disrupt or remove native plants; therefore, maintenance personnel would be trained to differentiate between native and non-native species. All invasive plant control would occur before seeds set, to the maximum extent possible.

During the plant establishment, the newly installed fences would be temporarily closed to the public to protect newly planted vegetation from pedestrian damage. Therefore, the temporary fence closure would be removed after plants are established but only for the east bank, the west bank would only be accessible to maintenance crews. During this establishment phase, the project site would be checked periodically for damage and repaired when appropriate. Following construction and the 1 year establishment of vegetation, the Local Sponsor would be responsible for periodic replacement, watering, and general care of vegetation plantings.

Following the construction and establishment periods, the Corps would utilize the CRAM (California Rapid Assessment Method) technique for long-term habitat assessments to determine the post project success of the restoration effort. The Corps and Local Sponsor would evaluate the success of the stream, vegetation plantings, and exotic vegetation removal.

Annual inspections would need to be performed for minor, moderate and major erosion damage would need to be conducted after each storm event with rainfall magnitudes of anywhere from two to fifty year return frequency and above. Details related to maintenance and monitoring is provided in Section 8.0, Environmental Commitments.

5.7 Operation and Maintenance (O&M) Considerations

The Local Sponsor would assume all long-term project operations, maintenance, repairs, replacements, and rehabilitations following completion of construction and establishment of monitoring activities after five years. Estimated annual operations and maintenance costs total approximately $52,000.

Annual inspections for minor, moderate and major erosion damage would need to be conducted after each storm event with rainfall magnitudes of two to ten year return frequency, ten to fifty-year return frequency, and more than fifty-year return frequency, respectively, would need to be performed. Details related to maintenance and monitoring is provided in Section 8.0, Environmental Commitments.

The operation and maintenance schedule would vary by season and necessity and should include, but not be limited to the following activities: 1) removal of debris from access paths and the stream in flood prone areas; 2) annual assessment and removal of invasive and exotic species within the project area; and 3) maintenance of recreational features and fencing.

A new O&M Manual will be created specifically for ecosystem restoration. It would be a separate O&M Manual rather than the existing LACDA O&M Manual, which was prepared mainly for Flood Control Purposes. The DPR identifies commitments to maintain and monitor the restored area. The Corps Environmental Resources Branch shall make sure that all conditions are included in the O&M Manual.

5.8 Staging Area and Disposal Sites

Possible staging areas include the area within the existing right-of-way located west and east of Tujunga Wash and north of Sherman Way. A total of 3,230 cy will be excavated for construction of the streams and ponds. Approximately 2,584 cy or 80% of material would remain on-site, be distributed within the site, and reshaped and contoured. Approximately 640 cy or 20% of material would be hauled offsite. The Corps shall provide the contractor with potential disposal sites, but ultimately the excavated 646 cy becomes the property of the contractor. These items are typically left to the contractor to determine. The proposed sites would need to be submitted by the contractor and approved to ensure they are suitable. The nearest disposal locations within 30 miles of the project area are listed below.

Figure 5.8-1 Project Water Source, Inlet Connection and Staging Areas

Table 5.8-1 Disposal Site Locations

Facility Name	Address	Permitted Tonnage[1]	Estimated Closure Date[2]
Bradley Landfill	9081 Tujunga Ave. Sun Valley	10,000 tons/day	1/1/2007
Strathern Inert Landfill	8230 Tujunga Ave. Sun Valley	2,700 tons/day	4/5/2021
Calmat Inert Landfill	9436 Glenoaks Blvd. Sun Valley	500 tons/day	1/1/2026

Source: 1 City of Los Angeles, 2003.
2 California Integrated Waste Management Board, 2003.

5.9 DISTRICT ENGINEER'S RECOMMENDATIONS

I recommend that the proposed ecosystem restoration of the 3000 foot long section (approximately 9 acres) of Tujunga Wash is in accordance with the plan selected herein, as authorized by Section 1135 of the Water Resources Development Act of 1986, as amended (P.L. 99-662). The project is located in Los Angeles County, California. The Local Sponsor is the Los Angeles County Department of Public Works (County).

This Detailed Project Report (DPR) satisfies Section 1135 of the Water Resources Development Act (WRDA) of 1986, authorizing the Secretary of the Army to carry out ecosystem restoration and protection if the Secretary determines that the project will improve the quality of the environment, is in the public interest, and is cost-effective.

Alternative 2 is the Recommended Alternative which meets the project purpose and objectives. The proposed restoration area includes two strips of land that are 65-feet wide and approximately 3000 feet long located on both sides of the Tujunga Wash channel between Sherman Way and Vanowen Street. For the vegetation to become successful, a meandering stream parallel to the channel would be constructed on the west bank and would receive water from the eastern branch of the South Pacoima Wash via gravity feed pipeline; no water would be removed from Tujunga Wash. Implementation of this Alternative will increase the habitat value from 0.00 to 7.09. The habitat would consist of approximately 51% riparian vegetation.

The proposed restoration project would connect to two constructed restoration areas: 1) the County's restoration project, which is 6,000 feet long, located between Vanowen Street and Oxnard Street and 2) the Corps' existing Tujunga Greenbelt project, which is 4,200 feet long, located between Oxnard Street and Chandler Boulevard. With the addition of these two projects, the total length of the riparian habitat corridor would increase to 13,200 feet and would provide benefits to wildlife and migratory birds along the Tujunga Wash channel. Increased opportunities for passive recreational uses are also incorporated in the project design. Due to urbanization, riparian habitat is becoming scarce in southern California; restoration of degraded habitat is highly valuable. The Local Sponsor supports the Recommended Alternative which is similar in nature to their restoration area downstream of the proposed project area.

The recommended plan is estimated to have a total first cost of $4,523,120 with a total Federal first cost of $3,359,814, and a total non-Federal first cost of $1,163,306. The Federal costs to carry out such modifications shall not exceed $5,000,000 without specific authorization by Congress. The County has demonstrated that they have the authority and financial capability to provide all non-Federal requirements for the implementation, operation, and maintenance of the project. The Corps and County have been apprised that they are responsible for providing all lands, easements, rights-of-way, relocations, disposal areas, and for 100 percent of operations and maintenance of the constructed project.

This recommendation is made after complete and thorough analysis of problems and opportunities and evaluation of viable alternatives to meet the goal of restoring riparian and wetland habitat and functional capacity. Full consideration has been given to engineering,

environmental, social and other aspects in the overall public interest. Implementing these restoration features and activities under Section 1135 of WRDA 1986 will enable the initiation of Plans and Specifications immediately following South Pacific Division approval of the DPR for the Tujunga Wash Ecosystem Restoration Project.

Prior to the commencement of the Plans and Specifications phase, the non-Federal sponsor must agree to meet the requirements as outlined in this report and execute the Project Cooperation Agreement (PCA). The PCA, based on the Corps model, is being coordinated with the non-Federal sponsor. The County shall also comply with the provision of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980 (42 USC 9601-9675) and hold and save the Department of the Army free from damages arising from the implementation, operation, maintenance, repair, replacement and rehabilitation of the restoration project, except for damages due to the fault of or negligence of the Department of the Army or its contractor.

The recommendations contained herein reflect the information available at this time and current Departmental policies governing formulation of individual projects.

Thomas H. Magness
COL, US Army
District Commander

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SECTION 6

IMPACT ANALYSIS

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SECTION 6 – IMPACT ANALYSIS

This section of the DPR describes the potential impacts of the viable alternatives including the No Action alternative on the human and natural environment. An impact (consequence or effect) is defined as a modification to the human or natural environment that would result from the implementation of an action. These impacts can be either beneficial or adverse, and can be either directly related to the action or indirectly caused by the action (secondary, indirect, or synergistic effects). The effects can be temporary (short-term), long lasting (long-term), or permanent. For purposes of this DPR, temporary effects are defined as those that would last less than 3 years after completion of the action. Long-term impacts are defined as those that would last 3 to 50 years, which is the estimated life of the project.

Impacts can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. The significance of the impacts presented in this DPR is based upon existing regulatory standards, scientific and environmental knowledge, and/or best professional knowledge of the authors of the DPR. The significance of the impacts on each resource will be described as either significant, moderate, insignificant (or negligible), or no impact. Significant impacts are those effects that would result in substantial changes to the environment (as defined by 40 CFR 1500-1508) and should receive the greatest attention in the decision-making process.

The following discussions describe and, where possible, quantify the potential effects of each viable alternative on the resources within or near the project area. These discussions are presented in the same sequential order as they appeared in Section 2 for each alternative carried forward for analysis. Climate and geology would not be affected by, or affect the recommended plan and are not evaluated.

6.1 SOILS & GEOLOGY

Criteria for Evaluation

A significant impact would occur if the proposed project:

- Results in substantial adverse effects to people or structures from geologic conditions including expansive soils, liquefaction, earthquakes, landslides, substantial erosion, depletion of groundwater supplies or interference with groundwater recharge;
- Results in the direct or indirect destruction of a unique geologic feature; or
- Results in the loss of availability of a known mineral resource of local, regional, or state value.

6.1.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

Some temporary disturbances would occur to soils during the grading of slopes and paved areas, and excavation of the gravity fed pipeline and meandering stream. Soil amendments would be added to the existing soil to increase water and nutrient holding capacity and improve aeration and water infiltration. These impacts are expected to be temporary and very negligible in nature.

The graded areas would be planted with species identified in the DPR. Restoration of approximately 7 acres would minimize soil erosion, thus generating beneficial impacts. This alternative would not have any adverse impacts to soils and geological resources or soil conditions.

6.1.2 No Action Plan

During site visits, there were no signs of erosion or soil loss attributable to the existing conditions of the project area. Under the No Action Plan soils would not be removed from the project area and there would be no disturbance to soils.

6.1.3 Future Operation and Maintenance

There would not be any impacts to soils and geology by future operation and maintenance since no heavy excavation would be required by removal of weeds, replanting vegetation, maintaining the irrigation system or clearing the meandering stream of debris.

6.1.4 Environmental Commitments

Standard erosion control measures shall be included in all construction specifications. Environmental commitments for all alternatives include:

SG-1 Minimize exposed soil surfaces in area and in time.

SG-2 Construction would not occur during heavy storms.

6.1.5 Determination of Impacts

No significant impacts would occur with the implementation of the above environmental commitments.

6.2 WATER RESOURCES

Criteria for Evaluation

Impacts to water resources are considered significant if one or more of the following conditions would have a significant impact on surface or groundwater from implementation of one of the project alternatives:

- If the project results in an increase of turbidity during construction, the impact would be considered significant.

- If the project would increase erosion or sedimentation in relation to the existing condition, the impact would be considered significant.

- If the project would release chemicals such as oil and grease into the waters of the

United States, the impact would be considered significant.

6.2.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

No work would be accomplished within the flood control channel or flowing water. Restoration would occur along the banks of the flood control channel. Grading activities may result in loosening the top soils which could be temporarily exposed and susceptible to erosion, especially if large rainfall events occur. With the implementation of BMPs (Best Management Practices) such as sand bags, fiber rolls and silt fences identified in the Storm Water Pollution Prevention Plan (SWPPP) for the project, the potential for sediments to enter the Tujunga Wash through runoff and pollute surface waters would be minimized. Construction would not occur during the rainy season. But in case any rain storms do occur during construction, the project construction would be ceased.

The Recommended Restoration Plan would have beneficial long term effects to the Tujunga Wash and the surrounding neighborhoods. The creation of a riparian habitat from a once barren sand channel bank would help filter out pollutants that may come from stormwater runoff from the nearby parking lots, residential and commercial areas and would minimize pollutants entering groundwater resources.

Through coordination with the Corps Regulatory Branch, it was determined that a Section 404 Permit and a Section 404(b)(1) analysis would not be needed since no discharge or fill of material would be placed into waters of the United States during construction or future maintenance operations. The selected Alternative impacts no waters of the United States. It results in the addition of more habitat units (HU) than any other alternative investigated. Alternative 2 is the preferred alternative.

6.2.2 No Action Plan

Under the No Action Plan, surface and ground water would continue to be affected by stormwater runoff. The potential for the deterioration of the barren channel banks and runoff going into the Tujunga Wash would continue.

6.2.3 Future Operation and Maintenance

There would be no impacts to water resources by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not dispose of any fill into any waters of the United States.

6.2.4 Environmental Commitments

WR-1 The construction contractor shall obtain a National Pollution Discharge Elimination System (NPDES) construction storm water permit.

WR-2 The construction contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) to reduce the potential for accidental release of fuels, pesticides, and other materials. The construction contractor shall submit a Notice of Intent (NOI) to the California Water Resources Board in Sacramento. The SWPPP would be reviewed and approved by the Corps team members, including ERB and Engineering. This plan will include the designation of refueling locations, emergency response procedures, and definition of reporting requirements for any spill that occurs. Equipment for immediate cleanup will be kept at the staging area for immediate use. This plan will also include pesticide application activities such as storage, handling of herbicides, and application methods.

WR-3 Construction contractors shall implement Best Management Practices (BMPs) to prevent erosion and sedimentation to avoid significant adverse impacts to surface water quality.

WR-4 During the rainy season, the project construction would cease during rain events.

WR-5 Project construction will be monitored by Corps environmental PDT members.

6.2.5 Determination of Impacts

With the implementation of the above environmental commitments, the project construction related impacts would not have an adverse effect to water quality.

6.3 BIOLOGICAL RESOURCES

Criteria for Evaluation

Impacts to biological resources are considered significant if one or more of the following conditions would result from implementation of one of the project alternatives:

- Substantial loss of species diversity in natural vegetation and wildlife habitat.
- Loss of habitat that is regionally unique, declining, or designated sensitive by resource agencies.
- Disturbances to populations or breeding areas of listed threatened or endangered species, or reduction in the foraging habitat for threatened or endangered species.
- Significant disruption of wildlife corridors.

An evaluation of whether an impact on biological resources would be substantial must consider the resource and how that resource fits into a regional or ecological context. Impacts are sometimes locally important but not regionally significant; although they may result in an adverse alteration of existing conditions at the project site, they may not substantially diminish, or result in the permanent loss of, that resource on a population-wide or region-wide basis.

6.3.1 Wildlife Habitat

6.3.1.1 Alternative 2 (NER/Recommended Restoration Plan)

The restoration plan will involve restoration of riparian/native vegetation on both sides of the channel. Both banks will be planted with native plant assemblages that historically occur in riverine and alluvial fan areas of southern California. Included will be trees such as California sycamore (*Platanus racemosa)* and coast live oak (*Quercus agrifolia* var. *agrifolia)* and shrubs such as California brittlebush (*Encelia californica*) and California sage (*Artimesia california*). All species selected for planting are California Natives and are available at local nurseries. A meandering stream will be constructed on the west bank, which would provide a natural water supply to the planted vegetation. This side of the channel will be fenced with no public access to allow for sustainability of the habitat. The east side of the channel will include a temporary irrigation system that will help establish the native vegetation. This side of the channel will be designed with public access, which provides passive recreation features. A walking path, interpretive signage and seating will be incorporated. Access roads will be maintained along both sides of the channel for maintenance purposes. The maintenance road on the east bank will be used as a multipurpose trail. Table 6.3-1 shows the plant acreages for Alternative 2.

Table 6.3-1 Alternative 2 Plant Acreages

Alternative 2	West Terrace	East Terrace	Total
Aquatic/Emergent	0.013	0	0.013
Cottonwood-willow	0.42	0.42	0.84
Sycamore riparian	0.17	0.17	0.34
Alluvial fan sage scrub	1.75	1.75	3.5
Meadow	1.13	1.48	2.61
Vegetation Subtotal	***3.48***	***3.82***	***7.3***
Maintenance Road	0.68	0.68	1.36
Meandering Stream	0.34	0	0.34
Total	***4.5***	***4.5***	***9***

The greatest benefit to the wildlife and sensitive species will occur at approximately 50% overstory canopy coverage. To achieve this, approximately 50 container plants per acre would be planted. At maturity, the average height of the deciduous shrub canopy will be approximately 6.6 feet (2 m). Understory canopy coverage will be approximately 50% at maturity. This will be achieved by planting approximately 165 container shrubs per acre along with small perennials at approximately 245 container plants per acre. The understory canopy could then be supplemented by the application of a herbaceous seed mix applied at approximately 1-3 pounds live seed (PLS) per acre.

Micro-basins for stormwater harvesting would be contoured into discrete areas of the east bank at a maximum depth of three (3) feet in order to support native plants including hydrophytic shrubs. In addition, irrigation will be added to supplement seasonal rains.

Special attention will be given to the size and shaped of the habitat created by the landscape design. Every effort will be made to reduce the edge effect of the planned habitat patches which can lead to increased depredation of resident and transient species.

Additional benefits for species habitat as discussed in the HEP analysis in Appendix B1 gives the existing conditions 0 habitat units. Once the project is completed and established, the project would provide 7.09 habitat units.

6.3.1.2 Alternative 3

Alternative 3's acreages of the various plant species would differ due to the outlet of the stream connecting to the channel wall instead of the County's downstream restoration project.

When subtracting the service roads (1.36 acres) and single naturalized stream (0.34 acres) from the total of 9 project acres, the remaining 7.30 acres of land would be restored. By implementing this alternative total 5.59 HUs would be generated.

Table 6.3-2 Alternative 3 Plant Acreages

Alternative 3	West Bank	East Bank	Total
Aquatic/Emergent	0.013	0	0.013
Cottonwood-willow	0.21	0.21	0.42
Sycamore riparian	0.085	0.085	0.17
Alluvial fan sage scrub	1.75	1.75	3.5
Meadow	1.42	1.78	3.2
Total	3.48	3.82	7.3

6.3.1.2 No Action Plan

Under a plan of no action the project location would remain barren and biologically unproductive.

6.3.2 Endangered and Threatened Species

Many of the species historically present in project area are now locally extinct. Remnant populations of many species can be found in isolated patches throughout southern California. This project is part of the larger plan of returning southern California to a more natural state that can support a multitude of habitat types and the species that rely on them.

6.3.2.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

This project results in the creation of habitat suitable for several wildlife species, provides habitat for migratory birds and provides a wildlife corridor. Once the habitat is mature, there is a potential to support species such as the California newt (*Taricha torosa torosa*), least Bell's vireo (*Vireo beli pusillus*), loggerhead shrike (*Lanius ludovicianua*), and Nevin's barberry

(*Berbis nevinii*). There are no impacts to biological resources because there are no endangered species or habitat currently present in the project area.

6.3.2.2 No Action Plan

A plan of no action would provide no new habitat for endangered, threatened or commonly found migratory species.

6.3.3 Future Operation and Maintenance

There would be no impacts to biological resources by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not affect any endangered or threatened species or habitat.

6.3.4 Environmental Commitments

BR-1 The Corps and project sponsors shall retain a qualified on-site biologist(s) on site to review grading and revegetation plans; supervise all grading and planting, excavation, and other ground disturbing activities and oversee all aspects of construction monitoring that pertain to biological resource protection.

BR-2 Construction shall occur only during daylight hours, if possible, to minimize disturbances to any urban wildlife species that move primarily at night.

BR-3 Unpaved areas shall be watered as needed (or other measures implemented) to control dust on a continual basis.

BR-4 Wherever possible, construction personnel shall utilize existing access roads or previously disturbed areas to reach the project area or stage their vehicles and equipment.

6.3.5 Determination of Impacts

The proposed project is beneficial to the ecosystem. The main objective of the Proposed Project is to restore degraded habitat under the Section 1135 Authority. The proposed project will generate habitat that will benefit wildlife movement, bird species and migratory birds. More importantly, the project would generate greater value for the wildlife corridor because it would extend the County's restoration project by connecting to the Federal project. The project would increase the habitat values from 0 to 7.09 HUs. During construction, short term impacts could occur, but they would be minimal. The above mitigation measures would be implemented to ensure restoration would occur as identified in the DPR.

6.4 LAND USE, AESTHETIC and RECREATIONAL RESOURCES

Criteria for Evaluation

An alternative would have a significant impact on Land Use if it would cause:
- Incompatibilities with surrounding or onsite uses
- Inconsistencies with plans or policies

An alternative would have a significant impact on Aesthetics if it would cause:
- Substantially and permanently degraded the existing visual character or quality of the site and its surroundings,
- Created a permanent new source of light or glare which would adversely affect day or nighttime views in the area.

An alternative would have a significant impact on Recreational Resources if it would cause:
- Degrade or displace existing recreational facilities
- Permanently disrupt existing recreational facilities
- Temporarily cause the closure of an entire recreational facility

6.4.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

Land Use:
The proposed project would be consistent with the County's General Plan and Policies. It would not alter existing land uses. Currently, the existing area is restricted to the public but once construction is completed, public access would be available along the eastern terrace. The project is an open space area and would remain as an open space area after construction. The proposed project would not have any impacts to Land Use resources.

Aesthetics:
The proposed project would have beneficial effects to scenic and aesthetic resources. Upon the removal of the exotic vegetation and rusted chain link fencing, the safety of visitors would be greatly improved. Also, the replacement of these features with riparian habitat and stronger, newer fencing would greatly enhance the scenic and aesthetic value of the area. The proposed project would not have any impacts to Aesthetic resources.

Recreation:
The proposed project would provide a connection to the existing trails of the Local Sponsor's restoration project. The existing area currently consists of two restricted barren channel banks. Upon construction completion, the proposed project would allow the local community to walk up and down an ecologically restored greenway along the east bank. Recreation features will be passive but the site could serve as the venue for nature observation and educational meetings. The restoration would be consistent with the General Plan and Policies of the County. The proposed project would not have any impacts to Recreational resources.

6.4.2 No Action Plan

Under the No Action Plan, the degrading barren channel banks would continue to detract from the recreational, scenic and aesthetic resources of the area. The proximity of Tujunga Wash to the Van Nuys urban area and the efforts of the local community to educate the public about the importance of riparian habitats all contribute to the value of this natural resource. Under the No Action Plan, the Tujunga Wash would remain a barren strip of soil that would remain off limits to visitors and detract from the aesthetic value of the urban setting.

6.4.3 Future Operation and Maintenance

There would be no impacts to land use, aesthetic and recreational resources by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not close any recreational trails, degrade the surrounding habitat or create unexpected land usage of the project.

6.4.4 Determination of Impacts

With the implementation of the above environmental commitments, the project construction related impacts would not have an adverse effect to Land Use, Aesthetic or Recreational Resources.

6.4.5 Environmental Commitments

LU-1 Construction contractors shall keep construction and staging areas orderly, free of trash and debris.

6.5 CULTURAL RESOURCES

Based on investigations conducted by Los Angeles District archeological staff, the Corps has determined that there are no historic properties within 1 mile of the Tujunga Wash project APE. Due to the thick layer of fill used at the time of initial construction, no historic properties will be affected by the proposed undertaking.

Criteria for Evaluation

Criteria for the evaluation of effects to National Register properties are found in 36 CFR 800.9, *Criteria of Effect and Adverse Effect*. These include:

- An undertaking has an effect on a historic property when the undertaking may alter characteristics of the property that may qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of a property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.
- An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials,

workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction; and
- Transfer, lease, or sale of the property.

- Effect of an undertaking that would otherwise be found to be adverse may be considered as being not adverse for the purpose of these regulations;
  - When the historic property is of value only for its potential contribution to archeological, historical, or architectural research, and when such value can be substantially preserved through the conduct of appropriate research, and such research is conducted in accordance with applicable professional standards and guidelines;
  - When the undertaking is limited to the rehabilitation of buildings and structures and is conducted in a manner that preserves the historical and architectural value of affected historic property through conformance with the "Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings," or;
  - When the undertaking is limited to the transfer, lease, or sale of a historic property, and adequate restrictions or conditions are included to ensure preservation of the property's significant historic features.

6.5.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

Based on the Corps' identification efforts to date, there are no historic properties within the APE. However, whenever a project involves ground disturbance in previously undisturbed soil, there is a chance that buried cultural resources could be unearthed. The Recommended Plan involves the construction of a meandering stream. If the construction of the meandering stream involves excavation into previously undisturbed soil, it is possible that the project could impact buried cultural resources.

6.5.2 No Action Plan

With the No Action Alternative, there is no potential to cause impacts on historic properties since no action will be taking place.

6.5.3 Future Operation and Maintenance

There would be no impacts to cultural resources by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not disturb any historic properties.

6.5.4 Environmental Commitments

CR-1 Any earthmoving that will involve previously undisturbed soil will be monitored by a qualified archeologist who meets the Secretary of Interior's Standards for an Archeologist (see 36 CFR Part 61). Earthmoving includes grubbing and ground clearing, grading, and excavation activities. If a previously unidentified cultural resource (i.e., property) that may be eligible for the National Register of Historic Places is discovered, all earthmoving activities in the vicinity of the discovery shall be diverted until the Corps complies with 36 CFR § 800.13(a)(2).

6.5.5 Determination of Impacts

After the implementation of the above mitigation measures, the alternatives would not significantly affect cultural resources.

6.6 AIR QUALITY

NEPA Significance Criteria

The General Conformity Rule applicability emission thresholds shown in Table 6.6-1 would apply to those areas in nonattainment of the National Ambient Air Quality Standards (NAAQS).

Table 6.6-1 SCAB General Conformity Thresholds

NOx and VOC	PM10	CO and PM2.5 and SO_2	CO_2 Equivalent
25 tons/year	70 tons/year	100 tons/year	7000 tons/year

Per Section 176(c) of the Clean Air Act Amendments (CAAA) of 1990, the Corps must make a determination of whether the proposed project (i.e., Proposed Action) "conforms" with the State Implementation Plan (SIP). The total direct and indirect emissions from the proposed project are below the General Conformity Rule *de minimis* emission thresholds, therefore the proposed project is exempt from performing a comprehensive Air Quality Conformity Analysis, and would be considered to be in conformity with the SIP and have less than significant impacts.

The SCAQMD has established regional thresholds of significance for construction activities as shown below in Table 6.6-2 that will be used for NEPA and CEQA.

Table 6.6-2 SCAQMD Air Quality Regional Thresholds	
Criteria Pollutant	**Construction Emissions lbs/day**
Carbon Monoxide (CO)	550
Oxides of Nitrogen (NOx)	100
Particulate Matter (PM10)	150
Fine Particulate Matter (PM2.5)	55
Oxides of Sulfur (SOx)	150
Volatile Organic Compounds (VOC)	75

Source: SCAQMD 2007.

Criteria for Evaluation

For this analysis, the proposed project may result in significant impacts if:

- The project would be inconsistent with the current approved Air Quality Management Plan.
- The project would result in non-compliance with the Federal General Conformity Rule (40 CFR Parts 6, 51, and 93) requirements as defined in Table 6.6.1.
- The project would generate emissions of air pollutants that would exceed any SCAQMD regional air quality standard as defined in Table 6.6-2.
- The project would exceed 7000 tons of CO_2 equivalent.

6.6.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

The only impacts to air quality expected from the Recommended Restoration Plan alternative would be emissions generated by heavy equipment during construction activities. Increased emissions that would impact ambient air quality during construction activities are expected to be short-term and can be reduced further through proper equipment maintenance. Because the use of heavy equipment during grading the project area to establish plant species will be limited in number and duration, emissions are expected to be minimal and below the *de minimus* thresholds and thus would not violate National or State standards. As a result, the Recommended Restoration Plan alternative would have no long-term impacts on local or regional air quality.

Air quality analysis revealed that the installation of the proposed project would not exceed State or Federal standards. Emissions from construction equipment are calculated based on the equipment provided in Appendix D, Table D-7. About 16 construction workers per day would travel to the construction site. The construction workers would be coming from an average radius of about 30 miles. Emissions generated by the construction workers are presented in Appendix D, Table D-5. Finally, it is assumed that the total daily vehicle miles traveled (VMT) by construction trucks would be 20 miles. This would result in the daily emission levels shown in Appendix D, Table D-3. Total daily emission generated by the entire construction activity per day would be 17.94 pounds CO, 5.49 pounds VOC, 41.22 pounds NOx, 0.04 pounds SOx, 20.39 pounds of PM_{10} and 6.92 pounds of $PM_{2.5}$. All of these emission levels are below state and federal standards and are explained in Appendix D, Table D-6.

Annual emission levels are shown in Appendix D, Table D-6. Considering the worst-case scenario of construction, the project would result in emissions of 0.42 tons per year of CO, 0.09 tons of VOC per year, 0.49 tons of NOx per year, 0.001 tons of SOx per year, 0.58 tons of PM_{10} per year, and .11 tons of $PM_{2.5}$ per year. As shown in Appendix D, Table D-6, these levels are all well below the federal standard. Construction impacts would be short term and, therefore, project construction would not have any significant impacts on air quality. There is no long-term impact anticipated from the installation of the pipeline.

The significant criteria for GHG are currently being updated/developed by the resource agencies. There are some direct emissions for CO_2 equivalent for construction for this project. The calculations are shown in Appendix D, Table D-9. The quantities of CO_2 for the project are 4.31 tons and are below the current threshold of 7000 metric tons. Indirect emissions are more of an issue for projects with ongoing electricity consumption such as a housing or industrial complex project. The indirect GHG impact for this type of project would be beneficial and likely incalculable based on the ecosystem restoration of the project. The long term project will have beneficial impacts due to vegetation consuming the CO_2.

Table 6.6-3 Emissions Table Summary

	CO	VOC	N0x	S0x	PM10	PM 2.5	CO2E
Pounds Per Day	17.94	5.49	41.22	0.04	20.39	6.92	8617
Daily Threshold	550	75	100	150	150	55	n/a
Exceed (Yes/No)	No	No	No	No	No	No	n/a
	CO	**VOC**	**N0x**	**S0x**	**PM10**	**PM 2.5**	**CO2E**
Tons Per Year	0.42	0.09	0.49	0.001	0.58	0.11	4.31
Annual Threshold	100	25	25	100	70	100	7000
Exceed (Yes/No)	No	No	No	No	No	No	No

6.6.2 Determination of Conformity

Based on the air quality analysis described in Appendix D, Tables D-1 through D-9, the proposed project will not have a significant impact on air quality. The total emissions of each criteria pollutant either meets or is below *de minimus* levels as prescribed in 40 CFR 93.153(b). Therefore, this proposed project conforms to the Federal Clean Air Act as amended 1990 and, as required, a Record of Non-Applicability has been prepared instead of a conformity determination and is located in Appendix D.

6.6.3 No Action Plan

There would be no operation associated with the project area and would not affect air quality in the area and would not be altered as part of the No Action Plan.

6.6.4 Future Operation and Maintenance

There would be no impacts to air resources by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and

removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not create any major long term pollutants into the environment.

6.6.5 Environmental Commitments

Implementation of Environmental Commitments AQ-1 through AQ-3 would reduce construction impacts to air quality in the SCAQMD to the maximum degree feasible. The proposed project's NOx, VOC, PM_{10}, and $PM_{2.5}$ emissions, even after implementation of these feasible mitigation measures, would remain below the SCAQMD daily significance threshold values. Therefore, the daily emissions from this alternative would not cause significant and unavoidable impacts.

AQ-1 Develop and Implement a Fugitive Dust Emission Control Plan. The project developer shall develop and implement a Fugitive Dust Emission Control Plan (FDECP) for construction work. Measures to be incorporated into the plan shall include, but are not limited to the following:

- Water the unpaved road access and other disturbed areas of the active construction sites at least three times per day, or apply CARB certified soil binders.
- If possible, install wheel washers/cleaners or wash the wheels of trucks and other heavy equipment where vehicles exit the site or unpaved access roads.
- Increase the frequency of watering, or implement other additional fugitive dust mitigation measures, to all disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 miles per hour (mph).
- Travel route planning shall be completed to identify required travel routes to minimize unpaved road travel to each construction site to the extent feasible.

AQ-2 Restrict engine idling. Diesel engine idle time shall be restricted to no more than 10 minutes duration. This is not required for trucks that require engines to be on while waiting onsite, such as concrete trucks.

AQ-3 Use on-road vehicles that meet California on-road standards. All on-road construction vehicles working within California shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.

6.6.6 Determination of Impacts

The operating and construction impacts for all of the alternatives are less than significant and do not require mitigation. Impacts related to air quality are temporary and minimum and do not require mitigation.

6.7 NOISE

Operation of equipment used during the restoration, stream and pipeline construction would temporarily increase noise levels to well in excess of ambient noise levels. The construction

noise would vary with the particular construction stage in progress due to the different pieces of construction equipment being used.

Criteria for Evaluation

The proposed action would result in significant noise impacts during construction if operational noise does not occur in accordance with applicable local noise ordinances. The contractor shall comply with local noise ordinance restrictions on construction activity.

6.7.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

Temporary construction noise impacts would occur with the Recommended Restoration Plan. Short-term noise impacts would be expected from the operations of necessary equipment needed to complete the demolition and removal of hard structures and installation of soil and vegetation. No noise impacts are expected once the project is completed.

6.7.2 No Action Plan

There would be no operation associated with the project area and would not contribute to noise levels in the area and would not be altered as part of the No Action Plan.

6.7.3 Future Operation and Maintenance

There would be no impacts to noise by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not require heavy duty machinery that would create loud long term noise.

6.7.4 Environmental Commitments

N-1 Construction activities shall comply with local ordinances. Any nighttime or weekend construction activities shall be coordinated with local ordinances and shall require the construction contractor to obtain a noise permit.

N-2 All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engine driven equipment shall be fitted with well maintained mufflers in accordance with manufacturer's recommendations.

N-3 Surrounding residents will be notified of the project construction.

6.7.5 Determination of Impacts

Implementation of the proposed action would not result in significant noise impacts

6.8 HAZARDOUS MATERIALS

Criteria for Evaluation

The project would have significant impacts if it conflicted with CERCLA or RCRA.

6.8.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

TPHg (Total petroleum hydrocarbons as gasoline), TPHd (total petroleum hydrocarbons as diesel), TRPH (total recoverable petroleum hydrocarbons), oxygenates, and VOCs (volatile organic compounds) including BTEX (Benzene, Toluene, Ethylbenzene, and Xylenes) and MTBE(methyl tertiary butyl ether) were not detected in the analytical testing above the respective reporting limits for any of the soils samples. Soil beneath the site is not impacted by gasoline, diesel, TRPH, oxygenates, or VOCs (including BTEX or MTBE). No special handling is anticipated for the subsurface soil that will be encountered during construction for the subject project. Based on the information presented, there are no environmental concerns that would preclude the proposed design and construction of the project. Implementation of the proposed project would not generate any HTRW substance, therefore, there would not be any impacts.

6.8.2 No Action Plan

Under the no action plan, the surrounding soils would remain barren and undisturbed thus providing no environmental concerns.

6.8.3 Future Operation and Maintenance

There would be no impacts to HTRW materials by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not dispose of any contaminants into any waters of the United States or in the surrounding environment.

6.8.4 Environmental Commitments

The project is not in conflict with CERCLA or RCRA so environmental commitments are not required.

6.8.5 Determination of Impacts

The project is not in conflict with CERCLA or RCRA, therefore the project does not have significant impacts.

6.9 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

Criteria for Evaluation

The proposed project would result in a significant socioeconomic impact if the following were to occur:

- A substantial long-term decrease in local employment due to direct loss of jobs or an adverse effect on the local economy that results in an indirect long-term loss of jobs.
- A shortage of temporary housing during project construction caused by construction workers seeking local accommodations that prevents normal users from being able to obtain temporary housing in the area. Temporary housing would include motels, hotels, campgrounds, RV parks, dormitories, and similar lodging.
- Disproportionately high and adverse impacts on minorities, low-income residents, or children.
- A substantial population growth in an area was induced by the project.
- Substantial numbers of existing housing or people were displaced.

6.9.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

6.9.1.1 Socioeconomics

The implementation of the Recommended Restoration Plan would have temporary, beneficial impacts to the income of the area during construction of the project. With improvement to the general aesthetics, safety, and educational opportunities provided by the recommended restoration plan, it is possible that visits to the Tujunga Wash by both locals, construction workers and tourists would increase. This increase of visitors and workers would provide minimal, long-term benefits to local businesses and the general economy of Van Nuys. Therefore, no impacts on socioeconomics are expected to occur.

6.9.1.2 Environmental Justice

No impacts are anticipated to the population or racial mix of the area. The project area is already fully built out with residential homes on both sides of the channel thus no growth inducement impacts are expected. The project will not cause any relocation of housing for any people in the project area. No impacts are anticipated to the number of jobs, unemployment, or poverty levels within the region of impact. Beneficial health impacts and passive recreational opportunities are anticipated for all populations, including potential minority and low-income populations, as well as children. Therefore, no impacts on environmental justice are expected to occur.

6.9.2 No Action Plan

Under the No Action Plan, socioeconomic indicators would remain unchanged.

6.9.3 Future Operation and Maintenance

There would be no impacts to socioeconomics or environmental justice by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would not negatively affect the economy, housing or job incomes of the surrounding community.

6.9.4 Environmental Commitments

There were no population, housing, employment, business or tax revenue impacts identified, therefore, no environmental commitments are implemented.

6.9.5 Determination of Impacts

There were no population, housing, employment, business or tax revenue impacts identified, therefore, no impacts are anticipated.

6.10 TRAFFIC

Criteria for Evaluation
An impact would be considered significant if any of the following would occur:

- A major roadway (arterial or collector classification) would be closed to through traffic as a result of project activities and there would be no suitable alternative route available

- An increase in roadway wear in the vicinity of the work zone would occur as a result of heavy truck or equipment movements, resulting in noticeable deterioration of roadway surfaces

- Project activities or operation of the project would result in safety problems for vehicular traffic, transit operations, or trains

- An increase in vehicle trips associated with additional commuter and truck trips would result in an unacceptable reduction in the level of service (LOS) standards of local jurisdictions in the project vicinity

6.10.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

Construction would last for a duration of approximately four to six months. During construction of the project, the method of open cut trenching will be used to install the 18-inch diameter HDPE bypass pipeline, including the section of pipe crossing Sherman Way. Cast-in-place method will be used to install the drop down intake structure and concrete headwalls. This has the potential to temporarily disrupt traffic flow on those street segments affected by construction, as well as adjacent roadways. As previously discussed, traffic conditions in this area of Los Angeles are generally congested. The lane closure would result in less traffic capacity on the

affected roadway. However, it is anticipated that construction of the pipeline would be completed within less than a month. Thus, traffic impacts along any one street segment or at any intersection would be temporary and, thus, less than significant. After completion of construction, the project would not affect traffic flow in any way.

6.10.2 No Action Plan

No impacts to traffic would be incurred under the No Action Alternative. Mitigation is not required.

6.10.3 Future Operation and Maintenance

There would be no impacts to traffic by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and fencing would cause any traffic delays along Sherman Way and/or Vanowen Street or any other major streets and highways in surrounding project area.

6.10.4 Environmental Commitments

The following recommended mitigation measures to reduce the transportation/traffic impacts should be adhered to.

TT-1 Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.

TT-2 Measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.

TT-3 Roads designated for truck traffic shall be used for truck traffic and movement of heavy equipment.

TT-4 The selected contractor shall coordinate with the transportation department of the applicable jurisdiction in order to implement standard construction traffic controls, such as the posting of notices, signage, detours, flag men and other appropriate measures along Sherman Way and Vanowen Street.

TT-5 The construction contractor shall receive any applicable permits from the City of Van Nuys, Los Angeles and/or Los Angeles County.

6.10.5 Determination of Impacts

Implementation of the above recommended environmental commitments would reduce the transportation/traffic impacts to a level of insignificance.

6.11 UTILITIES

Criteria for Evaluation
The proposed project would have a significant impact on utilities and service systems if it would:

- Require a substantial modification to existing facilities or services that would have an adverse environmental impact on sensitive resources or land uses or

- Create a hazardous situation that could not be mitigated

6.11.1 Alternative 2 (NER/Recommended Restoration Plan) and Alternative 3

As is the case for traffic, the pipeline and ecosystem features will be installed along existing right-of-ways along the Tujunga Wash channel. Method of open cut trench will be used to install the 18-inch diameter HDPE bypass pipeline, including the section of pipe crossing Sherman Way. Cast-in-place method will be used to install the drop down intake structure and concrete headwalls. This has the potential to temporarily disrupt utilities on those street segments affected by construction but the pipeline is designed to go between existing utility lines via squash box. It is anticipated that construction of the pipeline would be completed within less than a month. The only other utility along the right-of-way portions along the Tujunga Wash are existing power lines that lie along the walls bordering the residential homes. These power lines will not be affected by construction of the stream or pipeline. Thus utility impacts along any segment of the street or right-of-way would be temporary and, thus, less than significant. After completion of construction, the project would not affect utilities in any way.

Interference with Existing Underground Utilities
As described in Section 2.11 above, various utility lines are located within existing street rights-of-way in the project area. Utilities that may be affected by construction include water lines, sewer lines, electricity lines, gas lines, telephone lines, and cable lines. There is one power line located along the west side of the west bank and would not be impacted. However, during Plans and Specifications, it will ensure that no utility lines would be damaged during project construction. Coordination and notification with utility service providers, as outlined in Environmental Commitments U-1, U-2, and U-3, would minimize interference with existing lines and interruption of service. With implementation of mitigation measures, construction impact on utilities would be less than significant.

6.11.2 No Action Plan

Under the no action alternative, no utilities would be disturbed or relocated therefore having no impacts to the project at all.

6.11.3 Future Operation and Maintenance

There would be no impacts to utilities by future operation and maintenance since the removal of debris from access paths and the meandering stream, the annual assessment and removal of invasive and exotic species within the project area, and maintenance of recreational features and

fencing would not shut down or damage any existing utility lines in the project area and are out of flood prone areas.

6.11.4 Environmental Commitments

In order to avoid conflicts with existing utilities, the following environmental commitments are recommended.

Construction Impact on Underground Utilities

U-1 During the preliminary design phase of each project component, the utility service providers would be consulted to identify existing and proposed buried facilities in affected roadways and to determine which utilities require relocation and which can be avoided. If relocation is required, the appropriate utility service provider will be consulted to sequence construction activities to avoid or minimize interruptions in service. The Local Sponsor and its contractor shall comply with permit conditions and such conditions shall be included in the contract specifications.

U-2 If utility service disruption is necessary, residents and businesses in the project area will be notified a minimum of two to four days prior to service disruption through local newspapers, and direct mailings to affected parties.

U-3 The contractor will be required to excavate around utilities, including hand excavation as necessary, to avoid damage and to minimize interference with safe operation and use. Hand tools must be used to expose the exact location of buried gas or electric utilities.

U-4 Prior to construction during the Plans and Specifications phase, utility locations shall be verified through field surveys.

6.11.5 Determination of Impacts

Implementation of the above recommended environmental commitments would reduce the utility and service systems impacts to a level of insignificance.

6.12 CUMULATIVE EFFECTS

Within a radius of 10 miles, there are several ongoing activities occurring in the vicinity of the proposed project area. These projects include the following:

1. L.A. River Ecosystem Restoration

This is a feasibility-level environmental restoration study located along the 32 mile L.A. River. There are 5 potential restoration sites located along the river and are currently being studied. It is located at downstream end of the Tujunga Wash channel. The Tujunga Wash is a tributary to the L.A. River thus would add benefits to the overall ecosystem restoration project.

2. Hansen Dam Corps Project

Hansen Dam is a constructed flood control project that is north of the Tujunga Wash project. Water flows are released from Hansen Dam and flow into the Tujunga Wash. The Dam is approximately 4 miles north of the project area. The Dam contains several pools and lakes that are used for recreational purposes.

3. Headworks Restoration Project

This is a feasibility-level environmental restoration study located at the Headworks site, a groundwater recharge facility previously withdrawn from use. It is located immediately downstream of the confluence of the Tujunga Wash and the Los Angeles River.

6.12.1 Recommended Restoration Plan

The combined impacts of the restoration project and other proposed projects would result in beneficial impacts to biological resources. The project would contribute to expanding habitat for wildlife movement. The restoration activity would play a part in the habitat connectivity of the L.A. River Ecosystem Restoration project. Apart from biological resources, cumulatively the project would contribute beneficial indirect impacts on water quality and groundwater recharge.

All these projects are located within approximately a 10 mile radius. If all the proposed projects were scheduled simultaneously, air quality, noise and traffic could result in adverse affected impacts within that region. Projects that include substantial construction activities have the potential to increase cumulative impacts on air quality, noise and traffic. However it is expected that projects listed above may not occur at the same time, thus cumulative impacts could be minimized. The proposed project is very small in nature and would not result in adding a significant percentage of impacts to environmental resources.

The probability of an impact on traffic congestion along Sherman Way or Vanowen Street would be very minimal or none at all because the projects are miles apart in distance. However, the proposed restoration project would result in long-term beneficial effects to biological resources as well as reduce the adverse affects of other proposed projects through the creation of a connecting corridor along the Los Angeles River to Hansen Dam. Cumulative impacts resulted from implementation of the proposed project would be minimal. Cultural resources would be protected by the proposed restoration plan and other projects in the area are not likely to affect these resources, thus there are no cumulative effects.

The significant criteria for GHG are currently being updated/developed by the resource agencies. There are some direct emissions for CO_2 equivalent for construction for this project. The quantities of CO_2 for the project are 4.31metric tons and are below the current threshold of 7000 metric tons. Indirect emissions are more of an issue for projects with ongoing electricity consumption such as a housing or industrial complex project. The indirect GHG impact for this type of project would be beneficial and likely incalculable based on the ecosystem restoration of the project. The long term project will have beneficial impacts due to vegetation consuming the CO_2 thus there are no cumulative effects.

6.12.2 No Action Plan

Under the No Action Plan, improvements to habitats along the Tujunga Wash would not be made. Without the proposed restoration project, pollution from within and outside the project area would continue to degrade. Therefore, the No Action Plan would directly contribute to the degradation of the existing environment along Tujunga Wash on its own and to the cumulative affects of existing conditions and proposed projects in the area.

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SECTION 7

ENVIRONMENTAL COMMITMENTS

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SECTION 7 – ENVIRONMENTAL COMMITMENTS

This section describes the environmental commitments that would be implemented as part of the proposed restoration project for the Tujunga Wash and surrounding area. Due to the limited nature of disturbance, the proposed restoration activities are not expected to cause any long term adverse effects. The environmental commitments discussed below would decrease the severity of any short-term or temporary project related activities on resources.

All construction equipment would be maintained and fueled outside of the project area to prevent any spills from affecting water resources. Construction activities would be performed with careful staging of heavy equipment near the Tujunga Wash channel. Inspections would be made for leaking fluids and any other maintenance work that may be needed on construction vehicles.

7.1 Soils & Geology

SG-1 Minimize exposed soil surfaces in area and in time.

SG-2 Construction would not occur during heavy storms.

7.2 Water Resources

WR-1 The construction contractor shall obtain a National Pollution Discharge Elimination System (NPDES) construction storm water permit.

WR-2 The construction contractor shall prepare a Storm Water Pollution Prevention Plan (SWPPP) to reduce the potential for accidental release of fuels, pesticides, and other materials. The construction contractor shall submit a Notice of Intent (NOI) to the California Water Resources Board in Sacramento. The SWPPP would be reviewed and approved by the Corps team members, including ERB and Engineering. This plan will include the designation of refueling locations, emergency response procedures, and definition of reporting requirements for any spill that occurs. Equipment for immediate cleanup will be kept at the staging area for immediate use. This plan will also include pesticide application activities such as storage, handling of herbicides, and application methods.

WR-3 Construction contractors shall implement Best Management Practices (BMPs) to prevent erosion and sedimentation to avoid significant adverse impacts to surface water quality.

WR-4 During the rainy season, the project construction would cease during rain events.

WR-5 Project construction will be monitored by Corps environmental PDT members.

7.3 Biological Resources

BR-1 The Corps and project sponsors shall retain a qualified on-site biologist(s) on site to review grading and revegetation plans; supervise all grading and planting, excavation, and other ground disturbing activities and oversee all aspects of construction monitoring that pertain to biological resource protection.

BR-2 Construction shall occur only during daylight hours, if possible, to minimize disturbances to any urban wildlife species that move primarily at night.

BR-3 Unpaved areas shall be watered as needed (or other measures implemented) to control dust on a continual basis.

BR-4 Wherever possible, construction personnel shall utilize existing access roads or previously disturbed areas to reach the project area or stage their vehicles and equipment.

7.4 Land Use, Aesthetics and Recreation

LU-1 Construction contractors shall keep construction and staging areas orderly, free of trash and debris.

7.5 Cultural Resources

CR-1 Any earthmoving that will involve previously undisturbed soil will be monitored by a qualified archeologist who meets the Secretary of Interior's Standards for an Archeologist (see 36 CFR Part 61). Earthmoving includes grubbing and ground clearing, grading, and excavation activities. If a previously unidentified cultural resource (i.e., property) that may be eligible for the National Register of Historic Places is discovered, all earthmoving activities in the vicinity of the discovery shall be diverted until the Corps complies with 36 CFR § 800.13(a)(2).

7.6 Air Quality

AQ-1 Develop and Implement a Fugitive Dust Emission Control Plan. The project developer shall develop and implement a Fugitive Dust Emission Control Plan (FDECP) for construction work. Measures to be incorporated into the plan shall include, but are not limited to the following:

- Water the unpaved road access and other disturbed areas of the active construction sites at least three times per day, or apply CARB certified soil binders.
- Install wheel washers/cleaners or wash the wheels of trucks and other heavy equipment where vehicles exit the site or unpaved access roads.
- Increase the frequency of watering, or implement other additional fugitive dust mitigation measures, to all disturbed fugitive dust emission sources when wind speeds (as instantaneous wind gusts) exceed 25 miles per hour (mph).

- Travel route planning shall be completed to identify required travel routes to minimize unpaved road travel to each construction site to the extent feasible.

AQ-2 Restrict engine idling. Diesel engine idle time shall be restricted to no more than 10 minutes duration. This is not required for trucks that require engines to be on while waiting onsite, such as concrete trucks.

AQ-3 Use on-road vehicles that meet California on-road standards. All on-road construction vehicles working within California shall meet all applicable California on-road emission standards and shall be licensed in the State of California. This does not apply to construction worker personal vehicles.

7.7 Noise

N-1 Construction activities shall comply with local ordinances. Any nighttime or weekend construction activities shall be coordinated with local ordinances and shall require the construction contractor to obtain a noise permit.

N-2 All equipment used during construction shall be muffled and maintained in good operating condition. All internal combustion engine driven equipment shall be fitted with well maintained mufflers in accordance with manufacturer's recommendations.

N-3 Surrounding residents need to be notified of the project construction.

7.8 HTRW

The project is not in conflict with CERCLA or RCRA so environmental commitments are not required.

7.9 Socioeconomics

There were no population, housing, employment, business or tax revenue impacts identified, therefore, no impacts are anticipated.

7.10 Traffic

TT-1 Public streets shall be kept operational during construction, particularly during the morning and evening peak hours of traffic. Lane closures shall be minimized during peak traffic hours.

TT-2 Measures to provide an adequate level of access to private properties shall be maintained to allow delivery of emergency services.

TT-3 Roads designated for truck traffic shall be used for truck traffic and movement of heavy equipment.

TT-4 The selected contractor shall coordinate with the transportation department of the applicable jurisdiction in order to implement standard construction traffic controls, such as the posting of notices, signage, detours, flag men and other appropriate measures along Sherman Way and Vanowen Street.

TT-5 The construction contractor shall receive any applicable permits from the City of Van Nuys, Los Angeles and/or Los Angeles County.

7.11 Utilities

U-1 During the preliminary design phase of each project component, the utility service providers would be consulted to identify existing and proposed buried facilities in affected roadways and to determine which utilities require relocation and which can be avoided. If relocation is required, the appropriate utility service provider will be consulted to sequence construction activities to avoid or minimize interruptions in service. The Local Sponsor and its contractor shall comply with permit conditions and such conditions shall be included in the contract specifications.

U-2 If utility service disruption is necessary, residents and businesses in the project area will be notified a minimum of two to four days prior to service disruption through local newspapers, and direct mailings to affected parties.

U-3 The contractor will be required to excavate around utilities, including hand excavation as necessary, to avoid damage and to minimize interference with safe operation and use. Hand tools must be used to expose the exact location of buried gas or electric utilities.

U-4 Prior to construction during the Plans and Specifications phase, utility locations shall be verified through field surveys.

SECTION 8

COORDINATION
&
ENVIRONMENTAL COMPLIANCE

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SECTION 8 – COORDINATION

&

ENVIRONMENTAL COMPLIANCE

The Tujunga Wash restoration study is strongly supported by the Mountains Recreation and Conservation Authority (MRCA). This project is important because not only does it provide the potential for habitat linkages and corridors but also provide an opportunity for large-scale habitat restoration in an urbanized area, and could be used as demonstration projects for this type of restoration and watershed management in other parts of the State of California.

8.1 PUBLIC VIEWS AND COMMENTS

A number of public concerns have been identified during the course of the study. While initial concerns were expressed in the early stage of the study, additional input was received through coordination with local agencies. The Los Angeles County Department of Public Works was contacted to solicit comments and concerns regarding the Tujunga Wash project. The public concerns/input is summarized in the following paragraphs:

- The community would like to see restoration of the native habitat within their community and neighborhood. Small improvements would be very significant within the densely populated are of the City of Los Angeles. Also, it was recognized that within the urban context of Los Angeles, any reintroduction of native habitat and associated species would be desirable.
- Development of a project that is consistent with the neighborhood characteristics of the community.
- The desire of the community to improve habitat quality and quantity, aesthetics and public accessibility to recreational facilities.
- Potential site areas expressed a desire to develop linkage of habitat with existing open space in the area.

8.2 SPONSOR VIEWS

In the LACDPW letter dated July 15, 2008, the Local Sponsor states that they are very interested in ecosystem restoration along the entire lower Tujunga Wash, from Hansen Dam to the confluence with the Los Angeles River. The Local Sponsor specifies performing the restoration working upstream from the existing Tujunga Wash greenbelt, which utilizes both sides of the right-of-way and currently ends where Oxnard Street crosses Tujunga Wash, at the Los Angeles Valley College. The target area is to extend use of the right-of-way for potential ecosystem restoration between Sherman Way and Vanowen Street.

8.3 AGENCY COORDINATION

U.S. Fish and Wildlife Service (USFWS)
A site visit was conducted with Christine Medak of the USFWS along with the PDT in September 2007 to discuss various issues, opportunities and recommendations for the project. She had suggested putting a settling pond positioned at the upstream end of the site to be used to naturally treat the water before it enters the remainder of the restoration site. She also suggested incorporating a small access path along the fence line behind the houses to allow maintenance crews to trim exotic vegetation growing on the fence and reduce the potential for exotic plants to spread into the restoration site.

No Federally threatened or endangered species are located in the project area. Coordination with the U.S. Fish and Wildlife Service (USFWS) has been performed and they provided a Final Coordination Act Report (CAR) in compliance with the Coordination Act. The Draft and Final CAR evaluates four alternatives, but the DPR evaluates three alternatives. This discrepancy occurred because USFWS prepared the Draft and Final CAR prior to preparation of the Draft DPR. Further refinement was made by combining two of the alternatives identified in the CAR to reduce redundancy and to generate greater output in HUs. The Corps then coordinated with USFWS regarding the refinements and number of alternatives evaluated in the Draft DPR. USFWS stated there is no need to provide a revised CAR because combining the two alternatives in the CAR created greater benefits for the ecosystem. Both the Corps and USFWS agreed on this decision.

U.S. Army Corps of Engineers Regulatory Division
The Environmental Resources Branch of the Corps coordinated with Mr. Ken Wong of the Corps Regulatory Branch throughout the planning process. The project description was provided to Regulatory Division and it was determined that project construction and/or maintenance would not result in discharge of material or fill into the waters of the United States. Therefore, a Section 404(b)(1) analysis is not prepared.

California Department of Fish and Game (CDFG)
A site visit was conducted with Scott Harris of CDFG along with the PDT in September 2007 to discuss various issues, opportunities and recommendations for the project. His suggestion was similar to those of USFWS.

California Regional Water Quality Control Board (CRWQCB)
The Environmental Resources Branch of the Corps coordinated with Mr. Dana Cole of the CRWQCB Los Angeles Region throughout the planning process and determined that a 401 Certification would not be required since a 404 permit would not be required because no dredge or fill material would be discharged into waters of the United States.

California State Historic Preservation Officer (SHPO)
An initial consultation letter was sent on June 15, 2006 to the California State Historic Preservation Officer (SHPO) in accordance with Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR 800, as amended. The consultation

letter described the Corp's identification efforts for historic properties (i.e., cultural resources recommended as eligible for listing in the National Register of Historic Places) within the APE, and tribal consultation efforts. The consultation letter also asked for SHPO concurrence with the finding of "no historic properties affected" for the proposed project. SHPO did not respond to the Corps with comments; this signifies their concurrence per 36 CFR 800, as amended. Therefore, the project is in compliance with the act.

8.4 ENVIRONMENTAL COMPLIANCE

8.4.1 Federal

National Environmental Policy Act of 1969 (NEPA)

This Draft DPR has been prepared in accordance with the requirements of NEPA of 1969 (42 USC 43221, as amended) and the CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500-1508), dated 1 July 1988. NEPA requires that agencies of the Federal Government shall implement an environmental impact analysis program in order to evaluate "major federal actions significantly affecting the quality of the human environment." A "major federal action" may include projects financed, assisted, conducted, regulated, or approved by a federal agency. NEPA regulations are followed in the preparation of this DEA.

ER-200-2-2, 33 CFR 230, March 1988

This regulation provides guidance for implementation of the procedural provisions of the National Environmental Policy Act (NEPA) for the Civil Works Program of the USACOE. It supplements Council on Environmental Quality (CEQ) regulations 40 CFR 1500-1508, November 29, 1978, in accordance with the CEQ regulations. Wherever the guidance in this regulation is unclear or not specific, the reader is referred to the CEQ regulations. This regulation is applicable to all USACOE responsibility for preparing and processing environmental documents in support of civil works functions. This is an Integrated Report which satisfies the requirement of the ER 200-2-2, Policy and Procedures for Implementing NEPA.

Clean Water Act of 1977

In compliance with the guidelines in 40 CFR 230.10(c) (promulgated by EPA under Section 404(b)(1) of the Clean Water Act), no discharge of dredge or fill material would occur due to implementation of the proposed project. Therefore, the project would not result in degradation of the waters of the U.S. During future maintenance of the project, there would not be any fill or discharge of the material into the water of the United States, therefore, a Section 404 water quality permit would not be required. The Environmental Resources Branch of the Corps coordinated with Mr. Ken Wong of the Corps Regulatory Division and Mr. Dana Cole of the RWQCB throughout the planning process to confirm that a Section 404(b)(1) Analysis would not be required. The proposed project is not subject to Section 404 of the Clean Water Act thus would not need a Section 401 WQC as this project would not have any discharge into the waters of the United States. Thus the proposed project is in compliance with the Clean Water Act.

The construction contractor will prepare a Storm Water Pollution Prevention Plan (SWPPP) to meet the State's requirements of the NPDES Storm Water Program prior to project construction. ERB staff will review the SWPPP to ensure that feasible erosion control methods are included to minimize impacts to water quality. The construction contractor would submit a Notice of Intent (NOI) to the State Water Resources Board located in Sacramento with applicable fees. After completion of the project, the construction contractor would submit a Notice of Completion notice to the State Water Resources Board. The SWPPP shall be made available on the project construction site at all times.

Clean Air Act

Section 118 specifies that any Federal activity that may result in discharge of air pollutants must comply with Federal, State, interstate, and local requirements respecting control and abatement of air pollution. Section 176(c) requires that all Federal projects conform to Environmental Protection Agency-approved or promulgated State Implementation Plans. The potential air quality impacts of the proposed project have been examined and have been compared to the significant levels identified by the South Coast Air Quality Management District (SCAQMD), which is the agency with jurisdiction to enforce the Clean Air Act regulations and other relevant local air quality regulations. The SCAQMD sets the threshold limits which, if exceeded, trigger New Source Review Rules, as defined by the Clean Air Act. Based on the air quality analysis described in Section 4.3 and Appendix B, it has been determined that the proposed project is exempt from demonstrating conformity to State or Federal Implementation Plans, as the total emissions of each criteria pollutant are below de minimus levels as described in 40 CFR 93.153(b). As a result, this project conforms to the Federal Clean Air Act, as amended, and will not exceed threshold limits, in compliance with the Act.

An air quality analysis has been performed in Appendix D. Analysis revealed that the emission generated by the construction activity would not exceed state or federal standards. Therefore, conformity determination is not required. A Record of Non Applicability is prepared to comply with the Clean Air Act (see Appendix B). The proposed project is in compliance with the Clean Air Act.

Endangered Species Act of 1973

The project biologist and ERB team members conducted a site visit with the resource agencies. The project area does not have any habitat supporting critical habitat for any listed species. Therefore, a determination was made that no threatened or endangered species are located within the project area The proposed project implementation would not have any affect on the federal or state listed species. Therefore, informal or formal Section 7 consultation under the Endangered Species Act is not required.

Fish and Wildlife Coordination Act of 1958 (Public Law 85-624)

In response to the requirements of this Act, the Corps is coordinated with the USFWS and the California Department of Fish and Game (CDFG) during the initial and current stages of planning. The USFWS provided a Draft Coordination Report in March 2007. A Final

Coordination Act Report was provided in April 2007 (See Appendix B-3) which evaluates two potential restoration alternatives and the environmental benefits arising from implementation of the ecosystem restoration project. The USFWS participated in the site visit and provided recommendations in the CAR.

Migratory Bird Treaty Act, as amended (16 USC 703-711)

Requires management and protection of migratory birds. The Migratory Bird Treaty Act (1916), agreed upon between the United States and Canada; the Convention for the Protection of Migratory Birds and Animals (1936), agreed upon between the United States and Mexico; and subsequent amendments to these Acts provide legal protection for almost all breeding bird species occurring in the United States. These Acts restrict the killing, taking, collecting, and selling or purchasing of native bird species or their parts, nests, or eggs. Certain game bird species are allowed to be hunted for specific periods determined by federal and state governments. The intent of the Act is to eliminate any commercial market for migratory birds, feathers, or bird parts, especially for eagles and other birds of prey. The proposed ecosystem restoration would generate habitat which could be utilized by the migratory bird. Currently, no habitat exists to support nesting of the migratory bird. The proposed project complies with this Act.

Executive Order 11988, Floodplain Management, May 24, 1977

Under this Order, the USACOE shall take action to avoid development in the base (l00-year) floodplain unless it is the only practicable alternative; to reduce hazards and risks associated with floods; to minimize the impact of floods on human safety, health and welfare; and to restore and preserve the natural and beneficial value of the base floodplain. The proposed project would not result in reducing flood protection capacity of the constructed flood control channel; therefore, there the proposed project is in compliance with the Floodplain Management Executive Order.

National Historic Preservation Act

Based on the Corps' identification efforts there are no historic properties within the APE. A qualified archeologist would monitor construction/grading activities to avoid or minimize impacts to buried cultural resources.

Coordination with the California State Historic Preservation Officer was completed in 2006. A letter containing the Corps determination of "No Historic Properties Affected" for the undertaking was transmitted. The Corps is in compliance with Section 106 (36 CFR 800). A copy of the coordination letter is included in the appendix.

Executive Order 12898, Environmental Justice

The alternatives developed for the proposed restoration project were based on a set of criteria that did not discriminate on the basis of race, color, or national origin. This Executive Order requires that the DPR analyze the impacts of federal actions on minority and low-income populations and provides opportunities. Implementation of the proposed project would not result

in discrimination on race, color, or national origin. The proposed project would not have any adverse impacts on low-income and minority populations. The proposed project would have beneficial impacts by providing a recreational opportunity to the minority population in a highly urbanized area.

8.4.2 State

California Environmental Quality Act (CEQA)

CEQA requires state and local agencies to disclose and consider the environmental implications of their actions. It further requires that agencies, when feasible, avoid or reduce the significant environmental impacts of their decisions. This document meets the goals, policies, and requirements of CEQA.

California Endangered Species Act (Cal. Fish and Game Code '' 2050-2116)

The California Endangered Species Act (CESA) parallels FESA. As a responsible agency, the California Department of Fish and Game (CDFG) has regulatory authority over state-listed endangered and threatened species. Since the proposed project does not have any habitat supporting State or federally, listed species. The project would generate habitat supporting wildlife as well nesting opportunity for the migratory birds. The project would not affect species that are listed as threatened or endangered under both the state and federal Endangered Species Acts.

8.4.3 Local

Local Jurisdictions

The project area is subject to the policies, regulations and ordinances set forth in the Municipal Codes, General Plans, Zoning Ordinances, and other applicable regulating documents of the City of Van Nuys and the County of Los Angeles. The project will comply with all local regulations and policies, especially those concerning construction traffic, construction noise, and storm water runoff. The construction contractor would obtain all required permits from the Cities and County for noise, traffic and applicable resources.

SECTION 9

LIST OF PREPARERS & REVIEWERS

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SECTION 9 – LIST OF PREPARES & REVIEWERS

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SECTION 10

REFERENCES

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SECTION 10 - REFERENCES

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APPENDIX A

SITE PHOTOGRAPHS

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Photograph 1: 1928 Aerial of the Sun Valley region, eastern San Fernando Valley

Source: Fairchild; Flight C300; Frame K-33

Photograph 2: Aerial photograph looking SW from Big Tujunga, c. 1939

Photograph 3: Project Area Map

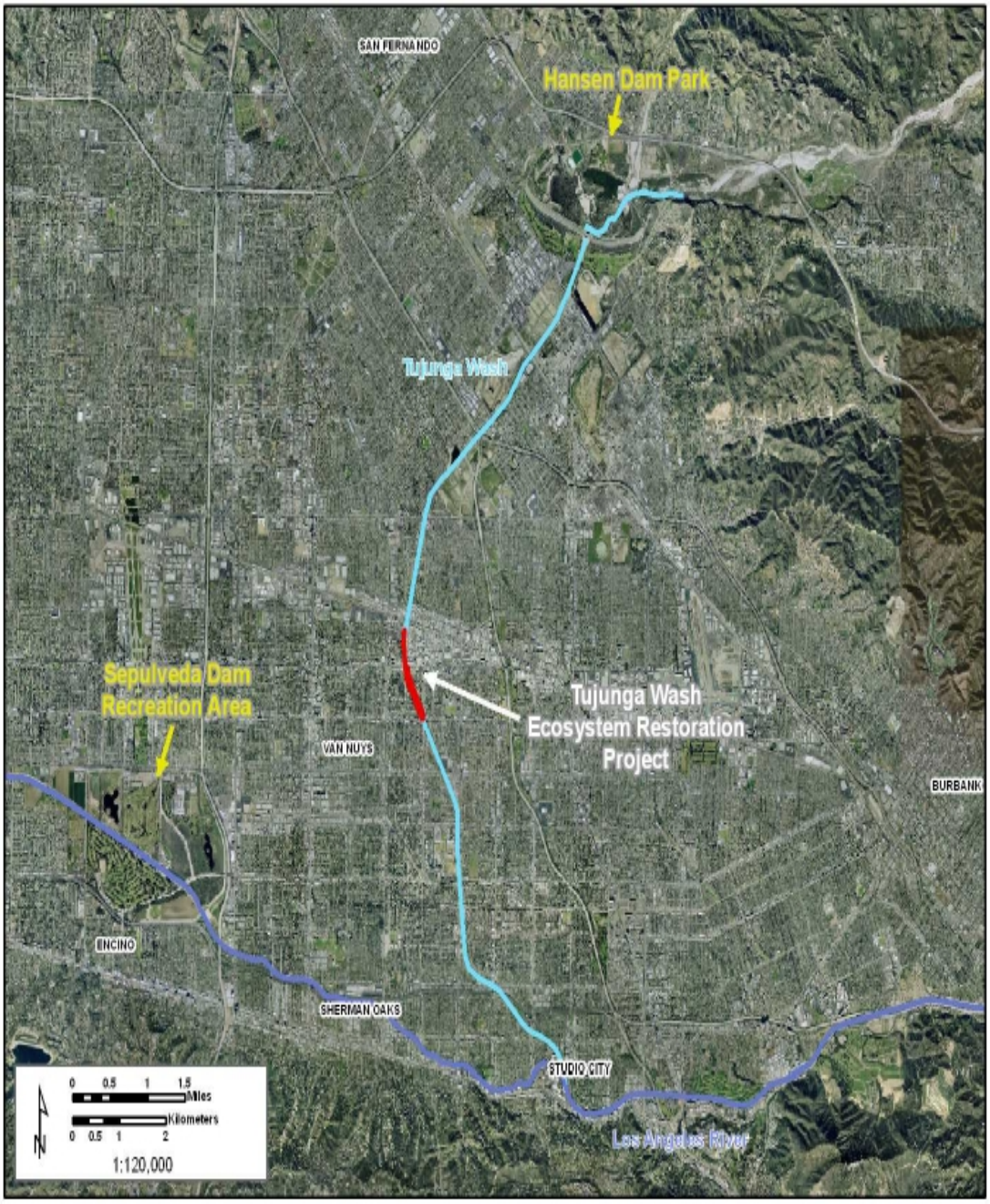

Figure 1. Regional view of the proposed Tujunga Wash project (U.S. Geological Survey 2003 true color aerial imagery).

Photograph 4: Project Location Map

Figure 2. Local view of the proposed Tujunga Wash project (U.S. Geological Survey 2003 true color aerial imagery).

Photograph 5: L.A. County Department of Public Works Downstream Project

Photograph 6: Tujunga Wash channel (view from west terrace looking northeast) towards Sherman Way – The northern limit of the project in the City of Los Angeles North Hollywood neighborhood

Photograph 7: Tujunga Wash channel with view of east side 70' ROW backed by strip commercial development along Sherman Way, NHO in the San Fernando Valley

Photograph 8: View north on Tujunga Wash centered on Sherman Way Bridge

Photograph 9: View of access road on west side of Tujunga Wash.
The access road links gate from Sherman Way south to Van Owen gate (southern project limit)

Photograph 10: View from west of Tujunga Wash invert, channel wall, drain, and 70' ROW strip

Photograph 11: Newly completed (2005-2006) cage protects gravity-flow intake/sluice gate to provide Tujunga Wash 1134 project with water for the ecosystem restoration component.

Photograph 12: Intake gate and protective cage looking north (team members provide scale). West side, Tujunga Wash channel near Sherman Way gate.

Photograph 13: Downstream view of Tujunga Wash channel from west side (near cage for intake gate). Note existing chain link fence will be replaced (keeping with sponsor's plans for their on-going river restoration) with OMEGA fencing, considered a safer alternative for finished projects.

APPENDIX B1

HABITAT EVALUATION PROCEDURE (HEP)

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Appendix B-1: Habitat Evaluation Procedure (HEP)

The ecological benefits of any restoration project must be put in a quantitative form in order to evaluate its effectiveness. Habitat Evaluation Procedures (HEPs) converts ecosystem outputs of plan alternatives into a number representing the amount of area, Habitat Units (HUs), and the quality of the area, Habitat Suitability Index (HSI). This allows for the selection of the most cost efficient alternative to be selected.

Key habitat components for selected species are evaluated and compared to an optimum.

$$HSI = \frac{\text{Habitat Conditions in the Study Area}}{\text{Optimum Habitat Conditions}}$$

The result is the Habitat Suitability Index (HSI). This index value ranges from 0.1 (low restoration value) to 1.0 (high restoration value). Each HIS is multiplied by the amount of habitat available (HUs). This is done for the site before restoration and for projected times in the future. Comparison to optimums allow for the selection of alternatives that would yield the best result.

The HEP for Tujunga Wash used the Yellow Warbler (*Dendroica petechia)* as the model species as published by the USFWS. All HSI models published by USFWS are approved for use without certification. HSI models not documented in the USFWS series will have to be certified. Specific habitat components were selected for this species by an analysis team. Analysis was done for time intervals 1, 5 and 50 years and four habitat types were evaluated: Aquatic/Emergent, Southern Cottonwood-Willow Riparian, Southern Sycamore Riparian Woodland, and Alluvial Fan Sage Scrub.

The following restoration alternatives were analyzed:

Alternative 1: No Action. No vegetation will be planted. Right of ways will be maintained as is. The area will remain devoid of suitable habitat for resident and transient riparian species.

Alternative 2: it was proposed that 7.30 acres be restored by the creating a stream on the west terrace adjacent to the flood control channel that would drain downstream into the existing 36 inch RCP bypass line of the County project. This restoration alternative would contain approximately 0.68 acres of Aquatic/Emergent habitat, and 5.08 acres consisting of a mixture of native plant species assemblages that historically occur in the Southern Cottonwood-Willow Riparian Forest and the Southern Sycamore Riparian Woodland of California. It should be noted that under Alternative 2 when subtracting the service roads (1.36 acres) and single naturalized stream (0.34 acres) from the total of 9 project acres, 7.30 acres would remain for the restoration effort of which 3.48 acres would comprise the restoration effort on the west terrace. For this alternative, the planting of native trees to achieve an overstory canopy of approximately 50% would require approximately 50 container trees per acre. In order to achieve an understory canopy coverage of approximating a 50% planting density, approximately 165 container

shrubs per acre could be planted along with small perennials at approximately 245 container plants per acre. The understory canopy could then be supplemented by the application of a herbaceous seed mix applied at approximately 1-3 pounds live seed (PLS) per acre. In addition, it is assumed that under Alternative 2, the percentage of hydrophytic shrub cover within these native plant communities would average approximately 32%, comprising 2.20 acres of this cover type

Eighty five percent of the east terrace (3.82 acres) would be planted with native plant assemblages that historically occur in the Alluvial Fan Sage Scrub community, including trees such as California Sycamore *Platanus racemosa)* and Coast Live Oak (*Quercus agrifolia* var. *agrifolia)*. The planting of such trees on this terrace is assumed to be < 25% coverage. The percent of deciduous shrub crown cover desired would be approximately < 50% with the average height of the deciduous shrub canopy to be < 6.6 feet (2 m) at maturity, and the percentage of the shrub canopy comprised of hydrophytic species to be < 50%. Micro-basins for stormwater harvesting would be contoured into discrete areas of the east terrace at a maximum depth of three (3) feet in order to support xeroriparian habitat including hydrophytic shrubs, supplement project irrigation, and periodically supply ephemeral surface pools of water while increasing wetted surficial soils for seasonal habitat variation. Final plant community acreages are expected to be 0.13 acres aquatic emergent wetland, 0.84 acres southern cottonwood-willow riparian forest, 0.34 acres southern sycamore riparian woodland, 3.50 alluvial fan sage scrub. All species selected for planting are California Natives and are available at local nurseries.

Alternative 3: The restoration efforts of 7.60 acres would include an artificial stream on the west terrace which would connect downstream to the existing channel wall on the west side of the wash. The created stream would support the restoration of an Aquatic/Emergent assemblage of native hydrophytic species including shrubs that historically occur in the Southern Cottonwood-Willow Riparian Forest and the Southern Sycamore Riparian Woodland. When subtracting the service roads (1.36 acres) and single naturalized stream (0.34 acres) from the total of 9 project acres, 7.30 acres would remain for the restoration effort of which 3.48 acres would comprise the restoration effort on the west terrace. For this alternative, the planting of native trees to achieve an overstory canopy of approximately 50% would require approximately 50 container trees per acre. This alternative assumes planting an understory of native deciduous shrub canopy coverage ranging from 60-75% and comprised of a minimum composition of 60-80% for hydrophytic native species. It should be noted that the canopy coverage of willows is typically higher than that of the deciduous shrubs found in the Southern Sycamore Riparian Woodland. An average mature height of 6.5 ft for native willow species was considered as the mature growth pattern at project year T=5 providing optimal habitat for the Yellow Warbler *(Dendroica petechia)*(Schroeder 1982). The east terrace would be restored as in Alternative 2 using native California species readily available at local nurseries. Final plant community acreages are expected to be 0.13 acres aquatic emergent wetland, 0.42 acres southern cottonwood-willow riparian forest, 0.17 acres southern sycamore riparian woodland, 3.00 alluvial fan sage scrub.

A description of the HSI Model for the *Dendroica petechia* (Yellow Warbler) is provided below. The equation is as follows:

(V1 + V2 + V3) ÷3; where
V1 is the percent deciduous shrub crown cover,
V2 is the average height of deciduous shrub canopy, and
V3 is the percent of shrub canopy comprised of hydrophytic shrubs.

The following assumptions are made in completing the HIS:

- It is assumed that optimal habitats contain 100% hydrophytic deciduous shrubs and that habitats with no hydrophytic shrubs will provide marginal suitability.
- Shrub densities between 60 - 80% crown cover are assumed to be optimal. As shrub densities approach zero cover, suitability also approaches zero.
- Totally closed shrub canopies are assumed to be of only moderate suitability, due to the probable restrictions on movement of the warblers in those conditions.
- Shrub heights of 2 m (6.6 feet) or greater are assumed to be optimal, and suitability will decrease as heights decrease to zero.
- Based on the reported territory sizes, it is assumed that at least 0.37 acres (0.15 ha) of suitable habitat must be available for the Yellow Warbler to occupy an area. If less than this amount is present, the HSI is assumed to be 0.0 (Schroeder 1982).

The following are the results projecting potential habitat units:

Aquatic and Emergent Wetland
T=1 - Alternative 2: 0.25 + 0.5 + 0.50 = 1.25 ÷ 3 = 0.42 x 0.013 acres = 0.005
T=1 – Alternative 3: 0.35 + 0.5 + 0.60 = 1.45 ÷ 3 = 0.48 x 0.013 acres = 0.006
T=5 – Alternative 2: 0.30 + 1.5 + 0.50 = 2.3 ÷ 3 = 0.76 x 0.013 acres = 0.009
T=5 – Alternative 3: 0.45 + 2.0 + 0.60 = 2.3 ÷ 3 = 0.72 x 0.013 acres = 0.009
T=50 – Alternative 2: 0.40 + 2.0 + 0.50 = 2.9 ÷ 3 = 0.96 x 0.013 acres = 0.013
T=50 – Alternative 3: 0.55 + 2.0 + 0.60 = 3.15 ÷ 3 = 1.05 x 0.013 acres = 0.0137

Southern Cottonwood-Willow Riparian Forest
T=1 – Alternative 2: 0.50 + 2.5 + 0.50 = 0.62 ÷ 3 = 1.16 x 0.84 acres = 0.974
T=1 – Alternative 3: 0.60 + 2.5 + 0.60 = 3.7 ÷ 3 = 1.23 x 0.42 acres = 0.52
T=5 – Alternative 2: 0.50 + 6.5 + 0.50 = 1.62 ÷ 3 = 1.83 x 0.84 acres = 1.54
T=5 – Alternative 3: 0.75 + 6.5 + 0.80 = 8.05 ÷ 3 = 2.68 x 0.42 acres = 1.13
T=50 – Alternative 2: 0.50 + 6.5 + 0.50 = 1.62 ÷ 3 = 2.5 x 0.84 acres = 2.1
T=50 – Alternative 3: 0.75 + 6.5 + 0.80 = 3.90 ÷ 3 = 8.05 x 0.42 acres = 1.13

Southern Sycamore Riparian Woodland
T=1 – Alternative 2: 0.50 + 2.5 + 0.50 = 3.5 ÷ 3 = 1.16 x 0.34 acres = 0.04
T=1 – Alternative 3: 0.60 + 2.5 + 0.60 = 3.7 ÷ 3 = 1.23 x 0.17 acres = 0.21
T=5 – Alternative 2: 0.50 + 4.5 + 0.50 = 5.5 ÷ 3 = 1.83 x 0.34 acres = 0.62
T=5 – Alternative 3: 0.65 + 4.5 + 0.80 = 5.95 ÷ 3 = 1.98 x 0.17 acres = 0.30
T=50 – Alternative 2: 0.50 + 5.5 + 0.50 = 6.5 ÷ 3 = 2.17 x 0.34 acres = 0.74
T=50 – Alternative 3: 0.75 + 5.5 + 0.80 = 7.05 ÷ 3 = 2.35 x 0.17 acres = 0.40

Alluvial Fan Sage Scrub

T=1 - Alternative 2: 0.25 + 2.0 + 0.35 = 2.6 ÷ 3 = 0.87 x 3.50 acres = 3.03
T=1 - Alternative 3: 0.25 + 2.0 + 0.35 = 2.6÷ 3 = 0.87 x 3.00 acres = 2.61
T=5 – Alternative 2: 0.45 + 4.5 + 0.35 = 5.3 ÷ 3 = 1.77 x 3.50 acres = 6.18
T=5 – Alternative 3: 0.45 + 4.5 + 0.35 = 1.77 ÷ 3 = 5.3 x 3.00 acres = 5.31
T=50 – Alternative 2: 0.35 + 4.5 + 0.30 = 5.15 ÷ 3 = 1.72 x 3.50 acres = 6.01
T=50 – Alternative 3: 0.35 + 4.5 + 0.30 = 5.15 ÷ 3 = 1.72 x 3.00 acres = 5.16

Results and Conclusions

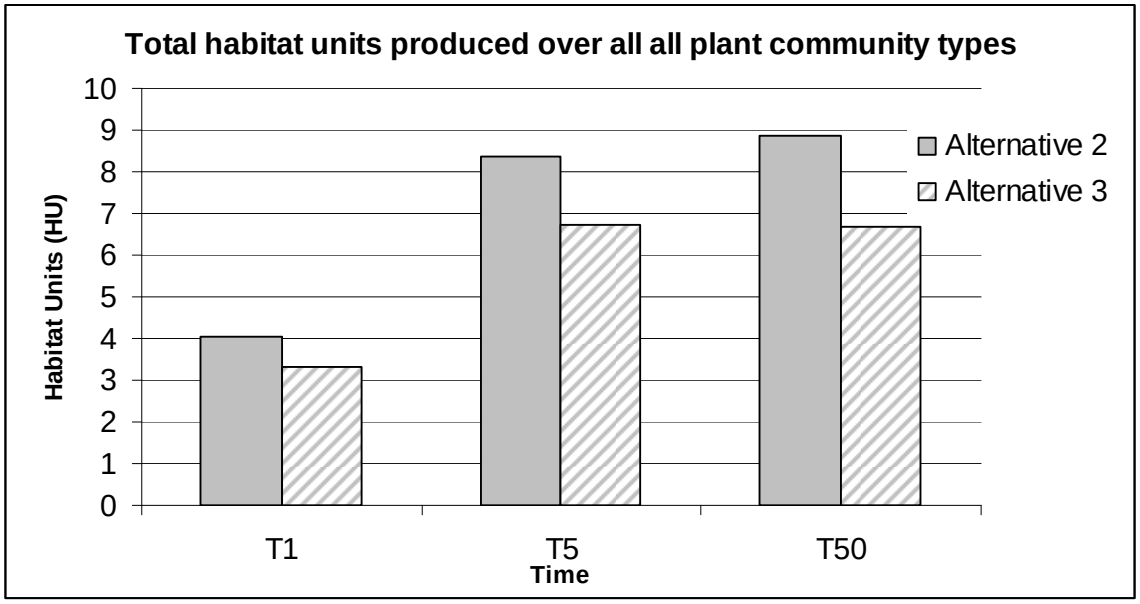
The project area is severely degraded and presently contains extremely limited habitat value. Each alternative involve makes efforts to restore native plant assemblages across acreages that are geographically constrained. The number and density of deciduous, hydrophytic species varies between typical descriptions of the Southern Cottonwood-Willow Riparian Forest and the Southern Sycamore Riparian Woodland. However, this project presents the opportunity to maximize the density and diversity of such understory species.

The results of each alternative can be found in table X. Alternatives 2 generates more habitat units than alternative 3. Graph X shows total habitat units created over time. Graph Y shows habitat units of specific plant communities created by alternatives 2 and 3 at time T50.

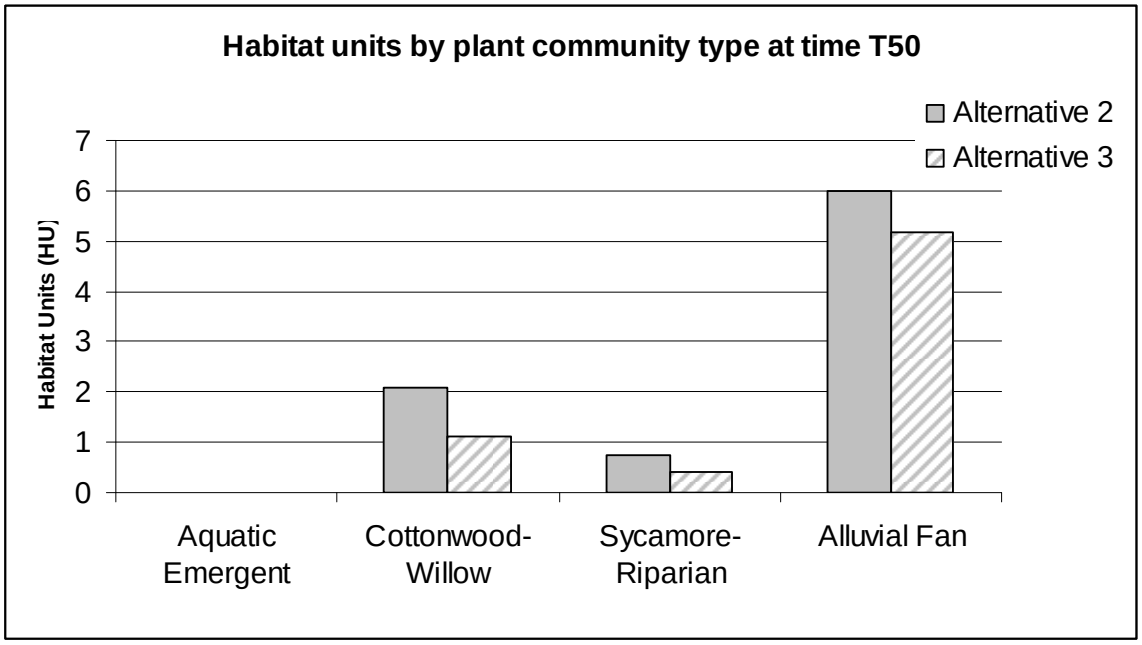
Table X: Total habitat units by plant community type over time

Habitat Type	**Timeframe**	**Habitat Output**		
		Alt. 1	**Alt. 2**	**Alt. 3**
Aquatic and Emergent Wetland	T=1	0.0	0.005	0.006
	T=5	0.0	0.009	0.009
	T=50	0.0	0.013	0.014
Southern Cottonwood-Willow Riparian Forest	T=1	0.0	0.97	0.52
	T=5	0.0	1.54	1.13
	T=50	0.0	2.1	1.13
Southern Sycamore Riparian Woodland	T=1	0.0	0.04	0.21
	T=5	0.0	0.62	0.30
	T=50	0.0	0.74	0.40
Alluvial Fan Sage Scrub	T=1	0.0	3.03	2.61
	T=5	0.0	6.18	5.31
	T=50	0.0	6.01	5.16
Total T=1		0.0	4.05	3.34
Total T=5		0.0	8.35	6.74
Total T=50		0.0	8.86	6.69
Average Annual HUs		0.0	7.09	5.59

Graph X: Total habitat units across all plant community types created by alternatives 2 and 3 over time periods T1, T5 and T50. Alternative 1 is a no action plan



Graph Y: Habitat units created by alternatives 2 and 3 at time T30 in four different plant communities.



Incidental Benefits

This project provides an opportunity for residents to experience a natural set of habitats in a highly urbanized area. Visitors to the Tujunga Wash Stream Restoration Project can be led through the area in an educational fashion or walk through on their own. Interpretive signs can explain natural processes, describe habitat, and identify wildlife using the project area. Before and after pictures could provide visitors with a sense of how highly disturbed and modified environments can be rehabilitated to function in a more natural way.

REFERENCES

Schoeder, R. L. 1982. *Habitat Suitability Index Models: Yellow Warbler.*

U.S. Dept. Int., Fish Wildl. Serv. FWS/OBS-82/10.27. 7 pp.

APPENDIX B2

ENDANGERED AND THREATENED

SPECIES LIST

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	Federally listed species with historical distributions within the Tujunga wash basin		
Taxon	Scientific Name	Common Name	Federal Status
Amphibians	*Bufo californicus*	Arroyo toad	Endangered
	Rana aurora draytoniii	California red-legged frog	Threatened
	Rana muscosa	Mountain yellow-legged frog	Endangered
Fish	*Catostomus santaanae*	Santa Ana sucker	Threatened
	Gasterosteus aculeatus williamsonii	Unarmored threespined stickleback	Endangered
Birds	*Gymnogyps californianus*	California condor	Endangered
	Haliaeetus leucocephalus	Bald eagle	Threatened
	Empidonax trailii extimus	Southwestern willow flycatcher	Endangered
	Polioptila californica californica	Coastal California gnatcatcher	Threatened
	Vireo belii pusillus	Least Bell's vireo	Endangered
Plants	*Berbis nevinii*	Nevin's barberry	Endangered
	Dodecahema leptoceras	Slender-horned spineflower	Endangered
	Orcutta californica	California Orcutt grass	Endangered

	State listed species with historical distributions within the Tujunga wash basin		
Taxon	Scientific Name	Common Name	State Status
Fish	*Gasterosteus aculeatus williamsonii*	Unarmored threespined stickleback	Endangered
Birds	*Gymnogyps californianus*	California condor	Endangered
	Haliaeetus leucocephalus	Bald eagle	Endangered
	Falco peregrinus	Peregrine falcon	Endangered
	Coccyzus americanus occidentale	Western yellow-billed cuckoo	Endangered
	Empidonax trailii extimus	Southwestern willow flycatcher	Endangered
	Vireo belii pusillus	Least Bell's vireo	Endangered
Plants	*Berbis nevinii*	Nevin's barberry	Endangered
	Chorizanthe parryi fernandina	San Fernando Valley spineflower	Endangered
	Dodecahema leptoceras	Slender-horned spineflower	Endangered
	Orcutta californica	California Orcutt grass	Endangered

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APPENDIX B3

FISH AND WILDLIFE

COORDINATION ACT REPORT (CAR)

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FISH AND WILDLIFE COORDINATION ACT REPORT

for the

Tujunga Wash Ecosystem Restoration Project
City of Los Angeles,
Los Angeles County, California

Prepared for the

U.S. Army Corps of Engineers
Los Angeles District
Los Angeles, California

by the

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
Carlsbad, California

April 2007

FISH AND WILDLIFE COORDINATION ACT REPORT

for the

Tujunga Wash Ecosystem Restoration Project
City of Los Angeles,
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Prepared for the

U.S. Army Corps of Engineers
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by the

U.S. Fish and Wildlife Service
Carlsbad Fish and Wildlife Office
Carlsbad, California

Report Author
Federal Projects Point-of-Contact

Brian Root

April 2007

EXECUTIVE SUMMARY

The U.S. Army Corps of Engineers proposes an ecosystem restoration project (under the authority of Section 1135 of the Water Resources Development Act of 1986) along a portion of Tujunga Wash, near the community of Van Nuys in Los Angeles County, California. The proposed project would restore native riparian habitats along 3,000 linear feet (915 m) of the existing concrete-lined flood-control channel (a 65-foot [20-m]-wide area on each bank), and create a naturalized streamcourse that parallels the channel on one side. The total project will encompass 9 acres (3.6 ha), parts of which will be devoted to a biking/hiking pathway for human recreation. The proposed project site currently has no vegetative cover, and therefore provides very poor wildlife habitat.

Relative to existing conditions, and especially after the planted riparian vegetation matures and becomes structurally diverse, the proposed project will provide substantially increased habitat opportunities for a number of fauna including breeding, migrating, and over-wintering birds; urban-adapted mammals; invertebrates; and possibly a few aquatic vertebrates (amphibians and fish). The current lack of riparian vegetation in this urban landscape increases the potential positive benefits of the proposed project. However, these long-term ecological benefits will only be achieved through perpetual maintenance of the plantings and stream.

Although outweighed by the benefits provided by a well-managed restoration project, these created riparian habitats also will be subjected to substantial negative forces that may limit the project's benefit to biological resources. These forces include the project's small size, linear shape, and relative isolation from other riparian habitats; potential water quality issues; human disturbance; prevalence of native and domestic mammals that are known to substantially reduce bird survival and reproductive success; and problems associated with the establishment and growth of exotic vegetation.

In summary, the proposed project should provide substantive benefits to biological resources, especially for migratory songbirds and urban-adopted mammals. A few breeding bird species may be locally abundant, but there are many potential factors that could substantially limit their survival and reproductive success. Implementation of the recommendations contained in this report, including water-quality assessments; development of detailed management and monitoring plans (including long-term maintenance commitments); minimization of human recreational disturbances; control of feral and domestic cats; control of exotic vegetation; and prioritization of future restoration projects so that they occur in close proximity to the proposed project site; will maximize the biological benefits.

PREFACE

This document constitutes the Fish and Wildlife Coordination Act Report (Report) in fulfillment of the Scope of Work (SOW) Number W81EYN70337161 between the U.S. Fish and Wildlife Service (Service) and the U.S. Army Corps of Engineers (Corps), and addresses the potential effects on fish and wildlife resources of implementing the Tujunga Wash Ecosystem Restoration Project, City of Los Angeles, Los Angeles County, California. We have prepared this Report pursuant to section 2(b) of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and in keeping with the spirit and intent of the National Environmental Policy Act (P.L. 91-190). This Report supersedes all of our previous planning input regarding this project.

Via a 19 April 2007 e-mail (Appendix), the Corps agreed with the "physical and biological concerns" and "recommendations" presented in the Service's Draft Fish and Wildlife Coordination Act report (provided to the Corps on 6 March 2007), and stated that these issues subsequently had been addressed in the project's Draft Detailed Project Report / Environmental Assessment. Because the Corps did not identify any biological resource issues that required additional project assessments, we provide this Report with no substantive changes from the March 2007 draft report.

Our analysis of the proposed project and the recommendations provided herein are based on information in: 1) the SOW; 2) a Preliminary Restoration Plan (U.S. Army Corps of Engineers, July 2006); 3) maps and conceptual drawings of the proposed project provided by the Corps; 4) aerial photography; 5) faxes, e-mails, and attached electronic files from the Corps; 6) a review of the published and unpublished literature on the biological resources in the study area; 7) discussions with professional biologists and representatives from other Federal, State, and local agencies; 8) the State of California's Natural Diversity Database; 9) various scientific papers, technical reports, and letters; 10) information contained in our files; and 11) our best collective professional judgment. Our goals in this analysis were to identify and evaluate the impacts of the proposed project on fish and wildlife resources and habitat within the project area and to recommend methods for 1) maximizing the benefits to fish and wildlife resources, and 2) avoiding and/or offsetting any negative impacts.

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INTRODUCTION

The Corps is proposing an Ecosystem Restoration project to "reestablish a riparian ecosystem" along 3,000 linear feet (915 m) of the Tujunga Wash channel in Los Angeles County, California (U.S. Army Corps of Engineers 2006, p.5). The existing channel is entirely concrete-lined, lacks any vegetation in the right-of-way, and abuts residential properties along its length. The proposed project would restore native riparian habitats along the channel banks, including the creation of a naturalized streamcourse parallel to the channel.

The Corps' authority to conduct this study is Section 1135(b) of the Water Resources Development Act of 1986, P.L. 99-662, as amended. It authorizes the Secretary of the Army to

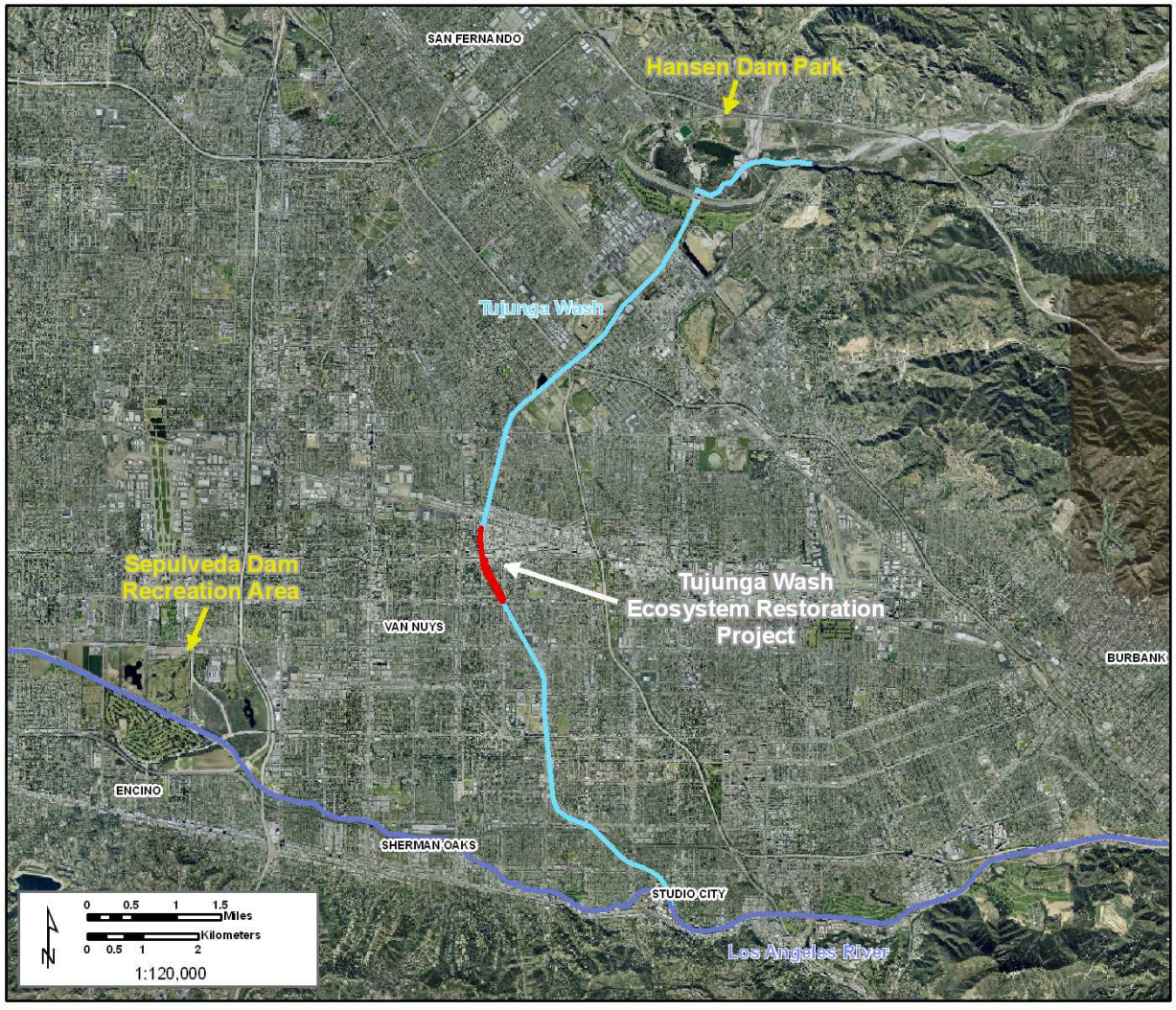

Figure 1. Regional view of the proposed Tujunga Wash project (U.S. Geological Survey 2003 true color aerial imagery).

1) modify existing Corps water-resources projects for the improvement of the environment, and 2) construct new projects to restore areas degraded by Corps projects. Section 1135 projects are accepted for construction after a detailed investigation shows they are technically feasible, environmentally acceptable, and provide cost-effective environmental benefits. Each project must be complete within itself, and not a part of a larger project. The County of Los Angeles Department of Public Works (CLADPW), acting on behalf of the Los Angeles County Flood Control District, is the local non-Federal sponsor for sharing costs of the proposed project. The Fish and Wildlife Coordination Act is the Service's authority to participate in water resources development projects during pre-construction planning.

DESCRIPTION OF THE PROJECT AREA

The proposed Tujunga Wash Restoration Project lies within the Tujunga Wash channel (Figure 1). This 9-mile (14.5-km)-long channel, which was constructed by the Corps during 1950-1952 for flood-damage reduction, is part of the comprehensive plan for flood control in the Los Angeles County Drainage Area (U.S. Army Corps of Engineers 1989). Tujunga Wash is located in the San Fernando Valley of the City of Los Angeles, about 6 miles (10 km) west of Burbank and 1.5 miles (3.2 km) northeast of Van Nuys, and conveys flows from Hansen Dam to the Wash's confluence with the Los Angeles River. The Wash is a 60- to 70-foot (18- to 21-m)-wide rectangular reinforced-concrete channel, with 15-foot (4.5-m)-wide maintenance roads along each side. The channel footprint lies within a 200-foot (61-m)-wide right-of-way owned and maintained by the Los Angeles County Flood Control District. Maintenance activities keep the right-of-way vegetation-free. Chain-link fencing exists along

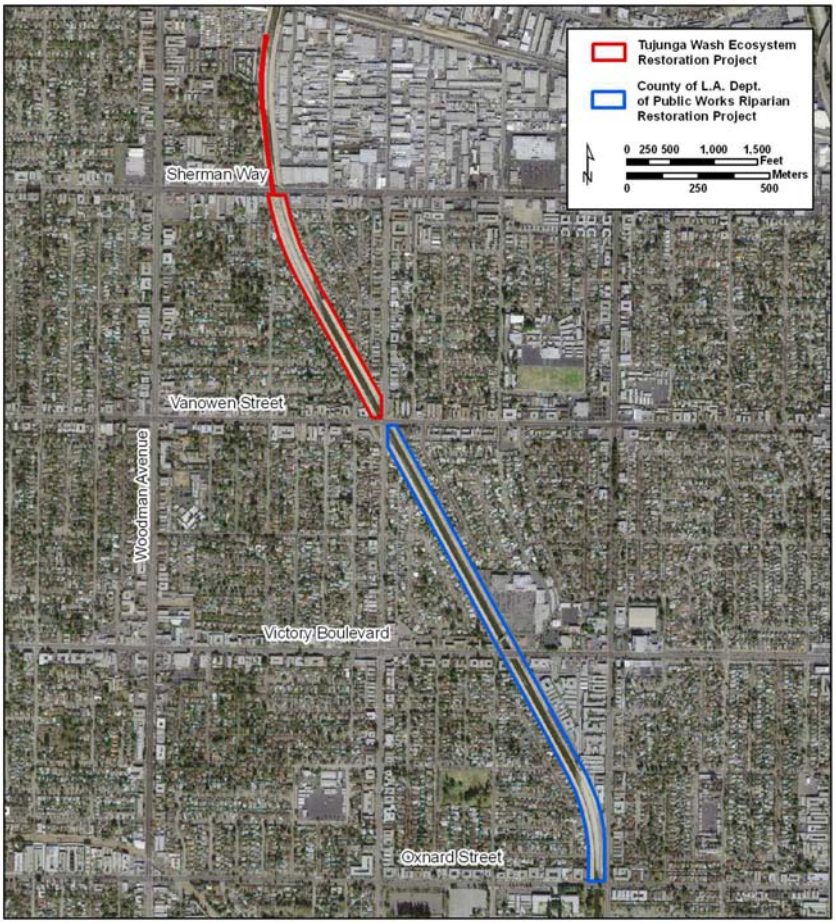

Figure 2. Local view of the proposed Tujunga Wash project (U.S. Geological Survey 2003 true color aerial imagery).

the edge of the concrete channel as well as the right-of-way boundary. The Community Plans of Arleta-Pacoima, Sun Valley, and Van Nuys–Sherman Oaks designate the Tujunga Wash as open space (County of Los Angeles Department of Public Works 1996, p. 287).

The proposed project reach extends about 3,000 linear feet (915 m) from Vanowen Street northerly to Sherman Way (Figure 2). The 9-acre (3.6-ha) project does not include, and will not alter, the existing rectangular, concrete-lined portion of the Tujunga Wash flood-control channel, but will occupy about 65 feet (20 m) on each bank. The project area also includes the west side of Tujunga Wash, about 900 feet (275 m) upstream from Sherman Way to the South Pacoima Wash stormdrain confluence; this would be the location of a pipeline to divert water from the South Pacoima Wash to the upstream end of the constructed streamcourse at Sherman Way.

The project area is surrounded by highly urbanized residential and commercial developments. Riparian vegetation is regionally scarce and fragmented, and the proposed project site currently does not connect directly to existing wildlife habitats. The 1,400-acre (567-ha) Hansen Dam Park and adjacent portions of Big Tujunga Wash, located 4.7 miles (7.6 km) upstream from the proposed project site, provide a relatively large block of riparian habitat. The Sepulveda Dam Recreation Area, located 3.1 miles (5 km) southwest from the project site, includes the 225-acre (91-ha) Sepulveda Basin Wildlife Reserve, which provides riparian habitats along the Los Angeles River and surrounding a 60-acre (24-ha) lake. Along Tujunga Wash, the only other existing vegetation occurs 1.1 miles (1.8 km) downstream from the proposed project site near Los Angeles Valley College and Ulysses Grant Senior High School; this 8-acre (3.2-ha) "greenway" (60-70 feet [18-21 m] on each side of the 0.5-mile [0.8 km] channel section) provides mostly a park-like setting of larger trees with an open, grass groundcover.

As of February 2007, the CLADPW was finishing construction (expected completion in June 2007) of a similarly designed, 6,100 linear-foot (1,860 m) riparian restoration project immediately south of the Corps' proposed project, from Vanowen Street to Oxnard Street (S. Takeguchi, CLADPW, personal communication; Figure 2). Therefore, if completed, the Corps' proposed project would be contiguous with about 18 acres (7 ha) of newly restored, linear riparian habitat.

The Tujunga Wash between Hansen Dam and its confluence with the Los Angeles River is included under the State of California's Clean Water Act section 303(d) list for ammonia, copper, bacteria (high coliform count), odors, scum, and trash (California Environmental Protection Agency 2002). Data presented by The River Project (2006) also indicated potentially elevated levels of cadmium. Sources of ammonia include human and animal wastes, commercial fertilizers, and landfill leachate. Bacteria sources include human and animal wastes, leaky septic tanks or sewer lines, and decaying organic trash deposited in the water. Sources of copper, cadmium, and other metals include a variety of industrial sources and auto-related uses. Large quantities of trash and solid waste are generated in urban areas like Los Angeles, some of which ends up blowing across the landscape or washing off surfaces into waterways.

DESCRIPTION OF PROJECT ALTERNATIVES

The Corps and local sponsor investigated three project alternatives plus a no-action alternative (Alternative 1) for the restoration of this section of Tujunga Wash. Alternatives 2 and 3 essentially are variations of Alternative 4, which was selected as the Preferred Alternative, so common details are described under the 'Description of the Proposed Project' section below.

Alternative 2 would have constructed a meandering stream along the west bank of the channel, augmented soil quality by replacing the top 2 feet (0.6 m) of existing soil, and planted native vegetation (riparian and sage/scrub). The stream would receive water, via a pipeline, from the eastern branch of the South Pacoima Wash; no water would be removed from Tujunga Wash. Water used for the project would be returned to Tujunga Wash at Vanowen Street. Two habitat types, which historically dominated this area, would have been re-established through planting: southern cottonwood-willow riparian, and the alluvial scrub type of coastal sage-scrub chaparral (according to specifications in the Los Angeles River Master Plan [County of Los Angeles Department of Public Works 2004]). A multipurpose trail system with picnic tables, water fountains and ramadas, and off-street parking areas as well as informational interpretive nodes would have been placed along both perimeters of the project area. The trails were to be bordered with markers and plantings that would help delineate the interface between park users and habitat areas, but would not have entered into all portions of the habitat areas.

Alternative 3 would have been composed of the basic elements described in Alternative 2 above. It expanded the aquatic and riparian habitats while reducing sage-scrub/upland chaparral habitat. Grading was to be combined with the construction of ponds and marshes to create perennial wetland habitats, especially oriented toward migratory waterbirds. The volume of surface water flow into the restoration area (from the same source) would have been greater than for Alternative 2, owing to the evaporative losses from the more-extensive water surface area of ponds or marshes, as well as increased groundwater infiltration. This alternative also included a series of fenced pedestrian trails, elevated decks for wildlife viewing, and interpretive nodes and signage (as described in Alternative 2), located at strategic locations along this trail system to educate park users and avoid impacts to sensitive habitat zones. As with Alternative 2, no water would have been extracted from Tujunga Wash.

DESCRIPTION OF THE PROPOSED PROJECT

The objective of the proposed project (Alternative 4) is to restore 9 acres (3.6 ha) of regionally scarce riparian habitats along 3,000 linear feet (915 m) of the Tujunga Wash that has been impacted by flood-damage reduction activities and urbanization. The proposed project is still in a conceptual form, so construction details were unavailable at the time this report was written. However, the general plans are described below.

The proposed project incorporates the foundation elements included in Alternatives 2 and 3 in terms of basic stream and habitat configuration. A meandering stream element will be located on

the west bank (Figure 3 A, B). Dry-weather runoff water will be diverted from the South Pacoima Wash confluence using a pipeline and intake siphon/pump. The water will be imported to the project site at Sherman Way. If similar to the specifications for the CLADPW project, the constructed stream will convey a maximum flow of 25 cubic feet (0.708 m^3) per second, but flows would be ephemeral. The streambed will be soft-bottomed (unlined), with the banks landscaped with native vegetation to minimize erosion and sedimentation. An outlet structure will be constructed to return water to the Tujunga Wash at Vanowen Street.

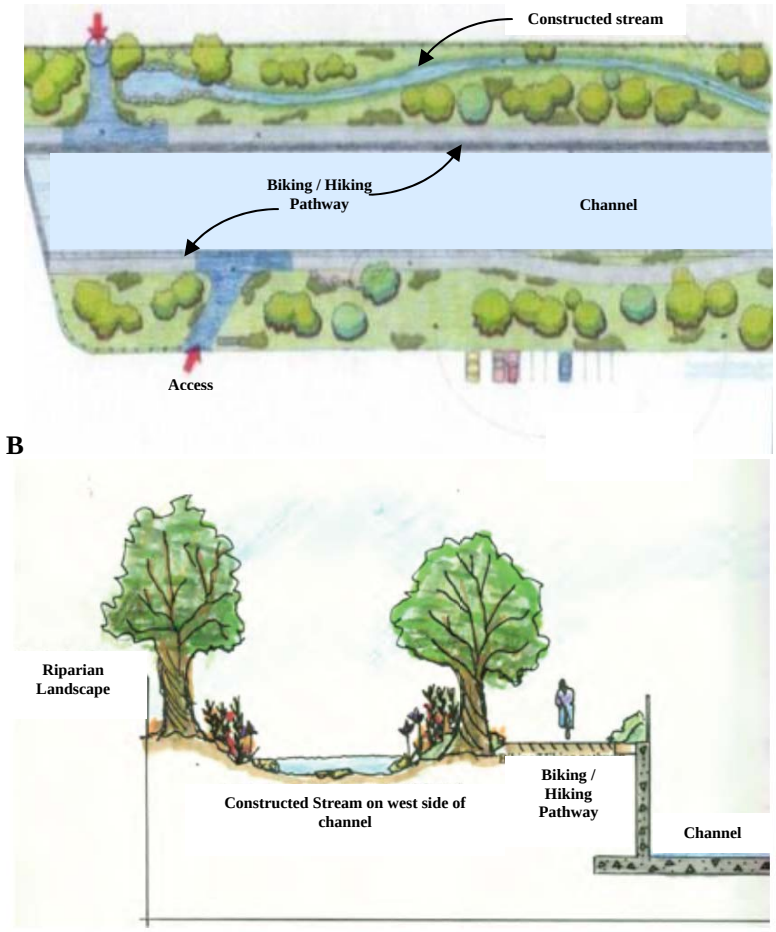

Figure 3. Conceptual design plans for the proposed Tujunga Wash restoration site: (A) overhead view (from U.S. Army Corps of Engineers 2006), (B) cross-section view of stream (from U.S. Army Corps of Engineers unpublished diagram).

The upper two feet (0.6 m) of existing soil will be removed from both banks of the channel, replaced with higher-quality soils, and re-contoured in a manner that will increase the water flow capacity and be capable of accommodating peak water flow during winter storms. This alternative might also increase retention of urban runoff flows, which could help recharge groundwater aquifers and slightly increase flood-reduction capacity in the existing channel.

Riparian vegetation will be re-established following the Los Angeles River Master Plan guidelines (County of Los Angeles Department of Public Works 2004). These plantings will mimic a southern cottonwood-willow riparian plant community, and include California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), arroyo willows (*Salix lasiolepsis*), mulefat (*Baccharis salicifolia*), Mexican elderberry (*Sambucus mexicana*), and several herbaceous species including mugwort (*Artemisia douglasiana*), rushes (*Juncus* spp.), sedges (*Carex* spp.) bent grass (*Agrostis exarata*), and goldenrods (*Solidago* spp.). All plantings will be irrigated for 3-5 years, or until riparian vegetation has become established.

The proposed project will create a multipurpose trail system, including ornamental security-fenced (linear) pedestrian trails and interpretive pathways which will include benches, trash receptacles, bollards, bike racks, drinking fountains, emergency call boxes, and signage located at strategic intervals along this trail system to educate park users and instruct pedestrians to avoid sensitive habitat zones.

Figure 4. View of existing habitat conditions at the proposed Tujunga Wash project site (photo from U.S. Army Corps of Engineers 2006).

DESCRIPTION OF BIOLOGICAL RESOURCES

The entire 200-foot (61-m) right-of-way within the proposed project area is devoid of any vegetation (Figure 4). The channel is completely concrete-lined, and the remainder of the right-of-way is regularly maintained with herbicides to eliminate vegetation. Because of the severely degraded habitat conditions within the proposed 9-acre (3.6-ha) project site, no field surveys were conducted for biological resources.

It is expected that a few urban-adapted bird and mammal species use the proposed project site, including raccoon (*Procyon lotor*), Virginia opossum (*Didelphis virginiana*), coyote (*Canis latrans*), striped skunk (*Mephitis mephitis*), house mouse (*Mus musculus*), Norway rat (*Rattus norvegicus*), black rat (*Rattus rattus*), eastern fox squirrel (*Sciurus niger*), northern mockingbird (*Mimus polyglottus*), European starling (*Sturnus vulgares*), house sparrow (*Passer domesticus*), mourning dove (*Zenaida macroura*), rock pigeon (*Columba livia*), American crow (*Corvus brachyrhynchos*), house finch (*Carpodacus mexicanus*), black phoebe (*Sayornis nigricans*), and Anna's hummingbird (*Calypte anna*) (Barkley 1993, Garrett 1993). However, use of the proposed project site by these species likely is transitory (to and from foraging and resting locations), and part of larger home ranges (The River Project 2006). The compacted soils of the proposed project site likely provide poor habitat for burrowing animals. It is likely that feral and domestic cats are abundant throughout the proposed project site.

The Tujunga Wash channel through the proposed project area receives relatively perennial runoff water from the South Pacoima Wash stormdrain, which provides shallow sheetwater along the concrete-lined channel bottom. These waters do not provide habitat for fish or amphibians, and so do not support foraging opportunities for wading birds (Bloom et al. 2002). However, mats of algae (*Cladophora* spp., *Scenesdesmus acuminatus*, *Pediastrum* spp.) can grow in these wetted-concrete channels (Anderson 1993), which in turn provide habitat for insects and other invertebrates. These invertebrate resources can provide concentrated foraging opportunities for

shorebirds, particularly during fall migrations (Cooper 2006). Garrett (1993) reported 22 shorebird species using the Hansen Dam Basin, and Cooper (2006) reported large concentrations of black-necked stilts (*Himantopus mexicanus*), western sandpipers (*Calidris mauri*), and least sandpipers (*C. minutilla*) using similar algal mats along concrete-lined sections of the lower Los Angeles River.

Because of the severely degraded habitat conditions, there are no sensitive species or habitats (i.e., Federal- or California-listed as endangered or threatened; California species or habitats of special concern) that occur within the proposed project site (California Department of Fish and Game Natural Diversity Database 2006).

IMPACTS OF THE PROPOSED PROJECT ON BIOLOGICAL RESOURCES

Beneficial Impacts

Over time, the creation of riparian habitats within the proposed project site will benefit several species of breeding and migratory songbirds and waterbirds. Along the western bank, and in conjunction with the naturalized stream, riparian vegetation should become relatively dense, with a diverse vertical structure – dense mulefat patches and perennial herbaceous plants in the understory, willows in the mid-story, and cottonwoods and sycamores as scattered overstory trees. The vegetation and stream will provide increased opportunities for a diverse array of insects and other invertebrates to colonize the site.

Because the surrounding landscape is primarily urban, this project's riparian vegetation, with its concomitant invertebrate resources, should provide important stopover habitats for a variety of bird species (Moore et al. 1993). Relatively large numbers of migratory songbirds could potentially use the riparian vegetation during spring and fall migrations and as over-wintering residents, including yellow-rumped warblers (*Dendroica coronata*), orange-crowned warblers (*Vermivora celata*), ruby-crowned kinglets (*Regulus calendula*), cedar waxwings (*Bombycilla cedrorum*), and white-crowned sparrows (*Zonotricha atricapilla*).

The riparian vegetation also will provide nesting habitat for bird species not currently using the site, including common yellowthroats (*Geothlypis trichas*), song sparrows (*Melospiza melodia*), American goldfinches (*Carduelis tristis*), and Nuttall's woodpeckers (*Picoides nuttallii*). Other breeding birds that may use mature, densely vegetated riparian habitats include yellow warblers (*Dendroica petechia*), house wrens (*Troglodytes aedon*), and Bewick's wrens (*Thryomanes bewickii*)(Garrett and Dunn 1981, Cooper 2004). Although unlikely because of its small size and isolation from extant habitats, the project's riparian habitats might attract least Bell's vireos (*Vireo bellii pusillus*), a Federal-listed 'endangered' species, which breed in small numbers upstream from Hansen Dam. Densities of some breeding bird species could be relatively high (e.g., song sparrows at 7-15 pairs per acre [3-6 per ha], common yellowthroats at up to 15 pairs per acre [6 per ha][Arcese et al. 2002 and Guzy and Richison 1999, respectively]), although most species likely will occur at substantially lesser densities.

Along the eastern bank, especially after supplemental irrigation is discontinued, the understory vegetation structure will be sparser, and the site likely will be dominated by larger-diameter shrubs and trees. Species that use more open vegetation, such as California towhees (*Pipilo fuscus*), western kingbirds (*Tyrannus verticalis*), bushtits (*Psaltriparus minimus*), and Bullock's orioles (*Icterus bullockii*), might nest and/or forage here.

If the naturalized stream retains perennial water, it is possible that certain fish species, such as exotic mosquitofish (*Gambusia affinis*), will become established. Relatively perennial water would also provide habitat for certain amphibians, including exotic bullfrogs (*Rana catesbeiana*), Pacific treefrogs (*Pseudacris regilla*), and western toads (*Bufo boreas*). If this occurs, the stream would likely be used for foraging by wading birds, such as snowy egrets (*Egretta thula*) and great blue herons (*Ardea herodias*).

No new mammalian species would likely occur after the riparian habitat becomes established, but abundances of existing species, especially raccoons, Virginia opossums, striped skunks, and rodents, likely would increase because of increased cover and foraging opportunities.

Physical and Biological Concerns

There are several existing and potentially expected negative factors that may be exacerbated or created by the proposed project:

Water quality. The water quality from the South Pacoima Wash stromdrain, which will provide the source flows for the naturalized stream, may pose both acute and chronic problems to wildlife and humans (Eisler 1985, Beyer et al. 1996; see reviews in Pitt 2003, Sutula and Stein 2003). Although the quantity of data available to make water-quality assessments is sparse, existing data from Tujunga Wash downstream from the proposed project site (The River Project 2006) indicated elevated levels of coliform bacteria, cadmium, copper, and ammonium that exceed objective criteria for this basin within the Los Angeles Region's Water Quality Control Plan (California Regional Water Quality Control Board 1994). Other potentially harmful constituents that have not been addressed in previous sampling efforts include organics, organochlorine pesticides, and PCB's.

Habitat configuration. Excluding the approximately 10-foot (3-m)-wide trail on each bank, there will be a maximum of 7.5 acres (3 ha) of vegetation and stream, with dense riparian vegetation occurring only along the stream edges on the west bank. The size and geometric shape of habitat patches can have substantial effects on their suitability for many species, especially breeding birds (Fletcher 2005). Riparian greenways, such as the proposed project, are narrow and linear, resulting in the entire area being essentially an "edge." Because most bird nests in greenways are located close to the habitat edge, they are more susceptible to avian and mammalian depredation (Flashpohler et al. 2001). American crows and "meso-predators" (e.g., raccoons, opossums), which are tolerant of human activity and are abundant in urban areas, can cause

substantial nest depredation near trails (Knight et al. 1987, Miller and Hobbs 2000).

Human disturbance. Human users (e.g., recreationists) of urban parks can cause substantial disruption to breeding and roosting birds (Knight and Cole 1995). Nesting birds that are disturbed by human recreational activity can have substantially reduced reproductive success (Knight and Temple 1995, Miller et al. 1998, Miller and Hobbs 2000). Nesting and foraging birds may also avoid otherwise suitable habitats adjacent to trails (Miller et al. 2001, Fernández-Juricic et al. 2004), thereby reducing the overall biological benefit. However, when recreationists remain on designated trails, birds are less prone to human disturbance (Fernández-Juricic et al. 2004).

Feral & domestic cats, other meso-predators, and brown-headed cowbird brood parasitism. Cats (both feral and domestic) and other "meso-predators" can be major sources of bird mortality, both through depredation of adults (Lepczyk et al. 2003) and nests (Crooks and Soulé 1999). This is especially true for small urban parks, where feral and free-roaming domestic cats can cause substantial reductions in bird and rodent species, especially to ground-nesting birds such as California towhees (Thelander and Crabtree 1994, Hawkins et al. 1999). Cats, raccoons, and opossums are abundant in urban areas, and likely will increase in abundance after vegetation becomes established at the proposed project site. In conjunction with the pronounced "edge effect" of the proposed habitat configuration (i.e., narrow and linear), predation of breeding birds and their nests could be substantial. Feral and free-ranging domestic cat population management programs have been difficult to implement (Winter 2006), but lack of such a program may preclude sustainable breeding bird populations within the proposed project site (Crooks and Soulé 1999).

Brown-headed cowbirds (*Molothrus ater*) parasitize nests of other songbirds, thereby decreasing the host species' reproductive output (Lowther 1993). Cowbird parasitism is especially prevalent in riparian habitats. Cowbirds are tolerant of urbanized landscapes (Stephenson and Calcarone 1999), and are present near the proposed project site (at Hansen Dam Park and Sepulveda Dam Recreation Area). Cowbirds are highly mobile (Lowther 1993), and it is likely that they will occur at the proposed project site once riparian vegetation becomes established.

Competition from exotic species. Exotic plants can rapidly invade riparian habitats, and are especially problematic in newly established areas. For the proposed project site, several exotic / invasive plants might become established, including common reed (*Arundo donax*), fennel (*Foeniculum vulgare*), castorbean (*Ricinus communis*), and perennial pepperweed (*Lepidium latifolium*)(California Invasive Plant Council; <http://www.cal-ipc.org>). If this happens, and control measures are not instituted, these species could displace virtually all other vegetation, severely reducing plant and animal diversity.

If bullfrogs (or even mosquitofish) become established, they will severely reduce the abundance and diversity of other amphibians within the naturalized stream (Kupferberg 1997, Lawler et al. 1999). However, bullfrogs, their tadpoles, and mosquitofish would potentially provide foraging

resources to other animals.

Direct physical impacts. Because of the severely degraded existing habitat conditions, construction of the proposed project would not have any permanent adverse impacts on the biological resources in the project area. Any minor impacts would be temporary. As long as Best Management Practices are employed during construction to minimize erosion, there should be no significant effects on downstream portions of Tujunga Wash or the Los Angeles River.

Depending on the volume of dry-season runoff diverted from the South Pacoima Wash, all or portions of currently existing wetted-concrete areas within the Tujunga Wash channel would be displaced to the area south of Vanowen Street. Therefore, the algal mats that provide potential foraging habitat for shorebirds would form further downstream in the channel. However, this impact should be very minor, because shorebirds and other animals that might use these wetted-concrete habitats are highly mobile and can easily find the new location of sheet water and algal mats.

Summary

The proposed project, if well-implemented and maintained, will provide substantive improvements to the existing breeding, foraging, and resting habitats for a number of fauna. However, these long-term ecological benefits will only be achieved through perpetual maintenance of the plantings and stream. Although outweighed by the benefits provided by a well-managed restoration project, these created riparian habitats also will be subjected to substantial negative forces, such as isolation from other aquatic habitats and linear habitat configuration, which may limit the project's benefit to biological resources.

It is difficult to predict the future abundances and diversity of these biological resources, but the Service expects that migratory songbirds and urban-adopted mammals will receive the greatest benefit from the proposed project. A few breeding bird species may be locally abundant, but there are many potential factors that could substantially limit their survival and reproductive success.

RECOMMENDATIONS

The Fish and Wildlife Coordination Act states that "...wildlife conservation shall receive equal consideration and be coordinated with other features of water-resource development projects through the effectual and harmonious planning, development, maintenance, and coordination of wildlife conservation...." (16 U.S.C. 661). Should any of the Corps' proposed options for the selected alternative be implemented, incorporation of the following recommendations would maximize the benefits to biological resources within the project site, and minimize the potential for detrimental impacts downstream.

In accordance with the Fish and Wildlife Coordination Act, we make the following

recommendations:

1) Initiate and maintain a water-quality analysis of water diverted from the South Pacoima Wash. Because many of the project's biological benefits are related to the long-term operation of the naturalized stream, there is substantial concern that poor water quality could negatively affect wildlife and humans through direct contact with the water or through ingestion of contaminated water and vegetation. An initial water-quality analysis should be performed prior to construction. Before the project is funded further, any negative water-quality results, as well as potential solutions, should be discussed with the Corps, Service, California Department of Fish and Game (Department), California Regional Water Quality Control Board, and any other relevant environmental health agencies.

2) In cooperation with the Corps, Service, and Department, develop a long-term management and monitoring plan for the Tujunga Wash project. This plan should detail the planting palette; planting / seeding locations and quantities; irrigation methods and timing; water sources and quantities; maintenance of the plantings and stream; success criteria for planted vegetation; water quality monitoring; biological monitoring; and invasive plant control.

The water-quality and biological monitoring programs are especially important, because there is a general lack of information regarding the short- and long-term responses of vegetation and wildlife to urban restoration projects of this size and logistical intensity (i.e., re-creating relatively small stream and riparian habitats where none existed previously). Timely and good-quality monitoring data will be essential to assess this project's success, but just as importantly will provide adaptive feedback to future planning efforts for similar projects – if this project's biological benefits are minimal or can be improved, then it would be detrimental to use similar planning guidance for future projects.

We suggest the following be incorporated into any long-term management and monitoring plan:

a) Long-term management and maintenance agreements should be negotiated and clearly specified prior to construction. The long-term biological benefits from this project will only occur if the vegetation plantings and stream infrastructure are monitored and maintained in perpetuity. Long-term and adequate funding for these efforts is essential to the project's success.

b) Water-quality assessments. These assessments should be conducted initially by contracted professionals. However, depending on initial results, it might be possible to use volunteer water-quality monitors to provide routine, long-term monitoring. The U.S. Environmental Protection Agency has developed guidance on establishing monitoring goals and objectives, quality assurance methods, and project organization for volunteer school and citizen groups (<http://www.epa.gov/owow/monitoring/volunteer>). Funding provisions should be made to provide all necessary supplies and analysis equipment to any volunteer monitoring effort.

c) Vegetation monitoring. The survival and growth of the planted riparian vegetation should be monitored as part of the established project-success criteria. Intensive, short-term monitoring during the early project years should focus on successfully establishing native vegetation, while long-term monitoring should document vegetative health. This is particularly important after supplemental irrigation is discontinued. This monitoring should be conducted by trained professionals

d) Long-term bird surveys. Basic objectives should address trends in species diversity and abundance as habitats mature. Because of the relatively small acreage and easy access of the proposed project site, these surveys might be accomplished by recruiting volunteers through local birding groups such as the Audubon Society (West 1999). Under relatively standardized survey conditions (e.g., time of year, time of day, weather), these volunteer birders could provide information on breeding, migrant, resident, and over-wintering bird species and relative abundances. Breeding surveys should include a record of fledglings observed as a measure of reproductive success. Winter surveys might be included in a new or existing Christmas Bird Count, an annual count sponsored by the Audubon Society. However, if volunteer efforts cannot be effectively implemented to provide necessary monitoring information, then provisions should be made to periodically fund professionally contracted bird surveys. Regardless of whether volunteer or professional surveys are conducted, a survey coordinator should be designated to oversee field-survey logistics (e.g., training, supplies, scheduling); compile and summarize results; and make recommendations concerning future surveys.

e) Invasive plant monitoring and control should be conducted with annual inspections by trained professionals. Exotics should be completely eradicated when they are encountered.

3) Reduce human and domestic-pet intrusion to as large a section of the riparian habitat as possible. Except at one or two designated locations (e.g., for educational purposes), promote the establishment of dense riparian vegetation along the naturalized stream to minimize opportunities for recreationists to access the central portions of the riparian habitat. This will reduce trampling of vegetation, erosion, and disturbance to wildlife. Fencing at stream-access locations, or preferentially along all trail borders, would also reduce human intrusion. Closure of the trails during nighttime hours will reduce disturbance to roosting birds.

4) Institute a feral cat control program for the project site and surrounding residential neighborhoods. Also, institute an education program in adjacent residential neighborhoods to proactively reduce the feral cat population as well as reduce free-roaming domestic cat disturbances to the project site (for guidance, see the American Bird Conservancy's education materials at <http://www.abcbirds.org/cats/>).

5) As part of the biological monitoring program, report the presence of any Federal- or California-listed species to the Service and Department, respectively. We recommend discussions with both of these resource agencies prior to construction, to develop a proactive

strategy to manage listed species.

6) Institute Best Management Practices during construction activities to minimize any on-site and downstream disturbances. These may include construction during the dry season and control of sediment runoff.

7) Promote and prioritize future habitat restoration and greenway projects in this local area that will link directly to the proposed project site, similar to the proposed project's connection with the CLADPW's riparian restoration project. Larger, connected habitat patches provide greater benefits to breeding and migratory wildlife than smaller, isolated patches.

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Appendix. Corps of Engineers' 19 April 2007 e-mail accepting the U.S. Fish and Wildlife Service's project assessment and recommendations from the draft Fish and Wildlife Coordination Act Report.

"Fink, Michael J SPL"
<Michael.J.Fink@spl01.usace.army.mil>
04/19/2007 09:15 AM

To <brian_root@fws.gov>
cc "Tabije, Roland R SPL" <Roland.R.Tabije@spl01.usace.army.mil>, "Lockmann, Ronald F SPL"
bcc
Subject Tujunga Wash CAR

Good morning:
The Draft CAR looks comprehensive to me, and I agree with your "physical and biological concerns," and with your "recommendations." I have already addressed these issues in revision ot our Draft DPR/EA and have written a distinct section on monitoring and management. Please provide the final CAR both electronically to my attention, and in wiriting to the LAD address and a copy to my address for the project compliance file. Thank you in advance for your consideration.

Respectfully,

Michael J. Fink
Landscape Ecologist
Environmental Resources Branch
U.S. Army Corps of Engineers
AZ/NV Area Office
3636 N Central Ave., Ste. 900
Phoenix, AZ 85012-1939

602.640.2001 x232

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APPENDIX C

HYDROLOGY AND HYDRAULICS REPORT

Tujunga Wash Ecosystem Restoration Study

Hydrology & Hydraulics Appendix

DRAFT
3/17/08

U.S. Army Corps of Engineers
Los Angeles District
Los Angeles, CA 90053-2325

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OBJECTIVE

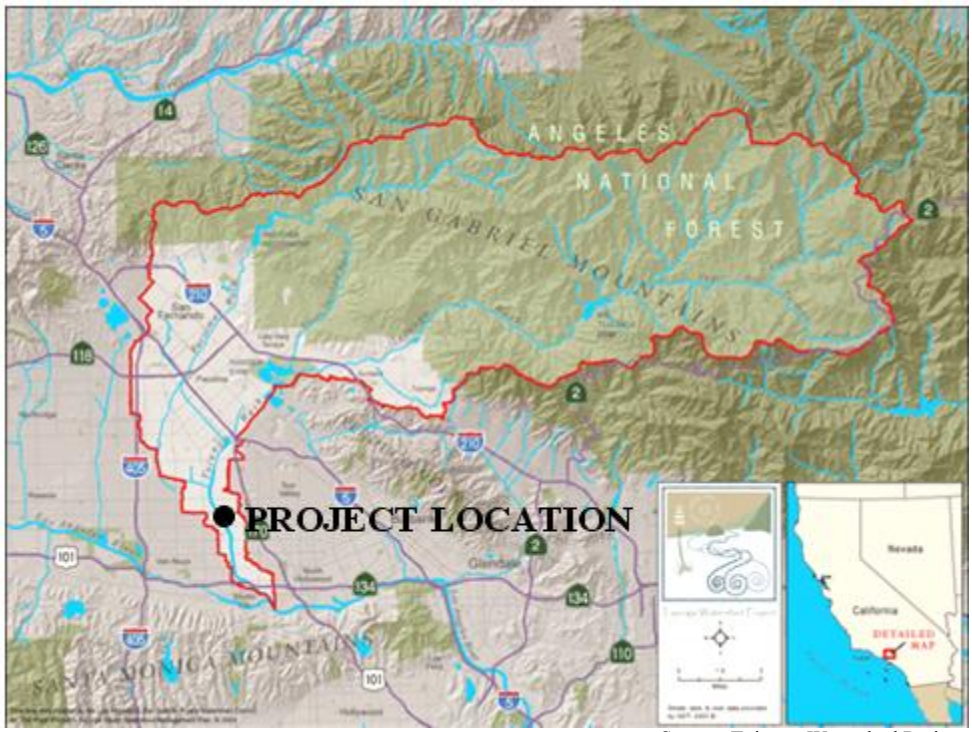
The objective of this appendix is to provide the hydrological and hydraulic baseline information to support the Tujunga wash ecosystem restoration study along the Tujunga Wash reach from Sherman Way to Vanowen Street with a channel length of approximately 3,000 feet.

PROJECT AREA

The project area consists of two channel banks on west and east sides along the Tujunga Wash reach from Sherman Way to Vanowen Street. Each channel bank is approximately 65 feet in width and 3,000 feet in length. The project area is located about 2.6 miles above the confluence of Tujunga Wash and the Los Angeles Rive. Figure 1 shows the boundary of the Tujunga Wash watershed and the project location. The project area encompasses an area of approximately 9 acres of land. Figure 2 shows the site location of the project area.

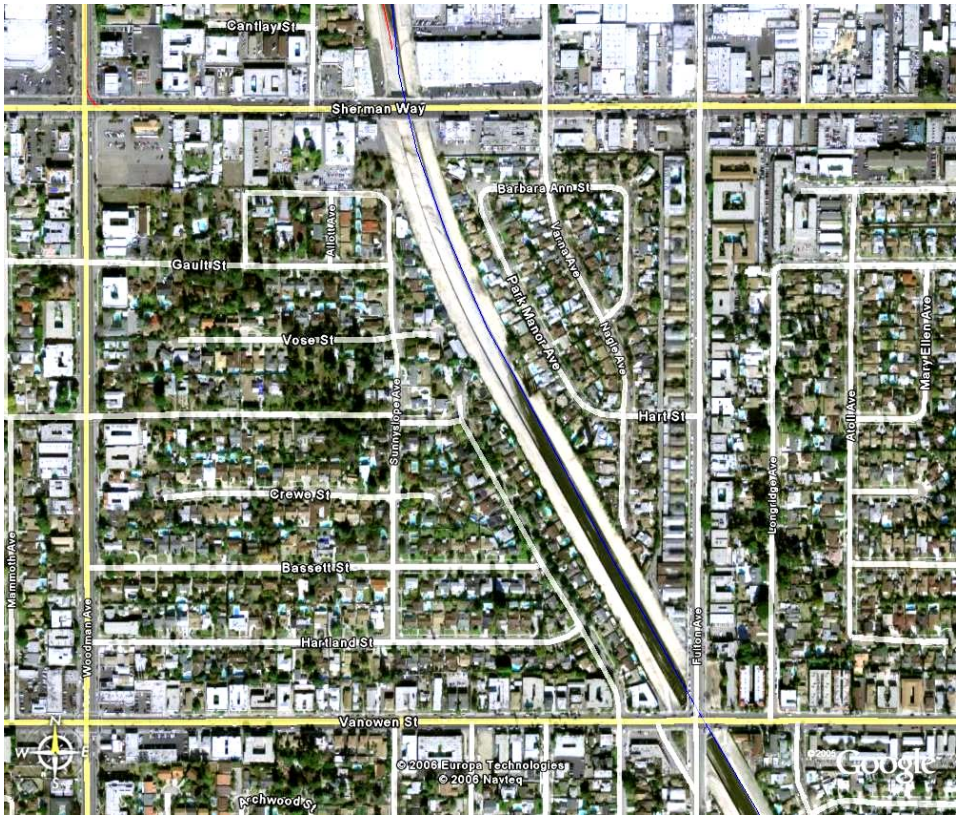
PROJECT DESCRIPTION

The purpose of the project is to restore and enhance the habitat of the 3,000 feet of channel that extends between Van Owen Street and Sherman Way, in Los Angeles, CA. The habitat along this portion of the channel has been substantially degraded due to modifications made for flood damage reductions and the operation and maintenance decision to keep plant material, or vegetation, off the surface. The opportunity exists to restore the habitat areas by restoring the eastern and western terraces, increasing native vegetation cover, and expanding the amount of riparian habitat. In addition, the proposed project would increase recreational and educational opportunities and uses along the eastern terrace. The proposed project would not reduce the flood control performance of the original Tujunga Wash project**.** In addition, the proposed project would increase recreational and educational opportunities and uses along the channel reach. The total area proposed for restoration includes strips of land 65-ft. wide (210 feet total width, including channel) on both sides of the channel, for a total of 9 acres.



Source: Tujunga Watershed Project

Figure 1: Tujunga Wash Watershed



Source: Google Earth

Figure 2: Tujunga Wash Ecosystem Restoration Site Location.

HYDROLOGY

Tujunga Wash emanates from the western end of the San Gabriel Mountains, flowing through the range in an east/west direction (due to the San Gabriel fault) to the control structure of Hansen Dam, and then in a southerly direction through the eastern San Fernando Valley all the way to its confluence with the Los Angeles River. It is the primary drainage system for the western half of the San Gabriel Mountains. Elevations of the upper watershed range from approximately 1200 feet to 7200 feet. Due to tectonic activity, the western San Gabriel Mountain have one of most rapid rates of uplift in the region, and are thereby defined with very steep escarpments. Physical weathering of the soils in the range is very rapid and, when combined with local fire ecology, major sedimentation has historically been the result. This was especially notable following 1975 Big Tujunga Fire.

The Wash is then joined by two major tributaries at Hansen Dam: Lopez Canyon Wash and Little Tujunga Canyon Wash; still further downstream it is joined by another major tributary, Pacoima Canyon Wash. As mentioned earlier, Tujunga Wash is the major tributary of the upper Los Angeles River watershed.

Average daily flow in the Tujunga Wash at USGS gauge (11097000) is about 23 cfs. For the period May-October, the average daily flow is about 19 cfs and period June-October the average daily flow is only about 6 cfs. Tujunga Wash has a channel capacity of 29,000 cfs. The channel is rectangular with concrete sides and invert. The bottom width is seventy feet and its depth varies from twelve to thirteen and a half feet. The design velocity is 35-40 feet per second.

Hydrometeorologic Characteristics

In general, the San Fernando Valley basin has warm dry summer and cool, wet winters. Both temperature and precipitation vary considerably with elevation and topography.

Temperature

At the City of Burbank, located southeast of the Big Tujunga Dam and the project area and 726 feet above sea level, the average temperature is about 65^{o} F, with extremes of 22^{o} F and 118^{o} F record. Pertinent data and monthly average temperature for Burbank weather station are shown on table 1 below.

Table 1: Burbank, CA – Monthly Temperature

Station Name:		BURBANK VALLEY PUMP								Station Number:			41194
Period of Record:		7/1/1971 to 7/31/2000								Latitude:			34:11:00
Elevation:		655 feet								Longitude:			118:20:00
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Maximum	67.5	69.5	70.6	74.9	77.5	83.2	88.9	89.9	87.1	81.5	73.5	67.9	77.7
Minimum	42	44.3	46.2	49.5	54.2	58.3	62.1	62.4	59.9	53.6	45.4	41.3	51.6

Average	54.75	56.9	58.4	62.2	65.85	70.75	75.5	76.15	73.5	67.55	59.45	54.6	64.65
Temperature in degrees Fahrenheit (F)													
Data from NWS, Nation Climatic Data Center(NCDC), Western regional Climate Center													

Precipitation

Precipitation characteristically occurs in the form of rainfall, although in the higher elevation above Big Tujunga Dam, some falls as snow. In general, the quantity of precipitation increases with elevation. The mean seasonal precipitation at the project area is about 17.49 inches. Nearly all precipitation occurs during the months of December through March. Rainless periods of several months during the summer are common. Pertinent data and monthly average precipitation values for the weather station are shown on table 2 below.

Table 2: Burbank, CA – Monthly Precipitation Totals

Station Name:	Burbank Valley Pump								Station Number:			41194
Period of Record:	7/1/1971 to 7/31/2000								Latitude:			34:11:00
Elevation:	655 feet								Longitude:			118:20:00
Average Total Precipitation												
Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
3.56	4.29	3.88	1.02	0.37	0.12	0.02	0.18	0.3	0.55	1.05	2.15	17.49
Precipitation in inches Data from NWS, Nation Climatic Data Center(NCDC), Western Regional Climate Center												

Point precipitation estimate for selected frequencies are available from NOAA Atlas 14. Specific estimates for Big Tujunga Dam are shown on table 3 below.

Table 3: Precipitation Frequency Estimate (Point Estimates)

Precipitation Frequency Estimates										
Station:	Big Tujunga Dam							Latitude:	34:49	
Elevation:	2358 feet							Longitude:	118:31	
ARI (years)	5 min	10 min	15 min	30 min	1 hr	2 hr	3 hr	6 hr	12 hr	24 hr
2	0.25	0.38	0.47	0.63	0.78	1.2	1.56	2.43	3.49	4.82
5	0.33	0.49	0.61	0.83	1.02	1.55	2	3.14	4.63	6.59
10	0.39	0.59	0.74	0.99	1.23	1.84	2.37	3.7	5.53	7.96
25	0.49	0.74	0.92	1.24	1.53	2.25	2.88	4.45	6.75	9.88
50	0.56	0.86	1.07	1.44	1.78	2.59	3.29	5.05	7.71	11.42
100	0.65	0.99	1.23	1.66	2.05	2.94	3.71	5.67	8.71	13.03
200	0.74	1.13	1.41	1.89	2.34	3.31	4.15	6.3	9.74	14.73
500	0.88	1.34	1.67	2.24	2.77	3.84	4.77	7.14	11.16	17.09
1000	1	1.52	1.88	2.54	3.14	4.27	5.26	7.79	12.27	18.99
Precipitation in inches Source: NOAA Atlas 14 for Big Tujunga Dam										

Stream Gage

USGS stream gage station (11097000) is located at Mission San Fernando Grant, in city of Los Angeles. The gage is located on left bank of concrete outlet channel, 0.1 mi upstream from Glenoaks Boulevard, 0.5 mi downstream from Hansen Dam. It has 153 square mile drainage areas. It has period of record from May 1932 to February 1938, August 1940 to current year. This stream gage provides stream flow data for discharge frequency analysis and low flow analysis for the current study.

Discharge Frequency Analysis

Total 71 year length of record at the Big Tujunga Blvd Hansen Dam gage was used. The data on table 4, used for the Flood Frequency Analysis (FFA) program, to determine the 5 to 95 percent confidence discharge limits of storm frequency events was obtained from annual peak value at USGS station 11097000. This USGS station is approximate 4.4 miles upstream of this restoration project. Data was collected from the stream gage on Big Tujunga Blvd. (station ID 11097000), at which, location represents 153 square miles of watershed. The years for which there were no data includes: 1939 and 1940. The annual peak discharges were entered into the HEC FFA program, with a regional skew of -0.4500 (Flood Flow Frequency Bulletin # 17B, average skew coefficient by one degree quadrangles) with the resulting discharge frequency graph as seen in Figure 3.

The Flood Frequency Analysis Results in table 4 lists the year ranking of peak flows in cfs and the corresponding median plotting position as seen on the discharge frequency curve in Figure 3. The Synthetic Statistics reveal the range of record covers a period of 71 years with 69 years of recorded data, with missing years of data as mentioned above. The 5 to 95 percent confidence limits are listed pertaining to the one year (99.0 %) through the five hundred year (.2 %) frequency events. The one hundred year frequency event (1.0 Percent Chance Exceedance), is computed to be a flow of 35,000 cfs with a 5 to 95 percent confidence limit of 94,300 cfs to 17,000 cfs respectively

Table 4: Discharge Frequency Analysis

Table 4. Flood Frequency Analysis Results-Tujunga Wash, Stream Gage 11097000 (Present Conditions)

Year	Flow		Rank	Year	Flow	Median		Year	Flow		Rank	Year	Flow	Median
	cfs				cfs	Plot Pos			cfs				cfs	Plot Pos.
1933	2260		1	1938	54000	1.54		1992	4680		57	1956	20	81.43
1934	3750		2	1978	15200	3.08		1993	5600		58	1957	18	82.86
1935	615		3	1983	15200	4.62		1994	721		59	1959	16	84.29
1936	628		4	1969	11700	6.15		1995	1220		60	1955	9	85.71
1938	54000		5	1998	8600	7.69		1996	1500		61	1961	4	87.14
1941	1200		6	1993	5600	9.23		1997	853		62	1960	2	88.57
1942	59		7	1967	5130	10.77		1998	8600		63	1950	2	90
1943	1780		8	1980	5020	12.31		1999	235		64	1949	1	91.43
1944	1100		9	1992	4680	13.85		2000	864		65	1964	0	92.86
1945	710		10	1934	3750	15.38		2001	689		66	1963	0	94.29
1946	610		11	1966	3240	16.92		2002	41		67	1951	0	95.71
1947	900		12	1962	3130	18.46		2003	678		68	1972	0	97.14
1948	34		13	1952	3000	20		2004	105		69	1965	0	98.57
1949	1		14	1933	2260	21.54								
1950	2		15	1982	2100	23.08								
1951	0		16	1943	1780	24.62		**FREQUENCY CURVES**						
1952	3000		17	1958	1700	26.15		COMPUT.	EXPECT.			PERCENT	CONFID. LIMITS	
1953	178		18	1996	1500	27.69		CURVE	PROBAB.			CHANCE	0.05	0.95
1954	50		19	1985	1350	29.23		FLOW IN CFS				EXCEED	FLOW IN CFS	
1955	9		20	1995	1220	30.77		75700	87700			0.2	218000	32900
1956	20		21	1941	1200	32.31		51400	57900			0.5	140000	23200
1957	18		22	1988	1120	33.85		36300	40200			1	94300	17000
1958	1700		23	1944	1100	35.38		24100	26200			2	59400	11700
1959	16		24	1981	1070	36.92		12400	13100			5	27900	6370
1960	2		25	1979	1040	38.46		6420	6670			10	13400	3480
1961	4		26	1991	1010	40		2680	2740			20	5090	1540
1962	3130		27	1947	900	41.54		388	388			50	650	234
1963	0		28	1986	887	43.08		39	38			80	68	21
1964	0		29	2000	864	44.62		10	9			90	19	5
1965	0		30	1997	853	46.15		3	3			95	6	1
1966	3240		31	1984	761	47.69		0	0			99	1	0
1967	5130		32	1994	721	49.23								
1968	372		33	1945	710	50.77		**SYNTHETIC STAISTICS**						
1969	11700		34	2001	689	52.31								
1970	200		35	2003	678	53.85		LOG TRANS. FLOW CFS				NUMBER OF EVENTS		
1971	228		36	1936	628	55.38		MEAN			2.4786	HISTORIC EVENTS		0
1972	0		37	1935	615	56.92		STANDARD DEV			1.1069	HIGH OUTLIERS		0
1973	329		38	1946	610	58.46		COMPUTED SKEW			-0.6799	LOW OUTLIERS		0
1974	71		39	1968	372	60		REGIONAL SKEW			-0.45	ZERO OR MISSING		5
1975	38		40	1973	329	61.54		ADOPTED SKEW			-0.6	SYSTEMATIC EVENTS		69
1976	31		41	1999	235	63.08								
1977	108		42	1971	228	64.62								
1978	15200		43	1970	200	66.15								
1979	1040		44	1953	178	67.69								
1980	5020		45	1989	161	69.23		Tujunga Wash						
1981	1070		46	1977	108	70.77								
1982	2100		47	2004	105	72.31		Streams Gage at Big Tujunga Blvd Hansen Dam						
1983	15200		48	1974	71	73.85								
1984	761		49	1942	59	75.38		Drainage Area = 153 sq mi						
1985	1350		50	1954	50	76.92								
1986	887		51	1990	41	78.46								
1987	38		52	2002	41	80								
1988	1120		53	1975	38	81.54								
1989	161		54	1987	38	83.08								
1990	41		55	1948	34	84.62								
1991	1010		56	1976	31	86.15								

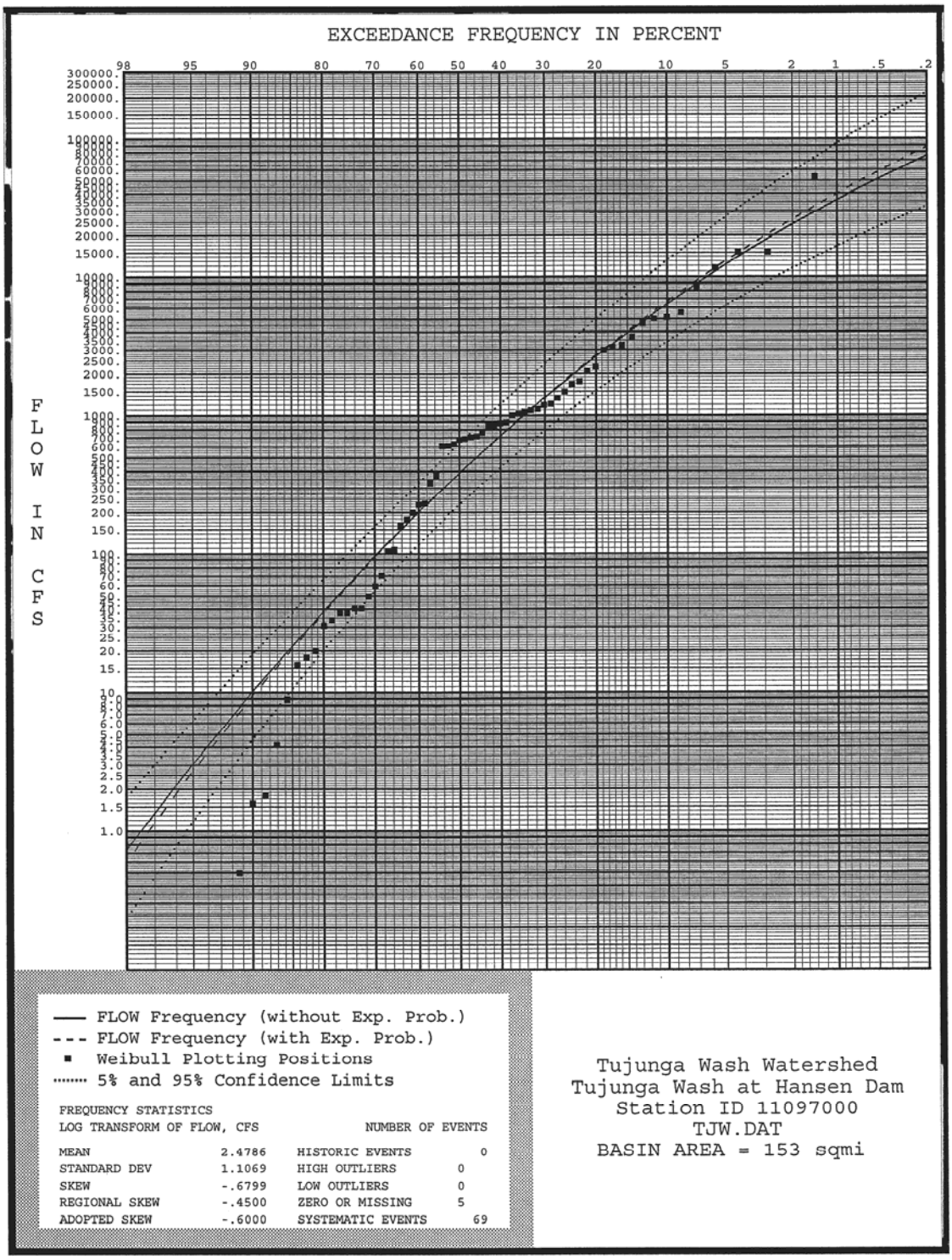


Figure 3: Discharge Frequency Curve

Monthly Statistics of Stream Flow and Low-Flow Analysis

According to the EM 1110-2-1415, Hydrologic Frequency Analysis, analytical frequency techniques are usually not applicable to low-flow data, because most theoretical frequency distributions cannot satisfactorily fit the recorded data. Therefore, graphical techniques are recommended and were used in this study. Also, during a low flow analysis, the percent chance of non-exceedance is usually determined and plotted instead of percent change of exceedance, which is determined for high or peak flow analysis.

By using same stream gage (USGS 11097000), records from surface water gauging stations are available from the U.S. Geological Survey (USGS). Monthly statistics of surface water flow were analyzed at the Big Tujunga blvd Hansen Dam, CA

An analysis of low flow in the Tujunga wash was conducted using the daily stream gage data at Big Tujunga Blvd at Hansen Dam from 1932 through 2004.

The average daily discharges were first analyzed on a monthly basis to determine the frequency of various low flows. The average number of days in a given month that the average daily discharge were non-exceeding a given discharge are list in the Table 5.

The Tujunga Wash between Sherman Way and Vanowen Street is part of the Tujunga Wash study area. Periods of record for gauging stations vary from a few years to several decades, and the statistical data may not reflect average conditions. In terms of water budget, monthly statistics stream flow analyses illustrated in Table 5 should be utilized in developing alternatives of Ecosystem Restoration with more specific analysis of each case.

The Monthly Statistics view displays a suite of summary statistics on a month-by-month basis. This suite summarizes data over the entire period of record, reporting three types of statistics: daily statistics, period statistics (monthly), and exceedences. Daily statistics are calculated against the daily observations. Period statistics are calculated against the population of valid monthly totals or means for each period (month). Exceedences are calculated against all non-missing daily observations.

On table 5 shows for the month of August, it has lowest mean flow 2.62 cfs which is driest summer month, and for month of February, it has highest mean flow 90.78 cfs which is wettest winter month.

Table 5: Monthly Statistics of Big Tujunga Wash Blvd at Hansen Dam, CA

ID:11097000
Parameter: Stream Flow CFS
Year: 1933-2004
State: CA

Statistic: Mean
Latitude: 34:15:17
Longitude: 118:23:17
Drainage Area: 153 mi^2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Year
# Days	2164	1977	2139	2066	2154	2100	2170	2170	2100	2168	2098	2169	25475
Avg Day	37.96	90.78	84.61	30.07	22.33	6.92	3.16	2.62	3.31	2.79	8.05	6.54	24.49
Max Day	7100	9450	11400	1510	1060	229	133	62	519	267	2320	577	11400
Min Day	0	0	0	0	0	0	0	0	0	0	0	0	0
# Months	69	70	69	68	69	70	70	70	70	70	70	70	68
SDev Month	115.9	230.7	223.1	67.51	67.4	15.28	8.44	6.68	8.23	6.32	27.67	14.61	48.73
Skew Month	4.74	3.43	4	2.68	4.81	3.21	3.9	3.38	3.2	2.95	4.61	3.63	2.5
Min Month	0	0	0	0	0	0	0	0	0	0	0	0	0
Max Month	742	1218	1387	304.2	446.3	81.07	52.39	33.1	41.4	32.19	152.9	85.61	224

South Channel

As a part of the Los Angeles River Watershed, the South Channel is fed by the Pacoima Wash. The Pacoima Wash which run from the Angeles National Forest in the San Gabriel Mountains, through the City of San Fernando, and down to the Tujunga Wash. The Pacoima Wash is an ephemeral waterway, which runs mainly during periods of precipitation. However, there are occasional releases of water from Pacoima Dam and considerable urban runoff from its 51 square mile watershed so it continuously has water flowing in it. It is difficult to gauge the quantity of water flowing thru it because it can fluctuate on a daily basis.

Runoff

Runoff from the watershed is characterized by high flood peaks of short duration that result from high-intensity rainfall on the watershed. Flood hydrographs are typically of less than 12 hours duration and are usually less than 48 hours duration. Inflow rates drop rapidly between storms, and inflow during the dry summer season is usually less than 10 cfs. Long-term average inflow to Hansen Dam for the 1946 through 1988 is 27,450 acre-feet per year.

In general, antecedent precipitation is required as a prerequisite for the occurrence of large floods from this watershed. Loss rates may decrease to as low as 0.15 inch per hour by the end of a major storms

The watershed is heavily urbanized, and available open space is extremely limited. The only opportunities for storm runoff detention, infiltration, or storage are to modify low-impact and low-density areas such as parks, sport fields, large parking lots, and public streets.

There are two sources of surface runoff. One is the South channel of Pacoima Wash outlet into the Tujunga Wash and second is Tujunga Wash. During field reconnaissance, the South channel of Pacoima Wash outlet water source was approximate 10 ft wide and 1 inch water depth (visual) on June 1, 2006. And on September 20, 2007 the South channel of Pacoima Wash outlet water source was approximate 8 ft wide and 1 inch water depth (visual). Estimate average discharge from South Channel of Pacoima Wash is1.30 cfs. For Tujunga Wash water source was approximate 18 ft wide and 1 inch depth (visual). And the estimate discharge is 2.61 cfs (n = 0.014, s = 0.0085, W = 18 ft, H = 0.08 ft).

Must used caution that the above two water sources are estimate. Data only used from one field visit on June 1, 2006 and September 20, 2007. Not based on history of flows in the Tujunga or south channel Pacoima Wash during “low flow” condition.

WATER DEMANDS

Infiltration

Water losses due to infiltration can be a significant factor in the water budget, especially if ponded areas are to be included in the proposed project. Normally, you can expect channel infiltration to be about 0.5 – 2.0 feet per day in Southern California streams. If the soil is not saturated, moisture will infiltrate into the ground at a rate controlled by the soil texture, vegetal cover, and degree of saturation. Infiltration rates are variable with time. Rates are highest when the soil is dry and lower after it is wetted. Infiltration rates decrease with time during a rainstorm and finally assume a uniform and minimum value. A large amount of rainfall on silt or clay surface will usually have limit infiltration. The presence of organic matter (loam) and vegetation will generally increase infiltration. The infiltration capacity is the maximum or potential rate at which water can enter the soil at any point in time. The soils underlying the project location are about 60% Chular Clay Loam and 40% Chino Silt Loams. The soils in the project location would fall into Hydrologic Soil Group C. The minimum infiltration rates for Hydrologic Soil Group C are shown in Table 6 below.

Table 6: Infiltration Rate Criteria for SCS Hydrologic Soil Groups

Group	Minimum Infiltration	
	(in/hr)	(ft/day)
A	0.30 – 0.45	0.6 – 0.9
B	0.15 – 0.30	0.3 – 0.6
C	0.05 – 0.15	0.1 – 0.3
D	0.0 – 0.15	0.0 – 0.3

Source: McCuen, R. H., *Hydrologic Analysis and Design*, 2nd ed., Prentice Hall, Upper Saddle River, New Jersey, 07458, 1998

For this site, an average infiltration loss 0.9 feet per day was used.

Evaporation

Evaporation as used here represents that portion of the water balance that evaporation from open water sources. Calculations for evaporation were made by LADPW from year 2001 to 2002 of the Hydrologic Report. Evaporation was computed by compiling average monthly pan evaporation at Big Tujunga Dam and average monthly precipitation at Big Tujunga Dam. The average monthly evaporation rates for Big Tujunga Dam are shown in Table 7 below.

Table 7: Big Tujunga Dam – Monthly Evaporation Rates

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
9.35	4.65	2.63	3.91	4.49	5.32	5.61	8.77	11.93	15.38	14.39	12.14	98.54

Evaporation rates in inches
252C Castaic Dam and 409B Pyramid Reservoir stations malfunctioned for 2001-2002 water year.
Data from County of Los Angeles Department of Public Works (LADPW)

For this site, an average evaporation loss 0.68 feet per month was used.

Evapotranspiration

The Department of Water Resources for California (CADWR) provides evapotranspiration data through the California Irrigation Management Information System (CIMIS). Reference Evapotranspiration (ETo) is a term used to describe the evapotranspiration rate of a reference crop expressed in inches. The reference crop used for the CIMIS program is grass, which is close clipped, actively growing, completely shading the soil, and well watered. ETo varies by location, time, and weather conditions. The main factors that influence ETo include incoming radiation (energy from the sun), outgoing radiation (sensible energy leaving the earth), and the amount of moisture in the air, air temperature, and wind speed. ETo can be estimated quite accurately through the use of a "model" (a series of complex mathematical equations). Evapotranspriration rate was computed at San Fernando Valley as shown in Table 8 below.

Table 8: San Fernando Valley - Monthly Evapotranspiration Rates

Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Annual
3.95	2.73	2.31	2.20	2.45	3.64	4.74	5.31	6.06	6.75	6.66	5.01	51.81
Monthly evapotranspiration rates in inches Data from CIMIS database, available on the Internet												

The Corps of Engineers previously undertook a study for the Rio Salado (Salt River) in Arizona. During that study, the State Arizona Game and Fish Department provide plant consumption values for riparian vegetation. These estimates can be used for planning purposes to develop the final water budget for the proposed project. The original data sources are listed in Table 9 below.

Table 9 Estimates for Riparian Vegetation Consumption Values

Habitat	Transpiration Rate feet/year	Transpiration Rate inches/month
Arrowweed	1.2	1.2
Screwbean Mesquite and Tamarisk Mix	1.2	1.2
Honey Mesquite	1.6	1.6
Salt Cedar (sparse)	2.3	2.3
Salt Cedar (dense)	2.5	2.5
Salt Cedar and Honey Mesquite Mix	3.3	3.3
Cottonwood willow (low density)	3.6	3.6
Willow	2.5-4.4	2.5 – 4.4
Cottonwood and Mesquite	3.1	3.1
Cottonwood	7 - 8.5	7 – 8.5
Cattail	7.5 – 16.5	7.5 – 16.5
Scirpus	3.2 – 22.7	3.2 -22.7

Carex	3.8 – 6.4	3.8 – 6.4
Salt Cedar	3 – 7.5	3 -7.5
Mesquite (oak)	4 – 5	4 – 5
Quailbush	3 – 4	3 – 4
Tamarisk	1.1 – 9.2	1.1 – 9.2
Saltgress	0.8 – 4.0	0.8 -4.0
Saltbush	3.2	3.2
Sacaton Grass	4	4
Bermuda Grass	2.3 – 6.0	2.3 – 6.0

For this site, an average Evapotranspiration rate for Sycamores loss 3.6 feet per year, for Valley oak Woodland loss 5.0 feet per year, and for Cottonwood loss 8.5 feet per year were used

Spreading Grounds

County of Los Angeles has indicated there are two Spreading Grounds above the project area. There are Lopez and Pacoima Spreading Grounds. They are mostly dry. They are only fed water to the Spreading Grounds during heavy storms. They release water from the dams for only 24 hours between December and March. It shouldn't block routine flows to the South Channel. Therefore, the Spreading Grounds above the South Channel is insignificant to this project.

Agriculture

There is little agriculture remaining in the watershed. The only agricultural use of water is that used by nurseries growing plants for sale to be used for landscaping.

RESTORATION ALTERNATIVE

The restoration alternative includes meandering stream with a low-flow channel. The habitat along this portion of a Tujunga Wash has been substantially degraded due to modifications made for flood damage reductions and the maintenance decision to keep plants off the surface. The opportunity exists to restore habitat areas along the channel by increasing native vegetation cover, and expanding the amount of riparian habitat. In addition, the proposed project would increase recreational and educational opportunities and uses along the Channel reach. The total area proposed for restoration include strips of land 65-ft wide (210 feet total width, including channel) on both sides of the Channel, for a total of 9 acres.

Pipe Line Design

South Channel design discharge is 2000 cfs. During the raining season, the South Channel could convey as much as 2000 cfs. However, during dry summer season, the South Channel only conveys about 1.3 cfs. To maintain the flow in the meandering low flow channel, a pipeline carrying a maximum of 15 cfs from South Channel was design for the project.

From the project description note, gravity flow in a pipeline with 24 inches diameter should be sufficient to convey the design discharge range from 3 cfs to 15 cfs.

Manning's Equation for a circular pipe was used to determine the diameter of pipe need to convey 15 cfs.

$$Q = 1.486/n\ AR^{2/3} S^{½}$$

Where $A = (\theta - \sin\theta)\ d^2/8$
$R = A/P$
$S = 0.00665$
$P = \theta d/2$
$n = 0.014$
$Q = 15$ cfs

To ensure that the flow in the pipe is not pressurized, the Cross Sectional Area of the flow in the pipe should not be >70% of the Pipe Area. Given these two constraints, The Table below summarizes the calculation for different sized pipes.

Table 10: Summary of Hydraulic Calculation for Pipe Size Diameter

Pipe Diamater(ft)	Depth of Flow	Area of Flow / Area of Pipe	Q cfs
1.0	0.66	0.70	2.09
1.5	1.00	0.71	6.24
2.0	**1.45**	**0.77**	**14.99**
2.5	**1.22**	**0.48**	**14.90**

Meandering Stream Low-flow channel

Water will diverted along the west bank and flow under gravity until it daylight at the upstream boundary of the Corps' TJW restoration project which is located at Sherman Way (See figure 4 below).

Figure 4: Up Stream Boundary of Tujunga Wash Restoration Project at Sherman Way Bridge

The low-flow channel will be 3000 feet from Sherman Way to Vanowen approximate 2 to 2 1/2 ft deep (note: over 3 ft requires fencing). Channel width varies from 8 to 12 feet. The low flow stream will be mostly cobbled with some continuous lining of clay locations (meander bends) to minimize scour. The roughness coefficient used for the channel design is 0.025. The channel design is for a maximum of 15 cfs with average flow depth is 0.64 feet and average velocity is 2.95 feet per second. Normal flow will be about 12 cfs (when available) and 0 during dry summer months. A summary of the hydraulic elements for TJW Restoration low-flow channel are shown in Table 11 below.

Table 11: Summary of the Hydraulic Elements of Low-Flow Channel for TJW Restoration Project

HEC-RAS Plan: low flow_a River: Tujunga wash Reach: tjw Profile: 15 cfs

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl	Max Chl Dpth (ft)
			(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)		
tjw	22800	15 cfs	15	711.5	712.24	711.98	712.34	0.00501	2.56	5.86	7.96	0.53	0.74
tjw	22896.9	15 cfs	15	712.28	712.87		713.03	0.01011	3.2	4.68	7.95	0.74	0.59
tjw	22993.8	15 cfs	15	713.07	713.73		713.86	0.00702	2.85	5.26	7.95	0.62	0.66
tjw	23090.7	15 cfs	15	713.85	714.48		714.62	0.0083	3.01	4.99	7.95	0.67	0.63
tjw	23187.6	15 cfs	15	714.63	715.27		715.41	0.0077	2.94	5.11	7.95	0.65	0.64
tjw	23284.5	15 cfs	15	715.41	716.05		716.18	0.00803	2.98	5.04	7.95	0.66	0.64
tjw	23381.5	15 cfs	15	716.2	716.84		716.97	0.00794	2.97	5.06	7.95	0.66	0.64
tjw	23478.4	15 cfs	15	716.98	717.62		717.76	0.00789	2.96	5.07	7.95	0.65	0.64

tjw	23575.3	15 cfs	15	717.76	718.4	718.53	0.008	2.97	5.04	7.95	0.66	0.64
tjw	23672.2	15 cfs	15	718.54	719.18	719.32	0.00787	2.96	5.07	7.95	0.65	0.64
tjw	23769.1	15 cfs	15	719.33	719.96	720.1	0.00807	2.98	5.03	7.95	0.66	0.63
tjw	23866	15 cfs	15	720.11	720.75	720.89	0.00781	2.95	5.08	7.95	0.65	0.64
tjw	23962.9	15 cfs	15	720.89	721.53	721.66	0.00796	2.97	5.05	7.95	0.66	0.64
tjw	24059.9	15 cfs	15	721.67	722.31	722.45	0.00775	2.94	5.1	7.95	0.65	0.64
tjw	24156.8	15 cfs	15	722.46	723.09	723.23	0.00813	2.99	5.02	7.95	0.66	0.63
tjw	24253.7	15 cfs	15	723.24	723.88	724.02	0.00778	2.95	5.09	7.95	0.65	0.64
tjw	24350.6	15 cfs	15	724.02	724.66	724.79	0.00798	2.97	5.05	7.95	0.66	0.64
tjw	24447.5	15 cfs	15	724.8	725.44	725.57	0.00796	2.97	5.05	7.95	0.66	0.64
tjw	24544.4	15 cfs	15	725.59	726.22	726.36	0.00814	2.99	5.02	7.95	0.66	0.63
tjw	24641.4	15 cfs	15	726.37	727.01	727.15	0.00791	2.96	5.06	7.95	0.65	0.64
tjw	24738.3	15 cfs	15	727.15	727.79	727.93	0.00792	2.96	5.06	7.95	0.65	0.64
tjw	24835.2	15 cfs	15	727.93	728.57	728.7	0.00793	2.97	5.06	7.95	0.66	0.64
tjw	24932.1	15 cfs	15	728.72	729.36	729.49	0.00798	2.97	5.05	7.95	0.66	0.64

Water Budget

In general water budget includes the available water and water consumptions. The available water source for this study is from South Channel. The water consumptions included evapotranspiration, infiltration, and evaporation.

Environmental study team requested three different types of habitat for this ecosystem restoration project, these include; Sycamores, Valley Oak Woodland, and Cottonwood.

Table 12 presents the water budget calculations for this study. As shown in this table, the total loss for the 3000 feet channel in August for Sycamores is about 217.91 acre-feet/year or 0.30 cfs, for Valley oak woodland is about 230.51 acre-feet/year or 0.32 cfs, and for Cottonwood is about 262.01 acre-feet/year or 0.36 cfs. The average flow from South Channel during the summer month is 1.30 cfs. From TWJ, the low flow statistics analysis during the dry summer month of August is 2.62 cfs, and the high flow statistics analysis during the wet winter month of February is 90.78 cfs.

Table 12: Summary of the Total Water Loss

	Habitats		
	Sycamores	Valley oak woodland	Cottonwood
Evapotranspiration (acre-feet/year)	32.40	45.00	76.50
Infiltration loss (acre-feet/year)	180.99	180.99	180.99
Evaporation loss (acre-feet/year)	4.52	4.52	4.52
Total loss (acre-feet/year)	217.91	230.51	262.01
Total loss (cfs)	**0.30**	**0.32**	**0.36**
Available water from South Channel (cfs)	**1.30**	**1.30**	**1.30**
Average annual flow available cfs	24.49	24.49	24.49

SUMMARY

As discussed above, sources of water to support restoration projects are realistically limited to the release and capture of runoff. Current annual average flows from South Channel of Pacoima Wash outlets are showing in table 12.

The low-flow channel with a maximum capacity of 15 cfs is recommended to deliver the required quantity of water to support this restoration project. The average annual flow available of 24.49 cfs is for this project.

For Cottonwood total loss of the water due to the restoration project is 262.01 acre-feet/year or 0.36 cfs, for Valley Oak woodland total loss of the water is 230.51 acre-feet/year or 0.32 cfs and for Sycamores total loss of the water is 217.91 1.22 acre-feet/year or 0.30 cfs.

REFERENCES

Analysis of Design, Tujunga Wash Channel Improvement, Los Angeles River to Hansen Dam, Los Angeles River to Magnolia Blvd., U.S. Army Corps of Engineers, Los Angeles District, March 1948.

Analysis of Design, Tujunga Wash Channel Improvement, Los Angeles River to Hansen Dam, Magnolia Blvd to Vanowen St.., U.S. Army Corps of Engineers, Los Angeles District, March 1949.

Analysis of Design, Tujunga Wash Channel Improvement, Los Angeles River to Hansen Dam, Vanowen St to Beachy Ave.., U.S. Army Corps of Engineers, Los Angeles District, March 1950.

Water Control Manual Hansen Dam Tujunga Wash, Los Angeles County, California,. U.S. Army Corps of Engineers, Los Angeles District, November 1990.

Guidelines For Determining Flood Flow Frequency, U.S. Department of the Interior Geological Survey, Office of the Data Coordination Reston, Virginia, March 1982.

APPENDIX D

RECORD OF NON-APPLICABILITY (RONA)

&

AIR QUALITY CALCULATIONS

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RECORD OF NON-APPLICABILITY
FOR THE
TUJUNGA WASH SECTION 1135 ECOSYSTEM RESTORATION PROJECT
DETAILED PROJECT REPORT / ENVIRONMENTAL ASSESSMENT
LOS ANGELES COUNTY, CALIFORNIA

The proposed project is located in Los Angeles County, California. Los Angeles is located along the southern coastal plain of the State of California. The city is 468 square miles. The proposed construction occurs within Los Angeles County.

The Clean Air Act (CAA) as amended in 1990, specifies in Section 176 that no department, agency, or instrumentality of the Federal Government shall engage in, support in anyway, or provide financial assistance for, license or permit, or approve, any activity which does not conform to an implementation plan after it has been approved or promulgated under Section 110 of this title. "Conformity" is defined in Section 176 of the CAA as conformity to the State Implementation Plan's (SIPs) purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) while achieving expeditious attainment of such standards, and that the activities will not:

1. Cause or contribute to any new violation of the NAAQS; or

2. Increase the frequency or severity of any existing violation;

3. Delay timely attainment of a standard, interim emission reductions, or milestones.

Air quality standards in Los Angeles County are under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD acts as the lead agency responsible agency or a concerned agency with jurisdiction by law over the air resources of the County under the California Environmental Quality Act (CEQA). The 1998 Clean Air Plan (CAP) is the most recently adopted clean air plan for the Los Angeles County.

Estimation of air quality impacts was performed under the guidance of the SCAQMD using methods prescribed in the 1993 CEQA Air Quality Handbook published by the SCAQMD. Although quantitative thresholds of significance are not currently in place for short term emissions, CEQA requires that short term impacts be discussed in the environmental document. These concerns are addressed in Chapter 2 and 6 of the Detailed Project Report (DPR) / Environmental Assessment (EA). In the interest of public disclosure, SCAQMD recommended that construction-related NOx, VOC, PM_{10}, $PM_{2.5}$, CO and CO_2 Equivalent (CO_2E) emissions from diesel and gasoline powered equipment, paving and other activities, be quantified.

To determine the significance of air quality impacts, daily thresholds were based on construction emissions based in the South Coast Air Basin (SCAB). If emissions on an individual day exceed 55 lbs a day for VOC, 55 lbs/day for N0x, 550 lbs/day for CO, 150 lbs/day for PM_{10}, or 55 lbs/day for $PM_{2.5}$, the project should be considered significant. Also, the

Environmental Protection Agency and AQMD requires that the construction emissions do not exceed 7000 tons per year of CO_2E.

Based on the air quality analysis described in D-1 through D-9, the proposed project will not have a significant air quality effect on the environment. The total emissions of each criteria pollutant are below *de minimus* levels as prescribed in 40 CFR 93.153(b). This proposed project conforms with the Federal Clean Air Act as amended 1990. As a result, this Record of Non-Applicability is prepared instead of a conformity determination.

For further information, please contact Mr. Randy Tabije, Environmental Manager, U.S. Army Corps of Engineers at (213) 452-3871.

5/14/09
Date

Thomas H. Magness
COL, US Army
District Commander

TABLE D-1

Emission Calculation Assumptions

Proposed Project General Assumptions

1) Work occurs 5 days a week, 8 hours a day, excepting major holidays (average 21 days/month).
2) Project starts June 2008 and is completed by end of December 2008.

Offroad Equipment Emission Calculation Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the nearest horsepower sized equipment given in the SCAQMD emission factor database are used with a ratio of actual assumed equipment horsepower to derive hourly emission factors.
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Equipment type, number, and usage estimates are used as estimated using equipment data and quantity estimates provided by the project design engineer.
4) The following vehicle types, which could be offroad vehicles are assumed to be onroad vehicles considering the project description, needs and location: water trucks and dump trucks.

Onroad Equipment Emission Calculations Assumptions

1) Emission factors are the latest available from the SCAQMD website, where the vehicles have been assigned three classes, passenger (i.e. employee vehicles and pickups), delivery (all nonpassenger vehicles smaller than Heavy Duty), and heavy duty vehicles.
2) Emission factors from each year assumed in the project schedule are used to calculate the annual emissions.
3) Trip estimates are based on import/export quantities, equipment and worker trips estimated using information provided by the project design engineer.
4) All onroad traffic for the project is assumed to occur within SCAQMD jurisdiction.
5) Grout and engineered fill is imported for use on the bottom half of open trench, existing soils are used to refill the rest.
6) Dump trucks are 12 cubic yards. Grout and fill loads are 10 cubic yards.
7) A ten percent contingency is added to the soil and grout and fill trips. This contingency considers excavated soil expansion and grout wastage.

Fugitive Dust Emission Calculations Assumptions

1) Unpaved road travel is minimized to the extent feasible and shall be no more than one-half mile per trip for equipment that must access the working sites. Construction employee traffic does not use unpaved roads, parking will be on paved roads/lots.
2) Unpaved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt content is assumed to be 6% on average; and 2) average vehicle weight based on VMT estimate for unpaved roads
3) Paved road emission factors are calculated using the most current version of USEPA AP-42 Section 13.2.1 and use the following assumptions: 1) Silt loading is average for 5000-10000 ADT road; 2) average vehicle weight is calculated on VMT average basis.
4) Earthmoving emission factors are calculated using the recent version of USEPA AP-42 Section 11.9 for Dozing and Grading, and Section 13.2.4 for soil handling (drop emissions).
5) Due to very generally coarse materials and work areas primarily being in pits the wind erosion potential is considered negligible for most of the project.

TABLE D-2

Construction Schedule									
Main Project Start July 2008									
Alternative 2		**Total Days**	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total Days**
	Crew Size	**85**	15	14	14	14	14	14	85
Clear, Grub, Stage, Cleanup	22	**5**	3	0	0	0	0	2	5
Excavation	9	**15**	5	5	5	0	0	0	15
Surfacing/Paving	16	**15**	3	3	3	3	3	0	15
18' HDPE Pipe	4	**15**	0	5	5	5	0	0	15
Seeding/Planting	8	**32**	0	0	0	16	16	0	32
Clay Layer	6	**3**	0	0	0	1	1	1	3
Round Trips									
Alternative 2			**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total Trips**
Construction Employee Trips			159	113	113	202	182	50	819
Equipment Delivery			2					2	4
Soil/Grub Waste Hauling			7	7	7	0	0	0	21
Onsite Soil Trips			10	10	10	10	10	0	50
Import Trips			0	2	2	5	3	0	12
Crew Trucks			16	16	16	16	16	16	96
Water Trucks			1	1	1	1	1	1	6

TABLE D-3

Onroad Trip Assumptions									
Round Trips									
Alternative 2	**July**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	Veh. Class	Distance	Unpaved
Construction Employee Trips	159	113	113	202	182	50	Passenger	30	2
Equipment Delivery	2	0	0	0	0	2	Heavy-Heavy	60	2
Soil/Grub Waste Hauling	7	7	7	0	0	0	Heavy-Heavy	40	2
Onsite Soil Trips	10	10	10	10	10	0	Heavy-Heavy	0.25	0.25
Import Trips	0	2	2	5	3	0	Heavy-Heavy	40	2
Crew Trucks	16	16	16	16	16	16	Delivery	30	10
Water Trucks	1	1	1	1	1	1	Heavy-Heavy	10	8
VMT Monthly Totals - All									
Passenger	4770	3390	3390	6060	5460	1500			
Delivery	480	480	480	480	480	480			
Heavy-Heavy	412.5	372.5	372.5	212.5	132.5	130			
VMT Monthly Totals - Unpaved									
Passenger	318	226	226	404	364	100			
Delivery	160	160	160	160	160	160			
Heavy-Heavy	28.5	28.5	28.5	20.5	16.5	12			
	Bank Protection								
Worst-case day	VMT	Unpaved							
Passenger	227.1	15.1							
Delivery	22.9	7.6							
Heavy-Heavy	19.6	1.4							

TABLE D-4

Paved							Unpaved						
Alternative 2	July	Aug	Sep	Oct	Nov	Dec	Alternative 2	July	Aug	Sep	Oct	Nov	Dec
Construction Employee Trips	4770	3390	3390	6060	5460	1500	Construction Employee Trips	318	226	226	404	364	100
Equipment Delivery	120	0	0	0	0	120	Equipment Delivery	4	0	0	0	0	4
Soil/Grub Waste Hauling	280	280	280	0	0	0	Soil/Grub Waste Hauling	14	14	14	0	0	0
Onsite Soil Trips	2.5	2.5	2.5	2.5	2.5	0	Onsite Soil Trips	2.5	2.5	2.5	2.5	2.5	0
Import Trips	0	80	80	200	120	0	Import Trips	0	4	4	10	6	0
Crew Trucks	480	480	480	480	480	480	Crew Trucks	160	160	160	160	160	160
Water Trucks	10	10	10	10	10	10	Water Trucks	8	8	8	8	8	8

TABLE D-5

Onroad Emission Calculations

ONROAD EMISSIONS: SCAQMD EMISSION FACTORS FOR 2008

Scenario Year: 2008 -- Model Years: 1965 to 2008

Passenger Vehicles		Delivery Trucks		Heavy-Heavy Duty Trucks	
CO	0.011552	CO	0.021949	CO	0.013614
NOx	0.001213	NOx	0.023713	NOx	0.044580
ROG	0.001182	ROG	0.002993	ROG	0.003516
SOx	0.000011	SOx	0.000026	SOx	0.000041
PM10	0.000084	PM10	0.000856	PM10	0.002156
PM2.5	0.000052	PM2.5	0.000739	PM2.5	0.001900
	lb/mile		lb/mile		lb/mile

Scenario Year: 2009 -- Model Years: 1965 to 2009

Passenger Vehicles		Delivery Trucks		Heavy-Heavy Duty Trucks	
CO	0.00968562	CO	0.020161	CO	0.012822
NOx	0.001005	NOx	0.022366	NOx	0.041846
ROG	0.000992	ROG	0.002789	ROG	0.003293
SOx	0.000011	SOx	0.000027	SOx	0.000040
PM10	0.000086	PM10	0.000805	PM10	0.001996
PM2.5	0.000054	PM2.5	0.000692	PM2.5	0.001752
	lb/mile		lb/mile		lb/mile

Onroad Equipment Maximum Daily Emissions

		Emissions lbs/day					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM	PM2.5
Passenger	16	0.02	0.15	0.02	0.00	0.00	0.00
Delivery	16	0.04	0.32	0.36	0.00	0.01	0.01
Heavy-Heavy Duty	16	0.05	0.21	0.67	0.00	0.03	0.03
	Totals	0.11	0.68	1.04	0.00	0.05	0.04

Onroad Equipment Total Project Emissions

		Emissions lbs/year - 2008					
Vehicle Type	Total	VOC	CO	NOx	SOx	PM	PM2.5
Passenger	24,570	29.05	283.82	29.81	0.26	2.08	1.29
Delivery	2,880	8.62	63.21	68.29	0.07	2.47	2.13
Heavy-Heavy Duty	1,633	5.74	22.22	72.78	0.07	3.52	3.10
	Totals	43.41	369.26	170.88	0.41	8.06	6.52
	Tons	0.022	0.185	0.085	0.000	0.004	0.003

TABLE D-6

Tujunga Wash Construction Emission Totals

Worst-Case Day

	Emissions (lbs/day)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.11	0.68	1.04	0.00	0.05	0.04
Offroad Vehicles/Equipment	5.38	17.26	40.17	0.04	2.35	2.16
Fugitive Dust	---	---	---	---	17.99	4.72
Totals	**5.49**	**17.94**	**41.22**	**0.04**	**20.39**	**6.92**

Total Emissions

2008	Emissions (tons/year)					
	VOC	CO	NOx	SOx	PM10	PM2.5
Onroad Vehicles	0.02	0.18	0.09	0.00	0.00	0.00
Offroad Vehicles/Equipment	0.07	0.23	0.40	0.00	0.03	0.02
Fugitive Dust	---	---	---	---	0.55	0.09
Totals	**0.09**	**0.42**	**0.49**	**0.00**	**0.58**	**0.11**

TABLE D-7

SCAQMD Offroad Emission Factors

	HP	2008 SCAQMD Emission Factor lbs/hour ROG	CO	NOX	SOX	PM
Crane RT700E 50 Ton	240	0.1386	0.4021	1.3407	0.0012	0.0542
Vib. Compactor CS-433E	100	0.1384	0.4007	0.6671	0.0006	0.0594
Dozer, D7	240	0.2247	0.6543	2.0958	0.0018	0.0887
Excavator - 325C L	188	0.1664	0.6326	1.3666	0.0014	0.0722
Forklift - 10 ton	85	0.1639	0.4511	0.5985	0.0006	0.0592
Loader - 924	129	0.1429	0.4694	0.8920	0.0008	0.0737
Backhoe	85	0.1310	0.3767	0.4866	0.0005	0.0478
Motor Grader - 120H	125	0.1796	0.5757	1.0850	0.0009	0.0940
Chippers - WC 342G	100	0.2116	0.5985	0.9527	0.0009	0.0897
Generator - 50 hp	50	0.1238	0.3024	0.3155	0.0004	0.0307
Grout Pump	50	0.1479	0.3563	0.3574	0.0004	0.0359
Other Emission Factors						
Chainsaws Stihl MS 460	6	0.794048	2.973942	0.026455	2.274E-05	0.050926
		All Years				

2008 Emission Calculations

Clear, Grub			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Dozer, D7	240	1	0.2247	0.6543	2.0958	0.0018	0.0887	8	1.80	5.23	16.77	0.01	0.71	5	8.99	26.17	83.83	0.07	3.55
Grader - 120H	125	1	0.1796	0.5757	1.0850	0.0009	0.0940	8	1.44	4.61	8.68	0.01	0.75	5	7.18	23.03	43.40	0.04	3.76
Loader - 924	129	1	0.1429	0.4694	0.8920	0.0008	0.0737	8	1.14	3.76	7.14	0.01	0.59	5	5.72	18.78	35.68	0.03	2.95
Chippers - WC 342G	100	1	0.2116	0.5985	0.9527	0.0009	0.0897	8	1.69	4.79	7.62	0.01	0.72	5	8.47	23.94	38.11	0.03	3.59
Chainsaws Stihl MS 460	6	1	0.794048	2.973942	0.026455	2.274E-05	0.050926	8	6.35	23.79	0.21	0.00	0.41	5	31.76	118.96	1.06	0.00	2.04
									12.42	42.18	40.42	0.04	3.18		62.12	210.88	202.08	0.18	15.88

Excavation			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Excavator - 325C L	188	1	0.1664	0.6326	1.3666	0.0014	0.0722	8	1.33	5.06	10.93	0.01	0.58	15	19.97	75.91	164.00	0.16	8.66
Loader - 924	129	1	0.1429	0.4694	0.8920	0.0008	0.0737	8	1.14	3.76	7.14	0.01	0.59	15	17.15	56.33	107.04	0.09	8.84
									2.47	8.82	18.07	0.02	1.17		37.12	132.24	271.04	0.26	17.50

Recompaction			SCAQMD Emission Factor lbs/hour						Daily Emissions lbs						Annual Emissions lbs				
	HP	Number	ROG	CO	NOX	SOX	PM	Hours/day	ROG	CO	NOX	SOX	PM	Days	ROG	CO	NOX	SOX	PM
Dozer, D7	240	1	0.2247	0.6543	2.0958	0.0018	0.0887	8	1.80	5.23	16.77	0.01	0.71	15	26.97	78.52	251.50	0.22	10.65
Vib. Compactor CS-433E	100	1	0.1384	0.4007	0.6671	0.0006	0.0594	8	1.11	3.21	5.34	0.00	0.48	15	16.61	48.08	80.05	0.07	7.13
									2.91	8.44	22.10	0.02	1.19		43.58	126.60	331.54	0.29	17.78

		Project Emissions ROG	CO	NOX	SOX	PM	PM2.5
	Maximum lbs/day	5.38	17.26	40.17	0.04	2.35	2.16
Excavation and Compact Fill construction activities	2008 Tons	0.07	0.23	0.40	0.00	0.03	0.02

TABLE D-8

Fugitive Dust Emissions

Emission Categories
1) Earthmoving
2) Road Dust Paved/Unpaved

1) Earthmoving

Emission Types
A) Dozing
B) Grading
C) Scraper
D) Material
Loading/Handling

A) Dozing (AP-42 Section 11.9 for overburden)

$E = k \times (s)^{1.5} / (M)^{1.4}$ For PM10 and $k \times 5.7 \times (s)^{1.2} / (M)^{1.3}$ for PM2.5
E = lb/hr
k = Scaling Constant (0.75 for PM10 and 0.105 for
PM2.5)
s = Silt Content (assumed to be 6% - SCAQMD Handbook for Sand and Gravel Plant Road)
M = Moisture Content = 10% (assumes watering when necessary for mitigation)

PM10 Emission Factor
0.4388217 lb/hr

PM2.5 Emission Factor
0.2575406 lb/hr

Maximum Daily Dozer Use

8 hrs/day

Total Dozer Use

160 hrs/year 2008

Dozer Emissions

Lbs/Day		Tons/year - 2008	
PM10	PM2.5	PM10	PM2.5
3.51	2.06	0.04	0.02

B) Grading

$E = k \times 0.051 \times (S)^{2.0}$ for PM10 and $k \times 0.040 \times (S)^{2.5}$ for PM2.5
E = lb/VMT
k = Scaling Constant (0.60 for PM10 and 0.031 for PM2.5)
S = Mean Vehicle Speed assumed to be 3 mph
Assumes VMT = 3 x hours in use

PM10 Emission Factor

0.2754 lb/VMT

PM2.5 Emission Factor

0.0193297 lb/VMT

Maximum Daily Grader VMT

8 VMT/day

Annual Grader VMT

40 VMT/year 2008
0 VMT/year 2009

Grading Emissions

Lbs/Day		Tons/year - 2008	
PM10	PM2.5	PM10	PM2.5
2.20	0.15	0.01	0.00

C) Material Loading/Handling (AP-42, p. 13.2.4-3)

$E = (k)(0.0032)[(U/5)^{1.3}]/[(M/2)^{1.4}]$
E = lb/ton
k = Particle Size Constant (0.35 for PM10 and 0.11 for PM2.5)
U = average wind speed = 26.5 MPH worst day, 6.4 MPH avg from Norco Met File
M = moisture content = 10% (mitigated)
Three separate drops are assumed

Maximum daily is estimated to be approximately 40 haul trips per day at 12 cubic yards and moist soil weight of 2700 lbs per cubic yard

3743	Maximum daily tons	
651223	Annual tons	2008
58465	Annual tons	2009

Emission Factors and Emissions

Emission Factors				Emissions lbs/day	
PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual	PM10	PM2.5
0.00103	0.00032	0.00016	0.00005	3.85	1.21

Emissions tons/year - 2008

PM10	PM2.5
0.05	0.02

2) Road Dust

Emission Types

A) Paved Road Dust

B) Unpaved Road Dust

A) Paved Road Dust

$E = [k \times (sL/2)^{0.65} \times (W/3)^{1.5} - C] \times (1 - P/4N)$

E = lb/VMT

k = Constant (0.016 for PM10 and 0.0040 for PM2.5)

sL = Silt Loading (assumed to be 0.06 g/m2 - assumes 5,000 to 10,000 ADT profile of Table 13.2.1-3 average for all traffic)

W = Average weight of vehicles in tons (calculated below)

C = Correction for exhaust, break wear, tire wear (0.00047 lb/VMT for PM10, 0.00036 lb/VMT for PM2.5)

No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions

Passenger Vehicles = 2 tons average

Midsize "Delivery" Vehicles = 8 ton average

Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)

Worst Case Day VMT

212	Passenger Vehicles
15	Delivery/Work Vehicles
18	Heavy-Heavy Duty Vehicles
246	Total Paved VMT (2009)

Average Weight = 4.5 Tons

Annual Case VMT 2008

22932	Passenger Vehicles
1920	Delivery/Work Vehicles
	Heavy-Heavy Duty
1498	Vehicles
	Total Paved
26350	VMT

Average Weight = 4.0 Tons - 2008

Emission Factors and Emissions

Emission Factors

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual	
0.0025	0.0004	0.0021	0.0003	2008

Emissions lbs/day		Emissions tons/year - 2008	
PM10	PM2.5	PM10	PM2.5
0.61	0.09	0.03	0.00

B) Unpaved Road Dust

$E = (k)[(s/12)^{0.9}][(W/3)^{0.45}][(365-P)/365]$ (for industrial sites)

k = constant = 1.5 lb/VMT for PM10 and 0.23 lb/VMT for PM2.5
s = Silt Content (assumed to be 6% - SCAQMD Handbook for Sand and Gravel Plant Road)

W = avg. vehicle weight = calculated below
No correction for number of wet days due to assumption of working in dry season

Average Vehicle Weight Calculation

Assumptions
Personal/Professionals/inspection Vehicles = 2 tons average
Midsize "Delivery" Vehicles = 8 ton average
Heavy-Heavy Duty Trucks = 30 tons average (loaded 40 tons, unloaded 20 tons)
Scraper (avg weight empty/full) = 35 tons

Worst Case Day VMT

15.142857	Passenger Vehicles
7.6190476	Delivery/Work Vehicles
1.3571429	Heavy-Heavy Duty Vehicles
24.119048	Total Unpaved VMT (onroad vehicles)

Average Weight =	5.8	Tons

Annual Case VMT 2008

1638	Passenger Vehicles
960	Delivery/Work Vehicles
135	Heavy-Heavy Duty Vehicles
2733	Total Unpaved VMT

Average Weight =	5.5	Tons - 2008

Uncontrolled Emission Factors and Emissions

Emission Factors (lb/VMT)

PM10 Daily	PM2.5 Daily	PM10 Annual	PM2.5 Annual	
1.08	0.17	1.05	0.11	2008

Emissions lbs/day		Emissions tons/year - 2008	
PM10	PM2.5	PM10	PM2.5
26.05	3.99	1.44	0.15

Controlled Emissions (assumes 70% efficiency with minimum 3x daily watering of unpaved roads)

Emissions lbs/day		Emission Control
PM10	PM2.5	70%
7.82	1.20	

Emissions tons/year - 2008	
PM10	PM2.5
0.43	0.05

Fugitive Dust Emission Totals

	Maximum Day		2008	
	PM10 lb/day	PM2.5 lb/day	PM10 t/yr	PM2.5 t/yr
Dozer	3.51	2.06	0.04	0.02
Grading	2.20	0.15	0.01	0.00
Soil Handling	3.85	1.21	0.05	0.02
Paved Road Dust	0.61	0.09	0.03	0.00
Unpaved Road Dust	7.82	1.20	0.43	0.05
Totals	17.99	4.72	0.55	0.09

Table D-9

Green House Gas CO2e Emission Calculations

Off Road Equipment

E = n x H x EF

E = emission lbs per day

n = number of equipment

H = hours of use of equipment per day

EF = 2009 Off Road Emission Factor of equipment based off Horse Power

CO2 emissions x 1.008 = CO2e

Off Road Equipment	HP	n	H	EF	E = CO2	CO2e
Clear & Grub						
Dozer	240	1	8	183	1464	1476
Grader	125	1	8	75	600	605
Loader	129	1	8	93.9	751	757
Chipper	100	1	8	132	1056	1064
Chainsaw	5	1	8	23.2	186	187
Excavation						
Excavator	188	1	8	112	896	903
Loader	129	1	8	93.9	751	757
Recompaction						
Dozer	240	1	8	183	1464	1476
Vibratory Compactor	100	1	8	54.5	436	439
Total Emissions lb/day					7604	7665
Total Emission tons/yr					3.80	3.83

On Road Equipment

E = N x TL x EF

N = number of trips

TL = trip length (miles per day)

EF = emission factor

On Road Equipment		N	TL	EF	E = CO2	CO2e
Passenger		16	15.1	1.10	265	267
Delivery		16	7.6	2.72	331	334
Heavy-Heavy		16	8	2.72	349	351
Total Emissions lb/day					945	952
Total Emission tons/yr					0.47	0.48

Project Totals for CO2e tons/yr	4.31	tons per year
EPA & SCAQMD GHG Threshold	7000	tons per year

APPENDIX E1

DESIGN ENGINEERING REPORT

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Design Appendix
for
Tujunga Wash Ecosystem Restoration Study
(Sherman Way to Vanowen Street)
Los Angeles County, California

Section 1135 Continuing Authorities Program

CONTENTS

1. OBJECTIVE

The objective of this appendix is to provide engineering design information for the restoration study of a reach of existing channel of Tujunga Wash from Sherman Way to Vanowen Street. The design information covers (1) an intake structure near the downstream end of the Pacoima Wash South Channel (South Channel), (2) approximate 1,200 feet in length of underground diversion pipeline on the west terrace of the Tujunga Wash between the intake structure and near the north edge of Sherman Way, (3) approximate 110 feet of underground diversion pipeline crossing Sherman Way to the project site on the west terrace of Tujunga Wash, (4) approximate 2,500 feet of meandering unimproved trapezoidal channel on the west terrace of Tujunga Wash, (5) a junction structure at the downstream end of the west terrace meandering channel to salvage residual channel flow to the existing 36-inch RCP bypass line of the County's project, and (6) a junction structure at the downstream end of the west terrace meandering channel to salvage residual channel flow back to the Tujunga Wash.

2. STUDY AREA

The study area is for a reach of existing Tujunga Wash channel from Sherman Way to Vanowen Street, and this reach of channel is about 3,000 feet long. The study area includes both the 65-foot wide west and the east terraces with approximately 9 acres of bare land in the city of Los Angeles, California. Sheet D-1 shows the location map and general plan for the study area. Sheet D-1 also shows the confluence of South Channel with Tujunga Wash. At the confluence, flows from the South Channel enter the Tujunga Wash Channel through a side overflow spillway with a vertical drop of approximately 10 feet over the west channel wall. Flows from the South Channel are the only water source for this project. An intake structure and approximate 1,200 feet diversion pipeline are needed to convey water from South Channel to the west side of the project area.

3. DESIGN FEATURES

3.1 Intake structure to divert water from South Channel

Sheet D-6 shows the water intake location near station 43+00. The water intake has double drop inlets with metal grate to screen large sediments. The upstream compartment of the structure would be separated from the downstream basin with a divider wall with three one-foot-square openings. The upstream compartment would trap the finer sediment not screened out by the gate and would thereby reduce maintenance costs for removing sediment downstream as well as reduce the potential for abrasion damage to the inside of the pipeline. A butterfly type shutoff valve is proposed in an underground valve structure to shut

off the pipeline flow for downstream pipeline maintenance work. Sheets D-9 and D-10 show details of the water intake structure.

3.2 Underground pipeline conveying water from intake structure to north side of Sherman Way

To convey water from the intake structure at South Channel to the north side of Sherman Way, an 18-inch diameter underground High Density Polyethylene (HDPE) pipeline having approximate length of 910 feet is proposed between station 33+89.48 and station 43+00. The plan and profile for the pipeline are shown on sheets D-5 and D-6. The grade of pipeline varies from 0.00403 to 0.00598, and the pipeline is designed to support gravity flow to the meandering open channel head work located at station 30+75. Four manholes are proposed along the pipeline for future operation and maintenance works.

3.3 Underground pipeline conveying water from north side of Sherman Way to headwork of meandering channel

To convey water from the north side of Sherman Way to the headwork for the meandering channel at station 30+75, a portion of the 18-inch diameter HDPE underground pipeline would cross Sherman Way. This portion of pipeline has a length of approximate 315 feet long, and it has a grade of 0.00312. The plan and profile of the pipeline are shown on sheet D-5.

3.4 Meandering unimproved trapezoidal channel on the west terrace of Tujunga Wash

Approximate 2,500 feet in length of unimproved meandering trapezoidal channel are shown on sheets D-2, D-3, D-4, and D-5. To enhance environmental appearance, five pond areas with wider and deeper channel are designed near stations 14+00, 17+80, 22+00, 26+00, and 30+00. Typical cross sections for the channel and ponds are shown on sheet D-7. Dimension and details for the channel and ponds are shown on sheets D-7 and D-8. The purpose of the clay lining is to slow down the seepage from the channel flow. Details for the concrete headwalls at the beginning and the end of the channel are shown on sheet D-8.

3.5 A junction structure to connect the downstream end of meandering channel to the existing 36-inch RCP bypass line

A junction structure is proposed near station 6+11 to connect the downstream end of meandering channel to the existing 36-inch RCP bypass line owned by Los Angeles County Department of Public Works, see sheet D-2. The purpose is to salvage the residual flow from the downstream end of meandering channel and to benefit the existing County's project. Details of the proposed junction structure will be prepared in the final design.

3.6 A junction structure to connect the downstream end of meandering channel to the existing channel wall of Tujunga Wash

A junction structure is proposed near station 6+10 to connect the downstream end of meandering channel to the existing channel wall on the west side of Tujunga Wash. Any residual flow at the downstream end of the meandering channel will be diverted back to Tujunga Wash. Details of the proposed junction structure will be prepared in the final design.

4. ALTERNATIVES

4.1 Alternative 1 - No Action Alternative

No design feature required for this alternative.

4.2 Alternative 2 - Restore the west terrace with a section of unimproved meandering channel, connect the downstream end of meandering channel to the existing 36-inch RCP bypass line of the County project, and maintain the native riparian vegetation with irrigation systems on both west and east terraces.

This alternative requires design features of (a) an intake structure to divert water from South Channel, (b) approximate 1,200 feet long underground pipeline to convey water to Sherman Way, (c) approximate 110 feet long underground pipeline crossing Sherman Way to the project site, (d) approximate 2,500 feet long unimproved meandering trapezoidal channel, and (e) a junction structure to connect the downstream end of meandering channel to the existing 36-inch RCP bypass line of the County.

4.3 Alternative 3 - Restore the west terrace with a section of unimproved meandering channel, connect the downstream end of meandering channel to the existing channel wall on the west side of Tujunga Wash, and maintain the native riparian vegetation with irrigation systems on both west and east terraces.

This alternative requires design features of (a) an intake structure to divert water from South Channel, (b) approximate 1,200 feet long underground pipeline to convey water to Sherman Way, (c) approximate 110 feet long underground pipeline crossing Sherman Way to the project site, (d) approximate 2,500 feet long unimproved meandering trapezoidal channel, and (e) a junction structure to connect the downstream end of meandering channel to the existing channel wall on west side of Tujunga Wash.

5. CONSTRUCTION RELATED INFORMATION

5.1 Access points

The project site can be accessed by freeways 5, 405, 101 and 170. Local streets include Sherman Way, Woodman Avenue, Vanowen Street, and Fulton Avenue.

5.2 Staging areas

Possible staging areas include the area within the existing right-of-way located west of Tujunga Wash and downstream from South Channel, and the area located east of Tujunga Wash and north of Sherman Way.

5.3 Temporary construction easement and permanent impacted areas

Temporary construction easement areas include (1) approximate 110 feet long and 5 feet wide open cut for pipeline crossing Sherman Way on the west side of Tujunga Wash, (2) approximate 1,100 feet long 5 feet wide open cut along the route of the underground bypass HDPE line, (3) approximate 10'x 10' area for underground valve structure, (4) approximate 10'x 10' area for the drop inlet with metal grate structure, and (5) approximate 20 feet long and 5 feet wide open cut for the junction structure to connect the downstream end of meandering channel to the existing 36-inch RCP bypass line or to the existing channel wall on the west side of Tujunga Wash.

Permanent impacted areas include (1) five 2' diameter manhole covers, (2) two concrete headwalls in U-shape with approximate 15 feet long and 10 inches wide concrete surface each, and (3) a 18-inch diameter hole through the existing west side channel wall of Tujunga Wash.

5.4 Disposal areas

Facility Name	Address	Permitted Tonnage[1]	Estimated Closure Date[2]
Bradley Landfill	9081 Tujunga Ave. Sun Valley	10,000 tons/day	1/1/2007
Strathern Inert Landfill	8230 Tujunga Ave. Sun Valley	2,700 tons/day	4/5/2021
Calmat Inert Landfill	9436 Glenoaks Blvd. Sun Valley	500 tons/day	1/1/2026

Source: 1 City of Los Angeles, 2003.
2 California Integrated Waste Management Board, 2003.

5.5 Borrow pit locations

Soil design will identify any nearby borrow pit locations.

5.6 Travel routes in/out of the project

Refer to Section 5.1 access points for the freeways and local streets near the project site.

5.7 Methods of construction

Method of open cut trench will be used to install the 18-inch diameter HDPE bypass pipeline, including the section of pipe crossing Sherman Way. Cast-in-place method will be used to install the drop down intake structure and concrete headwalls.

5.8 Construction equipment

Construction equipment includes, but is not limited to, one bulldozer, three dump trucks, one hydraulic excavator, one track loader, one flatbed truck, one set of water tank and water truck, and one concrete truck and pump.

5.9 Utilities relocation

No information on utilities relocation is available at this time. It is the responsibility of the local sponsor to relocate existing utilities which interfere with the proposed HDPE bypass pipeline.

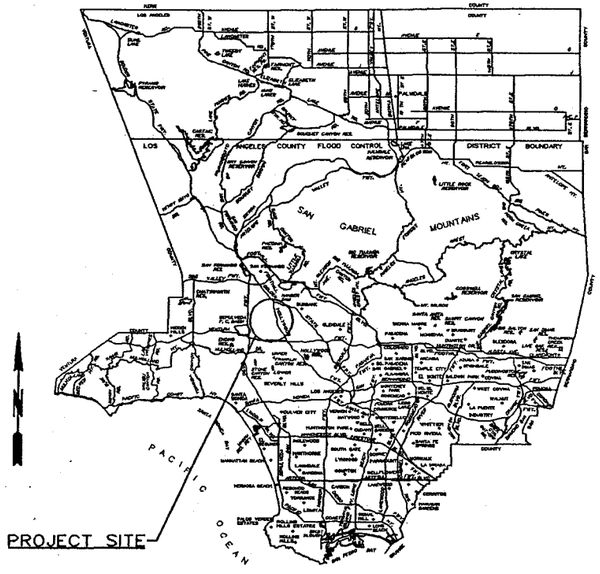
5.10 Future maintenance requirements

Future maintenance requirements include annual inspection and removal of weed or invasive non-native plants within the project area. Conduct inspection for minor erosion damage and provide necessary maintenance after each storm event with rainfall magnitude of two to ten-year return frequency. Conduct inspection for moderate erosion damage and provide necessary maintenance after each storm event with rainfall magnitude of ten to fifty-year return frequency. Conduct inspection for major erosion damage and provide necessary maintenance after each storm event with rainfall magnitude more than fifty-year return frequency.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY

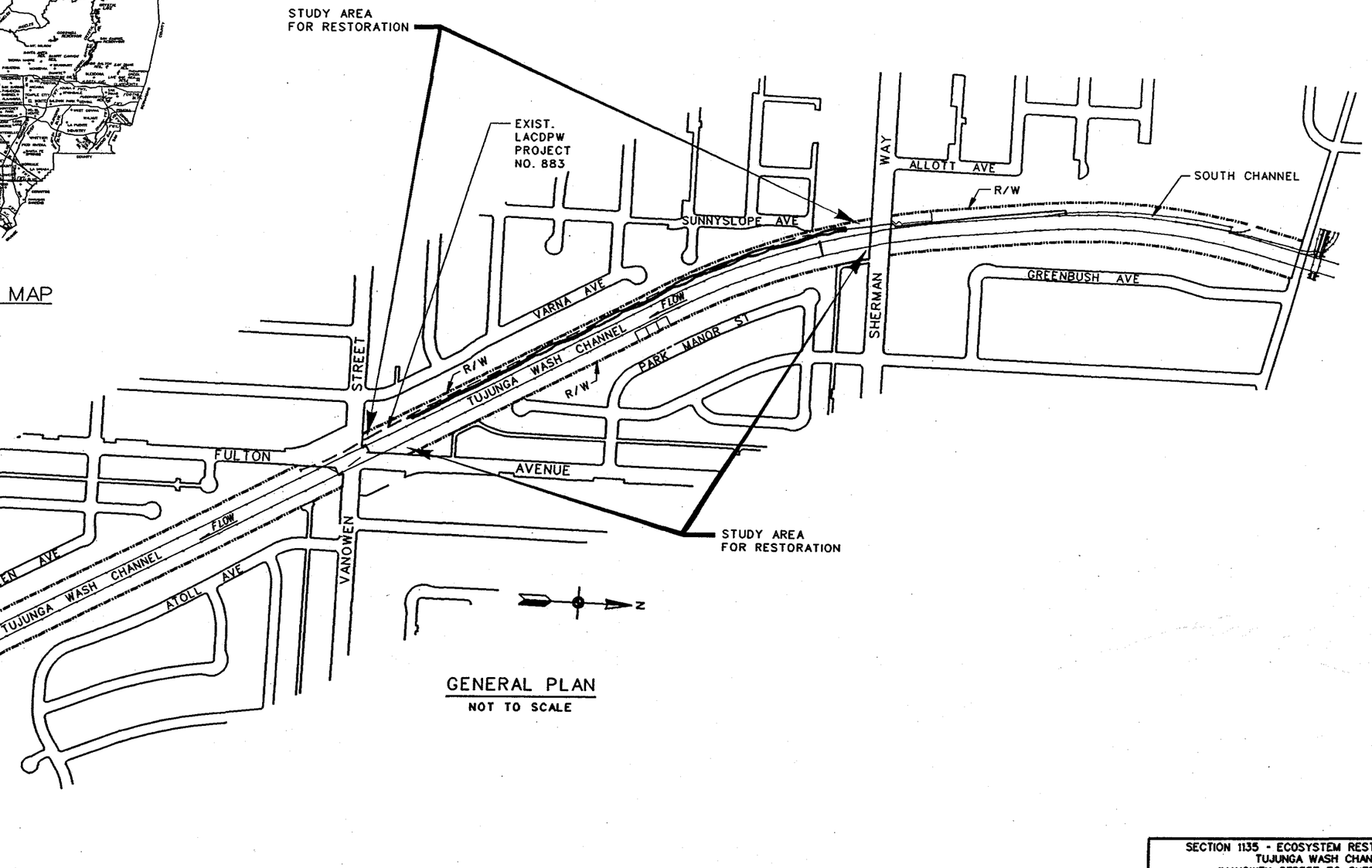
TUJUNGA WASH CHANNEL

(VANOWEN STREET TO SHERMAN WAY)



Thomas Bros. Pg. 532-C5,D6,D7

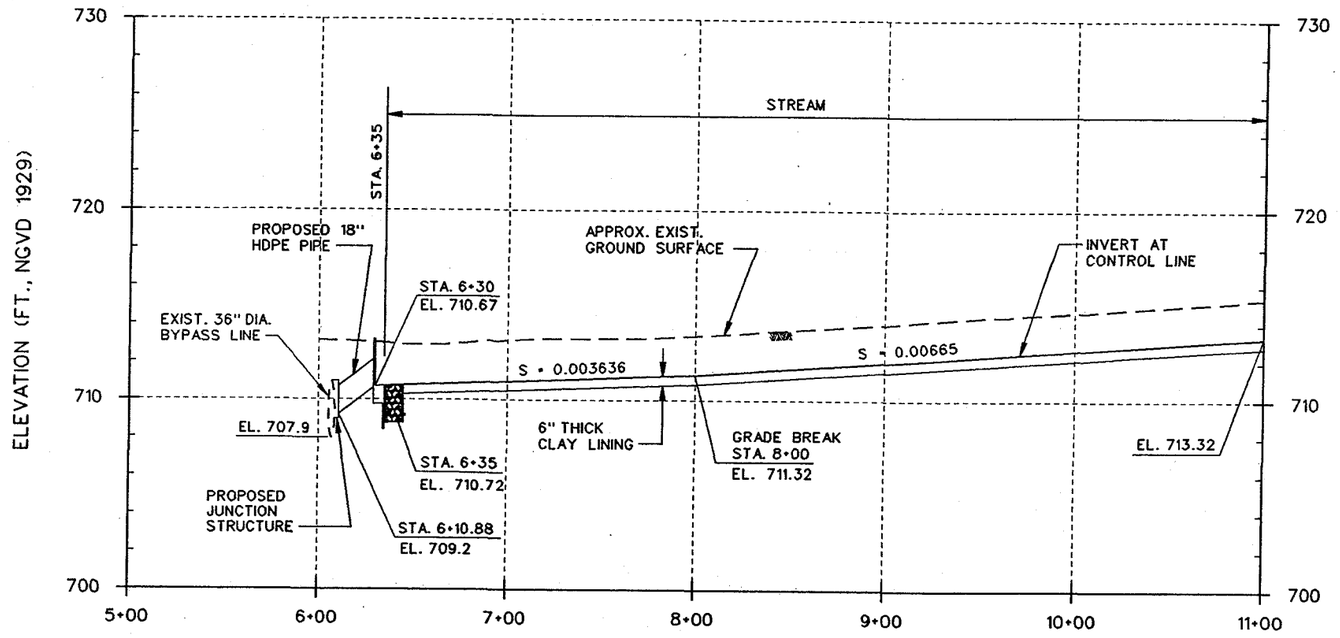
LOCATION MAP



GENERAL PLAN

NOT TO SCALE

SECTION 1135 - ECOSYSTEM RESTORATION STUDY TUJUNGA WASH CHANNEL (VANOWEN STREET TO SHERMAN WAY) GENERAL PLAN AND LOCATION MAP	
PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT	SHEET D-1



PROFILE

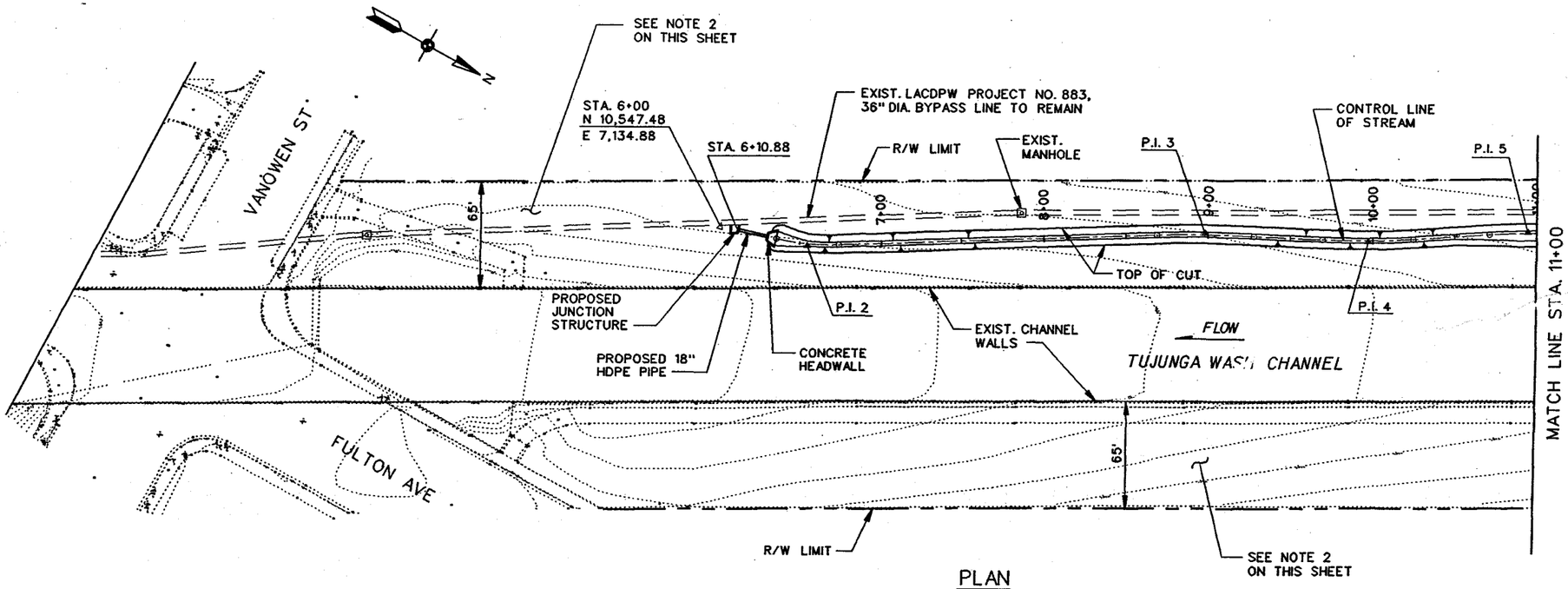
VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

CONTROL LINE CURVE DATA		
P.I. NO.	2	3
NORTHING	10,600.08	10,809.19
EASTING	7,119.62	6,993.85
Δ=	14° 51' 13"	4° 48' 49"
R=	200'	700'
T=	26.07'	29.42'
L=	51.85'	58.81'
B.C. STA.	6+28.70	8+69.08
E.C. STA.	6+80.55	9+27.88

CONTROL LINE CURVE DATA		
P.I. NO.	4	5
NORTHING	10,897.69	10,980.35
EASTING	6,950.27	6,897.59
Δ=	6° 17' 50"	5° 23' 01"
R=	500'	500'
T=	27.50'	23.51'
L=	54.95'	46.98'
B.C. STA.	9+69.61	10+71.57
E.C. STA.	10+24.56	11+18.55

NOTE ON TOPOGRAPHIC SURVEY:

EXISTING TOPOGRAPHIC SURVEY SHOWN IS OBTAINED FROM LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS. THE SURVEY WAS PERFORMED IN 2001. PER FIELD SURVEY NOTES (FC 3290), HORIZONTAL COORDINATES OF N 5,000.00 AND E 10,000.00 ARE ASSUMED AT THE INTERSECTION POINT OF CENTERLINES FOR OXNARD STREET AND COLDWATER CANYON AVENUE.



PLAN

SCALE: 1 IN. = 40 FT.

NOTES:

1. SEE SHEET D-7 FOR TYPICAL SECTIONS OF PROPOSED STREAM AND POND.
2. SEE SHEET L-1 FOR PROPOSED RESTORATION OF NATIVE PLANT IN AREA BOUNDED BY R/W LIMIT AND EXIST. CHANNEL WALL.

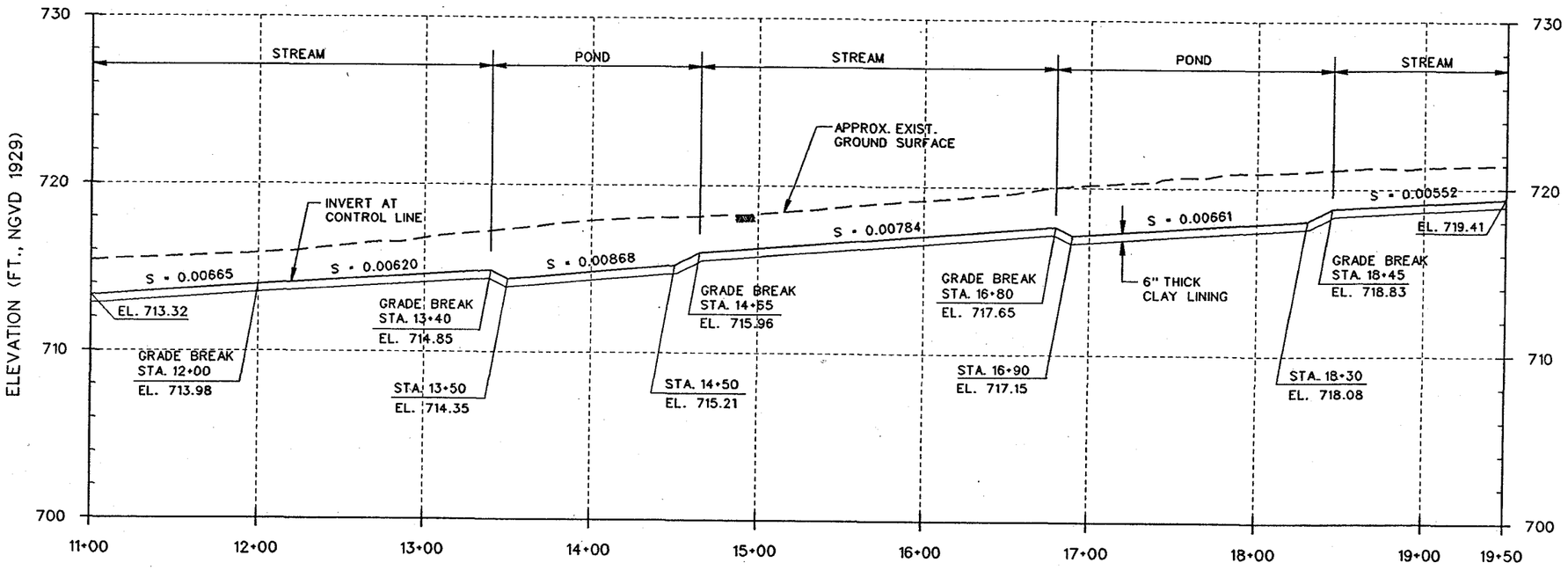
SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 2

STREAM PLAN AND PROFILE
STA. 6+10.88 TO STA. 11+00

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D-2

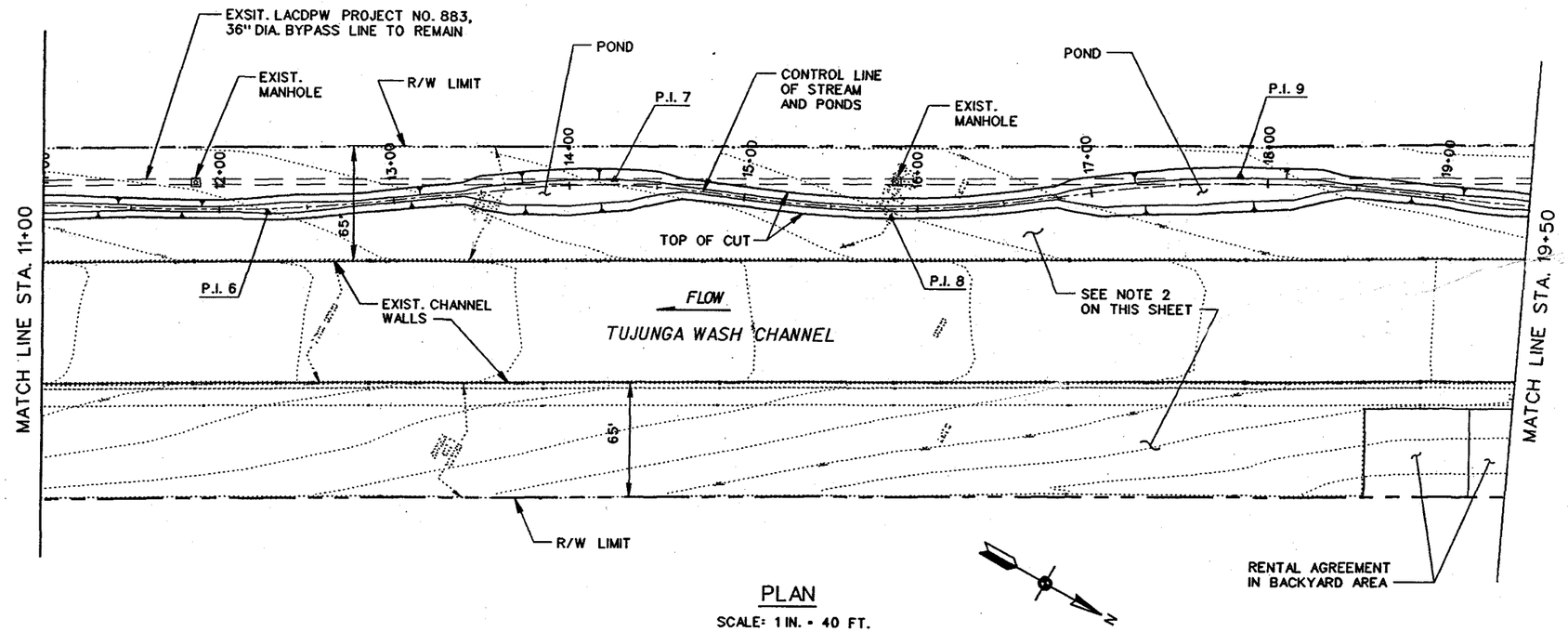


PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

CONTROL LINE CURVE DATA		
P.I. NO.	6	7
NORTHING	11098.17	12261.04
EASTING	6837.24	6724.48
Δ=	7° 34' 10"	13° 13' 14"
R=	1000'	500'
T=	66.15'	57.94'
L=	132.11'	115.37'
B.C. STA.	11+61.27	13+67.38
E.C. STA.	12+93.38	14+82.76

CONTROL LINE CURVE DATA		
P.I. NO.	8	9
NORTHING	11410.50	11571.89
EASTING	6665.68	6547.22
Δ=	14° 48' 09"	13° 28' 02"
R=	600'	700'
T=	29.42'	82.65'
L=	155.01'	164.53'
B.C. STA.	15+07.48	17+02.10
E.C. STA.	16+62.49	18+66.63



PLAN

SCALE: 1 IN. = 40 FT.

NOTES:

1. SEE SHEET D-7 FOR TYPICAL SECTIONS OF PROPOSED STREAM AND POND.
2. SEE SHEET L-2 FOR PROPOSED RESTORATION OF NATIVE PLANT IN AREA BOUNDED BY R/W LIMIT AND EXIST. CHANNEL WALL.

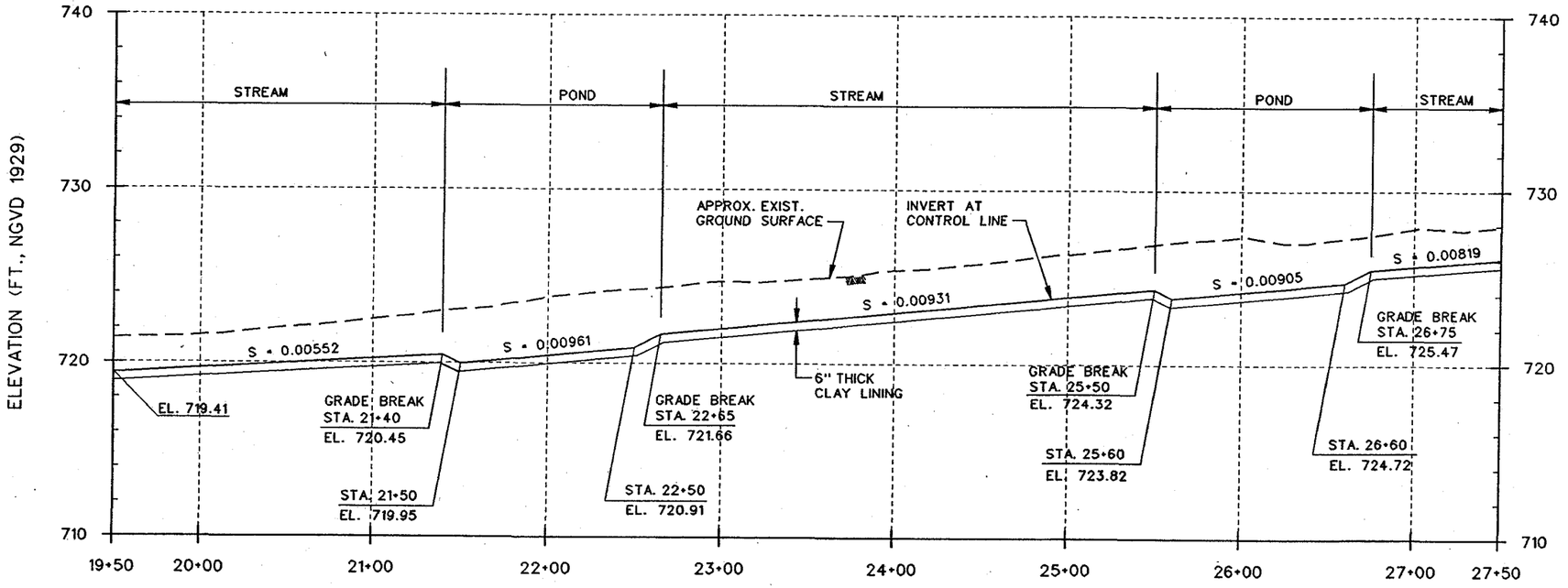
SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 2 AND ALTERNATIVE 3

STREAM PLAN AND PROFILE
STA. 11+00 TO STA. 19+50

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D-3

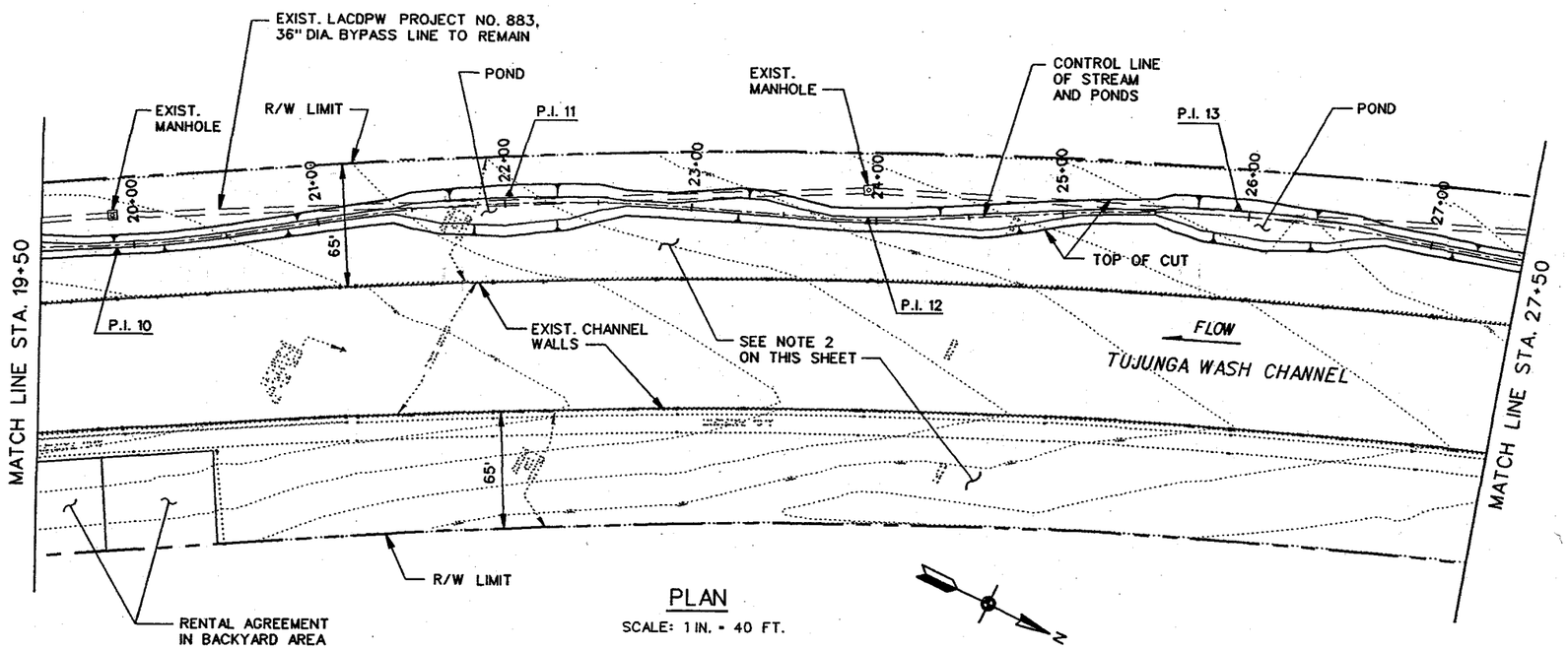


PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

CONTROL LINE CURVE DATA		
P.I. NO.	10	11
NORTHING	11762.64	11938.00
EASTING	6467.00	6346.90
Δ=	11° 35' 48"	13° 05' 01"
R=	700'	800'
T=	71.08'	91.74'
L=	141.68'	182.68'
B.C. STA.	19+19.83	21+11.24
E.C. STA.	20+61.51	22+93.22

CONTROL LINE CURVE DATA		
P.I. NO.	12	13
NORTHING	12118.26	12293.58
EASTING	6276.54	6183.18
Δ=	6° 42' 43"	13° 19' 18"
R=	400'	700'
T=	23.46'	81.75'
L=	46.86'	162.76'
B.C. STA.	23+72.23	25+12.52
E.C. STA.	24+19.09	26+75.27



PLAN

SCALE: 1 IN. = 40 FT.

NOTES:

1. SEE SHEET D-7 FOR TYPICAL SECTIONS OF PROPOSED STREAM AND POND.
2. SEE SHEET L-3 FOR PROPOSED RESTORATION OF NATIVE PLANT IN AREA BOUNDED BY R/W LIMIT AND EXIST. CHANNEL WALL.

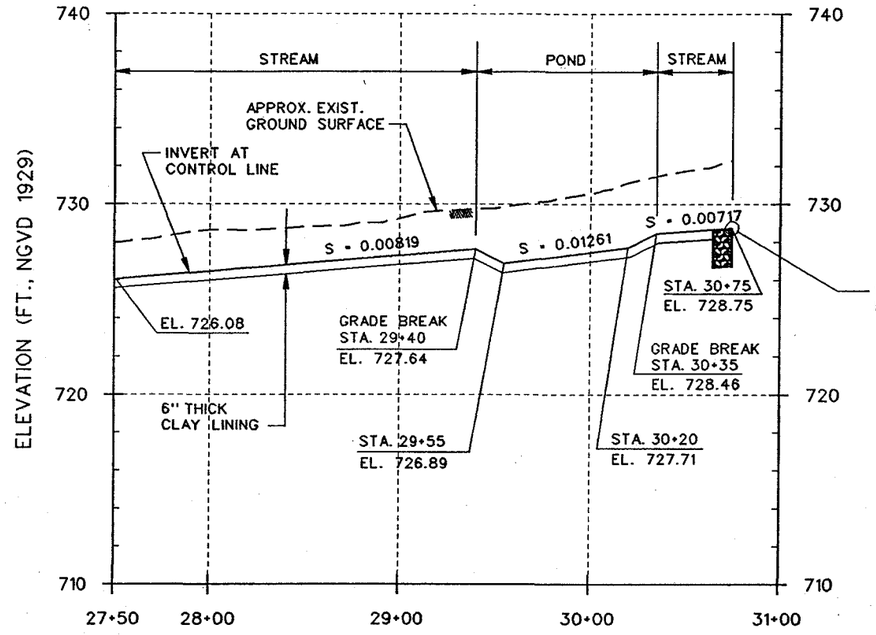
SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 2 AND ALTERNATIVE 3

STREAM PLAN AND PROFILE
STA. 19+50 TO STA. 27+50

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

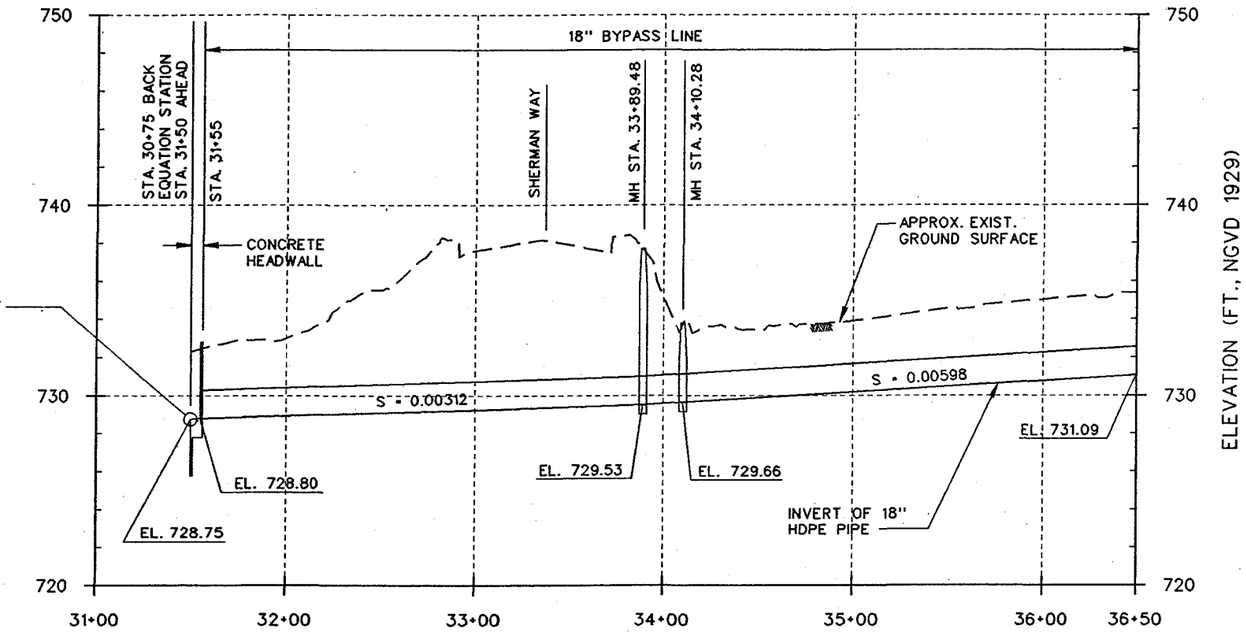
SHEET D-4



PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

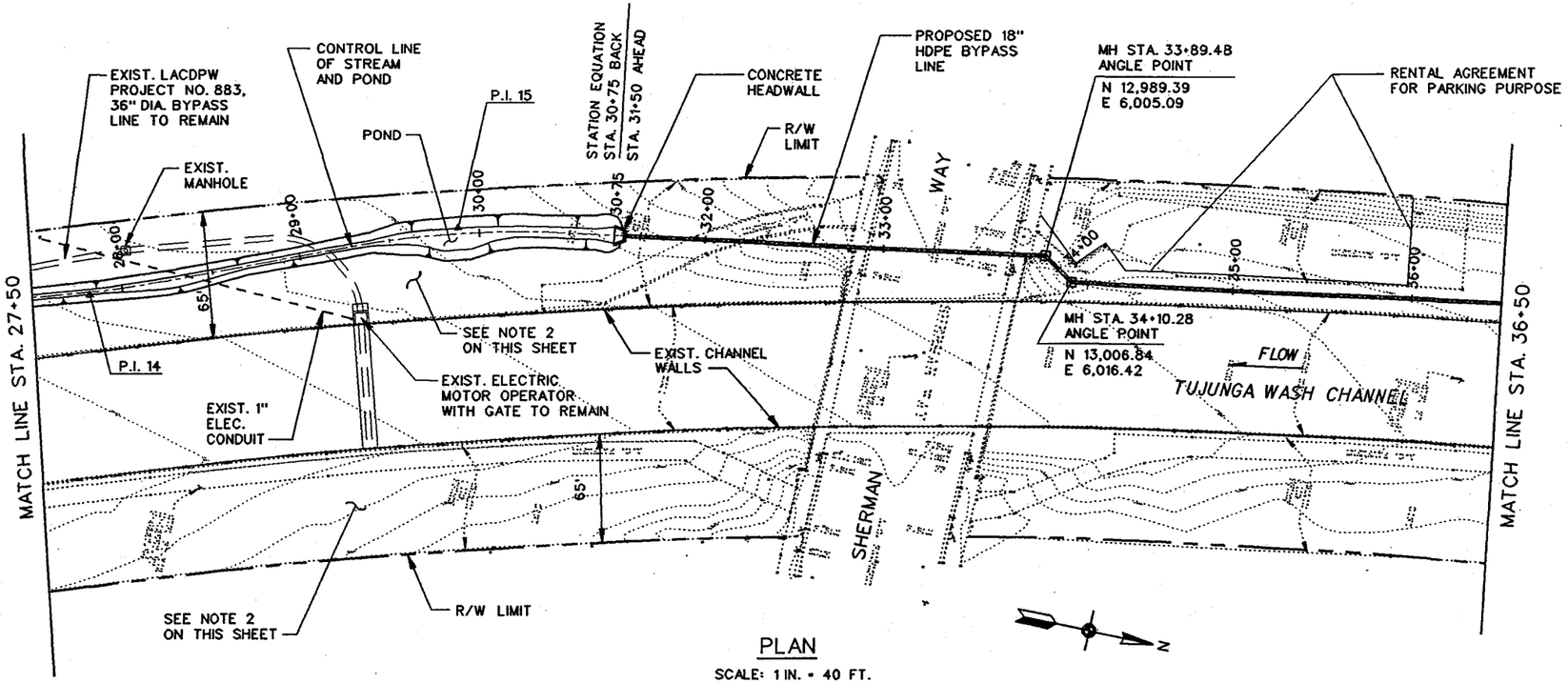
SAME POINT



PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

CONTROL LINE CURVE DATA		
P.I. NO.	14	15
NORTHING	12475.77	12667.13
EASTING	6135.34	6056.75
Δ=	7° 36' 49"	13° 13' 08"
R=	700'	500'
T=	46.58'	57.93'
L=	93.02'	115.36'
B.C. STA.	27+35.31	29+30.68
E.C. STA.	28+28.32	30+46.04



PLAN

SCALE: 1 IN. = 40 FT.

NOTES:

1. SEE SHEET D-7 FOR TYPICAL SECTIONS OF PROPOSED STREAM AND POND.
2. SEE SHEET L-4 FOR PROPOSED RESTORATION OF NATIVE PLANT IN AREA BOUNDED BY R/W LIMIT AND EXIST. CHANNEL WALL SOUTH OF SHERMAN WAY.

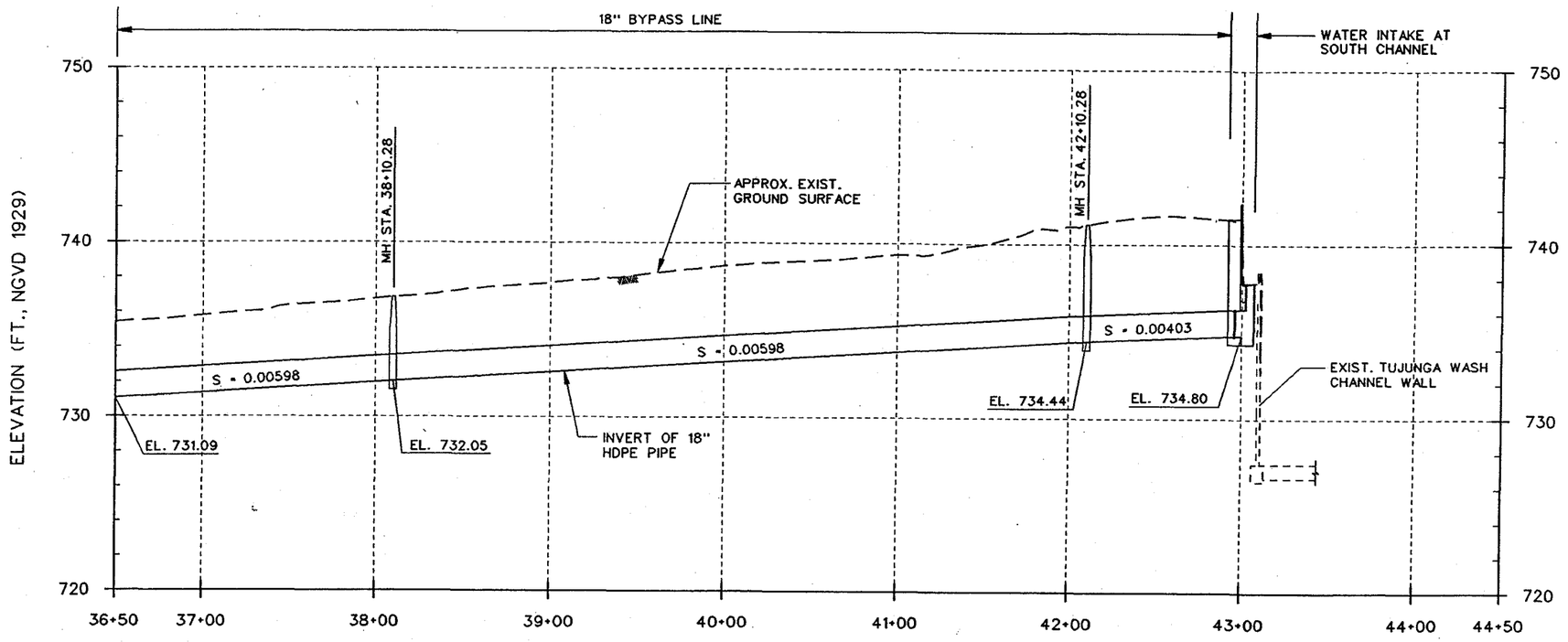
SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 2 AND ALTERNATIVE 3

STREAM AND BYPASS LINE PLAN AND PROFILE
STA. 27+50 TO STA. 30+75
AND STA. 31+50 TO STA. 36+50

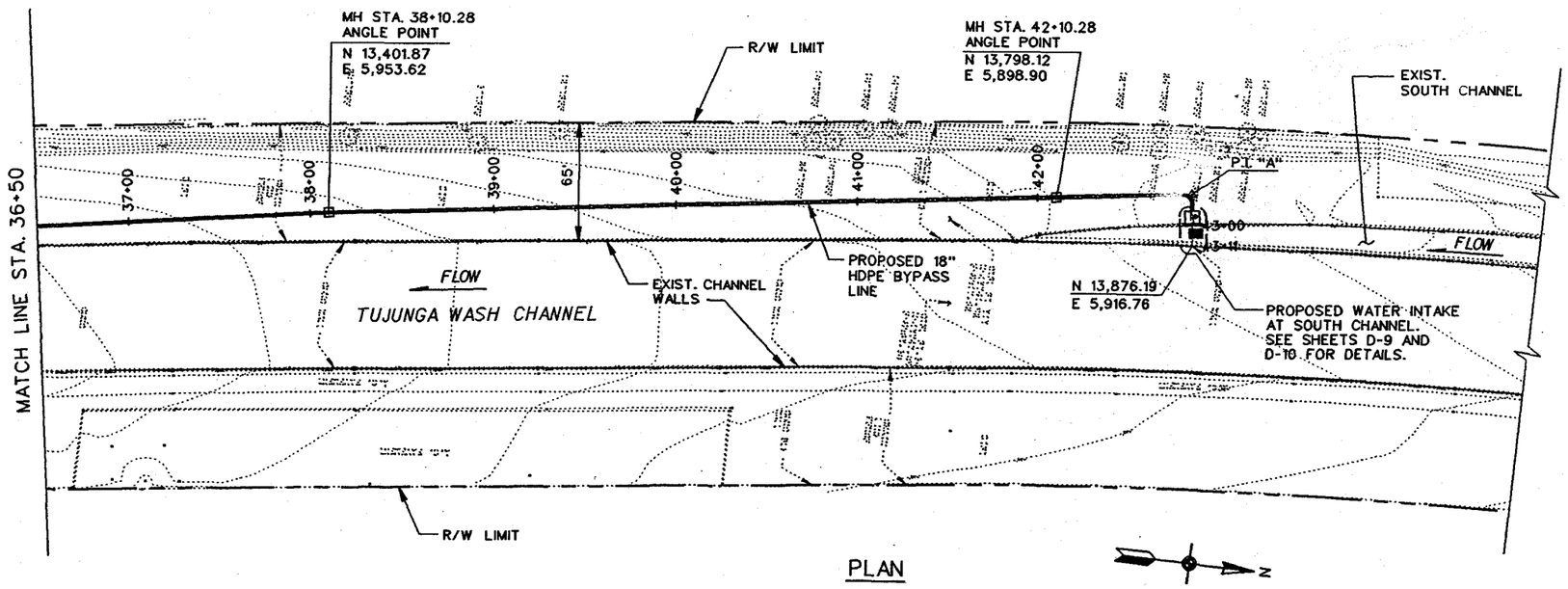
PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D-5



PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.



PLAN

SCALE: 1 IN. = 40 FT.

P.I. NO.	"A"
NORTHING	13,872.31
EASTING	5,888.66
Δ=	90° 00' 00"
R=	5'
T=	5'
L=	7.85'
B.C. STA.	42+80.18
E.C. STA.	42+88.03

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 2 AND ALTERNATIVE 3

BYPASS LINE PLAN AND PROFILE
STA. 36+50 TO STA. 43+11

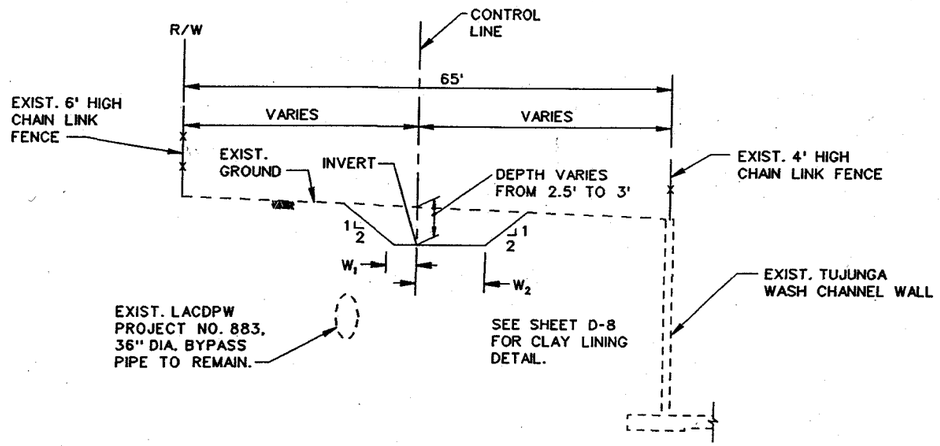
PREPARED BY: U.S. ARMY
CORPS OF ENGINEERS
LOS ANGELES DISTRICT

SHEET
D-6

DIMENSION W_2 FOR STREAM AND POND	
STATION	W_2 (FT.)
6+35 TO 6+55	VARIES FROM 4.5' TO 1.5'
6+55 TO 10+50	1.5'
10+50 TO 10+90	VARIES FROM 1.5' TO 4.5'
10+90 TO 11+05	4.5'
11+05 TO 11+50	VARIES FROM 4.5' TO 1.5'
11+50 TO 12+05	1.5'
12+05 TO 12+35	VARIES FROM 1.5' TO 3'
12+35 TO 12+45	3'
12+45 TO 12+75	VARIES FROM 3' TO 1.5'
12+75 TO 13+40	1.5'
13+40 TO 13+50	VARIES FROM 1.5' TO 4.5'
13+50 TO 13+65	VARIES FROM 4.5' TO 9'
13+65 TO 14+00	VARIES FROM 9' TO 12'
14+00 TO 14+35	VARIES FROM 12' TO 9'
14+35 TO 14+50	VARIES FROM 9' TO 4.5'
14+50 TO 14+65	VARIES FROM 4.5' TO 1.5'
14+65 TO 14+80	1.5'
14+80 TO 16+90	VARIES FROM 1.5' TO 4.5'
16+90 TO 17+05	VARIES FROM 4.5' TO 9'
17+05 TO 17+60	VARIES FROM 9' TO 12'
17+60 TO 18+15	VARIES FROM 12' TO 9'
18+15 TO 18+30	VARIES FROM 9' TO 4.5'
18+30 TO 18+45	VARIES FROM 4.5' TO 1.5'
18+45 TO 18+95	1.5'
18+95 TO 19+25	VARIES FROM 1.5' TO 3'
19+25 TO 19+40	3'
19+40 TO 19+70	VARIES FROM 3' TO 1.5'
19+70 TO 21+40	1.5'
21+40 TO 21+50	VARIES FROM 1.5' TO 4.5'
21+50 TO 21+65	VARIES FROM 4.5' TO 9'
21+65 TO 22+00	VARIES FROM 9' TO 12'

DIMENSION W_2 FOR STREAM AND POND	
STATION	W_2 (FT.)
22+00 TO 22+35	VARIES FROM 12' TO 9'
22+35 TO 22+50	VARIES FROM 9' TO 4.5'
22+50 TO 22+65	VARIES FROM 4.5' TO 1.5'
22+65 TO 24+10	1.5'
24+10 TO 24+25	VARIES FROM 1.5' TO 3'
24+25 TO 24+35	VARIES FROM 3' TO 4.5'
24+35 TO 24+55	VARIES FROM 4.5' TO 7'
24+55 TO 24+65	7'
24+65 TO 24+85	VARIES FROM 7' TO 4.5'
24+85 TO 24+95	VARIES FROM 4.5' TO 3'
24+95 TO 25+10	VARIES FROM 3' TO 1.5'
25+10 TO 25+50	1.5'
25+50 TO 25+60	VARIES FROM 1.5' TO 4.5'
25+60 TO 25+75	VARIES FROM 4.5' TO 9'
25+75 TO 26+10	VARIES FROM 9' TO 12'
26+10 TO 26+45	VARIES FROM 12' TO 9'
26+45 TO 26+60	VARIES FROM 9' TO 4.5'
26+60 TO 26+75	VARIES FROM 4.5' TO 1.5'
26+75 TO 27+90	1.5'
27+90 TO 28+25	VARIES FROM 1.5' TO 4.5'
28+25 TO 28+35	4.5'
28+35 TO 28+70	VARIES FROM 4.5' TO 1.5'
28+70 TO 29+40	1.5'
29+40 TO 29+55	VARIES FROM 1.5' TO 3'
29+55 TO 29+65	VARIES FROM 3' TO 4.5'
29+65 TO 29+80	VARIES FROM 4.5' TO 9'
29+80 TO 29+95	9'
29+95 TO 30+10	VARIES FROM 9' TO 4.5'
30+10 TO 30+20	VARIES FROM 4.5' TO 3'
30+20 TO 30+65	3'
30+65 TO 30+75	VARIES FROM 3' TO 4.5'

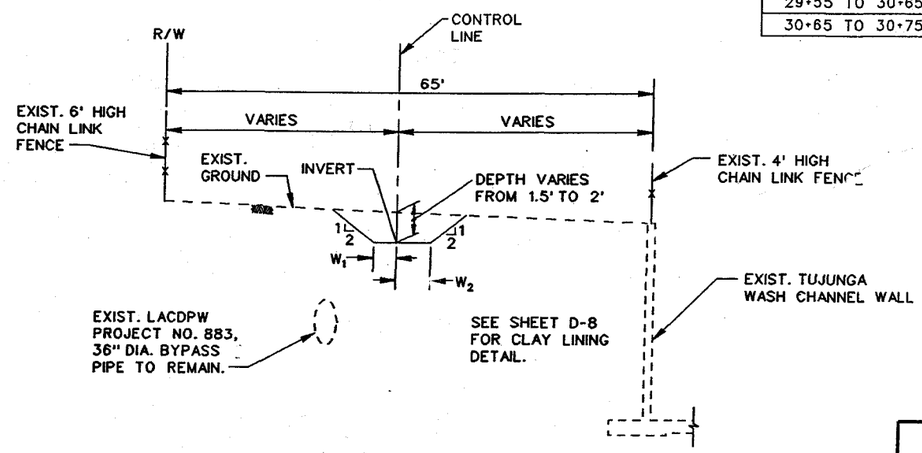
DIMENSION W_1 FOR STREAM AND POND	
STATION	W_1 (FT.)
6+35 TO 6+55	VARIES FROM 4.5' TO 1.5'
6+55 TO 12+05	1.5'
12+05 TO 12+35	VARIES FROM 1.5' TO 3'
12+35 TO 12+45	3'
12+45 TO 12+75	VARIES FROM 3' TO 1.5'
12+75 TO 13+40	1.5'
13+40 TO 13+50	VARIES FROM 1.5' TO 3'
13+50 TO 14+50	3'
14+50 TO 14+65	VARIES FROM 3' TO 1.5'
14+65 TO 16+80	1.5'
16+80 TO 16+90	VARIES FROM 1.5' TO 3'
16+90 TO 18+30	3'
18+30 TO 18+45	VARIES FROM 3' TO 1.5'
18+45 TO 18+95	1.5'
18+95 TO 19+25	VARIES FROM 1.5' TO 3'
19+25 TO 19+40	3'
19+40 TO 19+70	VARIES FROM 3' TO 1.5'
19+70 TO 21+40	1.5'
21+40 TO 21+50	VARIES FROM 1.5' TO 3'
21+50 TO 22+50	3'
22+50 TO 22+65	VARIES FROM 3' TO 1.5'
22+65 TO 22+90	1.5'
22+90 TO 23+00	VARIES FROM 1.5' TO 3'
23+00 TO 23+10	VARIES FROM 3' TO 4.5'
23+10 TO 23+25	VARIES FROM 4.5' TO 7'
23+25 TO 23+40	7'
23+40 TO 23+55	VARIES FROM 7' TO 4.5'
23+55 TO 23+65	VARIES FROM 4.5' TO 3'
23+65 TO 23+75	VARIES FROM 3' TO 1.5'
23+75 TO 25+50	1.5'
25+50 TO 25+60	VARIES FROM 1.5' TO 3'
25+60 TO 26+60	3'
26+60 TO 26+75	VARIES FROM 3' TO 1.5'
26+75 TO 29+40	1.5'
29+40 TO 29+55	VARIES FROM 1.5' TO 3'
29+55 TO 30+65	3'
30+65 TO 30+75	VARIES FROM 3' TO 4.5'



TYPICAL SECTION OF POND

(VIEW TOWARDS ADVANCING STATIONING)

NOT TO SCALE



TYPICAL SECTION OF STREAM

(VIEW TOWARDS ADVANCING STATIONING)

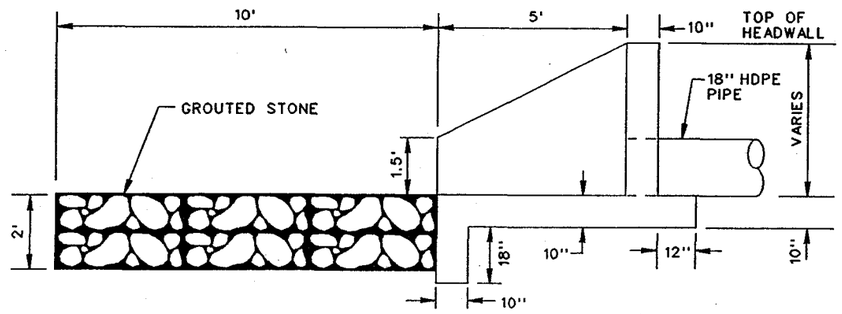
NOT TO SCALE

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

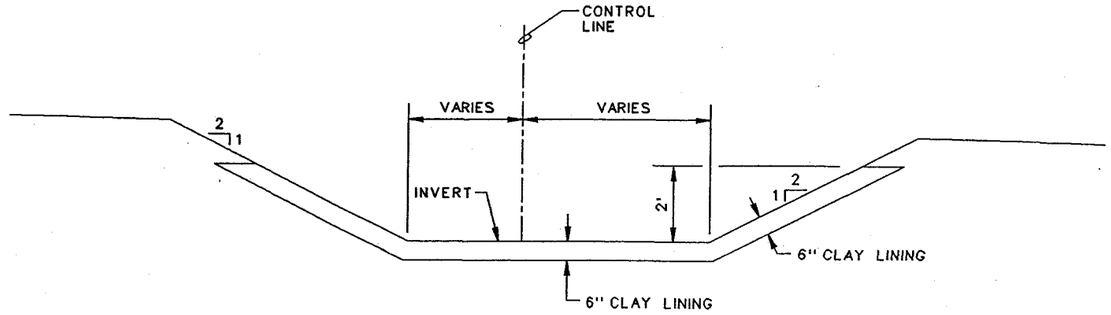
TYPICAL SECTIONS
STREAM AND POND

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

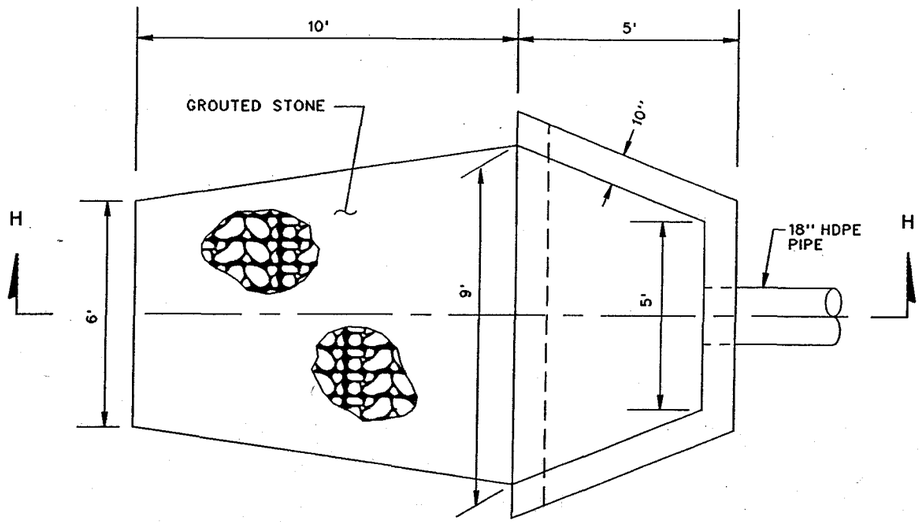
SHEET D-7



SECTION H - H
NOT TO SCALE

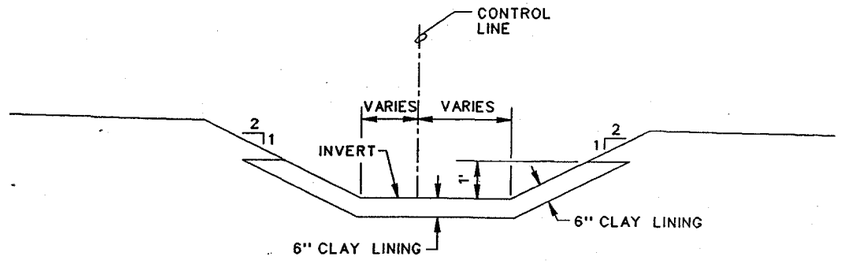


CLAY LINING DETAIL FOR POND
NOT TO SCALE

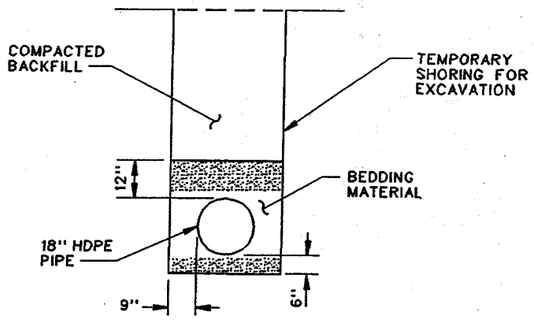


PLAN
NOT TO SCALE

CONCRETE HEADWALL



CLAY LINING DETAIL FOR STREAM
NOT TO SCALE



EXCAVATION FOR BYPASS LINE
NOT TO SCALE

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

DETAILS

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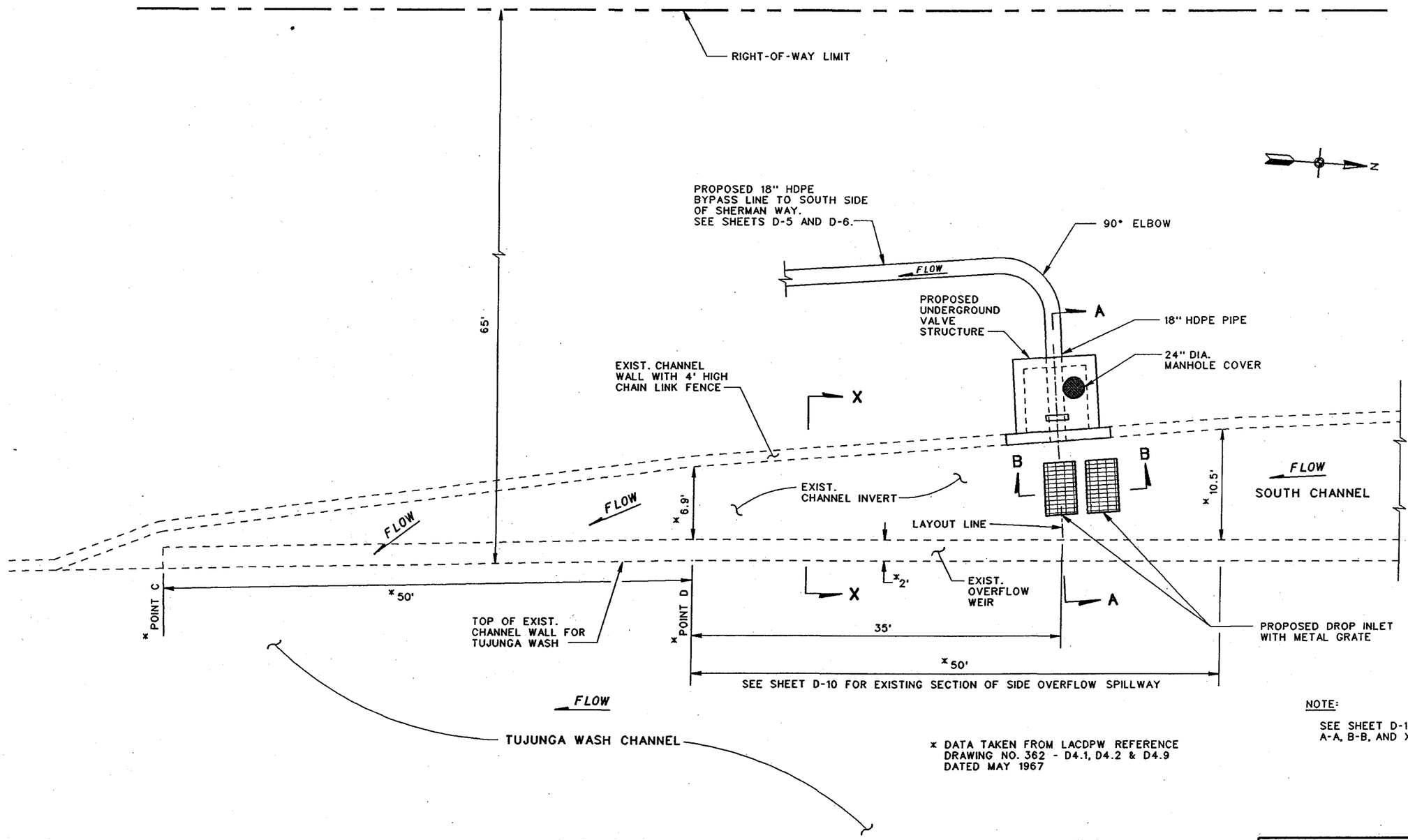
SHEET D-8



WATER INTAKE AT SOUTH CHANNEL
CONCEPTUAL PLAN
NOT TO SCALE

* DATA TAKEN FROM LACDPW REFERENCE DRAWING NO. 362 - D4.1, D4.2 & D4.9 DATED MAY 1967

NOTE:

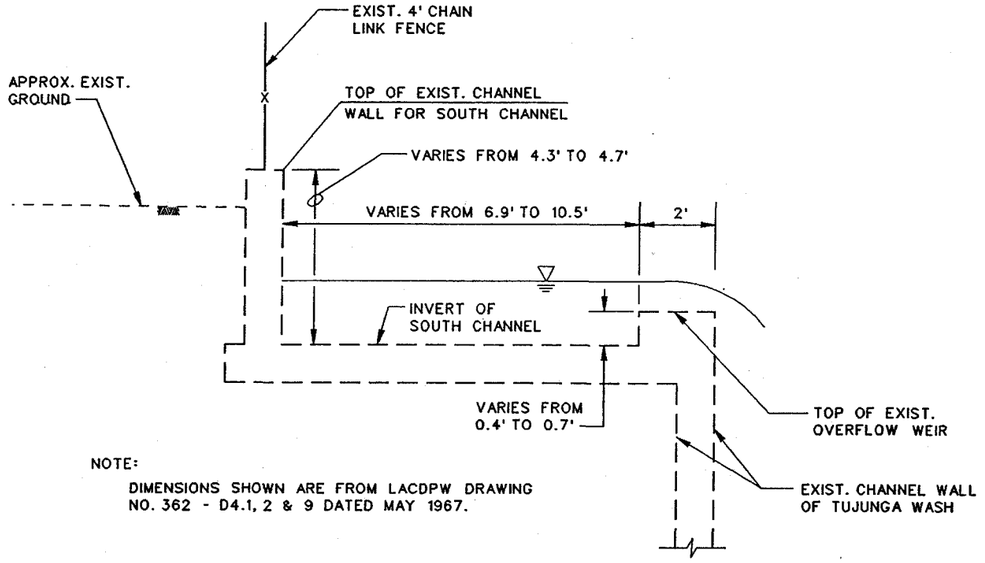
SEE SHEET D-10 FOR SECTIONS A-A, B-B, AND X-X

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

WATER INTAKE AT SOUTH CHANNEL
PLAN

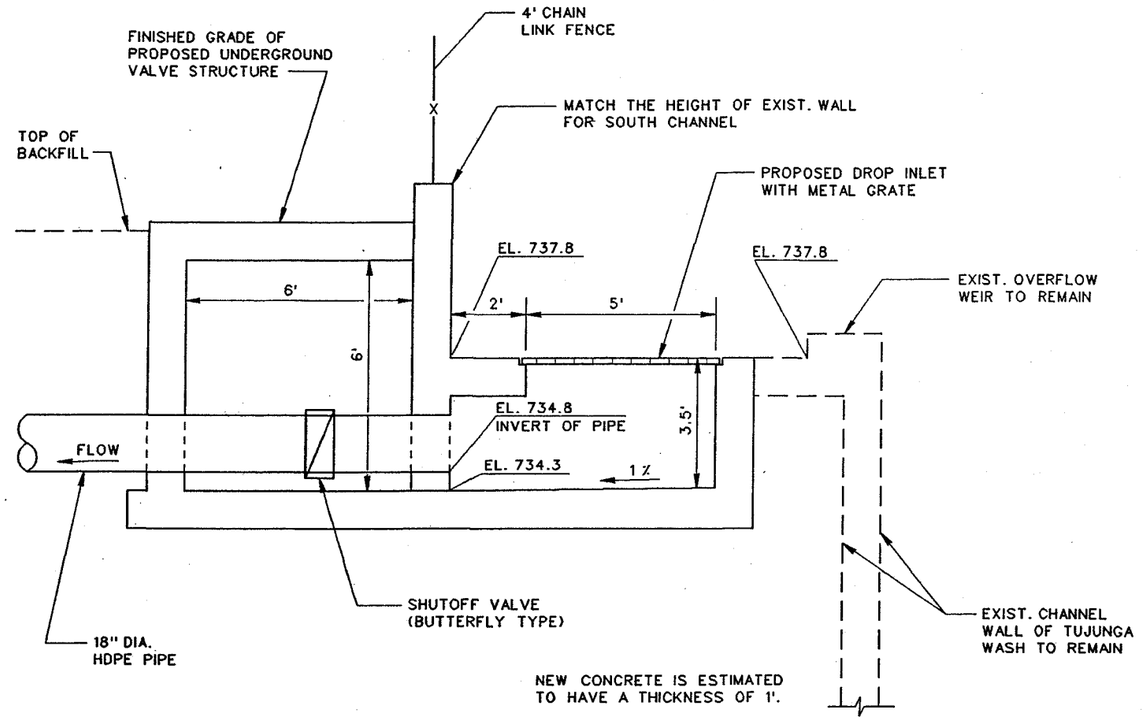
PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D-9



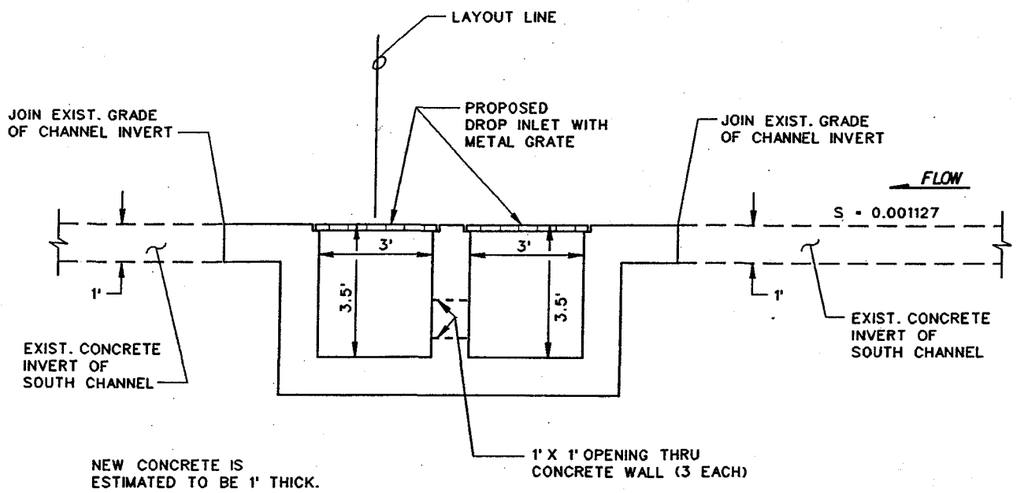
SECTION X - X
EXISTING SECTION FOR SIDE OVERFLOW SPILLWAY AT SOUTH CHANNEL

NOT TO SCALE



SECTION A - A

NOT TO SCALE



SECTION B - B

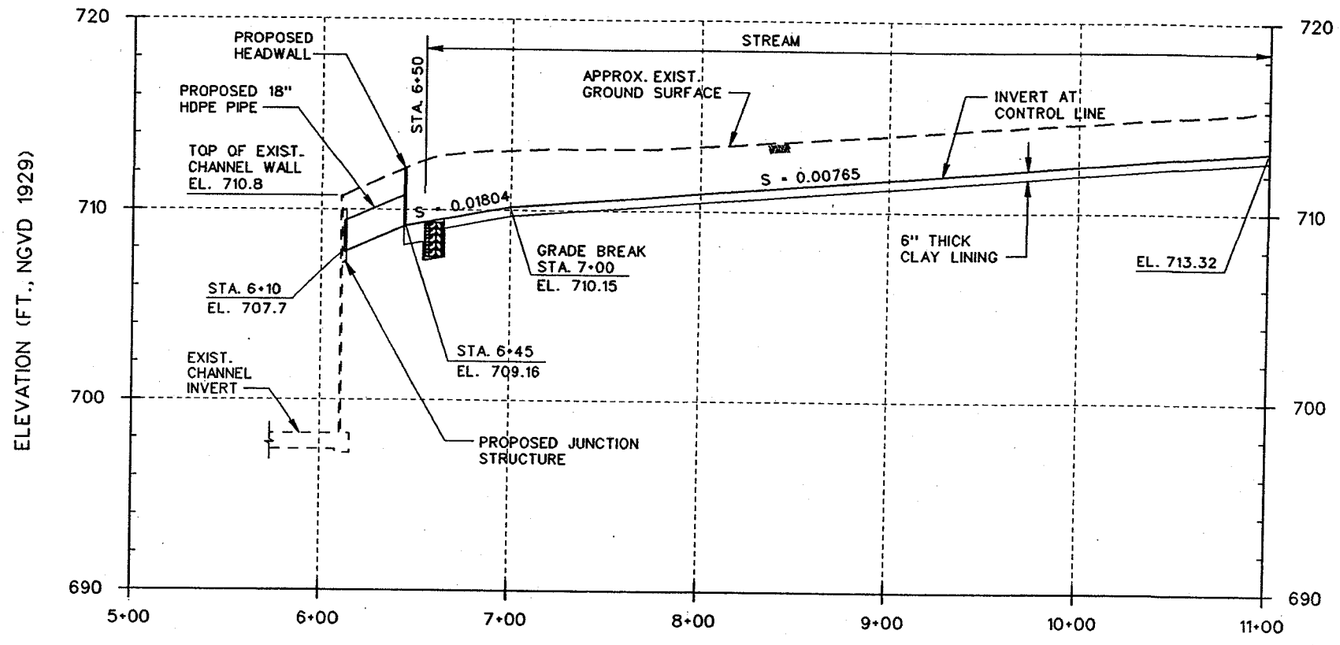
NOT TO SCALE

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

WATER INTAKE AT SOUTH CHANNEL
SECTIONS

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D-10

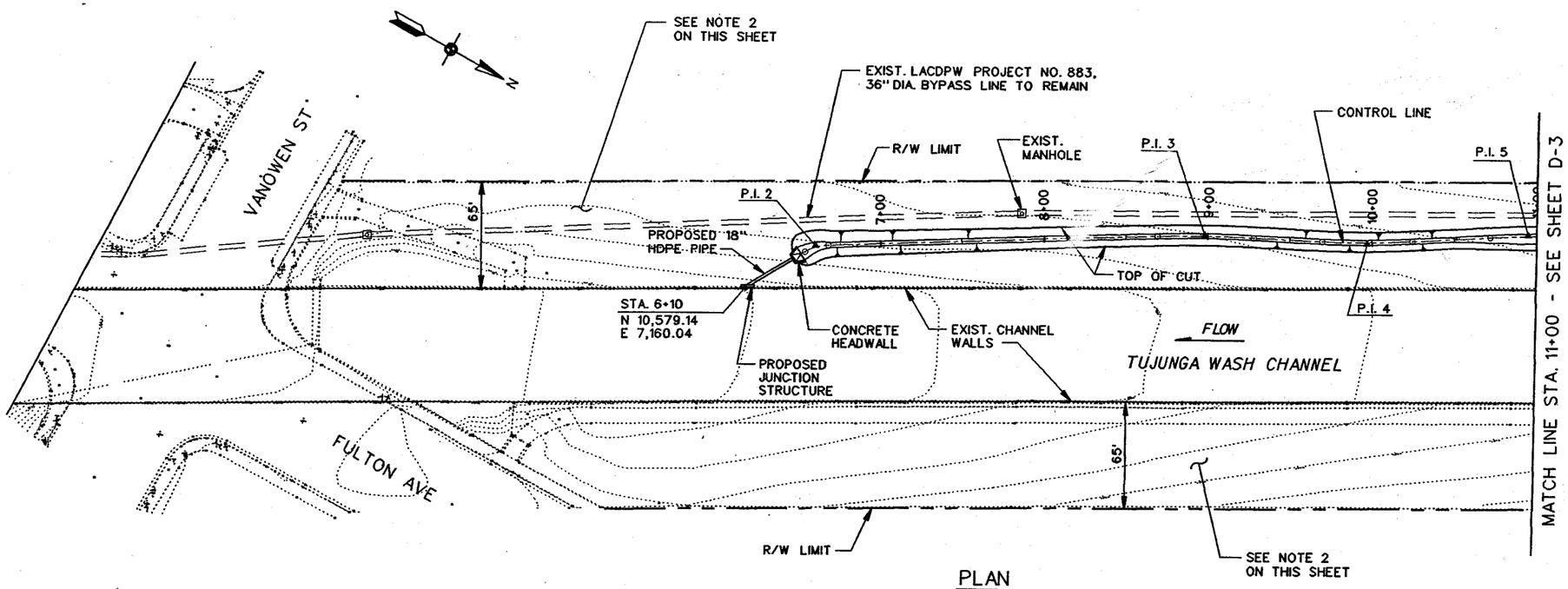


PROFILE

VERT. SCALE: 1 IN. = 4 FT.
HORIZ. SCALE: 1 IN. = 40 FT.

CONTROL LINE CURVE DATA		
P.I. NO.	2	3
NORTHING	10,604.81	10,809.19
EASTING	7,116.78	6,993.85
Δ=	28° 17' 40"	4° 48' 49"
R=	30'	700'
T=	7.56'	29.42'
L=	14.81'	58.81'
B.C. STA.	6+52.75	8+69.08
E.C. STA.	6+67.56	9+27.88

CONTROL LINE CURVE DATA		
P.I. NO.	4	5
NORTHING	10,897.69	10,980.35
EASTING	6,950.27	68,97.59
Δ=	6° 17' 50"	5° 23' 01"
R=	500'	500'
T=	27.50'	23.51'
L=	54.95'	46.98'
B.C. STA.	9+69.61	10+71.57
E.C. STA.	10+24.56	11+18.55



PLAN

SCALE: 1 IN. = 40 FT.

NOTE ON TOPOGRAPHIC SURVEY:

EXISTING TOPOGRAPHIC SURVEY SHOWN IS OBTAINED FROM LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS. THE SURVEY WAS PERFORMED IN 2001. PER FIELD SURVEY NOTES (FC 3290), HORIZONTAL COORDINATES OF N 5,000.00 AND E 10,000.00 ARE ASSUMED AT THE INTERSECTION POINT OF CENTERLINES FOR OXNARD STREET AND COLDWATER CANYON AVENUE.

NOTES:

1. SEE SHEETS D-3 THRU D-6 FOR PLAN AND PROFILE OF ALTERNATIVE 3.
2. SEE SHEET L-1 FOR PROPOSED RESTORATION OF NATIVE PLANT IN AREA BOUNDED BY R/W LIMIT AND EXIST. CHANNEL WALL.
3. SEE SHEET D-7 FOR TYPICAL SECTIONS OF PROPOSED STREAM AND POND.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

ALTERNATIVE 3

STREAM PLAN AND PROFILE
STA. 6+10 TO STA. 11+00

PREPARED BY: U.S. ARMY CORPS OF ENGINEERS LOS ANGELES DISTRICT

SHEET D11

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APPENDIX E2

RESTORATION DESIGN REPORT

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Restoration Design

For

Tujunga Wash (Sherman Way to Van Owen Street) Ecosystem Restoration Study

Of

Section 1135 Continuing Authorities Program

Los Angeles County, California

December 2007

CONTENTS

1.0 OBJECTIVE

The objective of this appendix is to provide restoration architectural design development information to support the Tujunga wash ecosystem restoration study for the approximate 3,000 feet channel section from Sherman Way to Van Owen Street. The key restoration architectural objectives are to include (1) protect integrity of flood control walls (2) replace barren landscape with green space and a more visually appealing landscape; (3) provide opportunities for native habitat; (4) provide recreational opportunities for the neighborhood.

2.0 ALTERNATIVES

Alternative 1 – No Action Alternative.

No design features required for this alternative.

Alternative 2 – On the west terrace, a manmade stream will be constructed which will use diverted water from the South Channel. This water will help support the native riparian plant communities which will be planted along the manmade stream's edges. Any water left over after running through our manmade stream will continue downstream to the manmade stream on the terrace of the Los Angeles County project.

The west terrace will also have a domestic water irrigation system to help support the plants. The west terrace will be used as a native habitat restoration area. To help the restoration area thrive, the west terrace will not be open for public access. Instead, this terrace will have a maintenance road which will also be used for emergency access. The public will have access to project information and interpretive opportunities at the west terrace project entrances.

The east terrace will have more drought tolerant native plant communities which will be irrigated with domestic water. This terrace will be open to the public with a trail, seating/wildlife observation areas and interpretive signage.

Alternative 3 – The restoration design, public access, planting and irrigation design of this alternative will be the same as for Alternative 2. On the west terrace, any left over water (after running through our manmade stream) will go to the Tujunga Wash via the existing channel sidewall.

3.0 EXISTING CONDITIONS

Existing flood control channel with tall concrete walls, project site is the two terraces (east and west) on top of either side of channel wall. The two terraces are each approximately 65' wide with the tall channel wall on one side and a chain link fence on the other side of the terrace. The existing chain link fence separates our project from adjacent private properties.

The adjacent private properties are primarily backyards of single family residences, some apartment complexes and a few commercial/retail properties. On the east terrace, there is

a private property encroachment issue with one property owner who has extended his backyard approx 50' into the project site.

Just outside of the fence line on the west terrace is a line of utility poles/lines.

The project area is virtually barren dirt with an existing asphaltic concrete driveway and entry road to the site. The soil is hard packed and doesn't have many plants growing on it indicating possible use of herbicide as a maintenance practice on this part of the channel.

The north and south border of the project site is where public streets cross the channel.

4.0 POTENTIAL SAFETY ISSUES

Project provides opportunity for much needed open green space, but increases potential for criminal and vandalism activities as well. Accumulation of trash, and graffiti, incidences of vandalism and potential for attracting homeless camps in this project is high. Adjacent property owners are concerned public access to the project and heavy vegetation would provide ideal hiding places for criminals and homeless camps. Safety considerations are high.

These maintenance and monitoring measures will be performed by the Local Sponsor concurrently with the Contractor's one year maintenance requirement. Once the one year maintenance period is over, the project will be turned over to the Local Sponsor and they will continue to maintain and monitor the project.

5.0 PUBLIC ACCESS

Eastside will be open to the public during the day, but will be closed at night. Only pedestrian entry gates are open during the day. The project site is a habitat area which needs protection from people trampling the plants and destroying the irrigation system. The project will be very attractive as camps for the homeless and the neighbors are concerned of trespassers etc. from entering their backyards from the project site. Because of this, the project must be cleared of people before it is closed each night.

Empty trash cans and more frequently on weekends. East side will have habitat with public access and passive recreational opportunities. Maintenance road wide enough for staff to drive thru project everyday and remove people from the project prior to closing and locking the Entry gates to be closed after hours (just past sunset). This shall be performed daily by the Sponsor and is critically needed to help preserve this environmental project as an asset to the community.

These maintenance and monitoring measures will be performed by the Local Sponsor concurrently with the Contractor's one year maintenance requirement. Once the one year maintenance period is over, the project will be turned over to the Local Sponsor and they will continue to maintain and monitor the project.

West Side: This environmental corridor is haven for environmental restoration and must be protected from public access and their pets. Proper operations and maintenance is critical to ensure public does not have access to the site. Public "pocket parks" at entrances will provide informal seating area, overview and wildlife observation opportunities, interpretive and informational signage. In order to minimize degradation and destruction of the habitat, access to the west side would be limited to authorized vehicles only. Gates shall be locked shut to prevent public and dogs from entering the habitat restoration area. Educational information will be designed at protect entries for public to view wildlife and understand why they are being kept out (and hopefully enlist their support and stewardship)

These maintenance and monitoring measures will be performed by the Local Sponsor concurrently with the Contractor's one year maintenance requirement. Once the one year maintenance period is over, the project will be turned over to the Local Sponsor and they will continue to maintain and monitor the project.

6.0 OPPORTUNITIES

(See Plans in Restoration Design Reference A)

The project site offers opportunities to create an open green space of native plants which attracts wildlife. Passive recreational opportunities including, walking, wildlife observation, sitting, interpretive educational signage will help provide relief from congested city life.

Census indicates approximately 60% of population in this neighborhood speak Spanish. Provide Spanish translation on some of the project signage.

"Pocket parks" at project entrances provide information, project overview, interpretive signs, informal seating and waste receptacles.

7.0 DESIGN FEATURES

(See Restoration Design Reference B for additional information)

Entry Gates with Stone Columns: Will be constructed at the project entries. These columns will be made of concrete block with stone facing. The columns will match the existing stone columns of the adjacent project just downstream of this project. If the project budget allows, tubular steel gates can be used at the public entrances, but careful attention to the design must be made to prevent creating footholds which will allow people to climb the gate. Otherwise, welded steel wire mesh gates will be used for the non-public entrances and if necessary the public entrances.

Trash Receptacles: The type of trash receptacle selected shall discourage graffiti and vandalism by being heavy duty and round in shape, made of dense concrete with rough pebble texture on the outside surface. The heavy duty steel lids shall be lockable and removable. The can liners shall be a large size for less maintenance. To prevent vandals from tipping the can, the trash receptacle shall be permanently attached to ground by

anchoring it to a concrete footing. To prevent unsightly leakage from the bottom of the can, the top of the concrete footing will be sloped toward a center drain hole with a gravel sump.

Stone Seat Wall: Will be constructed of concrete block with local stone veneer. The stone will match the existing stone columns and seat wall of the adjacent project just downstream of this project. The seat wall will be backless giving people more flexibility in how to use the space and more opportunities for wildlife observation.

Benches: To deter graffiti, the benches shall be made with factory powder-coated metal straps. The benches shall be attached to concrete footings with vandal-resistant fasteners. To prevent rusting at the base, the concrete footings shall be sloped for drainage, and raised 1-2" from the surrounding finished grade. The width of the benches shall not exceed 5' without center structural supports and metal straps shall be placed at a right angle to the bench face to help discourage structural damage. Some of these benches shall have backs and some shall be backless. For benches in the entry areas, care should be taken to not place the benches too close to fences (to prevent their use as step to climb over fence).

Paving Materials: As much as possible, permeable paving shall be used because it allows water to drain through, looks more natural, blends in better with the site and the environmental principles of the project, and provides a different feel to the neighborhood than asphalt. The maintenance and emergency access road on the west terrace will be constructed of gravel. Ideally the color of the gravel will be in the earth tones. The maintenance road/pedestrian trail on the east terrace will be constructed of decomposed granite. This material is American Disability Act (ADA) compliant and is used in many of the COE projects for this purpose. On the west side, recycled plastic headers will be used to separate the maintenance road from the dirt shoulder. No headers will be used for the decomposed granite paving since the flood wall will be on one edge and the habitat fencing on the other. Asphalt paving will be used for the entry transition roads connecting the public street to the flat portion of the project where the material will change to the permeable paving. All paving will be graded towards planting areas to allow more water infiltration and for plant use.

Fencing: Welded steel wire mesh (WSWM) fence will be used to completely enclose the project. The color of the fence will match the existing fence of the adjacent project just downstream of this project. The fence height will be 8 feet tall along the project entries and the right of way line separating private property from the project. This added height is needed to discourage trespassers from entering backyards from the project site and to prevent them from entering our project after hours. The fence height will be reduced to five feet tall along the top of the flood channel walls.

Habitat Protection Fencing: Will be placed on the east terrace between the pedestrian trail and the habitat. This fence is three and a half feet tall and is made of post and cable. This type of fence becomes virtually invisible by allowing high visibility through and over it yet provides a psychological barrier to deter people from entering the habitat.

Signage: Project identification signs, hours of operation, and rules & regulations signs will be attached to fence in the project entry areas. Interpretive and educational panels/signs will also be attached in the project entry areas in the "pocket parks" for people to learn about the project. Some of the information should also be in Spanish.

Along the pedestrian trail small signage attached to the habitat protection fencing should mark distances to assist people on an exercise program and remind people to stay on path, and not to enter the habitat, etc.

More interpretive panels will be placed in locations along the pedestrian trail in areas for wildlife observation and sitting.

Site Grading: All excess clean soil left over from the construction of the manmade stream shall be used to create berms for the landscaping. A series of small berms should be placed between the stream side maintenance road and the stream to help protect the road from getting washed out from flooding. Higher and bigger berms should be placed near the right of way line and taper down towards the stream. This will protect private property from flooding and also help create a buffer to protect the habitat from environmental nuisances (light, noise, visibility) created by the neighborhood. As a last priority, any left over excess soil should be placed on the east side to first create a berm by the right of way line and finally all remaining clean soil should be placed throughout the site to create some topographic undulation and interest.

8.0 WATER SUPPLY AND IRRIGATION IMPROVEMENTS

A permanent buried automatic irrigation/watering system would be provided for plant establishment. After 3 years the amount of watering can be reduced and slowly be tapered off to provide only spray irrigation during times of plant distress or occasional summer watering. A separate bubbler system would be designed to provide deep watering to the trees and large tree-like shrubs indefinitely.

Water captured from upstream will be engineered by gravity flow to feed the manmade stream bed. It is our hope there will be enough water to allow it to continue to flow in our stream" to the end of our project. Clay liner or improved geotextile fabrics will be used to line the "stream to allow more of the water to flow downstream and not be completely absorbed into ground. Ponds will be configured to allow more opportunity for more naturalized plant materials including aquatics.

9.0 VEGETATION AND PLANTING IMPROVEMENTS

Buffer Planting: Provide a vegetative buffer on the berm by the right of way line by to help screen residential areas from project. This vegetative buffer will mutually protect the habitat and residential privacy. The buffer area will use more trees and taller shrubs to help create a screen.

No Tree Zone: No trees will be allowed to grow within 17 feet of channel walls. This will help protect the flood control channel walls from tree roots, and allow access for

emergency vehicles and Swift access along the channel walls. However, shorter woody plants less than 2' tall, and short perennial, groundcovers and grasses can be incorporated into this zone.

Native Plant Communities: Provide multi-storied plantings. Understory, vertical structure, canopy, understory and groundcovers. A variety of plant sizes (from seed to 24" box) will be planted to help stratify the plantings. There will be five native plant community types planted:

Aquatic/Emergent Wetland
Southern Cottonwood Willow Riparian Forest
Southern Sycamore Riparian Woodland
Alluvial Fan Scrub
Meadow

Refer to Restoration Design Reference C for plants listed under each community. The restoration contractor will select 8-10 of the listed plants under each category for approval and planting.

Young Plant Protection: Gopher and rabbit cages may be needed to protect the plants for the first several years.

Maintenance Access: Provide a maintenance path four foot wide dirt path between the private property at the right of way fence and start of project planting. This path will allow maintenance staff to keep non-native vegetation out of the project site.

10.0 OPERATIONS AND MAINTENANCE

Proper maintenance of the irrigation system is critical to ensure viability of the habitat and for the long term ability to water to when plants are suffering from a drought and to help prevent the plants from becoming a fire hazard.

Operation and maintenance is critical to ensure people are not inside the project every evening prior to locking gates. Maintenance is critical to ensure fences and gates are in good order. This will go a long way to help prevent people from hiding in the landscape and camping out or doing other criminal activities.

11.0 RESTORATION DESIGN REFERENCE A – DESIGN DRAWINGS

LEGEND

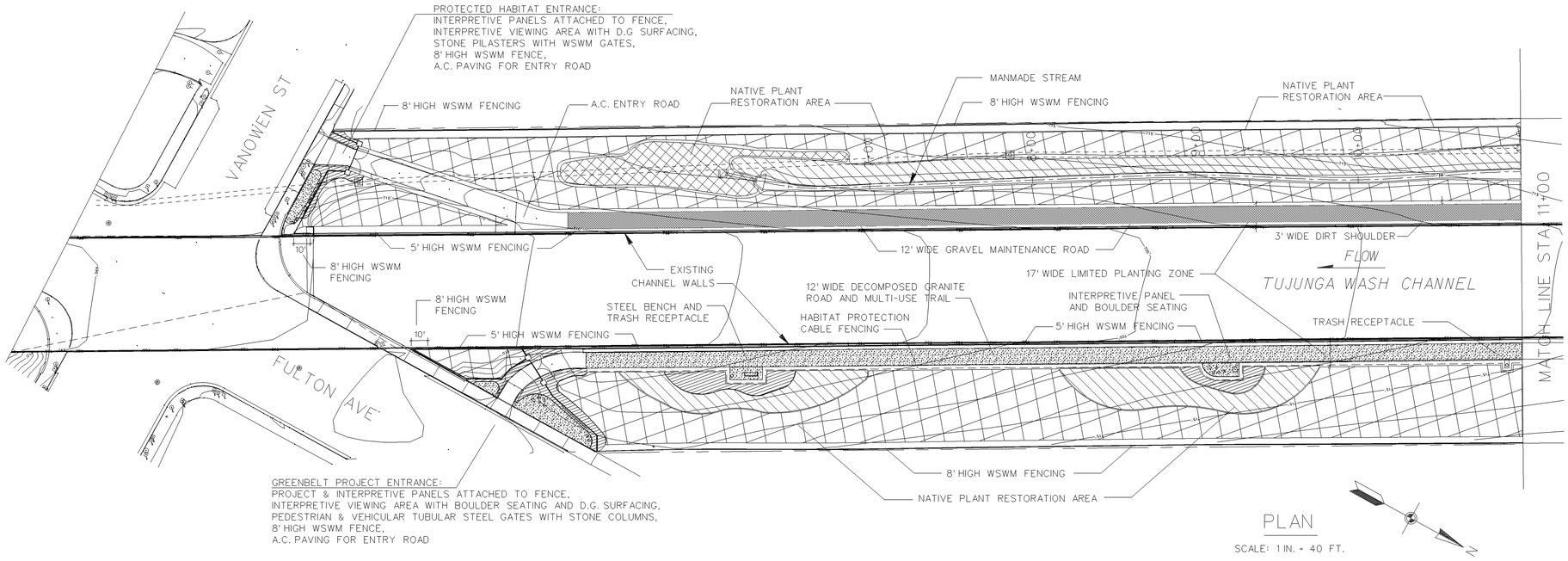
SYMBOL	NATIVE PLANT COMMUNITY TYPE	QUANTITY
	AQUATIC/EMERGENT WETLAND	-
	SOUTHERN COTTONWOOD-WILLOW RIPARIAN FOREST	10,525 SF
	SOUTHERN SYCAMORE RIPARIAN WOODLAND	2890 SF
	ALLUVIAL FAN SCRUB	39,250 SF
	MEADOW	275 SF

SYMBOL	PAVING TYPE
	DECOMPOSED GRANITE
	GRAVEL ROAD

SYMBOL	ABBREVIATIONS
A.C.	ASPHALTIC CONCRETE
D.G.	DECOMPOSED GRANITE
WSWM	WELDED STEEL WIRE MESH

GENERAL NOTES:

1. A PERMAMENT IRRIGATION SYSTEM SAHLL BE DESIGN TO IRRIGATE ALL PLANTING AREAS. DOMESTIC WATER SOURCES ARE AVAIABLE FROM CITY WATER LINES FOUND IN NEARBY PUBLIC STREETS. SEE SECTION 8.0 - WATER SUPPLY AND IRRIGATION IMPROVEMENTS, AND SECTION 10.0 - OPERATIONS AND MAINTENACE OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION.
2. SEE SECTION 9.0 - VEGETATION AND PLANTING IMPROVEMENTS OF APPRENDIX E - LANDSCAPE DESIGN FOR PLANT DENSITIES AND PLANT LISTS.
3. SEE SECTION 7.0 - DESIGN FEATURES OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION ON INDIVIDUAL DESIGN FEATURES.



PLAN

SCALE: 1 IN. = 40 FT.

GENERAL NOTES:

1. A PERMAMENT IRRIGATION SYSTEM SAHLL BE DESIGN TO IRRIGATE ALL PLANTING AREAS. DOMESTIC WATER SOURCES ARE AVAIABLE FROM CITY WATER LINES FOUND IN NEARBY PUBLIC STREETS. SEE SECTION 8.0 - WATER SUPPLY AND IRRIGATION IMPROVEMENTS, AND SECTION 10.0 - OPERATIONS AND MAINTENACE OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION.
2. SEE SECTION 9.0 - VEGETATION AND PLANTING IMPROVEMENTS OF APPRENDIX E - LANDSCAPE DESIGN FOR PLANT DENSITIES AND PLANT LISTS.
3. SEE SECTION 7.0 - DESIGN FEATURES OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION ON INDIVIDUAL DESIGN FEATURES.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

STA. 6+00 TO STA. 11+00

LANDSCAPE DESIGN

PREPARED BY: U.S. ARMY
CORPS OF ENGINEERS
LOS ANGELES DISTRICT

SHEET
L-1

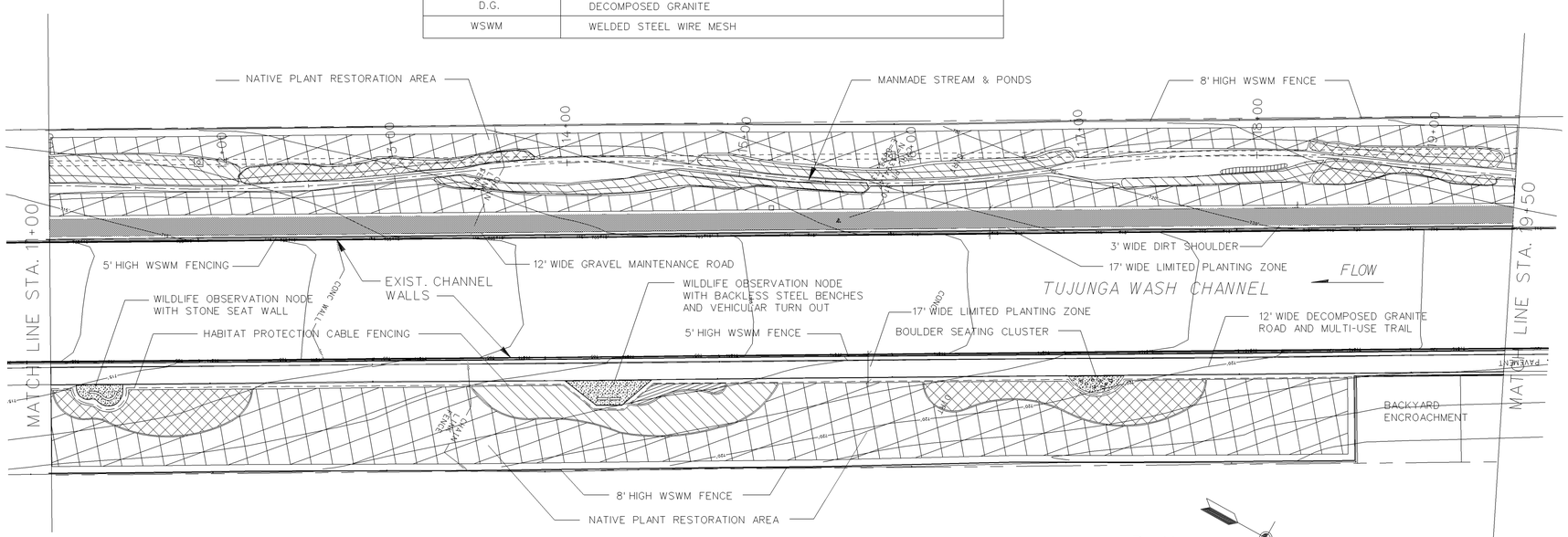
FILENAME :

LEGEND

SYMBOL	NATIVE PLANT COMMUNITY TYPE	QUANTITY
	AQUATIC/EMERGENT WETLAND	105 SF
	SOUTHERN COTTONWOOD-WILLOW RIPARIAN FOREST	8,260 SF
	SOUTHERN SYCAMORE RIPARIAN WOODLAND	7,420SF
	ALLUVIAL FAN SCRUB	46,690 SF
	MEADOW	275 SF

SYMBOL	PAVING TYPE
	DECOMPOSED GRANITE
	GRAVEL ROAD

SYMBOL	ABBREVIATIONS
A.C.	ASPHALTIC CONCRETE
D.G.	DECOMPOSED GRANITE
WSWM	WELDED STEEL WIRE MESH



PLAN

SCALE: 1 IN. = 40 FT.

GENERAL NOTES:

1. A PERMAMENT IRRIGATION SYSTEM SAHLL BE DESIGN TO IRRIGATE ALL PLANTING AREAS. DOMESTIC WATER SOURCES ARE AVAIABLE FROM CITY WATER LINES FOUND IN NEARBY PUBLIC STREETS. SEE SECTION 8.0 - WATER SUPPLY AND IRRIGATION IMPROVEMENTS, AND SECTION 10.0 - OPERATIONS AND MAINTENACE OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION.
2. SEE SECTION 9.0 - VEGETATION AND PLANTING IMPROVEMENTS OF APPRENDIX E - LANDSCAPE DESIGN FOR PLANT DENSITIES AND PLANT LISTS.
3. SEE SECTION 7.0 - DESIGN FEATURES OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION ON INDIVIDUAL DESIGN FEATURES.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

STA. 11+00 TO STA. 19+50
LANDSCAPE DESIGN

PREPARED BY: U.S. ARMY
CORPS OF ENGINEERS
LOS ANGELES DISTRICT

SHEET
L-2

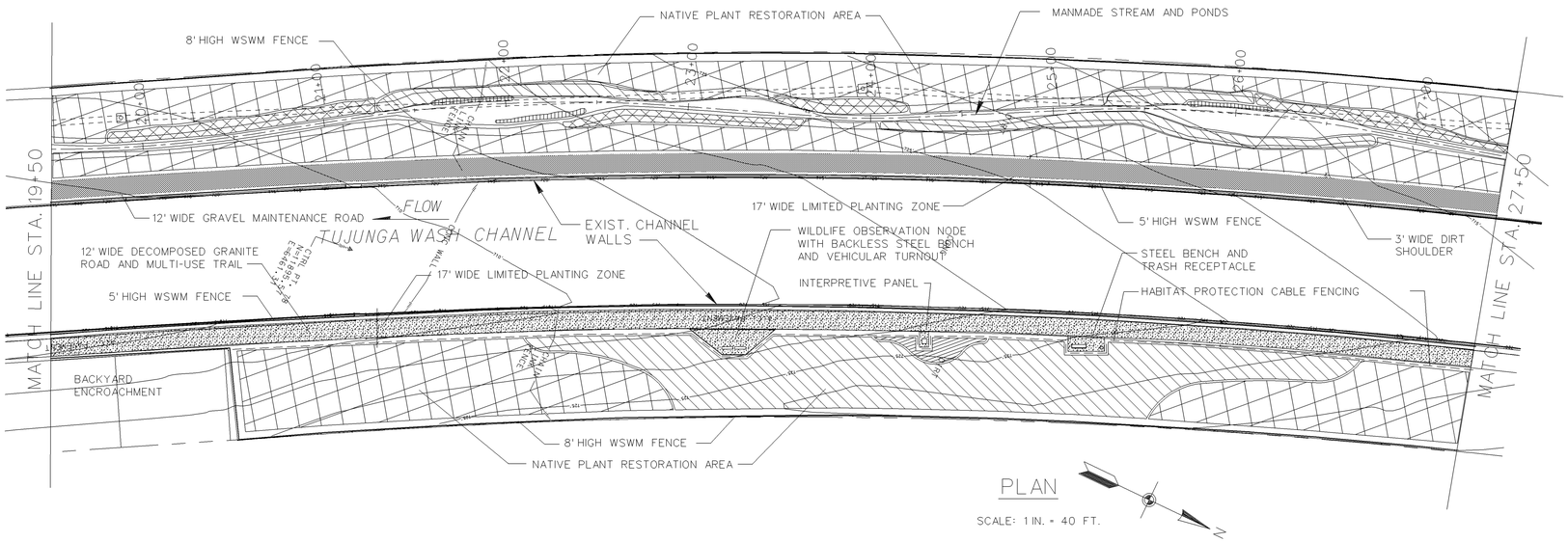
FILENAME :

LEGEND

SYMBOL	NATIVE PLANT COMMUNITY TYPE	QUANTITY
	AQUATIC/EMERGENT WETLAND	350 SF
	SOUTHERN COTTONWOOD-WILLOW RIPARIAN FOREST	15,560 SF
	SOUTHERN SYCAMORE RIPARIAN WOODLAND	3045 SF
	ALLUVIAL FAN SCRUB	38,950 SF
	MEADOW	360 SF

SYMBOL	PAVING TYPE
	DECOMPOSED GRANITE
	GRAVEL ROAD

SYMBOL	ABBREVIATIONS
A.C.	ASPHALTIC CONCRETE
D.G.	DECOMPOSED GRANITE
WSWM	WELDED STEEL WIRE MESH



PLAN

SCALE: 1 IN. = 40 FT.

GENERAL NOTES:

1. A PERMAMENT IRRIGATION SYSTEM SAHLL BE DESIGN TO IRRIGATE ALL PLANTING AREAS. DOMESTIC WATER SOURCES ARE AVAIABLE FROM CITY WATER LINES FOUND IN NEARBY PUBLIC STREETS. SEE SECTION 8.0 - WATER SUPPLY AND IRRIGATION IMPROVEMENTS, AND SECTION 10.0 - OPERATIONS AND MAINTENACE OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION.
2. SEE SECTION 9.0 - VEGETATION AND PLANTING IMPROVEMENTS OF APPRENDIX E - LANDSCAPE DESIGN FOR PLANT DENSITIES AND PLANT LISTS.
3. SEE SECTION 7.0 - DESIGN FEATURES OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION ON INDIVIDUAL DESIGN FEATURES.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

STA. 19+50 TO STA. 27+50
LANDSCAPE DESIGN

PREPARED BY: U.S. ARMY
CORPS OF ENGINEERS
LOS ANGELES DISTRICT

SHEET
L-3

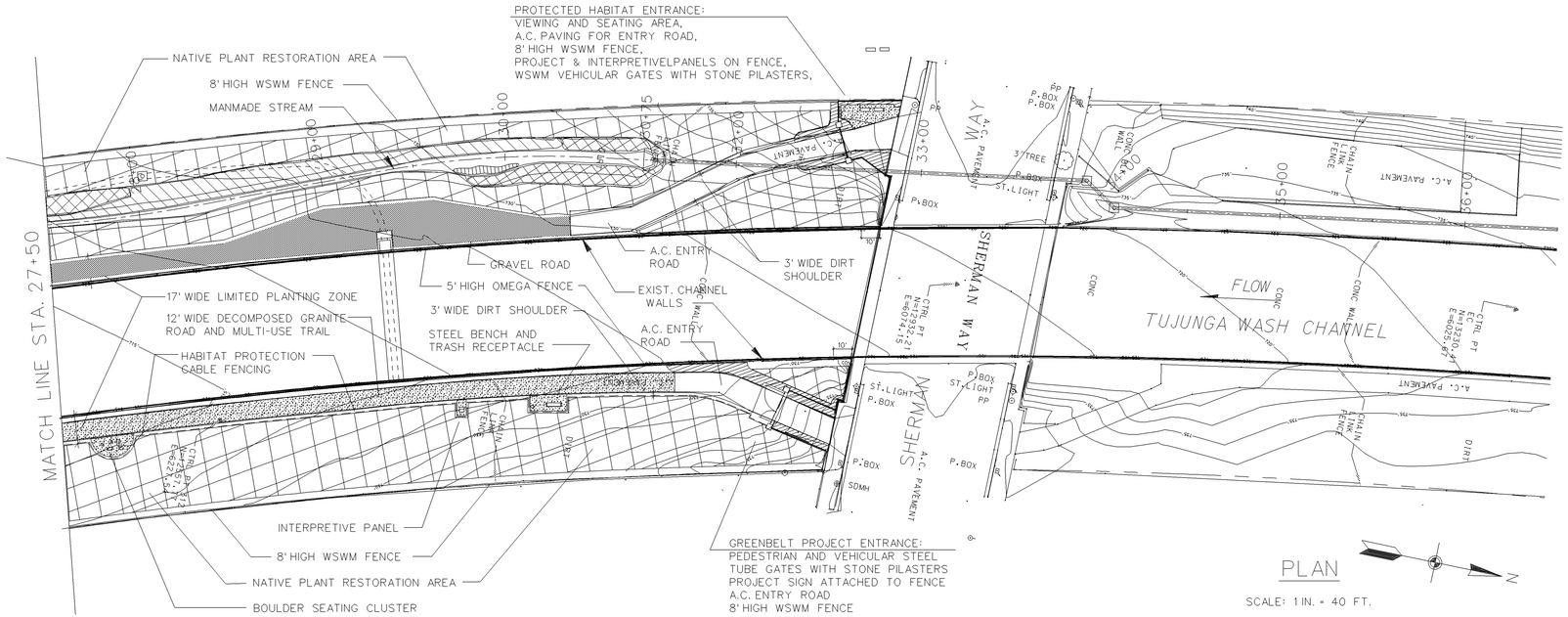
FILENAME :

LEGEND

SYMBOL	NATIVE PLANT COMMUNITY TYPE	QUANTITY
	AQUATIC/EMERGENT WETLAND	110 SF
	SOUTHERN COTTONWOOD-WILLOW RIPARIAN FOREST	2,460 SF
	SOUTHERN SYCAMORE RIPARIAN WOODLAND	1,640 SF
	ALLUVIAL FAN SCRUB	29,300 SF
	MEADOW	1,125 SF

SYMBOL	PAVING TYPE
	DECOMPOSED GRANITE
	GRAVEL ROAD

SYMBOL	ABBREVIATIONS
A.C.	ASPHALTIC CONCRETE
D.G.	DECOMPOSED GRANITE
WSWM	WELDED STEEL WIRE MESH



PLAN

SCALE: 1 IN. = 40 FT.

GENERAL NOTES:

1. A PERMAMENT IRRIGATION SYSTEM SAHLL BE DESIGN TO IRRIGATE ALL PLANTING AREAS. DOMESTIC WATER SOURCES ARE AVAIABLE FROM CITY WATER LINES FOUND IN NEARBY PUBLIC STREETS. SEE SECTION 8.0 - WATER SUPPLY AND IRRIGATION IMPROVEMENTS, AND SECTION 10.0 - OPERATIONS AND MAINTENACE OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION.
2. SEE SECTION 9.0 - VEGETATION AND PLANTING IMPROVEMENTS OF APPRENDIX E - LANDSCAPE DESIGN FOR PLANT DENSITIES AND PLANT LISTS.
3. SEE SECTION 7.0 - DESIGN FEATURES OF APPENDIX E - LANDSCAPE DESIGN FOR MORE INFORMATION ON INDIVIDUAL DESIGN FEATURES.

SECTION 1135 - ECOSYSTEM RESTORATION STUDY
TUJUNGA WASH CHANNEL
(VANOWEN STREET TO SHERMAN WAY)

STA. 27+50 TO STA.
LANDSCAPE DESIGN

PREPARED BY: U.S. ARMY
CORPS OF ENGINEERS
LOS ANGELES DISTRICT

SHEET
L-4

FILENAME :

12.0 RESTORATION DESIGN REFERENCE B - ADDITIONAL INFORMATION ON DESIGN FEATURES

Figure 14.4 Custom wrought iron gate used in conjunction with tubular steel fence. Installation to be done in accordance with manufacturers specifications.

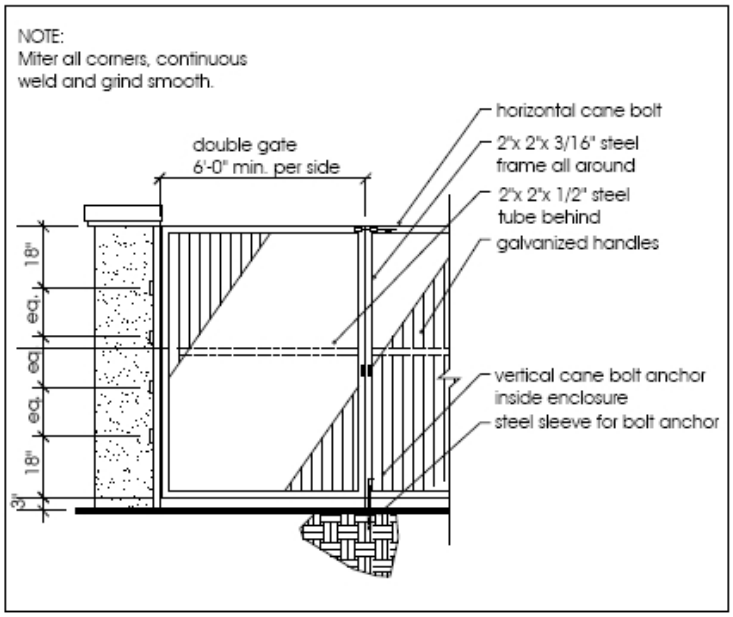


Figure 14.5 Tubular Steel Gate (N.T.S.)

GATES, TUBLULAR STEEL

- Gate Height-
  Match fence height
- Top Crossbar Height (if applied)-
  7'-6" min. for pedestrians
  8' min. for bicycles
  14' min. for equestrians
  14' min. for vehicles
  15' min. for all maintenance access gates
- Gate Width-
  3' min. for pedestrians (ADA access 4' min.)
  4' min. for bicycles
  8' min. for equestrians
  12' min. for vehicles
- Posts-
  4" square, 3/16" thick steel tube, maximum 12' o.c.
- Footings-
  36" deep by 18" wide
- Frames-
  To be determined
- Hinges-
  To be determined

Design Considerations

- Color optional
- All gate materials to be electrostatically painted to match fence.
- Consider artistic opportunities such as in combination with wrought iron.

Maintenance

- Periodic checks for corrosion, bent or damaged pickets

Available from

- See Appendix C

FENCE, WELDED STEEL WIRE MESH

- 60" min. height along rectangular channel, and any slope greater than 2:1
- Footings-
  36" deep by 12" dia. minimum
- Posts-
  2-3/8"x 2-3/8" rectangular tubing galvanized steel 10' o.c. 3/32" wall thickness
- Top and Bottom Rails-
  2" square, 3/16" thick steel tube
- Mesh Pickets-
  13/64" hardened steel wire, spaces 2" wide by 6" high
- Finish-
  Galvanized. Apply cold galvanizing to field-welded joints.

Design Considerations

- Color optional
- Mesh dimensions should reflect safety codes.

Maintenance

- Periodic checking for broken, missing or damaged posts, bracing, or fasteners. Replace as necessary.

Available from

- See Appendix C

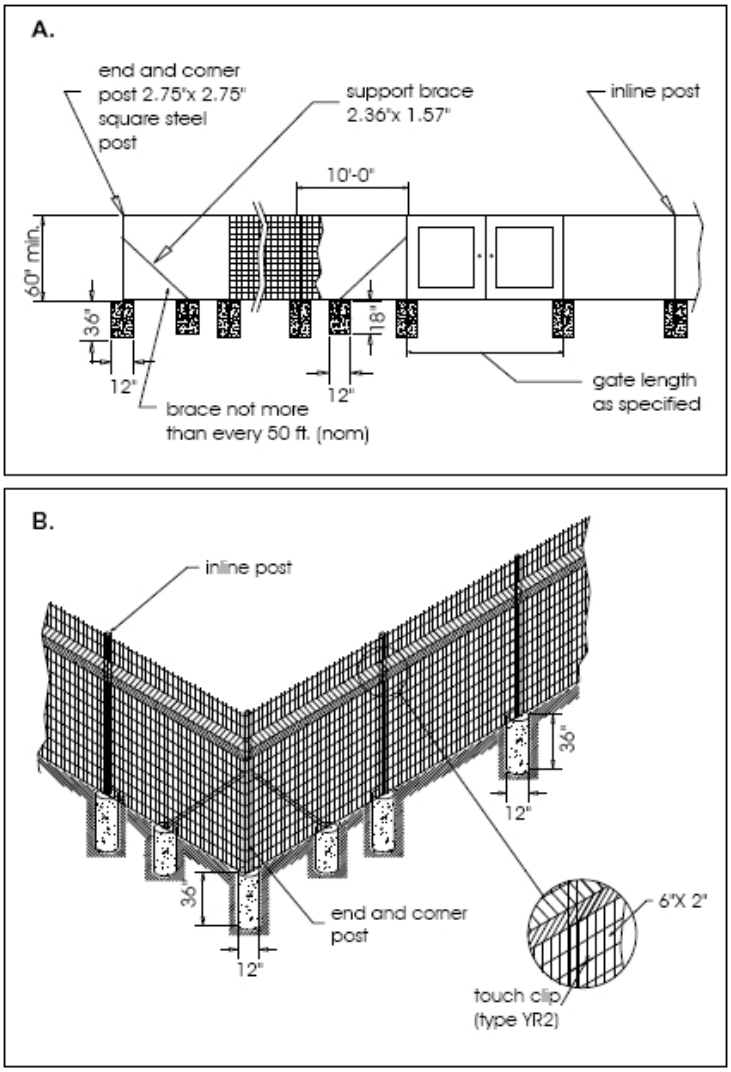


Figure 14.6 Welded steel wire mesh fence (N.T.S.) - Detailed provided by Secure Technology, Inc. Installation to be done in accordance with manufacturers specifications.

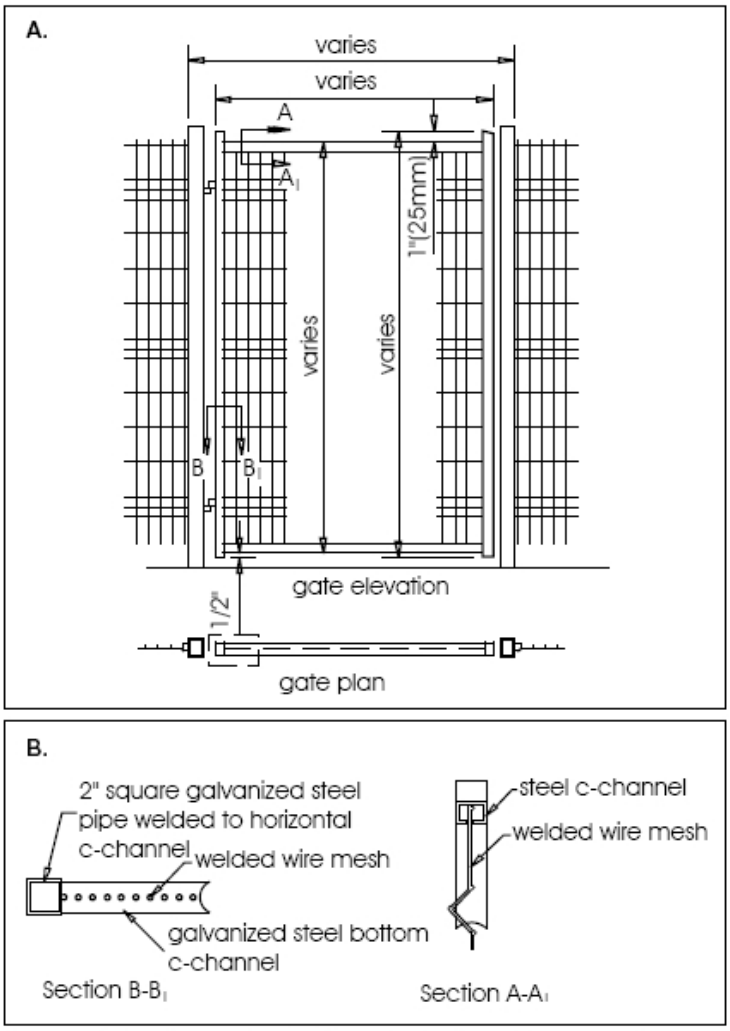


Figure 14.7 Welded wire mesh gate (N.T.S.) - Detailed provided by Omega Fence Systems, Inc. Installation to be done in accordance with manufacturers specifications. Double gates required for vehicular access.

GATES, WELDED WIRE

- Gate Height-
  Match fence height.
- See optional top crossbar height under gates: chain link.
- Gate Width-
  See gates: chain link
- 60" min. height along rectangular channel, and any slope greater than 2:1
- Footings-
  36" deep by 12" dia. minimum
- Posts-
  2 3/8"x 2 3/8" rectangular tubing galvanized steel 10' o.c. 3/32" wall thickness
- Bracing and Fasteners -
  1st and last post, and every 5th post. Mesh attached to post by stainless steel fasteners
- Fabric-
  13/64" hardened steel wire, spaces 2" wide by 6" high
- Finish-
  Galvanized: Apply cold galvanizing to field-welded joints.

Design Considerations

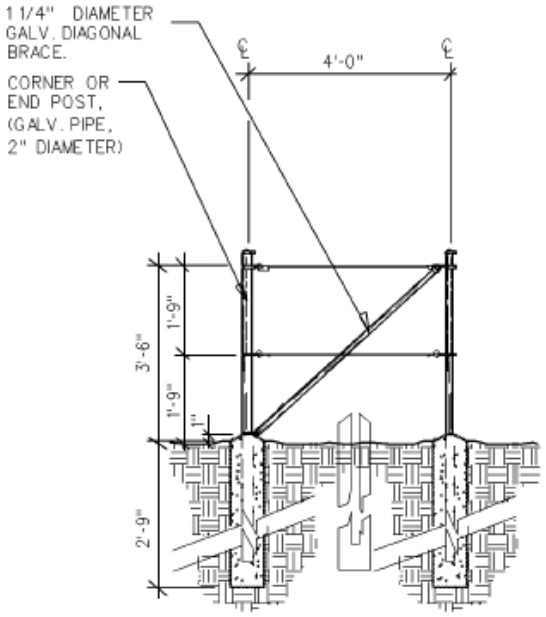
- Color optional

Maintenance

- Periodic checks for fabric tension and/or tears in the fence fabric, damaged or broken hinges

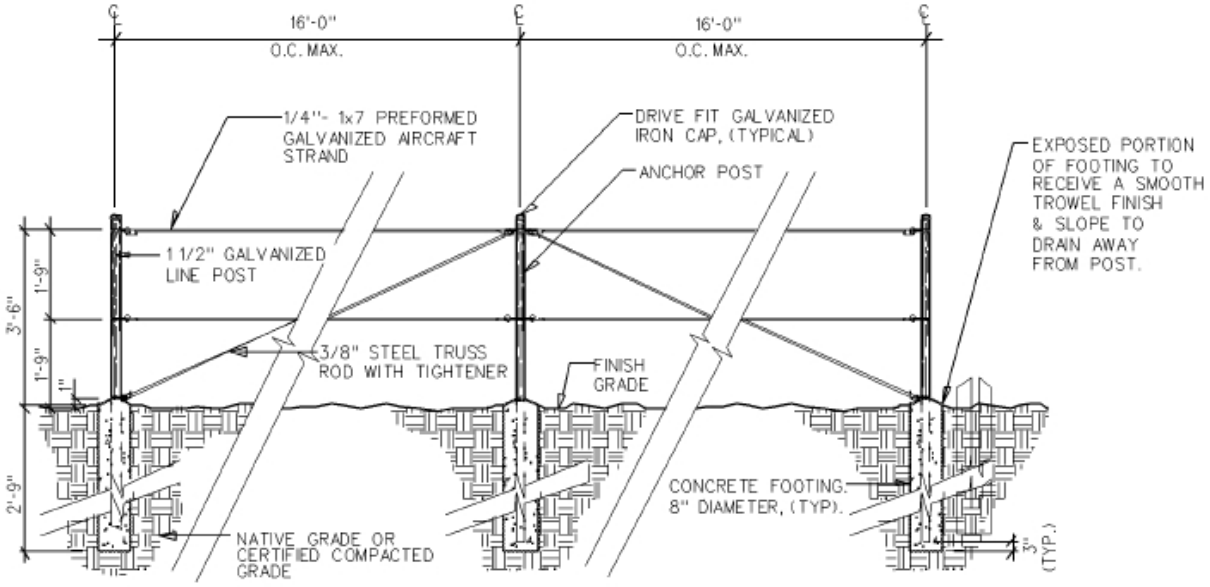
Available from

- See Appendix C



GENERAL FENCING NOTES

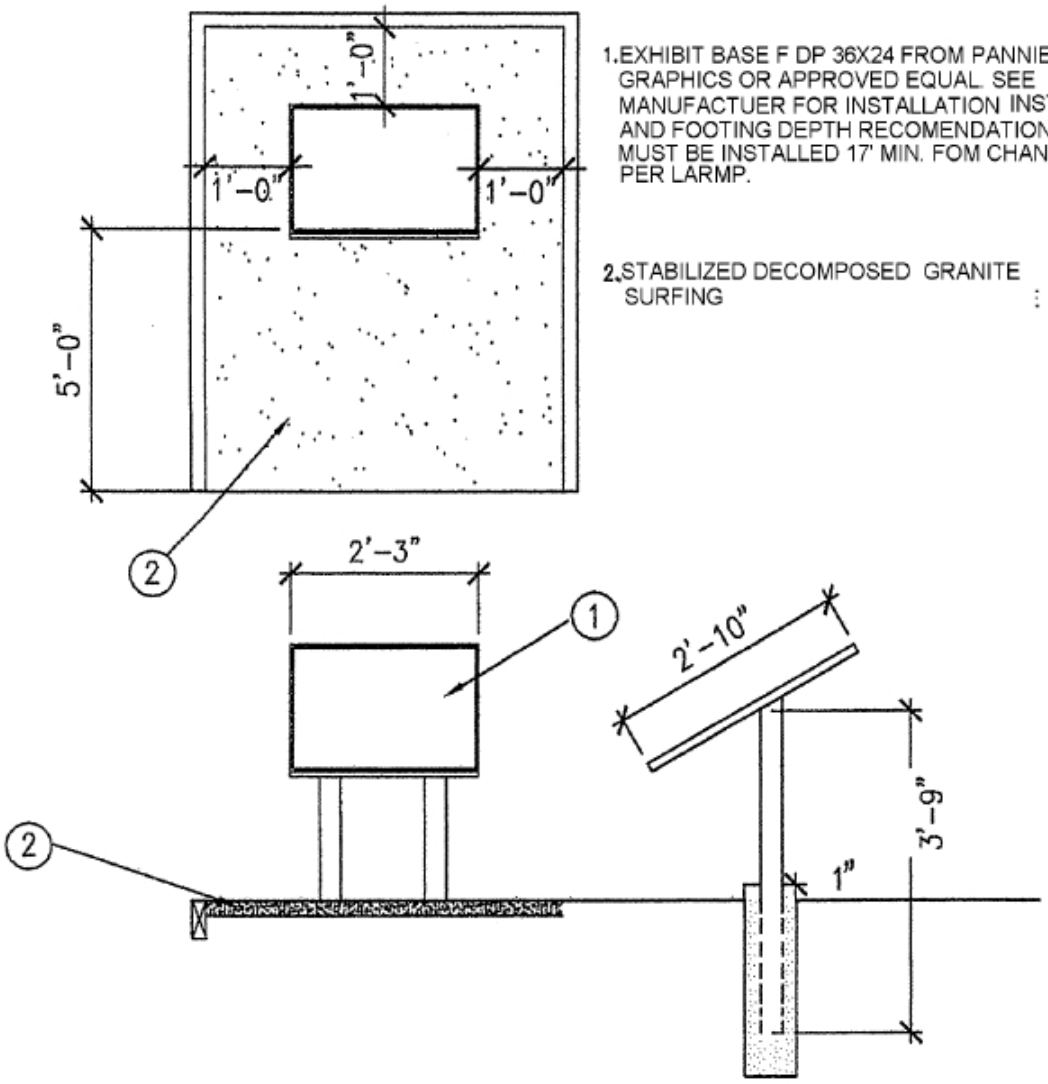
1. GROUND SHALL BE GRADED BEFORE FENCE CONSTRUCTION BEGINS.
2. ALL METAL PARTS OF FENCE SHALL BE GALVANIZED NEW MATERIALS, AND ALL POSTS SHALL BE FITTED WITH DRIVE-FIT CAPS.
3. LIGHTWEIGHT METAL INSERTS SHALL BE SHEET METAL TUBE WITH I.D. 3/4" GREATER THAN POST O.D. GROUT POSTS WITH NEAT GROUT OF ONE PART CEMENT TO TWO PARTS WATER OR, IF APPROVED BY THE CONTRACTING OFFICER, WITH SULPHUR.
4. CABLES SHALL BE STRETCHED AND FASTENED WITH 2 CABLE CLAMPS AT EACH ANCHOR POST AT 160 FEET O.C. NUTS SHALL BE WELDED TO CLAMPS OR COVERED WITH AN EPOXY PUTTY (J.B. WELD OR EQUAL) TO PREVENT REMOVAL.
5. ANCHOR POSTS SHALL BE GUYED WITH 3/8" STEEL TRUSS RODS AS SHOWN.
6. CABLE FENCE SHALL BE LOCATED 18" FROM EDGE OF ROAD/TRAIL.



CABLE FENCING

N.T.S.

SECTION



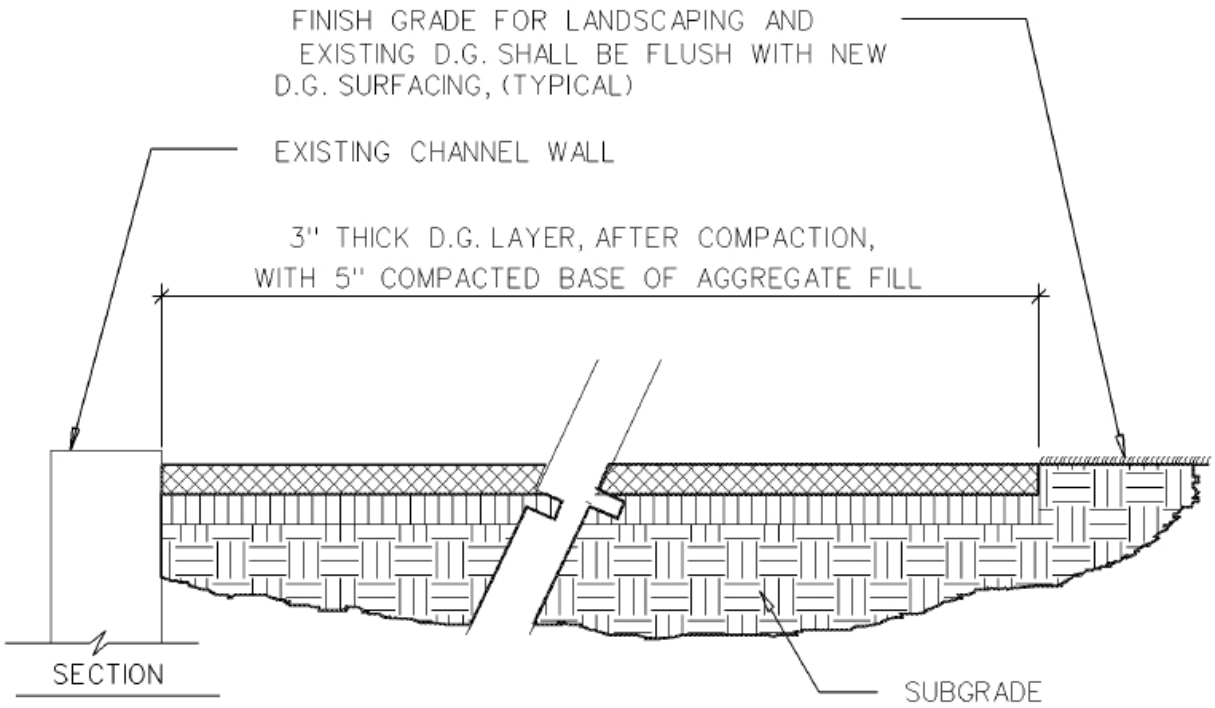
1. EXHIBIT BASE F DP 36X24 FROM PANNIER GRAPHICS OR APPROVED EQUAL. SEE MANUFACTUER FOR INSTALLATION INSTRUCTIONS, AND FOOTING DEPTH RECOMENDATIONS. MUST BE INSTALLED 17' MIN. FOM CHANNEL WALL PER LARMP.

2. STABILIZED DECOMPOSED GRANITE SURFING

INTERPRETIVE PANEL

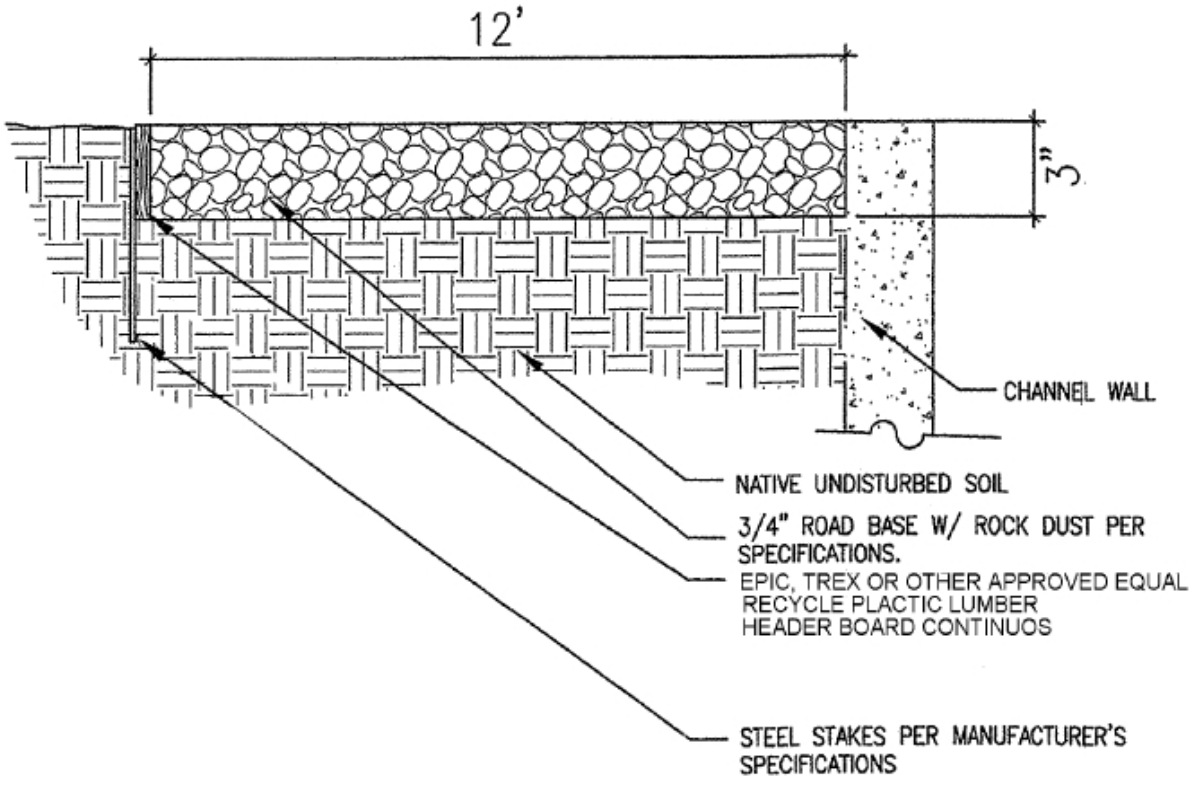
NOTES:

1. ALL D.G. AREAS SHOWN ON PLANS TO CONFORM TO THIS DETAIL UNLESS OTHERWISE NOTED.
2. TOP OF DECOMPOSED GRANITE (D.G.) SHALL BE FLUSH WITH ADJACENT GRADE.
3. MOISTEN D.G. AND COMPACT TO 95% WITH 350 LB. (MIN.) ROLLER.
4. EXCESS CUT REMOVED FOR INSTALLATION OF D.G. LAYER SHALL BE RELOCATED TO AREAS OF REGRADE AND RECOMPACTION.
5. PRE-EMERGENT HERBICIDE SHALL BE APPLIED PRIOR TO D.G. PLACEMENT AND AFTER ROLLER COMPACTION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL NOTIFY THE CONTRACTING OFFICER PRIOR TO PRE-EMERGENT HERBICIDE APPLICATION.



DECOMPOSED GRANITE ROAD/TRAIL

N.T.S.



GRAVEL ROADWAY

SCALE: NTS

13.0 RESTORATION DESIGN REFERENCE C – NATIVE PLANT COMMUNITY PLANT LIST

Native Plant Community Restoration Zones

I. Aquatic and Emergent Wetland (Freshwater)[1]

Aquatic

Common Cattail[2´3]	*Thypha angustifolia*
Tule Bulrush[2´3]	*Scirpus* L.
California Bulrush[2´3]	*Schoenoplectus californicus*
Arrow Weed[2´3]	*Pluchea sericea*

Emergent

Big Leaf Sedge[3]	*Carex amplifolia*
California Sedge[3]	*Carex californica*
Scouringrush Horsetail[3]	*Equisetum hyemale* L.
Common Tree-square[3]	*Schoenoplectus pungens*
Spiny Rush	*Juncus*
Hardstem Bulrush	*Scirpus*

II. Southern Cottonwood-Willow Riparian Forest[1]

Trees

Black Cottonwood[2´3]	*Populus balsamerifera* ssp. *trichocarpa*
Black Willow[2´3]	*Salix gooddingii*
Red Willow[2´3]	*Salix laevigata*
Mexican Elderberry[2]	*Sambucus Mexicana*
California Sycamore[2´3]	*Platanus racemosa*
Fremont's Cottonwood[2´3]	*Populus fremontii* ssp. *fremontii*

Shrubs

Arrow Weed[2´3]	*Pluchea sericea*
Sand Bar Willow[3]	*Salix exigua*
Arroyo Willow[3]	*Salix lasiolepis*
Shining Willow[3]	*Salix lucida* ssp. *lasiandra*
Mulefat[2]	*Baccharis salicifolia*
Basket Bush[2]	*Rhus trilobata*
California Blackberry[2]	*Rubus ursinus*
California Wild Rose[2]	*Rosa californica*

Perennials

Scarlet Monkeyflower	*Mimulus cardinalis*
Field Sedge[3]	*Carex praegracilis*

Coastal Tidytips	*Layia platyglossa*
Field Mint	*Mentha arvensis*
Meadow Rue[2]	*Thalictrum fendleri* var. *polycarpum*
California Gray Rush[2´3]	*Juncus patens*
Rush[2´3]	*Juncus torreyi*
Golden Yarrow[2]	*Eriophyllum confertiflorum*
Mugwort[2]	*Artemisia doulglasiana*

Vines

Virgin's bower[2]	*Clematis ligusticifolia*
Desert grape[2]	*Vitis girdiana*

Grasses

Alkali ryegrass	*Leymus triticoides*
Deergrass[2]	*Muhlenbergia rigens*
Bent Grass[2]	*Agrostis exarata*

Groundcovers

Bur-marigold	*Bidens laevis*
Owl's clover	*Castilleja densiflora*
California goldfields	*Lasthenia californica*
Southern goldenrod[2]	*Solidago confinis*
Creeping wild rye[2]	*Leymus triticoides*
Western goldenrod[2]	*Euthamia occidentalis*
California goldenrod[2]	*Solidago californica*
Giant ryegrass	*Leymus condensatus*
Creeping Snowberry[2]	*Symphoricarpos mollis*

III. Southern Sycamore Riparian Woodland[1]

Trees

California Sycamore[2´3]	*Platanus racemosa*
White Alder[3]	*Alnus rhombifolia*
Black Cottonwood[2´3]	*Populus balsamerifera* ssp. *trichocarpa*
Coast Live Oak[2]	*Quercus agrifolia* var. *agrifolia*
California Walnut	*Juglans californica* var. *californica*
Mexican Elderberry[2]	*Sambucus mexicana*
Fremont's Cottonwood[2´3]	*Populus fremontii* ssp. *fremontii*
California Bay Laurel[2]	*Umbellularia californica*
Velvet Ash[2]	*Fraxinus velutina* var. *coriacea*

Shrubs

Hollyleaf Cherry[2]	*Prunus ilicifolia* ssp. *ilicifolia*
California Coffeeberry	*Rhamnus californica* var. *californica*
Hollyleaf Redberry or Buckthorn	*Rhamnus crocea* ssp. *ilicifolia*
Woolly Blue Curls	*Trichostema lanatum*

Lemonadeberry[2]	Rhus integrifolia
California Barberry	*Berberis (Mahonia) pinnata*
Mulefat[2]	*Baccharis salicifolia*
False Indigobush	*Amorpha fruticosa*
Goldenbush	*Isocoma mensiesii* ssp. *vernonioides*
Toyon	*Heteromeles arbutifolia*
Coyote Brush	*Baccharis pilularis* var. *consanguinea*
Brown Dogwood	*Cornus glabrata*
Basket Bush[2]	*Rhus trilobata*
California Blackberry[2]	*Rubus ursinus*
Golden Currant	*Ribes aureum* var. *gracillimum*
California Wild Rose[2]	*Rosa californica*
Bush Monkeyflower	*Mimulus (Diplacus) aurantiacus*
Hillside Gooseberry	*Ribes californicum* var. *hesperium*
White Sage[2]	*Salvia apiana*
Fuchsia-Flowered Gooseberry	*Ribes speciosum*
California Sagebrush[2]	*Artemesia californica*

Perennials

Deerweed[2]	*Lotus scoparius*
Rush[2´3]	*Juncus patens*
Rush[2´3]	*Juncus torreyi*
Golden Yarrow[2]	*Eriophyllum confertiflorum*
California Poppy[2]	*Eschscholzia californica*
Meadow Rue[2]	*Thalictrum fendleri* var. *polycarpum*
Heart-Leaved Penstemon	*Keckiella cordifolia*
Mugwort[2]	*Artemisia douglasiana*
Canyon Sunflower	*Venegasia carpesioides*
Broad-Leaf Canyon Lupine	*Lupinus latifolius* var. *parishii*

Grasses

Blue Wild Rye	*Elymus glaucus* ssp. *glaucus*
California Brome	*Bromus carinatus* var. *carinatus*
Bent Grass[2]	*Agrostis exarata*
Deergrass[2]	*Muhlenbergia rigens*

Vines

Desert Grape[2]	*Vitis girdiana*
Virgin's Bower[2]	*Clematis ligusticifolia*

Groundcovers

Western Goldenrod[2]	*Euthamia occidentalis*
Southern Goldenrod[2]	*Solidaga confinis*
Giant Ryegrass	*Leymus condensatus*
Creeping Snowberry[2]	*Symphoricarpos mollis*
Pitcher Sage	*Salvia spathacea*

Slender Sedge[2´3]	*Carex praegracilis*
Creeping Wild Rye[2]	*Leymus triticoides*
Pink Hedgenettle	*Stachys bullata*
Prostrate Coyote Brush	*Baccharis pilularis* var. *pilularis*
California Barley	*Hordem brachyantherum* ssp. *californicum*

IV. Alluvial Fan Sage Scrub[1]

Common Name	***Botanical Name***
Trees	
Coast Live Oak[2]	*Quercus agrifolia* var. *agrifolia*
California Sycamore[2´3]	*Platanus racemosa*
Mexican Elderberry[2]	*Sambucus mexicana*
Shrubs	
California Sagebrush[2]	*Artemisia californica*
Bigberry Manzanita	*Arctostaphylos glauca*
California Bricklebush	*Brickellia californica*
California Encelia	*Encelia californica*
Pine Goldenbush	*Ericameria (Happlopappus) pinifolia*
Hairy Yerba Santa	*Eriodictyon trichocalyx* var. *trichocalyx*
California Buckwheat	*Eriogonum fasciculatum* var. *fasciculatum*
California Buckwheat	*Eriogonum fasciculatum* var. *polifolium*
Chapparal Whitethorn	*Ceanothus leucodermis*
California Matchweed	*Gutierrezia californica*
Chamise	*Adenostoma fasciculatum*
Broom Snakeweed	*Gutierrezia sarothrae*
Arrow Weed[2´3]	*Pluchea sericea*
Hollyleaf Cherry[2]	*Prunus ilicifolia* ssp. *ilicifolia*
Bush Poppy	*Dendromecon rigida*
Scrub Oak	*Quercus berberidifolia (Q. dumosa)*
Laurel Sumac	*Malosma laurina*
Spiny Redberry	*Rhamnus crocea*
Lemonadeberry[2]	*Rhus integrifolia*
White Sage[2]	*Salvia apiana*
Sugar Bush	*Rhus ovata*
Hoaryleaf Ceanothus	*Ceanothus crassifolius*
Chapparal Bush Mallow	*Malacothamnus fasciculatus*
Mountain Mahogany	*Cercocarpus betuloides* var. *betuloides*
Thick-Leaved Yerba Santa	*Eriodictyon crassifolium*
California Buckwheat	*Eriogonum fasciculatum* var. *foliolosum*
Black Sage	*Salvia mellifera*
Perennials	
California Croton	*Croton californicus*

Coffee Fern	*Pellea andromedifolia*
Scarlet Larkspur	*Delphinium cardinale*
Bird's Foot Fern	*Pellea mucronata*
Woolly Star	*Eriastrum densifolium* ssp. *elongatum*
Golden Ear Drops	*Dicentra chrysantha*
Golden Yarrow[2]	*Eriophyllum confertiflorum*
California Poppy[2]	*Eschscholzia californica*
Narrow-leaf Bedstraw	*Galium angustifolium*
Deerweed[2]	*Lotus scoparius*
Wishbone Bush	*Mirabilis californica*
Showy Penstemon	*Pestemon spectabilis*
California Polypody Fern	*Polypodium californicum*
Purple or Chaparral Nightshade	*Solanum xanti*

Grasses

Giant Stipa	*Achnatherum (Stipa) coronatum*
Squirreltail Grass	*Elymus elymoides (Sitanion hystrix)*
Desert Needlegrass	*Achnatherum (Stipa) speciosum*
Coast Range Melic	*Melica imperfecta*

Succulents

Lance-leaved Live-forever	*Dudleya lanceolata*
Coastal Prickly Pear	*Opuntia littoralis*
Chaparral Yucca	*Yucca whipplei*

Vines

Finger-leaf Morning Glory	*Calystegia macrostegia* ssp. *arida*
Virgin's Bower[2]	*Clematis ligusticifolia*
Showy Pacific Sweet Pea	*Lathyrus vestitus* var. *alefeldii*
Twining Milkweed	*Sarcostemma cyanchoides* var. *hartweggi*
Pacific Sweet Pea	*Lathyrus vestitus* var. *vestitus*

Groundcovers

Western Goldenrod[2]	*Euthamia occidentalis*
California Aster	*Lessingia filanginifolia* var. *filaginifolia*
California Goldenrod[2]	*Solidago californica*
Southern Goldenrod[2]	*Solidago confinis*

V. Meadow

Alkali ryegrass	*Leymus triticoides*
Blue Wild Rye	*Elymus glaucus* ssp. *glaucus*
California Brome	*Bromus carinatus* var. *carinatus*
Bent Grass[2]	*Agrostis exarata*
Deergrass[2]	*Muhlenbergia rigens*
Giant Stipa	*Achnatherum (Stipa) coronatum*

Squirreltail Grass	*Elymus elymoides (Sitanion hystrix)*
Desert Needlegrass	*Achnatherum (Stipa) speciosum*
Coast Range Melic	*Melica imperfecta*

Meadow Seed Mix (Assorted Seeds) from Tree of Life Nursery @ 2 lbs per acre

TREE OF LIFE NURSERY

Meadow Mix

Assorted Seed

A drought tolerant meadow is an excellent replacement for a resource intensive, inefficient lawn. Tree of Life Nursery offers a variety of customized native wildflower blends for use in southern California gardens. Seed is supplied by *S & S Seeds of Carpinteria, California*. This mixture of perennial bunchgrasses and herbaceous flowering natives will create a dynamic ecosystem right in your front yard! Consider combining it with one of our other seed blends (like Nature Mix or Foothill Mix...) or plant additional low, spreading perennials for added color and textures.

Botanical Name	Common Name	Flower Color	Life Cycle
Achillea millefolium	Yarrow	White	Perennial
Bouteloua gracilis	Blue Grama Grass	Silver to Purple to Golden	Bunch Grass
Buchloe dactyloides	Buffalo Grass	Non-Native	Perennial
Deschampsia caespitosa	Tufted Hairgrass	Fine Gold to Gray	Bunch Grass
Melica imperfecta	Coast Range Melic	Dark Spikelets Fade to Gold	Bunch Grass
Muhlenbergia rigens	Deergrass	Slender White Stalks	Bunch Grass
Nassella cernua	Nodding Needlegrass	Delicate Purple to Golden	Bunch Grass
Nassella lepida	Foothill Needlegrass	Gold	Bunch Grass
Nassella pulchra	Purple Needlegrass	Delicate Purple to Golden	Bunch Grass
Sisyrinchium bellum	Blue-Eyed Grass	Blue	Perennial

COVERAGE :	
1 ounce	± 550 square feet
5 ounces	± 3,000 square feet
1 pound	± 10,000 square feet
5 pounds	1 Acre

Planting instructions: Seedbed or area to be seeded should be prepared by light cultivation and weed removal. Optimum planting season is November 15 through March 31, just prior to anticipated rain. Broadcast seed evenly over soil surface. Rake the area lightly to incorporate seed into the top 1/4"- 1/2" of soil. A top dressing of composted organic mulch (not manure) is recommended to help maintain even moisture during the germination period.

Maintenance: Irrigate just enough (between rains) to maintain soil moisture during germination. After germination until initial flowering, sprinkle the area to a depth of about 2". After flowering, little to no supplemental water should be needed. Allow the seed heads to remain after flowering. This encourages reseeding for next year.

PLANTS OF EL CAMINO REAL
33201 Ortega Highway P.O. Box 635 San Juan Capistrano, CA 92693
(949) 728-0685 Fax:(949) 728-0509 www.treeoflifenursery.com

APPENDIX E3

COST ENGINEERING

ESTIMATE SUMMARY

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PLAN COST APPORTIONMENT - TUJUNGA WASH (Alternative 2)				
Cost Item		**Federal Cost**	**Non-Federal Cost**	**Total Cost**
FEASIBILITY PHASE				
Initial 100% Federal Feasibility Cost		$675,025	$0	$675,025
	% of Total Cost-shared cost	75%	25%	
	Total Feasibility Phase Cost	**$506,269**	**$168,756**	**$675,025**
DESIGN AND IMPLEMENTATION PHASE				
.30	Planning, Engineering and Design	$247,307	$82,436	$329,743
.31	Construction Management	$165,695	$55,232	$220,927
	% of Total Cost-shared cost	75%	25%	
	Total Design and Implementation Cost	**$413,003**	**$137,668**	**$550,670**
CONSTRUCTION PHASE				
Cost-Share Costs				
.01	Lands and Damages	$0	$0	$0
.02	Relocation	$0	$0	$0
.09	Tujunga Wash	$2,375,491	$791,830	$3,167,321
	% of Total Cost-shared cost	75%	25%	
.14	Recreational Features	$65,052	$65,052	$130,104
	% of Total Cost-shared cost	50%	50%	
	Sponsor in-kind services	$0	$0	$0
	Cash contributions	$0	$0	$0
	Total Construction Phase Cost	**$2,440,543**	**$856,882**	**$3,297,425**
	TOTAL PROJECT COST	**$3,359,814**	**$1,163,306**	**$4,523,120**

PLAN COST APPORTIONMENT - TUJUNGA WASH (Alternative 3)				
Cost Item		**Federal Cost**	**Non-Federal Cost**	**Total Cost**
FEASIBILITY PHASE				
Initial 100% Federal Feasibility Cost		$675,025	$0	$675,025
	% of Total Cost-shared cost	75%	25%	
	Total Feasibility Phase Cost	**$506,269**	**$168,756**	**$675,025**
DESIGN AND IMPLEMENTATION PHASE				
.30	Planning, Engineering and Design	$247,307	$82,436	$330,079
.31	Construction Management	$165,695	$55,232	$221,153
	% of Total Cost-shared cost	75%	25%	
	Total Design and Implementation Cost	**$413,003**	**$137,668**	**$551,232**
	CONSTRUCTION PHASE			
Cost-Share Feasibility Costs				
.01	Lands and Damages	$0	$0	$0
.02	Relocation	$0	$0	$0
.09	Tujunga Wash	$2,378,017	$792,672	$3,170,689
	% of Total Cost-shared cost	75%	25%	
.14	Recreational Features	$65,052	$65,052	$130,104
	% of Total Cost-shared cost	50%	50%	
	Sponsor in-kind services	$0	$0	$0
	Cash contributions	$0	$0	$0
	Total Construction Phase Costs	**$2,443,070**	**$857,725**	**$3,300,795**
	TOTAL PROJECT COST	**$3,362,341**	**$1,164,149**	**$4,527,052**

SUMMARY SHEET
Tujunga Wash Ecosystem Restoration **1 OCT 07 PRICE LEVEL**
FEASIBILITY REPORT

CODE OF ACCTS	DESCRIPTION	COST WITHOUT CONTINGENCY	CONTINGENCY	COST WITH CONTINGENCY 2007	CONTING PERCENT	FOOT NOTES
Tujunga Wash Ecosystem Restoration - Alt 2						
Junction Structure @ existing 36" RCP Bypass Line						
01.	LANDS & DAMAGES	0	0	0	0%	
02.	Relocation (Utilities)					
09.	Tujunga Wash					
09.01.	Tujunga Wash Ecosystem Restoration					
09.01.01.	Mob, Demob and Preparatory Work	106,990	26,748	133,738	25%	
09.01.02.	Traffic Control	5,740	1,435	7,175	25%	
09.01.03.	Landscape	2,070,266	517,567	2,587,833	25%	
09.01.04.	Stream, Ponds and Bypass Line	350,861	87,715	438,576	25%	
14.	Recreational Features	104,083	26,021	130,104	25%	
	Total Construction Cost:	**2,637,940**	**659,485**	**3,297,425**		
30.	PLANNING, ENG, & DESIGN	329,743	0	329,743	0%	Assume 10% of cost w/ contng.
31.	CONSTRUCTION MANAGEMENT	220,927	0	220,927	0%	Assume 6.7% of cost w/ conting.
	TOTAL COSTS:	**3,188,610**	**659,485**	**3,848,095**		
Tujunga Wash Ecosystem Restoration - Alt 3						
Junction Structure to existing channel wall of Tujunga Wash						
01.	LANDS & DAMAGES	0	0	0	0%	
02.	Relocation (Utilities)					
09.	Tujunga Wash					
09.01.	Tujunga Wash Ecosystem Restoration					
09.01.01.	Mob, Demob and Preparatory Work	106,990	26,748	133,738	25%	
09.01.02.	Traffic Control	5,740	1,435	7,175	25%	
09.01.03.	Landscape	2,070,266	517,567	2,587,833	25%	
09.01.04.	Stream, Ponds and Junction Structure	353,555	88,389	441,944	25%	
14.	Recreational Features	104,083	26,021	130,104	25%	
	Total Construction Cost:	**2,640,634**	**660,159**	**3,300,793**		
30.	PLANNING, ENG, & DESIGN	330,079	0	330,079	0%	Assume 10% of cost w/ contng.
31.	CONSTRUCTION MANAGEMENT	221,153	0	221,153	0%	Assume 6.7% of cost w/ conting.
	TOTAL COSTS:	**3,191,866**	**660,159**	**3,852,025**		
O&M Tujunga Wash Ecosystem Restoration - Alt 2 and 3						
O&M is linked to landscape for the most part. Work involves checking that the irrigation system is working properly and keeping the weeds out of the channel. On occassions some road resurfacing may be required. In short, current designs call for a low maintenance schedule.						
09.	Yearly Operation and Maintenance	51,757	0	51,757	0%	2% of landscape cost

APPENDIX E4

COST ENGINEERING MCACES

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MCACES FOR ALTERNATIVE 2

Tujunga Wash, Ecosytem Restoration Study - Alt 2
Junction Structure @ existing 36" RCP Bypass Line

Estimated by	Juan Dominguez, PE, CCE
Designed by	Chris Tu PE and Wilson Diep PE
Prepared by	U.S. Army Corps of Engineers

Preparation Date	12/4/2007
Effective Date of Pricing	12/4/2007
Estimated Construction Time	180 Days

Designed by
Chris Tu PE and Wilson Diep PE
Estimated by
Juan Dominguez, PE, CCE
Prepared by
U.S. Army Corps of Engineers

Design Document	Feasibility
Document Date	12/4/2007
District	Los Angeles
Contact	Juan Dominguez, x3737
Budget Year	200
UOM System	Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency

Preparation Date	12/4/2007
Escalation Date	12/4/2007
Eff. Pricing Date	12/4/2007
Estimated Duration	180 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB06EB: MII English Cost Book 2006

Labor LB07LA: Labor_Los Angeles 2007

Note: Taxable fringe: vacation Non-taxable fringe: health, welfare, training, 401K, pension and travel.

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP05R07: MII Equipment Region 7 2005

07 WEST

Sales Tax	8.25
Working Hours per Year	1,630
Labor Adjustment Factor	1.16
Cost of Money	5.13
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.087
Gas	3.000
Diesel Off-Road	2.750
Diesel On-Road	3.250

Shipping Rates

Over 0 CWT	2.71
Over 240 CWT	2.81
Over 300 CWT	3.48
Over 400 CWT	6.17
Over 500 CWT	6.73
Over 700 CWT	5.05
Over 800 CWT	4.49

Direct Cost Markups

Productivity

Overtime

	Days/Week	Hours/Shift	Shifts/Day	1st Shift	2nd Shift	3rd Shift
Standard	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*
Actual	*5.00*	*8.00*	*1.00*	*8.00*	*0.00*	*0.00*

Day	OT Factor	Working	OT Percent	FCCM Percent
Monday	*1.50*	*Yes*	*0.00*	*0.00*
Tuesday	*1.50*	*Yes*		
Wednesday	*1.50*	*Yes*		
Thursday	*1.50*	*Yes*		
Friday	*1.50*	*Yes*		
Saturday	*1.50*	*No*		
Sunday	*2.00*	*No*		

Sales Tax
MatlCost

Category

Productivity

Overtime

TaxAdj

Method

Productivity

Overtime

Running % on Selected Costs

Contractor Markups

JOOH

HOOH

Profit

Bond

Category

JOOH

HOOH

Profit

Bond

Method

JOOH Running %

HOOH Running %

Profit Running %

Bond Running %

Owner Markups

Escalation

StartDate

Contingency

SIOH

Category

Escalation

StartIndex *EndDate*

Contingency

SIOH

Method

Escalation

EndIndex *Escalation*

Contingency Running %

SIOH Running %

Description	Quantity	UOM	BareCost	DirectCost	CostToPrime	ContractCost
Project Summary Report			**1,837,990**	**1,925,774**	**2,218,165**	**2,637,941**
			0.00	*0.00*	*0.00*	*0.00*
01. Lands and Damages	**1.00**	**EA**	**0**	**0**	**0**	**0**
			1,765,077.73	*1,851,122.93*	*2,129,026.27*	*2,533,858.23*
09. Tujunga Wash Ecosystem Restoration	**1.00**	**EA**	**1,765,078**	**1,851,123**	**2,129,026**	**2,533,858**
			1,765,077.73	*1,851,122.93*	*2,129,026.27*	*2,533,858.23*
0901. Tujunga Wash	**1.00**	**EA**	**1,765,078**	**1,851,123**	**2,129,026**	**2,533,858**
			80,005.07	*83,461.97*	*83,461.97*	*106,990.58*
090101. Mob, Demob and Preparatory Work	**1.00**	**EA**	**80,005**	**83,462**	**83,462**	**106,991**
09010101. Diversion and Control of Water at South Channel	**1.00**	**LS**	**19,369**	**20,616**	**20,616**	**26,428**
			10,000.00	*10,000.00*	*10,000.00*	*12,819.08*
09010102. Mobilization and Demobilization	**1.00**	**EA**	**10,000**	**10,000**	**10,000**	**12,819**
			41,620.74	*43,315.05*	*43,315.05*	*55,525.92*
09010103. Demolition	**1.00**	**EA**	**41,621**	**43,315**	**43,315**	**55,526**
			1,186.29	*1,254.08*	*1,254.08*	*1,607.61*
09010104. Clear and Grub	**7.60**	**ACR**	**9,016**	**9,531**	**9,531**	**12,218**
090113. Traffic Control	**1.00**	**LS**	**4,131**	**4,477**	**4,477**	**5,739**
09011301. Traffic Detour at Sherman Way	**1.00**	**LS**	**4,131**	**4,477**	**4,477**	**5,739**
			297,896.93	*311,606.91*	*369,745.69*	*433,110.15*
090198. Landscape	**4.78**	**ACR**	**1,423,947**	**1,489,481**	**1,767,384**	**2,070,267**
			29.79	*32.62*	*39.60*	*45.86*
09019801. Fencing	**14,645.00**	**FT**	**436,325**	**477,730**	**579,889**	**671,550**
09019802. Surfacing	**1.00**	**LS**	**152,216**	**153,580**	**153,580**	**196,875**
09019803. Furnishings	**1.00**	**LS**	**33,766**	**36,330**	**36,330**	**46,571**
			0.23	*0.25*	*0.31*	*0.36*
09019804. Seeding	**208,020.00**	**SF**	**48,858**	**52,812**	**64,105**	**74,238**
09019805. Irrigation	**1.00**	**LS**	**582,508**	**586,570**	**712,004**	**824,547**
09019806. Planting	**1.00**	**LS**	**112,548**	**118,554**	**143,906**	**166,652**
			12,076.76	*13,369.40*	*16,228.34*	*18,793.49*
09019807. Plant Establishment/Maintenance, 1st Yr	**4.78**	**ACR**	**57,727**	**63,906**	**77,571**	**89,833**
			256,994.72	*273,702.64*	*273,702.64*	*350,861.65*
090199. Stream, Ponds and Bypass Line	**1.00**	**EA**	**256,995**	**273,703**	**273,703**	**350,862**

Description	Quantity	UOM	BareCost	DirectCost	CostToPrime	ContractCost
09019901. Junction Structure @ existing 36" RCP Bypass Line	**1.00**	**LS**	**10,140**	**11,028**	**11,028**	**14,137**
			10.91	*11.34*	*11.34*	*14.53*
09019902. Excavation (Stream and Ponds)	**3,230.00**	**CY**	**35,238**	**36,614**	**36,614**	**46,936**
			96.31	*102.52*	*102.52*	*131.42*
09019903. 18" HDPE Pipe	**1,160.00**	**LF**	**111,714**	**118,926**	**118,926**	**152,452**
			10.94	*11.04*	*11.04*	*14.15*
09019904. Disposal of Excess Material	**320.00**	**CY**	**3,501**	**3,533**	**3,533**	**4,529**
			99.60	*107.21*	*107.21*	*137.44*
09019905. Clay Layer, 6" Lining of pond and stream	**600.00**	**CY**	**59,761**	**64,327**	**64,327**	**82,461**
			6,931.22	*7,167.06*	*7,167.06*	*9,187.52*
09019906. Concrete Headwall Structures	**2.00**	**EA**	**13,862**	**14,334**	**14,334**	**18,375**
09019907. Water Intake and Underground Valve Structures	**1.00**	**LS**	**16,119**	**17,773**	**17,773**	**22,783**
			565.15	*606.31*	*606.31*	*777.23*
09019908. Sawcut/Demo existing channel INVERT at South Channel	**4.00**	**CY**	**2,261**	**2,425**	**2,425**	**3,109**
			2,199.48	*2,370.74*	*2,370.74*	*3,039.08*
09019909. Sawcut/Demo existing channel WALL at South Channel	**2.00**	**CY**	**4,399**	**4,741**	**4,741**	**6,078**
14. Recreational Facilities	**1.00**	**LS**	**72,912**	**74,651**	**89,138**	**104,083**
140023 Landscaping Recreational Facilities	**1.00**	**LS**	**72,912**	**74,651**	**89,138**	**104,083**
14002301. Surfacing (D.G. Paving and Road)	**1.00**	**LS**	**6,569**	**6,905**	**6,905**	**8,851**
			0.44	*0.47*	*0.47*	*0.60*
D.G. Paving	**3,540.00**	**SF**	**1,564**	**1,648**	**1,648**	**2,112**
			0.39	*0.41*	*0.41*	*0.52*
12 ft wide D.G. Road/Trail (1/2 the area)	**12,841.00**	**SF**	**5,005**	**5,257**	**5,257**	**6,739**
			66,342.99	*67,746.68*	*82,233.79*	*95,232.15*
14002302. Fencing	**1.00**	**EA**	**66,343**	**67,747**	**82,234**	**95,232**
			1,187.25	*1,295.32*	*1,572.32*	*1,820.85*
Stone Columns	**8.00**	**EA**	**9,498**	**10,363**	**12,579**	**14,567**
			2,372.51	*2,642.05*	*3,207.03*	*3,713.95*
14' Wide, 5' Ht Welded Steel Wire Fence Mesh "Gaelic Fence"	**2.00**	**EA**	**4,745**	**5,284**	**6,414**	**7,428**
			20.00	*20.00*	*24.28*	*28.11*
Guard Cable Fence, 3'-6" Ht	**2,605.00**	**LF**	**52,100**	**52,100**	**63,241**	**73,237**

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
Project Direct Costs Report (Details)					**253,334**	**96,769**	**713,269**	**862,163**	**240**	**1,925,774**
					0.00	*0.00*	*0.00*	*0.00*		*0.00*
1 Lands and Damages		**1.00**	**EA**		**0**	**0**	**0**	**0**	**0**	**0**
1.1 Real Estate Costs		1.00	LS		0	0	0	0	0	0
(Note: Submittted by real estate Dec 2 '08)										
					246,757.03	*92,640.81*	*703,825.95*	*807,659.15*		*1,851,122.93*
3 Tujunga Wash Ecosystem Restoration	**1 Prime Contractor**	**1.00**	**EA**		**246,757**	**92,641**	**703,826**	**807,659**	**240**	**1,851,123**
					246,757.03	*92,640.81*	*703,825.95*	*807,659.15*		*1,851,122.93*
3.1 Tujunga Wash	**1 Prime Contractor**	**1.00**	**EA**		**246,757**	**92,641**	**703,826**	**807,659**	**240**	**1,851,123**
					30,101.81	*10,405.15*	*0.00*	*42,955.00*		*83,461.97*
3.1.1 Mob, Demob and Preparatory Work	**1 Prime Contractor**	**1.00**	**EA**		**30,102**	**10,405**	**0**	**42,955**	**0**	**83,462**
3.1.1.1 Diversion and Control of Water at South Channel	**1 Prime Contractor**	**1.00**	**LS**		**10,906**	**3,500**	**0**	**6,210**	**0**	**20,616**
					0.00	*0.00*	*0.00*	*1,035.00*	*0.00*	*1,035.00*
3.1.1.1.2.1 4" Submersible Pump Rental, Month. (2 ea for 3 months = 6 months)	1 Prime Contractor	6.00	MO		0	0	0	6,210	0	6,210
					7,007.43	*0.00*	*0.00*	*0.00*	*0.00*	*7,007.43*
3.1.1.1.2.2 Pump Tender	1 Prime Contractor	1.00	MO		7,007	0	0	0	0	7,007
					0.00	*0.00*	*0.00*	*10,000.00*		*10,000.00*
3.1.1.2 Mobilization and Demobilization	**1 Prime Contractor**	**1.00**	**EA**		**0**	**0**	**0**	**10,000**	**0**	**10,000**
					0.00	*0.00*	*0.00*	*400.00*	*0.00*	*400.00*
3.1.1.2.1 Mob/Demob Assume 10 heavy pieces of	1 Prime Contractor	10.00	EA		0	0	0	4,000	0	4,000
(Note: equipment)										
3.1.1.2.2 Preparatory & Clean-up	1 Prime Contractor	1.00	LS		0	0	0	2,000	0	2,000

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*1,000.00*	*0.00*	*1,000.00*
3.1.1.2.3 Exploratory Excv @ Connctn Ptos	1 Prime Contractor	1.00	EA		0	0	0	1,000	0	1,000
					0.00	*0.00*	*0.00*	*5.00*	*0.00*	*5.00*
3.1.1.2.4 Fencing Securing Temp construction yard	1 Prime Contractor	600.00	LF		0	0	0	3,000	0	3,000
					14,663.21	*1,906.84*	*0.00*	*26,745.00*		*43,315.05*
3.1.1.3 Demolition	**1 Prime Contractor**	**1.00**	**EA**		**14,663**	**1,907**	**0**	**26,745**	**0**	**43,315**
					0.00	*0.00*	*0.00*	*1.00*	*0.00*	*1.00*
3.1.1.3.3.1 AC and ABC Demolition including disposal fees	1 Prime Contractor	24,645.00	SF		0	0	0	24,645	0	24,645
(Note: Richardsons 2-100, p3)										
					596.37	*657.71*	*0.00*	*0.00*		*1,254.08*
3.1.1.4 Clear and Grub	**1 Prime Contractor**	**7.60**	**ACR**		**4,532**	**4,999**	**0**	**0**	**0**	**9,531**
					0.27	*0.39*	*0.00*	*0.00*	*0.00*	*0.65*
3.1.1.4.1 Clear and Grubb under ideal conditions, upper 2"	1 Prime Contractor	2,045.00	CY	CODTB10B	550	790	0	0	0	1,339
					1.74	*1.84*	*0.00*	*0.00*	*0.00*	*3.58*
3.1.1.4.2 Hauling, soil, 12 C.Y. truck, 5 mile haul, includes loading (12% swell)	1 Prime Contractor	2,290.00	LCY	CODEB30	3,983	4,209	0	0	0	8,192
3.1.2 Traffic Control	**1 Prime Contractor**	**1.00**	**LS**		**1,617**	**398**	**2,162**	**300**	**0**	**4,477**
3.1.2.1 Traffic Detour at Sherman Way	**1 Prime Contractor**	**1.00**	**LS**		**1,617**	**398**	**2,162**	**300**	**0**	**4,477**

(Note: Flagman duties, moving signs, etc... Most signs will be attached to the barricades. Other signs may be attached to existing posts or on top of existing signs. All sings carry their purchase price, since the signs will be reused throughout the job.)

(Note: Arrowhead monthly rental = $785/mo Light duty arrowhead purchasing price = $5,000. Heavy duty arrowhead purchasing price = $6,000. Assume the contractor will rent 1 arrowhead for 1 week. $785/4 wk = $200/week)

(Note: Purchase price.)

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: This covers costs such as running the arrowheads and miscll repairs due tovandalism, etc...)										
3.1.2.1.9.1 Delivery and Miscll costs	1 Prime Contractor	1.00	LS		0	0	0	300	0	300
(Note: This covers costs such as running the arrowheads and miscll repairs due tovandalism, etc...)										
					32,177.13	*7,116.00*	*120,921.14*	*151,392.64*		*311,606.91*
3.1.3 Landscape	**1 Prime Contractor**	**4.78**	**ACR**		**153,807**	**34,014**	**578,003**	**723,657**	**0**	**1,489,481**
					4.90	*1.17*	*26.34*	*0.20*		*32.62*
3.1.3.1 Fencing	**1.2 Fencing Subcontractor**	**14,645.00**	**FT**		**71,788**	**17,119**	**385,822**	**3,000**	**0**	**477,730**
3.1.3.1.4.1 Delivery	1.2 Fencing Subcontractor	1.00	LS		0	0	0	3,000	0	3,000
(Note: Assume 5 trucks @ $600/ea)										
3.1.3.2 Surfacing	**1 Prime Contractor**	**1.00**	**LS**		**7,069**	**4,814**	**7,008**	**134,688**	**0**	**153,580**
(Note: Finish grading (balancing cut/fill) is accounted under stream and ponds excavation.)										
(Note: The other 1/2 is accounted under recreational resources (Acc. 14).)										
(Note: t=3", width is 12', Area = 25,682 SF, Volume = 238 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
(Note: t=3", width is 12', Area = 26,690 SF, Volume = 247 CY)										
(Note: Assume 20 ton/hr (a truck/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
3.1.3.2.4.1.4.1 Spread/compact DG	1 Prime Contractor	308.75	TON		1,517	999	0	0	0	2,516
3.1.3.3 Furnishings	**1 Prime Contractor**	**1.00**	**LS**		**8,015**	**5,033**	**21,202**	**2,079**	**0**	**36,330**
(Note: Allow 1 hr per location. Consider a crane for the 3-ton stones.)										

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Assume 3 ton/rock)										
(Note: Excavate 12" dia x 48" depth hole = 0.12 BCY excavation & 3000 psi concrete Embed 2-1/2" dia. galvanized steel post Use standard 48"x48" signs from 2006 English Cost Book)										
					29.40	*0.00*	*514.19*	*0.00*	*0.00*	*543.59*
3.1.3.3.7.1 Trash receptacle, reinforced concrete, circular, 32 gallon capacity	1 Prime Contractor	9.00	EA	ALABCLAB2	265	0	4,628	0	0	4,892
					67.58	*0.00*	*0.00*	*0.00*	*0.00*	*67.58*
3.1.3.3.7.2 Excavate by hand, normal soil, to 2' deep	1 Prime Contractor	0.52	BCY	B2	35	0	0	0	0	35
					258.99	*44.53*	*21.65*	*0.00*	*0.00*	*325.17*
3.1.3.3.7.3 Gravel fill, compacted, under receptacle	1 Prime Contractor	0.52	CY	B37	136	23	11	0	0	170
					0.00	*0.00*	*0.00*	*10.00*	*0.00*	*10.00*
3.1.3.3.7.4 Concrete Slab (15 sf/ea x 9 ea = 135 sf)	1 Prime Contractor	135.00	SF		0	0	0	1,350	0	1,350
					0.06	*0.02*	*0.16*	*0.01*		*0.25*
3.1.3.4 Seeding	**1.1 Landscape Subcontractor**	**208,020.00**	**SF**		**12,329**	**4,766**	**33,016**	**2,700**	**0**	**52,812**
(Note: Incorporated soil amendments as part of the tillage operation.)										
(Note: Tilling ranges from 2" to 4" deep.Productivity is 35 msf/hr.)										
(Note: This operation is concurrent with the tillage operation. Use sameproductivity. The skydsteer loader brings the amendments to the gradall orassists the gradall in other ways.)										
(Note: Moisten top 4".)										
(Note: 2-step process.)										
(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying 1/3 of the total amount. 2) Seed Mix A = 40.9 lb/acre and Mix B = 52.05 lb/acre. Productivity is 10 MSF/HR.)										
(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying remainder 2/3 of the total amount. 2) Hydrophilic Colloids (binder) = 103 lb/acr erosion ctrl material. Productivity is 10 MSF/HR.)										
(Note: Minimum depth of 1".)										

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Spray all visible weeds with a contact herbicide.)										
					184.81	*33.82*	*0.00*	*0.00*	*0.00*	*218.64*
3.1.3.4.1.7.1 Weed Abatement	1.1 Landscape Subcontractor	4.78	ACR		883	162	0	0	0	1,045
3.1.3.4.1.7.2 Miscll material costs	1.1 Landscape Subcontractor	1.00	LS		0	0	0	300	0	300
3.1.3.5 Irrigation	**1.1 Landscape Subcontractor**	**1.00**	**LS**		**16,763**	**1,714**	**27,051**	**541,042**	**0**	**586,570**
(Note: Inlcudes points of connections (2 ea), irrigation system, and electrical points of connections (2 ea))										
					0.00	*0.00*	*0.00*	*2.50*	*0.00*	*2.50*
3.1.3.5.5.1 Irrigation System	1.1 Landscape Subcontractor	208,216.80	SF		0	0	0	520,542	0	520,542
(Note: No design available at this stage of the design. Unit price on recently bidded Tujunga Wash Stream Restoration project equated to approximately $1/sf for a temporary system. SAR Reaches 2,3,7 IGE unit cost for irrigation amounts to $2.80/sf for a permanent system. Landscape Architect (Sandra Willis) mentioned the project might look like the SAR 2,3,7 project and it will be permanent. Assume $2.50/sf)										
3.1.3.6 Planting	**1.1 Landscape Subcontractor**	**1.00**	**LS**		**0**	**0**	**78,806**	**39,748**	**0**	**118,554**
(Note: Qty ratio out after the Tujunga Wash Restoration project. See: Planting QTY for Tujunga.xls)										
					0.00	*0.00*	*0.00*	*1,120.00*	*0.00*	*1,120.00*
3.1.3.6.1 48" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	1,120	0	1,120
					0.00	*0.00*	*0.00*	*1,000.00*	*0.00*	*1,000.00*
3.1.3.6.2 42" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	1,000	0	1,000
					0.00	*0.00*	*0.00*	*480.00*	*0.00*	*480.00*
3.1.3.6.3 36" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	480	0	480
					0.00	*0.00*	*216.50*	*0.00*	*0.00*	*216.50*
3.1.3.6.4 24" box tree	1.1 Landscape Subcontractor	364.00	EA		0	0	78,806	0	0	78,806
					0.00	*0.00*	*0.00*	*120.00*	*0.00*	*120.00*
3.1.3.6.5 15 gal tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	120	0	120
					0.00	*0.00*	*0.00*	*20.00*	*0.00*	*20.00*
3.1.3.6.6 5 gal tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	20	0	20

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*7.50*	*0.00*	*7.50*
3.1.3.6.7 1 gal shrub	1.1 Landscape Subcontractor	4,933.00	EA		0	0	0	36,998	0	36,998
					0.00	*0.00*	*0.00*	*10.50*	*0.00*	*10.50*
3.1.3.6.8 1 gal vines	1.1 Landscape Subcontractor	1.00	EA		0	0	0	11	0	11
					7,916.62	*118.80*	*5,250.30*	*83.68*		*13,369.40*
3.1.3.7 Plant Establishment/Maintenance, 1st Yr	**1.1 Landscape Subcontractor**	**4.78**	**ACR**		**37,841**	**568**	**25,096**	**400**	**0**	**63,906**

(Note: Eradicating weeds; protecting planted areas from surface erosion; maintaining slopes to design spec; trash removal; mowing; etc.)

(Note: Since the seed mix is heavy assume 10% of the initial planting will perish and will require replacement. Assume 90% survival rate out of 4.78 acres = 0.478 acres needs to be re-hydroseeded. Say 0.5 acr)

(Note: 2-step process.)

(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying 1/3 of the total amount. 2) Seed Mix A = 40.9 lb/acre and Mix B = 52.05 lb/acre. Productivity is 10 MSF/HR.)

(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying remainder 2/3 of the total amount. 2) Hydrophilic Colloids (binder) = 103 lb/acr erosion ctrl material. Productivity is 10 MSF/HR.)

(Note: 5,303 total plants x 10% = 530 plants need to be replanted)

(Note: Watering at intervals to maintain upper 4" moist. Water 5 times a week during the summer months and 2 times a week during the remainder of the establishment period. Assume 5 times/week for 2 months = 40 times and 2 times/week for the remainder 10 months = 80 times. For a total of 120 times.)

					0.00	*0.00*	*36.08*	*0.00*	*0.00*	*36.08*
3.1.3.7.4.1 Water cost @ $100/acre-ft	1.1 Landscape Subcontractor	574.00	ACR		0	0	20,710	0	0	20,710

(Note: Watering the top 4" translates into $33.33/acr. (4.78 acr x 120 times) = 574 acres.)

					61,231.45	*47,823.02*	*123,660.85*	*40,747.32*		*273,702.64*
3.1.4 Stream, Ponds and Bypass Line	**1 Prime Contractor**	**1.00**	**EA**		**61,231**	**47,823**	**123,661**	**40,747**	**240**	**273,703**
3.1.4.1 Junction Structure @ existing 36" RCP Bypass Line	**1 Prime Contractor**	**1.00**	**LS**		**5,649**	**2,495**	**2,685**	**200**	**0**	**11,028**
					0.57	*0.68*	*0.00*	*0.00*	*0.00*	*1.25*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.1.4.1 Unload and maneuver pipes from delivery truck	1 Prime Contractor	20.00	LF	JUA-LDR	11	14	0	0	0	25
					0.00	*0.00*	*40.05*	*0.00*	*0.00*	*40.05*
3.1.4.1.4.2 18" HDPE, SDR 11	1 Prime Contractor	20.00	LF		0	0	801	0	0	801
(Note: Quoted material price includes delivery charges.)										
					0.00	*0.00*	*129.90*	*0.00*	*0.00*	*129.90*
3.1.4.1.4.3 18" HDPE, SDR 11 Fitting (90 deg elbow and 45 deg bends)	1 Prime Contractor	2.00	EA		0	0	260	0	0	260
(Note: Ball-park price quoted.)										
					8.97	*7.19*	*0.00*	*0.00*	*0.00*	*16.16*
3.1.4.1.4.4 18" HDPE Installation Crew	1 Prime Contractor	20.00	LF	JUA-HDPE1	179	144	0	0	0	323
(Note: 50' lengths. Butt-fusion welded. Pipe crew lays 50 ft/hr or 0.02 hr/ft. Or 1 butt-fusion per hour.)										
					3.66	*5.82*	*0.00*	*1.86*		*11.34*
3.1.4.2 Excavation (Stream and Ponds)	**1 Prime Contractor**	**3,230.00**	**CY**		**11,813**	**18,801**	**0**	**6,000**	**0**	**36,614**
(Note: Assume 20% of the excavated volume is hauled away and 80% remains on-site. Remaining soil is shaped and contoured.)										
(Note: Allow 2 weeks)										
(Note: Assume contractor has "one-way access" in and out of the project site. Shrinkage factor = 1.20 Adjusted Volume = 646 BCY x 1.20 = 775.2 LCY Basis: 5 min load, 15 min haul loaded, 10 min wait/dump, 15 min haul unloaded and 15 min x-tra = 60 min. Roundtrip = one 12 LCY load/hr. Total = 12 Cy/hr @ 7 hr/day = 84 cy/day @ 8 hr of trucking. Total = 775.2 LCY / 84 LCY/day = 10 truck x 8 hrs = 80 hrs.)										
(Note: Allow 2 weeks)										
					0.00	*69.06*	*0.00*	*0.00*	*0.00*	*69.06*
3.1.4.2.5.1 TRACTOR, CAT D6, CRAWLER (DOZER), 165 HP, LOW GROUND PRESSURE, POWERSHIFT, W/ 5.09 CY SEMI-U BLADE (ADD ATTACHMENTS)	1 Prime Contractor	80.00	HR		0	5,525	0	0	0	5,525
					0.00	*5.24*	*0.00*	*0.00*	*0.00*	*5.24*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.2.5.2 TRACTOR ATTACHMENTS, BLADE, POWER ANGLE, HYDRAULIC, FOR D6, 4.16 CY (ADD D6 TRACTOR)	1 Prime Contractor	80.00	HR		0	420	0	0	0	420
(Note: 4)										
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.2.5.3 Outside Equip. Operators, Medium	1 Prime Contractor	80.00	HR		0	0	0	0	0	0
					40.43	*0.00*	*0.00*	*0.00*	*0.00*	*40.43*
3.1.4.2.5.4 Gradechecker	1 Prime Contractor	80.00	HR	1CLAB	3,234	0	0	0	0	3,234
					18.62	*13.82*	*52.47*	*17.61*		*102.52*
3.1.4.3 18" HDPE Pipe	**1 Prime Contractor**	**1,160.00**	**LF**		**21,595**	**16,035**	**60,870**	**20,427**	**0**	**118,926**
(Note: Production 67 bcy/hr or 84 lcy/hr (25% swell).)										
(Note: Accounted for 13% shrinkage and 20% overrun. That is 33% on top of the neat line qty (compacted cubic yards).1.5 ton/lcy.)										
(Note: Includes 90 deg elbow)										
(Note: Rent 3 trench boxes (10' deep x 12' long x 5' width). Box width can be adjusted to any size.The boxes are 10-feet deep by 12-feet long. Allow 8 hr equipment time for this operation.)										
(Note: The plates are 5-feet wide by 12-feet long. Plates are placed width-wise along the trench. Rent 3 plates for 1 mo. Allow 4hr for uncovering and covering the trench.)										
					0.00	*0.00*	*0.00*	*13.50*	*0.00*	*13.50*
3.1.4.3.6.1.2.1 6'x12'x1" Road Plates (Rental) $4.50/DAY/PLATE	1 Prime Contractor	3.00	EA		0	0	0	41	0	41
(Note: Rent for 5 days minimum = $13.50)										
					0.00	*0.00*	*0.00*	*36.00*	*0.00*	*36.00*
3.1.4.3.6.1.2.2 Lift-n-lock lifting tool $36/mo * 1 mo = $36/ea	1 Prime Contractor	1.00	EA		0	0	0	36	0	36

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.3.6.1.2.3 Delivery Cost $70/hr * (1 hr delivery + 1 hr pcik-up) = $140.	1 Prime Contractor	1.00	LS		0	0	0	140	0	140
					0.00	*150.00*	*0.00*	*0.00*	*0.00*	*150.00*
3.1.4.3.6.1.2.4 Rent: 325BL Hyd Excvtr w/ Opertr with 60" wide bkt (3 cy heaped)	1 Prime Contractor	4.00	HR		0	600	0	0	0	600
(Note: Rented Hourly Operated ECCO)										
					40.43	*0.00*	*0.00*	*0.00*	*0.00*	*40.43*
3.1.4.3.6.1.2.5 Laborer	1 Prime Contractor	4.00	HR	LL-X-LABORER	162	0	0	0	0	162
					0.84	*0.83*	*0.00*	*9.38*		*11.04*
3.1.4.4 Disposal of Excess Material	**1 Prime Contractor**	**320.00**	**CY**		**268**	**265**	**0**	**3,000**	**0**	**3,533**
(Note: Dispose of the 18" HDPE pipe bedding material volume (320 cy).)										
(Note: Assume contractor has "one-way access" in and out of the project site. Shrinkage factor = 1.20 Adjusted Volume = 320 BCY x 1.20 = 384 LCY Basis: 5 min load, 15 min haul loaded, 10 min wait/dump, 15 min haul unloaded and 15 min x-tra = 60 min. Roundtrip = one 12 LCY load/hr. Total = 12 Cy/hr @ 7 hr/day = 84 cy/day @ 8 hr of trucking. Total = 384 LCY / 84 LCY/day = 5 truck x 8 hrs = 40 hrs.)										
					0.42	*0.29*	*0.00*	*0.00*	*0.00*	*0.71*
3.1.4.4.1.1 Dozer assisting loader, bank measure, medium material, CAT D5	1 Prime Contractor	320.00	BCY	CODTB10W	134	92	0	0	0	226
					0.42	*0.54*	*0.00*	*0.00*	*0.00*	*0.96*
3.1.4.4.1.2 Load at borrow site, medium material, 3.8 m3 bucket, 980 wheeled loader	1 Prime Contractor	320.00	BCY	CODFB10U	134	173	0	0	0	307
					0.00	*0.00*	*0.00*	*75.00*	*0.00*	*75.00*
3.1.4.4.1.3 Haul Fill with 12 LCY (9.2 LM3) hwy trucks	1 Prime Contractor	40.00	HR		0	0	0	3,000	0	3,000
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.4.1.4 Traffic Control - Flagman	1 Prime Contractor	1.00	DAY		0	0	0	0	0	0

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.4.1.5 Dust Control with 3,000 gal water truck w/ driver.	1 Prime Contractor	1.00	DAY		0	0	0	0	0	0
					9.38	*6.58*	*85.12*	*6.13*		*107.21*
3.1.4.5 Clay Layer, 6" Lining of pond and stream	**1 Prime Contractor**	**600.00**	**CY**		**5,626**	**3,951**	**51,070**	**3,681**	**0**	**64,327**
(Note: Allow 10% additional for irregularities)										
					57.04	*74.81*	*0.00*	*0.00*	*0.00*	*131.85*
3.1.4.5.3.1 Hyd Excvtr/Gradall with operator	1 Prime Contractor	16.00	HR		913	1,197	0	0	0	2,110
(Note: Crew JUA-GR. Allow 16 hrs for fine grading, 2,440 lf stream and ponds. The stream and ponds are 1-foot and 2-feet deep respectively and 12-ft to 26-ft wide.)										
					57.04	*56.60*	*0.00*	*0.00*	*0.00*	*113.64*
3.1.4.5.3.2 Hyd Excvtr with compaction wheel attachment and operator	1 Prime Contractor	16.00	HR		913	906	0	0	0	1,818
(Note: Crew JUA-RL)										
					1,732.62	*1,398.77*	*415.68*	*3,500.00*		*7,167.06*
3.1.4.6 Concrete Headwall Structures	**1 Prime Contractor**	**2.00**	**EA**		**3,465**	**2,798**	**831**	**7,000**	**240**	**14,334**
3.1.4.6.2.2.1 Headwall Structure, 5-ft wide backwall - Wing type Headwall	1 Prime Contractor	1.00	LS		0	0	0	3,500	0	3,500
(Note: Based on Richardson 2-36, p1)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.6.2.2.2 Structural Excavation	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
					155.33	*172.30*	*0.00*	*0.00*	*0.00*	*327.63*
3.1.4.6.2.2.3 Structural Backfill	1 Prime Contractor	4.00	HR		621	689	0	0	0	1,311
3.1.4.7 Water Intake and Underground Valve Structures	**1 Prime Contractor**	**1.00**	**LS**		**8,494**	**1,190**	**8,089**	**0**	**0**	**17,773**

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Base preparation assumed to be performed with 6" of granular fill.)										
(Note: Scarify & compact area is 9' wide by 16' long = 144 sf)										
(Note:)										
					26.95	*0.00*	*218.67*	*0.00*	*0.00*	*245.62*
3.1.4.7.8.1 Manholes covers, gray iron, medium duty, 24" diameter	1 Prime Contractor	1.00	EA	2CLAB	27	0	219	0	0	246
					351.83	*194.69*	*4.78*	*55.00*		*606.31*
3.1.4.8 Sawcut/Demo existing channel INVERT at South Channel	**1 Prime Contractor**	**4.00**	**CY**		**1,407**	**779**	**19**	**220**	**0**	**2,425**
					3.43	*1.53*	*0.14*	*0.00*	*0.00*	*5.10*
3.1.4.8.1 Saw cut concrete slab, rod reinforced	1 Prime Contractor	136.00	LF	B89	466	209	19	0	0	694
(Note: For each additional inch of depth over 3". Slab is 1-foot thick and 34-feet in length. 3" first pass, 6" second pass, 9" third pass, 12" fourth pass. Total of 4 passes times 34 ft = 136. Allow 4-hr minimum for this operation.)										
					137.90	*55.02*	*0.00*	*0.00*	*0.00*	*192.92*
3.1.4.8.2 Concrete Breaker Crew	1 Prime Contractor	4.00	HR		552	220	0	0	0	772
(Note: Area is 8'x9'. Allow 4 hrs for demolition)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.8.3 Remove debris and load trucks wit hydraulic excavator	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
(Note: Allow 4 hrs for this operation)										
3.1.4.8.4 Hauling and disposal cost	1 Prime Contractor	1.00	LS		0	0	0	220	0	220
(Note: Assume 2 hrs round trip at $80/hr = $160. Plus $60 disposal fee.)										
					1,457.24	*754.66*	*48.84*	*110.00*		*2,370.74*
3.1.4.9 Sawcut/Demo existing channel WALL at South Channel	**1 Prime Contractor**	**2.00**	**CY**		**2,914**	**1,509**	**98**	**220**	**0**	**4,741**

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					10.28	*4.89*	*0.51*	*0.00*	*0.00*	*15.68*
3.1.4.9.1 Saw cut concrete wall, rod reinforcing, per inch of depth	1 Prime Contractor	192.00	LF	COELB89B	1,973	939	98	0	0	3,010
(Note: Wall is approx 8-ft in height, 9-feet in length and 1-foot thick. Lenght = 8+8 = 16 ft x 12" deep = 192 ')										
					137.90	*55.02*	*0.00*	*0.00*	*0.00*	*192.92*
3.1.4.9.2 Concrete Breaker Crew	1 Prime Contractor	4.00	HR		552	220	0	0	0	772
(Note: Area is 8'x9'. Allow 4 hrs for demolition)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.9.3 Remove debris and load trucks wit hydraulic excavator	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
(Note: Allow 4 hrs for this operation)										
3.1.4.9.4 Hauling and disposal cost	1 Prime Contractor	1.00	LS		0	0	0	220	0	220
(Note: Assume 2 hrs round trip at $80/hr = $160. Plus $60 disposal fee.)										
4 Recreational Facilities	**1 Prime Contractor**	**1.00**	**LS**		**6,577**	**4,128**	**9,443**	**54,504**	**0**	**74,651**
4.1 Landscaping Recreational Facilities	**1 Prime Contractor**	**1.00**	**LS**		**6,577**	**4,128**	**9,443**	**54,504**	**0**	**74,651**
4.1.1 Surfacing (D.G. Paving and Road)	**1 Prime Contractor**	**1.00**	**LS**		**1,364**	**840**	**2,297**	**2,404**	**0**	**6,905**
					0.09	*0.06*	*0.17*	*0.15*		*0.47*
4.1.1.1 D.G. Paving	**1 Prime Contractor**	**3,540.00**	**SF**		**316**	**200**	**609**	**522**	**0**	**1,648**
(Note: t=3", Area = 3,540 SF, Volume = 33 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
4.1.1.1.1.4.1 Spread/compact DG	1 Prime Contractor	41.25	TON		203	134	0	0	0	336
					0.08	*0.05*	*0.13*	*0.15*		*0.41*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
4.1.1.2 12 ft wide D.G. Road/Trail (1/2 the area)	**1 Prime Contractor**	**12,841.00**	**SF**		**1,049**	**639**	**1,688**	**1,882**	**0**	**5,257**
(Note: The other 1/2 is accounted under Tujunga Wash Ecosystem Restoration (Acc. 09).)										
(Note: t=3", width is 12', Area = 25,682 SF, Volume = 238 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
4.1.1.2.1.4.1 Spread/compact DG	1 Prime Contractor	148.75	TON		731	481	0	0	0	1,212
					5,212.66	*3,288.44*	*7,145.58*	*52,100.00*		*67,746.68*
4.1.2 Fencing	**1.2 Fencing Subcontractor**	**1.00**	**EA**		**5,213**	**3,288**	**7,146**	**52,100**	**0**	**67,747**
					407.47	*346.61*	*541.25*	*0.00*		*1,295.32*
4.1.2.1 Stone Columns	**1.2 Fencing Subcontractor**	**8.00**	**EA**		**3,260**	**2,773**	**4,330**	**0**	**0**	**10,363**
					101.87	*86.65*	*0.00*	*0.00*	*0.00*	*188.52*
4.1.2.1.1 Stone Mansory Crew	1.2 Fencing Subcontractor	32.00	HR		3,260	2,773	0	0	0	6,033
(Note: Allow 4 hrs per column)										
					0.00	*0.00*	*541.25*	*0.00*	*0.00*	*541.25*
4.1.2.1.2 Material cost per column	1.2 Fencing Subcontractor	8.00	EA		0	0	4,330	0	0	4,330
					976.46	*257.80*	*1,407.79*	*0.00*		*2,642.05*
4.1.2.2 14' Wide, 5' Ht Welded Steel Wire Fence Mesh "Gaelic Fence"	**1.2 Fencing Subcontractor**	**2.00**	**EA**		**1,953**	**516**	**2,816**	**0**	**0**	**5,284**
					136.45	*36.34*	*0.00*	*0.00*	*0.00*	*172.79*
4.1.2.2.2.1 Fencing Crew	1.2 Fencing Subcontractor	14.00	HR		1,910	509	0	0	0	2,419
(Note: Crew FNCJUA)										
					0.00	*0.00*	*132.91*	*0.00*	*0.00*	*132.91*
4.1.2.2.2.2 4"x4" gate post x 8'	1.2 Fencing Subcontractor	4.00	EA		0	0	532	0	0	532
					0.00	*0.00*	*1,060.85*	*0.00*	*0.00*	*1,060.85*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
4.1.2.2.2.3 5'x14' Double gate	1.2 Fencing Subcontractor	2.00	EA		0	0	2,122	0	0	2,122
					0.00	*0.00*	*27.71*	*0.00*	*0.00*	*27.71*
4.1.2.2.2.4 Braces 2"x2"x6'	1.2 Fencing Subcontractor	4.00	EA		0	0	111	0	0	111
					0.00	*0.00*	*3.11*	*0.00*	*0.00*	*3.11*
4.1.2.2.2.5 4"x4" post cap	1.2 Fencing Subcontractor	4.00	EA		0	0	12	0	0	12
					0.00	*0.00*	*0.00*	*20.00*		*20.00*
4.1.2.3 Guard Cable Fence, 3'-6" Ht	**1.2 Fencing Subcontractor**	**2,605.00**	**LF**		**0**	**0**	**0**	**52,100**	**0**	**52,100**
					0.00	*0.00*	*0.00*	*20.00*	*0.00*	*20.00*
4.1.2.3.1 Guard Cable Fence, 3'-6" ht	1.2 Fencing Subcontractor	2,605.00	LF		0	0	0	52,100	0	52,100

(Note: Crown Fencing, Corona, CA quote)

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
Crews (Bare Costs) by Contractor Report	**2,376.64**			**5,031.42**	**201,298**	**2,328.52**	**73,785**	**275,083**
				0.00	*0.00*	*1.00*	*9.95*	*9.95*
EP EE-T50FO005 4X2, 1T-Pickup Truck	77.19			0.00	0	77.19	768	768
EP T50FO005 TRK,HWY,10,000GVW,4X2, 1T-PICKUP		*Non-EP / Average*	*10*			*1.00*	*10*	
				0.00	*0.00*	*1.00*	*11.22*	*11.22*
GEN EE-L40Z4610 LOADER, SKIDSTEER, 60" BUCKET	39.55			0.00	0	39.55	444	444
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)		*EP / Average*	*11*			*1.00*	*11*	
				0.00	*0.00*	*1.00*	*4.37*	*4.37*
GEN EE-T40Z7055 WATER TANK, 3,000 GAL (11,356L)	3.75			0.00	0	3.75	16	16
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*4*			*1.00*	*4*	
				0.00	*0.00*	*1.00*	*39.19*	*39.19*
GEN EE-T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW	3.75			0.00	0	3.75	147	147
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*1.00*	*39*	
				2.00	*71.76*	*0.00*	*0.00*	*71.76*
HNC ALABCLAB2 2 laborers	19.27			38.55	1,383	0.00	0	1,383
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
				3.00	*113.29*	*3.00*	*35.35*	*148.64*
HNC CLABB80C 2 laborers + 1 post hole drill, up to 8" diam, 30" deep, one man	2.00			6.00	227	6.00	71	297
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
EP L15HZ001 POST HOLE DRILL, UP TO 8" DIA, 30" DEEP, ONE MAN OPERATION		*EP / Average*	*1*			*1.00*	*1*	
GEN T40Z6960 TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)		*EP / Average*	*1*			*1.00*	*1*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				8.00	*315.62*	*3.00*	*124.44*	*440.06*
HNC CLABC20 6 laborers + 1 concrete pump, 117 CY/hr	0.67			5.33	210	2.00	83	293
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*5.00*	*179*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED		*EP / Average*	*116*			*1.00*	*116*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				2.00	*72.26*	*2.00*	*126.60*	*198.86*
HNC CLADB23D 3 laborers + 1 drill, auger, 8" dia, 250' deep	4.71			9.43	341	9.43	597	937
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
GEN D30Z2890 DRILL, EARTH/AUGER, MULTI-PURPOSE, 8" (203 MM) DIA, 250' (76.2 M) DEPTH, 7,000 FT-LBS (967.8 KGF-M) TORQUE, W/21,000 LB (9,525 KG) GVW TRUCK W/PTO DRIVE (ADD COST FOR DRILL STEEL AND CUTTING EDGE)		*EP / Average*	*63*			*2.00*	*127*	
				2.00	*100.25*	*1.00*	*40.16*	*140.41*
HNC CODEB12F 1 eqoprcrn + 1 hydr excavator, crawler, 0.75 CY	2.04			4.07	204	2.04	82	286
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
MIL B-EQOPROIL Equip. Operators, Oilers		*Journeyman*	*47*	*1.00*	*47*			
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*40*			*1.00*	*40*	
				3.00	*134.23*	*5.00*	*159.91*	*294.14*
HNC CODEB30 1 eqoprmed + 1 hydr excavator, crawler, 1.50 CY	26.32			78.97	3,533	131.61	4,209	7,742
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*2.00*	*84*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH		*EP / Average*	*77*			*1.00*	*77*	
GEN T40Z7090 TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*2*			*2.00*	*4*	
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*2.00*	*78*	
				1.50	*68.05*	*1.00*	*35.82*	*103.87*
HNC CODFB10N 1 eqoprmed + 1 loader, F/E, crawler, 1.50 CY	2.28			3.42	155	2.28	82	237
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L35Z4240 LOADER, FRONT END, CRAWLER, 1.50 CY (1.2 M3) BUCKET		*EP / Average*	*36*			*1.00*	*36*	
				1.50	*68.05*	*1.00*	*53.38*	*121.43*
HNC CODFB10T 1 eqoprmed + 1 loader, F/E, wheel, 4WD, 3.25 CY	12.50			18.75	850	12.50	667	1,518
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L40Z4397 LOADER, FRONT END, WHEEL, ARTICULATED, 3.25 CY (2.5 M3) BUCKET, 4X4		*EP / Average*	*53*			*1.00*	*53*	
				1.50	*68.05*	*1.00*	*100.26*	*168.31*

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
HNC CODFB10U 1 eqoprmed + 1 loader, F/E, wheel, 4WD, 5.50 CY	5.22			7.83	355	5.22	524	879
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L40Z4420 LOADER, FRONT END, WHEEL, ARTICULATED, 5.50 CY (4.2 M3) BUCKET, 4X4		*EP / Average*	*100*			*1.00*	*100*	
				1.50	*68.05*	*1.00*	*111.00*	*179.05*
HNC CODTB10B 1 eqoprmed + 1 dozer, crawler, 181-250 HP	7.11			10.67	484	7.11	790	1,274
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN T15Z6520 TRACTOR, CRAWLER (DOZER), 181-250 HP (135-186 KW), POWERSHIFT, LGP, W/UNIVERSAL BLADE		*EP / Average*	*111*			*1.00*	*111*	
				1.50	*68.05*	*1.00*	*34.28*	*102.33*
HNC CODTB10L 1 eqoprmed + 1 dozer, crawler, 76-100 HP	15.94			23.91	1,085	15.94	546	1,631
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN T15Z6440 TRACTOR, CRAWLER (DOZER), 76-100 HP (57-75 KW), POWERSHIFT, W/UNIVERSAL BLADE		*EP / Average*	*34*			*1.00*	*34*	
				1.50	*68.05*	*1.00*	*53.00*	*121.05*
HNC CODTB10W 1 eqoprmed + 1 dozer, crawler, 101-135 HP	37.24			55.86	2,534	37.24	1,974	4,508
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN T15Z6480 TRACTOR, CRAWLER (DOZER), 101-135 HP (75-101 KW), POWERSHIFT, W/ UNIVERSAL BLADE		*EP / Average*	*53*			*1.00*	*53*	
				2.00	*91.04*	*4.00*	*48.92*	*139.96*
HNC COELB89B 1 eqoprlt + 1 truck, flatbed, 8' x 20'	19.20			38.40	1,748	76.80	939	2,687
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE		*Non-EP / Average*	*2*			*1.00*	*2*	
GEN C60Z1990 CONCRETE SAW, RAIL SAW, 15.5" (394 MM) DEPTH, WALL (ADD 250 CFM (7 CMM) COMPRESSOR & COST FOR SAWBLADE WEAR)		*EP / Average*	*12*			*1.00*	*12*	
GEN T40Z7000 TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)		*EP / Average*	*1*			*1.00*	*1*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				1.00	*42.06*	*2.00*	*45.33*	*87.39*
HNC CTDHB34C 1 trkdvrhv + 1 trailer, dump, 17 CY	16.00			16.00	673	32.00	725	1,398
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
GEN T45Z7080 TRUCK TRAILER, END DUMP, 17 CY (13 CM), 22 TON (20.0 MT) (ADD TOWING TRUCK)		*EP / Average*	*6*			*1.00*	*6*	
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*1.00*	*39*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				1.00	*49.35*	*0.00*	*0.00*	*49.35*
HNC EELEELEC1 1 electrn	8.00			8.00	395	0.00	0	395
MIL B-ELECTRN Electricians		*Journeyman*	*49*	*1.00*	*49*			
				4.00	*155.83*	*0.00*	*0.00*	*155.83*
HNC ULABB20A 2 laborers	1.00			4.00	156	0.00	0	156
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
				3.00	*113.82*	*5.00*	*71.45*	*185.27*
HNC ULABB9B 2 laborers + 1 trailer, water tanker, 5000 gal	1.00			3.00	114	5.00	71	185
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
GEN P50Z5086 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (76 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION		*EP / Average*	*0*			*2.00*	*1*	
GEN T50Z7520 TRUCK, HIGHWAY, 55,000 LB (24,948 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*46*			*1.00*	*46*	
GEN W25Z8605 WATER BLASTER, LOW PRESSURE, COLD WATER, 5.5 GPM (20.8 LPM) 1 NOZZLE, @ 3,500 PSI (24,132 KPA)		*EP / Average*	*6*			*1.00*	*6*	
GEN T45Z7280 TRUCK TRAILER, WATER TANKER, 5,000 GAL (18,927 L) (ADD 50,000 LB (22,680 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
				5.00	*209.13*	*1.00*	*59.23*	*268.36*
HNC UOEHB21A 2 laborers + 1 crane, hydr, S/P, RT, 4WD, 15 ton	1.20			6.00	251	1.20	71	322
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4		*EP / Average*	*59*			*1.00*	*59*	
				0.00	*0.00*	*1.00*	*43.11*	*43.11*
MAP EE-L15FG001 HYDROMULCHER, 3000 GAL, TRUCK MT	23.00			0.00	0	23.00	992	992
MAP L15FG001 LANDSCAPING EQUIPMENT, HYDROSEEDER, 3000 GAL, TRUCK MTD (INCLUDES 56,000 GVW TRUCK)		*EP / Average*	*43*			*1.00*	*43*	
				0.00	*0.00*	*1.00*	*142.47*	*142.47*
MAP EE-L40CA008 LOADER 988B, 7 CY (1 ea)	23.00			0.00	0	23.00	3,277	3,277
USR L40CA008 LOADER, FRONT END, WHEEL, 9.00 CY BUCKET, ARTICULATED, 4X4		*EP / Average*	*142*			*1.00*	*142*	
				0.00	*0.00*	*1.00*	*27.73*	*27.73*
MIL EE-C10BO013 ROLLER,VIB,DBL,33.5"W,0.5T,WK-BH	8.35			0.00	0	8.35	231	231

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
EP C10BO013 COMPACTOR, TRENCH ROLLER, VIBRATORY, 33.5"W X 19.7" DIA, DOUBLE TAMPING FOOT DRUMS, WALK BEHIND, 18000 LBS IMPACT		*EP / Average*	*28*			*1.00*	*28*	
				1.00	*49.51*	*0.00*	*0.00*	*49.51*
MIL LL-B-EQOPRLT Equip. Operator	34.09			34.09	1,688	0.00	0	1,688
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*49.51*	*0.00*	*0.00*	*49.51*
MIL LL-X-EQOPRLT Outside Equip. Operator,Compactr	8.35			8.35	413	0.00	0	413
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
MIL LL-X-EQOPRMED Eq Operator, Dozer (1)	56.93			56.93	2,853	0.00	0	2,853
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
MIL LL-X-EQOPRMED Outside Equip. Operator, Medium	23.00			23.00	1,153	0.00	0	1,153
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
MIL LL-X-LABORER Laborer (1)	44.85			44.85	1,609	0.00	0	1,609
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
MIL LL-X-LABORER Labs w/ brush saws (2)	28.46			28.46	1,021	0.00	0	1,021
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*42.06*	*0.00*	*0.00*	*42.06*
MIL LL-X-TRKDVRHV Outside Truck Driver, Heavy	3.75			3.75	158	0.00	0	158
MIL X-TRKDVRHV Outside Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
				1.00	*42.06*	*0.00*	*0.00*	*42.06*
MIL LL-X-TRKDVRHV Outside Truck Driver, Heavy	23.00			23.00	967	0.00	0	967
MIL X-TRKDVRHV Outside Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
				1.00	*49.73*	*0.00*	*0.00*	*49.73*
RSM 1CEFI 1 CEFI	3.42			3.42	170	0.00	0	170
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
RSM 1CLAB 1 CLAB	120.08			120.08	4,309	0.00	0	4,309
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*49.35*	*0.00*	*0.00*	*49.35*
RSM 1ELEC 1 ELEC	29.19			29.19	1,440	0.00	0	1,440
MIL B-ELECTRN Electricians		*Journeyman*	*49*	*1.00*	*49*			
				1.00	*44.95*	*0.00*	*0.00*	*44.95*
RSM 1PLUM 1 PLUM	7.90			7.90	355	0.00	0	355
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				1.00	*46.88*	*0.00*	*0.00*	*46.88*
RSM 1STPI 1 STPI	0.50			0.50	23	0.00	0	23
MIL B-STM/PIPE Steam/Pipefitters		*Journeyman*	*47*	*1.00*	*47*			
				2.00	*71.76*	*0.00*	*0.00*	*71.76*
RSM 2CLAB 2 CLAB	15.65			31.30	1,123	0.00	0	1,123
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
				4.00	*198.60*	*0.00*	*0.00*	*198.60*
RSM 4RODM 4 RODM	1.11			4.44	221	0.00	0	221
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
				1.00	*35.88*	*1.00*	*3.54*	*39.42*
RSM A1D A1D	4.35			4.35	156	4.35	15	172
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
GEN C10Z1380 COMPACTOR, VIBROPLATE, 18" (457 MM) WIDE x 21.5" (546 MM) PLATE		*EP / Average*	*4*			*1.00*	*4*	
				2.00	*53.35*	*1.00*	*1.73*	*55.08*
RSM A6 A6	16.00			32.00	854	16.00	28	881
FOP FC-SURYR Surveyors, Helper		*Journeyman*	*18*	*1.00*	*18*			
FOP FC-SURYC Surveyors, Chief		*Journeyman*	*36*	*1.00*	*36*			
GEN XMEZ8815 LASER LEVEL FOR PIPES		*Non-EP / Average*	*2*			*1.00*	*2*	
				1.50	*68.05*	*1.00*	*9.03*	*77.08*
RSM B10A B10A	20.95			31.43	1,426	20.95	189	1,615
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP C10BO011 COMPACTOR, ROLLER, VIBRATORY, 29.9"W X 19.7"DIA, DOUBLE SMOOTH DRUMS, WALK BEHIND, 1980 LBS IMPACT		*EP / Average*	*9*			*1.00*	*9*	
				1.50	*68.05*	*1.00*	*111.00*	*179.05*
RSM B10B B10B	6.12			9.17	416	6.12	679	1,095
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP T15CA014 TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)		*EP / Average*	*111*			*1.00*	*111*	
				1.50	*68.05*	*1.00*	*76.62*	*144.67*
RSM B10P B10P	3.00			4.50	204	3.00	230	434
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP L35CA014 LOADER, FRONT END, CRAWLER, 3.20 CY BUCKET		*EP / Average*	*77*			*1.00*	*77*	
				1.50	*68.05*	*1.00*	*53.00*	*121.05*
RSM B10W B10W	36.91			55.37	2,512	36.91	1,956	4,469
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP T15CS007 TRACTOR, CRAWLER (DOZER), 119 HP, POWERSHIFT, W/3.90 CY UNIVERSAL BLADE (ADD ATTACHMENTS)		*EP / Average*	*53*			*1.00*	*53*	
				2.00	*85.39*	*4.00*	*29.49*	*114.88*
RSM B11B B11B	2.80			5.60	239	11.20	83	322
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN A15Z0150 AIR COMPRESSOR, 375 CFM (11 CMM), 100 PSI (689 KPA) (ADD HOSE)		*EP / Average*	*23*			*1.00*	*23*	
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)		*EP / Average*	*2*			*2.00*	*4*	
GEN C10Z1360 COMPACTOR, RAMMER, 9" (229 MM) WIDE x 14" (356 MM) SHOE		*EP / Average*	*3*			*1.00*	*3*	
				2.00	*85.99*	*1.00*	*17.83*	*103.82*
RSM B11C B11C	21.60			43.20	1,857	21.60	385	2,243
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				6.00	*229.41*	*1.00*	*17.83*	*247.24*
RSM B14 B14	0.12			0.71	27	0.12	2	29
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				4.00	*163.33*	*2.00*	*61.76*	*225.09*
RSM B17 B17	2.65			10.60	433	5.30	164	596
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2		*EP / Average*	*44*			*1.00*	*44*	
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				5.00	*179.90*	*0.00*	*0.00*	*179.90*
RSM B2 B2	0.17			0.87	31	0.00	0	31
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
				3.00	*111.14*	*0.00*	*0.00*	*111.14*
RSM B20 B20	11.20			33.60	1,245	0.00	0	1,245
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-SKILLWKR Skilled Workers		*Journeyman*	*39*	*1.00*	*39*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				4.00	*155.83*	*0.00*	*0.00*	*155.83*
RSM B20A B20A	2.25			9.00	351	0.00	0	351
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
				3.50	*137.79*	*0.50*	*16.77*	*154.56*
RSM B21 B21	13.61			47.62	1,875	6.80	228	2,103
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-SKILLWKR Skilled Workers		*Journeyman*	*39*	*1.00*	*39*			
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*0.50*	*27*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MAP C75GV021 CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB		*EP / Average*	*34*			*0.50*	*17*	
				5.00	*209.13*	*1.00*	*59.23*	*268.36*
RSM B21A B21A	9.71			48.56	2,031	9.71	575	2,607
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MAP C75GV028 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 25 TON, 75' BOOM, 4X4X4		*EP / Average*	*59*			*1.00*	*59*	
				3.00	*128.04*	*0.00*	*0.00*	*128.04*
RSM B24 B24	8.00			24.00	1,024	0.00	0	1,024
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
				1.75	*80.58*	*1.25*	*107.70*	*188.28*
RSM B33F B33F	39.00			68.26	3,143	48.75	4,201	7,344
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.25*	*63*			
MAP S10CA001 SCRAPER, ELEVATING LOADING, 11 CY, 13 TON, 4X2 - SINGLE POWERED		*EP / Average*	*76*			*1.00*	*76*	
MAP T15CA016 TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)		*EP / Average*	*128*			*0.25*	*32*	
				6.00	*229.41*	*1.00*	*44.53*	*273.94*
RSM B37 B37	0.58			3.48	133	0.58	26	159
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MAP R45BO006 ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR		*EP / Average*	*45*			*1.00*	*45*	
				6.00	*229.41*	*5.00*	*21.82*	*251.23*
RSM B39 B39	3.74			22.45	858	18.71	82	940
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
GEN A15Z0140 AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)		*EP / Average*	*17*			*1.00*	*17*	
GEN A20Z0400 PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)		*EP / Average*	*1*			*2.00*	*1*	
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)		*EP / Average*	*2*			*2.00*	*4*	
				2.00	*92.17*	*2.00*	*61.43*	*153.60*
RSM B45 B45	4.73			9.46	436	9.46	291	727
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*43*			*1.00*	*43*	
				3.00	*121.27*	*1.00*	*17.83*	*139.10*
RSM B6 B6	115.10			345.31	13,958	115.10	2,052	16,011
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				4.00	*163.30*	*2.00*	*36.07*	*199.37*
RSM B80 B80	81.46			325.84	13,303	162.92	2,938	16,241
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
GEN XMEZ9120 POST DRIVER, 8" (203 MM) MAX DIA POST, 30,000 LB (13,608 KG) IMPACT (ADD 20,000-35,000 LB (9,072-15,876 KG) GVW TRUCK)		*Non-EP / Average*	*3*			*1.00*	*3*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				2.00	*91.04*	*3.00*	*46.04*	*137.08*
RSM B89 B89	4.53			9.07	413	13.60	209	621
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE		*Non-EP / Average*	*2*			*1.00*	*2*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
GEN C60Z1980 CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)		*EP / Average*	*11*			*1.00*	*11*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				4.00	*163.17*	*0.00*	*0.00*	*163.17*
RSM C1 C1	1.19			4.75	194	0.00	0	194
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*3.00*	*127*			
				26.00	*1,141.74*	*2.00*	*120.28*	*1,262.02*
RSM C14B C14B	0.07			1.77	78	0.14	8	86
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*2.00*	*99*			
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*16.00*	*679*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*1.00*	*4*	
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD		*EP / Average*	*116*			*1.00*	*116*	
				11.00	*483.76*	*1.00*	*4.16*	*487.92*
RSM C14E C14E	0.20			2.20	97	0.20	1	98
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*2.00*	*85*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*1.00*	*4*	
				6.00	*248.53*	*0.00*	*0.00*	*248.53*
RSM C2 C2	8.04			48.25	1,999	0.00	0	1,999
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*4.00*	*170*			
				8.00	*315.62*	*3.00*	*124.44*	*440.06*
RSM C20 C20	1.12			8.96	353	3.36	139	493
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*5.00*	*179*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD		*EP / Average*	*116*			*1.00*	*116*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				6.00	*229.63*	*2.00*	*8.32*	*237.95*
RSM C6 C6	10.56			63.34	2,424	21.11	88	2,512
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
RSM CLAB CLAB	13.25			13.25	475	0.00	0	475
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				2.00	*83.57*	*0.00*	*0.00*	*83.57*
RSM Q1 Q1	9.88			19.76	826	0.00	0	826
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
				2.00	*83.57*	*1.00*	*1.73*	*85.31*
RSM Q15 Q15	4.00			8.00	334	4.00	7	341
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED		*EP / Average*	*2*			*1.00*	*2*	
				3.00	*128.52*	*1.00*	*1.73*	*130.26*
RSM Q16 Q16	2.67			8.00	343	2.67	5	347
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*2.00*	*90*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED		*EP / Average*	*2*			*1.00*	*2*	
				3.00	*128.52*	*0.00*	*0.00*	*128.52*
RSM Q2 Q2	5.32			15.96	684	0.00	0	684
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*2.00*	*90*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
				2.00	*87.24*	*0.00*	*0.00*	*87.24*
RSM Q5 Q5	5.33			10.67	465	0.00	0	465
MIL B-STM/PIPE Steam/Pipefitters		*Journeyman*	*47*	*1.00*	*47*			
MIL B-STM/PIPE Steam/Pipefitters		*Apprentice*	*40*	*1.00*	*40*			
				1.00	*49.65*	*0.00*	*0.00*	*49.65*
RSM RODM RODM	2.09			2.09	104	0.00	0	104
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*1.00*	*50*			
				3.00	*121.87*	*2.00*	*55.02*	*176.89*
USR Concrete Breaker Crew	8.00			24.00	975	16.00	440	1,415
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MAP H25KN002 HYDRAULIC EXCAVATOR, ATTACHMENT, CONCRETE PULVERIZER, 3000 LB, W/POINT (ADD 26,000-36,000 LB HYDRAULIC EXCAVATOR)		*EP / Average*	*15*			*1.00*	*15*	
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*40*			*1.00*	*40*	
				5.00	*195.03*	*1.00*	*21.40*	*216.43*
USR Grouting (Grouted Stone)	2.00			10.00	390	2.00	43	433
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Foreman*	*38*	*1.00*	*38*			
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN C55Z1950 CONCRETE PUMP, 50 CY/HR (38 M3/HR), TRAILER MOUNTED (ADD HOSE)		*EP / Average*	*21*			*1.00*	*21*	
				5.00	*220.93*	*3.00*	*169.10*	*390.03*
USR Rock Placement (Grouted Stone)	4.00			20.00	884	12.00	676	1,560
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Foreman*	*52*	*1.00*	*52*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL X-EQOPROIL Outside Equip. Oilers		*Journeyman*	*47*	*1.00*	*47*			
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH		*EP / Average*	*87*			*1.00*	*87*	
GEN L40Z4410 LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4		*EP / Average*	*71*			*1.00*	*71*	
GEN T50Z7305 TRUCK, HIGHWAY, CONVENTIONAL, 3,500 LB (1,588 KG) GVW, 4X2, 2 AXLE, COMPACT-PICKUP		*EP / Average*	*11*			*1.00*	*11*	
				3.00	*136.90*	*2.00*	*172.30*	*309.20*
USR Structural Backfill	12.00			36.00	1,643	24.00	2,068	3,710
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL X-EQOPRLT Outside Equip. Operators, Light		*Foreman*	*52*	*1.00*	*52*			
GEN C10Z1440 COMPACTOR, ROLLER, VIBRATORY, 29.5" (749 MM) WIDE, 2.25 TON (2.0 MT), DOUBLE DRUM, WALK-BEHIND		*EP / Average*	*27*			*1.00*	*27*	
GEN L40Z4440 LOADER, FRONT END, WHEEL, ARTICULATED, 7.00 CY (5.4 M3) BUCKET, 4X4		*EP / Average*	*145*			*1.00*	*145*	
				2.00	*85.99*	*1.00*	*87.49*	*173.48*
USR Structural Excavation	60.00			120.00	5,159	60.00	5,250	10,409
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH		*EP / Average*	*87*			*1.00*	*87*	
				1.50	*68.05*	*1.00*	*11.22*	*79.27*
USR B10B-JUA B10B	13.76			20.64	936	13.76	154	1,091
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)		*EP / Average*	*11*			*1.00*	*11*	
				1.00	*42.06*	*2.00*	*61.43*	*103.49*
USR B45JUA B45	8.01			8.01	337	16.02	492	829
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*43*			*1.00*	*43*	
				0.00	*0.00*	*1.00*	*14.80*	*14.80*
USR EE-T50FO005 Pick-up Truck	10.93			0.00	0	10.93	162	162
EP T50XX006 TRUCK, HIGHWAY, CONVENTIONAL, 1 TON PICKUP, 4X4		*EP / Average*	*15*			*1.00*	*15*	
				1.00	*52.11*	*0.00*	*0.00*	*52.11*
USR FF-X-EQOPRMED Foreman	37.19			37.19	1,938	0.00	0	1,938
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Foreman*	*52*	*1.00*	*52*			
				3.00	*113.79*	*2.00*	*36.34*	*150.13*
USR FNCJUA Fencing Crew	403.00			1,209.00	45,857	806.00	14,646	60,504
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
EP T45XX026 TRUCK TRAILER, MISCELLANEOUS/UTILITY, TILT BED, 12 TON, 2 AXLE (ADD TOWING TRUCK)		*EP / Average*	*3*			*1.00*	*3*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				1.00	*50.11*	*1.00*	*77.32*	*127.43*
USR JUA-EXC Hyd Excavator 325Bl with operator	13.00			13.00	651	13.00	1,005	1,657
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH		*EP / Average*	*77*			*1.00*	*77*	
				1.00	*50.11*	*1.00*	*74.81*	*124.92*
USR JUA-GR Hyd Excvtr / Gradall with operator	32.00			32.00	1,604	32.00	2,394	3,997
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
USR H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, 22'6" DIGGING DEPTH, TELESCOPIC BOOM, 6X4		*EP / Average*	*75*			*1.00*	*75*	
				9.00	*394.82*	*5.00*	*359.45*	*754.27*
USR JUA-HDPE1 18" HDPE Installation Crew	23.60			212.40	9,318	118.00	8,483	17,801
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
MIL X-PLUMBER Outside Plumbers		*Foreman*	*47*	*1.00*	*47*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL X-PLUMBER Outside Plumbers		*Journeyman*	*45*	*2.00*	*90*			
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*3.00*	*150*			
USR JUA-WELD HDPE Butt-fusion Machine		*Non-EP Rental / Average*	*200*			*1.00*	*200*	
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4		*EP / Average*	*59*			*1.00*	*59*	
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE		*EP / Average*	*14*			*1.00*	*14*	
GEN P35Z4950 PIPELAYER, 20' (0.5 M) BOOM, 90,000 LB (40,823 KG)		*EP / Average*	*74*			*1.00*	*74*	
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP		*EP / Average*	*12*			*1.00*	*12*	
				1.00	*50.11*	*1.00*	*68.05*	*118.16*
USR JUA-LDR Loader 4 CY Bkt with oper	25.20			25.20	1,263	25.20	1,715	2,978
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
USR L40Z4410 962G LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4		*EP / Average*	*68*			*1.00*	*68*	
				1.00	*50.11*	*2.00*	*56.60*	*106.71*
USR JUA-RL Hyd Excvtr with compaction wheel attachment and operator	16.00			16.00	802	32.00	906	1,707
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
EP H25AX001 HYDRAULIC EXCAVATOR, ATTACHMENT, COMPACTOR, 23" WIDE, SHEEPS FOOT, 3 RIMS - 38" DIA (ADD 25,000-50,000 LB HYDRAULIC EXCAVATOR)		*EP / Average*	*2*			*1.00*	*2*	
GEN H25Z3175 HYDRAULIC EXCAVATOR, CRAWLER, 40,000 LB (18,144 KG), 1.00 CY (0.8 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*54*			*1.00*	*54*	
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR L4 1 laborer	36.13			36.13	1,296	0.00	0	1,296
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR LL-B-LABORER Laborer	39.55			39.55	1,419	0.00	0	1,419
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
USR LL-X-EQOPRMED Gradechecker	37.19			37.19	1,864	0.00	0	1,864
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR LL-X-LABORER Laborer	114.23			114.23	4,099	0.00	0	4,099
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				2.00	*85.16*	*2.00*	*86.65*	*171.81*
USR STNO Stone Mansory Crew	40.00			80.00	3,406	80.00	3,466	6,872
MIL B-STONEMAS Stone Masons		*Journeyman*	*42*	*1.00*	*42*			
MIL B-STONEMAS Stone Masons		*Foreman*	*43*	*1.00*	*43*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
USR T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW 6X4, 3 AXLE, (ADD ACCESSORIES)		*EP / Average*	*53*			*1.00*	*53*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				4.00	*144.02*	*0.00*	*0.00*	*144.02*
USR ULABB4 4 laborers	208.00			832.00	29,956	0.00	0	29,956
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Labor by Contractor Report												
				33.86	*0.00*	*1.00*	*7.57*	*0.00*				*49.11*
Carpenters	LaborCost1	Journeyman	45	1,531	0	45	342	0	0	200	103	2,221
				34.36	*0.00*	*1.00*	*7.57*	*0.00*				*49.71*
Carpenters	LaborCost1	Foreman	8	286	0	8	63	0	0	37	19	413
				34.43	*0.00*	*1.00*	*14.30*	*0.00*				*56.52*
Cement Finishers	LaborCost1	Journeyman	24	830	0	24	345	0	0	108	99	1,405
				33.50	*0.00*	*1.00*	*14.85*	*0.00*				*55.96*
Electricians	LaborCost1	Journeyman	37	1,246	0	37	552	0	0	162	83	2,081
				38.00	*0.00*	*1.00*	*14.30*	*0.00*				*60.78*
Equip. Operators, Crane/Shovel	LaborCost1	Journeyman	63	2,385	0	63	897	0	0	310	160	3,814
				34.21	*0.00*	*1.00*	*14.30*	*0.00*				*56.26*
Equip. Operators, Light	LaborCost1	Journeyman	264	9,041	0	264	3,779	0	0	1,178	934	15,196
				35.16	*0.00*	*1.00*	*13.95*	*0.00*				*57.04*
Equip. Operators, Medium	LaborCost1	Journeyman	264	9,293	0	264	3,687	0	0	1,210	622	15,076
				31.65	*0.00*	*1.00*	*14.30*	*0.00*				*53.20*
Equip. Operators, Oilers	LaborCost1	Journeyman	14	444	0	14	201	0	0	58	30	747
				22.84	*0.00*	*1.00*	*12.04*	*0.00*				*40.43*
Laborers, (Semi-Skilled)	LaborCost1	Journeyman	1,889	43,142	0	1,889	22,742	0	0	5,700	4,321	77,794
				23.34	*0.00*	*1.00*	*12.04*	*0.00*				*41.02*
Laborers, (Semi-Skilled)	LaborCost1	Foreman	753	17,577	0	753	9,067	0	0	2,320	2,552	32,270
				31.65	*0.00*	*1.00*	*14.30*	*0.00*				*53.20*
Outside Equip. Oilers	LaborCost1	Journeyman	4	127	0	4	57	0	0	17	8	213
				34.21	*0.00*	*1.00*	*14.30*	*0.00*				*56.26*
Outside Equip. Operators, Light	LaborCost1	Journeyman	45	1,528	0	45	639	0	0	199	102	2,514
				36.21	*0.00*	*1.00*	*14.30*	*0.00*				*58.65*
Outside Equip. Operators, Light	LaborCost1	Foreman	12	435	0	12	172	0	0	57	29	704
				35.16	*0.00*	*1.00*	*13.95*	*0.00*				*57.04*
Outside Equip. Operators, Medium	LaborCost1	Journeyman	389	13,688	0	389	5,431	0	0	1,782	917	22,207
				37.16	*0.00*	*1.00*	*13.95*	*0.00*				*59.43*

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Outside Equip. Operators, Medium	LaborCost1	Foreman	68	2,534	0	68	951	0	0	329	170	4,053
				22.84	*0.00*	*1.00*	*12.04*	*0.00*				*40.43*
Outside Laborers, (Semi-Skilled)	LaborCost1	Journeyman	556	12,699	0	556	6,694	0	0	1,678	851	22,478
				24.84	*0.00*	*1.00*	*12.04*	*0.00*				*42.81*
Outside Laborers, (Semi-Skilled)	LaborCost1	Foreman	24	604	0	24	293	0	0	80	40	1,042
				31.63	*0.00*	*1.00*	*12.32*	*0.00*				*51.20*
Outside Plumbers	LaborCost1	Journeyman	47	1,493	0	47	582	0	0	195	100	2,417
				33.63	*0.00*	*1.00*	*12.32*	*0.00*				*53.59*
Outside Plumbers	LaborCost1	Foreman	24	794	0	24	291	0	0	103	53	1,265
				25.57	*0.00*	*1.00*	*15.49*	*0.00*				*47.14*
Outside Truck Drivers, Heavy	LaborCost1	Journeyman	27	684	0	27	414	0	0	90	46	1,261
				31.63	*0.00*	*1.00*	*12.32*	*0.00*				*51.20*
Plumbers	LaborCost1	Journeyman	100	3,160	0	100	1,231	0	0	413	212	5,115
				25.30	*0.00*	*1.00*	*12.32*	*0.00*				*43.65*
Plumbers	LaborCost1	Apprentice	36	912	0	36	444	0	0	120	61	1,573
				32.13	*0.00*	*1.00*	*12.32*	*0.00*				*51.80*
Plumbers	LaborCost1	Foreman	12	386	0	12	148	0	0	50	26	622
				33.06	*0.00*	*1.00*	*15.59*	*0.00*				*56.18*
Rodmen, (Reinforcing)	LaborCost1	Journeyman	3	105	0	3	49	0	0	14	7	178
				25.84	*0.00*	*1.00*	*12.04*	*0.00*				*44.01*
Skilled Workers	LaborCost1	Journeyman	33	848	0	33	395	0	0	111	57	1,444
				32.61	*0.00*	*1.00*	*13.27*	*0.00*				*53.32*
Steam/Pipefitters	LaborCost1	Journeyman	6	190	0	6	77	0	0	25	13	311
				26.09	*0.00*	*1.00*	*13.27*	*0.00*				*45.53*
Steam/Pipefitters	LaborCost1	Apprentice	5	139	0	5	71	0	0	18	9	243
				26.05	*0.00*	*1.00*	*15.28*	*0.00*				*50.61*
Stone Masons	LaborCost1	Journeyman	40	1,042	0	40	611	0	0	137	169	1,999
				26.55	*0.00*	*1.00*	*15.28*	*0.00*				*51.26*
Stone Masons	LaborCost1	Foreman	40	1,062	0	40	611	0	0	139	172	2,025
				33.06	*0.00*	*1.00*	*15.59*	*0.00*				*56.18*
Structural Steel Workers	LaborCost1	Journeyman	4	132	0	4	62	0	0	17	9	225
				32.19	*0.00*	*1.00*	*2.35*	*0.00*				*41.90*

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Surveyors, Chief	LaborCost1	Journeyman	16	515	0	16	38	0	0	67	34	670
				15.36	*0.00*	*1.00*	*1.45*	*0.00*				*20.91*
Surveyors, Helper	LaborCost1	Journeyman	16	246	0	16	23	0	0	33	16	335
				25.57	*0.00*	*1.00*	*15.49*	*0.00*				*47.14*
Truck Drivers, Heavy	LaborCost1	Journeyman	85	2,174	0	85	1,317	0	0	286	146	4,008
				25.04	*0.00*	*1.00*	*15.49*	*0.00*				*49.49*
Truck Drivers, Light	LaborCost1	Journeyman	510	12,775	0	510	7,903	0	0	1,682	2,299	25,169

Description	CostType	ConditionType	Model		EQHours	Ownership	Operating	Total
Equipment by Contractor Report					**2,722**	**28,170**	**65,449**	**93,619**
						9.53	*18.20*	*27.73*
EP C10BO013 COMPACTOR, TRENCH ROLLER, VIBRATORY, 33.5"W X 19.7" DIA, DOUBLE TAMPING FOOT DRUMS, WALK BEHIND, 18000 LBS IMPACT	EP	Average	BMP851		8	80	152	231
						1.01	*1.34*	*2.35*
EP H25AX001 HYDRAULIC EXCAVATOR, ATTACHMENT, COMPACTOR, 23" WIDE, SHEEPS FOOT, 3 RIMS - 38" DIA (ADD 25,000-50,000 LB HYDRAULIC EXCAVATOR)	EP	Average	DC-24BL		16	16	21	38
						0.24	*1.07*	*1.31*
EP L15HZ001 POST HOLE DRILL, UP TO 8" DIA, 30" DEEP, ONE MAN OPERATION	EP	Average	PH980E		2	0	2	3
						1.57	*1.88*	*3.46*
EP T10LE005 TRACTOR ATTACHMENTS, POWER HARROW, 160" WIDE ROTERRA ROTARY HOE (ADD 75 HP TRACTOR W/PTO)	EP	Average	400-35		6	10	12	21
						1.38	*1.68*	*3.07*
EP T45XX026 TRUCK TRAILER, MISCELLANEOUS/UTILITY, TILT BED, 12 TON, 2 AXLE (ADD TOWING TRUCK)	EP	Average			403	557	679	1,236
						2.48	*7.48*	*9.95*
EP T50FO005 TRK,HWY,10,000GVW,4X2, 1T-PICKUP	Non-EP	Average	F350		77	191	577	768
						2.32	*12.48*	*14.80*
EP T50XX006 TRUCK, HIGHWAY, CONVENTIONAL, 1 TON PICKUP, 4X4	EP	Average	4X4 1 180 CONV GAS		11	25	136	162
						2.82	*13.99*	*16.82*
GEN A15Z0140 AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)	EP	Average		250	4	11	52	63
						3.73	*18.94*	*22.68*
GEN A15Z0150 AIR COMPRESSOR, 375 CFM (11 CMM), 100 PSI (689 KPA) (ADD HOSE)	EP	Average		375	3	10	53	63
						0.23	*0.41*	*0.64*
GEN A20Z0400 PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)	EP	Average	CP-1230-S1.25		7	2	3	5
						0.67	*1.19*	*1.86*
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)	EP	Average			13	9	16	24
						8.44	*10.34*	*18.78*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average	MAXIMIZER 11	13	108	132	239
					0.86	*2.23*	*3.08*
GEN C10Z1360 COMPACTOR, RAMMER, 9" (229 MM) WIDE x 14" (356 MM) SHOE	EP	Average	BT 50	3	2	6	9
					0.66	*2.88*	*3.54*
GEN C10Z1380 COMPACTOR, VIBROPLATE, 18" (457 MM) WIDE x 21.5" (546 MM) PLATE	EP	Average	BP 18/45-2	4	3	13	15
					9.17	*18.22*	*27.39*
GEN C10Z1440 COMPACTOR, ROLLER, VIBRATORY, 29.5" (749 MM) WIDE, 2.25 TON (2.0 MT), DOUBLE DRUM, WALK-BEHIND	EP	Average	RT 56-SC	12	110	219	329
					6.19	*15.21*	*21.40*
GEN C55Z1950 CONCRETE PUMP, 50 CY/HR (38 M3/HR), TRAILER MOUNTED (ADD HOSE)	EP	Average	ST-45	2	12	30	43
					37.53	*78.59*	*116.12*
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	EP	Average	BPL 900/KVM 23	1	25	52	77
					2.01	*8.63*	*10.64*
GEN C60Z1980 CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)	EP	Average	FS 3500/30	5	9	39	48
					3.97	*8.44*	*12.41*
GEN C60Z1990 CONCRETE SAW, RAIL SAW, 15.5" (394 MM) DEPTH, WALL (ADD 250 CFM (7 CMM) COMPRESSOR & COST FOR SAWBLADE WEAR)	EP	Average	360-10AP	19	76	162	238
					18.54	*40.69*	*59.23*
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4	EP	Average	RT525E	25	460	1,009	1,469
					17.36	*45.93*	*63.30*
GEN D30Z2890 DRILL, EARTH/AUGER, MULTI-PURPOSE, 8" (203 MM) DIA, 250' (76.2 M) DEPTH, 7,000 FT-LBS (967.8 KGF -M) TORQUE, W/21,000 LB (9,525 KG) GVW TRUCK W/PTO DRIVE (ADD COST FOR DRILL STEEL AND CUTTING EDGE)	EP	Average	B-58	9	164	433	597
					1.44	*12.65*	*14.10*
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	EP	Average	35G	24	34	299	333
					14.19	*29.85*	*44.04*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN G15Z3080 GRADER, MOTOR, ARTICULATED, 135 HP (101 KW), 12' (3.6 M) BLADE WIDTH	EP	Average	135-H	16	230	483	713
					14.30	*25.85*	*40.16*
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH	EP	Average	135SR LC	10	144	259	403
					20.59	*33.67*	*54.25*
GEN H25Z3175 HYDRAULIC EXCAVATOR, CRAWLER, 40,000 LB (18,144 KG), 1.00 CY (0.8 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH	EP	Average	PC 150LC-6	16	329	539	868
					27.32	*50.00*	*77.32*
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH	EP	Average	325BL	39	1,074	1,966	3,041
					28.98	*58.52*	*87.49*
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH	EP	Average	330CL	64	1,855	3,745	5,600
					32.27	*44.77*	*77.04*
GEN H30Z3760 HYDRAULIC EXCAVATOR, WHEEL, 44,851 LBS (20,344.1 KG), 0.75 CY (0.6 M3), TELESCOPIC BOOM, 6X4	EP	Average	XL4100	4	129	179	308
					9.68	*26.15*	*35.82*
GEN L35Z4240 LOADER, FRONT END, CRAWLER, 1.50 CY (1.2 M3) BUCKET	EP	Average	939-C	2	22	60	82
					8.96	*21.51*	*30.48*
GEN L40Z4390 LOADER, FRONT END, WHEEL, ARTICULATED, 1.75 CY (1.3 M3) BUCKET, 4X4	EP	Average	914G	16	145	348	493
					15.03	*38.35*	*53.38*
GEN L40Z4397 LOADER, FRONT END, WHEEL, ARTICULATED, 3.25 CY (2.5 M3) BUCKET, 4X4	EP	Average	938G	12	188	479	667
					20.73	*50.33*	*71.06*
GEN L40Z4410 LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4	EP	Average	962G	31	643	1,560	2,203
					30.98	*69.28*	*100.26*
GEN L40Z4420 LOADER, FRONT END, WHEEL, ARTICULATED, 5.50 CY (4.2 M3) BUCKET, 4X4	EP	Average	980G II	5	162	362	524
					46.34	*98.57*	*144.91*
GEN L40Z4440 LOADER, FRONT END, WHEEL, ARTICULATED, 7.00 CY (5.4 M3) BUCKET, 4X4	EP	Average	988G	12	556	1,183	1,739

Description	CostType	ConditionType	Model		EQHours	Ownership	Operating	Total
						2.33	*8.88*	*11.22*
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9 -11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	EP	Average		753	53	124	473	598
						26.99	*47.33*	*74.31*
GEN P35Z4950 PIPELAYER, 20' (0.5 M) BOOM, 90,000 LB (40,823 KG)	EP	Average	572-R		24	637	1,117	1,754
						0.13	*0.26*	*0.39*
GEN P50Z5086 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (76 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION	EP	Average			2	0	1	1
						15.06	*39.90*	*54.95*
GEN R50Z5810 ROLLER, VIBRATORY, SELF-PROPELLED, SINGLE DRUM, SMOOTH, 12 TON (10.9 MT), 84" (2.1 M) WIDE, SOIL COMPACTOR	EP	Average	CS-563E		16	244	646	890
						9.13	*25.15*	*34.28*
GEN T15Z6440 TRACTOR, CRAWLER (DOZER), 76-100 HP (57-75 KW), POWERSHIFT, W/UNIVERSAL BLADE	EP	Average	D-4G XL		16	146	401	546
						14.37	*38.63*	*53.00*
GEN T15Z6480 TRACTOR, CRAWLER (DOZER), 101-135 HP (75 -101 KW), POWERSHIFT, W/ UNIVERSAL BLADE	EP	Average	1150H WT		37	535	1,439	1,974
						31.52	*79.48*	*111.00*
GEN T15Z6520 TRACTOR, CRAWLER (DOZER), 181-250 HP (135-186 KW), POWERSHIFT, LGP, W/UNIVERSAL BLADE	EP	Average	D-7R II LGP		7	224	565	790
						0.42	*0.34*	*0.76*
GEN T40Z6960 TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	EP	Average	8' X 12'		2	1	1	2
						0.61	*0.50*	*1.11*
GEN T40Z7000 TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	EP	Average	8' X 20'		19	12	10	21
						2.35	*2.02*	*4.37*
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average			4	9	8	16
						1.13	*0.98*	*2.11*
GEN T40Z7090 TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average	KLEENSIDE		53	59	51	111
						2.50	*3.64*	*6.14*
GEN T45Z7080 TRUCK TRAILER, END DUMP, 17 CY (13 CM), 22 TON (20.0 MT) (ADD TOWING TRUCK)	EP	Average	28' SK2000		16	40	58	98

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					5.91	*12.79*	*18.70*
GEN T45Z7280 TRUCK TRAILER, WATER TANKER, 5,000 GAL (18,927 L) (ADD 50,000 LB (22,680 KG) GVW TRUCK)	EP	Average		1	6	13	19
					1.52	*9.03*	*10.54*
GEN T50Z7305 TRUCK, HIGHWAY, CONVENTIONAL, 3,500 LB (1,588 KG) GVW, 4X2, 2 AXLE, COMPACT-PICKUP	EP	Average	4X2 1/2 130 CONV GAS	4	6	36	42
					1.88	*9.26*	*11.14*
GEN T50Z7310 TRUCK, HIGHWAY, CONVENTIONAL, 8,600 LB (3,901 KG) GVW, 4X2, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP	EP	Average	4X2 3/4 130 CONV GAS	4	8	37	45
					2.23	*9.59*	*11.82*
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP	EP	Average	4X4 3/4 130 CONV GAS	24	53	226	279
					2.85	*30.43*	*33.28*
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	EP	Average	4X2 25KGVW GAS	550	1,568	16,740	18,308
					7.79	*31.40*	*39.19*
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	EP	Average	6X4 45KGVW DSL	72	564	2,273	2,837
					7.87	*34.78*	*42.66*
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	EP	Average	4X2 35KGVW DSL	25	195	860	1,055
					7.14	*39.27*	*46.41*
GEN T50Z7520 TRUCK, HIGHWAY, 55,000 LB (24,948 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	EP	Average	6X4 55KGVW DSL	1	7	39	46
					8.54	*35.38*	*43.93*
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2	EP	Average	4X2 35KGVW DSL	3	23	94	116
					0.72	*4.83*	*5.55*
GEN W25Z8605 WATER BLASTER, LOW PRESSURE, COLD WATER, 5.5 GPM (20.8 LPM) 1 NOZZLE, @ 3,500 PSI (24,132 KPA)	EP	Average	COLD 4/3000G	1	1	5	6
					0.40	*1.33*	*1.73*
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED	EP	Average	IDEAL ARC R3R-300	7	3	9	12
					1.12	*0.61*	*1.73*
GEN XMEZ8815 LASER LEVEL FOR PIPES	Non-EP	Average	MISC. EQUIPMENT	16	18	10	28
					0.78	*2.01*	*2.79*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN XMEZ9120 POST DRIVER, 8" (203 MM) MAX DIA POST, 30,000 LB (13,608 KG) IMPACT (ADD 20,000-35,000 LB (9,072-15,876 KG) GVW TRUCK)	Non-EP	Average	MISC. EQUIPMENT	81	64	164	227
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR	Non-EP	Average	MISC. EQUIPMENT	25	*0.63* 16	*3.53* 88	*4.16* 104
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE	Non-EP	Average	MISC. EQUIPMENT	24	*0.57* 14	*1.55* 37	*2.12* 50
MAP C10BO011 COMPACTOR, ROLLER, VIBRATORY, 29.9"W X 19.7"DIA, DOUBLE SMOOTH DRUMS, WALK BEHIND, 1980 LBS IMPACT	EP	Average	BW 75AD-2	21	*2.46* 51	*6.58* 138	*9.03* 189
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD	EP	Average	BPL 900/KVM 23	1	*37.53* 45	*78.59* 93	*116.12* 138
MAP C75GV021 CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB	EP	Average	YB4410	7	*7.90* 54	*25.64* 174	*33.53* 228
MAP C75GV023 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 30 TON, 95' BOOM, 4X4	EP	Average	RT530E	27	*19.27* 520	*46.06* 1,244	*65.33* 1,764
MAP C75GV028 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 25 TON, 75' BOOM, 4X4X4	EP	Average	RT525E	10	*18.54* 180	*40.69* 395	*59.23* 575
MAP C80TE005 CRANES, HYDRAULIC, TRUCK MTD, ALL TERRAIN, 20 TON, 94' BOOM, 6X4X2	EP	Average	T 220	12	*19.73* 237	*45.79* 549	*65.53* 786
MAP H25KN002 HYDRAULIC EXCAVATOR, ATTACHMENT, CONCRETE PULVERIZER, 3000 LB, W/POINT (ADD 26,000-36,000 LB HYDRAULIC EXCAVATOR)	EP	Average	KF19 QT	8	*6.15* 49	*8.72* 70	*14.87* 119
MAP H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, TELESCOPIC BOOM, 22'6" DIGGING DEPTH, 6X4	EP	Average	XL4100	80	*32.27* 2,582	*44.77* 3,582	*77.04* 6,163
MAP L15FG001 LANDSCAPING EQUIPMENT, HYDROSEEDER, 3000 GAL, TRUCK MTD (INCLUDES 56,000 GVW TRUCK)	EP	Average	T330	23	*11.07* 255	*32.04* 737	*43.11* 992

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					22.53	*54.09*	*76.62*
MAP L35CA014 LOADER, FRONT END, CRAWLER, 3.20 CY BUCKET	EP	Average	963-C	3	68	162	230
					5.18	*12.65*	*17.83*
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4	EP	Average	212S (4WS)	139	722	1,765	2,487
					13.03	*31.50*	*44.53*
MAP R45BO006 ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR	EP	Average	BW151AD-2	1	8	18	26
					23.44	*52.23*	*75.67*
MAP S10CA001 SCRAPER, ELEVATING LOADING, 11 CY, 13 TON, 4X2 - SINGLE POWERED	EP	Average	613-C SERIES II	39	914	2,037	2,952
					2.54	*2.71*	*5.24*
MAP T10CA010 TRACTOR ATTACHMENTS, BLADE, POWER ANGLE, HYDRAULIC, FOR D6, 4.16 CY (ADD D6 TRACTOR)	EP	Average	D6-108-3982	80	203	217	420
					31.52	*79.48*	*111.00*
MAP T15CA014 TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)	EP	Average	D-7R II LGP	6	193	486	679
					34.76	*93.36*	*128.12*
MAP T15CA016 TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-8R II	10	339	910	1,249
					9.13	*25.15*	*34.28*
MAP T15CA020 TRACTOR, CRAWLER (DOZER), 80 HP, POWERSHIFT, W/2.18 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-4G XL	6	56	155	211
					14.37	*38.63*	*53.00*
MAP T15CS007 TRACTOR, CRAWLER (DOZER), 119 HP, POWERSHIFT, W/3.90 CY UNIVERSAL BLADE (ADD ATTACHMENTS)	EP	Average	1150H WT	37	530	1,426	1,956
					1.52	*9.03*	*10.54*
MAP T50XX001 TRUCK, HIGHWAY, CONVENTIONAL, 1/2 TON PICKUP, 4X2	EP	Average	4X2 1/2 130 CONV GAS	6	9	55	65
					30.92	*43.89*	*74.81*
USR H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, 22'6" DIGGING DEPTH, TELESCOPIC BOOM, 6X4	EP	Average	XL4100	32	990	1,404	2,394

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					200.00	*0.00*	*200.00*
USR JUA-WELD HDPE Butt-fusion Machine	Non-EP Rental	Average	WELD	24	4,720	0	4,720
					48.57	*93.90*	*142.47*
USR L40CA008 LOADER, FRONT END, WHEEL, 9.00 CY BUCKET, ARTICULATED, 4X4	EP	Average	988F SERIES II	23	1,117	2,160	3,277
					21.48	*46.56*	*68.05*
USR L40Z4410 962G LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4	EP	Average	962G	25	541	1,173	1,715
					18.28	*50.78*	*69.06*
USR T15CA023 TRACTOR, CAT D6, CRAWLER (DOZER), 165 HP, LOW GROUND PRESSURE, POWERSHIFT, W/ 5.09 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-6R	80	1,463	4,062	5,525
					9.05	*44.33*	*53.38*
USR T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW 6X4, 3 AXLE, (ADD ACCESSORIES)	EP	Average	C500B	40	362	1,773	2,135

Description **Page**

MCACES FOR ALTERNATIVE 3

Tujunga Wash, Ecosytem Restoration Study - Alt 3
Junction Structure to existing channel wall of Tujunga Wash

Estimated by	Juan Dominguez, PE, CCE
Designed by	Chris Tu PE and Wilson Diep PE
Prepared by	U.S. Army Corps of Engineers

Preparation Date	12/18/2007
Effective Date of Pricing	12/18/2007
Estimated Construction Time	180 Days

Designed by
Chris Tu PE and Wilson Diep PE
Estimated by
Juan Dominguez, PE, CCE
Prepared by
U.S. Army Corps of Engineers

Design Document	Feasibility
Document Date	12/18/2007
District	Los Angeles
Contact	Juan Dominguez, x3737
Budget Year	2007
UOM System	Original

Direct Costs
LaborCost
EQCost
MatlCost
SubBidCost
UserCost1

Timeline/Currency

Preparation Date	12/18/2007
Escalation Date	12/18/2007
Eff. Pricing Date	12/18/2007
Estimated Duration	180 Day(s)
Currency	US dollars
Exchange Rate	1.000000

Costbook CB06EB: MII English Cost Book 2006

Labor LB07LA: Labor_Los Angeles 2007

Note: Taxable fringe: vacation Non-taxable fringe: health, welfare, training, 401K, pension and travel.

Labor Rates
LaborCost1
LaborCost2
LaborCost3
LaborCost4

Equipment EP05R07: MII Equipment Region 7 2005

07 WEST

Sales Tax	8.25
Working Hours per Year	1,630
Labor Adjustment Factor	1.16
Cost of Money	5.13
Cost of Money Discount	25.00
Tire Recap Cost Factor	1.50
Tire Recap Wear Factor	1.80
Tire Repair Factor	0.15
Equipment Cost Factor	1.00
Standby Depreciation Factor	0.50

Fuel

Electricity	0.087
Gas	3.000
Diesel Off-Road	2.750
Diesel On-Road	3.250

Shipping Rates

Over 0 CWT	2.71
Over 240 CWT	2.81
Over 300 CWT	3.48
Over 400 CWT	6.17
Over 500 CWT	6.73
Over 700 CWT	5.05
Over 800 CWT	4.49

Direct Cost Markups

Productivity

Overtime

	Days/Week	Hours/Shift	Shifts/Day
Standard	*5.00*	*8.00*	*1.00*
Actual	*5.00*	*8.00*	*1.00*

Day	*OT Factor*	*Working*
Monday	*1.50*	*Yes*
Tuesday	*1.50*	*Yes*
Wednesday	*1.50*	*Yes*
Thursday	*1.50*	*Yes*
Friday	*1.50*	*Yes*
Saturday	*1.50*	*No*
Sunday	*2.00*	*No*

Sales Tax
MatlCost

Category

Productivity

Overtime

1st Shift	2nd Shift	3rd Shift
8.00	*0.00*	*0.00*
8.00	*0.00*	*0.00*

OT Percent	*FCCM Percent*
0.00	*0.00*

TaxAdj

Method

Productivity

Overtime

Running % on Selected Costs

Contractor Markups

JOOH
HOOH
Profit
Bond

Category

JOOH
HOOH
Profit
Bond

Method

JOOH — Running %
HOOH — Running %
Profit — Running %
Bond — Running %

Owner Markups

Escalation

StartDate	*StartIndex*	*EndDate*	*EndIndex*	*Escalation*

Contingency
SIOH

Category

Escalation

Contingency
SIOH

Method

Escalation

Contingency — Running %
SIOH — Running %

Description	Quantity	UOM	BareCost	DirectCost	CostToPrime	ContractCost
Project Summary Report			**1,840,442**	**1,927,875**	**2,220,266**	**2,640,635**
			0.00	*0.00*	*0.00*	*0.00*
01. Lands and Damages	**1.00**	**EA**	**0**	**0**	**0**	**0**
			1,767,529.92	*1,853,224.09*	*2,131,127.43*	*2,536,551.71*
09. Tujunga Wash Ecosystem Restoration	**1.00**	**EA**	**1,767,530**	**1,853,224**	**2,131,127**	**2,536,552**
			1,767,529.92	*1,853,224.09*	*2,131,127.43*	*2,536,551.71*
0901. Tujunga Wash	**1.00**	**EA**	**1,767,530**	**1,853,224**	**2,131,127**	**2,536,552**
			80,005.07	*83,461.97*	*83,461.97*	*106,990.58*
090101. Mob, Demob and Preparatory Work	**1.00**	**EA**	**80,005**	**83,462**	**83,462**	**106,991**
09010101. Diversion and Control of Water at South Channel	**1.00**	**LS**	**19,369**	**20,616**	**20,616**	**26,428**
			10,000.00	*10,000.00*	*10,000.00*	*12,819.08*
09010102. Mobilization and Demobilization	**1.00**	**EA**	**10,000**	**10,000**	**10,000**	**12,819**
			41,620.74	*43,315.05*	*43,315.05*	*55,525.92*
09010103. Demolition	**1.00**	**EA**	**41,621**	**43,315**	**43,315**	**55,526**
			1,186.29	*1,254.08*	*1,254.08*	*1,607.61*
09010104. Clear and Grub	**7.60**	**ACR**	**9,016**	**9,531**	**9,531**	**12,218**
090113. Traffic Control	**1.00**	**LS**	**4,131**	**4,477**	**4,477**	**5,739**
09011301. Traffic Detour at Sherman Way	**1.00**	**LS**	**4,131**	**4,477**	**4,477**	**5,739**
			297,896.93	*311,606.91*	*369,745.69*	*433,110.15*
090198. Landscape	**4.78**	**ACR**	**1,423,947**	**1,489,481**	**1,767,384**	**2,070,267**
			29.79	*32.62*	*39.60*	*45.86*
09019801. Fencing	**14,645.00**	**FT**	**436,325**	**477,730**	**579,889**	**671,550**
09019802. Surfacing	**1.00**	**LS**	**152,216**	**153,580**	**153,580**	**196,875**
09019803. Furnishings	**1.00**	**LS**	**33,766**	**36,330**	**36,330**	**46,571**
			0.23	*0.25*	*0.31*	*0.36*
09019804. Seeding	**208,020.00**	**SF**	**48,858**	**52,812**	**64,105**	**74,238**
09019805. Irrigation	**1.00**	**LS**	**582,508**	**586,570**	**712,004**	**824,547**
09019806. Planting	**1.00**	**LS**	**112,548**	**118,554**	**143,906**	**166,652**
			12,076.76	*13,369.40*	*16,228.34*	*18,793.49*
09019807. Plant Establishment/Maintenance, 1st Yr	**4.78**	**ACR**	**57,727**	**63,906**	**77,571**	**89,833**
			259,446.90	*275,803.79*	*275,803.79*	*353,555.14*
090199. Stream, Ponds and Junction Structure	**1.00**	**EA**	**259,447**	**275,804**	**275,804**	**353,555**

Description	Quantity	UOM	BareCost	DirectCost	CostToPrime	ContractCost
09019901. Junction Structure to existing channel wall of Tujunga Wash	**1.00**	**LS**	**13,635**	**14,201**	**14,201**	**18,204**
			11.14	*11.58*	*11.58*	*14.84*
09019902. Excavation (Stream and Ponds)	**3,070.00**	**CY**	**34,195**	**35,543**	**35,543**	**45,563**
			96.31	*102.52*	*102.52*	*131.42*
09019903. 18" HDPE Pipe	**1,160.00**	**LF**	**111,714**	**118,926**	**118,926**	**152,452**
			10.94	*11.04*	*11.04*	*14.15*
09019904. Disposal of Excess Material	**320.00**	**CY**	**3,501**	**3,533**	**3,533**	**4,529**
			99.60	*107.21*	*107.21*	*137.44*
09019905. Clay Layer, 6" Lining of pond and stream	**600.00**	**CY**	**59,761**	**64,327**	**64,327**	**82,461**
			6,931.22	*7,167.06*	*7,167.06*	*9,187.52*
09019906. Concrete Headwall Structures	**2.00**	**EA**	**13,862**	**14,334**	**14,334**	**18,375**
09019907. Water Intake and Underground Valve Structures	**1.00**	**LS**	**16,119**	**17,773**	**17,773**	**22,783**
			565.15	*606.31*	*606.31*	*777.23*
09019908. Sawcut/Demo existing channel INVERT at South Channel	**4.00**	**CY**	**2,261**	**2,425**	**2,425**	**3,109**
			2,199.48	*2,370.74*	*2,370.74*	*3,039.08*
09019909. Sawcut/Demo existing channel WALL at South Channel	**2.00**	**CY**	**4,399**	**4,741**	**4,741**	**6,078**
14. Recreational Facilities	**1.00**	**LS**	**72,912**	**74,651**	**89,138**	**104,083**
140023 Landscaping Recreational Facilities	**1.00**	**LS**	**72,912**	**74,651**	**89,138**	**104,083**
14002301. Surfacing (D.G. Paving and Road)	**1.00**	**LS**	**6,569**	**6,905**	**6,905**	**8,851**
			0.44	*0.47*	*0.47*	*0.60*
D.G. Paving	**3,540.00**	**SF**	**1,564**	**1,648**	**1,648**	**2,112**
			0.39	*0.41*	*0.41*	*0.52*
12 ft wide D.G. Road/Trail (1/2 the area)	**12,841.00**	**SF**	**5,005**	**5,257**	**5,257**	**6,739**
			66,342.99	*67,746.68*	*82,233.79*	*95,232.15*
14002302. Fencing	**1.00**	**EA**	**66,343**	**67,747**	**82,234**	**95,232**
			1,187.25	*1,295.32*	*1,572.32*	*1,820.85*
Stone Columns	**8.00**	**EA**	**9,498**	**10,363**	**12,579**	**14,567**
			2,372.51	*2,642.05*	*3,207.03*	*3,713.95*
14' Wide, 5' Ht Welded Steel Wire Fence Mesh "Gaelic Fence"	**2.00**	**EA**	**4,745**	**5,284**	**6,414**	**7,428**
			20.00	*20.00*	*24.28*	*28.11*
Guard Cable Fence, 3'-6" Ht	**2,605.00**	**LF**	**52,100**	**52,100**	**63,241**	**73,237**

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
Project Direct Costs Report (Details)					**251,560**	**96,750**	**711,743**	**867,583**	**240**	**1,927,875**
					0.00	*0.00*	*0.00*	*0.00*		*0.00*
1 Lands and Damages		**1.00**	**EA**		**0**	**0**	**0**	**0**	**0**	**0**
1.1 Real Estate Costs		1.00	LS		0	0	0	0	0	0
(Note: Submittted by real estate Dec 2 '08)										
					244,982.66	*92,622.41*	*702,299.88*	*813,079.15*		*1,853,224.09*
3 Tujunga Wash Ecosystem Restoration	**1 Prime Contractor**	**1.00**	**EA**		**244,983**	**92,622**	**702,300**	**813,079**	**240**	**1,853,224**
					244,982.66	*92,622.41*	*702,299.88*	*813,079.15*		*1,853,224.09*
3.1 Tujunga Wash	**1 Prime Contractor**	**1.00**	**EA**		**244,983**	**92,622**	**702,300**	**813,079**	**240**	**1,853,224**
					30,101.81	*10,405.15*	*0.00*	*42,955.00*		*83,461.97*
3.1.1 Mob, Demob and Preparatory Work	**1 Prime Contractor**	**1.00**	**EA**		**30,102**	**10,405**	**0**	**42,955**	**0**	**83,462**
3.1.1.1 Diversion and Control of Water at South Channel	**1 Prime Contractor**	**1.00**	**LS**		**10,906**	**3,500**	**0**	**6,210**	**0**	**20,616**
					0.00	*0.00*	*0.00*	*1,035.00*	*0.00*	*1,035.00*
3.1.1.1.2.1 4" Submersible Pump Rental, Month. (2 ea for 3 months = 6 months)	1 Prime Contractor	6.00	MO		0	0	0	6,210	0	6,210
					7,007.43	*0.00*	*0.00*	*0.00*	*0.00*	*7,007.43*
3.1.1.1.2.2 Pump Tender	1 Prime Contractor	1.00	MO		7,007	0	0	0	0	7,007
					0.00	*0.00*	*0.00*	*10,000.00*		*10,000.00*
3.1.1.2 Mobilization and Demobilization	**1 Prime Contractor**	**1.00**	**EA**		**0**	**0**	**0**	**10,000**	**0**	**10,000**
					0.00	*0.00*	*0.00*	*400.00*	*0.00*	*400.00*
3.1.1.2.1 Mob/Demob Assume 10 heavy pieces of	1 Prime Contractor	10.00	EA		0	0	0	4,000	0	4,000
(Note: equipment)										
3.1.1.2.2 Preparatory & Clean-up	1 Prime Contractor	1.00	LS		0	0	0	2,000	0	2,000

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*1,000.00*	*0.00*	*1,000.00*
3.1.1.2.3 Exploratory Excv @ Connctn Ptos	1 Prime Contractor	1.00	EA		0	0	0	1,000	0	1,000
					0.00	*0.00*	*0.00*	*5.00*	*0.00*	*5.00*
3.1.1.2.4 Fencing Securing Temp construction yard	1 Prime Contractor	600.00	LF		0	0	0	3,000	0	3,000
					14,663.21	*1,906.84*	*0.00*	*26,745.00*		*43,315.05*
3.1.1.3 Demolition	**1 Prime Contractor**	**1.00**	**EA**		**14,663**	**1,907**	**0**	**26,745**	**0**	**43,315**
					0.00	*0.00*	*0.00*	*1.00*	*0.00*	*1.00*
3.1.1.3.3.1 AC and ABC Demolition including disposal fees	1 Prime Contractor	24,645.00	SF		0	0	0	24,645	0	24,645
(Note: Richardsons 2-100, p3)										
					596.37	*657.71*	*0.00*	*0.00*		*1,254.08*
3.1.1.4 Clear and Grub	**1 Prime Contractor**	**7.60**	**ACR**		**4,532**	**4,999**	**0**	**0**	**0**	**9,531**
					0.27	*0.39*	*0.00*	*0.00*	*0.00*	*0.65*
3.1.1.4.1 Clear and Grubb under ideal conditions, upper 2"	1 Prime Contractor	2,045.00	CY	CODTB10B	550	790	0	0	0	1,339
					1.74	*1.84*	*0.00*	*0.00*	*0.00*	*3.58*
3.1.1.4.2 Hauling, soil, 12 C.Y. truck, 5 mile haul, includes loading (12% swell)	1 Prime Contractor	2,290.00	LCY	CODEB30	3,983	4,209	0	0	0	8,192
3.1.2 Traffic Control	**1 Prime Contractor**	**1.00**	**LS**		**1,617**	**398**	**2,162**	**300**	**0**	**4,477**
3.1.2.1 Traffic Detour at Sherman Way	**1 Prime Contractor**	**1.00**	**LS**		**1,617**	**398**	**2,162**	**300**	**0**	**4,477**

(Note: Flagman duties, moving signs, etc... Most signs will be attached to the barricades. Other signs may be attached to existing posts or on top of existing signs. All sings carry their purchase price, since the signs will be reused throughout the job.)

(Note: Arrowhead monthly rental = $785/mo Light duty arrowhead purchasing price = $5,000. Heavy duty arrowhead purchasing price = $6,000. Assume the contractor will rent 1 arrowhead for 1 week. $785/4 wk = $200/week)

(Note: Purchase price.)

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: Purchased Price. All signs are 0.063 aluminum, Eng Grade Reflective, Stdsizes.)										
(Note: This covers costs such as running the arrowheads and miscll repairs due tovandalism, etc...)										
3.1.2.1.9.1 Delivery and Miscll costs	1 Prime Contractor	1.00	LS		0	0	0	300	0	300
(Note: This covers costs such as running the arrowheads and miscll repairs due tovandalism, etc...)										
					32,177.13	*7,116.00*	*120,921.14*	*151,392.64*		*311,606.91*
3.1.3 Landscape	**1 Prime Contractor**	**4.78**	**ACR**		**153,807**	**34,014**	**578,003**	**723,657**	**0**	**1,489,481**
					4.90	*1.17*	*26.34*	*0.20*		*32.62*
3.1.3.1 Fencing	**1.2 Fencing Subcontractor**	**14,645.00**	**FT**		**71,788**	**17,119**	**385,822**	**3,000**	**0**	**477,730**
3.1.3.1.4.1 Delivery	1.2 Fencing Subcontractor	1.00	LS		0	0	0	3,000	0	3,000
(Note: Assume 5 trucks @ $600/ea)										
3.1.3.2 Surfacing	**1 Prime Contractor**	**1.00**	**LS**		**7,069**	**4,814**	**7,008**	**134,688**	**0**	**153,580**
(Note: Finish grading (balancing cut/fill) is accounted under stream and ponds excavation.)										
(Note: t=3", width is 12', Area = 26,690 SF, Volume = 247 CY)										
(Note: Assume 20 ton/hr (a truck/hr))										
(Note: The other 1/2 is accounted under recreational resources (Acc. 14).)										
(Note: t=3", width is 12', Area = 25,682 SF, Volume = 238 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
3.1.3.2.4.1.4.1 Spread/compact DG	1 Prime Contractor	148.75	TON		731	481	0	0	0	1,212
3.1.3.3 Furnishings	**1 Prime Contractor**	**1.00**	**LS**		**8,015**	**5,033**	**21,202**	**2,079**	**0**	**36,330**
(Note: Allow 1 hr per location. Consider a crane for the 3-ton stones.)										

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Assume 3 ton/rock)										
(Note: Excavate 12" dia x 48" depth hole = 0.12 BCY excavation & 3000 psi concrete Embed 2-1/2" dia. galvanized steel post Use standard 48"x48" signs from 2006 English Cost Book)										
					29.40	*0.00*	*514.19*	*0.00*	*0.00*	*543.59*
3.1.3.3.7.1 Trash receptacle, reinforced concrete, circular, 32 gallon capacity	1 Prime Contractor	9.00	EA	ALABCLAB2	265	0	4,628	0	0	4,892
					67.58	*0.00*	*0.00*	*0.00*	*0.00*	*67.58*
3.1.3.3.7.2 Excavate by hand, normal soil, to 2' deep	1 Prime Contractor	0.52	BCY	B2	35	0	0	0	0	35
					258.99	*44.53*	*21.65*	*0.00*	*0.00*	*325.17*
3.1.3.3.7.3 Gravel fill, compacted, under receptacle	1 Prime Contractor	0.52	CY	B37	136	23	11	0	0	170
					0.00	*0.00*	*0.00*	*10.00*	*0.00*	*10.00*
3.1.3.3.7.4 Concrete Slab (15 sf/ea x 9 ea = 135 sf)	1 Prime Contractor	135.00	SF		0	0	0	1,350	0	1,350
					0.06	*0.02*	*0.16*	*0.01*		*0.25*
3.1.3.4 Seeding	**1.1 Landscape Subcontractor**	**208,020.00**	**SF**		**12,329**	**4,766**	**33,016**	**2,700**	**0**	**52,812**
(Note: Incorporated soil amendments as part of the tillage operation.)										
(Note: Tilling ranges from 2" to 4" deep.Productivity is 35 msf/hr.)										
(Note: This operation is concurrent with the tillage operation. Use sameproductivity. The skydsteer loader brings the amendments to the gradall orassists the gradall in other ways.)										
(Note: Moisten top 4".)										
(Note: 2-step process.)										
(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying 1/3 of the total amount. 2) Seed Mix A = 40.9 lb/acre and Mix B = 52.05 lb/acre. Productivity is 10 MSF/HR.)										
(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying remainder 2/3 of the total amount. 2) Hydrophilic Colloids (binder) = 103 lb/acr erosion ctrl material. Productivity is 10 MSF/HR.)										
(Note: Minimum depth of 1".)										

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Spray all visible weeds with a contact herbicide.)										
					184.81	*33.82*	*0.00*	*0.00*	*0.00*	*218.64*
3.1.3.4.1.7.1 Weed Abatement	1.1 Landscape Subcontractor	4.78	ACR		883	162	0	0	0	1,045
3.1.3.4.1.7.2 Miscll material costs	1.1 Landscape Subcontractor	1.00	LS		0	0	0	300	0	300
3.1.3.5 Irrigation	**1.1 Landscape Subcontractor**	**1.00**	**LS**		**16,763**	**1,714**	**27,051**	**541,042**	**0**	**586,570**
(Note: Inlcudes points of connections (2 ea), irrigation system, and electrical points of connections (2 ea))										
					0.00	*0.00*	*0.00*	*2.50*	*0.00*	*2.50*
3.1.3.5.5.1 Irrigation System	1.1 Landscape Subcontractor	208,216.80	SF		0	0	0	520,542	0	520,542
(Note: No design available at this stage of the design. Unit price on recently bidded Tujunga Wash Stream Restoration project equated to approximately $1/sf for a temporary system. SAR Reaches 2,3,7 IGE unit cost for irrigation amounts to $2.80/sf for a permanent system. Landscape Architect (Sandra Willis) mentioned the project might look like the SAR 2,3,7 project and it will be permanent. Assume $2.50/sf)										
3.1.3.6 Planting	**1.1 Landscape Subcontractor**	**1.00**	**LS**		**0**	**0**	**78,806**	**39,748**	**0**	**118,554**
(Note: Qty ratio out after the Tujunga Wash Restoration project. See: Planting QTY for Tujunga.xls)										
					0.00	*0.00*	*0.00*	*1,120.00*	*0.00*	*1,120.00*
3.1.3.6.1 48" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	1,120	0	1,120
					0.00	*0.00*	*0.00*	*1,000.00*	*0.00*	*1,000.00*
3.1.3.6.2 42" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	1,000	0	1,000
					0.00	*0.00*	*0.00*	*480.00*	*0.00*	*480.00*
3.1.3.6.3 36" box tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	480	0	480
					0.00	*0.00*	*216.50*	*0.00*	*0.00*	*216.50*
3.1.3.6.4 24" box tree	1.1 Landscape Subcontractor	364.00	EA		0	0	78,806	0	0	78,806
					0.00	*0.00*	*0.00*	*120.00*	*0.00*	*120.00*
3.1.3.6.5 15 gal tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	120	0	120
					0.00	*0.00*	*0.00*	*20.00*	*0.00*	*20.00*
3.1.3.6.6 5 gal tree	1.1 Landscape Subcontractor	1.00	EA		0	0	0	20	0	20

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*7.50*	*0.00*	*7.50*
3.1.3.6.7 1 gal shrub	1.1 Landscape Subcontractor	4,933.00	EA		0	0	0	36,998	0	36,998
					0.00	*0.00*	*0.00*	*10.50*	*0.00*	*10.50*
3.1.3.6.8 1 gal vines	1.1 Landscape Subcontractor	1.00	EA		0	0	0	11	0	11
					7,916.62	*118.80*	*5,250.30*	*83.68*		*13,369.40*
3.1.3.7 Plant Establishment/Maintenance, 1st Yr	**1.1 Landscape Subcontractor**	**4.78**	**ACR**		**37,841**	**568**	**25,096**	**400**	**0**	**63,906**

(Note: Eradicating weeds; protecting planted areas from surface erosion; maintaining slopes to design spec; trash removal; mowing; etc.)

(Note: Since the seed mix is heavy assume 10% of the initial planting will perish and will require replacement. Assume 90% survival rate out of 4.78 acres = 0.478 acres needs to be re-hydroseeded. Say 0.5 acr)

(Note: 2-step process.)

(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying 1/3 of the total amount. 2) Seed Mix A = 40.9 lb/acre and Mix B = 52.05 lb/acre. Productivity is 10 MSF/HR.)

(Note: 1) Mulch = 1,200 lb/acre (Wood cellulose fiber mulch) applying remainder 2/3 of the total amount. 2) Hydrophilic Colloids (binder) = 103 lb/acr erosion ctrl material. Productivity is 10 MSF/HR.)

(Note: 5,303 total plants x 10% = 530 plants need to be replanted)

(Note: Watering at intervals to maintain upper 4" moist. Water 5 times a week during the summer months and 2 times a week during the remainder of the establishment period. Assume 5 times/week for 2 months = 40 times and 2 times/week for the remainder 10 months = 80 times. For a total of 120 times.)

					0.00	*0.00*	*36.08*	*0.00*	*0.00*	*36.08*
3.1.3.7.4.1 Water cost @ $100/acre-ft	1.1 Landscape Subcontractor	574.00	ACR		0	0	20,710	0	0	20,710

(Note: Watering the top 4" translates into $33.33/acr. (4.78 acr x 120 times) = 574 acres.)

					59,457.07	*47,804.62*	*122,134.79*	*46,167.32*		*275,803.79*
3.1.4 Stream, Ponds and Junction Structure	**1 Prime Contractor**	**1.00**	**EA**		**59,457**	**47,805**	**122,135**	**46,167**	**240**	**275,804**
3.1.4.1 Junction Structure to existing channel wall of Tujunga Wash	**1 Prime Contractor**	**1.00**	**LS**		**4,116**	**2,706**	**1,159**	**6,220**	**0**	**14,201**
					0.00	*0.00*	*0.00*	*6,000.00*	*0.00*	*6,000.00*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.1.4.1 Outlet Structure	1 Prime Contractor	1.00	EA		0	0	0	6,000	0	6,000
(Note: Design is unavailable. Ball park figure based on Richardson's 2-36 , p1. Includes bottom slab, side walls, back wall, and flap gate.)										
					3.77	*6.05*	*0.00*	*1.76*		*11.58*
3.1.4.2 Excavation (Stream and Ponds)	**1 Prime Contractor**	**3,070.00**	**CY**		**11,571**	**18,572**	**0**	**5,400**	**0**	**35,543**
(Note: Assume 20% of the excavated volume is hauled away and 80% remains on-site. Remaining soil is shaped and contoured.)										
(Note: Allow 2 weeks)										
(Note: Assume contractor has "one-way access" in and out of the project site. Shrinkage factor = 1.20 Adjusted Volume = 614 BCY x 1.20 = 736.8 LCY Basis: 5 min load, 15 min haul loaded, 10 min wait/dump, 15 min haul unloaded and 15 min x-tra = 60 min. Roundtrip = one 12 LCY load/hr. Total = 12 Cy/hr @ 7 hr/day = 84 cy/day @ 8 hr of trucking. Total = 736.8 LCY / 84 LCY/day = 9 truck x 8 hrs = 72 hrs.)										
(Note: Allow 2 weeks)										
					0.00	*69.06*	*0.00*	*0.00*	*0.00*	*69.06*
3.1.4.2.5.1 TRACTOR, CAT D6, CRAWLER (DOZER), 165 HP, LOW GROUND PRESSURE, POWERSHIFT, W/ 5.09 CY SEMI-U BLADE (ADD ATTACHMENTS)	1 Prime Contractor	80.00	HR		0	5,525	0	0	0	5,525
					0.00	*5.24*	*0.00*	*0.00*	*0.00*	*5.24*
3.1.4.2.5.2 TRACTOR ATTACHMENTS, BLADE, POWER ANGLE, HYDRAULIC, FOR D6, 4.16 CY (ADD D6 TRACTOR)	1 Prime Contractor	80.00	HR		0	420	0	0	0	420
(Note: 4)										
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.2.5.3 Outside Equip. Operators, Medium	1 Prime Contractor	80.00	HR		0	0	0	0	0	0
					40.43	*0.00*	*0.00*	*0.00*	*0.00*	*40.43*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.2.5.4 Gradechecker	1 Prime Contractor	80.00	HR	1CLAB	3,234	0	0	0	0	3,234
					18.62	*13.82*	*52.47*	*17.61*		*102.52*
3.1.4.3 18" HDPE Pipe	**1 Prime Contractor**	**1,160.00**	**LF**		**21,595**	**16,035**	**60,870**	**20,427**	**0**	**118,926**
(Note: Production 67 bcy/hr or 84 lcy/hr (25% swell).)										
(Note: Accounted for 13% shrinkage and 20% overrun. That is 33% on top of the neat line qty (compacted cubic yards).1.5 ton/lcy.)										
(Note: Includes 90 deg elbow)										
(Note: Rent 3 trench boxes (10' deep x 12' long x 5' width). Box width can be adjusted to any size.The boxes are 10-feet deep by 12-feet long. Allow 8 hr equipment time for this operation.)										
(Note: The plates are 5-feet wide by 12-feet long. Plates are placed width-wise along the trench. Rent 3 plates for 1 mo. Allow 4hr for uncovering and covering the trench.)										
					0.00	*0.00*	*0.00*	*13.50*	*0.00*	*13.50*
3.1.4.3.6.1.2.1 6'x12'x1" Road Plates (Rental) $4.50/DAY/PLATE	1 Prime Contractor	3.00	EA		0	0	0	41	0	41
(Note: Rent for 5 days minimum = $13.50)										
					0.00	*0.00*	*0.00*	*36.00*	*0.00*	*36.00*
3.1.4.3.6.1.2.2 Lift-n-lock lifting tool $36/mo * 1 mo = $36/ea	1 Prime Contractor	1.00	EA		0	0	0	36	0	36
3.1.4.3.6.1.2.3 Delivery Cost $70/hr * (1 hr delivery + 1 hr pcik-up) = $140.	1 Prime Contractor	1.00	LS		0	0	0	140	0	140
					0.00	*150.00*	*0.00*	*0.00*	*0.00*	*150.00*
3.1.4.3.6.1.2.4 Rent: 325BL Hyd Excvtr w/ Opertr with 60" wide bkt (3 cy heaped)	1 Prime Contractor	4.00	HR		0	600	0	0	0	600
(Note: Rented Hourly Operated ECCO)										
					40.43	*0.00*	*0.00*	*0.00*	*0.00*	*40.43*
3.1.4.3.6.1.2.5 Laborer	1 Prime Contractor	4.00	HR	LL-X-LABORER	162	0	0	0	0	162

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.84	*0.83*	*0.00*	*9.38*		*11.04*
3.1.4.4 Disposal of Excess Material	**1 Prime Contractor**	**320.00**	**CY**		**268**	**265**	**0**	**3,000**	**0**	**3,533**
(Note: Dispose of the 18" HDPE pipe bedding material volume (320 cy).)										
(Note: Assume contractor has "one-way access" in and out of the project site. Shrinkage factor = 1.20 Adjusted Volume = 320 BCY x 1.20 = 384 LCY Basis: 5 min load, 15 min haul loaded, 10 min wait/dump, 15 min haul unloaded and 15 min x-tra = 60 min. Roundtrip = one 12 LCY load/hr. Total = 12 Cy/hr @ 7 hr/day = 84 cy/day @ 8 hr of trucking. Total = 384 LCY / 84 LCY/day = 5 truck x 8 hrs = 40 hrs.)										
					0.42	*0.29*	*0.00*	*0.00*	*0.00*	*0.71*
3.1.4.4.1.1 Dozer assisting loader, bank measure, medium material, CAT D5	1 Prime Contractor	320.00	BCY	CODTB10W	134	92	0	0	0	226
					0.42	*0.54*	*0.00*	*0.00*	*0.00*	*0.96*
3.1.4.4.1.2 Load at borrow site, medium material, 3.8 m3 bucket, 980 wheeled loader	1 Prime Contractor	320.00	BCY	CODFB10U	134	173	0	0	0	307
					0.00	*0.00*	*0.00*	*75.00*	*0.00*	*75.00*
3.1.4.4.1.3 Haul Fill with 12 LCY (9.2 LM3) hwy trucks	1 Prime Contractor	40.00	HR		0	0	0	3,000	0	3,000
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.4.1.4 Traffic Control - Flagman	1 Prime Contractor	1.00	DAY		0	0	0	0	0	0
					0.00	*0.00*	*0.00*	*0.00*	*0.00*	*0.00*
3.1.4.4.1.5 Dust Control with 3,000 gal water truck w/ driver.	1 Prime Contractor	1.00	DAY		0	0	0	0	0	0
					9.38	*6.58*	*85.12*	*6.13*		*107.21*
3.1.4.5 Clay Layer, 6" Lining of pond and stream	**1 Prime Contractor**	**600.00**	**CY**		**5,626**	**3,951**	**51,070**	**3,681**	**0**	**64,327**
(Note: Allow 10% additional for irregularities)										
					57.04	*74.81*	*0.00*	*0.00*	*0.00*	*131.85*
3.1.4.5.3.1 Hyd Excvtr/Gradall with operator	1 Prime Contractor	16.00	HR		913	1,197	0	0	0	2,110

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Crew JUA-GR. Allow 16 hrs for fine grading, 2,440 lf stream and ponds. The stream and ponds are 1-foot and 2-feet deep respectively and 12-ft to 26 -ft wide.)										
					57.04	*56.60*	*0.00*	*0.00*	*0.00*	*113.64*
3.1.4.5.3.2 Hyd Excvtr with compaction wheel attachment and operator	1 Prime Contractor	16.00	HR		913	906	0	0	0	1,818
(Note: Crew JUA-RL)										
					1,732.62	*1,398.77*	*415.68*	*3,500.00*		*7,167.06*
3.1.4.6 Concrete Headwall Structures	**1 Prime Contractor**	**2.00**	**EA**		**3,465**	**2,798**	**831**	**7,000**	**240**	**14,334**
3.1.4.6.2.2.1 Headwall Structure, 5-ft wide backwall - Wing type Headwall	1 Prime Contractor	1.00	LS		0	0	0	3,500	0	3,500
(Note: Based on Richardson 2-36, p1)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.6.2.2.2 Structural Excavation	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
					155.33	*172.30*	*0.00*	*0.00*	*0.00*	*327.63*
3.1.4.6.2.2.3 Structural Backfill	1 Prime Contractor	4.00	HR		621	689	0	0	0	1,311
3.1.4.7 Water Intake and Underground Valve Structures	**1 Prime Contractor**	**1.00**	**LS**		**8,494**	**1,190**	**8,089**	**0**	**0**	**17,773**
(Note: Base preparation assumed to be performed with 6" of granular fill.)										
(Note: Scarify & compact area is 9' wide by 16' long = 144 sf)										
(Note:)										
					26.95	*0.00*	*218.67*	*0.00*	*0.00*	*245.62*
3.1.4.7.8.1 Manholes covers, gray iron, medium duty, 24" diameter	1 Prime Contractor	1.00	EA	2CLAB	27	0	219	0	0	246
					351.83	*194.69*	*4.78*	*55.00*		*606.31*

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
3.1.4.8 Sawcut/Demo existing channel INVERT at South Channel	**1 Prime Contractor**	**4.00**	**CY**		**1,407**	**779**	**19**	**220**	**0**	**2,425**
					3.43	*1.53*	*0.14*	*0.00*	*0.00*	*5.10*
3.1.4.8.1 Saw cut concrete slab, rod reinforced	1 Prime Contractor	136.00	LF	B89	466	209	19	0	0	694
(Note: For each additional inch of depth over 3". Slab is 1-foot thick and 34-feet in length. 3" first pass, 6" second pass, 9" third pass, 12" fourth pass. Total of 4 passes times 34 ft = 136. Allow 4-hr minimum for this operation.)										
					137.90	*55.02*	*0.00*	*0.00*	*0.00*	*192.92*
3.1.4.8.2 Concrete Breaker Crew	1 Prime Contractor	4.00	HR		552	220	0	0	0	772
(Note: Area is 8'x9'. Allow 4 hrs for demolition)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.8.3 Remove debris and load trucks wit hydraulic excavator	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
(Note: Allow 4 hrs for this operation)										
3.1.4.8.4 Hauling and disposal cost	1 Prime Contractor	1.00	LS		0	0	0	220	0	220
(Note: Assume 2 hrs round trip at $80/hr = $160. Plus $60 disposal fee.)										
					1,457.24	*754.66*	*48.84*	*110.00*		*2,370.74*
3.1.4.9 Sawcut/Demo existing channel WALL at South Channel	**1 Prime Contractor**	**2.00**	**CY**		**2,914**	**1,509**	**98**	**220**	**0**	**4,741**
					10.28	*4.89*	*0.51*	*0.00*	*0.00*	*15.68*
3.1.4.9.1 Saw cut concrete wall, rod reinforcing, per inch of depth	1 Prime Contractor	192.00	LF	COELB89B	1,973	939	98	0	0	3,010
(Note: Wall is approx 8-ft in height, 9-feet in length and 1-foot thick. Lenght = 8+8 = 16 ft x 12" deep = 192 ')										
					137.90	*55.02*	*0.00*	*0.00*	*0.00*	*192.92*
3.1.4.9.2 Concrete Breaker Crew	1 Prime Contractor	4.00	HR		552	220	0	0	0	772

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
(Note: Area is 8'x9'. Allow 4 hrs for demolition)										
					97.47	*87.49*	*0.00*	*0.00*	*0.00*	*184.96*
3.1.4.9.3 Remove debris and load trucks wit hydraulic excavator	1 Prime Contractor	4.00	HR		390	350	0	0	0	740
(Note: Allow 4 hrs for this operation)										
3.1.4.9.4 Hauling and disposal cost	1 Prime Contractor	1.00	LS		0	0	0	220	0	220
(Note: Assume 2 hrs round trip at $80/hr = $160. Plus $60 disposal fee.)										
4 Recreational Facilities	**1 Prime Contractor**	**1.00**	**LS**		**6,577**	**4,128**	**9,443**	**54,504**	**0**	**74,651**
4.1 Landscaping Recreational Facilities	**1 Prime Contractor**	**1.00**	**LS**		**6,577**	**4,128**	**9,443**	**54,504**	**0**	**74,651**
4.1.1 Surfacing (D.G. Paving and Road)	**1 Prime Contractor**	**1.00**	**LS**		**1,364**	**840**	**2,297**	**2,404**	**0**	**6,905**
					0.09	*0.06*	*0.17*	*0.15*		*0.47*
4.1.1.1 D.G. Paving	**1 Prime Contractor**	**3,540.00**	**SF**		**316**	**200**	**609**	**522**	**0**	**1,648**
(Note: t=3", Area = 3,540 SF, Volume = 33 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
4.1.1.1.1.4.1 Spread/compact DG	1 Prime Contractor	41.25	TON		203	134	0	0	0	336
					0.08	*0.05*	*0.13*	*0.15*		*0.41*
4.1.1.2 12 ft wide D.G. Road/Trail (1/2 the area)	**1 Prime Contractor**	**12,841.00**	**SF**		**1,049**	**639**	**1,688**	**1,882**	**0**	**5,257**
(Note: The other 1/2 is accounted under Tujunga Wash Ecosystem Restoration (Acc. 09).)										
(Note: t=3", width is 12', Area = 25,682 SF, Volume = 238 CY)										
(Note: Assume 40 ton/hr (2 trucks/hr))										
					4.91	*3.24*	*0.00*	*0.00*	*0.00*	*8.15*
4.1.1.2.1.4.1 Spread/compact DG	1 Prime Contractor	148.75	TON		731	481	0	0	0	1,212

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					5,212.66	*3,288.44*	*7,145.58*	*52,100.00*		*67,746.68*
4.1.2 Fencing	**1.2 Fencing Subcontractor**	**1.00**	**EA**		**5,213**	**3,288**	**7,146**	**52,100**	**0**	**67,747**
					407.47	*346.61*	*541.25*	*0.00*		*1,295.32*
4.1.2.1 Stone Columns	**1.2 Fencing Subcontractor**	**8.00**	**EA**		**3,260**	**2,773**	**4,330**	**0**	**0**	**10,363**
					101.87	*86.65*	*0.00*	*0.00*	*0.00*	*188.52*
4.1.2.1.1 Stone Mansory Crew	1.2 Fencing Subcontractor	32.00	HR		3,260	2,773	0	0	0	6,033
(Note: Allow 4 hrs per column)										
					0.00	*0.00*	*541.25*	*0.00*	*0.00*	*541.25*
4.1.2.1.2 Material cost per column	1.2 Fencing Subcontractor	8.00	EA		0	0	4,330	0	0	4,330
					976.46	*257.80*	*1,407.79*	*0.00*		*2,642.05*
4.1.2.2 14' Wide, 5' Ht Welded Steel Wire Fence Mesh "Gaelic Fence"	**1.2 Fencing Subcontractor**	**2.00**	**EA**		**1,953**	**516**	**2,816**	**0**	**0**	**5,284**
					136.45	*36.34*	*0.00*	*0.00*	*0.00*	*172.79*
4.1.2.2.2.1 Fencing Crew	1.2 Fencing Subcontractor	14.00	HR		1,910	509	0	0	0	2,419
(Note: Crew FNCJUA)										
					0.00	*0.00*	*132.91*	*0.00*	*0.00*	*132.91*
4.1.2.2.2.2 4"x4" gate post x 8'	1.2 Fencing Subcontractor	4.00	EA		0	0	532	0	0	532
					0.00	*0.00*	*1,060.85*	*0.00*	*0.00*	*1,060.85*
4.1.2.2.2.3 5'x14' Double gate	1.2 Fencing Subcontractor	2.00	EA		0	0	2,122	0	0	2,122
					0.00	*0.00*	*27.71*	*0.00*	*0.00*	*27.71*
4.1.2.2.2.4 Braces 2"x2"x6'	1.2 Fencing Subcontractor	4.00	EA		0	0	111	0	0	111
					0.00	*0.00*	*3.11*	*0.00*	*0.00*	*3.11*
4.1.2.2.2.5 4"x4" post cap	1.2 Fencing Subcontractor	4.00	EA		0	0	12	0	0	12
					0.00	*0.00*	*0.00*	*20.00*		*20.00*
4.1.2.3 Guard Cable Fence, 3'-6" Ht	**1.2 Fencing Subcontractor**	**2,605.00**	**LF**		**0**	**0**	**0**	**52,100**	**0**	**52,100**

Description	Contractor	Quantity	UOM	CrewTag	DirectLabor	DirectEQ	DirectMatl	DirectSubBid	DirectUser1	DirectCost
					0.00	*0.00*	*0.00*	*20.00*	*0.00*	*20.00*
4.1.2.3.1 Guard Cable Fence, 3'-6" ht	1.2 Fencing Subcontractor	2,605.00	LF		0	0	0	52,100	0	52,100

(Note: Crown Fencing, Corona, CA quote)

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
Crews (Bare Costs) by Contractor Report	**2,401.06**			**5,085.18**	**203,665**	**2,414.06**	**75,064**	**278,729**
				0.00	*0.00*	*1.00*	*9.95*	*9.95*
EP EE-T50FO005 4X2, 1T-Pickup Truck	77.19			0.00	0	77.19	768	768
EP T50FO005 TRK,HWY,10,000GVW,4X2, 1T-PICKUP		*Non-EP / Average*	*10*			*1.00*	*10*	
				0.00	*0.00*	*1.00*	*11.22*	*11.22*
GEN EE-L40Z4610 LOADER, SKIDSTEER, 60" BUCKET	39.55			0.00	0	39.55	444	444
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)		*EP / Average*	*11*			*1.00*	*11*	
				0.00	*0.00*	*1.00*	*4.37*	*4.37*
GEN EE-T40Z7055 WATER TANK, 3,000 GAL (11,356L)	3.75			0.00	0	3.75	16	16
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*4*			*1.00*	*4*	
				0.00	*0.00*	*1.00*	*39.19*	*39.19*
GEN EE-T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW	3.75			0.00	0	3.75	147	147
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*1.00*	*39*	
				2.00	*71.76*	*0.00*	*0.00*	*71.76*
HNC ALABCLAB2 2 laborers	19.27			38.55	1,383	0.00	0	1,383
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
				3.00	*113.29*	*3.00*	*35.35*	*148.64*
HNC CLABB80C 2 laborers + 1 post hole drill, up to 8" diam, 30" deep, one man	2.00			6.00	227	6.00	71	297
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
EP L15HZ001 POST HOLE DRILL, UP TO 8" DIA, 30" DEEP, ONE MAN OPERATION		*EP / Average*	*1*			*1.00*	*1*	
GEN T40Z6960 TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)		*EP / Average*	*1*			*1.00*	*1*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				8.00	*315.62*	*3.00*	*124.44*	*440.06*
HNC CLABC20 6 laborers + 1 concrete pump, 117 CY/hr	0.67			5.33	210	2.00	83	293
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*5.00*	*179*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED		*EP / Average*	*116*			*1.00*	*116*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				2.00	*72.26*	*2.00*	*126.60*	*198.86*
HNC CLADB23D 3 laborers + 1 drill, auger, 8" dia, 250' deep	4.71			9.43	341	9.43	597	937
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
GEN D30Z2890 DRILL, EARTH/AUGER, MULTI-PURPOSE, 8" (203 MM) DIA, 250' (76.2 M) DEPTH, 7,000 FT-LBS (967.8 KGF-M) TORQUE, W/21,000 LB (9,525 KG) GVW TRUCK W/PTO DRIVE (ADD COST FOR DRILL STEEL AND CUTTING EDGE)		*EP / Average*	*63*			*2.00*	*127*	
				2.00	*100.25*	*1.00*	*40.16*	*140.41*
HNC CODEB12F 1 eqoprcrn + 1 hydr excavator, crawler, 0.75 CY	2.04			4.07	204	2.04	82	286
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
MIL B-EQOPROIL Equip. Operators, Oilers		*Journeyman*	*47*	*1.00*	*47*			
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*40*			*1.00*	*40*	
				3.00	*134.23*	*5.00*	*159.91*	*294.14*
HNC CODEB30 1 eqoprmed + 1 hydr excavator, crawler, 1.50 CY	26.32			78.97	3,533	131.61	4,209	7,742
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*2.00*	*84*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH		*EP / Average*	*77*			*1.00*	*77*	
GEN T40Z7090 TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*2*			*2.00*	*4*	
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*2.00*	*78*	
				1.50	*68.05*	*1.00*	*35.82*	*103.87*
HNC CODFB10N 1 eqoprmed + 1 loader, F/E, crawler, 1.50 CY	2.28			3.42	155	2.28	82	237
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L35Z4240 LOADER, FRONT END, CRAWLER, 1.50 CY (1.2 M3) BUCKET		*EP / Average*	*36*			*1.00*	*36*	
				1.50	*68.05*	*1.00*	*53.38*	*121.43*
HNC CODFB10T 1 eqoprmed + 1 loader, F/E, wheel, 4WD, 3.25 CY	12.50			18.75	850	12.50	667	1,518
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN L40Z4397 LOADER, FRONT END, WHEEL, ARTICULATED, 3.25 CY (2.5 M3) BUCKET, 4X4		*EP / Average*	*53*			*1.00*	*53*	
				1.50	*68.05*	*1.00*	*100.26*	*168.31*

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
HNC CODFB10U 1 eqoprmed + 1 loader, F/E, wheel, 4WD, 5.50 CY	5.71			8.57	389	5.71	573	962
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L40Z4420 LOADER, FRONT END, WHEEL, ARTICULATED, 5.50 CY (4.2 M3) BUCKET, 4X4		*EP / Average*	*100*			*1.00*	*100*	
				1.50	*68.05*	*1.00*	*111.00*	*179.05*
HNC CODTB10B 1 eqoprmed + 1 dozer, crawler, 181-250 HP	7.11			10.67	484	7.11	790	1,274
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN T15Z6520 TRACTOR, CRAWLER (DOZER), 181-250 HP (135-186 KW), POWERSHIFT, LGP, W/UNIVERSAL BLADE		*EP / Average*	*111*			*1.00*	*111*	
				1.50	*68.05*	*1.00*	*34.28*	*102.33*
HNC CODTB10L 1 eqoprmed + 1 dozer, crawler, 76-100 HP	15.94			23.91	1,085	15.94	546	1,631
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN T15Z6440 TRACTOR, CRAWLER (DOZER), 76-100 HP (57-75 KW), POWERSHIFT, W/UNIVERSAL BLADE		*EP / Average*	*34*			*1.00*	*34*	
				1.50	*68.05*	*1.00*	*53.00*	*121.05*
HNC CODTB10W 1 eqoprmed + 1 dozer, crawler, 101-135 HP	37.73			56.60	2,568	37.73	2,000	4,568
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN T15Z6480 TRACTOR, CRAWLER (DOZER), 101-135 HP (75-101 KW), POWERSHIFT, W/ UNIVERSAL BLADE		*EP / Average*	*53*			*1.00*	*53*	
				2.00	*91.04*	*4.00*	*48.92*	*139.96*
HNC COELB89B 1 eqoprlt + 1 truck, flatbed, 8' x 20'	38.40			76.80	3,496	153.60	1,879	5,374
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE		*Non-EP / Average*	*2*			*1.00*	*2*	
GEN C60Z1990 CONCRETE SAW, RAIL SAW, 15.5" (394 MM) DEPTH, WALL (ADD 250 CFM (7 CMM) COMPRESSOR & COST FOR SAWBLADE WEAR)		*EP / Average*	*12*			*1.00*	*12*	
GEN T40Z7000 TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)		*EP / Average*	*1*			*1.00*	*1*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				1.00	*42.06*	*2.00*	*45.33*	*87.39*
HNC CTDHB34C 1 trkdvrhv + 1 trailer, dump, 17 CY	16.00			16.00	673	32.00	725	1,398
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
GEN T45Z7080 TRUCK TRAILER, END DUMP, 17 CY (13 CM), 22 TON (20.0 MT) (ADD TOWING TRUCK)		*EP / Average*	*6*			*1.00*	*6*	
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*39*			*1.00*	*39*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				1.00	*49.35*	*0.00*	*0.00*	*49.35*
HNC EELEELEC1 1 electrn	8.00			8.00	395	0.00	0	395
MIL B-ELECTRN Electricians		*Journeyman*	*49*	*1.00*	*49*			
				4.00	*155.83*	*0.00*	*0.00*	*155.83*
HNC ULABB20A 2 laborers	1.00			4.00	156	0.00	0	156
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
				3.00	*113.82*	*5.00*	*71.45*	*185.27*
HNC ULABB9B 2 laborers + 1 trailer, water tanker, 5000 gal	1.00			3.00	114	5.00	71	185
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
GEN P50Z5086 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (76 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION		*EP / Average*	*0*			*2.00*	*1*	
GEN T50Z7520 TRUCK, HIGHWAY, 55,000 LB (24,948 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)		*EP / Average*	*46*			*1.00*	*46*	
GEN W25Z8605 WATER BLASTER, LOW PRESSURE, COLD WATER, 5.5 GPM (20.8 LPM) 1 NOZZLE, @ 3,500 PSI (24,132 KPA)		*EP / Average*	*6*			*1.00*	*6*	
GEN T45Z7280 TRUCK TRAILER, WATER TANKER, 5,000 GAL (18,927 L) (ADD 50,000 LB (22,680 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
				5.00	*209.13*	*1.00*	*59.23*	*268.36*
HNC UOEHB21A 2 laborers + 1 crane, hydr, S/P, RT, 4WD, 15 ton	1.20			6.00	251	1.20	71	322
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4		*EP / Average*	*59*			*1.00*	*59*	
				0.00	*0.00*	*1.00*	*43.11*	*43.11*
MAP EE-L15FG001 HYDROMULCHER, 3000 GAL, TRUCK MT	23.00			0.00	0	23.00	992	992
MAP L15FG001 LANDSCAPING EQUIPMENT, HYDROSEEDER, 3000 GAL, TRUCK MTD (INCLUDES 56,000 GVW TRUCK)		*EP / Average*	*43*			*1.00*	*43*	
				0.00	*0.00*	*1.00*	*142.47*	*142.47*
MAP EE-L40CA008 LOADER 988B, 7 CY (1 ea)	23.00			0.00	0	23.00	3,277	3,277
USR L40CA008 LOADER, FRONT END, WHEEL, 9.00 CY BUCKET, ARTICULATED, 4X4		*EP / Average*	*142*			*1.00*	*142*	
				0.00	*0.00*	*1.00*	*27.73*	*27.73*
MIL EE-C10BO013 ROLLER,VIB,DBL,33.5"W,0.5T,WK-BH	8.35			0.00	0	8.35	231	231

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
EP C10BO013 COMPACTOR, TRENCH ROLLER, VIBRATORY, 33.5"W X 19.7" DIA, DOUBLE TAMPING FOOT DRUMS, WALK BEHIND, 18000 LBS IMPACT		*EP / Average*	*28*			*1.00*	*28*	
				1.00	*49.51*	*0.00*	*0.00*	*49.51*
MIL LL-B-EQOPRLT Equip. Operator	34.09			34.09	1,688	0.00	0	1,688
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*49.51*	*0.00*	*0.00*	*49.51*
MIL LL-X-EQOPRLT Outside Equip. Operator,Compactr	8.35			8.35	413	0.00	0	413
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
MIL LL-X-EQOPRMED Eq Operator, Dozer (1)	56.93			56.93	2,853	0.00	0	2,853
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
MIL LL-X-EQOPRMED Outside Equip. Operator, Medium	23.00			23.00	1,153	0.00	0	1,153
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
MIL LL-X-LABORER Laborer (1)	44.85			44.85	1,609	0.00	0	1,609
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
MIL LL-X-LABORER Labs w/ brush saws (2)	28.46			28.46	1,021	0.00	0	1,021
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*42.06*	*0.00*	*0.00*	*42.06*
MIL LL-X-TRKDVRHV Outside Truck Driver, Heavy	3.75			3.75	158	0.00	0	158
MIL X-TRKDVRHV Outside Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
				1.00	*42.06*	*0.00*	*0.00*	*42.06*
MIL LL-X-TRKDVRHV Outside Truck Driver, Heavy	23.00			23.00	967	0.00	0	967
MIL X-TRKDVRHV Outside Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
				1.00	*49.73*	*0.00*	*0.00*	*49.73*
RSM 1CEFI 1 CEFI	3.42			3.42	170	0.00	0	170
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
RSM 1CLAB 1 CLAB	120.08			120.08	4,309	0.00	0	4,309
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*49.35*	*0.00*	*0.00*	*49.35*
RSM 1ELEC 1 ELEC	29.19			29.19	1,440	0.00	0	1,440
MIL B-ELECTRN Electricians		*Journeyman*	*49*	*1.00*	*49*			
				1.00	*44.95*	*0.00*	*0.00*	*44.95*
RSM 1PLUM 1 PLUM	7.90			7.90	355	0.00	0	355
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				1.00	*46.88*	*0.00*	*0.00*	*46.88*
RSM 1STPI 1 STPI	0.50			0.50	23	0.00	0	23
MIL B-STM/PIPE Steam/Pipefitters		*Journeyman*	*47*	*1.00*	*47*			
				2.00	*71.76*	*0.00*	*0.00*	*71.76*
RSM 2CLAB 2 CLAB	15.65			31.30	1,123	0.00	0	1,123
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
				4.00	*198.60*	*0.00*	*0.00*	*198.60*
RSM 4RODM 4 RODM	1.11			4.44	221	0.00	0	221
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
				1.00	*35.88*	*1.00*	*3.54*	*39.42*
RSM A1D A1D	4.35			4.35	156	4.35	15	172
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
GEN C10Z1380 COMPACTOR, VIBROPLATE, 18" (457 MM) WIDE x 21.5" (546 MM) PLATE		*EP / Average*	*4*			*1.00*	*4*	
				2.00	*53.35*	*1.00*	*1.73*	*55.08*
RSM A6 A6	16.00			32.00	854	16.00	28	881
FOP FC-SURYR Surveyors, Helper		*Journeyman*	*18*	*1.00*	*18*			
FOP FC-SURYC Surveyors, Chief		*Journeyman*	*36*	*1.00*	*36*			
GEN XMEZ8815 LASER LEVEL FOR PIPES		*Non-EP / Average*	*2*			*1.00*	*2*	
				1.50	*68.05*	*1.00*	*9.03*	*77.08*
RSM B10A B10A	20.95			31.43	1,426	20.95	189	1,615
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP C10BO011 COMPACTOR, ROLLER, VIBRATORY, 29.9"W X 19.7"DIA, DOUBLE SMOOTH DRUMS, WALK BEHIND, 1980 LBS IMPACT		*EP / Average*	*9*			*1.00*	*9*	
				1.50	*68.05*	*1.00*	*111.00*	*179.05*
RSM B10B B10B	6.12			9.17	416	6.12	679	1,095
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MAP T15CA014 TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)		*EP / Average*	*111*			*1.00*	*111*	
				1.50	*68.05*	*1.00*	*76.62*	*144.67*
RSM B10P B10P	3.00			4.50	204	3.00	230	434
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MAP L35CA014 LOADER, FRONT END, CRAWLER, 3.20 CY BUCKET		*EP / Average*	*77*			*1.00*	*77*	
				1.50	*68.05*	*1.00*	*53.00*	*121.05*
RSM B10W B10W	35.09			52.63	2,388	35.09	1,860	4,247
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP T15CS007 TRACTOR, CRAWLER (DOZER), 119 HP, POWERSHIFT, W/3.90 CY UNIVERSAL BLADE (ADD ATTACHMENTS)		*EP / Average*	*53*			*1.00*	*53*	
				2.00	*85.39*	*4.00*	*29.49*	*114.88*
RSM B11B B11B	2.80			5.60	239	11.20	83	322
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN A15Z0150 AIR COMPRESSOR, 375 CFM (11 CMM), 100 PSI (689 KPA) (ADD HOSE)		*EP / Average*	*23*			*1.00*	*23*	
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)		*EP / Average*	*2*			*2.00*	*4*	
GEN C10Z1360 COMPACTOR, RAMMER, 9" (229 MM) WIDE x 14" (356 MM) SHOE		*EP / Average*	*3*			*1.00*	*3*	
				2.00	*85.99*	*1.00*	*17.83*	*103.82*
RSM B11C B11C	21.60			43.20	1,857	21.60	385	2,243
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				6.00	*229.41*	*1.00*	*17.83*	*247.24*
RSM B14 B14	0.12			0.71	27	0.12	2	29
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				4.00	*163.33*	*2.00*	*61.76*	*225.09*
RSM B17 B17	2.65			10.60	433	5.30	164	596
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2		*EP / Average*	*44*			*1.00*	*44*	
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				5.00	*179.90*	*0.00*	*0.00*	*179.90*
RSM B2 B2	0.17			0.87	31	0.00	0	31
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
				3.00	*111.14*	*0.00*	*0.00*	*111.14*
RSM B20 B20	11.20			33.60	1,245	0.00	0	1,245
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-SKILLWKR Skilled Workers		*Journeyman*	*39*	*1.00*	*39*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				4.00	*155.83*	*0.00*	*0.00*	*155.83*
RSM B20A B20A	2.25			9.00	351	0.00	0	351
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
				3.50	*137.79*	*0.50*	*16.77*	*154.56*
RSM B21 B21	13.61			47.62	1,875	6.80	228	2,103
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-SKILLWKR Skilled Workers		*Journeyman*	*39*	*1.00*	*39*			
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*0.50*	*27*			
MAP C75GV021 CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB		*EP / Average*	*34*			*0.50*	*17*	
				5.00	*209.13*	*1.00*	*59.23*	*268.36*
RSM B21A B21A	9.71			48.56	2,031	9.71	575	2,607
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRCRN Equip. Operators, Crane/Shovel		*Journeyman*	*53*	*1.00*	*53*			
MAP C75GV028 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 25 TON, 75' BOOM, 4X4X4		*EP / Average*	*59*			*1.00*	*59*	
				3.00	*128.04*	*0.00*	*0.00*	*128.04*
RSM B24 B24	8.00			24.00	1,024	0.00	0	1,024
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*1.00*	*42*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.75	*80.58*	*1.25*	*107.70*	*188.28*
RSM B33F B33F	37.07			64.88	2,987	46.34	3,993	6,980
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.25*	*63*			
MAP S10CA001 SCRAPER, ELEVATING LOADING, 11 CY, 13 TON, 4X2 - SINGLE POWERED		*EP / Average*	*76*			*1.00*	*76*	
MAP T15CA016 TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)		*EP / Average*	*128*			*0.25*	*32*	
				6.00	*229.41*	*1.00*	*44.53*	*273.94*
RSM B37 B37	0.58			3.48	133	0.58	26	159
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MAP R45BO006 ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR		*EP / Average*	*45*			*1.00*	*45*	
				6.00	*229.41*	*5.00*	*21.82*	*251.23*
RSM B39 B39	3.74			22.45	858	18.71	82	940
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
GEN A15Z0140 AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)		*EP / Average*	*17*			*1.00*	*17*	
GEN A20Z0400 PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)		*EP / Average*	*1*			*2.00*	*1*	
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)		*EP / Average*	*2*			*2.00*	*4*	
				2.00	*92.17*	*2.00*	*61.43*	*153.60*
RSM B45 B45	4.73			9.46	436	9.46	291	727
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*43*			*1.00*	*43*	
				3.00	*121.27*	*1.00*	*17.83*	*139.10*
RSM B6 B6	115.10			345.31	13,958	115.10	2,052	16,011
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4		*EP / Average*	*18*			*1.00*	*18*	
				4.00	*163.30*	*2.00*	*36.07*	*199.37*
RSM B80 B80	81.46			325.84	13,303	162.92	2,938	16,241
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
GEN XMEZ9120 POST DRIVER, 8" (203 MM) MAX DIA POST, 30,000 LB (13,608 KG) IMPACT (ADD 20,000-35,000 LB (9,072-15,876 KG) GVW TRUCK)		*Non-EP / Average*	*3*			*1.00*	*3*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				2.00	*91.04*	*3.00*	*46.04*	*137.08*
RSM B89 B89	4.53			9.07	413	13.60	209	621
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
MIL B-EQOPRLT Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE		*Non-EP / Average*	*2*			*1.00*	*2*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
GEN C60Z1980 CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)		*EP / Average*	*11*			*1.00*	*11*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				4.00	*163.17*	*0.00*	*0.00*	*163.17*
RSM C1 C1	1.19			4.75	194	0.00	0	194
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*3.00*	*127*			
				26.00	*1,141.74*	*2.00*	*120.28*	*1,262.02*
RSM C14B C14B	0.07			1.77	78	0.14	8	86
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*16.00*	*679*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*2.00*	*99*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*1.00*	*4*	
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD		*EP / Average*	*116*			*1.00*	*116*	
				11.00	*483.76*	*1.00*	*4.16*	*487.92*
RSM C14E C14E	0.20			2.20	97	0.20	1	98
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*4.00*	*199*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*2.00*	*85*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*1.00*	*4*	
				6.00	*248.53*	*0.00*	*0.00*	*248.53*
RSM C2 C2	8.04			48.25	1,999	0.00	0	1,999
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL B-CARPNTER Carpenters		*Journeyman*	*42*	*4.00*	*170*			
MIL B-CARPNTER Carpenters		*Foreman*	*43*	*1.00*	*43*			
				8.00	*315.62*	*3.00*	*124.44*	*440.06*
RSM C20 C20	1.12			8.96	353	3.36	139	493
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*5.00*	*179*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD		*EP / Average*	*116*			*1.00*	*116*	

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
				6.00	*229.63*	*2.00*	*8.32*	*237.95*
RSM C6 C6	10.56			63.34	2,424	21.11	88	2,512
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-CEMTFINR Cement Finishers		*Journeyman*	*50*	*1.00*	*50*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*4.00*	*144*			
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR		*Non-EP / Average*	*4*			*2.00*	*8*	
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
RSM CLAB CLAB	13.25			13.25	475	0.00	0	475
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				2.00	*83.57*	*0.00*	*0.00*	*83.57*
RSM Q1 Q1	9.88			19.76	826	0.00	0	826
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
				2.00	*83.57*	*1.00*	*1.73*	*85.31*
RSM Q15 Q15	4.00			8.00	334	4.00	7	341
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*1.00*	*45*			
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED		*EP / Average*	*2*			*1.00*	*2*	
				3.00	*128.52*	*1.00*	*1.73*	*130.26*
RSM Q16 Q16	2.67			8.00	343	2.67	5	347
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*2.00*	*90*			
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED		*EP / Average*	*2*			*1.00*	*2*	
				3.00	*128.52*	*0.00*	*0.00*	*128.52*
RSM Q2 Q2	5.32			15.96	684	0.00	0	684
MIL B-PLUMBER Plumbers		*Apprentice*	*39*	*1.00*	*39*			
MIL B-PLUMBER Plumbers		*Journeyman*	*45*	*2.00*	*90*			
				2.00	*87.24*	*0.00*	*0.00*	*87.24*
RSM Q5 Q5	5.33			10.67	465	0.00	0	465
MIL B-STM/PIPE Steam/Pipefitters		*Apprentice*	*40*	*1.00*	*40*			
MIL B-STM/PIPE Steam/Pipefitters		*Journeyman*	*47*	*1.00*	*47*			
				1.00	*49.65*	*0.00*	*0.00*	*49.65*
RSM RODM RODM	2.09			2.09	104	0.00	0	104
MIL B-RODMAN Rodmen, (Reinforcing)		*Journeyman*	*50*	*1.00*	*50*			
				3.00	*121.87*	*2.00*	*55.02*	*176.89*
USR Concrete Breaker Crew	12.00			36.00	1,462	24.00	660	2,123
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MAP H25KN002 HYDRAULIC EXCAVATOR, ATTACHMENT, CONCRETE PULVERIZER, 3000 LB, W/POINT (ADD 26,000-36,000 LB HYDRAULIC EXCAVATOR)		*EP / Average*	*15*			*1.00*	*15*	
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*40*			*1.00*	*40*	
				5.00	*195.03*	*1.00*	*21.40*	*216.43*
USR Grouting (Grouted Stone)	2.00			10.00	390	2.00	43	433
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Foreman*	*38*	*1.00*	*38*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
GEN C55Z1950 CONCRETE PUMP, 50 CY/HR (38 M3/HR), TRAILER MOUNTED (ADD HOSE)		*EP / Average*	*21*			*1.00*	*21*	
				5.00	*220.93*	*3.00*	*169.10*	*390.03*
USR Rock Placement (Grouted Stone)	4.00			20.00	884	12.00	676	1,560
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Foreman*	*52*	*1.00*	*52*			
MIL X-EQOPROIL Outside Equip. Oilers		*Journeyman*	*47*	*1.00*	*47*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*2.00*	*72*			
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH		*EP / Average*	*87*			*1.00*	*87*	
GEN L40Z4410 LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4		*EP / Average*	*71*			*1.00*	*71*	
GEN T50Z7305 TRUCK, HIGHWAY, CONVENTIONAL, 3,500 LB (1,588 KG) GVW, 4X2, 2 AXLE, COMPACT-PICKUP		*EP / Average*	*11*			*1.00*	*11*	
				3.00	*136.90*	*2.00*	*172.30*	*309.20*
USR Structural Backfill	12.00			36.00	1,643	24.00	2,068	3,710
MIL X-EQOPRLT Outside Equip. Operators, Light		*Foreman*	*52*	*1.00*	*52*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
MIL X-EQOPRLT Outside Equip. Operators, Light		*Journeyman*	*50*	*1.00*	*50*			
GEN C10Z1440 COMPACTOR, ROLLER, VIBRATORY, 29.5" (749 MM) WIDE, 2.25 TON (2.0 MT), DOUBLE DRUM, WALK-BEHIND		*EP / Average*	*27*			*1.00*	*27*	
GEN L40Z4440 LOADER, FRONT END, WHEEL, ARTICULATED, 7.00 CY (5.4 M3) BUCKET, 4X4		*EP / Average*	*145*			*1.00*	*145*	
				2.00	*85.99*	*1.00*	*87.49*	*173.48*
USR Structural Excavation	64.00			128.00	5,503	64.00	5,600	11,103
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH		*EP / Average*	*87*			*1.00*	*87*	
				1.50	*68.05*	*1.00*	*11.22*	*79.27*
USR B10B-JUA B10B	13.76			20.64	936	13.76	154	1,091
MIL B-EQOPRMED Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*0.50*	*18*			
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)		*EP / Average*	*11*			*1.00*	*11*	
				1.00	*42.06*	*2.00*	*61.43*	*103.49*
USR B45JUA B45	8.01			8.01	337	16.02	492	829
MIL B-TRKDVRHV Truck Drivers, Heavy		*Journeyman*	*42*	*1.00*	*42*			
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)		*EP / Average*	*19*			*1.00*	*19*	
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*43*			*1.00*	*43*	
				0.00	*0.00*	*1.00*	*14.80*	*14.80*
USR EE-T50FO005 Pick-up Truck	10.93			0.00	0	10.93	162	162
EP T50XX006 TRUCK, HIGHWAY, CONVENTIONAL, 1 TON PICKUP, 4X4		*EP / Average*	*15*			*1.00*	*15*	
				1.00	*52.11*	*0.00*	*0.00*	*52.11*
USR FF-X-EQOPRMED Foreman	37.19			37.19	1,938	0.00	0	1,938
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Foreman*	*52*	*1.00*	*52*			
				3.00	*113.79*	*2.00*	*36.34*	*150.13*
USR FNCJUA Fencing Crew	403.00			1,209.00	45,857	806.00	14,646	60,504
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-TRKDVRLT Truck Drivers, Light		*Journeyman*	*42*	*1.00*	*42*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
EP T45XX026 TRUCK TRAILER, MISCELLANEOUS/UTILITY, TILT BED, 12 TON, 2 AXLE (ADD TOWING TRUCK)		*EP / Average*	*3*			*1.00*	*3*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				1.00	*50.11*	*1.00*	*77.32*	*127.43*
USR JUA-EXC Hyd Excavator 325Bl with operator	13.00			13.00	651	13.00	1,005	1,657
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH		*EP / Average*	*77*			*1.00*	*77*	
				1.00	*50.11*	*1.00*	*74.81*	*124.92*
USR JUA-GR Hyd Excvtr / Gradall with operator	32.00			32.00	1,604	32.00	2,394	3,997
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
USR H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, 22'6" DIGGING DEPTH, TELESCOPIC BOOM, 6X4		*EP / Average*	*75*			*1.00*	*75*	
				9.00	*394.82*	*5.00*	*359.45*	*754.27*
USR JUA-HDPE1 18" HDPE Installation Crew	23.60			212.40	9,318	118.00	8,483	17,801
MIL X-PLUMBER Outside Plumbers		*Foreman*	*47*	*1.00*	*47*			
MIL X-PLUMBER Outside Plumbers		*Journeyman*	*45*	*2.00*	*90*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*3.00*	*150*			
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			
USR JUA-WELD HDPE Butt-fusion Machine		*Non-EP Rental / Average*	*200*			*1.00*	*200*	
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4		*EP / Average*	*59*			*1.00*	*59*	
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE		*EP / Average*	*14*			*1.00*	*14*	
GEN P35Z4950 PIPELAYER, 20' (0.5 M) BOOM, 90,000 LB (40,823 KG)		*EP / Average*	*74*			*1.00*	*74*	
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP		*EP / Average*	*12*			*1.00*	*12*	
				1.00	*50.11*	*1.00*	*68.05*	*118.16*
USR JUA-LDR Loader 4 CY Bkt with oper	25.20			25.20	1,263	25.20	1,715	2,978
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
USR L40Z4410 962G LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4		*EP / Average*	*68*			*1.00*	*68*	
				1.00	*50.11*	*2.00*	*56.60*	*106.71*
USR JUA-RL Hyd Excvtr with compaction wheel attachment and operator	16.00			16.00	802	32.00	906	1,707
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
EP H25AX001 HYDRAULIC EXCAVATOR, ATTACHMENT, COMPACTOR, 23" WIDE, SHEEPS FOOT, 3 RIMS - 38" DIA (ADD 25,000-50,000 LB HYDRAULIC EXCAVATOR)		*EP / Average*	*2*			*1.00*	*2*	
GEN H25Z3175 HYDRAULIC EXCAVATOR, CRAWLER, 40,000 LB (18,144 KG), 1.00 CY (0.8 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH		*EP / Average*	*54*			*1.00*	*54*	
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR L4 1 laborer	36.13			36.13	1,296	0.00	0	1,296
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR LL-B-LABORER Laborer	39.55			39.55	1,419	0.00	0	1,419
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				1.00	*50.11*	*0.00*	*0.00*	*50.11*
USR LL-X-EQOPRMED Gradechecker	37.19			37.19	1,864	0.00	0	1,864
MIL X-EQOPRMED Outside Equip. Operators, Medium		*Journeyman*	*50*	*1.00*	*50*			
				1.00	*35.88*	*0.00*	*0.00*	*35.88*
USR LL-X-LABORER Laborer	114.23			114.23	4,099	0.00	0	4,099
MIL X-LABORER Outside Laborers, (Semi-Skilled)		*Journeyman*	*36*	*1.00*	*36*			
				2.00	*85.16*	*2.00*	*86.65*	*171.81*
USR STNO Stone Mansory Crew	40.00			80.00	3,406	80.00	3,466	6,872
MIL B-STONEMAS Stone Masons		*Foreman*	*43*	*1.00*	*43*			
MIL B-STONEMAS Stone Masons		*Journeyman*	*42*	*1.00*	*42*			

Description	CrewHours	MemberType	MemberRate	ManHours	LaborCost	EQHours	EQCost	CrewCost
USR T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW 6X4, 3 AXLE, (ADD ACCESSORIES)		*EP / Average*	*53*			*1.00*	*53*	
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)		*EP / Average*	*33*			*1.00*	*33*	
				4.00	*144.02*	*0.00*	*0.00*	*144.02*
USR ULABB4 4 laborers	208.00			832.00	29,956	0.00	0	29,956
MIL B-LABORER Laborers, (Semi-Skilled)		*Foreman*	*36*	*1.00*	*36*			
MIL B-LABORER Laborers, (Semi-Skilled)		*Journeyman*	*36*	*3.00*	*108*			

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Labor by Contractor Report												
				33.86	*0.00*	*1.00*	*7.57*	*0.00*				*49.11*
Carpenters	LaborCost1	Journeyman	45	1,531	0	45	342	0	0	200	103	2,221
				34.36	*0.00*	*1.00*	*7.57*	*0.00*				*49.71*
Carpenters	LaborCost1	Foreman	8	286	0	8	63	0	0	37	19	413
				34.43	*0.00*	*1.00*	*14.30*	*0.00*				*56.52*
Cement Finishers	LaborCost1	Journeyman	24	830	0	24	345	0	0	108	99	1,405
				33.50	*0.00*	*1.00*	*14.85*	*0.00*				*55.96*
Electricians	LaborCost1	Journeyman	37	1,246	0	37	552	0	0	162	83	2,081
				38.00	*0.00*	*1.00*	*14.30*	*0.00*				*60.78*
Equip. Operators, Crane/Shovel	LaborCost1	Journeyman	51	1,929	0	51	726	0	0	251	129	3,085
				34.21	*0.00*	*1.00*	*14.30*	*0.00*				*56.26*
Equip. Operators, Light	LaborCost1	Journeyman	283	9,698	0	283	4,054	0	0	1,263	978	16,276
				35.16	*0.00*	*1.00*	*13.95*	*0.00*				*57.04*
Equip. Operators, Medium	LaborCost1	Journeyman	261	9,178	0	261	3,641	0	0	1,195	615	14,890
				31.65	*0.00*	*1.00*	*14.30*	*0.00*				*53.20*
Equip. Operators, Oilers	LaborCost1	Journeyman	2	64	0	2	29	0	0	8	4	108
				22.84	*0.00*	*1.00*	*12.04*	*0.00*				*40.43*
Laborers, (Semi-Skilled)	LaborCost1	Journeyman	1,887	43,110	0	1,887	22,725	0	0	5,696	4,319	77,737
				23.34	*0.00*	*1.00*	*12.04*	*0.00*				*41.02*
Laborers, (Semi-Skilled)	LaborCost1	Foreman	753	17,577	0	753	9,067	0	0	2,320	2,552	32,270
				31.65	*0.00*	*1.00*	*14.30*	*0.00*				*53.20*
Outside Equip. Oilers	LaborCost1	Journeyman	4	127	0	4	57	0	0	17	8	213
				34.21	*0.00*	*1.00*	*14.30*	*0.00*				*56.26*
Outside Equip. Operators, Light	LaborCost1	Journeyman	45	1,528	0	45	639	0	0	199	102	2,514
				36.21	*0.00*	*1.00*	*14.30*	*0.00*				*58.65*
Outside Equip. Operators, Light	LaborCost1	Foreman	12	435	0	12	172	0	0	57	29	704
				35.16	*0.00*	*1.00*	*13.95*	*0.00*				*57.04*
Outside Equip. Operators, Medium	LaborCost1	Journeyman	397	13,969	0	397	5,542	0	0	1,819	936	22,663
				37.16	*0.00*	*1.00*	*13.95*	*0.00*				*59.43*

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Outside Equip. Operators, Medium	LaborCost1	Foreman	68	2,534	0	68	951	0	0	329	170	4,053
				22.84	*0.00*	*1.00*	*12.04*	*0.00*				*40.43*
Outside Laborers, (Semi-Skilled)	LaborCost1	Journeyman	568	12,973	0	568	6,839	0	0	1,714	869	22,963
				24.84	*0.00*	*1.00*	*12.04*	*0.00*				*42.81*
Outside Laborers, (Semi-Skilled)	LaborCost1	Foreman	24	604	0	24	293	0	0	80	40	1,042
				31.63	*0.00*	*1.00*	*12.32*	*0.00*				*51.20*
Outside Plumbers	LaborCost1	Journeyman	47	1,493	0	47	582	0	0	195	100	2,417
				33.63	*0.00*	*1.00*	*12.32*	*0.00*				*53.59*
Outside Plumbers	LaborCost1	Foreman	24	794	0	24	291	0	0	103	53	1,265
				25.57	*0.00*	*1.00*	*15.49*	*0.00*				*47.14*
Outside Truck Drivers, Heavy	LaborCost1	Journeyman	27	684	0	27	414	0	0	90	46	1,261
				31.63	*0.00*	*1.00*	*12.32*	*0.00*				*51.20*
Plumbers	LaborCost1	Journeyman	52	1,642	0	52	640	0	0	214	110	2,658
				25.30	*0.00*	*1.00*	*12.32*	*0.00*				*43.65*
Plumbers	LaborCost1	Apprentice	36	912	0	36	444	0	0	120	61	1,573
				33.06	*0.00*	*1.00*	*15.59*	*0.00*				*56.18*
Rodmen, (Reinforcing)	LaborCost1	Journeyman	3	105	0	3	49	0	0	14	7	178
				25.84	*0.00*	*1.00*	*12.04*	*0.00*				*44.01*
Skilled Workers	LaborCost1	Journeyman	33	848	0	33	395	0	0	111	57	1,444
				32.61	*0.00*	*1.00*	*13.27*	*0.00*				*53.32*
Steam/Pipefitters	LaborCost1	Journeyman	6	190	0	6	77	0	0	25	13	311
				26.09	*0.00*	*1.00*	*13.27*	*0.00*				*45.53*
Steam/Pipefitters	LaborCost1	Apprentice	5	139	0	5	71	0	0	18	9	243
				26.05	*0.00*	*1.00*	*15.28*	*0.00*				*50.61*
Stone Masons	LaborCost1	Journeyman	40	1,042	0	40	611	0	0	137	169	1,999
				26.55	*0.00*	*1.00*	*15.28*	*0.00*				*51.26*
Stone Masons	LaborCost1	Foreman	40	1,062	0	40	611	0	0	139	172	2,025
				33.06	*0.00*	*1.00*	*15.59*	*0.00*				*56.18*
Structural Steel Workers	LaborCost1	Journeyman	4	132	0	4	62	0	0	17	9	225
				32.19	*0.00*	*1.00*	*2.35*	*0.00*				*41.90*
Surveyors, Chief	LaborCost1	Journeyman	16	515	0	16	38	0	0	67	34	670
				15.36	*0.00*	*1.00*	*1.45*	*0.00*				*20.91*

Description	LaborRate	LaborType	ManHours	BaseWage	Travel	TaxableFringe	NonTaxFringe	Subsistence	Overtime	Payroll	WCI	Total
Surveyors, Helper	LaborCost1	Journeyman	16	246	0	16	23	0	0	33	16	335
				25.57	*0.00*	*1.00*	*15.49*	*0.00*				*47.14*
Truck Drivers, Heavy	LaborCost1	Journeyman	85	2,174	0	85	1,317	0	0	286	146	4,008
				25.04	*0.00*	*1.00*	*15.49*	*0.00*				*49.49*
Truck Drivers, Light	LaborCost1	Journeyman	529	13,256	0	529	8,200	0	0	1,745	2,331	26,062

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
Equipment by Contractor Report				**2,783**	**28,124**	**65,476**	**93,600**
					9.53	*18.20*	*27.73*
EP C10BO013 COMPACTOR, TRENCH ROLLER, VIBRATORY, 33.5"W X 19.7" DIA, DOUBLE TAMPING FOOT DRUMS, WALK BEHIND, 18000 LBS IMPACT	EP	Average	BMP851	8	80	152	231
					1.01	*1.34*	*2.35*
EP H25AX001 HYDRAULIC EXCAVATOR, ATTACHMENT, COMPACTOR, 23" WIDE, SHEEPS FOOT, 3 RIMS - 38" DIA (ADD 25,000-50,000 LB HYDRAULIC EXCAVATOR)	EP	Average	DC-24BL	16	16	21	38
					0.24	*1.07*	*1.31*
EP L15HZ001 POST HOLE DRILL, UP TO 8" DIA, 30" DEEP, ONE MAN OPERATION	EP	Average	PH980E	2	0	2	3
					1.57	*1.88*	*3.46*
EP T10LE005 TRACTOR ATTACHMENTS, POWER HARROW, 160" WIDE ROTERRA ROTARY HOE (ADD 75 HP TRACTOR W/PTO)	EP	Average	400-35	6	10	12	21
					1.38	*1.68*	*3.07*
EP T45XX026 TRUCK TRAILER, MISCELLANEOUS/UTILITY, TILT BED, 12 TON, 2 AXLE (ADD TOWING TRUCK)	EP	Average		403	557	679	1,236
					2.48	*7.48*	*9.95*
EP T50FO005 TRK,HWY,10,000GVW,4X2, 1T-PICKUP	Non-EP	Average	F350	77	191	577	768
					2.32	*12.48*	*14.80*
EP T50XX006 TRUCK, HIGHWAY, CONVENTIONAL, 1 TON PICKUP, 4X4	EP	Average	4X4 1 180 CONV GAS	11	25	136	162
					2.82	*13.99*	*16.82*
GEN A15Z0140 AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)	EP	Average	250	4	11	52	63
					3.73	*18.94*	*22.68*
GEN A15Z0150 AIR COMPRESSOR, 375 CFM (11 CMM), 100 PSI (689 KPA) (ADD HOSE)	EP	Average	375	3	10	53	63
					0.23	*0.41*	*0.64*
GEN A20Z0400 PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)	EP	Average	CP-1230-S1.25	7	2	3	5
					0.67	*1.19*	*1.86*
GEN A20Z0480 AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)	EP	Average		13	9	16	24
					8.44	*10.34*	*18.78*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN A25Z0580 ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average	MAXIMIZER 11	13	108	132	239
					0.86	*2.23*	*3.08*
GEN C10Z1360 COMPACTOR, RAMMER, 9" (229 MM) WIDE x 14" (356 MM) SHOE	EP	Average	BT 50	3	2	6	9
					0.66	*2.88*	*3.54*
GEN C10Z1380 COMPACTOR, VIBROPLATE, 18" (457 MM) WIDE x 21.5" (546 MM) PLATE	EP	Average	BP 18/45-2	4	3	13	15
					9.17	*18.22*	*27.39*
GEN C10Z1440 COMPACTOR, ROLLER, VIBRATORY, 29.5" (749 MM) WIDE, 2.25 TON (2.0 MT), DOUBLE DRUM, WALK-BEHIND	EP	Average	RT 56-SC	12	110	219	329
					6.19	*15.21*	*21.40*
GEN C55Z1950 CONCRETE PUMP, 50 CY/HR (38 M3/HR), TRAILER MOUNTED (ADD HOSE)	EP	Average	ST-45	2	12	30	43
					37.53	*78.59*	*116.12*
GEN C55Z1960 CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	EP	Average	BPL 900/KVM 23	1	25	52	77
					2.01	*8.63*	*10.64*
GEN C60Z1980 CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)	EP	Average	FS 3500/30	5	9	39	48
					3.97	*8.44*	*12.41*
GEN C60Z1990 CONCRETE SAW, RAIL SAW, 15.5" (394 MM) DEPTH, WALL (ADD 250 CFM (7 CMM) COMPRESSOR & COST FOR SAWBLADE WEAR)	EP	Average	360-10AP	38	153	324	477
					18.54	*40.69*	*59.23*
GEN C75Z2120 CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 15 TON (14 MT), 49' (14.9 M) BOOM, 4X4	EP	Average	RT525E	25	460	1,009	1,469
					17.36	*45.93*	*63.30*
GEN D30Z2890 DRILL, EARTH/AUGER, MULTI-PURPOSE, 8" (203 MM) DIA, 250' (76.2 M) DEPTH, 7,000 FT-LBS (967.8 KGF -M) TORQUE, W/21,000 LB (9,525 KG) GVW TRUCK W/PTO DRIVE (ADD COST FOR DRILL STEEL AND CUTTING EDGE)	EP	Average	B-58	9	164	433	597
					1.44	*12.65*	*14.10*
GEN G10Z3065 GENERATOR SET, SKID MOUNTED, 35 KW, VARIABLE POWER SETTINGS, RECONNECTIBLE	EP	Average	35G	24	34	299	333
					14.19	*29.85*	*44.04*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN G15Z3080 GRADER, MOTOR, ARTICULATED, 135 HP (101 KW), 12' (3.6 M) BLADE WIDTH	EP	Average	135-H	16	230	483	713
					14.30	*25.85*	*40.16*
GEN H25Z3170 HYDRAULIC EXCAVATOR, CRAWLER, 30,000 LB (13,608 KG), 0.75 CY (0.6 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH	EP	Average	135SR LC	14	201	363	564
					20.59	*33.67*	*54.25*
GEN H25Z3175 HYDRAULIC EXCAVATOR, CRAWLER, 40,000 LB (18,144 KG), 1.00 CY (0.8 M3) BUCKET, 19.6' (5.9 M) MAX DIGGING DEPTH	EP	Average	PC 150LC-6	16	329	539	868
					27.32	*50.00*	*77.32*
GEN H25Z3185 HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH	EP	Average	325BL	39	1,074	1,966	3,041
					28.98	*58.52*	*87.49*
GEN H25Z3190 HYDRAULIC EXCAVATOR, CRAWLER, 70,000 LB (31,751 KG), 2.00 CY (1.5 M3) BUCKET, 21.6' (6.6 M) MAX DIGGING DEPTH	EP	Average	330CL	68	1,970	3,979	5,950
					32.27	*44.77*	*77.04*
GEN H30Z3760 HYDRAULIC EXCAVATOR, WHEEL, 44,851 LBS (20,344.1 KG), 0.75 CY (0.6 M3), TELESCOPIC BOOM, 6X4	EP	Average	XL4100	4	129	179	308
					9.68	*26.15*	*35.82*
GEN L35Z4240 LOADER, FRONT END, CRAWLER, 1.50 CY (1.2 M3) BUCKET	EP	Average	939-C	2	22	60	82
					8.96	*21.51*	*30.48*
GEN L40Z4390 LOADER, FRONT END, WHEEL, ARTICULATED, 1.75 CY (1.3 M3) BUCKET, 4X4	EP	Average	914G	16	145	348	493
					15.03	*38.35*	*53.38*
GEN L40Z4397 LOADER, FRONT END, WHEEL, ARTICULATED, 3.25 CY (2.5 M3) BUCKET, 4X4	EP	Average	938G	12	188	479	667
					20.73	*50.33*	*71.06*
GEN L40Z4410 LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4	EP	Average	962G	31	643	1,560	2,203
					30.98	*69.28*	*100.26*
GEN L40Z4420 LOADER, FRONT END, WHEEL, ARTICULATED, 5.50 CY (4.2 M3) BUCKET, 4X4	EP	Average	980G II	6	177	396	573
					46.34	*98.57*	*144.91*
GEN L40Z4440 LOADER, FRONT END, WHEEL, ARTICULATED, 7.00 CY (5.4 M3) BUCKET, 4X4	EP	Average	988G	12	556	1,183	1,739

Description	CostType	ConditionType	Model		EQHours	Ownership	Operating	Total
						2.33	*8.88*	*11.22*
GEN L40Z4610 LOADER, FRONT END, WHEEL, SKID-STEER, 9 -11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	EP	Average		753	53	124	473	598
						26.99	*47.33*	*74.31*
GEN P35Z4950 PIPELAYER, 20' (0.5 M) BOOM, 90,000 LB (40,823 KG)	EP	Average	572-R		24	637	1,117	1,754
						0.13	*0.26*	*0.39*
GEN P50Z5086 PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (76 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION	EP	Average			2	0	1	1
						15.06	*39.90*	*54.95*
GEN R50Z5810 ROLLER, VIBRATORY, SELF-PROPELLED, SINGLE DRUM, SMOOTH, 12 TON (10.9 MT), 84" (2.1 M) WIDE, SOIL COMPACTOR	EP	Average	CS-563E		16	244	646	890
						9.13	*25.15*	*34.28*
GEN T15Z6440 TRACTOR, CRAWLER (DOZER), 76-100 HP (57-75 KW), POWERSHIFT, W/UNIVERSAL BLADE	EP	Average	D-4G XL		16	146	401	546
						14.37	*38.63*	*53.00*
GEN T15Z6480 TRACTOR, CRAWLER (DOZER), 101-135 HP (75 -101 KW), POWERSHIFT, W/ UNIVERSAL BLADE	EP	Average	1150H WT		38	542	1,458	2,000
						31.52	*79.48*	*111.00*
GEN T15Z6520 TRACTOR, CRAWLER (DOZER), 181-250 HP (135-186 KW), POWERSHIFT, LGP, W/UNIVERSAL BLADE	EP	Average	D-7R II LGP		7	224	565	790
						0.42	*0.34*	*0.76*
GEN T40Z6960 TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	EP	Average	8' X 12'		2	1	1	2
						0.61	*0.50*	*1.11*
GEN T40Z7000 TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	EP	Average	8' X 20'		38	23	19	43
						2.35	*2.02*	*4.37*
GEN T40Z7055 TRUCK OPTION, WATER TANK, 3,000 GAL (11,356 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average			4	9	8	16
						1.13	*0.98*	*2.11*
GEN T40Z7090 TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	EP	Average	KLEENSIDE		53	59	51	111
						2.50	*3.64*	*6.14*
GEN T45Z7080 TRUCK TRAILER, END DUMP, 17 CY (13 CM), 22 TON (20.0 MT) (ADD TOWING TRUCK)	EP	Average	28' SK2000		16	40	58	98

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					5.91	*12.79*	*18.70*
GEN T45Z7280 TRUCK TRAILER, WATER TANKER, 5,000 GAL (18,927 L) (ADD 50,000 LB (22,680 KG) GVW TRUCK)	EP	Average		1	6	13	19
					1.52	*9.03*	*10.54*
GEN T50Z7305 TRUCK, HIGHWAY, CONVENTIONAL, 3,500 LB (1,588 KG) GVW, 4X2, 2 AXLE, COMPACT-PICKUP	EP	Average	4X2 1/2 130 CONV GAS	4	6	36	42
					1.88	*9.26*	*11.14*
GEN T50Z7310 TRUCK, HIGHWAY, CONVENTIONAL, 8,600 LB (3,901 KG) GVW, 4X2, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP	EP	Average	4X2 3/4 130 CONV GAS	4	8	37	45
					2.23	*9.59*	*11.82*
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKUP	EP	Average	4X4 3/4 130 CONV GAS	24	53	226	279
					2.85	*30.43*	*33.28*
GEN T50Z7400 TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	EP	Average	4X2 25KGVW GAS	569	1,623	17,325	18,947
					7.79	*31.40*	*39.19*
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	EP	Average	6X4 45KGVW DSL	72	564	2,273	2,837
					7.87	*34.78*	*42.66*
GEN T50Z7480 TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	EP	Average	4X2 35KGVW DSL	13	100	443	543
					7.14	*39.27*	*46.41*
GEN T50Z7520 TRUCK, HIGHWAY, 55,000 LB (24,948 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	EP	Average	6X4 55KGVW DSL	1	7	39	46
					8.54	*35.38*	*43.93*
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2	EP	Average	4X2 35KGVW DSL	3	23	94	116
					0.72	*4.83*	*5.55*
GEN W25Z8605 WATER BLASTER, LOW PRESSURE, COLD WATER, 5.5 GPM (20.8 LPM) 1 NOZZLE, @ 3,500 PSI (24,132 KPA)	EP	Average	COLD 4/3000G	1	1	5	6
					0.40	*1.33*	*1.73*
GEN W35Z8680 WELDER, ELECTRIC DRIVEN, 300 AMP, SKID MOUNTED	EP	Average	IDEAL ARC R3R-300	7	3	9	12
					1.12	*0.61*	*1.73*
GEN XMEZ8815 LASER LEVEL FOR PIPES	Non-EP	Average	MISC. EQUIPMENT	16	18	10	28
					0.78	*2.01*	*2.79*

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
GEN XMEZ9120 POST DRIVER, 8" (203 MM) MAX DIA POST, 30,000 LB (13,608 KG) IMPACT (ADD 20,000-35,000 LB (9,072-15,876 KG) GVW TRUCK)	Non-EP	Average	MISC. EQUIPMENT	81	64	164	227
					0.63	*3.53*	*4.16*
GEN XMEZ9520 CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR	Non-EP	Average	MISC. EQUIPMENT	25	16	88	104
					0.57	*1.55*	*2.12*
GEN XMEZ9560 WATER TANK, 500 GAL (1,893 L) PORTABLE	Non-EP	Average	MISC. EQUIPMENT	43	24	67	91
					2.46	*6.58*	*9.03*
MAP C10BO011 COMPACTOR, ROLLER, VIBRATORY, 29.9"W X 19.7"DIA, DOUBLE SMOOTH DRUMS, WALK BEHIND, 1980 LBS IMPACT	EP	Average	BW 75AD-2	21	51	138	189
					37.53	*78.59*	*116.12*
MAP C55SC005 CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD	EP	Average	BPL 900/KVM 23	1	45	93	138
					7.90	*25.64*	*33.53*
MAP C75GV021 CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB	EP	Average	YB4410	7	54	174	228
					19.27	*46.06*	*65.33*
MAP C75GV023 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 30 TON, 95' BOOM, 4X4	EP	Average	RT530E	27	520	1,244	1,764
					18.54	*40.69*	*59.23*
MAP C75GV028 CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 25 TON, 75' BOOM, 4X4X4	EP	Average	RT525E	10	180	395	575
					6.15	*8.72*	*14.87*
MAP H25KN002 HYDRAULIC EXCAVATOR, ATTACHMENT, CONCRETE PULVERIZER, 3000 LB, W/POINT (ADD 26,000-36,000 LB HYDRAULIC EXCAVATOR)	EP	Average	KF19 QT	12	74	105	178
					32.27	*44.77*	*77.04*
MAP H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, TELESCOPIC BOOM, 22'6" DIGGING DEPTH, 6X4	EP	Average	XL4100	80	2,582	3,582	6,163
					11.07	*32.04*	*43.11*
MAP L15FG001 LANDSCAPING EQUIPMENT, HYDROSEEDER, 3000 GAL, TRUCK MTD (INCLUDES 56,000 GVW TRUCK)	EP	Average	T330	23	255	737	992
					22.53	*54.09*	*76.62*
MAP L35CA014 LOADER, FRONT END, CRAWLER, 3.20 CY BUCKET	EP	Average	963-C	3	68	162	230

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					5.18	*12.65*	*17.83*
MAP L50JC001 LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4	EP	Average	212S (4WS)	139	722	1,765	2,487
					13.03	*31.50*	*44.53*
MAP R45BO006 ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR	EP	Average	BW151AD-2	1	8	18	26
					23.44	*52.23*	*75.67*
MAP S10CA001 SCRAPER, ELEVATING LOADING, 11 CY, 13 TON, 4X2 - SINGLE POWERED	EP	Average	613-C SERIES II	37	869	1,936	2,805
					2.54	*2.71*	*5.24*
MAP T10CA010 TRACTOR ATTACHMENTS, BLADE, POWER ANGLE, HYDRAULIC, FOR D6, 4.16 CY (ADD D6 TRACTOR)	EP	Average	D6-108-3982	80	203	217	420
					31.52	*79.48*	*111.00*
MAP T15CA014 TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)	EP	Average	D-7R II LGP	6	193	486	679
					34.76	*93.36*	*128.12*
MAP T15CA016 TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-8R II	9	322	865	1,187
					9.13	*25.15*	*34.28*
MAP T15CA020 TRACTOR, CRAWLER (DOZER), 80 HP, POWERSHIFT, W/2.18 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-4G XL	6	56	155	211
					14.37	*38.63*	*53.00*
MAP T15CS007 TRACTOR, CRAWLER (DOZER), 119 HP, POWERSHIFT, W/3.90 CY UNIVERSAL BLADE (ADD ATTACHMENTS)	EP	Average	1150H WT	35	504	1,355	1,860
					1.52	*9.03*	*10.54*
MAP T50XX001 TRUCK, HIGHWAY, CONVENTIONAL, 1/2 TON PICKUP, 4X2	EP	Average	4X2 1/2 130 CONV GAS	6	9	55	65
					30.92	*43.89*	*74.81*
USR H30GA006 HYDRAULIC EXCAVATORS, WHEEL, 44,851 LBS, 0.75 CY BUCKET, 22'6" DIGGING DEPTH, TELESCOPIC BOOM, 6X4	EP	Average	XL4100	32	990	1,404	2,394
					200.00	*0.00*	*200.00*
USR JUA-WELD HDPE Butt-fusion Machine	Non-EP Rental	Average	WELD	24	4,720	0	4,720

Description	CostType	ConditionType	Model	EQHours	Ownership	Operating	Total
					48.57	*93.90*	*142.47*
USR L40CA008 LOADER, FRONT END, WHEEL, 9.00 CY BUCKET, ARTICULATED, 4X4	EP	Average	988F SERIES II	23	1,117	2,160	3,277
					21.48	*46.56*	*68.05*
USR L40Z4410 962G LOADER, FRONT END, WHEEL, ARTICULATED, 4.00 CY (3.1 M3) BUCKET, 4X4	EP	Average	962G	25	541	1,173	1,715
					18.28	*50.78*	*69.06*
USR T15CA023 TRACTOR, CAT D6, CRAWLER (DOZER), 165 HP, LOW GROUND PRESSURE, POWERSHIFT, W/ 5.09 CY SEMI-U BLADE (ADD ATTACHMENTS)	EP	Average	D-6R	80	1,463	4,062	5,525
					9.05	*44.33*	*53.38*
USR T50Z7420 TRUCK, HWY 45,000 (20,412KG)GVW 6X4, 3 AXLE, (ADD ACCESSORIES)	EP	Average	C500B	40	362	1,773	2,135

Description **Page**

APPENDIX F

INCREMENTAL COST ANALYSIS

ECONOMICS REPORT

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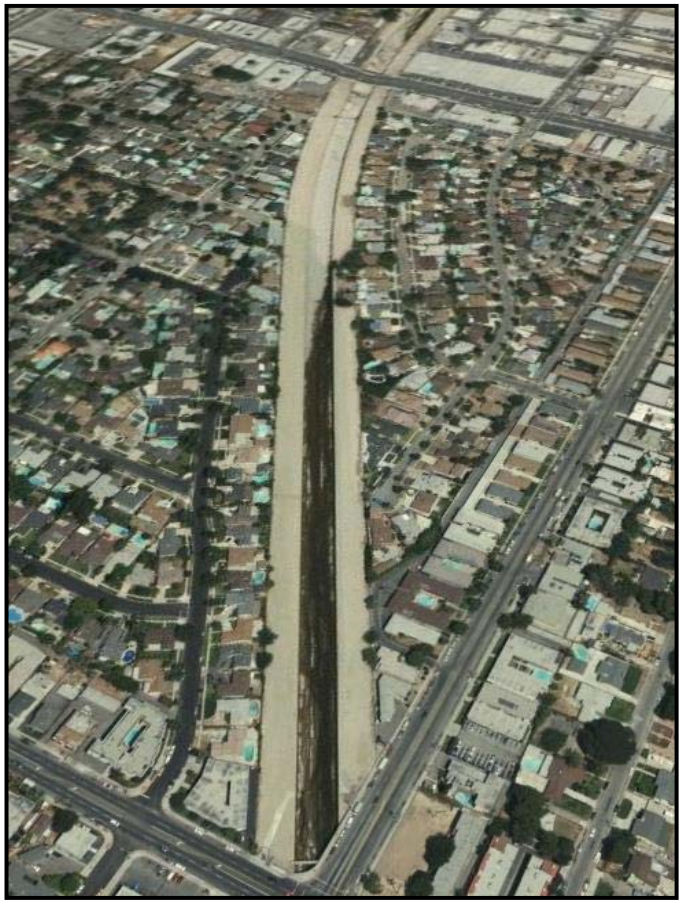
US Army Corps
of Engineers

Tujunga Wash Ecosystem Restoration

Detailed Project Report
Economic Appendix

November 2008



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Introduction

Purpose

The primary purpose of the Economic Analysis is to identify the best buy ecosystem restoration alternative via the process of cost-effectiveness and incremental cost analysis (CE/ICA). As a secondary purpose, this analysis will estimate the National Economic Development (NED) benefits of any recreational features that are associated with the alternatives considered as part of the Detailed Project Report.

Guidance & References

The overall methodology employed for this Economic Analysis is in accordance with current principles and guidelines, and standard economic practices, as outlined in the Planning Guidance Notebook - ER 1105-2-100. The evaluation of environmental restoration alternatives will be conducted in compliance with IWR-Report 95-R-1 – *Evaluation of Environmental Investments: Procedures Manual (May 1995)*. The recreational values will be computed at FY 2009 price levels utilizing the applicable Federal Discount rate of 4.625%. The period of analysis is 50 years.

Considerations of the Economic Analysis

The project site is located in a densely populated, fully built-out area of Los Angeles County. No significant changes in development or population within the project area are expected in the foreseeable future. For this reason, the Economic Analysis considers the existing and future without-project conditions to be equivalent. Thus, in evaluating the various project alternatives, the analysis will use the existing study area conditions as a baseline for the initial comparison.

The Study Area

The figure at right shows the location of the project site. The proposed project is located in the Tujunga community plan area of the City of Los Angeles, California, about approximately 15 miles north Downtown of Los Angeles.

Figure 1: Study Area Regional View

Existing Conditions

The Project Site

Historically, it is presumed that the Tujunga Wash and nearby streams hosted a variety of native vegetation, invertebrates, amphibians, and freshwater and anadromous fishes. Today, as seen in the aerial photograph at right, Tujunga Wash is a concrete-lined, rectangular channel devoid of any significant natural habitat. The channel was constructed between 1950 and 1952 by the Corps of Engineers to reduce the threat of flooding damages to people and property by effectively conveying storm flows from Hansen Dam to the Tujunga Wash confluence with the Los Angeles River. The local community is now looking to improve the quality of the environment in this area and reestablish a riparian ecosystem that functions within the constraints of the current flood control system. Under the authority of Section 1135 (b) of the Water Resources Development Act (WRDA) of 1986, PL 99-662, as amended, the Army is authorized to carry out a program for the purpose of making modifications in the structures and operations of water resources projects constructed.

Figure 2: Aerial Photo of Project Site, Upstream Reach

Land Use, Population, & Housing

The study area is located within the city of Los Angeles, and is part of the Tujunga Watershed. According to the Tujunga Watershed Project[1] (TWP), approximately 525,000 people currently live within the 204 square mile watershed. Most of the population in the watershed lives within communities that are part of the City of Los Angeles. These include the communities of Pacoima, Arleta, Sylmar, Sunland, Tujunga, Panorama City, Van Nuys, North Hollywood, Valley Glen, Valley Village, and Studio City. The population residing within the watershed is roughly 62% Latino, with 32% of the population under the age of seventeen, and 19% living at or below the poverty line.

As shown in the land use map on the following page, the dominant land uses in the project area are: high-density single family; low-rise apartments, condos, and townhouses; and manufacturing, assembly, and industrial services. As a note, this figure, as well as others in this Economic Appendix, is best viewed in color.

[1] http://www.theriverproject.org/tujunga/reports.html

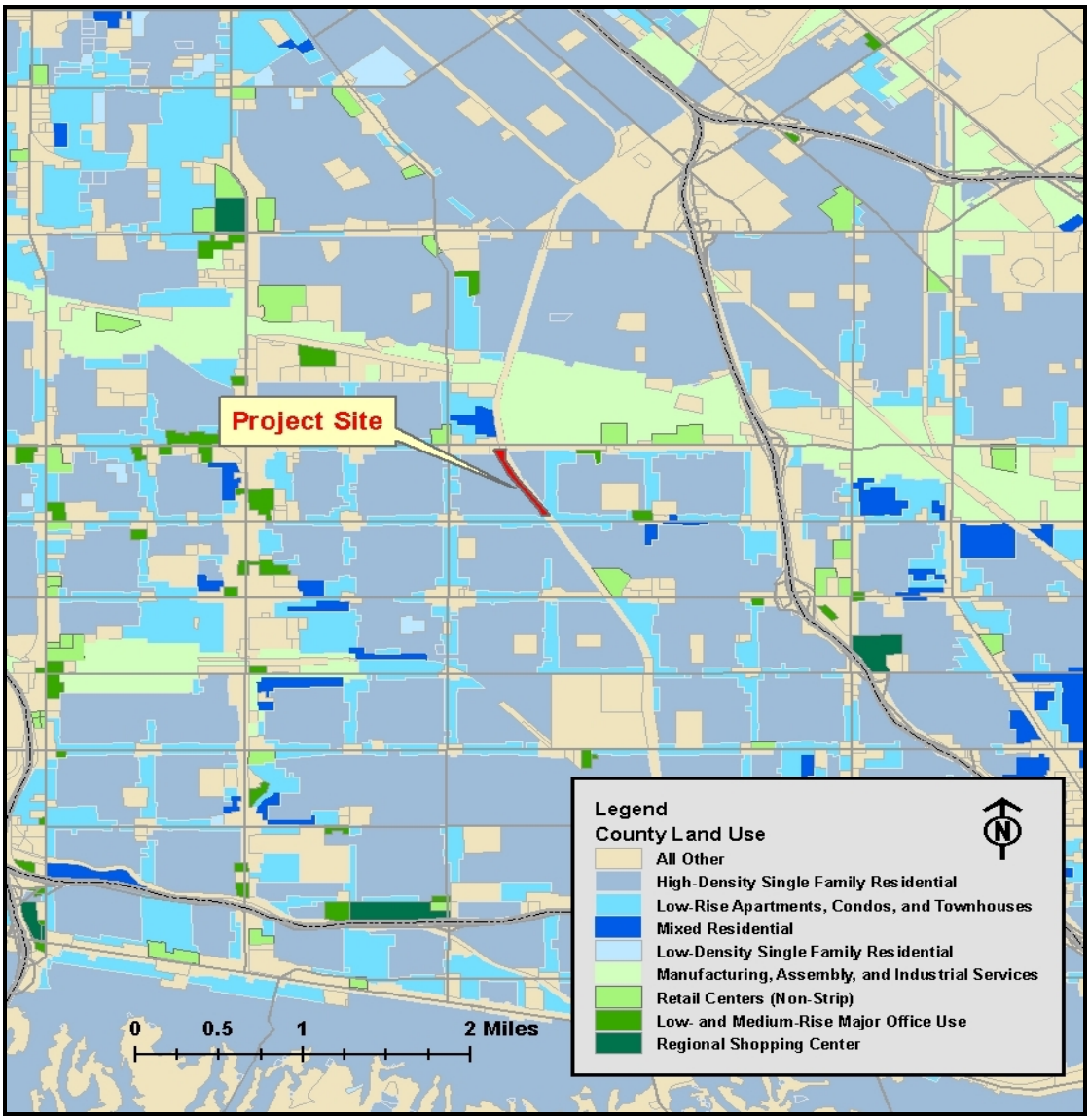

Figure 3: Project Area Land Use
Source: Southern California Association of Governments (SCAG), 2007. Figure best viewed in color.

Table 1 includes population and housing data for several of the communities in the Tujunga watershed. Three of the communities listed have a population density significantly higher – as much as 60% higher – than broader Los Angeles, which is part of the nation's most densely populated metropolitan area. According to the TWP, the highest population densities within the watershed occur in the central part of the lower watershed, in the communities of Panorama City, North Hills, and North Hollywood. Within a two mile radius of the project site (a circle of approximately twelve square miles), it is estimated that there are between 70,000 and 90,000 residents.[2]

[2] This estimate was made by using the average population density in the area, and subtracting the portion of land that appears from aerial photography to be strictly non-residential (in this case, mostly industrial land use).

Table 1: Study Area Population & Housing (2006)

	Los Angeles	Arleta-Pacoima	Sylmar	Sunland-Tujunga	Van Nuys	North Hollywood/ Valley Village
Square Miles	484.3	10.5	12.8	21.9	12.9	10.6
Population	3,974,000	104,800	77,400	62,500	169,100	148,200
Annual Pop. Growth Rate	1.1%	1.0%	1.7%	1.0%	1.0%	1.3%
Pop. Density	8,000	9,901	5,961	2,762	13,031	13,500
Total Housing Units	1,372,500	21,600	19,100	20,300	57,800	52,941
Housing Unit Density	2,794	2,098	1,494	946	4,581	4,978

Source: Los Angeles City Planning Department / Demographics Research Unit & Graphic Services Section - Data Effective October 2006. Population and housing density in units per square mile.

Population forecasts for Los Angeles County indicate a slow rate of growth through 2050 as compared to the surrounding counties. The total population of Los Angeles County is expected to increase by around 15% by this time, as compared to 25%, 80%, and 150% for the counties of Orange, San Bernardino, and Riverside, respectively. The already high housing and population density in Los Angeles County and the relatively high real estate prices are expected to be contributing factors to the slow rate of future population growth.

Income and Employment

The project area generally suffers from high unemployment and relatively high poverty rates. The highest poverty rates occur in high-density areas of Panorama City, North Hills, North Hollywood, and Pacoima. As can be seen in Table 2 below, according to the latest comprehensive census data, the project area is significantly poorer than greater Los Angeles City.

Table 2: Selected Economic Indicators

Category	Local Census Area*	City of Los Angeles
Median Household Income	$33,000	$40,876
Unemployment Rate	9.7%	9.6%
Percentage of Population at or Below Poverty Level	25%	21%

Source: City of Los Angeles Planning Department, Demographics Research Unit, July 2006. Income not adjusted for inflation. *Census Tracts 120000-123999, 124000-128999.

Within the general project area[3], the industries employing the most people are Management and Professional Trades (27%), Sales and Office Work (26%), Services (17%), and Manufacturing and Transportation (16%).

Existing Recreation Resources in the Study Area

More than half of the upper watershed lies within the Angeles National Forest (ANF), a very sparsely populated region in which the natural community has retained a significant presence. The ANF receives more visitors than any other US National Forest. Forest recreation sites located within the Tujunga Watershed are heavily used, extremely popular weekend destinations for local residents.

The City of Los Angeles has approximately 15,620 acres of parkland under the jurisdiction of the Department of Recreation and Parks. This number includes all park acreage and open space (Small/Pocket Parks, Neighborhood

[3] Defined as including census tracts 120000-123999 & 124000-128999

Parks, Community Parks, Regional Parks, Beaches, Canyons, etc.) in the Department's inventory. Overall, there is approximately 4.23 acres of parkland per 1,000 residents.

However, it should be noted that the City has a standard of 4.00 acres of Neighborhood & Community parkland per 1,000 residents, per the City's Public Recreation Plan. Considering just these more local resources, there are approximately 0.76 acres of parkland per 1,000 residents. According to the Department of Recreation and Parks, this standard is a more accurate reflection of the recreational resources available in each community.

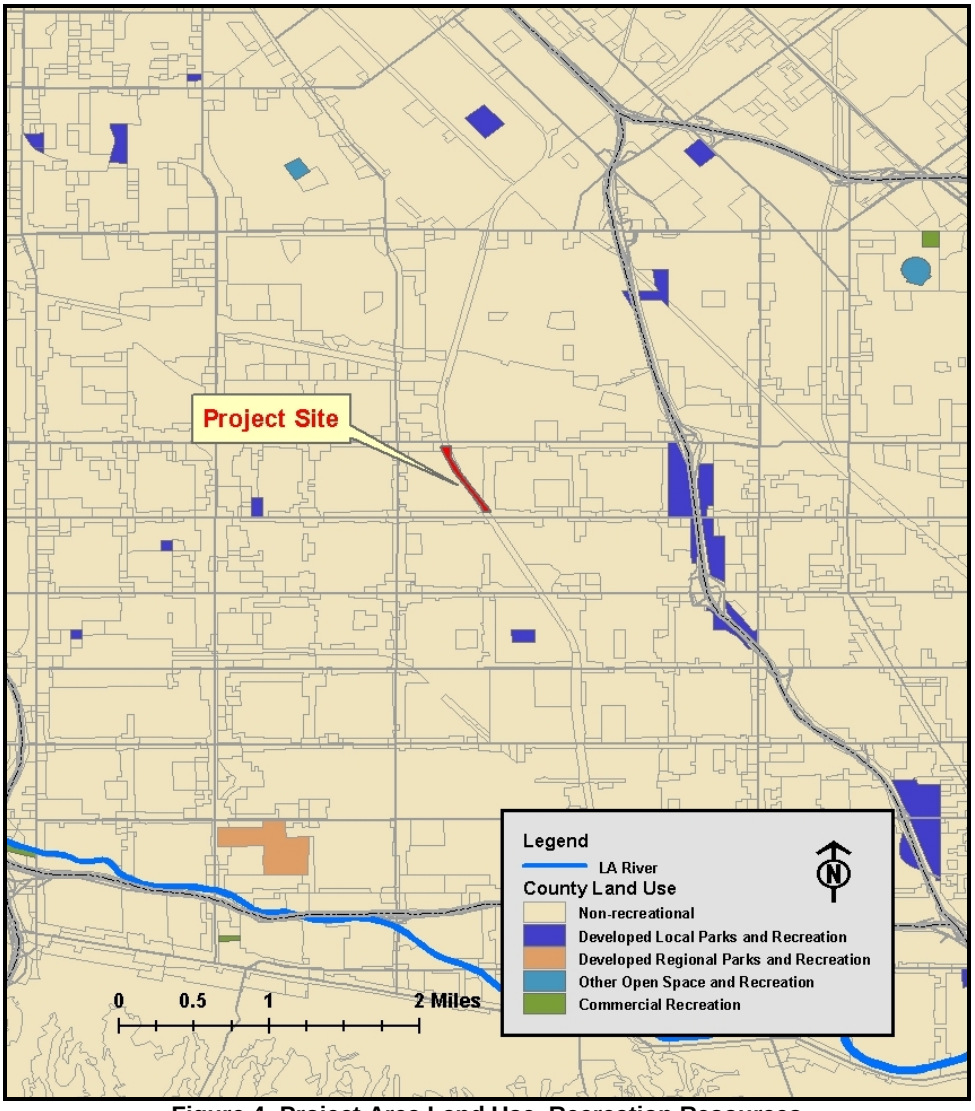

Figure 4: Project Area Land Use, Recreation Resources
Source: Southern California Association of Governments (SCAG), 2007. Figure best viewed in color.

Given that the recreation features considered at the project site are passive in nature and of a small scale, the recreation market is assumed to be relatively small in geography. The vast proportion of users is expected to be local residents. For local parks, the City of Los Angeles typically considers the market area as a two mile radius of the park location. The following recreation and parks facilities are located within a two mile radius of the project location:

- Strathern Park-North - 8.62 acre Community Park located north of Strathern Street and west of Whitsett Avenue.

- Strathern Park West / Strathern Greenbelt - 12.70 acre community park located at 12541 Saticoy Street.
- Valley Glen Community Park (formerly Erwin Community Park, as shown in the map below) - 5.72 acre neighborhood park located at Erwin Street and Ethel Avenue.
- Hartland Mini Park - 0.12 acre pocket park located at Woodman Avenue and Hartland Street.
- Kittridge Mini Park - 0.12 acre pocket park located at Kittridge Street and Greenbelt Avenue.
- Valley Plaza Recreation Center - 64.41 acre Community Park located at 12240 Archwood Street.
- Van Nuys Recreation Center - 3.92 acre Neighborhood Park located at 14301 Vanowen Street.

The recreation areas listed above comprise approximately 95 acres of local parkland. Given the density of the population in this area, it is estimated that most of the areas that are within a 2-mile radius of the project site have in their market area less than one acre of parkland per thousand residents – less than one-quarter of the recommended parkland recommended by the City.

With-Project Description and Analysis

The project reach extends from Vanowen Street north to Sherman Way, a distance of approximately 3,000 feet. Under the No Action Alternative, the project area would remain devoid of suitable habitat for resident and transient riparian species. Alternatives 2 and 3 would both create approximately seven acres of restored aquatic/emergent and riparian habitat. Under both of these alternatives, habitat would be created on both sides of the existing channel. Neither alternative would alter the configuration or the function of the channel, but rather simply abut on the 3,000 foot stretch of flood control channel. The primary difference between the two alternatives is that Alternative 2 would hydraulically connect the restoration project to the County's restoration project located downstream and adjacent to the Federal project area. Alternative 3 would return the water from the Federal project back into the Tujunga Wash. Also, the plant pallets between the two action alternatives differ slightly. A more detailed description of the alternatives can be found in Appendix D.

Cost Analysis

USACE policy dictates the maximum amount (as a percentage of project costs) that can be allocated to recreation features associated with a project that has ecosystem restoration as a primary purpose. ER 1105-2-100 states the following: "*…for recreation associated with ecosystem restoration, the Federal cost of ecosystem restoration plus the Federal cost of recreation may not exceed by more than 10 percent the Federal cost of the ecosystem restoration project without prior approval of the ASA(CW).*"

The following tables show the costs for the two action alternatives – with restoration features and recreation features separated out. These costs are separated in order to enable the separate analysis of these two project components. The restoration features of the two alternatives will be compared in a cost-effectiveness analysis, while a benefit-cost analysis will be conducted to determine whether the construction of the recreation features is justified according to USACE policy.

Table 3 shows that the limit on the Federal investment in the recreation components for each alternative is approximately $308,000. While the restoration features of the project are cost-shared 75% Federal/25% Non-Federal, the cost of recreation features are shared equally between the Federal government and the local sponsor.

Table 3: Restoration First Costs

	Alternative 2	Alternative 3
First Cost – Restoration*	$4,104,285	$4,108,218
Federal Share at 75%	$3,078,214	$3,081,163
10% of Federal Share	$307,821	$308,116

** Restoration First Cost includes the NPV of Future Monitoring over 5 years of $54,438*

Table 4 shows the costs of the recreation component of each alternative, and shows that the percentage of cost represented by the recreation components are for both alternatives below the 10% ceiling. Adding the recreation features increases the cost to the Federal government by just over two percent. This is calculated as the quotient of a) the First Cost – 50% Corps ($65,048) of the recreation features as shown in Table 4, and b) the Federal Share at 75% of the restoration features ($3.08 million) as shown in Table 3. Again, the intent of this result is to show that the cost of the recreation features is within the allowable limit per USACE policy. The subsequent Recreation Analysis will estimate the economic value to the public of the recreation features of the alternatives, and will include a comparison of the benefits to the costs.

Table 4: Cost Analysis for Recreation Features

	Alternative 2	Alternative 3
First Cost - Recreation	$130,096	$130,096
IDC	$1,234	$1,234
Gross Investment	$131,330	$131,330
Annual Cost*	$6,785	$6,785
O&M	NA	NA
Total Annual Cost - Recreation	$6,785	$6,785
First Cost - 50% Corps	$65,048	$65,048
Percent of Recreation to Restoration - Corps	2.1%	2.1%
Total First Cost - Restoration and Recreation	$4,234,381	$4,238,314
Annualized* Total First Cost - Restoration and Recreation	$218,641	$218,844
*Annualized at 4.625%		

CE/ICA – Choosing the NER Alternative

The Economist's role in the determination of the contribution of a particular project to the Environmental Quality account is to help characterize and rank the cost-effectiveness (CE) of the various alternatives that are part of a particular study. That is, each alternative can generally be a combination of measures, the sum of which has a particular level of habitat value and a particular monetary cost associated with it. A cost effectiveness analysis is simply a way of finding, for a given level of habitat output, those combinations of non-exclusive restoration measures that provide the best value. Once the cost-effective alternatives, or plans, have been identified, the Economist performs an incremental cost analysis (ICA), which helps decision-makers understand the added cost at each additional level of habitat output. From USACE guidance:

"Cost-effectiveness analysis shall be used to identify the least cost solution for each level of environmental

output considered. Incremental cost analysis compares the additional costs to the additional outputs of an alternative."

The first step is to identify those plans that are inefficient in production, and to remove them from further consideration. A plan is defined as inefficient (or not cost-effective) when another plan provides the same or greater level of output for less cost. Table 5 shows the three alternatives for the Tujunga Wash Ecosystem Restoration. As the table below shows, over the 50-year period of analysis, in the absence of a federal project the project area is expected to have zero habitat value. Alternative 2 would create just over seven AAHUs, while Alternative 3 would create just less than six AAHUs. Details on the procedure to determine the AAHU for each alternative can be found in Appendix D.

Table 5: Average Annual Habitat Units, 2009-2058

Alternative	Output (AAHUs)
No Action	0
2	7.09
3	5.59

The following tables show the total first cost for the restoration features (including the cost of real estate, design, construction, post construction project monitoring and interest during construction – IDC) for each of the alternatives, as well as the total annualized cost. The costs were annualized at 4.625% over a period of fifty years, and the rounded to the nearest hundred. The two action alternatives have the same operation and maintenance (O&M) cost.

Table 6: Total First Cost of Alternatives - Restoration

Alternative	First Cost	Interest During Construction	Total Investment Cost
No Action	NA	NA	NA
2	$4,104,285	$85,148	$4,189,432
3	$4,108,218	$85,230	$4,193,448

Table 7: Total Annual Cost of Alternatives - Restoration

Alternative	Annualized Investment Cost*	Annualized O&M	Total Annual Cost
No Action	0	NA	0
2	$216,300	$51,700	$268,000
3	$216,500	$51,700	$268,200
*Includes IDC; amortized at 4.625%			

Since Alternative 2 provides the most habitat units and is also the alternative with the lowest total cost, no additional cost-effective analysis is needed to identify the optimal plan. Also, because Alternative 3 is shown to be cost-ineffective, and since there are only two action alternatives, no incremental cost analysis is needed to identify the optimal plan. The alternatives are mutually exclusive and not combinable. Alternative 2 provides just over seven average annual habitat units at an annual cost of around $268,000, or just under $38,000 per habitat unit.

Recreation Analysis

This valuation is not an assessment of the economic value of the resource in terms of employment, income, or tourism. It is simply an estimate, based on well-established national parameters developed by federal water resource agencies, of users' "willingness to pay" for recreational experiences. The aggregate willingness of individuals to pay for the recreational resources is considered part of the National Economic Development (NED) account, which helps determine federal interest in a project.

NED benefits arising from recreation opportunities created by a project are measured in terms of aggregate willingness to pay. USACE Principles and Guidelines document describes three techniques which have been developed to estimate recreation demand and value. The three methods are: 1) Travel Cost; 2) Contingent Valuation; and 3) Unit Day. Because of its simplicity and general acceptability, the Unit Day method (Unit Day Value, or UDV) was selected for use in this analysis.

Unlike the Travel Cost method, the UDV method does not attempt to account for the impact of price on visitations to a recreation site. Instead, an assigned user day value is applied to the total number of estimated visitors. User day values are simulated market values derived from a range of values agreed to by Federal water resource agencies. It is intended to represent a typical user's average willingness to pay for a recreation experience at the site. When a properly formulated unit day value is applied to estimated use, an approximation of the area under the site demand curve is obtained, which is used in estimating recreation value at a site as well as the net recreation benefits of a proposed project.

Recreation Demand & Expected Future Use

According to City of Los Angeles Department of Recreation and Parks, facilities in the study area are very heavily utilized by the local community. Many factors contribute to making the area a valuable site for recreation. The project location is within one of the most densely populated communities in the nation. Currently, the area is vastly underserved by parks and recreation facilities, having less than one-quarter of the City's standard for parkland. Thus, it is reasonable to assume that demand in the project area for local parkland and recreational areas significantly exceeds the existing supply.

Except for the No-Action Alternative, each of the study alternatives feature open space and pedestrian trails with interpretive pathways and signage. Additionally, these two alternatives will create a limited amount of open and passive recreational space. For purposes of this analysis, the estimate of recreation use and value will be based on the expected use of the pedestrian trail.

The National Recreation and Park Association (NRPA) has developed a set of standards that is used to help guide city and urban planners make decisions on the number and size of various types of recreational facilities and resources. For urban trails, the NRPA recommends planning for ninety hikers per day per mile. Approximately .6 miles of walking path will be created under each of the two action alternatives. These numbers indicate that annual visits to the site will approximate 19,700.

Valuation of the Project Recreation Features

A national schedule is available showing a range of values for both specialized and general recreation opportunities. A point rating system can be used to select a specific value from the published schedule of value ranges. Unit Day Values are calculated by assigning points to each activity (based upon Federal guidelines) and then converting total points to dollar recreation values. As shown in the table below, point values are derived by ranking the recreation resource according to five different criteria.

Except for the No Action Alternative, the alternatives under consideration would create recreation opportunities of the same type and scale. Each features limited open space and pedestrian trails with interpretive pathways and

signage. As shown in the table below, the total number of points assigned to the recreational features is thirty-one. This total is representative of a site that a) provides opportunity for a small number of activity types, b) has other recreation sites within one hour travel time, c) has adequate facilities given the nature of the intended experience and the expected number of visitors, d) is quite accessible, and e) has only average esthetic qualities – including consideration of the surrounding area.

Table 8: Assessing the Value of Recreational Resources - UDV Method

Criteria	Key Variables	Range of Point Values	Points Assigned
Recreation Experience	Number & Type of Facilities	0-30	4
Availability of Opportunity	Number of Similar Opportunities Nearby	0-18	3
Carrying Capacity	Adequacy of Facilities for Activities	0-14	7
Accessibility	Ease of Access to and Within Site	0-18	11
Environmental	Esthetic Quality of Site	0-20	6
Total		**0-100**	**31**

In general, based upon the total number of points assigned and the type of activity, UDV's can range from $3.59 to $42.65 per recreation day, which includes specialized recreation opportunities. The recreational opportunities that will be offered under all of the alternatives are considered general recreation for purposes of the UDV calculation. The upper limit on the value of general recreation is set by guidance at $10.77, as shown in the Table 9 below. Thirty-one UDV points corresponds to $5.52 per user per visit.

Table 9: Dollar Value Assigned to UDV Points

	$ Value Assigned Per the Total Points Assigned, General Recreation										
Points Assigned	**0**	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**
Value	$3.59	$4.26	$4.71	$5.39	$6.73	$7.63	$8.30	$8.75	$9.65	$10.32	$10.77
Source: USACE Economics Guidance Memorandum, 09-03											

Benefit-Cost Analysis of the Recreation Features

According to the UDV methodology, with visitation at 19,700 users per year, at a UDV corresponding to $5.52, both Alternatives 2 and 3 would have an annual recreation value of $108,823, which is calculated as the product of the annual visitation and the UDV.

Table 10: Total Annual Value of Recreation - UDV Method

Alternative	UDV Points Assigned	UDV (Per Visit)	Expected Annual Visits	Total Annual Value
No Action	NA	NA	NA	NA
2	31	$5.52	19,700	$108,823
3	31	$5.52	19,700	$108,823

For recreation elements of a project, the economic value (Total Annual Value) is synonymous with the "benefits" of creating the recreation opportunity. The action alternatives have the same recreation features, and thus the benefits and costs associated with the recreation features are equivalent. Table 11 shows that for each alternative the recreation benefits of the project far outweigh the cost of constructing these features. The benefit to cost ratio is 16, and the net benefits of constructing the features is approximately $102,000. The result of a benefit to cost ratio greater than one (net benefits) from the construction of the recreation features is very robust, and holds as long as annual visitation is greater than 1,229 (which is less than ten percent of the expected annual visits according to the standards applied in this study).

Table 11: Benefit-Cost Analysis, Recreation Features

Alternative	Total Annual Value (Benefits) of Recreation	Total Annual Cost – Recreation Features	B/C	Total Annual Net Benefits
No Action	NA	NA	NA	NA
2	$108,823	$6,785	16	$102,038
3	$108,823	$6,785	16	$102,038

Summary and Conclusion

The above analyses provide several results. First, the CE/ICA demonstrates that Alternative 2 provides the most cost-effective opportunity for ecosystem restoration. It provides the most habitat units and has the lowest total restoration cost. Second, the construction of the recreation component for each alternative is justified and the total cost of the recreation features is well below the limit set by USACE policy. The two alternatives have equivalent recreation net benefits.

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APPENDIX G

REAL ESTATE PLAN

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Tujunga Wash Ecosystem Restoration
Los Angeles County, California

Real Estate Plan

1. PURPOSE

This appendix is prepared in accordance with ER 405-1-12, 12-16, Real Estate Plan, and presents the Real Estate Requirements for the Tujunga Wash Ecosystem Restoration project. This appendix will focus on the Real Estate requirements for the recommended plan which is designed to improve the quality of the environment. The study is being conducted under the authority provided under section 1135 of the Water Resources Development Act (WRDA) of 1986.

2. DESCRIPTION OF LAND, EASEMENTS and RIGHTS-OF-WAY (LER)

The project will involve about 9 acres of land along the Tujunga Wash with most of the features being constructed between Sherman Way and Vanowen Street. Plans call for the planting of riparian vegetation and the construction of a meandering stream on the west bank of the Tujunga Wash and the planting of upland vegetation in the buffer areas. An easement for 0.14 acres is needed above Sherman Way to construct an intake structure and install a pipeline which will be the source of water to the stream on the west bank. Approximately 100 square feet easement will also be needed at the downstream end of the channel to construct a junction structure to either the existing 36-inch RCP bypass or the existing channel wall. The minimum estate needed for the intake and junction structures according to ER 405-1-12, 12-9 “Determining the Appropriate Interest to Acquire” is an easement; however the non-federal sponsor has fee ownership of the project area. Native Vegetation will also be planted on about 4 acres of the east bank of the wash creating a walking path. A staging area has been identified north of Sherman

Way near the intake structure that is to be constructed along the bank of the Tujunga Wash. Two possible disposal sites have been identified Strathern Inert Landfill (2,700 tons/day permitted tonnage) or Calmat Inert Landfill (500 tons/day permitted tonnage) both are located near the project site in Sun Valley.

3. SPONSOR OWNED LER

The Los Angeles County Flood Control District also known as The Los Angeles County Department of Public Works (LACDPW), the local sponsor, owns several parcels in and around the Tujunga Wash in fee. The project will take place in five parcels that extend from 1,200 feet above Sherman Way down to Vanowen Street. All five parcels are owned by the sponsor.

4. PROPOSED NON-STANDARD ESTATES

According to Engineer Regulation ER405-1-12, 12-8 an ecosystem restoration project requires that the land be acquired in fee. The sponsor owns the existing right-of-way in fee and no potential non-standard estates have been identified.

5. EXISTING FEDERAL PROJECT

This project takes place on the banks of the Tujunga Wash. The Tujunga Wash was built by the Corps of Engineers in a project called The Tujunga Wash Channel Improvement: Beachy Ave. to Van Owen St. which was completed November 1951. This stretch is the third segment in the Tujunga Wash Channel Improvement: Los Angeles River to Hansen Dam and is part of the general plan for flood control in the Los Angeles County Drainage Area (LACDA) which was authorized under the Flood Control Act of 1936 as amended in 1937, 1938, 1941, 1944, 1946 and 1950. According to the Analysis of Design on this

project dated May 1950, the right-of-way for this area was acquired by the current Non-Federal sponsor.

6. FEDERALLY OWNED LAND

There is no federally owned land in the project area and as previously stated the staging area and disposal sites have not been identified at this time.

7. EXTENT OF NAVIGATIONAL SERVITUDE

There are no lands that are subject to the applications of Navigational Servitude.

8. MAP

A map of the project area has been provided. Exhibit A.

9. EXTENT OF INDUCED FLOODING

No anticipated flooding induced by the construction or the operation and maintenance of the project is expected.

10. BASELINE COST ESTIMATE

Based on the finding in the" Analysis of Design Tujunga Wash Channel Improvement: Los Angeles River to Hansen Dam" dated May 1950 the project area was previously provided as an item of cooperation by the Los Angeles County Flood Control District. According to ER 405-1-12, 12-38 Exceptions to LER Credit section a reads "Previously provided as an Item of Cooperation. The non-Federal sponsor shall not receive credit for the value of any LER, including incidental cost, that have been provided previously as an item of cooperation for another federal project." Therefore, the non-federal sponsor will not get credit for the land that will be used for the project and staging areas.

Plan	Lands (LERRD's)
Non-Federal Sponsor owned Land, Easement & Right-of-way	

Fee (9.09 acres)	$0
Contingency 10%	$0
Lands, Easements & Right-of-way to be acquired by Non-Federal Sponsor	$0
Relocations Facility/Utility	No Relocations Identified
Relocations PL 91-646	$0
Non-Federal Administrative Cost	$0
Federal Administrative Cost	$0
LERRD's Total	$0
Total Real Estate Cost Rounded	$0

11. PL 91-646 RELOCATION ASSISTANCE BENEFITS

There are no Public Law 91-646 relocations to consider within the proposed project area.

12. DESCRIPTION OF PRESENT OR ANTICIPATED MINERAL ACTIVITY

There are no present or anticipated mineral activities in the proposed project area.

13. PROJECT SPONSOR'S LAND ACQUISITION ABILITY

Have sent an E-mail to the Non-Federal Sponsor's Project Manager with the questions pertaining to appendix 12-E (Assessment of Non-Federal Sponsor's Real Estate Acquisition Capability). A response has yet to be received.

14. ENACTMENT OF ZONING ORDINANCES

There is no foreseen enactment of zoning ordinances to facilitate acquisition of Real Property.

15. LAND ACQUISITION SCHEDULE AND MILESTONES

A land acquisition schedule has not been required for this project. Currently the sponsor does not need to acquire any land because as stated the sponsor has fee ownership over the five parcels needed for the project.

16. DESCRIPTION OF FACILITY/UTILITY RELOCATIONS

No facility/utility relocations have been identified. An intake structure and a power pole are located on the west bank of the project area but will not need to be relocated. The project will be built around these structures.

17. KNOWLEDGE OR SUSPECTED PRESENCE OF CONTAMINANTS

According to the Environmental Assessment (EA) completed for the project, there were no contaminants found in the project area. Some Title 22 metals were found in the project area but levels were below threshold according California Code of Regulations, Title 22, February 2003. The EA states that no special handling of the subsurface soil is anticipated for the project area.

18. SUPPORT/OPPOSITION FOR PROJECT

The project is surrounded by several neighborhoods that are in favor of the project because it provides a much needed green space and would be an improvement to their community. According to the Landscape Design Appendix of the Detailed Project Report, potential safety issues such as vandalism and lighting are indentified. It also states that the people living in the area are concerned about an increase in criminal activity and homeless camps due to this project. All issues are being taken into consideration and addressed.

19. LAND ACQUISITION BEFORE PCA

The Sponsor will be advised in writing of the risks associated with acquiring land prior to the execution of the Project Cooperation Agreement even though the current project area is owned in fee by the Sponsor.

Tujunga Wash Project Area

0 125 250 500 750 1,000 Feet

USACE, SPL, Asset Management Division

Legend

Project Area

Exhibit A

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APPENDIX H

CORRESPONDENCE

- **Correspondence Letters**
- **Public Comment Letters**
- **Response to Public Comment Letters**

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CORRESPONDENCE LETTERS

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COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

DEAN D. EFSTATHIOU, Acting Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

July 15, 2008

IN REPLY PLEASE
REFER TO FILE: WM-5

Colonel Thomas H. Magness, IV
District Commander
U.S. Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, CA 90053-2325

Attention Dr. Josephine Axt

Dear Colonel Magness:

TUJUNGA WASH SECTION 1135 REPORT
LETTER OF INTEREST

As requested, we are writing to update our Letter of Interest since we submitted our last letter in 2005. In accordance with the provisions of Section 1135 of the Water Resources Development Act of 1986, the Federal government is authorized to conduct investigations and studies to improve the quality of the environment. Pursuant to your Environmental Restoration Program, the Los Angeles County Flood Control District (LACFCD) requests that the U.S. Army Corps of Engineers (Corps of Engineers) continue the environmental restoration study for the Tujunga Wash.

The Tujunga Wash channel flows through a highly urbanized area in the City of Los Angeles. The proposed restoration would seek to mimic a small tributary in this region by diverting urban runoff through a naturalized stream course along the bank of the Tujunga Wash. The project will demonstrate how constructed streams in an urban environment can reestablish a riparian ecosystem while functioning with the constraints of the current flood control system.

On November 7, 2007, we successfully completed Phase I of this environmental restoration effort by constructing a naturalized stream with native habitat along the Tujunga Wash between Oxnard Street and Vanowen Street. Our partnership on this project will be for Phase II of the overall Tujunga Wash environmental restoration effort and will extend the restoration north from Vanowen Street to Sherman Way. Currently,

ARG

your office has completed the Detailed Project Report (DPR) and is ready to send it out for public review upon receipt of this updated Letter of Interest. Once the DPR is finalized, plans and specifications are scheduled to be completed by January 2009 and construction is scheduled to start in December 2009.

We understand the local cost-sharing requirements for Section 1135 projects are 25 percent of the total project cost for a $5 million maximum Federal share. We are also aware that both the Corps of Engineers' and the LACFCD's responsibilities will be delineated in a Project Cooperative Agreement, which both parties will execute before construction or in-kind work commences. The LACFCD is willing and able to provide all necessary local cooperation and sponsorship, and we look forward to working with the Corps of Engineers on this important project.

If you have any questions, please contact Mr. Richard Gomez of our Watershed Management Division at (626) 458-4322 or rgomez@dpw.lacounty.gov.

Very truly yours,

DEAN D. EFSTATHIOU
Acting Director of Public Works

MARK PESTRELLA
Assistant Deputy Director
Watershed Management Division

RG:jtz
P:\wmpub\Secretarial\2008 Documents\Letters\Tujunga Wash Section 1135 Report.doc\C08257

cc: Supervisor Zev Yarovslavsky (Maria Chong-Castillo)

DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. BOX 532711
LOS ANGELES, CALIFORNIA 90053-2325

June 15, 2006

REPLY TO
ATTENTION OF

Planning Division
Office of the Chief

Mr. Milford Wayne Donaldson
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 942896
Sacramento, California 94296-0001

Dear Mr. Donaldson:

This letter is in regard to the Army Corps of Engineers, Los Angeles District (Corps) Tujunga Wash Ecosystem Restoration Project. The project requires preparation of an Environmental Assessment (EA). The proposed project involves restoration of riparian habitat] within the San Fernando Valley, Los Angeles County, California. Tujunga Wash is a rectangular channel constructed between 1950 and 1952 by the Corps. It conveys flows from Hansen Dam to its confluence with the Los Angeles River (see Enclosure 1).

The purpose of the proposed project is to restore and enhance the habitat of the 3,000 feet of Channel that extends between Vanowen on the south and Sherman on the north, in the City of Los Angeles, CA. The total area proposed for restoration includes strips of land 60-ft. wide (210 feet total width, including channel) on both sides of the channel, for a total of 9 acres. The Corps has defined the Area of Potential Effect (APE) as the entire 9-acre parcel (see Enclosure 2).

The subject lands are owned by Los Angeles County. This portion of Tujunga Wash has been substantially degraded due to modifications made for flood damage reductions and the operation and maintenance decision to keep plant material off the surface (see Enclosure 3). The channel is over 50 years old, having been constructed in the early 1950s. Construction methods and materials for this type of channel remains essentially the same, and no person or historic event is associated with the channel. The Corps has determined that the Tujunga Wash, between Hansen Dam and Vanowen Street is not eligible for listing on the National Register of Historic Places under criteria a, b, or c.

A records and literature search was conducted by Corps of Engineers' Staff Archeologist at the South Central Coastal Information Center, California State University, Fullerton, and involved review of archeological resources maps, historic topographic maps, and historic register lists. Historical resources include the *National Register of Historic Places* (2006), the *California State Historic Resources Inventory* (2006), the *California Points of Historical Interests* (2006), and the *California Historical Landmarks* (2006).

Previous surveys on file at the Los Angeles District Corps of Engineers (Cottrell et al. 1985, Demcak 1979, and Martz 1977, Greenwood and Associates 1994, Brock et al. 1993, and Wuellner and Wahoff 2005) observed no cultural material in the project area. There are no previously recorded historic properties within 1 mile of the Area of Potential Effect (APE) of the proposed project.

A search at the California Native American Heritage Commission determined that no sacred sites are recorded within the project area. A list of Native American tribes and groups with interest the Corps' project area was also requested and received. The draft EA will be sent to those on the list for review and comment.

Based on the information provided above, and pursuant to 36 CFR 800.4(d)(1), the Corps has determined that the Tujunga Wash Project will have no effect on historic properties. We request that this submittal be considered as an expedited consultation under 36 CFR 800.3(g). We look forward to your response within thirty days.

Please send Correspondence to:

U.S. Army Corps of Engineers
Los Angeles District
Attn: (CESPL-PD-RL, Maxwell)
P.O. Box 532711
Los Angeles, CA 90053-2325

Questions regarding this evaluation may be referred to Ms. Pamela Maxwell, Staff Archeologist, at (213) 452-3877, or via email at pamela.j.maxwell@usace.army.mil.

Sincerely,

Ruth Bajza Villalobos,
Chief, Planning Division

Enclosures

PUBLIC COMMENT LETTERS

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U.S. Department of Homeland Security
FEMA Region IX
1111 Broadway, Suite 1200
Oakland, CA. 94607-4052

FEMA

January 20, 2009

Dr. Josephine R. Axt
Chief, Planning Division
U. S. Army Corps of Engineers
Los Angeles District
P. O. Box 532711
Los Angeles, California 90053-2325

Dear Dr. Axt:

This is in response to your request for comments on the Draft Integrated Detailed Project Report/Environmental Assessment (DPR/EA) for the Tujunga Wash 1135 Ecosystem Restoration Project, Los Angeles County, California.

Please review the current effective countywide Flood Insurance Rate Maps (FIRMs) for the County of Los Angeles (Community Number 065043), Map revised September 26, 2008. Please note that the City and County of Los Angeles, California are participants in the National Flood Insurance Program (NFIP). The minimum, basic NFIP floodplain management building requirements are described in Vol. 44 Code of Federal Regulations (44 CFR), Sections 59 through 65.

A summary of these NFIP floodplain management building requirements are as follows:

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE, and A1 through A30 as delineated on the FIRM), must be elevated so that the lowest floor is at or above the Base Flood Elevation level in accordance with the effective Flood Insurance Rate Map.

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any ***development*** must not increase base flood elevation levels. **The term *development* means any man-made change to improved or unimproved real estate, including but not limited to buildings, other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, and storage of equipment or materials.** A hydrologic and hydraulic analysis must be performed *prior* to the start of development, and must demonstrate that the development would not cause any rise in base flood levels. No rise is permitted within regulatory floodways.

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on pilings and columns, so that the lowest horizontal structural member, (excluding the pilings and columns), is elevated to or above the base flood elevation level. In addition, the posts and pilings foundation and the structure attached thereto, is anchored to resist flotation, collapse and lateral movement due to the effects of wind and water loads acting simultaneously on all building components.

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities to submit the appropriate hydrologic and hydraulic data to FEMA for a FIRM revision. In accordance with 44 CFR, Section 65.3, as soon as practicable, but not later than six months after such data becomes available, a community shall notify FEMA of the changes by submitting technical data for a flood map revision. To obtain copies of FEMA's Flood Map Revision Application Packages, please refer to the FEMA website at http://www.fema.gov/business/nfip/forms.shtm.

Please Note:

Many NFIP participating communities have adopted floodplain management building requirements which are more restrictive than the minimum federal standards described in 44 CFR. Please contact the local community's floodplain manager for more information on local floodplain management building requirements. The Los Angeles County floodplain manager can be reached by calling George De La O, Department of Public Works, Watershed Management Division, at (626) 458-7155.

If you have any questions or concerns, please do not hesitate to call Cynthia McKenzie, Senior Floodplanner, of the Mitigation staff at (510) 627-7190.

Sincerely,

Gregor Blackburn, CFM, Branch Chief
Floodplain Management and Insurance Branch

cc:
Roland (Randy) Tabije, U. S. Army Corps of Engineers, Los Angeles District
Mark Pestrella, Assistant Deputy Director, Department of Public Works, City of Los Angeles
George De La O, Senior Civil Engineer, Department of Public Works, Los Angeles County
Garret Tam Sing/Salomon Miranda, State of California, Department of Water Resources, Southern District
Cynthia McKenzie, Senior Floodplanner, CFM, DHS/FEMA Region IX
Alessandro Amaglio, Environmental Officer, DHS/FEMA Region IX

STATE OF CALIFORNIA — Arnold Schwarzenegger, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
e-mail: ds_nahc@pacbell.net

February 5, 2009

Dr. Josephine R. Axt, Chief, Planning Division
DEPARTMENT OF THE ARMY
LOS ANGELES DISTRICT CORPS OF ENGINEERS
P.O. Box 532711
Los Angeles, CA 90053-2325

Re: SCH#2009014003; NEPA Notice of Completion; draft Detailed Project Report/Environmental Assessment (DPR/EA) for the Tujunga Wash 1135 Ecosystem Restoration Project; , 3,000 feet between Vanowen Street and Sherman Way, San Fernando Valley; Los Angeles County, California

Dear Dr. Axt:

The Native American Heritage Commission (NAHC) is the state 'trustee agency' pursuant to Public Resources Code §21070 designated to protect California's Native American Cultural Resources. The NAHC is also a 'reviewing agency' for environmental documents prepared under the National Environmental Policy Act (NEPA; 42 U.S.C 4321 *et seq*) and that are subject to the Tribal and interested Native American consultation requirements of the National Historic Preservation Act, as amended (Section 106) (16 U.S.C. 470).

The NAHC is of the opinion that the federal standards are similar to and in many cases more stringent with regard to the 'significance' of historic, including Native American items, and archaeological, including Native American items than the California Environmental Quality Act (CEQA.). The California Environmental Quality Act (CEQA) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ... objects of historic or aesthetic significance." In order to comply with this provision, the lead agency is required to assess whether the project will have an adverse impact on these resources within the 'area of potential effect (APE)', and if so, to mitigate that effect. To adequately assess the project-related impacts on historical resources, the Commission recommends the following action:

√ Contact the appropriate California Historic Resources Information Center (CHRIS) for possible 'recorded sites' in locations where the development will or might occur.. Contact information for the Information Center nearest you is available from the State Office of Historic Preservation (916/653-7278)/ http://www.ohp.parks.ca.gov. The record search will determine:

- If a part or the entire APE has been previously surveyed for cultural resources.
- If any known cultural resources have already been recorded in or adjacent to the APE.
- If the probability is low, moderate, or high that cultural resources are located in the APE.
- If a survey is required to determine whether previously unrecorded cultural resources are present.

√ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.

- The final report, Environmental Impact Statement, if required, prepared under NEPA guidelines, containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
- The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.

√ The Native American Heritage Commission (NAHC) performed:

- A Sacred Lands File (SLF) search of the project 'area of potential effect (APE)': The results: No known Native American Cultural Resources were identified within one-half mile of the 'area of potential effect' (APE).: However the NAHC SLF is not exhaustive and local tribal contacts should be consulted from the attached list and the there are significant Native American cultural resources in close proximity..

- The NAHC advises the use of Native American Monitors, also, when professional archaeologists or the equivalent are employed by project proponents, in order to ensure proper identification and care given cultural resources that may be discovered. The NAHC, FURTHER, recommends that contact be made with Native American Contacts on the attached list to get their input on potential IMPACT of the project (APE) on cultural

resources.. In some cases, the existence of a Native American cultural resources may be known only to a local tribe(s) or Native American individuals or elders.

- √ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
- Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5 (f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
- Again, a culturally-affiliated Native American tribe may be the only source of information about a Sacred Site/Native American cultural resource.
- Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.

√ Lead agencies should include provisions for discovery of Native American human remains or unmarked cemeteries in their mitigation plans.

* The NAHC recommends that the lead agency to work with the Native Americans identified by this Commission if the Environmental Assessment identifies the presence or likely presence of Native American human remains within the APE. The NAHC recommends agreements with Native American Contacts, identified by the NAHC, to assure the appropriate and dignified treatment of Native American human remains and any associated grave liens.

√ Even though this is a federal project, we advise that California Health and Safety Code §7050.5, Public Resources Code §5097.98 and Sec. §15064.5 (d) of the California Code of Regulations (CEQA Guidelines) mandate procedures to be followed, including that construction or excavation be stopped in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the county coroner or medical examiner can determine whether the remains are those of a Native American. . California Government Code §27460 requires that any find of human remains, even on federal property and/or on a federal project be reported to the County coroner.

√ The Native American Heritage Commission, furthermore advises Lead agencies to consider avoidance, when significant cultural resources are discovered during the course of project planning and implementation

Please feel free to contact me at (916) 653-6251 if you have any questions.

Sincerely,

Dave Singleton
Program Analyst

Attachment: List of Native American Contacts

Cc: State Clearinghouse

Native American Contacts
Los Angeles County
February 5, 2009

Charles Cooke
32835 Santiago Road
Acton , CA 93510
(661) 733-1812 - cell
suscol@intox.net
Chumash
Fernandeno
Tataviam
Kitanemuk

Beverly Salazar Folkes
1931 Shadybrook Drive
Thousand Oaks , CA 91362
805 492-7255
(805) 558-1154 - cell
folkes9@msn.com
Chumash
Tataviam
Fe†rnandeño

Fernandeno Tataviam Band of Mission Indians
William Gonzalaes, Cultural/Environ Depart
601 South Brand Boulevard, Suite 102
San Fernando , CA 91340
ced@tataviam.org
(818) 837-0794 Office
(818) 581-9293 Cell
(818) 837-0796 Fax
Fernandeno
Tataviam

Tongva Ancestral Territorial Tribal Nation
John Tommy Rosas, Tribal Admin.
,
tattnlaw@gmail.com
310-570-6567
Gabrielino Tongva

Kitanemuk & Yowlumne Tejon Indians
Delia Dominguez
981 N. Virginia
Covina , CA 91722
(626) 339-6785
Yowlumne
Kitanemuk

San Fernando Band of Mission Indians
John Valenzuela, Chairperson
P.O. Box 221838
Newhall , CA 91322
tsen2u@live.com
(661) 753-9833 Office
(760) 885-0955 Cell
(760) 949-1604 Fax
Fernandeño
Tataviam
Serrano
Vanyume
Kitanemuk

Randy Guzman - Folkes
4577 Alamo Street, Unit C
Simi Valley , CA 93063
ndnrandy@hotmail.com
(805) 905-1675 - cell
Chumash
Fernandeño
Tataviam
Shoshone Paiute
Yaqui

COUNTY OF LOS ANGELES

DEPARTMENT OF PARKS AND RECREATION

"Creating Community Through People, Parks and Programs"

Russ Guiney, Director

January 29, 2009

Dr. Josephine R. Axt
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
Attention: Mr. Roland (Randy) Tabije, CESPL-PD-RN
P.O. Box 532711
Los Angeles, CA 90053-2325

Dear Dr. Axt:

DRAFT DETAILED PROJECT REPORT/ENVIRONMENTAL ASSESSMENT TUJUNGA WASH SECTION 1135 ECOSYSTEM RESTORATION PROJECT

The Draft Integrated Detailed Project Report/ Environmental Assessment for Tujunga Wash Section 1135 Ecosystem Restoration Project has been reviewed for potential impact on the facilities of this Department. The project as described in the Notice will not affect facilities under the jurisdiction of this Department.

Thank you for including this Department in the review of this notice. If we may be of further assistance, please contact me at (213) 351-5129.

Sincerely,

Jui Ing Chien
Park Planner

JC:tls:g/response to ACOE Tujunga 1135

c: Parks and Recreation (N. E. Garcia, L. Hensley, F. Moreno, J. Barber, J. Rupert)

MOUNTAINS RECREATION & CONSERVATION AUTHORITY
Los Angeles River Center and Gardens
570 West Avenue Twenty-six, Suite 100
Los Angeles, California 90065
Phone (323) 221-9944 Fax (323) 221-9934

February 13, 2009

Dr. Josephine R. Axt
Chief, Planning Division
U.S. Army Corps of Engineers
Los Angeles District
Attn: Mr. Roland (Randy) Tabije, CESPL-PD-RN
P.O. Box 532711
Los Angeles, CA 90053-2325

Tujunga Wash Section 1135 Ecosystem Restoration Project

Dear Dr. Axt:

The Mountains Recreation and Conservation Authority (MRCA) is pleased to comment on the U.S. Army Corps of Engineers Draft DPR/EA for the Tujunga Wash Ecosystem Restoration Project. In 2007, the MRCA completed the downstream project in cooperation with Los Angeles County Department of Public Works. MRCA staff currently maintain that project.

MRCA is dedicated to the preservation and management of local open space and parkland, watershed lands, trails, and wildlife habitat. The MRCA works in cooperation with the Santa Monica Mountains Conservancy and other local government partners to acquire parkland, participate in vital planning processes, and complete major park improvement projects. These parklands increase recreation opportunities, create open space in urban areas and contribute to improved water quality, as well as incrementally augmenting the region's native ecosystems. We graciously offer the following comments on the Draft DPR/EA:

Alternative #2
The MRCA concurs with the selection of Alternative #2 as the recommended project. Alternative #2 involves construction of a stream restoration on the west bank, and a recreational path and habitat restoration on the east bank. The stream would connect downstream to our restoration project that is maintained by our agency. We request that the Corps provide some option for temporary diversions of water from the proposed constructed stream into the channel, in the event that flow needs to be limited or halted due to downstream conditions.

Recreational Amenities vs. Habitat Establishment
The MRCA is pleased at the potential addition of much needed recreational space. We are concerned however, that the plan prohibits public access to the stream restoration side (west bank) of the wash. We understand that protection from disturbance is

necessary in order for the native plants to become properly established, and for the restoration to be successful. A post and cable fence along the maintenance road, similar to what is proposed for the east bank, would provide adequate protection for the project. If public access cannot be provided immediately, the duration of inaccessibility must be limited to 1-2 years only for plant establishment.

The recreational and educational opportunities here are significant, and the project is located in a urban area that offers few choices for outdoor recreation. Opening the west bank to the pubic will create much-needed areas for respite. The MRCA also recommends that the public "pocket parks" at the entrances be made larger to mitigate for lack of access to the restoration site. Considering the lack of public park space in the immediate area, the amount of new park space must be maximized with every opportunity.

Stream Bed - Clay Liner
The proposed project calls for a clay liner to be installed in the constructed streambed. The Corps needs to conduct further analysis regarding impacts of such a clay liner. Our experience is that clay liners are cost-prohibitive. More significantly, a clay liner would prohibit the constructed stream from functioning naturally. Although it is an artificial construction, the restoration project should be designed with watershed benefits such as infiltration.

Bilingual Signage
The MRCA recommends that the stated intention that "some" interpretive signs be bilingual be expanded so that all project signage provide Spanish translation.

We appreciate the opportunity to comment. Please direct any questions and further correspondence to Sara FitzSimmons at (323) 221-9944 ext. 141.

Sincerely,

Cara Meyer

Cara Meyer
Chief of Special Projects

RESPONSE TO COMMENTS

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U.S. DEPARTMENT OF HOMELAND SECURITY - FEMA

Comment 1

- All buildings constructed within a riverine floodplain, (i.e., Flood Zones A, AO, AH, AE and A1 through A30 as delineated on the FIRM)……

Response 1

- There are no buildings that will be constructed within the riverine floodplain. The project is above the Base Flood Protection Elevation level and is built on top of the bank which are designed for 100 year flood protection.

Comment 2

- If the area of construction is located within a Regulatory Floodway as delineated on the FIRM, any development must not increase base …….

Response 2

- The project will not increase base flood elevation levels and it not constructed within a Regulatory Floodway.

Comment 3

- All buildings constructed within a coastal high hazard area, (any of the "V" Flood Zones as delineated on the FIRM), must be elevated on …….

Response 3

- The project is not constructed within a coastal high hazard area and is not prone to floatation, collapse and lateral movement. There are no buildings being constructed in the project area.

Comment 4

- Upon completion of any development that changes existing Special Flood Hazard Areas, the NFIP directs all participating communities ……

Response 4

- There are no building developments in the project area that will change the existing Special Flood Hazard Areas.

NATIVE AMERICAN HERITAGE COMMISSION

Comment 1

- To adequately assess the project-related impacts on historical resources, the Commission recommends the following action…….

Response 1

- The Corps has complied with Section 106 of the National Historic Preservation Act of 1966. The Corps conducted a records and literature search through the California Historical Resources Information System, South Central Coastal Information Center (CHRIS-SCCIC) at California State University, Fullerton; a Sacred Lands File (SLF) search through the California Native American Heritage Commission; and conducted a pedestrian survey of the Area of Potential Effects. The Corps has sent letters to the individuals on Native American Contacts list soliciting their input on potential impacts of the project on cultural resources. The Corps has included an Environmental Commitment in the draft EA that addresses monitoring earthmoving in previously undisturbed areas and addresses unexpected discoveries during construction.

COUNTY OF LOS ANGELES DEPARTMENT OF PARKS AND RECREATION

Comment 1

- The Draft Integrated Detailed Project/Environmental Assessment for Tujunga Wash Section 1135 Ecosystem Restoration Project has been reviewed for potential impact on the facilities of this Department. The project as described in the Notice will not affect facilities under the jurisdiction of this Department.

Response 1

- Thank you for your comments.

MOUNTAINS RECREATION & CONSERVATION AUTHORITY (MRCA)

Comment 1

- The MRCA concurs with the selection of Alternative #2 as the recommended project. Alternative #2 involves construction of a ……...

Response 1

- Concur, our Design Engineers have designed for a valve to be installed at the inlet of the project.

Comment 2

- The MRCA is pleased at the potential addition of much needed recreational space. We are concerned however, that the plan prohibits ……..

Response 2

- Concur, both the Corps and Local Sponsor would like to turn over the project as soon as possible but will have to agree in writing to turn over the project after 1 year of maintenance.

Comment 3

- The recreational and educational opportunities here are significant, and the project

is located in an urban area that offers few choices ……

Response 3

- The Corps is only allowed a very limited amount of effort in recreational features. If the Local Sponsor wants to create bigger parks, it would have to come as a betterment from the Local Sponsor.

Comment 4

- The proposed project calls for a clay liner to be installed in the constructed streambed. The Corps needs to conduct further ……..

Response 4

- If a clay liner is not installed, flows may not reach the downstream end of the project due to the limited flows that the project receives during certain seasons. The Landscape Designer has designed the project to have a semi impervious liner so that water will still be able to infiltrate the groundwater via percolation.

Comment 5

- The MRCA recommends that the stated intention that “some” interpretive signs be bilingual to be expanded so that all project ……..

Response 5

- Concur, these can be added.

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APPENDIX I

MAILING LIST

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Federal Agencies

Federal Emergency Management Agency - Region IX
1111 Broadway, Suite 1200
Oakland, CA 94607

U.S. Fish and Wildlife Service
6010 Hidden Valley Road
Carlsbad, CA 92009
ATTN: JOHN HANLON

U.S. Department of Transportation
Federal Highway Administration
650 Capitol Mall, Suite 4-100
Sacramento, CA 95814

Environmental Protection Agency,
Region IX
600 Wilshire Boulevard Suite 1460
Los Angeles, CA 90017
ATTN: STEVEN JOHN

Environmental Protection Agency
Region 9
75 Hawthorne St
San Francisco, CA 94105

U.S. Army Corps of Engineers
South Pacific Division, CESPD-PDC
1455 Market St, 20th Floor
San Francisco, CA 94103
ATTN: PAUL BOWERS

State Agencies

California Department of Fish and Game
CEQA Review Program
4949 Viewridge Avenue
San Diego, CA 92123
ATTN: Kelly Schmoker

California Air Resources Board
9480 Telstar Avenue, Suite 4
El Monte, CA 91731

Southern California Association of Governments
Perf. Assess & Implementation
818 West 7th Street, 12th Floor
Los Angeles, CA 90017
ATTN: J. David Stein

Office of Historic Preservation
Post Office Box 942896
Sacramento, CA 94296
ATTN: Dr. Knox Mellon

California Regional Water Quality Control Board
401 Certification Unit CalEPA
Los Angeles Region
320 W. 4th Street, 2nd Floor
Los Angeles, CA 90013
ATTN: DANA COLE

California Department of Transportation
100 South Main Street
Los Angeles, CA 90012
ATTN: DOUGLAS FAILING

California Department of Parks and Recreation
Office of Historic Preservation
1416 9th Street, Room 1442,
Sacramento, CA 95814
ATTN: State Officer

State Water Resources Control Board
1001 I Street
Sacramento, CA 95814
ATTN: Chairman

California Water Commission
1416 Ninth Street, Room 1148
Sacramento, CA 95814

Los Angeles Dept. of Parks and Recreation
1200 W. 7th Street Suite 700
Los Angeles, CA 90017
ATTN: GENERAL MANAGER

State Clearing House
1400 Tenth Street, Room 121
Sacramento, CA 95814

South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, CA 91765-4182
ATTN:DAVID JONES

County Agencies

Department of Parks and Recreation
Executive Office
Los Angeles County
433 S. Vermont Avenue
Los Angeles, CA 90020

Los Angeles County Department
of Public Works
900 S. Fremont Ave.
Alhambra, CA 91803
ATTN: RICHARD GOMEZ

City Agencies

City of Los Angeles
Environmental Affairs
200 N. Spring Street
Room 2403 City Hall
Los Angeles, CA 90012
ATTN: LILLIAN KAWASAKI

City of Los Angeles
Office of the Mayor
200 North Main Street
City Hall East
Los Angeles, CA 90012

Non Government Organizations (NGOs)

Friends of the Los Angeles River
570 West Avenue 26 #256
Los Angeles, CA 90065
ATTN:JIM DANZA

Mountains Recreation and Conservation Authority (MRCA)
570 West Avenue 26, Suite 100
Los Angeles, CA 90065
ATTN: CARA MEYER

Libraries

County of Los Angeles Public Library, Administration
7400 East Imperial Highway
Downey, CA 90241-7011

East Los Angeles Library
4837 East Third Street
Los Angeles, CA 90022

Head Librarian
Los Angeles Public Library
921 South Gaffey Street
San Pedro, CA 90731

Van Nuys Branch Library
6250 Sylmar Ave
Van Nuys, 91401
Panorama City Library

San Fernando Library
Kathy Coakley
Acting Community Library Manager
217 North Maclay Avenue
San Fernando, CA 91340-2433