

# Lindley Reservoir Tank Replacement Project

Draft Mitigated Negative Declaration

July 2014

Prepared for:  
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**CITY OF ESCONDIDO  
LINDLEY RESERVOIR TANK REPLACEMENT PROJECT  
DRAFT MITIGATED NEGATIVE DECLARATION**

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- A. Biological Technical Report and Coastal California Gnatcatcher Survey Report
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CITY OF ESCONDIDO  
PLANNING DIVISION  
201 NORTH BROADWAY  
ESCONDIDO, CA 92025-2798  
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## NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

CASE NO.: ENV 14-0004 "Lindley Reservoir Tank Replacement Project"

DATE ISSUED: June 30, 2014

PUBLIC REVIEW PERIOD: July 3, 2014 – August 1, 2014

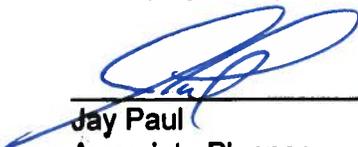
**LOCATION:** The 10.8-acre project site generally is located along the northwestern side of Hubbard Avenue, west of the intersection of Hubbard Avenue and North Ash Street, south of Vista Avenue in an unincorporated area under the jurisdiction of the County of San Diego, addressed as 720 Hubbard Avenue (APNs 227-010-55 and -58). The project site and most of the proposed off-site pipeline corridor are located within a small "island" of unincorporated land surrounded by areas within the incorporated City of Escondido. The project site also is within the northern portion of the City's water service area.

**PROJECT DESCRIPTION:** The proposed project includes the following general elements: (1) demolition and removal of the existing 2.0-million gallon (MG), above ground, steel Lindley Reservoir Water Tank (and demolition/removal or abandonment in-place of appurtenant facilities such as valves and pipelines); (2) construction of two, 1.5-MG, partially buried concrete water tanks (and related valves, pipelines, etc.); (3) construction of a separate, partially buried valve vault structure and associated structures (retaining walls) and facilities (valves, pipelines, etc.); (4) construction of two asphalt-concrete (AC) access road spurs extending to the proposed tanks and valve vault (with both roadway spurs tying into an existing on-site road that provides access to a buried recycled water tank, TW-1005); (5) installation of a subsurface potable water pipeline extending east from the valve vault to Hubbard Avenue, and then generally northeast along Hubbard Avenue to the intersection with North Ash Street (along with appropriate resurfacing/restoration of roadway/intersection areas); (6) construction of a detention basin to provide flow regulation and water quality treatment for applicable project site storm water drainage; and (7) reclamation (backfilling/recontouring) of the existing 2.0-MG tank site, and revegetation/ landscaping of both the existing and proposed tank sites.

**APPLICANT:** City of Escondido Utilities Department, Water Division

An Initial Study has been prepared to assess this project as required by the California Environmental Quality Act (CEQA) and State CEQA Guidelines, as well as related City Ordinances and Regulations. The Initial Study and Draft Mitigated Negative Declaration are on file in the City of Escondido Planning Division and can be viewed on the City of Escondido web Site at: <http://www.escondido.org/planning.aspx>.

**FINDINGS:** The findings of this review are that the Initial Study identified impacts related to the issues of biological resources, noise, and utilities/service systems that may be potentially significant, but associated mitigation measures would reduce these potential impacts to less-than-significant levels. All other project impacts studied were found to be less than significant.

  
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Jay Paul  
Associate Planner

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# DRAFT MITIGATED NEGATIVE DECLARATION

(Case No.: ENV14-0004)  
SUPPLEMENTAL COMMENTS

## INTRODUCTION

This Draft Mitigated Negative Declaration (MND) assesses the environmental effects of the proposed project, involving the demolition and removal of the existing above ground 2.0-million gallon (MG) Lindley Reservoir Potable Water Tank, and construction of two partially buried 1.5-MG Lindley Reservoir replacement potable water tanks in the north-central portion of the City (Figure 1, Regional Location Map). The project site is owned by the City of Escondido, but is located within unincorporated County of San Diego territory (Figure 2, Jurisdictions). The project site also is entirely within the City's water service area. The project would encompass a number of related facilities/activities, including: (1) a separate, partially buried valve vault structure located just south of the tanks; (2) two short access road spurs extending from an existing on-site recycled water tank access road to the proposed tanks and the valve vault; (3) ancillary facilities such as on-site valves, pipelines, electrical equipment, and drainage structures (including a detention basin); (4) retaining walls and manufactured slopes; (5) resurfacing (AC overlay) on portions of the existing recycled water tank access road within the project site; (6) installation of approximately 1,300 linear feet (lf) of subsurface pipeline between the valve vault and the off-site Hubbard Avenue/North Ash Street intersection, with the 1,000-lf off-site portion of the proposed pipeline located within Hubbard Avenue; (7) landscaping and related irrigation hardware; (8) two on-site parking stalls; and (9) security fencing and gates. The 3.56-acre project site is generally bound by Leslie Lane on the south, Hubbard Avenue on the east, and open space/residential uses on the west and north (Figure 3, Project Location Map; and Figure 4, Project Site and Proposed Impact Area).

An Initial Study Environmental Checklist was prepared for the project and is included as a separate attachment to the Supplemental Comments within this report. The information contained in the Initial Study Environmental Checklist and the Supplemental Comments will be used by the City to determine potential impacts associated with the proposed project.

The detailed Supplemental Comments included in this document identify and evaluate physical impacts to the environment associated with implementing the proposed project based on preliminary review of various environmental factors identified in the attached Environmental Checklist. In analyzing the project, it has been determined that potentially significant impacts related to biological resources, noise, and utilities/service systems would occur. Based on information and documentation incorporated in the analysis, it has been concluded that this Initial Study warrants issuing a Mitigated Negative Declaration (MND) in draft form. The MND acknowledges that certain aspects

of the project would potentially cause significant impact(s) on the environment, but that those impacts would be reduced to less than a significant level by incorporating identified mitigation measures. The City is both the project proponent and the California Environmental Quality Act (CEQA) lead agency for the project.

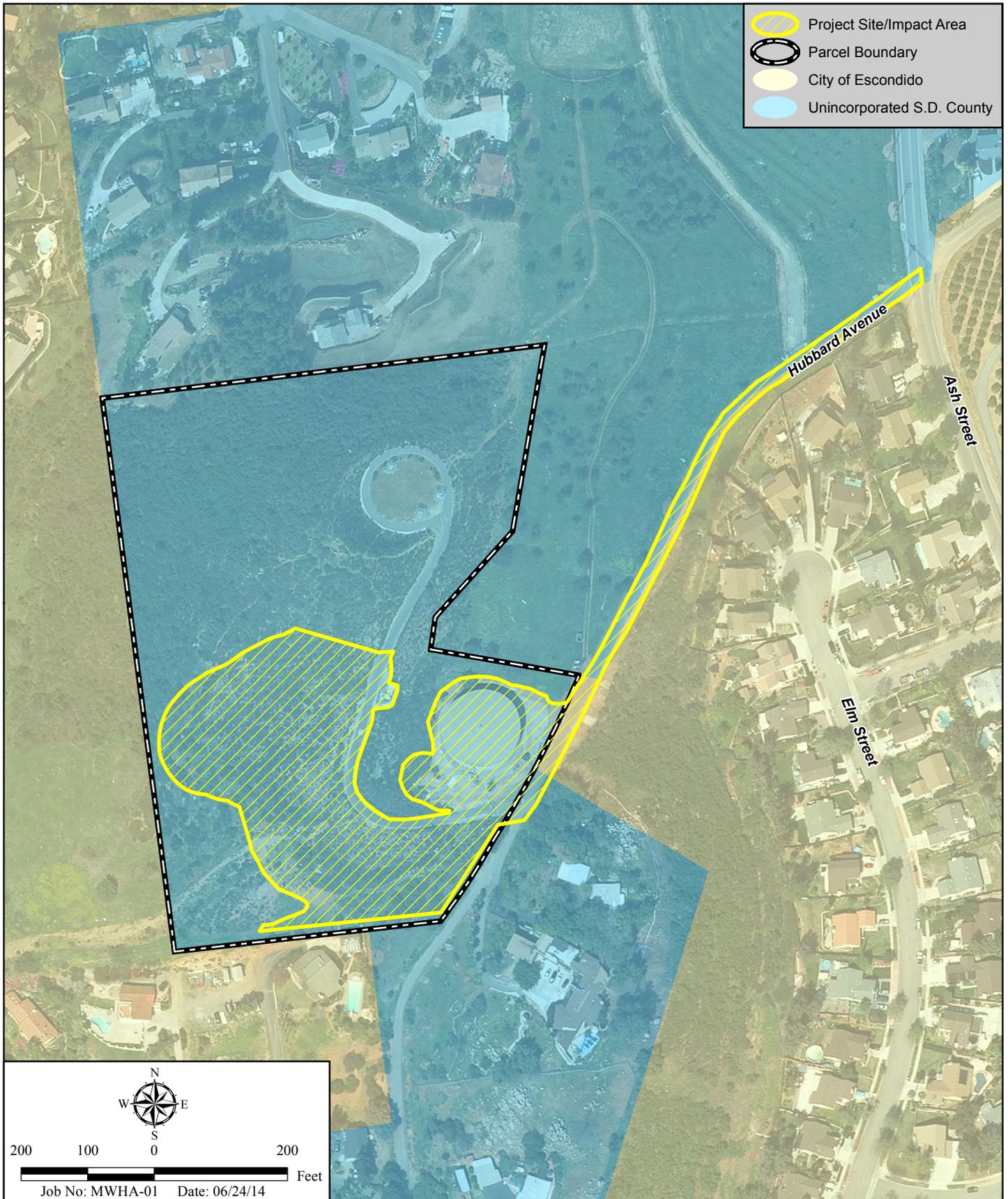
As mandated by Section 15105 of the State CEQA Guidelines, affected public agencies and the interested public may submit comments on the MND in writing before the end of the 30-day public review period starting on July 3, 2014 and ending on August 1, 2014. Written comments on this environmental document must be submitted to the following address by 5:00 p.m. on August 1, 2014. Following the close of the public review comment period, the City will consider this MND and all received comments in determining whether to approve this project.

City of Escondido  
Planning Division  
201 North Broadway  
Escondido, CA 92025-2798  
Contact: Jay Paul, Associate Planner  
Telephone: (760) 839-4537  
email: [jpaul@ci.escondido.ca.us](mailto:jpaul@ci.escondido.ca.us)

Hard copies of this document and all associated technical reports, plans and applicable related materials are available for review during normal hours of operation for the duration of the public review period at the City of Escondido Planning Division. The Draft MND also can be viewed on the City of Escondido web Site at: <http://www.escondido.org/planning.aspx>. The following pertinent documents related to the proposed project are also incorporated herein by reference, pursuant to Section 15150 of the State CEQA Guidelines:

- MWH, 2012, Lindley Tank Replacement Draft Preliminary Design Report, June.
- City of Escondido, 2013, Plans for the Construction of Lindley Reservoir 2013. June.
- Ninyo & Moore, 2012, Geotechnical Evaluation Lindley Reservoir Replacement Project, Escondido, California. December 14.
- ASM Affiliates, Inc., 2012, Inventory and Evaluation of Cultural Resources for the Lindley Tank Replacement Project in Escondido, San Diego County, California, November.
- HELIX Environmental Planning, Inc. (HELIX), 2014, Biological Resources Letter Report for the Lindley Tank Reservoir Project, June 24.
- HELIX, 2013a, Year 2012 Coastal California Gnatcatcher Survey Report for the Lindley Tank Reservoir Project, January 10.
- HELIX 2013b, Lindley Reservoir Construction Noise/Vibration Impact Review. July 9.



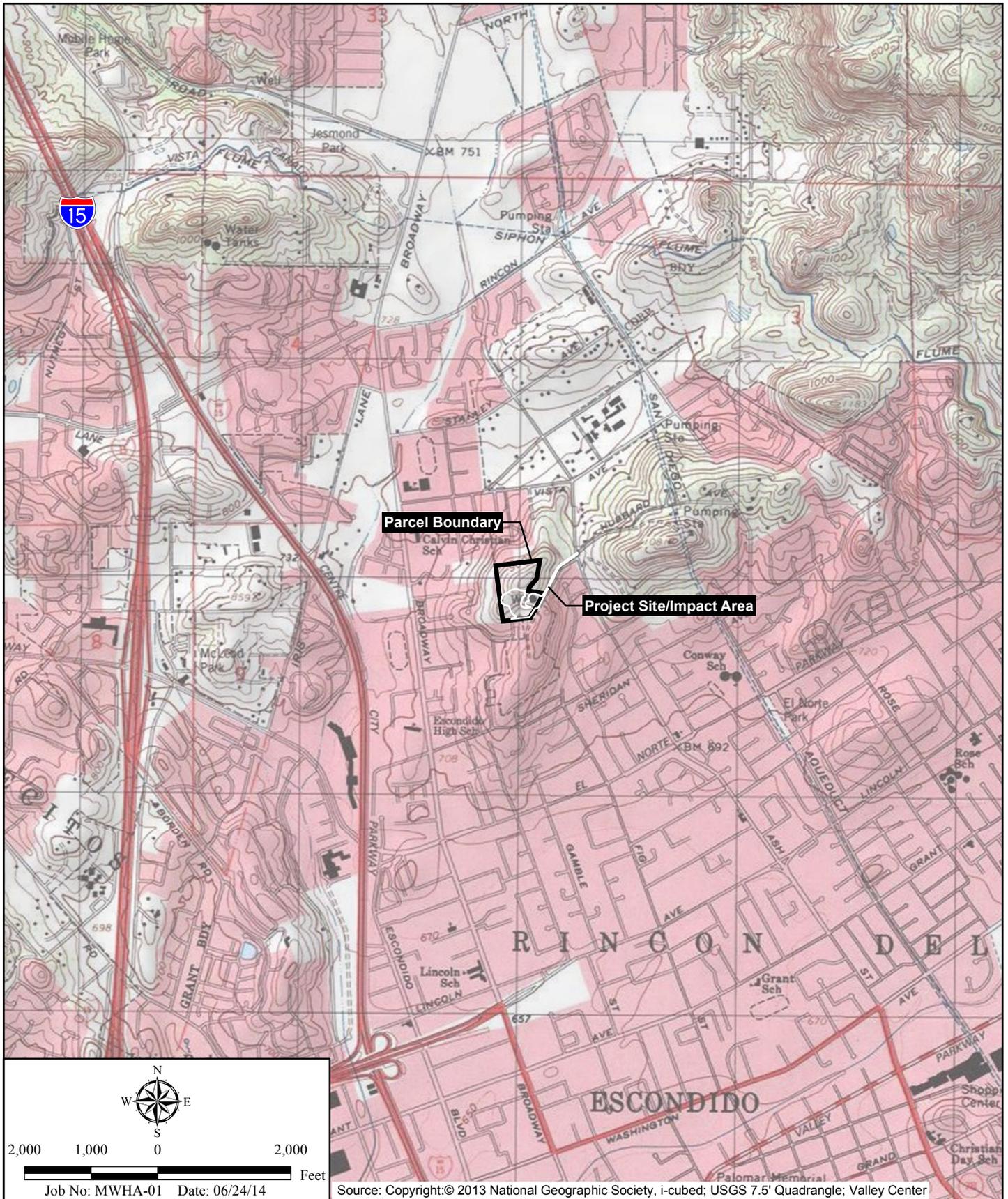


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## Jurisdictions

LINDLEY TANK

Figure 2



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## Project Location Map

LINDLEY TANK

Figure 3



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## Project Site and Proposed Impact Area

LINDLEY TANK

Figure 4

## **DETAILED PROJECT DESCRIPTION/LOCATION**

The approximately 3.56-acre project site and the proposed off-site pipeline are located within portions of the Lindley and Clear Well pressure zones in the northwestern portion of the City's Utilities Department, Water Division, service area. The project site is located within an unincorporated area of the County, while the off-site pipeline corridor along Hubbard Avenue includes areas within the jurisdiction of both the City and County. Adjacent areas include County jurisdiction to the north, east and southeast, and City jurisdiction to the west, south and east (refer to Figure 2). More distant surrounding areas are predominantly within the incorporated City of Escondido. The project area generally is bound by Leslie Lane on the south, Hubbard Avenue on the east, and open space/residential uses on the west and north. The project site is transitional between primarily rural uses in nearby areas to the north and northeast, and denser urban development in other directions.

The proposed project generally consists of demolishing and removing the existing 2.0-MG, above ground, steel Lindley Reservoir Potable Water Tank, and construction of two 1.5-MG partially buried concrete replacement potable water tanks. Because the existing 2.0-MG tank is undersized for current demand, a combined capacity of 3.0 MG is identified for the proposed tanks to provide adequate capacity for potable water storage and distribution, per current industry standards. Project construction is estimated to require an overall period of approximately 600 calendar days (or 20 months), with a construction schedule of 7:00 am to 4:30 pm on Monday through Friday. Based on this five-day work schedule, project construction would entail approximately 406 workdays, with a maximum of 20 construction personnel anticipated to be on site at any given time. In order to maintain existing water service throughout the proposed project implementation process, the existing tank would not be taken out of service and demolished/removed until after at least one of the proposed tanks is constructed, tested, disinfected, and operational. Based on this sequence of events, proposed grading and related activities for the proposed new tanks are described below, followed by proposed facility construction (including off-site areas); demolition/removal and grading associated with the existing tank and related facilities; revegetation/landscaping for all applicable portions of the project site; and a summary of construction-related equipment requirements and associated traffic generation.

### Grading, Drainage and Erosion Control for the Proposed Lindley Reservoir Tanks

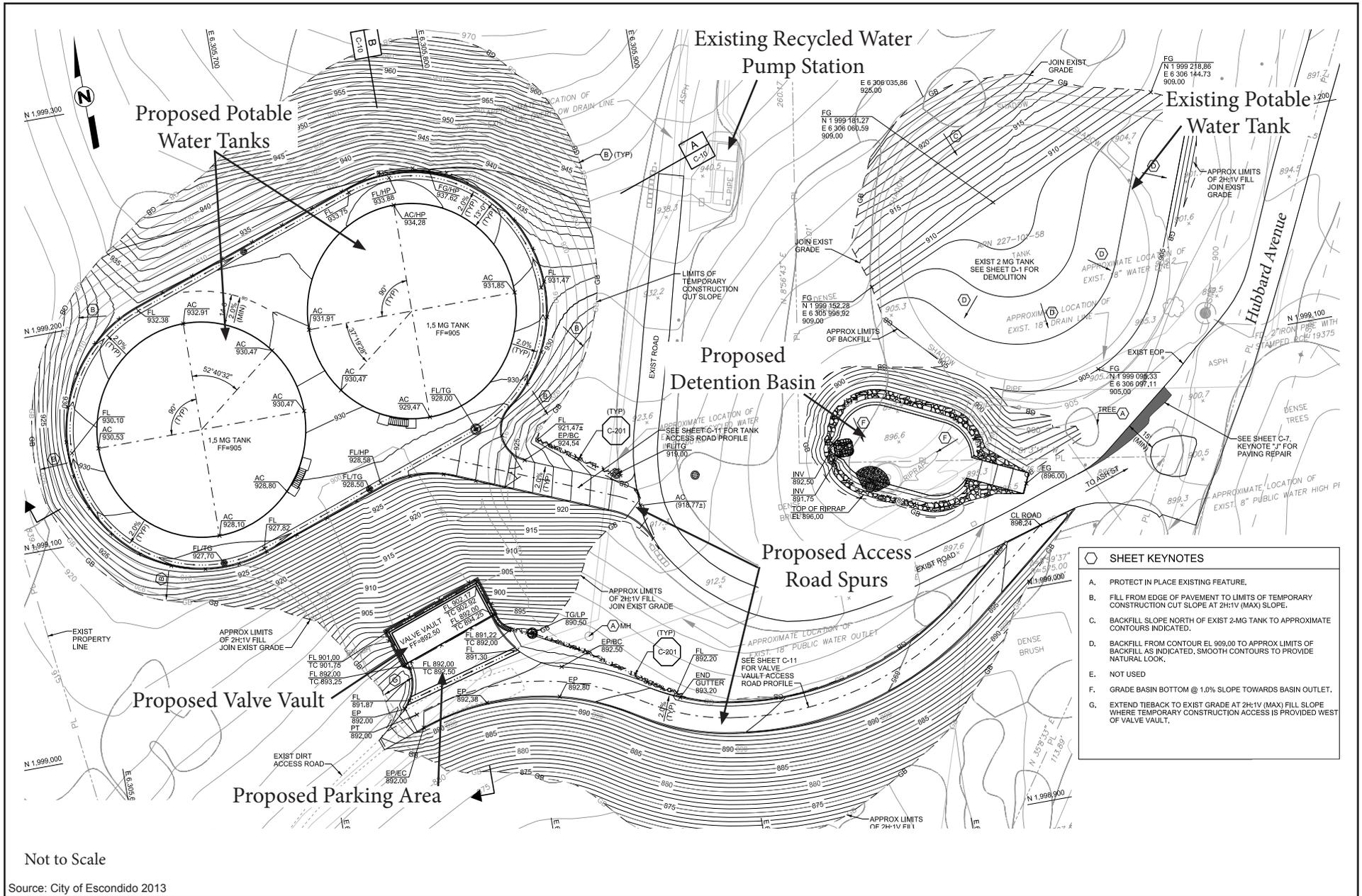
Both of the proposed new Lindley Reservoir Tanks would be partially buried as previously noted, with grading plan and cross-section views shown on Figures 5 (Grading Plan View) and 6 (Grading Cross-Sections). Project grading would be conducted with standard earth-moving and related equipment, as well as specialized equipment for rock excavation/breaking. Specifically, because blasting is precluded at the project site (due to the proximity of surrounding residences), rock excavation/breaking would entail mechanical methods and equipment such as rippers, drills and pneumatic hammers. The excavated rock and other material would then be

transported off site for reuse or disposal, with additional discussion of excavation and cut and fill requirements provided below.

As depicted on Figures 5 and 6, excavation for the proposed tanks and related facilities would entail excavating a large (up to approximately 35 feet high) cut and fill slope behind (generally north of) the tank sites, and constructing two large (approximately 29 and 35 feet high) fill slopes below (generally south of) the tanks and valve vault (as well as other minor cut and fill slopes). The slope located behind the tank sites would be excavated as a cut slope during initial grading/excavation, and then would be partially backfilled after installation of the tanks and related facilities (as outlined below). Pursuant to geotechnical recommendations, maximum grades for cut slopes in granitic bedrock would be 1:1 (horizontal to vertical), while maximum fill slope grades would be 2:1. After backfilling in areas adjacent to the tanks as noted (i.e., after construction, testing, etc.), all but approximately the upper six feet of the tanks would be below finish grade. Similarly, the areas adjacent to the north-, east-, and west-facing sides of the valve vault would be backfilled (and associated retaining walls installed), so that only approximately the upper one to two feet are above grade. The south facing valve vault wall would extend approximately five feet above finish grade, and would be adjacent to the proposed parking area and valve vault access road. Total estimated grading for the project would involve approximately 69,200 cubic yards (cy), including 42,600 cy of cut and 26,600 cy of fill. Based on the shallow nature of on-site bedrock, it is assumed that all excavated material (i.e., predominantly rock) would be hauled off-site for disposal and/or reuse, and all backfill material would be imported into the site. Because the specific site(s) to acquire fill and dispose of excavated material would be determined by the project contractor(s), it is assumed that any associated technical and/or environmental evaluations would be conducted and approved separately, and are not part of the proposed project as described herein. For purposes of this analysis, it also is assumed that fill acquisition and material disposal sites to be utilized for the proposed project would be within approximately five miles of the project site. This assumption is based on the known occurrence of such sites within that distance, as well as the fact that longer hauling distances could result in prohibitive transportation costs.

Proposed manufactured slopes would tie into existing grades to minimize the visible change in topographic profile to the extent feasible, and appropriate landscaping would be installed to provide visual screening (as outlined below). In addition, the proposed tanks would be treated/painted to blend in with the applicable cut slopes, and bronze-anodized aluminum would be used for applicable external facilities to help reduce visual contrast.

In addition to the permanent manufactured slopes described above, a number of temporary construction slopes also would be excavated to accommodate construction activities and equipment (with portions of these slopes associated with the tank and valve vault sites, as depicted on Figure 6). Per geotechnical recommendations (and in conformance with applicable Occupational Safety and Health Administration [OSHA] guidelines), temporary slopes would be limited to maximum grades of 1.5:1 for colluvial

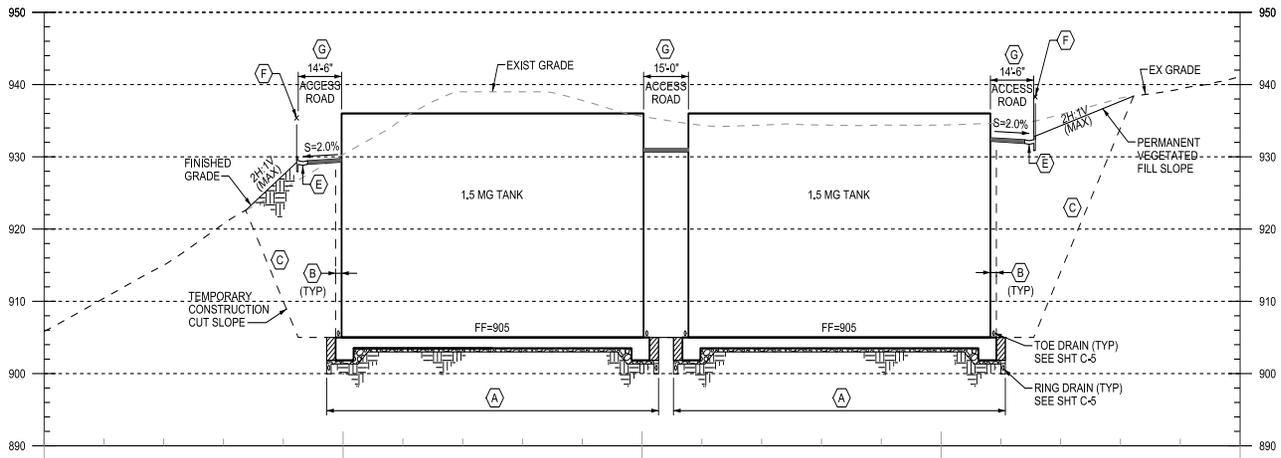


SHEET KEYNOTES	
A.	PROTECT IN PLACE EXISTING FEATURE.
B.	FILL FROM EDGE OF PAVEMENT TO LIMITS OF TEMPORARY CONSTRUCTION CUT SLOPE AT 2H:1V (MAX) SLOPE.
C.	BACKFILL SLOPE NORTH OF EXIST 2MG TANK TO APPROXIMATE CONTOURS INDICATED.
D.	BACKFILL FROM CONTOUR EL 909.00 TO APPROX LIMITS OF BACKFILL AS INDICATED, SMOOTH CONTOURS TO PROVIDE NATURAL LOOK.
E.	NOT USED
F.	GRADE BASIN BOTTOM @ 1.0% SLOPE TOWARDS BASIN OUTLET.
G.	EXTEND TIEBACK TO EXIST GRADE AT 2H:1V (MAX) FILL SLOPE WHERE TEMPORARY CONSTRUCTION ACCESS IS PROVIDED WEST OF VALVE VAULT.

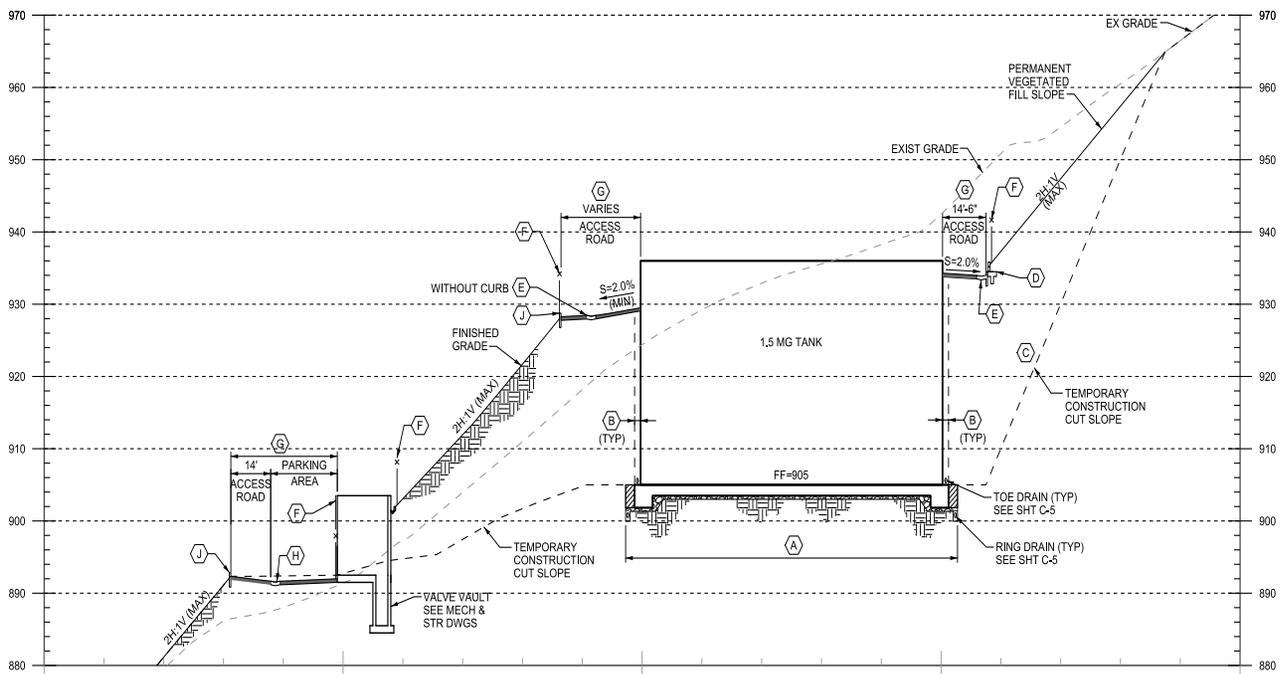
# Grading Plan View

LINDLEY TANK

Figure 5



SECTION A  
SCALE: AS NOTED



- SHEET KEYNOTES**
- A. SEE DETAIL C-918 FOR FOUNDATION AND RING DRAIN BELOW FOUNDATION.
  - B. SEE DETAIL C-918 FOR DRAIN BACKFILL AND TOE DRAIN AROUND TANK.
  - C. CUT SLOPE SHALL NOT EXCEED 1.5:1 FOR COLLUVIAL MATERIALS AND 1:1 FOR GRANITIC BEDROCK MATERIAL.
  - D. SEE SHEET C-1 FOR RETAINING WALL. INSTALL 1" EXPANSION JOINT BETWEEN BACK OF CURB AND RETAINING WALL FOOTING. SET TOP OF FOOTING AT EL 934.00. TAPER WALL FROM HEIGHT OF H=48 INCHES (AT HIGH POINT) TO H=8 INCHES (AT BOTH ENDS OF WALL) MATCHING FINISHED GRADE.
  - E. INTEGRAL CURB & GUTTER PER STD DETAIL C-131.
  - F. ORNAMENTAL HIGH SECURITY FENCE PER SPEC SECTION 323119.
  - G. AC PAVING PER STD DETAIL C-900.
  - H. CONCRETE CROSS GUTTER PER STD DETAIL C-127.
  - J. A-CURB PER STD DETAIL C-132.

Source: City of Escondido 2013  
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# Grading Cross-Sections

LINDLEY TANK

Figure 6



(unconsolidated) materials, and 1:1 for granitic bedrock, and would include appropriate shoring.

Existing drainage in the project site and vicinity is provided via drainage structures in the developed areas (e.g., the existing Lindley Tank site and recycled water tank access road), and occurs as overland flow in undeveloped areas. Existing drainage structures include a series of inlets (e.g., manholes), catch basins and related facilities to convey storm water and/or drainage flows from developed areas into the existing City/County storm drain system in local roadways. Specific on-site facilities include a catch basin inlet/concrete apron, overflow and drain piping, and a riprap-lined swale associated with the existing reservoir tank; a reinforced concrete pipe (RCP) storm drain to convey associated flows into the existing storm drain system, a concrete storm drain splash structure to convey overflow from the tank into the storm drain system, a series of curb/gutter and inlet structures along the access road, and an associated storm drain line to convey flows into the existing storm drain system. A number of the existing on-site facilities would be removed and replaced with a storm drain system to accommodate flows from the proposed development (with riprap from the existing tank drain facility to be stockpiled on-site for reuse as appropriate, and excess riprap, if any, to be disposed of off-site). Specifically, the proposed system would include the following facilities: (1) a series of concrete-lined swales located around the tank site perimeter road (and across the associated access road spur) and across the valve vault access road spur/parking area, with these facilities designed to prevent runoff over manufactured slopes; (2) riprap-lined drainage swales located above (north of) both access road spurs to convey (and treat) flows from upslope developed areas (including blow-off assemblies) into drainage inlets and storm drains in the existing/proposed access roads, and ultimately the City/County storm drain system; (3) a series of curb/gutter and inlet structures along the proposed access roads, with associated flows conveyed to the existing access road via storm drains (and prevented from draining over associated fill slopes), and ultimately entering the existing storm drain system; (4) a replacement splash structure to accommodate appropriate existing and post-development drainage; (5) a series of underdrains beneath the proposed tanks to collect any water leaking from the tanks and alert maintenance personnel to the occurrence of a leak; and (6) a detention basin located just downslope (south) of the existing tank site (refer to Figure 5 and the following discussion of reservoir/vault construction for additional description of the proposed detention basin).

Most storm flows from the developed project site would be captured by the described facilities and conveyed to the existing storm drain system. Specifically, flows from the tank site, adjacent areas north of the associated access road, and east of the existing recycled water tank access road would be conveyed to the detention basin for flow regulation and treatment prior to discharge into the existing storm drain system. Flows originating between the tank site and valve vault access roads would flow south to the valve vault road and be conveyed to the storm drain system via the associated project drainage facilities. Minor flows from the manufactured slope adjacent to the valve vault access road on the south and other portions of the site would drain overland and, similar to existing conditions, ultimately enter existing storm drain facilities associated

with surrounding residential development and roadways. The volume of such overland flow would be slightly less than current discharge, with the overall drainage patterns within and from the site to be essentially the same as existing conditions.

Erosion and sediment control would be provided throughout the proposed project construction period and beyond, pursuant to associated requirements under the City and County storm water programs, as well as related standards of the National Pollutant Discharge Elimination System (NPDES). Specifically, these requirements typically are implemented as part of a Storm Water Pollution Prevention Plan (SWPPP), and include efforts to prevent erosion from occurring (e.g., by stabilizing slopes and precluding flows on slopes and graded areas), and to control sediment transport (e.g., by installing facilities such as silt fences or temporary sediment basins). Erosion control measures identified in the project plans include requirements for the construction contractor(s) to: (1) submit a SWPPP (signed and stamped by a registered civil engineer) to the City for review/approval prior to the commencement of project construction activities; (2) install/implement temporary and permanent slope protection measures, including a temporary swale behind the tank site, hydroseeding of appropriate areas, and permanent swales as previously described, with all such protections to be installed/implemented during, or as soon as feasible after construction, and maintained until installation of permanent hardscape and landscaping; and (3) implement and maintain other appropriate erosion and sediment control measures to ensure compliance with associated regulatory standards. Such measures would be identified based on site-specific conditions (and detailed in the project SWPPP), and may include efforts such as the use of temporary hydroseed, mulch, fiber rolls, inlet filters, geotextiles, sand or gravel bags, silt fences, and sediment basins. In addition, the proposed detention basin would regulate storm water discharge rates and amounts, thereby providing erosion and sediment control during project construction and/or operation (depending on the final construction schedule for this facility). Additional discussion of regulatory requirements under City/County and NPDES standards, as well as associated potential erosion and sediment control measures, is provided below in Sections V, Geology and Soils, and VIII, Hydrology and Water Quality.

#### Construction of the Proposed Lindley Reservoir Tanks, Valve Vault and Related Facilities

As previously noted, at least one of the proposed 1.5-MG Lindley Reservoir replacement tanks would be fully operational prior to demolition and removal of the existing tank, with no interruption of existing water service. Both proposed tanks would be partially buried as described above under the discussion of project grading, and would consist of prestressed and post-tensioned concrete (per applicable industry and regulatory standards). The term prestressed refers to wrapping the structure with multiple layers of wire to create a compressive force (i.e., to counteract the load from the water when the tank is full), while post-tensioning involves reinforcement with high-strength steel strands or bars. The tanks would exhibit an exterior diameter of approximately 101 feet and a maximum height of approximately 30 feet, with only approximately the upper 6 feet to be above finish grade. The proposed maximum water

depth in both tanks is 27 feet, leaving a minimum freeboard of 3 feet. A number of standard appurtenant facilities would be associated with the tanks, including piping, valves, regulators, electrical equipment, drains, grating, access structures (e.g., ladders and stairways/landings), railings, sumps, vents, access hatches, meters, and perimeter fencing/gates. Both tanks would be connected to the project valve vault structure via a number of pipelines, including 18-inch diameter potable water inlet/outlet lines, drains and overflow lines. The tanks would be designed and operated such that either tank would function independently of the other, thereby allowing at least one tank to remain in service during maintenance (or other) shutdowns.

The proposed valve vault would be approximately 47 feet long, 17 feet wide and 10.5 feet deep, and would be partially buried as previously described. This facility would include a number of valves, pipelines and related facilities, and would be used (among other purposes) to control flows in and out of the reservoir tanks. The valve vault would include inlet and outlet lines to/from both tanks, an outlet line to the existing potable water pipeline located just to the south, and a potable water inlet line. Specifically, the inlet line would include approximately 1,300 lf of 18-inch diameter subsurface pipeline extending between the valve vault and the off-site Hubbard Avenue/North Ash Street intersection, with the 1,000-foot off-site portion to be located within Hubbard Avenue. Based on typical industry practices, it is estimated that the off-site portion of the inlet line located within Hubbard Avenue would be constructed at a rate of approximately 200 lf per day. All applicable portions of Hubbard Avenue, the associated intersection with North Ash Street, and the recycled water tank access road would be repaired/resurfaced per applicable standards after installation of the described potable water inlet line and/or other project facilities.

As previously described, the project would include access road spurs extending to the proposed tanks and valve vault, with both roadway spurs tying into the existing on-site recycled water tank access road. Both the tank site and valve vault access road spurs would generally extend west from the existing recycled water tank access road. The tank site road would extend approximately 100 lf from the existing access road to the tank site, and would continue around and between the two tanks (refer to Figure 5). The valve vault access road spur would extend approximately 350 lf from the existing road and terminate just past the parking area adjacent to the vault structure, with this area to provide two parking spaces and room for vehicle maneuvering. Approximately 450 lf of the existing recycled water tank access road within the project site would be resurfaced with an AC overlay (in addition to repair/resurfacing efforts described above for the potable water inlet line), with this resurfacing to extend approximately between Hubbard Avenue and the existing recycled water pump station.

As noted above, the proposed project includes an approximately 45-foot long, 30-foot wide, and 3-foot deep detention basin located just south of the existing reservoir site. The proposed basin would provide flow regulation for a 50-year design storm event, with detained flows to be slowly released into the existing storm drain system (via an associated outlet/pipeline) and the basin designed to completely drain within approximately 48 hours (to preclude long-term ponding and creation of vector habitat).

While long-term facility operation would not be expected to generate substantial pollutants, the detention basin would also provide water quality treatment through removal (settlement) of suspended sediment and any associated pollutants such as petroleum compounds (which tend to adhere to sediment particles). Additional discussion of short- and long-term water quality considerations is provided below in Section VIII.

A total of approximately 5,260 cy yards of concrete would be required for the proposed project facilities described above, including access road construction/resurfacing, reservoir slabs, parking areas, and other miscellaneous structures.

#### Existing Lindley Tank Reservoir Demolition/Removal and Grading

After the proposed tanks and related facilities are installed and at least one tank is operational, the existing above ground Lindley Reservoir Tank would be completely demolished and removed to a minimum depth of three feet below existing grade, including any trash, debris and sediment within the tank interior. These activities also would encompass demolition and/or removal of related existing facilities, including: (1) inlet/outlet and overflow structures; (2) drain piping, valves/controls, vents, ladders, railings and other appurtenances; (3) chain-link fencing, barbed wire, gates, posts and concrete post supports (to a minimum depth of three feet below existing grade); (4) electric service pole(s) and related connections and facilities; (5) AC pavement, base and subbase material (with the associated subgrade to be scarified to a minimum of 12 inches prior to backfilling to finish grade); (6) a catch basin inlet, concrete apron and headwall (to a minimum depth of three feet below existing grade), as well as the associated riprap-lined swale (with riprap to be stockpiled on-site for reuse where appropriate as previously noted); and (7) a concrete storm drain splash structure (with this facility to be replaced to accommodate post-development drainage as previously described). All structures, facilities and debris removed as part of the proposed project would be reused or recycled if feasible, or disposed of at an appropriate off-site location (e.g., a permitted landfill), in conformance with all applicable legal, regulatory and environmental requirements. In addition to the described demolition/removal activities, a number of existing pipeline segments would be capped and abandoned in place outside the limits of facility removal (i.e., areas where removal is not required to accommodate proposed project facilities/activities).

After facility demolition/removal, the existing tank and related facility sites would be backfilled and graded to match the existing, adjacent (natural) topography to the extent feasible (refer to Figure 5). Fill slope grades would be limited to a maximum of 2:1, and grading would be conducted to direct surface flows to the previously described detention basin.

#### Project Site Revegetation/Landscaping

After completion of (and/or in concert with, as feasible) project construction activities, a landscaping and irrigation plan would be implemented for the project site by a qualified landscape contractor. The proposed planting palette would include non-invasive, native

and/or drought-tolerant hydroseed and container plant varieties as outlined in Table 1, with all applicable fill slopes and other (e.g., non-paved) areas to be landscaped (including areas adjacent to the tank site, valve vault, and access road spurs, as well as the existing tank and related facility sites; refer to Figure 7, Landscape Plan). Landscaping efforts also would include soil amendment as necessary, and installation/operation of a recycled water irrigation system, with irrigation subject to all applicable requirements for recycled water use (including, but not limited to, prevention of overspray/ponding/runoff, appropriate separation of recycled and potable facilities, and proper recycled facility labeling/signage/color coding). The project irrigation system would encompass facilities such as meters, pressure reducers, and flow/moisture sensors to minimize water use and maximize efficiency. The landscape contractor also would be responsible for monitoring and maintenance of the landscaping and irrigation system for a minimum period of approximately 30 months after completion of installation (or until landscaping/revegetation efforts are deemed successful by the City). Monitoring reports would be submitted to the City for review and approval at the following intervals: (1) 0 to 1 month; (2) 1 to 3 months; (3) 3 to 12 months; (4) 12 to 25 months; and (5) over 25 months. Specific maintenance activities to be conducted by the landscape contractor would include weeding, seed germination/plant replacement, erosion repair, and adjustment/repair/replacement of irrigation equipment.

#### Summary of Project-related Equipment and Traffic

A preliminary list of project-related construction equipment includes bulldozers, excavators (including an excavator-mounted hydraulic breaker), a track-mounted pneumatic rock drill, loaders, scrapers, dump trucks, transport trucks (for excavated materials/demolition debris and material/equipment deliveries), cranes, concrete trucks, vibratory compactors, work trucks (e.g., mechanic's trucks), paving machines, water trucks, and pickup trucks. Due to the relatively small size of the project site and associated work area, it is anticipated that larger equipment types would be limited to one or two pieces on site at any given time, with final equipment types and numbers to be determined by the project contractor(s). Based on the previous discussions, a total of approximately 74,460 cy of excavated material/fill (69,200 cy) and concrete (5,260 cy) hauling would be required for project construction. Assuming an average load capacity of 9 cy, this would entail a total of approximately 8,273 truck round trips ( $74,460 \div 9$ ). From the previously noted schedule of 406 workdays, this would translate to an average of approximately 20 truck round trips per day ( $8,273 \div 406$ ). An additional 10 round trips per day is assumed for construction crew/equipment and material deliveries, with a total average daily traffic (ADT) level of approximately 30 vehicle round trips per day during project construction.

<b>Table 1 Landscape Planting Palette<sup>1</sup></b>			
<b>Hydroseed Mix</b>			
<b>Common Name</b>	<b>Botanical Name</b>	<b>Pounds per Acre</b>	
Molate Fescue	<i>Festuca rubra molate</i>	20	
Purple Needlegrass	<i>Nessalla (stipa) pulchra</i>	12	
Purple Three-Awn	<i>Aristida purpurea</i>	5	
California Barley	<i>Hordeum californicum</i>	15	
Creeping Wildrye	<i>Leymus triticoides</i>	6	
<b>Total</b>		<b>58</b>	
<b>Container Plantings</b>			
<b>Common Name</b>	<b>Botanical Name</b>	<b>Size</b>	<b>Quantity</b>
Desert Museum Palo Verde	<i>Ceracidium "desert museum" (CER DM)</i>	15 gallon	24
		5 gallon	40
Holly Oak	<i>Quercus ilex (QUE ILE)</i>	15 gallon	20
		5 gallon	21
Island Bush Snapdragon	<i>Galvezia speciosa (GAE SPE)</i>	1 gallon	125
No Common Name	<i>Grevillea "Canberra" (GRE CAN)</i>	1 gallon	172
Lavender Grevillea	<i>Grevillea lavandulacea "penola" (GRE LAV)</i>	1 gallon	160
<b>Total</b>		<b>562</b>	

<sup>1</sup> Refer to Figure 7 for individual species locations and layouts.  
Source: City of Escondido 2013

### Project Purpose and Objectives

The primary purpose of the proposed project is to replace the existing Lindley Reservoir Tank, which is approximately 60 years old and has reached the end of its design service life, and maintain adequate and reliable potable water storage/delivery capacity and pressure in the associated service areas. As previously described, the project would also be implemented so that the existing tank would remain operational until at least one of the replacement tanks is on-line, thereby avoiding associated service interruptions. Additional project objectives include: (1) minimizing short- and long-term visual effects to surrounding areas through efforts such as partially burying the tanks (i.e., to avoid prominent ridge top profiles), use of color treatments to reduce visual contrast, and installing/maintaining extensive landscaping; (2) reducing potential noise and vibration conflicts with local residents by precluding construction-related blasting; (3) minimizing local access restrictions during construction by maintaining driveway access on local roadways, and maintaining at least one through lane on Hubbard Avenue at all times; and (4) reducing project-related potable water consumption by using recycled water for landscape irrigation.

### **PAST PUBLIC MEETINGS:**

No previous public meetings have been conducted for the proposed project.



## **ANTICIPATED PUBLIC MEETINGS/HEARINGS:**

The proposed project and Final Mitigated Negative Declaration would be adopted by the City Council at a future Council meeting after the close of the public comment period. No specific date has been set.

## **PROJECT ENVIRONMENTAL SETTING:**

The project site consists mainly of undeveloped open space that supports some native vegetation, with existing on-site development including the previously described above ground Lindley Reservoir Tank (and related facilities), and portions of a paved access road and recycled water pump station associated with the buried off-site TW-1005 recycled water tank (refer to Figures 4 and 5). The project site generally is irregularly shaped and includes portions of a small prominent hilltop that continues off-site to the north. Topography of the site includes a maximum elevation of approximately 980 feet above mean sea level (AMSL) near the northern site boundary, and slopes down towards the existing metal water tank and access road with an elevation of approximately 900 feet AMSL, with the southwestern corner of the site characterized as south to east facing topography at an elevation of approximately 860 feet AMSL. Access to the site is provided from Hubbard Avenue, which intersects Ash Street on the east. Hubbard Avenue is gated at the entry to the site to restrict access.

The project site is within an area that is transitional between mainly semi-rural and estate type uses in surrounding areas to the north and northeast, and denser suburban and urban type residential development in other directions. Local residential sites include generally low- to medium-density development in both City and County jurisdictions. Existing land uses in more distant surrounding areas include agriculture to the east and northeast, urban development and open space to the north, and generally high-density urban uses in other directions. The project site and applicable off-site areas along Hubbard Avenue within County jurisdiction are zoned Single-Family Residential (RS), with a corresponding General Plan land use designation of Semi-Rural Residential (SR-1). Both of these designations are intended primarily for residential uses, although allowable uses include “civic use types” such as “essential services.” Zoning and land use designations in adjacent areas to the north, northeast and southeast under County jurisdiction are the same as those described for the project site. The City of Escondido General Plan land-use designation for the subject site is Estate 1, which is a single-family residential estate designation. The project site also has an underlying City of Escondido pre-zoning designation of PZ-RA-5 (Residential Agriculture, 5 acre minimum lot size) and PZ-RE-40 (Residential Estate, 40,000-square foot minimum lot size). Adjacent areas within the City are zoned and designated Single-Family Residential (R-1) and Suburban Residential, respectively. These categories are intended mainly for residential uses, with allowable lot sizes and supporting uses variable with site-specific conditions such as slope.

## I. AGRICULTURE AND FORESTRY RESOURCES

### Significance Criteria and Impact Analysis

*In determining whether impacts to agricultural resources are significant environmental effects, the City has referred to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, the City has referred to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. The effects of a project on agricultural and forestry resources are considered significant if the proposed project would:*

- a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;*
- b. Conflict with existing zoning for agricultural use, or a Williamson Act contract;*
- c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g));*
- d. Result in the loss of forest land or conversion of forest land to non-forest use; or*
- e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.*

The proposed project is located in an area characterized by low- to medium-density residential, and larger vacant and semi-rural/estate type lots/development. The project site is not used for any agricultural operations, but as previously described, agricultural uses and resources are present in surrounding areas to the east and northeast, with the closest agricultural area consisting of active citrus orchards located just east of the Hubbard Avenue/North Ash Street intersection (with this area designated as Unique Farmland). According to the California Division of Land Resources Protection (2010 Farmland Mapping and Monitoring Program [FMMP]) and the County of San Diego Process Guide (2013), the project site and applicable off-site areas along Hubbard Avenue do not include Farmland (as defined above) or Williamson Act contract lands. The majority of the project site is classified as "Other Land" with the existing water tank on land classified as "Farmland of Local Importance" on the 2010 FMMP maps. The surrounding areas (including applicable portions of Hubbard Avenue) are designated as Farmland of Local Importance, Urban and Built-Up Land, or Other Land. Based on these conditions and the nature of the project in areas adjacent to designated Farmland

(i.e., subsurface pipelines), the project would not convert Farmland ( as defined) to non-agricultural use, conflict with a Williamson Act contract, or involve changes in the existing environment that would result in conversion of adjacent Farmland to non-agricultural use. The project site has a City of Escondido prezone designation of PZ-RA-5, which would allow for a variety of agricultural uses along with single-family residential development. Public utilities and water storage facilities also are permitted uses within the RA zone. The applicable off-site areas do not include any areas zoned for agriculture, forest land, timberland or timber production. The surrounding area has been changing from agricultural and semi-rural type development to estate and suburban residential development. The Escondido General Plan supports existing agricultural activity and land use in the community while planning for possible transition to estate and urban uses in a manner which is consistent with the policies of the Land Use Element and Community Facilities Element of the General Plan. Therefore, no conflicts with existing zoning for agricultural use, forest land or timberland; or impacts to Farmland, agricultural activity, forest land or timberland would occur as a result of project implementation.

## II. AIR QUALITY

### Significance Criteria and Impact Analysis

Where applicable, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Impacts would be significant if the project:

- a. *Conflicts with or obstructs implementation of the applicable air quality plan;*
- b. *Violates any air quality standard or contributes substantially to an existing or projected air quality violation;*
- c. *Results in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);*
- d. *Exposes sensitive receptors to substantial pollutant concentrations;*
- e. *Creates objectionable odors affecting a substantial number of people;*

### *Air Quality Plans and Standards*

The proposed project is within the San Diego Air Basin (SDAB). The San Diego County Air Pollution Control District (SDAPCD) is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County, including applicable project areas within the County and the City of Escondido. The SDAPCD regulates most air pollutant sources, except for motor vehicles, marine vessels, aircraft, and construction equipment, which are regulated by the California Air Resources Board (CARB) or the U.S. Environmental Protection Agency (EPA). State

and local government projects, as well as projects proposed by the private sector, are subject to SDAPCD requirements if the sources are regulated by the SDAPCD.

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the SDAB. The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, and most recently in April 2009. The RAQS outlines the SDAPCD's plans and control measures designed to attain the state air quality standards for ozone (O<sub>3</sub>). The SDAPCD has also developed the air basin's Ozone Maintenance Plan as an update to the State Implementation Plan (SIP), which is required under the federal Clean Air Act for areas that are out of attainment for air quality standards.

The RAQS relies on information from CARB and SANDAG, including mobile and area source emissions, along with information regarding projected growth in the County, to project future emissions and then determine the strategies necessary for reduction of emissions through regulatory controls. The CARB mobile source emission projections and SANDAG growth projections are based on population and vehicle trends, as well as land use plans developed by the cities and County as part of their general plans. As such, projects proposing development that is consistent with the growth anticipated by the general plans would be consistent with the RAQS. In the event that a project proposes development that is less dense than anticipated within the general plan, the project would likewise be consistent with the RAQS. If a project proposes development that is greater than that anticipated in the general plan and SANDAG's growth projections, the project could be in conflict with the RAQS and SIP, and may have a potentially significant impact on air quality.

The SIP relies on the same information from SANDAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The SIP also includes rules and regulations that have been adopted by the SDAPCD to control emissions from stationary sources. These SIP-approved rules may be used as a guideline to determine whether a project's emissions would have the potential to conflict with the SIP and thereby hinder attainment of the National Ambient Air Quality Standards (NAAQS) for O<sub>3</sub>.

The Environmental Quality Regulations pertaining to Air quality for the City and County are also relevant for the Project. Section 33-924(G) of the City's Municipal Code states that a project would require a technical study if it would exceed the thresholds outlined below in Table 2. Similarly, County guidelines (2007) note that exceeding the stated thresholds would require specific modeling to demonstrate regulatory compliance. Exceeding these thresholds, however, would not necessarily indicate a significant impact on the environment. Rather, it would indicate that further analysis is required to determine if there are potentially significant project-related impacts.

<b>Table 2 City of Escondido Daily Emission Screening Level Criteria</b>		
<b>Pollutant</b>	<b>Environmental Quality Ordinance Criteria (lbs/day)</b>	
	<b>City</b>	<b>County</b>
Carbon monoxide	550	550
Volatile organic compounds	*55/75	75
Oxides of nitrogen	250	250
Fine particulate matter (PM <sub>10</sub> )	100	100
Respirable particulate matter (PM <sub>2.5</sub> )	55	100
Sulfur oxide	250	250
Lead	3.2	3.2

Source: Article 47 of the City of Escondido Municipal Code; County 2007.

\*Operation/Construction

The proposed project would result in construction of two replacement potable water reservoir tanks, along with related facilities including approximately 1,300 lf of 18-inch potable water pipeline. As discussed below and in Section XII, *Population and Housing*, the proposed project would not directly or indirectly induce population growth. Because the project does not include any growth-generating components, it would be consistent with projections contained in the County General Plan and the City of Escondido General Plan, and thus also would be consistent with SANDAG and RAQS forecasts. Specifically, as noted above under the Detailed Project Description, the existing 2.0-MG tank is undersized for current demand, and a combined capacity of 3.0 MG is identified for the proposed tanks to provide adequate capacity under current industry standards for potable water storage and distribution. That is, the proposed capacity of 3.0 MG per day would be used to meet current and projected demand (with a minor amount of additional capacity to avoid shortfalls), and would not result in excess capacity that could be used to allow or induce additional consumption (i.e., growth). Because the proposed project is consistent with the local general plan and the regional growth forecast, it would be considered consistent with the RAQS. Accordingly, project-related emissions are accounted for in the RAQS, which was created to bring the SDAB into attainment for O<sub>3</sub>. No impact would occur because the project would not conflict with applicable air quality plans.

During project construction, emissions associated with fugitive dust and exhaust from construction equipment would be generated. Daily emissions would vary, depending on which phase of construction (e.g., site grading/excavation, demolition of existing tank, etc.) was currently underway. Regardless of the construction phase, however, emissions would be relatively low because only a few pieces of construction equipment (e.g., backhoe, crane, excavator, and loader) would be operating at any given time. The number and types of equipment would also vary based on construction phase. In order to plan for a worst case scenario, the maximum number of construction equipment likely to be utilized during each phase was incorporated into the emissions calculations (including on-road hauling trucks). Specifically, a comparison of the worst-case daily

project construction emissions (criteria pollutants) and the associated City and County screening thresholds are provided below in Table 3. Emissions factors used in the analysis were obtained from the CARB's OFFROAD 2007 model; specifically, the South Coast Air Quality Management District (SCAQMD) Off-road Mobile Source Emission Factors spreadsheet (a simplified spreadsheet incorporating CARB emissions factors) was utilized (available at: <http://www.aqmd.gov/ceqa/hdbk.html>). Additionally, the SCAQMD On-Road Heavy-Duty Diesel Trucks emissions factors were used for the on-road haul truck trips associated with construction at this site. The analysis assumed a 2013 scenario year, and utilized the list of construction equipment types provided in the Detailed Project Description, with reasonable numbers of each type of equipment assumed based on the Project Description details.

<b>Table 3 Worst-Case Daily Construction Emissions Criteria Pollutants (lbs/day)</b>						
	<b>CO</b>	<b>VOC</b>	<b>NOx</b>	<b>SOx</b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>
<b>Worst-Case</b>	20.489	5.451	46.170	0.054	1.792	1.649
<b>City of Escondido Thresholds</b>	550	55/75*	250	250	100	55
<b>County of San Diego Thresholds</b>	550	75	250	250	100	55
<b>Thresholds Exceeded?</b>	No	No	No	No	No	No

\*Operation/Construction

Project construction would employ dust control measures (i.e., watering twice daily), and would not result in emissions that would violate an air quality standard or contribute substantially to an existing or projected air quality violation. In addition, project construction would not result in a cumulatively considerable net increase of fine particulate matter (PM), including PM smaller than 10 microns in diameter (PM<sub>10</sub>) or PM smaller than 2.5 microns in diameter (PM<sub>2.5</sub>).

A less-than-significant impact would occur with incorporation of the following control measures, which are required under CARB and SDAPCD regulations and are incorporated into the proposed project design (with the following measures also to be included on all project construction contracts, grading permits, improvement plans, and final maps).

- AQ-1** Off-road construction equipment engines shall utilize a maximum of 75 percent (by horsepower) CARB/EPA Certification Tier 2 and a minimum of 25 percent (by horsepower) Tier 3 or better engines, or other equivalent methods approved by the CARB, to reduce air emissions.

**AQ-2** All off-road construction equipment shall be equipped with CARB Verified Level II catalysts or other equivalent methods approved by the CARB, to reduce PM and volatile organic compound (VOC) emissions at least 85 percent.

**AQ-3** The project applicant shall prepare and implement a Fugitive Dust Plan per SDAPCD Rule 55, and shall include the following or other measures with the equivalent level of reduction:

- Water shall be applied every three hours during construction work hours to disturbed areas within a construction site.
- Minimum soil moisture of 12 percent during earthmoving activities shall be maintained by use of a moveable sprinkler system or a water truck. Moisture content can be verified by lab sample or moisture probe.
- Ground cover shall be replaced in disturbed areas as quickly as possible.
- All trucks hauling dirt, sand, soil, or other loose materials shall be tarped with a fabric cover and maintain a freeboard height of 12 inches.
- The maximum speed on unpaved roads shall be limited to 25 miles per hour.
- Chemical dust suppressant shall be applied annually to unpaved parking areas.
- Construction of three-sided enclosures with 50-percent porosity around storage piles shall be required.
- Storage piles shall be watered by hand or cover applied when wind events are declared.
- Chemical soil stabilizers shall be applied on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Vegetative ground cover shall be planted in disturbed areas as soon as possible.

**AQ-4** All construction equipment/vehicles shall be maintained properly as per the manufacturer's recommendations.

**AQ-5** Truck idling shall be minimized to no more than five minutes.

Based on the implementation of the noted measures as part of the project design, as well as the fact that construction emissions would be temporary and localized within the immediate project vicinity, project-related construction emissions would result in a less-than-significant impact to air quality.

With regard to operational emissions, no substantial long-term operational emissions would be generated from the proposed project. Specifically, operational emissions would be limited to infrequent maintenance-related vehicle trips to the project site, with these emissions comparable to similar operational emissions for the existing on-site

tank. These activities would result in short duration and minor emissions and associated impacts would be less than significant.

### *Criteria Pollutants*

The approach for assessing cumulative impacts is based on the RAQS forecasts of attaining ambient air quality standards in accordance with the requirements of the federal and state Clean Air Acts. As discussed above, the proposed project would be consistent with the RAQS, which is intended to bring the SDAB into attainment for all criteria pollutants. In addition, and as discussed above, daily emissions would be minor in extent, temporary, and short-term in duration. Accordingly, cumulative impacts would be less than significant.

### *Sensitive Receptors*

Sensitive receptors in the vicinity of the project site consist of single-family residences (with agricultural areas not considered sensitive receptors for air quality). Construction activities would generate diesel emissions from construction equipment, and diesel exhaust PM is recognized as a carcinogenic compound by the state of California. The risks associated with exposure to substances with carcinogenic effects are typically evaluated based on a lifetime of chronic exposure, which is defined in the California Air Pollution Control Officers' Association (CAPCOA) Air Toxics "Hot Spots" Program Risk Assessment Guidelines as 24 hours per day, 7 days per week, 365 days per year, for 70 years. Diesel exhaust PM would be emitted from heavy equipment used during the approximately 20-month active construction process (i.e., 406 workdays) assumed for the proposed project. Because PM from diesel exhaust is considered carcinogenic, long-term exposure to such emissions has the potential to result in adverse health impacts. Exposure of sensitive receptors (e.g., surrounding residents) to diesel exhaust emissions during construction of the proposed project would not result in significant impacts related to health concerns, however, based on the following considerations: (1) the relatively short-term duration and small-scale nature of project construction; (2) the limited number of, and intervening distances to, sensitive receptors in the vicinity of project site construction operations (i.e., 4 residences within approximately 100 feet, 2 residences within approximately 100 to 200 feet, 3 residences within approximately 200 to 300 feet, 3 residences within approximately 300 to 350 feet, 4 residences within approximately 350 to 415 feet, and 2 residences within approximately 415 to 450 feet); (3) the fact that not all identified vehicles and equipment would operate on a daily basis, or in the same locations, during the 20-month construction period (with the distances noted above representing the most proximal construction areas to surrounding residences); and (4) the limited extent (1,000 lf) and linear nature of off-site pipeline construction along Hubbard Avenue, with an anticipated construction rate of approximately 200-feet per day and a total associated construction period of approximately 5 days.

## Odors

The only source of odor anticipated from Project construction would be exhaust emissions from the diesel equipment and haul trucks (with no potential for odor generation during project operation). Project construction could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. During construction, diesel equipment operating at various locations on the site may generate some nuisance odors; however, due to the short-term nature of construction activities, odors associated with Project construction would cease at the completion of the construction period. As such, project construction would not cause an odor nuisance, and odor impacts would be less than significant.

### III. BIOLOGICAL RESOURCES

#### Significance Criteria and Impact Analysis

*The effects of a project on biological resources are considered to be significant if the proposed project would:*

- a. Have a substantial adverse effect either directly or through habitat modifications on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS);*
- b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS;*
- c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;*

#### *Vegetation Communities and Sensitive Plant and Animal Species*

Vegetation mapping, a general biological survey, and a focused presence/absence protocol survey for the federally listed as threatened coastal California gnatcatcher (CAGN; *Poliioptila californica californica*) were conducted in October and November of 2012 by HELIX Environmental Planning, Inc., (HELIX). The vegetation mapping and general biological survey encompassed the entire 3.56-acre project site and surrounding areas, while the focused CAGN survey included approximately 10.1 acres within the site and vicinity identified as potential CAGN habitat. A Biological Technical Report (BTR) and a CAGN Survey Report were prepared from these investigations (HELIX 2014 and 2013a, respectively), with the reports summarized herein and included in Appendix A of this Initial Study. As previously noted, the project site is owned by the City and located on unincorporated County land. The site is within the Draft North County Multiple Species Conservation Program (MSCP; County 2009), but is outside of the associated Pre-Approved Mitigation Area (PAMA).

Vegetation Communities. Based on the analysis in the BTR, implementation of the proposed project would result in direct impacts to a total of 2.39 acres of sensitive habitat consisting of Diegan coastal sage scrub (DCSS). These impacts are considered potentially significant, with associated mitigation identified below in this section.

Impacts to 1.17 acres of non-sensitive communities within the project site also would result from the proposed project, including direct impacts to 0.65 acre of disturbed habitat and 0.52 acre of developed land. Additionally, the off-site pipeline construction would include 0.53 acre of impacts to developed land. Impacts to non-sensitive vegetation communities are not considered significant.

Critical habitat consists of areas that the USFWS has formally designated as necessary for endangered or threatened species to recover. No critical habitat for any species occurs within the project site or applicable off-site areas, with no associated impacts to result from project implementation.

Sensitive Plant Species. As defined by the California Native Plant Society (CNPS), sensitive plant species are those considered unusual or limited in that they are: (1) only found in the San Diego region; (2) a local representative of a species or association of species not otherwise found in the region; or (3) severely depleted within their ranges or within the region.

The County's 1997 Draft MSCP Subarea Plan includes a list of narrow endemic plant species that are protected under the MSCP, and the Draft Escondido MSCP Subarea Plan (2001) identifies major populations and critical locations of plant species within its boundaries. No sensitive plant species (including narrow endemic species) were observed on site during biological investigation, although several sensitive species were identified as exhibiting some potential to occur, with levels varying from "low" to "none" as outlined in Appendix C of the BTR. The identified species in Appendix C primarily exhibit potential levels of "very low" or "none" based on criteria including unsuitable habitat or soils. Based on the described information, the BTR concludes, "No sensitive plant species are proposed or anticipated to be directly impacted by the project." Accordingly, no impact is identified.

Sensitive Animal Species. As previously noted, a focused protocol survey for CAGN was conducted on the site, due to the presence of suitable habitat. This survey involved three separate site visits, per current (1997) USFWS protocol, with these surveys conducted on November 20 and 29, and December 6, 2012. The CAGN survey area encompassed approximately 10.1 acres of potential CAGN habitat, and was conducted on foot with the aid of binoculars. No CAGN individuals were observed or detected during the described protocol presence/absence survey. One CAGN individual was observed on site, however, during vegetation surveys conducted in October 2012. Accordingly, even though CAGN was not observed on site during the noted protocol survey, the site is assumed to be occupied for purposes of this analysis. As a result, removal of any suitable habitat during the breeding season for CAGN (February 15 through August 31) would be considered potentially significant, with related mitigation identified below in this section.

While no other sensitive animal species were observed on site during project biological investigations, several additional sensitive species were identified as exhibiting potential to occur, with levels varying from “moderate” to “none” as outlined in Appendix E of the BTR. With the exception of birds, potential impacts to the noted animal species are considered less than significant, based on factors including the lack or scarcity of suitable habitat, and/or the low level of species sensitivity. It should also be noted, however, that impacts to the noted non-avian sensitive species from habitat loss would be further reduced through mitigation for direct impacts to sensitive habitats, as outlined below in this section.

Project-related impacts to bird species are considered potentially significant due to habitat loss and/or disruption of seasonal nesting activities, pursuant to the federal Migratory Bird Treaty Act (MBTA; as amended under the Migratory Bird Treaty Reform Act [MBTRA] of 2004 [FR Doc. 05-5127]). Accordingly, project-related disturbance of active bird nests during the nesting season (generally February 1 to July 31) would be considered a significant impact, with associated mitigation provided below in this section.

#### *Wetlands*

No U.S. Army Corps of Engineers (USACE) or CDFW jurisdictional areas, or County Resource Protection Ordinance (RPO) wetlands, are present within or adjacent to the project site or applicable off-site areas. Accordingly, project implementation would not result in associated impacts to wetlands or jurisdictional areas.

#### *Indirect Impacts*

Indirect impacts to biological resources consist of secondary effects from a project such as water quality impairment, construction-related dust and noise generation, edge effects, or increased lighting. The magnitude of an indirect impact can be the same as a direct impact, although such effects usually take a longer time to become apparent. While biological resources may not initially be impacted directly, over time they may be affected indirectly due to the relative proximity of development. Potential indirect impacts from the proposed project are discussed below.

Water Quality: Water quality in off-site riparian areas can be adversely affected by potential surface runoff and sedimentation during construction. The use of petroleum products such as fuels, oils, and lubricants, as well as erosion of areas disturbed during construction could potentially contaminate surface water in downstream areas. Temporarily diminished water quality could adversely affect vegetation, aquatic animals, and terrestrial wildlife that depend on these resources.

During construction, project design measures would be implemented to control erosion, sedimentation, and other pollutant sources that could impact downstream water resources and indirectly impact dependent biological resources. As described below in

Sections V and VIII, the proposed project would comply with applicable requirements of the NPDES and related City and/or County storm water standards, including implementation of an approved SWPPP and use of appropriate best management practices (BMPs) for construction-related and long-term water quality concerns. Therefore, conformance with these requirements would reduce potential impacts to water quality and dependent biological resources to below a level of significance.

Fugitive Dust: Dust produced by construction could disperse onto native vegetation adjacent to construction areas, with related effects such as reduction of the overall vigor of individual plants by reducing photosynthetic capabilities and increasing susceptibility to pests or disease. This in turn could affect animals dependent on these plants (e.g., seed-eating rodents), as well as reducing the suitability of plants as habitat for insects and birds.

As described in Section II, Air Quality, dust dispersal during project construction would be controlled by standard measures such as applications of water three times per day and/or use of chemical palliatives, covering haul vehicles, replanting disturbed areas as soon as practical, and restricting vehicle speeds on unpaved roads to 25 miles per hour or less. Because active construction areas and unpaved surfaces would incorporate the noted measures, and be subject to applicable grading permit requirements to minimize dust generation (e.g., watering), related impacts to biological resources would be less than significant.

Construction Noise: Noise from such construction-related sources as grubbing, clearing, grading, excavating, and vehicular traffic would impact local wildlife. Noise-related impacts would be considered significant if sensitive species (such as CAGN) were displaced from their nests and failed to breed. Birds nesting within any area impacted by noise exceeding 60 decibels (dB)  $L_{EQ}$ <sup>1</sup>, or exceeding ambient levels (if ambient is greater than 60 dB  $L_{EQ}$ ), may be significantly impacted without implementation of the associated mitigation provided below in this section.

Habitat Fragmentation/Edge Effects: Removal of existing native habitats within the project site would result in some habitat fragmentation and an increase in associated edge effects. Fragmentation is the breaking up of larger, contiguous parcels of habitat into smaller, noncontiguous patches. Potential edge effects from such fragmentation could include the invasion of non-native plant species into newly fragmented areas, as well as increased access by predators (native and non-native) to prey that would otherwise be more protected in an unfragmented parcel of habitat.

Although implementation of the proposed project would impact 2.39 acres of sensitive habitat, these impacts would occur within a relatively small area of native habitat surrounded by existing developed/disturbed areas. The proposed project would incorporate measures to reduce these potential effects, such as landscaping with non-invasive species and implementation of erosion control efforts. Therefore, project-

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<sup>1</sup>  $L_{EQ}$  is the time-averaged noise level for a specified period (e.g., 8 hours).

related impacts associated with habitat fragmentation/edge effects would be less than significant.

Night Lighting: Night lighting has the potential to spill over into adjacent native habitats, which can both interfere with wildlife movement and provide nocturnal predators with an unnatural advantage over their prey, thereby potentially causing an increased loss in native wildlife. Existing outdoor lighting sources in the project site vicinity are associated with local residential uses, which generally are minor and of low wattage. Project construction is proposed to be limited to daylight hours and thus would not require lighting. If nighttime work is subsequently proposed, associated lighting would be limited to the lowest feasible illumination levels required for safety purposes, and would be selectively located, shielded, and directed away from surrounding sensitive habitat and receptors. Based on these conditions and the temporary nature of construction lighting, if required, associated impacts to biological resources would be less than significant.

While substantial permanent lighting related to the proposed water tanks and associated facilities is not anticipated, some minor exterior lighting is proposed to accommodate potential nighttime access by maintenance personnel. Specifically, this lighting would consist of two exterior lights at the valve vault facility, with these fixtures to be operated by a switch located inside the valve vault structure. Accordingly, these lights only would be illuminated when switched on by maintenance personnel during infrequent on-site inspection or maintenance visits, and would not be regularly illuminated by methods such as timers or light/motion sensors. These lights also would be required to comply with Section 33-711, Article 35 (Outdoor Lighting) of the Escondido Municipal Code; and Division 9 of the San Diego County Light Pollution Code. Based on the described conditions, any associated potential light-related impacts to biological resources would be less than significant.

Human Activity: Increases in human activity in the area could result in degradation of sensitive species through the creation of unauthorized roads or trails, removal of native vegetation, and illegal dumping. Based on the nature of the project (primarily construction) and the fact that the site access road is gated, increased human activity in adjacent undeveloped areas is not anticipated during project operation and maintenance. Impacts from human activity during construction (i.e., from construction workers), however, should they occur, could potentially result in a significant project-related indirect impact without implementation of the associated mitigation provided below in this section.

### ***Mitigation Measures***

Implementation of the proposed project would result in direct and/or indirect impacts related to sensitive vegetation communities, sensitive wildlife species, construction noise, and construction-related human activity as described above. Implementation of the following mitigation measures would reduce the described impacts to biological resources below a level of significance.

**Bio-1** Mitigation for impacts to DCSS habitat shall occur at a 2:1 ratio, pursuant to applicable criteria in the County Biological Guidelines. This mitigation will entail acquisition of suitable habitat credits at an approved mitigation bank (potentially including the Red Mountain Mitigation Bank) prior to clearing, grubbing or grading, in consultation with the City, County and applicable resource agencies. Specifically, prior to commencing project construction operations, a Habitat Loss Permit (HLP) shall be approved for the proposed project by the County, with this approval also requiring concurrence from the USFWS and CDFW. Accordingly, a total of 4.78 acres of occupied (i.e., occupied by CAGN) DCSS habitat credits shall be acquired to mitigate associated direct impacts to this habitat.

**Bio-2** The beginning of project construction shall be precluded during the CAGN breeding season (February 15 through August 31), if feasible. If it is determined that the initiation of construction during the noted breeding season is required, a pre-grading CAGN survey shall be conducted by a qualified biologist within three days prior to grading to determine if this species occurs within the areas directly impacted by grading, or would be indirectly impacted by construction noise. If no CAGN nesting activities (including nest building or other breeding/nesting behavior) are occurring within the applicable areas, development shall be allowed to proceed. If the CAGN is observed nesting or displaying breeding/nesting behavior within 300 feet of the construction area, however, construction shall be postponed until: (1) all nesting (or breeding/nesting behavior) has ceased, or until after September 15; or (2) a temporary noise barrier or berm is constructed at the edge of the development footprint to reduce noise levels below 60 dB L<sub>EQ</sub> or ambient (if ambient is greater than 60 dB L<sub>EQ</sub>). Alternatively, the duration of construction equipment operation could potentially be controlled to keep noise levels below 60 dB L<sub>EQ</sub> or ambient in lieu of, or in concert with, a wall or other sound attenuation barrier. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.

**Bio-3** To ensure compliance with the MBTA, clearing of native vegetation shall occur outside of the general avian breeding season (February 1 through July 31), if feasible. If vegetation clearing is required during the noted breeding season, a qualified biologist shall conduct a pre-construction survey for nesting birds no more than 7 days prior to vegetation clearing. If no active nests are observed during this survey, clearing shall be allowed to proceed. If active nests are found, however, all vegetation clearing shall be precluded within 100 feet of the nest(s) until a qualified biologist determines that the nest(s) is (are) no longer active or has (have) failed. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.

**Bio-4** In areas adjacent to sensitive vegetation, the construction and staging area limits shall be clearly demarcated with temporary construction (orange blaze) fencing under the supervision of a qualified biologist to ensure that construction activity remains within the defined limits of work. This fencing shall be erected prior to commencement of brushing or grading activities, and shall demarcate areas where human and equipment access and disturbance from grading are prohibited adjacent to sensitive habitats. In addition, appropriate signs shall be erected noting the restricted areas. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.

*d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors or impede the use of native wildlife nursery sites;*

Wildlife corridors can be local or regional in scale, and represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Local corridors provide access to resources such as food, water, and shelter, and animals use these corridors to move between different habitats. Regional corridors also provide these functions by linking two or more large habitat areas, and provide avenues for wildlife dispersal, migration, and contact between otherwise distinct populations.

Neither the Draft North County MSCP nor the Draft Escondido Subarea Plan identify any Biological Core and Linkage Area within or adjacent to the project site and applicable off-site areas. The project site does, however, contain undeveloped lands that can be used by wildlife as habitat for foraging. Because native habitat within the project site is primarily surrounded by developed/disturbed properties, the on-site areas do not provide ideal habitat for larger species, although they are likely used for foraging and are likely used extensively by smaller native species, particularly birds and reptiles.

The project would not significantly impact wildlife corridors, as no barriers to wildlife movement would be constructed. Specifically, substantial long-term interference with local wildlife movement would not occur, due to the small area of proposed disturbance and the ability of local wildlife to move within the site outside of the proposed development areas. While the project could temporarily interfere with local wildlife movement during construction, these impacts are considered less than significant due to their short-term nature and the fact that construction is proposed during daylight hours. Although nighttime work is not anticipated, if subsequently proposed associated lighting would be limited to the lowest feasible illumination levels required for safety purposes, and would be selectively located, shielded, and directed away from surrounding sensitive habitat and receptors. As a result, disruption to animal species that may be present in the vicinity would be minimized, and associated potential impacts would be less than significant.

- e. *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; or*
- f. *Conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved state, regional, or local habitat conservation plan.*

As detailed in the project BTR and summarized above, the proposed project would be subject to several regulatory provisions, policies, and ordinances pursuant to federal, state, City and County requirements. Discussions of the federal Endangered Species Act- (ESA-), MBTA-, and Clean Water Act (CWA)-related issues that pertain to the project are included above, in the project BTR (Appendix A), and in Sections V and VIII of this analysis. Chapter 33, Zoning, of the City Municipal Code also identifies a number of requirements regarding removal of mature and “protected” trees. While the proposed project would entail the removal of one or two non-native mature trees on the site, the proposed landscape plan includes over 100, 5- to 15-gallon container plantings of native and non-invasive tree species, as outlined in Table 1 of the Detailed Project Description. Accordingly, the project would comply with applicable requirements of Municipal Code Section 33-1069(4), which mandates a minimum 1:1 tree replacement ratio for mature trees and a 2:1 ratio for “protected” trees, and associated potential impacts would be less than significant.

The project is not within an adopted HCP/NCCP subarea plan. The project is subject to the NCCP, which allows the CDFW to authorize take of species covered by plans in agreement with NCCP guidelines. The NCCP initiated by the State of California under Section 4(d) of the federal ESA focuses on conserving coastal sage scrub habitat to avoid the need for future federal and state listing of coastal sage scrub-dependent species. The CAGN is presently listed as threatened under the federal ESA, while several additional species inhabiting coastal sage scrub are candidates for federal and/or state listing. The impacts on this project encompass 2.39 acres of DCSS. The County regulates DCSS loss through its HLP Ordinance (County 1993). The project design complies with all HLP findings under Section 4(d) of the federal ESA and the NCCP Process Guidelines. The proposed loss of 2.39 acres would not exceed the County’s five percent loss limit, which has a current total of 2953.30 acres of loss, with a remaining allowable loss of 1749.15 acres. The project habitat loss would not preclude connectivity between high habitat value areas or prevent preparation of a subregional NCCP. This is because the limited amount of DCSS on the subject site does not qualify as an area of “high (DCSS) habitat value.” The site contains only habitat characterized as “moderate” and “agricultural” value land. The site is also surrounded by residential development and agricultural lands; therefore, it has lower conservation value. The proposed project has been designed to limit impacts to DCSS to the 2.39 acres within the proposed development area. Off-site mitigation at a 2:1 ratio of preservation to impact would be implemented. Mitigation of all impacts to DCSS habitat loss via the preservation of land within an approved mitigation bank is an acceptable mitigation option listed in Section 4.3 of the NCCP Guidelines. The proposed habitat loss would not appreciably reduce the likelihood of survival and recovery of listed species in the wild, and would be incidental to otherwise lawful activities. Mitigation for DCSS impacts

are identified above under items a through c of this section, and are outlined in mitigation measures **Bio-1** through **Bio-4** (including approval of an HLP). All associated impacts would be reduced below a level of significance. Thus, the project would not conflict with any local policies or ordinances protecting biological resources. The project also would not conflict with any approved state, regional, or local conservation plans, and, as detailed above, would comply with all applicable provisions of the NCCP

#### **IV. CULTURAL RESOURCES**

##### Significance Criteria and Impact Analysis

*The effects of a project on cultural resources are considered to be significant if the proposed project would:*

- a. Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5;*
- b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5;*
- c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature; or*
- d. Disturb any human remains, including those interred outside of formal cemeteries.*

##### *Historical and Archaeological Resources*

An Inventory and Evaluation of Cultural Resources (Cultural Resources Evaluation) was conducted for the proposed project in November 2012 by ASM Affiliates, Inc. The report is summarized below and included as Appendix B to this Draft MND.

Historical Resources. The existing Lindley reservoir tank was identified as an historic structure in the Cultural Resources Evaluation due to its age (approximately 60 years old) and historic context in providing water to the Escondido Municipal Water District (which has served the Escondido area since the early 20<sup>th</sup> Century). No additional historic structures or resources were identified within the project site or applicable off-site areas. An evaluation of the Lindley tank was conducted in compliance with applicable requirements under Section 106 of the National Historic Preservation Act (NHPA); the California Register of Historical Resources (CRHR); Chapter 33, Article 40, Section 33-794 of the City Municipal Code; and other pertinent federal, state, and/or local laws, ordinance, rules, regulations and policies. From this analysis, the Cultural Resources Evaluation concludes that the Lindley tank is not eligible for inclusion on the National Register of Historic Places (NRHP) under NHPA guidelines, the CRHR under state guidelines, or the Escondido local register under City guidelines. Specifically, this conclusion is based on the following considerations: (1) the tank has no association with any historically important individual; (2) the tank does not encompass materials or construction elements that are uniquely characteristic of its time of construction; (3) the

tank is a commonplace structure in the context of its time of construction; and (4) data recovery associated with the tank would likely not yield important historical data. As a result, potential impacts to historical resources associated with the proposed demolition/removal of the Lindley tank and associated facilities would be less than significant.

Archaeological Resources. The project evaluation of archaeological resources included a cultural resource records search at the South Coastal Information Center (SCIC), literature reviews, archival research, Native American correspondence, and a pedestrian field survey (conducted on November 12, 2012). A Sacred Lands File records search was also conducted in consultation with the Native American Heritage Commission (NAHC), with the results of this survey discussed separately below. Based on the noted investigations, the Cultural Resources Evaluation concludes that no previously recorded cultural resource sites are located within the project site and applicable off-site areas, and no previously unrecorded prehistoric sites or isolates were identified during the field survey. Accordingly, the Cultural Resources Evaluation concludes that "...there will be no adverse effects to cultural resources from the proposed project."

While no sacred sites were specifically identified within the project site or applicable off-site areas, the Sacred Lands file search conducted by the NAHC did indicate the presence of Native American cultural resources within 0.5 mile of the site. Accordingly, the NAHC has recommended that nine local tribal groups or individuals be contacted regarding the specific nature and location of potential local sacred sites (refer to Appendix D of the Cultural Resources Evaluation included as Appendix B of this document). Because such sites are not known or expected to occur with the project site or applicable off-site areas, associated potential impacts are considered less than significant. Based on the NAHC recommendation, however, the City will conduct consultation with the appropriate tribal contacts, with this effort outlined below and incorporated into the proposed project design (with the following measure to be included on all project grading permits, improvement plans, and final maps).

**CR-1** Prior to project approval, the City of Escondido shall consult with the nine applicable tribal contacts identified in the October 12, 2012 letter from NAHC regarding the nature and location of local sacred sites. This consultation shall consist of providing notification to the noted tribal contacts of the proposed project, including a description of the nature and location of the proposed facilities and related grading/construction activities, as well as the estimated project implementation schedule.

### *Paleontological Resources*

The proposed project is located in the Peninsular Ranges Geomorphic Province in an area underlain by Cretaceous granitic rock. Additional geologic units include artificial fill (e.g., in association with the existing reservoir tank and access road), as well as colluvium and topsoil derived from the underlying granitic rock (Ninyo and Moore 2012;

refer to Section V and Appendix C for additional discussion of geologic units). Paleontological resources are typically associated with sedimentary rock and related deposits. Because of the igneous nature of local bedrock and the age and depositional origin of associated deposits, no paleontological resources are anticipated to occur on site. Specifically, igneous rocks exhibit a molten origin, and are broadly assigned no potential for the occurrence of paleontological resources. Local colluvium and topsoil derived from igneous rocks are relatively recent in origin and are generated through mechanical processes (e.g., high-energy weathering and gravity) generally not conducive to fossil formation/preservation, and are thus typically assigned a paleontological resource sensitivity of low to none. Accordingly, implementation of the proposed project would not result in impacts related to paleontological resources.

### *Unique Geological Features*

Unique geological features generally are defined to include geologic structures, formations, or other features that exhibit unusual or important characteristics in the context of scientific information (e.g., rare geologic/mineral assemblages or structural features), economic considerations (e.g., economically valuable mineral deposits), or cultural perception (e.g., prominent, unusual, and/or aesthetically pleasing rock outcrops or exposures). The County General Plan Conservation and Open Space Element defines unique geological features as exhibiting "...distinctive characteristics...exclusive to the region, or...a key piece of geologic information important to the study of geology or geologic history." While the proposed project would entail disturbance of a number of granitic outcrops within the site, associated impacts would be less than significant as these features are typical of widespread granitic formations in the site vicinity, and do not exhibit any distinct or unique geologic characteristics, information or features.

### *Human Remains*

The occurrence of human remains on the project site is not anticipated, based on the results of the Cultural Resources Evaluation described above, as well as the fact the site exhibits generally steep topography and shallow granitic bedrock. Accordingly, no associated impacts are anticipated from implementation of the proposed project. Because the potential for on-site occurrence of currently unknown human remains cannot be completely eliminated, however, the following control measure has been included in the proposed project design (and would be included on all project construction contracts, grading permits, improvement plans, and final maps):

- CR-2** Appropriate information regarding the potential to encounter currently unknown human remains shall be included in construction contract specifications. Specifically, if unanticipated human remains are discovered, further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner would be contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the Coroner would notify the NAHC, who would then notify the Most Likely Descendant (MLD). At the same time, the

person who discovered the remains would contact the City of Escondido so that they could work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 would be followed, as applicable.

## V. GEOLOGY AND SOILS

A Geotechnical Evaluation was prepared for the proposed project by Ninyo and Moore (2012) and is summarized below, with the complete report included as Appendix C of this analysis. The Geotechnical Evaluation concludes that "...construction of the proposed project is feasible from a geotechnical standpoint..." provided that applicable geotechnical considerations are incorporated. The report identifies a number of recommendations related to seismic and non-seismic concerns, including conformance with applicable regulatory standards and a number of site-specific measures to address potential impacts. Geotechnical recommendations are summarized below, with additional detail provided in Appendix C.

### Significance Criteria and Impact Analysis

*The effects of a project on geology and soils are considered to be significant if the proposed project would:*

- a. *Expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving:*
  - i. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (Refer to Division of Mines and Geology Special Publication 42);*
  - ii. *Strong seismic ground shaking;*
  - iii. *Seismic-related ground failure, including liquefaction; or*
  - iv. *Landslides.*

The project site is not located within a State of California Fault-Rupture Hazard Zone (formerly known as Alquist-Priolo Special Studies Zones). The project site is within a seismically active area, however, and could potentially be subject to strong seismic ground motion during the design life of the project. Potential seismic hazards evaluated in the project Geotechnical Evaluation include surface fault rupture, ground motion (ground acceleration or ground shaking), liquefaction and seismically induced settlement, and landslides and rock slope stability.

No active faults are known to cross the project site, although several active faults traverse the Peninsular Ranges Province. The active Elsinore Fault is located approximately 15 to 16 miles east of the project site, and the active Rose Canyon Fault is located approximately 19 miles to the west. While lurching or cracking of the ground surface as a result of nearby seismic activity is possible, the probability of such events

occurring on site is identified as low and associated potential impacts are considered less than significant.

The project site is within a seismically active region, and is potentially subject to strong ground shaking from earthquake events along major regional faults. Ground acceleration is expressed in terms of “g” forces, where g equals the acceleration due to gravity. The 2010 California Building Code (CBC) recommends that the design of structures be based on the horizontal peak ground acceleration (PGA) having a 2-percent probability of being exceeded during a 50-year period, which is defined as the Maximum Considered Earthquake (MCE). Estimated PGA values identified in the Geotechnical Evaluation for the project site range from 0.44g ( $PGA_{MCE}$ ) to 0.30g (design PGA, which is two-thirds of the  $PGA_{MCE}$ ). These estimated ground acceleration values could potentially result in significant impacts to proposed facilities if not properly addressed. The Geotechnical Report identifies a number of associated recommendations to address these concerns, however, including: (1) conformance with applicable criteria of the CBC; (2) appropriate site preparation (e.g., clearing/grubbing and removal of buried structures); (3) implementation of geotechnical monitoring and remedial grading as applicable; (4) appropriate excavation parameters, such as removal/replacement of unsuitable materials including fill and colluvium (unconsolidated material typically deposited at the base of slopes by fluvial action and/or gravity); (5) proper engineered fill composition/placement methodology; and (6) appropriate design and construction of structures, foundations, trenches, manufactured slopes, retaining walls, pavement, and drainage facilities (with detailed recommendations provided in Appendix C). Based on conformance with these recommendations and related regulatory standards as part of the project design requirements, implementation of the proposed project would not be subject to significant impacts related to seismic ground acceleration.

Liquefaction is the phenomenon in which surficial materials located below the water table undergo a rapid loss of shear strength when subjected to strong earthquake-induced ground acceleration. Specifically, ground acceleration of sufficient duration can result in the loss of grain-to-grain contact due to a rapid rise in pore water pressure, and cause the soil to behave as a fluid for a short period of time (with an associated loss of support for surface and subsurface structures). Based on the dense nature of underlying bedrock and the absence of a shallow groundwater table, the project Geotechnical Evaluation concludes that “...liquefaction and seismically induced settlement at the subject site are not design considerations.” Accordingly, no impacts associated with liquefaction or related effects such as seismically induced settlement are anticipated from project implementation.

The project Geotechnical Evaluation concludes that “...no deep-seated landslides or related features underlie or are adjacent to the site.” Based on the extent and grade of proposed temporary (construction) and permanent slopes, however, a number of associated slope stability recommendations are identified in the Geotechnical Evaluation as outlined below, with these measures incorporated into the proposed project design and to be included on all project construction contracts, grading permits, improvement plans, and final maps.

**Geo-1** Temporary excavations shall be limited to maximum slope grades of 1.5:1 in colluvial materials and 1:1 for granitic bedrock materials, with shoring to be utilized where appropriate (e.g., if seepage is encountered), pursuant to applicable OSHA requirements.

**Geo-2** Permanent cut and fill slopes shall be limited to maximum grades of 1:1 and 2:1, respectively, and shall include all preparation, inspection and finishing efforts identified in the project Geotechnical Evaluation.

Based on implementation of the described design measures, and conformance with related geotechnical recommendations and regulatory requirements as part of the project design requirements, potential impacts related to the stability of temporary or permanent excavations and manufactured slopes from project implementation would be less than significant.

*b. Result in substantial soil erosion or the loss of topsoil;*

Implementation of the proposed project would increase the potential for erosion and transport of eroded material (sedimentation) both within and downslope of the project site. These potential effects are particularly applicable to proposed grading and fill slope construction at the project site, with erosion potential in the off-site pipeline corridor along Hubbard Avenue considered generally low due to the nature of associated activities (i.e., subsurface pipeline construction within an existing paved roadway corridor). Proposed activities within the project site would involve: (1) removal of surface stabilizing features (e.g., vegetation); (2) excavation of previously undisturbed and compacted materials (i.e., in association with the proposed tanks and related facilities); and (3) redeposition of imported material as backfill in proposed development areas, including large manufactured slopes. While graded/excavated areas and fill materials would be stabilized through efforts such as paving/repaving and revegetation/landscaping, erosion potential would be higher in the short-term than during pre-construction conditions. Potential erosion and sedimentation effects primarily are associated with the project construction period and are not considered to be significant long-term concerns, as all developed areas would be stabilized as noted. The off-site transport of sediment also could potentially result in effects to downstream receiving waters, such as increased turbidity and the provision of a transport mechanism for other contaminants that tend to adhere to sediment particles (e.g., hydrocarbons). Additional discussion of potential water quality effects associated with project-related erosion and sedimentation is provided below in Section VIII.

Short-term erosion and sedimentation impacts would be addressed through conformance with applicable elements of the City and County storm water programs, as well as related NPDES standards. Specifically, this would entail implementing appropriate measures to comply with requirements identified in sources that may include: (1) Section 33 of Article 55 (Grading and Erosion Control) of the City Municipal Code; (2) Sections 87.414 and 87.417 of Division 7 (Excavation and Grading) of the San Diego County Zoning and Land Use Regulations; (3) the City Jurisdictional Urban Runoff Management Plan (JURMP, 2008) and related storm water standards; (4) the

County Watershed Protection, Storm Water Management and Discharge Control Ordinance (Storm Water Ordinance, No. 10096) and associated Storm Water Standards Manual; and (5) the NPDES Construction General Permit (NPDES No. CAS000002, SWRCB Order 2009-0009-DWQ). Conformance with the noted NPDES and City/County standards is required prior to development of applicable sites exceeding one acre, and typically includes measures such as implementing an approved SWPPP, an associated Construction Site Monitoring Program (CSMP), employee training, and minimum BMPs, as well as a Rain Event Action Plan (REAP) for applicable projects (i.e., those in Risk Categories 2 or 3 outlined below). Under the Construction General Permit, project sites are designated as Risk Level 1 through 3 based on site-specific criteria (e.g., erosion potential and receiving water risk), with Risk Level 3 sites requiring the most stringent controls. Based on the site-specific risk level designation, the SWPPP and related plans/efforts identify detailed measures to prevent and control the off-site discharge of pollutants in storm water runoff. Depending on the risk level, these may include mandatory technology-based action levels, effluent limitations, and advanced treatment systems (ATS). Specific pollution control measures require the use of best available technology (BAT) economically achievable and/or best conventional pollutant control technology (BCT) levels of treatment, with these requirements implemented through applicable BMPs. While site-specific measures vary with conditions such as risk level, proposed grading, and slope/soil characteristics, detailed guidance for construction-related BMPs is provided in the Construction General Permit, as well as additional sources including the City of Escondido Standard Urban Storm Water Mitigation Plan (SUSMP, 2010), the previously noted County Stormwater Ordinance and Manual, and the California Storm Water Quality Association (CASQA) Storm Water Best Management Practices Handbooks (CASQA 2009). Specific requirements for the proposed project under this permit would be determined during SWPPP development, after completion of project plans and application submittal to the SWRCB.

Typical erosion and sediment control measures that may be required in the project SWPPP include the following: (1) seasonal grading restrictions during the rainy season (October 1 to April 30) for applicable areas; (2) preparation and implementation of a CSMP and, if applicable, a REAP to provide enhanced erosion and sediment control measures prior to predicted storm events; (3) use of erosion control/stabilizing measures such as geotextiles, mats, fiber rolls, or soil binders; (4) use of sediment controls to protect the site perimeter and prevent off-site sediment transport, including measures such as silt fencing, fiber rolls, gravel bags, temporary sediment basins, street sweeping, stabilized construction access points and sediment stockpiles, and use of properly fitted covers for sediment transport vehicles; (5) compliance with local dust control measures, and (6) implementation of additional BMPs as necessary to ensure adequate erosion/sediment control and regulatory conformance.

Based on implementation of appropriate erosion and sediment control BMPs as part of, and in conformance with, the project SWPPP and related City, County and NPDES requirements, associated potential erosion and sedimentation impacts would be avoided or reduced below a level of significance. Erosion and sedimentation BMPs

implemented for the proposed project would be further defined during the described regulatory compliance/SWPPP process, with the resulting measures taking priority over the more general types of industry standard measures listed above.

- c. *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;*

Based on the previously described nature and location of proposed facilities and the Geotechnical Evaluation conclusions, project area soil and geologic conditions generally are suitable for proposed development, provided that proper design and construction measures are implemented. Potential liquefaction (and related effects such as lateral spreading) and landslide impacts are discussed above in association with items a.iii and a.iv of this section. Potential impacts related to phenomena such as subsidence and collapse are not considered significant with respect to the proposed project, based on the following considerations: (1) subsidence and collapse may be associated with conditions such as groundwater (or other fluid) withdrawal, with such activities not proposed as part of the project and shallow groundwater not observed or expected to occur on site; (2) while the noted effects can also be associated with loading related to placement of larger surface structures, the project site is underlain by dense granitic bedrock, which is generally not subject to effects such as subsidence or collapse; and (3) potentially less stable materials present within the project area (fill, colluvium and topsoil) would be addressed through the required inclusion of geotechnical recommendations and conformance with applicable regulatory requirements (as described in association with item a of this section and the project Geotechnical Evaluation in Appendix C). Specifically, such measures would include provisions related to the composition and placement methodology (e.g., compaction) of materials used as backfill, as well as seismic, manufactured slope, retaining wall, drainage, structure, foundation, and pavement design, pursuant to standards from sources including the CBC. Conformance with the described geotechnical recommendations and industry standards would effectively avoid or reduce associated geologic and soil stability impacts below a level of significance.

Additional possible issues related to collapse identified in Appendix C involve the stability of pipeline trenches or other applicable excavations (and related safety effects for construction workers), the possible generation of oversize materials during excavation that may not be suitable for use as backfill, and the possible occurrence of corrosive soils. Trench (and potentially other) excavations typically involve vertical or near-vertical walls, and can exhibit instability and the potential for collapse related to loose or unstable soil and geologic materials. Such instability can be exacerbated through effects such as the potential occurrence of jointing and fracturing in local bedrock. The project Geotechnical Evaluation identifies a number of recommendations to address potential trench instability, including conformance with applicable OSHA requirements involving efforts such as trench slope limitations and shoring requirements. Conformance with these recommendations and associated regulatory

requirements would avoid or reduce all potential impacts related to trench stability below a level of significance.

Improper use of oversized materials in fill can result in effects such as differential compaction (varying levels of compaction over short distances) that may adversely affect subsurface structures. The project Geotechnical Evaluation identifies a number of standard industry recommendations to address these potential effects, including maximum particle size restrictions for fill materials, and inspection of fill by the project geotechnical engineer. Conformance with these recommendations would avoid or reduce all potential impacts related to oversized materials below a level of significance.

Corrosion testing for soil electrical resistivity, chloride and sulfate content, and pH was conducted as part of the project Geotechnical Evaluation (Appendix C). Based on the resulting laboratory analyses, all of the tested parameters were below established thresholds for corrosive concerns, and associated potential impacts would be less than significant. It should also be noted that recommendations for fill composition in the Geotechnical Evaluation specifically state that imported fill material "...should also be non-corrosive..." pursuant to applicable industry guidelines.

- d. Be located on expansive soil, as defined in Section 1802.3.2 of the International Building Code, creating substantial risks to life or property;*

Expansive (or shrink-swell) behavior in surface or near-surface materials is attributable to the water holding capacity of clay materials. Such behavior can adversely affect structural integrity (including underground pipelines) through shifting of foundations or supporting materials during the shrink-swell process. Potential impacts to proposed facilities from expansive soils are considered less than significant, based on the nature of underlying granitic bedrock, and the required inclusion of Geotechnical Evaluation recommendations and appropriate industry standards in the project design (as described above in this section and in Appendix C). Such measures include provisions related to the composition of materials used for backfill and foundation design, pursuant to existing industry standards, including applicable elements of the CBC. Additionally, the Geotechnical Evaluation specifically recommends that "Imported material, if needed for the project, should generally be granular soils with a very low expansion potential (ASTM International 4829)." Conformance with the described recommendations and industry standards would avoid or reduce all potential impacts related to expansive soils below a level of significance.

- e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.*

The proposed project would not require wastewater facilities, and no related impacts would occur.

## VI. GREENHOUSE GAS EMISSIONS

### Significance Criteria and Impact Analysis

- a. *Generate greenhouse gas (GHG) emissions, either directly or indirectly, that may have a significant impact on the environment; or*
- b. *Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.*

Global Climate Change refers to changes in average climatic conditions on the Earth as a whole, including temperature, wind patterns, precipitation and storms. Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and ozone. These gases, known as greenhouse gases (GHGs), allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. GHGs are emitted by both natural processes and human activities, and the accumulation of GHGs in the atmosphere regulates the Earth's temperature. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the greenhouse effect and contributing to what is termed "global warming," the trend of warming of the Earth's climate from anthropogenic activities.

While no CEQA significance thresholds for GHG emissions have been developed by the City, the County developed an interim significance threshold for GHG emissions under CEQA. The County's recommended GHG significance threshold proposal (County 2012) identifies a screening level of 2,500 metric tons of CO<sub>2</sub>e emissions<sup>2</sup> per year. As global climate change impacts are by nature cumulative, direct impacts cannot be evaluated because the impacts themselves are global rather than localized. The analysis herein, therefore, addresses cumulative impacts.

GHG emissions associated with the construction phase of the project would be generated through use of heavy equipment and vehicle trips. Specifically, construction-related emissions of GHGs would be short term and temporary, totaling approximately 635 metric tons during the entire 600-day (including 406 actual work days) construction period. This would equate to an even smaller emissions total over a 365-day (single year) period. Accordingly, construction-related GHG emissions would be well below the annual 2,500-metric ton screening threshold recommended by the County, and construction-related impacts resulting from GHG emissions would be less than significant.

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<sup>2</sup> The effect each GHG has on climate change is measured as a combination of the volume of its emissions, and its global warming potential. The global warming potential is the potential of a gas or aerosol to trap heat in the atmosphere, and is expressed as a function of how much warming would be caused by the same mass of CO<sub>2</sub> (i.e., equivalent to CO<sub>2</sub>, or CO<sub>2</sub>e). For instance, CH<sub>4</sub> has a global warming potential of 21, meaning that one gram of CH<sub>4</sub> traps the same amount of heat as 21 grams of CO<sub>2</sub>.

GHG emissions resulting from operational activities would remain virtually unchanged from present levels. A limited number of vehicle trips would be necessary for tank and pipeline maintenance, but the maintenance activities for the newly constructed tanks would be similar to those occurring for the currently existing tank. Because no new maintenance trips would be generated, associated GHG emissions would be negligible and operational impacts resulting from GHG emissions would be less than significant.

As discussed, the proposed project would have negligible GHG emissions. The proposed project would not result in emissions that would adversely affect State-wide attainment of GHG emission reduction goals as described in AB 32 and Executive Order S-21-09. Construction and operational emissions, therefore, would have a less-than-cumulatively considerable contribution to global climate change impacts. Impacts would be less than significant.

## **VII. HAZARDS AND HAZARDOUS MATERIALS**

### Significance Criteria and Impact Analysis

*The effects of a project on hazards and hazardous materials are considered to be significant if the proposed project would:*

- a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;*
- b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;*

The proposed project entails replacement of an existing potable water reservoir water tank and related facilities, and is not anticipated to involve the routine transport, use, or disposal of hazardous materials or wastes. Accordingly, no associated project-related impacts would result. Additionally, the proposed project is not reasonably expected to disturb hazardous materials or wastes that may be present within the project site or applicable off-site areas (including contaminated soil and/or groundwater), based on the following considerations: (1) the project site consists mainly of previously undisturbed areas that support native habitat or areas developed for potable or recycled water facilities, with a low potential for the related occurrence of hazardous materials or wastes; (2) while areas adjacent to the site on the east and southwest were used for agricultural purposes between approximately the 1940s and 1990s (HistoricAerials 2013), the types of observed uses (citrus and/or avocado groves) typically are not associated with high levels of chemical pesticide or other potential hazardous material use, and the noted areas are located downslope from the project site; (3) the project would be subject to applicable City/County and NPDES storm water standards, including requirements related to proper handling, storage and use of construction-related hazardous materials such as vehicle fuels and lubricants (refer to Section VIII for additional discussion); and (4) searches of the California Department of Toxic Substances Control (DTSC) EnviroStor website (Government Code Section 65962.5,

“Cortese” List) and the State Water Resources Control Board (SWRCB) GeoTracker site did not identify any hazardous material or waste listings within or adjacent to the project site (with the closest such listing located approximately 0.26 mile to the west at Escondido High School; SWRCB 2013, DTSC 2013). Accordingly, potential impacts related to the reasonably foreseeable upset or accident conditions involving the release of hazardous materials or wastes are not anticipated. It should also be noted, however, that some potential may exist for unknown hazardous materials or wastes to be encountered or disturbed during project implementation. Disturbance of such materials (if present) could potentially result in significant impacts to the public or the environment, with the following control measure therefore included in the proposed project design (and to be included on all project construction contracts, grading permits, improvement plans, and final maps) to ensure that associated potential impacts would be less than significant.

**Haz-1** Appropriate information regarding the potential to encounter contaminated soils and/or groundwater shall be included in construction contract specifications. If contamination or other hazardous sites are encountered during ground-disturbing activities, the City, County Department of Environmental Health (DEH), and Regional Water Quality RWQCB would be notified; and the on-site construction supervisor would redirect work away from the location of the contamination. The contamination remediation and removal activities would be conducted in accordance with a remediation plan prepared by a registered environmental assessor and pertinent regulations, under the oversight of the appropriate regulatory agency.

*c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;*

The project site is located within one-quarter mile of two schools, including Calvin Christian Elementary School (0.17 mile to the northwest) and Calvin Christian Preschool (0.22 mile to the northwest). Two additional school sites are located just over one-quarter mile from the project site, including Escondido High School (0.26 mile to the west) and Calvin Christian High School (0.26 mile to the northwest). While small amounts of hazardous materials would be present on site during project construction as noted above, these materials would be typical of those used at construction sites and would be handled in accordance with applicable regulatory requirements. Project operation and maintenance generally would not entail the use or storage of hazardous materials, with such potential use limited to minor quantities of substances such as lubricants, sealants or paint. Based on the described conditions, potential project-related impacts from hazardous material use, handling, or emission within one-quarter mile of a school would be less than significant.

*d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;*

As noted above under items a and b of this section, a search of the Section 65962.5 “Cortese” List (EnviroStor website) did not identify any listings within or adjacent to the project site, with the closest such listing located approximately four miles to the south, at 2257 Bernardo Avenue (DTSC 2013). Accordingly, no associated impacts would result from implementation of the proposed project.

- e. *For a project located within an airport land-use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would result in safety hazard for people residing or working in the project area;*
- f. *For a project within the vicinity of a private airstrip, the project would result in a safety hazard for people residing or working in the project area;*

The project site is not located within two miles of a public/public use airport or private airstrip, with the closest such facility, Lake Wohlford Resort Airport, located approximately five miles to the northeast. Based on the described distance, as well as the fact that the proposed project would not result in occupancy or other conditions that might generate safety concerns, no impacts related to airport or airstrip safety hazards would result from project implementation.

- g. *Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan; or*

Information regarding emergency response is provided in the County General Plan (2011) and related documents, and in the City General Plan (2012). The County General Plan includes information on emergency evacuation in the Mobility and Safety elements, with reference to the Office of Emergency Services *Unified San Diego County Emergency Services Organization Operational Area Emergency Plan* (County 2010). Specifically, Annex Q (Evacuation) of the plan notes that: “Primary evacuation routes consist of major interstates, highways and prime arterials within San Diego County...,” with I-5 and SR-78 identified in the project site vicinity. The County plan also notes that “Local jurisdictions will work with...applicable agencies/departments to identify evacuation points and transportation routes.”

The City General Plan identifies information related to emergency response in association with vehicular and aircraft (helicopter) access for police, fire and ambulance/EMT services, as described in the Community Health and Services and Community Protection elements (with no specific “emergency response or evacuation plans” included). In addition, the Community Protection Element includes a number of policies related to emergency response for the noted services, including provision of adequate staffing, equipment and response times, and also identifies a number of designated emergency evacuation routes, “...to aid in the orderly and rapid movement of people away from a threat or actual occurrence of a hazard.” Several of these designated routes are located in the vicinity of the proposed project, and may be utilized by project-related construction and maintenance traffic, including I-15, El Norte Parkway, North Ash Street (south of Sheridan Avenue), and North Broadway.

From the above information and the proposed project design, potential impacts to emergency response or evacuation plans would be less than significant, based on the following considerations: (1) operational project traffic would be limited to a small and infrequent number of trips related to site inspection and maintenance (with no associated impacts to emergency response or evacuation plans); (2) direct project impacts to local roadways from pipeline construction would be limited to portions of Hubbard Avenue and the associated intersection with North Ash Street (north of Sheridan Avenue), and therefore would not affect designated emergency evacuation routes; (3) indirect effects to regional and local roadways (including I-5, SR-78 and the designated emergency evacuation routes noted above) from project-related construction traffic would be minor, due to the relatively low average daily traffic (ADT) levels (approximately 30 trips) and the temporary nature of project construction; and (4) primary access to all major roads would be maintained during construction and operation activities.

- h. Expose people or structures to significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.*

The proposed project is located in a semi-rural area where residential and other developed/disturbed sites are intermixed with agricultural uses and wildlands. The project site and surrounding areas also are within an area designated as a high risk zone for wildfire hazards in the County General Plan Safety Element and the City General Plan Community Protection Element. Because the project would involve facilities that generally are not susceptible to wildfire hazards (e.g., subsurface pipelines and non-occupied potable water structures) it would not increase long-term exposure of people or structures to significant risk of loss, injury or death involving wildland fire. Therefore, no associated impacts would result from project implementation.

The construction phase of the project could potentially increase the risk of wildland fires on a short-term basis, if, for example, equipment-related fires were accidentally started at the site. The probability for such fires to occur is low, however, and construction equipment would be outfitted with spark arrestors and other fire protection features such as on-board fire extinguishers. As a result, potential impacts associated with short-term wildland fire hazards from project construction would be less than significant.

## **VIII. HYDROLOGY AND WATER QUALITY**

### Significance Criteria and Impact Analysis

*The effects of a project on hydrology and water quality are considered to be significant if the proposed project would:*

- a. *Violate any water quality standards or waste discharge requirements, including but not limited to increasing pollutant discharges to receiving waters (consider temperature, dissolved oxygen turbidity and other typical storm water pollutants);*
- b. *Have potentially significant adverse impacts on ground water resources, including but not limited to, substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);*
- c. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner which would result in substantial/increased erosion or siltation on- or off-site;*
- d. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site and/or significant adverse environmental impacts;*
- e. *Cause significant alteration of receiving water quality during or following construction;*
- f. *Cause an increase of impervious surfaces and associated runoff;*
- g. *Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;*
- h. *Cause potentially significant adverse impact on ground water quality;*
- i. *Cause or contribute to an exceedance of applicable surface or ground water receiving water quality objectives or degradation of beneficial uses;*
- j. *Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired;*
- k. *Otherwise substantially degrade water quality;*
- l. *Create or exacerbate already existing environmentally sensitive areas;*
- m. *Create potentially significant environmental impact on surface water quality, to either marine, fresh or wetland waters;*
- n. *Impact aquatic, wetland or riparian habitat;*

### *Water Quality*

The discussion of potential water quality impacts includes threshold items a, e, and g through n, as listed above. As outlined below, potential water quality impacts from the proposed project would be limited primarily to construction-related concerns, including erosion/sedimentation and the use and storage of hazardous substances such as

vehicle fuels and lubricants. Long-term project operations would generally be limited to routine inspection and maintenance of proposed facilities, and would not involve activities or materials that could result in significant water quality impacts. Specifically, potential contaminant sources used on-site during long-term project operations would be limited to minor quantities of substances such as lubricants, sealants or paint, with these materials (if required) to be associated with maintenance activities/vehicles and not stored on site. Any such use of potential contaminants on the project site during facility operation also would include standard measures to ensure safe handling (e.g., temporary containment to avoid spills) and proper disposal of associated wastes.

As described above in Section V, Geology and Soils, potential construction-related erosion/sedimentation impacts would be avoided or reduced below a level of significance through conformance with the existing NPDES Construction General Permit and related City/County requirements. Specifically, this would entail implementing a SWPPP and related BMPs in conformance with applicable regulatory requirements.

The noted SWPPP also would address project-related use and storage of construction-related hazardous materials, through the use of appropriate BMPs in accordance with applicable regulatory standards. While detailed BMPs would be determined as part of the NPDES/SWPPP process based on site-specific parameters, they may include the following types of standard industry measures: (1) restricting paving operations during wet weather and use of sediment control devices downstream of paving activities; (2) proper containment and disposal of paving wastes and slurry (e.g., use of properly designed and contained concrete washout areas); (3) minimizing the amount of hazardous materials stored on site and restricting storage/use locations to areas at least 50 feet from storm drains and surface waters; (4) using raised (e.g., on pallets), covered and/or enclosed storage facilities for all hazardous materials; (5) maintaining accurate and up-to-date written inventories and labels for all stored hazardous materials; (6) using berms, ditches and/or impervious liners (or other applicable methods) in material storage and vehicle/equipment maintenance and fueling areas to provide a containment volume of 1.5 times the volume of stored/used materials and prevent discharge in the event of a spill; (7) placing warning signs in areas of hazardous material use or storage and along drainages and storm drains (or other appropriate locations) to avoid inadvertent hazardous material disposal; (8) providing training for applicable employees in the proper use, handling and disposal of hazardous materials, as well as appropriate action to take in the event of a spill; (9) storing absorbent and clean-up materials in appropriate on-site locations where they are readily accessible; (10) properly locating, containing and maintaining portable trash and wastewater facilities; (11) posting regulatory agency telephone numbers and a summary guide of clean-up procedures in a conspicuous location such as at or near the job site trailer; (12) regularly (at least weekly) monitoring and maintaining hazardous material use/storage facilities and operations to ensure proper working order; and (13) implementing a CSMP and a REAP (if applicable) pursuant to regulatory guidelines.

Based on the described use of appropriate BMPs as part of a SWPPP and in conformance with applicable NPDES and City/County requirements, proposed project construction is not expected to result in significant water quality impacts, including effects related to violations of water quality standards or requirements, erosion/sedimentation, water quality objectives or beneficial uses, deterioration of on-site or receiving water quality (including 303[d] listed waters), or environmentally sensitive or biological resources (including aquatic, wetland, and riparian habitats). Long-term project operation is not anticipated to result in significant water quality impacts as previously noted, although the proposed detention basin would also provide long-term water quality treatment for associated drainage within the site. Specifically, as outlined in the Detailed Project Description, flows within unlined swales and into the detention basin would be treated through removal (settlement) of suspended sediment and any associated pollutants such as petroleum compounds (which tend to adhere to sediment particles), prior to discharge into the local storm drain system.

Project implementation would not result in direct or indirect impacts to groundwater quality through activities such as (for example) underground storage of hazardous materials or discharge of contaminated runoff that could percolate into local aquifers. While shallow groundwater is generally not expected to be encountered during project construction, perched aquifers could potentially be present and require extraction/disposal (dewatering) to facilitate proposed construction operations. If construction-related dewatering is necessary, the project would be required to conform to applicable requirements of the NPDES General Groundwater Extraction Waste Discharge Permit (Groundwater Permit, NPDES No. CAG919002, RWQCB Order No. R9-2008-0002). These requirements are generally applicable to all groundwater discharge regardless of volume, with certain exceptions as noted in the permit text. Specific requirements for permit conformance include: (1) implementing an appropriate sampling and analysis/monitoring program; (2) providing at least 30 days notification to the appropriate local agency prior to discharging to a municipal storm drain system; (3) conforming with applicable water quality standards, including (but not limited to) the RWQCB San Diego Basin Plan, CWA, and State Porter-Cologne Water Quality Control Act; and (4) submitting applicable monitoring reports. Conformance with applicable requirements under the NPDES Groundwater Permit would ensure that associated regulatory standards are met, and would reduce potential construction-related water quality impacts from groundwater extraction/disposal (if required) below a level of significance.

### *Groundwater Resources*

This discussion of potential impacts to groundwater resources includes threshold item b, as listed above. The proposed project would not result in increased use or extraction of local groundwater, with no associated impacts to groundwater supplies, aquifer volumes, or groundwater tables. In the unlikely event that shallow groundwater is encountered during project construction, temporary dewatering efforts would be implemented in conformance with applicable NPDES requirements as noted above. Based on the temporary nature of such potential dewatering activities, no associated

significant impacts from the drawdown or depletion of local groundwater resources would be anticipated.

### *Drainage and Runoff*

The discussion of potential drainage and runoff impacts includes threshold items c, d, f, and g, as listed above. Proposed construction activities involve the installation of new impervious surfaces, including the two proposed tanks and related facilities such as pavement, with a total new impervious area of approximately 1.3 acres. As previously described, the proposed project also would entail removing the existing reservoir tank and associated facilities (including pavement and drainage structures), with an impervious surface area of approximately 0.45 acre. As a result, project implementation would result in a net increase of approximately 0.85 acre of on-site impervious surfaces. As noted above and under the Detailed Project Description, the proposed project would incorporate a number of drainage facilities, including concrete and rip rap swales, curb/gutter structures (along portions of the proposed access road spurs), inlets, storm drain pipelines, and a detention basin. The majority of surface flows generated within the developed portions of the site would be captured by these facilities and conveyed to the detention basin, with all on-site flows ultimately conveyed to the existing City and/or County storm drain systems (similar to existing conditions). Accordingly, no associated significant impacts related to the alteration of existing drainage patterns, directions or runoff rates/amounts are anticipated, including effects associated with erosion/sedimentation, flooding and storm drain capacity, based on the following considerations: (1) the net increase of on-site impervious surfaces would be minor, with the corresponding increase of flow rates and amounts to be incremental in nature; (2) the majority of flows from the developed portion of the site would be conveyed to the detention basin, which would provide flow regulation (through measured slow release) prior to discharging to the existing storm water system; (3) the project design includes adequate facilities to accommodate proposed drainage, including appropriately designed/sized drainage facilities and the use of pervious (riprap-lined) swales that would reduce flow velocities and allow some associated infiltration of surface drainage; (4) project construction and operation would incorporate appropriate erosion and sedimentation controls, pursuant to applicable City/County and NPDES regulatory requirements, as described above in item V.b; and (5) all surface flows from the site would either be conveyed to proposed and existing storm drain facilities as described, or would drain off-site as overland flow (similar to existing conditions), with no substantial changes to existing drainage patterns or directions.

- o. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;*
- p. Place project within a 100-year flood hazard area structures which would impede or redirect flows;*
- q. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or*

The project site and vicinity (including all applicable off-site areas along Hubbard Avenue/North Ash Street) are within areas mapped as Zone “X” by the Federal Emergency Management Agency (FEMA), with this designation defined as areas determined to be outside of the 500-year (and therefore the 100-year) floodplain (FEMA 2012). The closest mapped 100-year floodplain is located approximately 900 feet west of the site, in association with Reidy Creek. Based on the described conditions, as well as the fact that proposed facilities do not include housing or other habitable structures, no impacts related to the placement of housing or other facilities within 100-year floodplains that could impede or redirect flood waters, or associated hazards, are anticipated from the proposed project.

The project site is not located within or adjacent to any mapped dam inundation areas, with the closest such designation located approximately 0.75 mile to the south in association with Lake Dixon (City of Escondido 2012). Based on the noted distance and the location of proposed surface facilities on a prominent knoll, no impacts related to dam inundation would result from project implementation.

*r. Inundate the site by seiches, tsunami or mudflow.*

Tsunamis (commonly referred to as tidal waves) are seismic sea waves that can generate impacts related to inundation in coastal zones. Because the project area is located approximately 14 miles inland and between approximately 860 and 1,000 feet above mean sea level, no impacts related to inundation by tsunami are anticipated from project implementation.

Seiches are defined as wave-like oscillatory movements in enclosed or semi-enclosed bodies of water such as lakes or reservoirs, and are most typically associated with seismic activity. Seiches can result in flooding damage and related effects (e.g., erosion) in surrounding areas from spilling or sloshing water, as well as increasing pressure on containment structures. The closest large water body to the project site is Lake Dixon, approximately 2.2 miles to the northeast. Based on the noted distance and the fact that proposed surficial facilities are located on a prominent knoll, no seiche-related impacts would result from project implementation.

Proposed project facilities are not considered susceptible to significant impacts from inundation by mudflow, due to the site location on a prominent knoll with shallow underlying bedrock, and the underground location of proposed off-site pipelines.

## **IX. LAND USE AND PLANNING**

### Significance Criteria and Impact Analysis

*The effects of a project on existing or planned land uses are considered significant if the proposed project would:*

- a. *Physically divide an established community;*
- b. *Conflict with any applicable land-use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;*

The proposed project is located primarily within a site that includes existing potable and recycled water facilities, as well as previously undeveloped areas. Associated on-site facilities would not extend into or through, or otherwise physically affect, established community development in surrounding areas. Proposed off-site facilities consist of a potable water pipeline located within adjacent portions of Hubbard Avenue and the associated intersection with North Ash Street. Once the pipeline is installed, the associated roadways and intersection would be backfilled and repaired/repaved to current conditions. Based on the described considerations, implementation of proposed on- and off-site project facilities would not result in impacts related to physically dividing an established community.

As previously noted under the Project Environmental Setting, the project site and applicable off-site areas along Hubbard Avenue within County jurisdiction are zoned RS, with a corresponding General Plan land use designation of SR-1. Both of these designations are intended primarily for residential uses, although allowable uses include “civic use types” such as “essential services.” The project site also has an underlying City of Escondido pre-zoning designation of PZ-RA-5 (Residential Agriculture, 5-acre minimum lot size) and PZ-RE-40 (Residential Estate, 40,000-square foot minimum lot size). Adjacent areas within the City are zoned and designated Single-Family Residential (R-1) and Suburban Residential, respectively. These categories are intended mainly for residential uses, with allowable lot sizes and supporting uses variable with site-specific conditions such as slope. Public utilities and water storage facilities also are permitted uses within the RA zone. The project site is not located within the coastal zone, and is not subject to general plan, specific plan or other known land use policies/regulations intended to avoid or mitigate environmental effects. Accordingly, the proposed construction and operation of potable water facilities would not result in impacts related to conflicts with applicable zoning, general plan or other land use requirements.

- c. *Conflict with any applicable habitat conservation plan or natural community conservation plan;*

As discussed above in Section III, Biological Resources, the project site and associated off-site areas are subject to applicable requirements under the NCCP, through the County HLP Ordinance. The project would include mitigation measures (**Bio-1** through **Bio-4**) to ensure compliance with applicable requirements under the NCCP. As a result, no conflict with an applicable NCCP or HCP, or associated impacts, would occur.

- d. Have a substantial adverse effect on a scenic vista;*
- e. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;*
- f. Substantially degrade the existing visual character or quality of the site and its surroundings; or*

The proposed project would involve constructing two partially buried potable water tanks and related facilities including a valve vault, pipelines, access roads, pavement, drainage facilities and manufactured slopes, as well as removing an existing above ground water tank and associated structures. While the project site and adjacent areas include scenic resources associated with topographic features and native habitat, project implementation would not have a significant effect on scenic vistas, resources or character based on the following considerations: (1) the proposed water tanks would be located primarily underground, with only approximately the upper six feet to be above finish grade and generally not visible from off-site areas (and other project facilities would consist of low-profile or subsurface structures); (2) the existing above ground water tank would be removed, with this relatively massive, approximately 30-foot tall and mostly unlandscaped structure visible from a number of residential sites to the north, south and east; (3) while the project would include relatively large manufactured slopes (up to 35 feet high), the proposed design includes measures to address associated visual concerns, including recontouring to blend with existing topography and installation of appropriate landscaping to provide visual screening (including several large tree and shrub species, refer to Figure 7 and Table 1); (4) appropriate color treatments would be used for pertinent facilities to help reduce visual contrast, including buff coloring for the reservoir tanks and associated cut slope, and bronze-anodized aluminum for exterior structures such as stairs/handrails and landings; (5) the project site is not located within or adjacent to a state scenic highway corridor, with the closest such designation located along I-15 approximately 13 miles to the north (near the State Route 76 junction); (6) the project site is not located within or adjacent to a City- or County-designated scenic highway corridor, with the closest such designations located along I-15 approximately one mile to the northwest, and approximately 3.25 miles to the east along Lake Wohlford Road; and (7) the project site and vicinity are not identified as primary/secondary ridgelines, prominent natural landforms, or other scenic resource designations in the City General Plan Resource Conservation Element, or the County General Plan Conservation and Open Space Element. Temporary construction-related effects to scenic resources and views from local residences could occur during project construction, although, these would not result in significant impacts due to their temporary and relatively short-term nature.

- g. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.*

Existing outdoor lighting sources in the project site vicinity are associated with local residential uses, which generally are minor and of low wattage. Project construction is proposed to be limited to daylight hours and thus would not require lighting. If nighttime work is subsequently proposed, however, associated lighting would be limited to the

lowest feasible illumination levels to ensure human safety, and would be selectively located, shielded, and directed away from surrounding sensitive receptors. Based on these conditions and the temporary nature of construction lighting, if required, associated impacts related to light and glare would be less than significant.

While substantial permanent lighting related to the proposed water tanks and associated facilities is not anticipated or proposed, some minor exterior lighting is proposed to accommodate potential nighttime access by maintenance personnel. Specifically, this lighting would consist of two exterior lights at the valve vault facility, with these fixtures to be operated by a switch located inside the valve vault structure. These lights only would be illuminated when switched on by maintenance personnel during infrequent on-site inspection or maintenance visits, and would not be regularly illuminated by methods such as timers or light/motion sensors. These lights would also be required to comply with Section 33-711, Article 35 (Outdoor Lighting) of the Escondido Municipal Code; and Division 9 of the San Diego County Light Pollution Code. Based on the described conditions, any associated potential light and glare impacts would be less than significant.

## **X. MINERAL RESOURCES**

### Significance Criteria and Impact Analysis

*The effects of a project on mineral resources are considered to be significant if the proposed project would:*

- a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or*
- b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.*

The project site is located within an area designated as Aggregate Mineral Resource Zone Category 3 (MRZ-3; County of San Diego 2008). The MRZ-3 designation generally indicates the occurrence of known or inferred mineral deposits, the significance of which cannot be evaluated from available data. Based on this designation, the lack of previous mineral-related activities (e.g., exploration and production), and the fact that the site and applicable off-site areas are not delineated as mineral resource recovery areas on any land use plans, potential impacts to aggregate mineral resources from the proposed project would be less than significant. Similarly, due to local geologic conditions and the lack of historic mining/exploration activities, the potential for recoverable deposits of mineral types other than aggregate (e.g., metals and petroleum) to occur on site is considered low, and no associated impacts would result from project implementation.

## **XI. NOISE**

### Significance Criteria and Impact Analysis

*The effects of a project on noise are considered to be significant if the proposed project would result in:*

- a. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;*

A Technical Noise Memorandum was prepared for the proposed project, with this document summarized in the following analysis and included as Appendix D of this Initial Study. Based on the nature of the proposed project (i.e., water storage tanks and related facilities with minimal, maintenance-related, traffic), no associated significant operational noise impacts are anticipated and no additional discussion of operational noise is provided in the following analysis. Construction of the proposed project may potentially create elevated short-term noise impacts, however, particularly from grading and excavation activities, with these potential impacts addressed below. As previously described in this Initial Study and outlined in Appendix D, the project site is within an unincorporated area of the County, while nearby off-site properties include areas under the jurisdiction of both the City and County. Accordingly, the analysis of potential construction noise impacts includes assessment under both City and County noise standards (with these standards outlined below and described in Appendix D).

#### *On-site Construction Noise Analysis*

As noted above under the Detailed Project Description, blasting activities would not be conducted during project construction, due to the proximity of local residential sites. Construction activities also would be limited to the hours of 7:00 am to 4:30 pm, on Monday through Friday, in accordance with the City of Escondido General Plan Community Protection and Safety Element and Chapter 17, Article 12 of the Escondido Municipal Code (Noise Abatement and Control). Associated County guidelines (County Code Sections 36.409 through 36.410) do not include specified time restrictions for construction activities as noted for the City, but rather establish an eight-hour average ( $L_{EQ}$ , 8-hour)<sup>3</sup> noise level limit of 75 dBA for the period of 7:00 a.m. to 7:00 p.m. Based on these conditions, the noise analysis in Appendix D provides an assessment of on-site construction-related “worst case” noise impacts associated with the use of an excavator-mounted hydraulic breaker (breaker), a track-mounted pneumatic rock drill (drill), and a large tracked crawler with blade and rippers (dozer). Other on-site noise sources, including a loader used to place excavated material into trucks and other smaller equipment, would have significantly less potential for noise generation, with the analysis therefore focused on the three noted equipment types which represent the primary on-site noise impact sources.

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<sup>3</sup>  $L_{EQ}$  is the time-averaged noise level for a specified period (e.g., 8 hours).

As described in Appendix D, the Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) Version 1.0 (February 2, 2006) lists the maximum sound level ( $L_{MAX}$ ) at 50 feet for the three “worst case” equipment types as: 85 dBA  $L_{MAX}$  for a dozer; 90 dBA  $L_{MAX}$  for a breaker; 85 dBA  $L_{MAX}$  for a drill. None of these types of equipment are used continuously and the normal FHWA analysis utilizes an assumed 40 percent hourly operating time for the dozer, 10 percent for a breaker, and 10 percent for a drill, which reduces the average noise impacts substantially.

Based on the project grading plan shown on Figure 5, dozer operations would occur at a minimum distance of 70 feet from the closest residence along the southern property line, in association with proposed fill slope construction. The closest residential location to areas where primary excavation involving drill and breaker operations would occur (i.e., for the tank sites) is approximately 225 feet to the south.

Table 4 provides the potential construction noise impacts at the proximal southern and western residential areas (with residences to the north and east located at greater distances and/or afforded some noise shielding by intervening topography). As shown therein, if the described equipment was in simultaneous use, the normally allowable 75 dBA limits ( $L_{EQ}$ , 8-hour), as defined above and described in Appendix D) would be exceeded at the southern residences, with associated impacts considered significant and associated mitigation identified below in this section. Implementation of the described measure would provide a minimum five dBA of noise reduction, and would reduce identified impacts at the southern residences below a level of significance. As shown in Table 4, “worst case” noise levels associated with project-related construction at the western residences would be below the allowable limits, with associated impacts therefore less than significant. Due to the duration of construction, the potential extended use of impact rock breaking, and the relatively high levels of noise at the western residential locations, however, it is recommended in Appendix D that the mitigation measure identified for the southern residences also be implemented for the western residences.

<b>Table 4 Construction Noise Impacts at Nearby Residences (dBA)</b>		
<b>Proximal Southern Residences</b>		
<b>Equipment</b>	<b>L<sub>MAX</sub></b>	<b>L<sub>EQ</sub> 8-Hour</b>
Breaker	76.9	66.9
Rock Drill	71.9	64.9
Dozer	78.7	74.8
Total	78.7	75.8
<b>Proximal Western Residences</b>		
<b>Equipment</b>	<b>L<sub>MAX</sub></b>	<b>L<sub>EQ</sub> 8-Hour</b>
Breaker	64.8	60.8
Rock Drill	73.1	63.1
Dozer	64.1	57.1
Total	73.1	65.7

Source: HELIX 2013b

#### *Off-site Construction Noise Analysis*

Potential project-related sources of noise generation from off-site activities include pipeline construction along Hubbard Avenue/North Ash Street, and vehicular traffic related to material hauling, deliveries and access requirements. As noted in the Detailed Project Description, construction of the off-site pipeline would encompass approximately 1,000 lf within Hubbard Avenue and the associated North Ash Street intersection, with these activities to proceed at a rate of approximately 200 feet per day. As a result, construction operations and associated noise generation from excavation and related activities would be limited to less than one day at any individual residential property (i.e., when construction is adjacent to the property). Based on this consideration and the relatively low noise generation levels of associated equipment (e.g., an excavator, loader, crane and transport trucks), associated impacts would be less than significant based on the noted regulatory standards (i.e., 75 dBA L<sub>EQ</sub>, 8-hour).

Per the discussion in the Detailed Project Description and Appendix D, a total average of approximately 30 vehicle round trips per day would occur during project construction. Typically, many of the daily trips associated with construction-related material import/export and site access are clustered at the beginning of the day. Accordingly, the assessment of associated noise impacts is based on a “worst case” hourly (7 am to 8 am) traffic volume of 10 autos (including pickups), 5 Medium Trucks (MT, two-axles) and 5 Heavy Trucks (HT, three or more axles). The hourly average for traffic volumes during other portions of the workday are assumed as 1 auto, 1 MT, and 3 HT, with the analysis based on a residential speed limit of 25 miles per hour. With the noted criteria, noise levels at a distance of 50 feet would be 56.9 dBA during the 7 am to 8 am worst case period, and 53.7 dBA during the remaining hours of the workday. From these

data, the calculated CNEL<sup>4</sup> for the daily roadway trips is 50.3 CNEL at 50 feet from the centerline of the roadway. Based on these calculated noise levels and the discussion of regulatory standards in Appendix D, project-related noise levels from off-site traffic would be below the City and County standards of 60 CNEL, and associated impacts would be less than significant.

Implementation of the proposed project would exceed significance thresholds related to construction noise levels at the proximal residential sites along the southern property boundary, with associated significant, short-term noise impacts. Implementation of the following mitigation measure would reduce the described impacts below a level of significance. As described in Appendix D, the following mitigation measure also is recommended to be implemented for proximal residences along the western property boundary, due to the duration of construction, the potential extended use of impact rock breaking, and the relatively high levels of noise at the western residential locations. Therefore, the following mitigation is identified in association with residential sites along both the southern and western property boundaries.

**Noise-1** A temporary 12-foot high noise control barrier shall be constructed along the western and southern boundaries of project-related equipment operations to provide noise shielding for nearby residences. The location of this barrier shall be in close proximity to equipment operations to break the line of sight to nearby residences, and shall continue past the location of the horizontal construction line-of-sight by a minimum of 12 feet. The barrier shall be constructed of a double layer of 0.5-inch thick plywood arranged in a ships lap, or a single layer of 0.75-inch plywood with no cracks or gaps. Noise blankets or other temporary noise control fencing are acceptable replacements if they provide a Sound Transmission Control (STC) noise control rating of 18 or greater. The location, composition, and design of the project noise barrier(s) shall be reviewed and approved by a qualified acoustician prior to commencement of project construction.

*b. Exposure of persons to, or generation of, excessive groundborne vibration or groundborne noise levels;*

The technical evaluation in Appendix D includes an assessment of groundborne noise and vibration associated with project construction. This analysis identifies the previously described dozer and breaker operations/locations as the most likely sources of groundborne noise and vibration impacts, and provides the following conclusions:

- At 70 feet, groundborne noise/vibration levels from dozer operations would be below the associated regulatory guideline for building damage, and slightly above the “level of annoyance for infrequent events” associated with residential uses

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<sup>4</sup> The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 pm to 10:00 pm have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 pm to 7:00 am have an added 10 dB weighting.

(refer to Tables 3 and 4 of Appendix D). The analysis concludes, however, that potential impacts associated with the noted “level of annoyance” would be less than significant, based on the short-term duration (one or two days) of dozer operations in the noted area.

- At 225 feet, groundborne noise/vibration levels from breaker operations would be below the associated regulatory guidelines for both building damage and the “level of annoyance for frequent events” associated with residential uses (refer to Tables 3 and 4 of Appendix D). Accordingly, associated potential impacts would be less than significant.
- c. *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;*
- d. *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;*

As noted above in item a of this section, the proposed project consists of constructing/replacing water storage tanks and related facilities, with potential long-term noise-generating activities limited primarily to small amounts of maintenance-related traffic and other activities (e.g., landscape/irrigation system repair). Accordingly, no significant impacts related to long-term noise generation would result from implementation of the proposed project.

While the preceding analysis of short-term, construction-related noise effects identified significant impacts related to the proposed use of equipment including a dozer, breaker and drill, these impacts would be reduced below a level of significance through the associated mitigation measure (**Noise-1**).

- e. *For a project located within an airport land use plan, or where such a plan has not been adopted, within two miles of a public airport or public use airport, significant impact would occur if the project exposed people residing or working in the project area to excessive noise levels; or*
- f. *For a project within the vicinity of a private airstrip, if the project exposed people residing or working in the project area to excessive noise levels.*

As described above in Sections VII.e and VII.f, the project site is not located within 2 miles of a public/public use airport or private airstrip, with the closest such facility, Lake Wohlford Resort Airport, located approximately five miles to the northeast. Based on the described distance, as well as the fact that the proposed project would not result in occupancy or other conditions that might generate concerns from excessive noise levels, no associated impacts would result from project implementation.

## **XII. POPULATION AND HOUSING**

### Significance Criteria and Impact Analysis

*The effects of a project on population and housing are considered to be significant if the proposed project would:*

- a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);*

The proposed project would not include the construction of housing and/or businesses, and thus would not induce a direct increase in the local or regional population. As previously noted in the Detailed Project Description, a combined capacity of 3.0 MG is identified for the proposed water tanks to replace the existing 2.0-MG tank. The existing tank is undersized for current demand, however, with the proposed tanks to provide adequate capacity to meet the associated demand and comply with current industry standards for potable water storage and distribution (e.g., adequate capacity to meet peak demands for water supply and pressure). The project also would provide better capability to deliver adequate water supplies and pressure in the event of a fire-related (or other) emergency, and would not extend public utilities into areas not already served by such infrastructure. Based on the described conditions, impacts to population or housing related to direct or indirect growth inducement from implementation of the proposed project would be less than significant.

- b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or*
- c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.*

The proposed project would not displace any existing housing, cause the displacement of substantial numbers of people, or require the construction of any replacement housing. Accordingly, no associated impacts would result from project implementation.

## **XIII. PUBLIC SERVICES AND XIV. RECREATION**

### Significance Criteria and Impact Analysis

*The effects of a project on public services are considered to be significant if the proposed project would:*

- a. Result in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, need for new or physically altered government facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*

1. *Fire Protection*
2. *Police Protection*

The proposed project would not result in operational impacts to fire or police protection, and would not generate the need for new or altered fire or police protection facilities or related infrastructure. The construction phase of the project could potentially impact existing services on a short-term basis if, for example, equipment-related fires were accidentally started at the site. The probability for such fires to occur is low, and construction equipment would be outfitted with spark arrestors and other fire protection measures (refer to Section VII, Hazards and Hazardous Materials, for additional information). Even in the unlikely event of such a potential impact, the project would not result in the need for new or altered public facilities. It also is feasible that construction-related impacts to emergency vehicle traffic could occur along Hubbard Avenue and/or North Ash Street in the project site vicinity during pipeline construction. Such an occurrence is considered unlikely as pipeline construction would be relatively short-term in duration (approximately five days), and it is expected that at least one through lane would be maintained at all times (or, if that does not occur, an alternate route would be temporarily established). All applicable portions of Hubbard Avenue and North Ash Street subject to potential lane closures also would incorporate standard measures to ensure adequate public safety, potentially including the use of flaggers, guide vehicles, and/or appropriate traffic control facilities (e.g., signs, warning devices, cones, and barricades). Emergency vehicles would be allowed access through construction zones under these conditions. If a detour was determined to be necessary, it would be short given the small size of the affected roadway area, and would not be expected to affect emergency response times for priority calls. Based on the above discussion, potential impacts to fire and police protection from the proposed project would be less than significant.

3. *Schools*
4. *Parks*
5. *Libraries*
6. *Gas/Electric*

The proposed project consists of replacing and improving existing potable water storage/distribution facilities in a predominantly residential community. Accordingly, project implementation would not generate requirements for new or altered public facilities including schools, parks, libraries or natural gas lines, and no associated impacts would result. The project would entail the construction and/or relocation of on-site electrical facilities to accommodate proposed features such as lights, meters and other instrumentation. The site is currently served by electrical service and all on-site electrical facility construction/modification would occur in areas that are either already disturbed or proposed for development/disturbance by water-related facilities. As a result, no associated environmental impacts from construction/modification of project-related electrical facilities would occur.

## **XV. TRANSPORTATION/TRAFFIC**

### Significance Criteria and Impact Analysis

*According to the City of Escondido Environmental Quality Regulation (Article 47, Sec. 33-924), impacts are considered significant if the project:*

- a. Causes the level of service (LOS) of a circulation element street to fall below a mid-range of LOS "D" and/or adds more than 200 ADT to a circulation element street with a level of service (LOS) below the mid-range "D" yet above LOS "F." According to the Escondido General Plan, the minimum acceptable LOS is "C";*
- b. Exceeds, either individually or cumulatively, a level of service established by the county congestion management agency for designated roads and highways;*

Potential long-term traffic generation from the proposed project would be minimal, and essentially the same as current traffic generation associated with the existing on-site water tank. Specifically, such traffic would be associated with inspection and maintenance activities that are anticipated to be infrequent in nature, minor in duration, and generally limited to one or two smaller vehicles (e.g., pickups). Accordingly, while long-term project access would entail the use of a number of City Circulation Element roadways (e.g., North Ash Street and El Norte Parkway), as well as one County Mobility Element Community Collector roadway segment (North Ash Street), associated impacts would be less than significant due to the infrequent nature, limited duration, and low volumes of project-related traffic.

Project-related traffic increases would occur during construction activities, and would include daily employee trips to and from the site, one-time ingress-egress for construction equipment/vehicles, and daily truck traffic for requirements such as material deliveries and demolition/excavation-related material (rock and fill) transport. Such traffic would be relatively minor in volume and duration, as previously described under the Detailed Project Description. Specifically, an average of approximately 30 daily trips would occur during project construction, with construction-related traffic to utilize the City Circulation Element and County Mobility Element roadways noted above for operational traffic. Circulation Element roadway designations and associated acceptable (LOS C) traffic volumes identified in the City Circulation Element for North Ash Street and El Norte Parkway in the project vicinity are as follows (City of Escondido 2012): (1) North Ash Street is designated as a Local Collector between Vista Avenue (north of the site) and Sheridan Avenue, with an acceptable capacity of 15,000 ADT; (2) North Ash Street between Sheridan Avenue and El Norte Parkway is designated as a Collector, with an acceptable capacity of 34,200 ADT; and (3) El Norte Parkway is designated as a Major Road between North Ash Street and I-15, with an acceptable capacity of 50,000 ADT. North Ash Street in the project site vicinity is identified as a two-lane "Community Collector with improvement options" in the County Mobility Element, with no corresponding capacity limits provided. Traffic data compiled by SANDAG (the congestion management agency for San Diego County) for the noted roadway segments in 2009/2010 (the most current available data) include 9,200 ADT

for North Ash Street between Vista Avenue and El Norte Parkway, and a range of 23,100 to 28,400 ADT for El Norte Parkway between North Ash Street and I-15 (SANDAG 2013). Based on the level of existing ADT on local Circulation and Mobility Element roadways, as well as the low level (30 ADT) and temporary nature of construction-related traffic, project-generated trips are not anticipated to exceed associated applicable LOS standards either individually or cumulatively, and associated impacts would be less than significant.

The segment of Hubbard Avenue between the project site and North Ash Street is not designated as a Circulation or Mobility Element roadway, and would likely be classified as a Local Street per the City General Plan. Specifically, Local Streets generally are defined therein as two-lane roadways without medians that are not shown on the Circulation Plan, but which provide a vital service by connecting subdivision and neighborhoods to the City street system. The associated limit of acceptable traffic volume in residential environments is given as “less than 10,000 vehicles per day.” While no known traffic counts are available for the noted segment of Hubbard Avenue, existing ADT is expected to be substantially less than that identified for North Ash Street in the project site vicinity (9,200 ADT) due to the noted lower classification (and size), as well as the fact that much of Hubbard Avenue is bordered by undeveloped areas without driveway or other access points (refer to Figure 4). Based on the described conditions and the low level and temporary nature of construction-related traffic, project-generated trips are not anticipated to exceed applicable LOS standards for Hubbard Avenue either individually or cumulatively, and associated impacts would be less than significant.

- c. Results in a change of air traffic patterns, including either an increase in traffic levels or in a location that results in substantial safety risks or increased hazards due to a design feature;*

The proposed project does not include any aviation components or structures where height would be an aviation concern. Accordingly, project implementation would not affect air traffic patterns and no associated air traffic impacts would result.

- d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);*

The proposed project would upgrade an existing potable water storage and delivery system, and would not involve potential hazards related to design features such as sharp curves, dangerous intersections, or incompatible uses. Accordingly, no associated impacts would result from project implementation.

- e. Result in inadequate emergency access;*

As discussed above in Section XIII, Public Services, it is expected that at least one through lane would be maintained at all times during proposed pipeline construction along Hubbard Avenue and North Ash Street (or if that does not occur, an alternate

route would be temporarily established). Appropriate traffic control measures would be implemented to ensure adequate safety and circulation, and emergency vehicles would be allowed access through construction zones under these conditions. If a detour was determined to be necessary, it would be short given the small size of the affected roadway area, and would not be expected to affect emergency response times for priority calls. As a result, potential impacts to emergency access during project construction would be less than significant. Long-term operations of the proposed project would not result in any restrictions to emergency access, and no related impacts would occur.

- f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).*

No road/traffic improvements or land use changes that would affect alternative transportation are proposed as part of this project, and no related impacts would occur.

## **XVI. UTILITIES AND SERVICE SYSTEMS**

### Significance Criteria and Impact Analysis

*The effects of the project on utilities and service systems are considered to be significant if the proposed project would:*

- a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;*

The proposed project would provide improvements to an existing potable water infrastructure system, with associated wastewater treatment generation limited to minor and temporary requirements during construction. As a result, no impacts related to exceeding wastewater treatment requirements would result from project implementation.

- b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;*

The proposed project would result in the modification of existing City water facilities to provide increased capability and reliability. Certain elements of the project would result in potentially significant impacts to the environment for the reasons described elsewhere in this document. These potentially significant environmental effects would be reduced to a level below significance through associated mitigation measures as detailed within these Supplemental Comments.

- c. Require, or result in, the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;*

Implementation of the proposed project would entail construction of relatively minor new storm water facilities on the site to address associated drainage requirements. While the construction of these facilities would contribute to potentially significant environmental impacts identified for the project in this document (e.g., biological resources), all of these potential impacts would be reduced below a level of significance through the associated mitigation measures detailed within these Supplemental Comments.

- d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;*
- e. Result in a determination by the wastewater treatment provider which serves, or may serve, the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;*

The proposed project would consist of replacing an existing potable water reservoir and installing related facilities such as a valve vault and associated pipelines. Accordingly, project implementation would not require new or expanded entitlements for water service, as it would not increase water service capacity to accommodate new users or require construction of new wastewater or expanded wastewater treatment facilities. Based on these conditions, no related impacts would result.

- f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs; or*
- g. Comply with federal, state and local statutes and regulations related to solid waste.*

Project-related generation of solid waste would be predominantly associated with demolition and construction activities, with facility operation and maintenance to result in minimal solid waste generation. The project design includes a number of measures to reduce solid waste generation where feasible, including proposed reuse (e.g., riprap) and/or recycling of applicable materials. Based on these considerations and the temporary nature of project-related waste generation, associated impacts to landfills would be less than significant.

Both construction and operation of the proposed project would comply with applicable federal, state, and local statutes and regulations related to solid waste, and impacts would be less than significant.

## **XVII. MANDATORY FINDINGS OF SIGNIFICANCE**

Potentially significant impacts to the environment resulting from the proposed project have been identified for the areas of biological resources, noise and utilities/service systems. With implementation of identified project mitigation measures, however, the project is not expected to have any significant impacts, either long-term or short-term, or result in any substantial adverse effects on human beings, either directly or indirectly. Specifically, the project would not degrade the quality of the environment for plant or

animal communities, substantially reduce the habitat of a fish or wildlife species, cause fish or wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or reduce the number or restrict the range of endangered plants or animals. The project would also not eliminate important examples of the major periods of California history or prehistory. As described, project-related impacts would be avoided by incorporation of project design measures, or mitigated to levels below significance, and no cumulatively considerable impacts would occur. Therefore, the proposed project would not have a significant individual or cumulative impact on the environment.

## **SUMMARY OF DESIGN MEASURES AND MITIGATION MEASURES**

### **Design Measures**

#### Air Quality Design Measures

To minimize air quality impacts during construction, the following control measures would be incorporated into the proposed project design (and included on all project construction contracts, grading permits, improvement plans, and final maps).

- AQ-1** Off-road construction equipment engines shall utilize a maximum of 75 percent (by horsepower) CARB/EPA Certification Tier 2 and a minimum of 25 percent (by horsepower) Tier 3 or better engines, or other equivalent methods approved by the CARB, to reduce air emissions.
- AQ-2** All off-road construction equipment shall be equipped with CARB Verified Level III catalysts or other equivalent methods approved by the CARB, to reduce PM and volatile organic compound (VOC) emissions at least 85 percent.
- AQ-3** The project applicant shall prepare and implement a Fugitive Dust Plan per SDAPCD Rule 55, and shall include the following or other measures with the equivalent level of reduction:
- Water shall be applied every three hours during construction work hours to disturbed areas within a construction site.
  - Minimum soil moisture of 12 percent during earthmoving activities shall be maintained by use of a moveable sprinkler system or a water truck. Moisture content can be verified by lab sample or moisture probe.
  - Ground cover shall be replaced in disturbed areas as quickly as possible.
  - All trucks hauling dirt, sand, soil, or other loose materials shall be tarped with a fabric cover and maintain a freeboard height of 12 inches.
  - The maximum speed on unpaved roads shall be limited to 25 miles per hour.
  - Chemical dust suppressant shall be applied annually to unpaved parking areas.

- Construction of three-sided enclosures with 50-percent porosity around storage piles shall be required.
- Storage piles shall be watered by hand or cover applied when wind events are declared.
- Chemical soil stabilizers shall be applied on inactive construction areas (disturbed lands within construction projects that are unused for at least four consecutive days).
- Vegetative ground cover shall be planted in disturbed areas as soon as possible.

**AQ-4** All construction equipment/vehicles shall be maintained properly as per the manufacturer's recommendations.

**AQ-5** Truck idling shall be minimized to no more than five minutes.

### Cultural Resources Design Measures

To avoid or minimize potential conflicts with sacred sites and unanticipated human remains in the project site and vicinity, the following control measures would be incorporated into the proposed project design (and included on all project grading permits, improvement plans, and final maps).

**CR-1** Prior to project approval, the City of Escondido shall consult with the nine applicable tribal contacts identified in the October 12, 2012 letter from NAHC regarding the nature and location of local sacred sites. This consultation shall consist of providing notification to the noted tribal contacts of the proposed project, including a description of the nature and location of the proposed facilities and related grading/construction activities, as well as the estimated project implementation schedule.

**CR-2** Appropriate information regarding the potential to encounter currently unknown human remains shall be included in construction contract specifications. Specifically, if unanticipated human remains are discovered, further disturbances and activities would cease in any area or nearby area suspected to overlie remains, and the County Coroner would be contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the Coroner would notify the NAHC, who would then notify the Most Likely Descendant (MLD). At the same time, the person who discovered the remains would contact the City of Escondido so that they could work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 would be followed, as applicable.

## Geology and Soils Design Measures

To avoid or minimize potential impacts related manufactured slope stability, the following control measures would be incorporated into the proposed project design (and included on all project construction contracts, grading permits, improvement plans, and final maps).

**Geo-1** Temporary excavations shall be limited to maximum slope grades of 1.5:1 in colluvial materials and 1:1 for granitic bedrock materials, with shoring to be utilized where appropriate (e.g., if seepage is encountered) pursuant to applicable OSHA requirements.

**Geo-2** Permanent cut and fill slopes shall be limited to maximum grades of 1:1 and 2:1, respectively, and shall include all preparation, inspection and finishing efforts identified in the project Geotechnical Evaluation.

## Hazards and Hazardous Materials Design Measure

To minimize potential impacts associated with encountering or disturbing hazardous materials to less-than-significant levels, the following design measure would be incorporated into project design (and included on all project construction contracts, grading permits, improvement plans, and final maps).

**Haz-1** Appropriate information regarding the potential to encounter contaminated soils and/or groundwater shall be included in construction contract specifications. If contamination or other hazardous sites are encountered during ground-disturbing activities, the City, County Department of Environmental Health (DEH), and Regional Water Quality RWQCB would be notified; and the on-site construction supervisor would redirect work away from the location of the contamination. The contamination remediation and removal activities would be conducted in accordance with a remediation plan prepared by a registered environmental assessor and pertinent regulations, under the oversight of the appropriate regulatory agency.

## **Mitigation Measures**

### Biological Resources Mitigation Measures

To reduce potentially significant impacts to sensitive biological resources to less-than-significant levels, the following mitigation measures are required.

**Bio-1** Mitigation for impacts to DCSS habitat shall occur at a 2:1 ratio, pursuant to applicable criteria in the County Biological Guidelines. This mitigation will entail acquisition of suitable habitat credits at an approved mitigation bank (potentially including the Red Mountain Mitigation Bank) prior to clearing, grubbing or grading, in consultation with the City, County and applicable

resource agencies. Specifically, prior to commencing project construction operations, a Habitat Loss Permit (HLP) shall be approved for the proposed project by the County, with this approval also requiring concurrence from the USFWS and CDFW. Accordingly, a total of 4.78 acres of occupied (i.e., occupied by CAGN) DCSS habitat credits shall be acquired to mitigate associated direct impacts to this habitat.

**Bio-2** The beginning of project construction shall be precluded during the CAGN breeding season (February 15 through August 31), if feasible. If it is determined that the initiation of construction during the noted breeding season is required, a pre-grading CAGN survey shall be conducted by a qualified biologist within three days prior to grading to determine if this species occurs within the areas directly impacted by grading, or would be indirectly impacted by construction noise. If no CAGN nesting activities (including nest building or other breeding/nesting behavior) are occurring within the applicable areas, development shall be allowed to proceed. If the CAGN is observed nesting or displaying breeding/nesting behavior within 300 feet of the construction area, however, construction shall be postponed until: (1) all nesting (or breeding/nesting behavior) has ceased, or until after September 15; or (2) a temporary noise barrier or berm is constructed at the edge of the development footprint to reduce noise levels below 60 dB  $L_{EQ}$  or ambient (if ambient is greater than 60 dB  $L_{EQ}$ ). Alternatively, the duration of construction equipment operation could potentially be controlled to keep noise levels below 60 dB  $L_{EQ}$  or ambient in lieu of, or in concert with, a wall or other sound attenuation barrier. All project grading permits, improvement plans, and final maps shall incorporate the above.

**Bio-3** To ensure compliance with the MBTA, clearing of native vegetation shall occur outside of the general avian breeding season (February 1 through July 31), if feasible. If vegetation clearing is required during the noted breeding season, a qualified biologist shall conduct a pre-construction survey for nesting birds no more than seven (7) days prior to vegetation clearing. If no active nests are observed during this survey, clearing shall be allowed to proceed. If active nests are found, however, all vegetation clearing shall be precluded within 100 feet of the nest(s) until a qualified biologist determines that the nest(s) is (are) no longer active or has (have) failed. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.

**Bio-4** In areas adjacent to sensitive vegetation, the construction and staging area limits shall be clearly demarcated with temporary construction (orange blaze) fencing under the supervision of a qualified biologist to ensure that construction activity remains within the defined limits of work. This fencing shall be erected prior to commencement of brushing or grading activities, and shall demarcate areas where human and equipment access and disturbance from grading are prohibited adjacent to sensitive habitats. In addition,

appropriate signs shall be erected noting the restricted areas. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.

#### Noise Mitigation Measure

**Noise-1** A temporary 12-foot high noise control barrier shall be constructed along the western and southern boundaries of project-related equipment operations to provide noise shielding for nearby residences. The location of this barrier shall be in close proximity to equipment operations to break the line of sight to nearby residences, and shall continue past the location of the horizontal construction line-of-sight by a minimum of 12 feet. The barrier shall be constructed of a double layer of 0.5-inch thick plywood arranged in a ships lap, or a single layer of 0.75-inch plywood with no cracks or gaps. Noise blankets or other temporary noise control fencing are acceptable replacements if they provide a Sound Transmission Control (STC) noise control rating of 18 or greater. The location, composition, and design of the project noise barrier(s) shall be reviewed and approved by a qualified acoustician prior to commencement of project construction.

#### Utilities/Service Systems Mitigation Measures

Potentially significant impacts related to utilities/service systems would be reduced below a level of significance through implementation of the mitigation measures identified above for other issue areas.

## **MATERIALS USED IN PREPARATION OF THIS ANALYSIS**

The following materials were used during the preparation of this document. The project-specific technical reports listed below are on file with the City of Escondido and available online.

### Project-specific Technical Reports

ASM Affiliates, Inc.

2012 Inventory and Evaluation of Cultural Resources for the Lindley Tank Replacement Project in Escondido, San Diego County, California. November 12.

HELIX Environmental Planning, Inc. (HELIX)

2014 Biological Resources Letter Report for the Lindley Tank Reservoir Project. June 24.

2013a Year 2012 Coastal California Gnatcatcher Survey Report for the Lindley Tank Reservoir Project. January 10.

2013b Lindley Reservoir Construction Noise/Vibration Impact Review. July 9.

Ninyo & Moore

2012 Geotechnical Evaluation Lindley Reservoir Replacement Project Escondido, California. December 14.

### Specific Cited References

California Department of Toxic Substances Control (DTSC)

2013 EnviroStor hazardous Waste and Substances Site List. [http://www.envirostor.dtsc.ca.gov/public/search.asp?page=1&cmd=search&business name=&main street name=&city=&zip=&county=&status=ACT%20CBKLG%20CCOM&branch=&site type=CSITES%20OPEN%20CFUDS%20CCLOSE&npl=&funding=&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST&reporttype=CORTESE&federal superfund=&state response=&voluntary cleanup=&school cleanup=&operating=&post closure=&non operating=&corrective action=&tiered permit=&evaluation=&spec prog=&national priority list=&senate=&congress=&assembly=&critical pol=&business type=&case type=&searchtype=&hwmp site type=&cleanup type=&ocieerp=False&hwmp=False&permitted=&pc permitted=&orderby=upper%28business%5Fname%29](http://www.envirostor.dtsc.ca.gov/public/search.asp?page=1&cmd=search&business%20name=&main%20street%20name=&city=&zip=&county=&status=ACT%20CBKLG%20CCOM&branch=&site%20type=CSITES%20OPEN%20CFUDS%20CCLOSE&npl=&funding=&reporttitle=HAZARDOUS+WASTE+AND+SUBSTANCES+SITE+LIST&reporttype=CORTESE&federal%20superfund=&state%20response=&voluntary%20cleanup=&school%20cleanup=&operating=&post%20closure=&non%20operating=&corrective%20action=&tiered%20permit=&evaluation=&spec%20prog=&national%20priority%20list=&senate=&congress=&assembly=&critical%20pol=&business%20type=&case%20type=&searchtype=&hwmp%20site%20type=&cleanup%20type=&ocieerp=False&hwmp=False&permitted=&pc%20permitted=&orderby=upper%28business%5Fname%29). Accessed April 19.

California Division of Land Resource Protection

2010 San Diego County Important Farmland Map. Available at: ([ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/sdg10\\_w.pdf](ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2010/sdg10_w.pdf)). Accessed April 16.

- California Stormwater Quality Association (CASQA)  
2009 Stormwater Best Management Practice Handbook Portal: Construction.  
November.
- Escondido, City of  
2013 Plans for the Construction of Lindley Reservoir 2013. June.
- 2012 City of Escondido General Plan. May.  
<http://www.escondido.org/general-plan.aspx>.
- 2008 Jurisdictional Urban Runoff Management Plan. March.
- Federal Emergency Management Agency (FEMA)  
2012 Flood Insurance Rate Map (FIRM), San Diego County, California and  
Incorporated Areas, Map No. 06073C0814G. May 16.
- HistoricAerials  
2013 <http://www.historicaerials.com/>. Accessed for Escondido, California on  
April 19.
- MWH  
2012 Lindley Tank Replacement Draft Preliminary Design Report. June.
- Ogden Environmental and Energy Services Co., Inc. (Ogden), and Conservation  
Biology Institute (CBI)  
2001 Public Review Draft Escondido Subarea Plan. Implementing the Multiple  
Habitat Conservation Program. City Case File 95-25-GPIP. June.
- San Diego Association of Governments (SANDAG)  
2013 Demographics and Other Data/Traffic Data, City of Escondido.  
[http://www.sandag.org/resources/demographics\\_and\\_other\\_data/transportation/adtv/escondido\\_adt.pdf](http://www.sandag.org/resources/demographics_and_other_data/transportation/adtv/escondido_adt.pdf). Accessed June 4.
- San Diego, County of  
2013 County Progress Guide;  
<http://www.sdcounty.ca.gov/pds/docs/williamson.pdf>.  
Accessed April 16.
- 2012 Guidelines for Determining Significance, Climate Change. June 20.
- 2011 San Diego County General Plan, A Plan for Growth, Conservation and  
Sustainability. August 3.

San Diego, County of (cont.)

2010 Unified San Diego County Emergency Services Organization Operational Area Emergency Plan. October. [http://www.co.san-diego.ca.us/oes/emergency\\_management/protected/docs/2010\\_Complete\\_Plan\\_w\\_Annexes.pdf](http://www.co.san-diego.ca.us/oes/emergency_management/protected/docs/2010_Complete_Plan_w_Annexes.pdf).

2009 Draft North County MSCP Plan. February.

2008 County of San Diego Guidelines for Determining Significance and Report Format and Content Guidelines, Mineral Resources. July 30.

2007 County of San Diego Guidelines for Determining Significance and Report Format Content Requirements, Air Quality. March 19.

1993 Habitat Loss Permit Ordinance.

State Water Resources Control Board (SWRCB)

2013 GeoTracker Clean Up Sites, San Diego County. <http://geotracker.waterboards.ca.gov/search.asp?cmd=search&hidept=True&status=&reporttitle=San+Diego+County&county=San+Diego>. Accessed April 19.

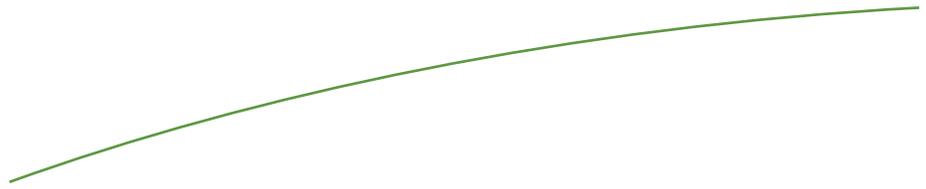
General References

1. Escondido Zoning Code and Land Use Maps
2. Escondido Municipal Code
3. County of San Diego Zoning Ordinance and Land Use Maps
4. County of San Diego Administrative and Regulatory Codes
5. Draft MHCP maps (Multiple Habitat Conservation Program)
6. USGS 7.5-Minute Topographic Quadrangle Map; Valley Center
7. Site Visits/Field Inspections
8. Project Description & Preliminary Information

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ATTACHMENT A  
MITIGATION MONITORING REPORT



## Attachment "A"

### MITIGATION MONITORING REPORT

**PROJECT NAME:** Lindley Reservoir Tank Replacement Project  
**PROJECT DESCRIPTION:** Demolition, removal of existing 2.0 MG water tank and construction of two 1.5-MG partially buried concrete water tanks and associated facilities within the County of San Diego

**CASE NO.:** ENV 14-0004  
**APPROVAL BODY/DATE:** City Council \_\_\_\_\_  
**PROJECT MANAGER:** Jay Paul, Assoc. Planner  
**PHONE NO.:** (760) 839-4537  
**EMAIL:** jpaul@ci.escondido.ca.us

**PROJECT LOCATION:** 3.56 acres located north of El Norte Parkway and Leslie Lane, west of Ash Street and Hubbard Ave in an unincorporated area of the County of San Diego (APNs 227-010-55 and -58)

**CONTACT PERSON:** Paul Keck, Sr. Engineer - Wastewater  
**PHONE NUMBER:** (760)-839-6299  
**EMAIL:** pkeck@ci.escondido.ca.us

Phase at which the Mitigation Measures are to be Implemented

PRIOR TO APPROVAL OF GRADING, BUILDING AND LANDSCAPE PLANS AND ISSUANCE OF GRADING PERMITS					
NATURE OF IMPACT	MITIGATION MEASURE	ID NO. LOCATION IN DOC.	RESPONSIBILITY FOR IMPLEMENT.	CERTIFIED INITIAL/DATE	COMMENTS
Project Direct Impacts to Sensitive Vegetation Communities	<b>Bio-1:</b> Mitigation for impacts to DCSS habitat shall occur at a 2:1 ratio, pursuant to applicable criteria in the County Biological Guidelines. This mitigation will entail acquisition of suitable habitat credits at an approved mitigation bank (potentially including the City's Daley Ranch Mitigation Bank) prior to clearing, grubbing or grading, in consultation with the City, County and applicable resource agencies. Specifically, prior to commencing project construction operations, a Habitat Loss Permit (HLP) shall be approved for the proposed project by the County, with this approval also requiring concurrence from the USFWS and CDFW. Accordingly, a total of 4.78 acres of occupied (i.e., occupied by CAGN) DCSS habitat credits shall be acquired to mitigate associated direct impacts to this habitat.	Bio-1 in Section III, Biological Resources	City of Escondido Utilities – Water Department  City of Escondido Planning Division		The City will coordinate mitigation monitoring and reporting with the County of San Diego.

**PRIOR TO AND DURING CONSTRUCTION**

NATURE OF IMPACT	MITIGATION MEASURE	ID NO. LOCATION IN DOC.	RESPONSIBILITY FOR IMPLEMENT.	CERTIFIED INITIAL/DATE	COMMENTS
Potential Direct and Indirect Impacts to Sensitive Animal Species	<p><b>Bio-2:</b> The beginning of project construction shall be precluded during the CAGN breeding season (February 15 through August 31), if feasible. If it is determined that the initiation construction during the noted breeding season is required, a pre-grading CAGN survey shall be conducted by a qualified biologist within three days prior to grading to determine if this species occurs within the areas directly impacted by grading, or would be indirectly impacted by construction noise. If no CAGN nesting activities (including nest building or other breeding/nesting behavior) are occurring within the applicable areas, development shall be allowed to proceed. If the CAGN is observed nesting or displaying breeding/nesting behavior within 300 feet of the construction area, however, construction shall be postponed until: (1) all nesting (or breeding/nesting behavior) has ceased, or until after September 15; or (2) a temporary noise barrier or berm is constructed at the edge of the development footprint to reduce noise levels below 60 dB LEQ or ambient (if ambient is greater than 60 dB LEQ). Alternatively, the duration of construction equipment operation could potentially be controlled to keep noise levels below 60 dB LEQ or ambient in lieu of, or in concert with, a wall or other sound attenuation barrier. All project grading permits, improvement plans, and final maps shall incorporate the above requirements.</p>	Bio -2 in Section III, Biological Resources	City of Escondido Utilities-Water Department  City of Escondido Planning Division		The City will coordinate mitigation monitoring and reporting with the County of San Diego.
Potential Direct and Indirect Impacts to Sensitive Animal Species	<p><b>Bio-3:</b> To ensure compliance with the MBTA, clearing of native vegetation shall occur outside of the general avian breeding season (February 1 through July 31), if feasible. If vegetation clearing is required during the noted breeding season, a qualified biologist shall conduct a pre-construction survey for nesting birds no more than seven (7) days prior to vegetation clearing. If no active nests are observed during this survey, clearing shall be allowed to proceed. If active nests are found, however, all vegetation clearing shall be precluded within 100 feet of the nest(s) until a qualified biologist determines that the nest(s) is (are) no longer active or has (have) failed. All project grading permits, improvement plans and final maps shall incorporate the above requirements.</p>	Bio -3 in Section III, Biological Resources	City of Escondido Utilities-Water Department  City of Escondido Planning Division		The City will coordinate mitigation monitoring and reporting with the County of San Diego.

**PRIOR TO AND DURING CONSTRUCTION**

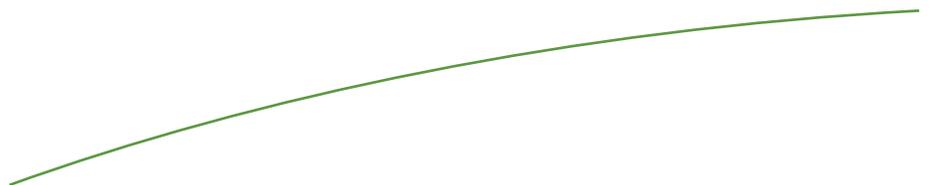
NATURE OF IMPACT	MITIGATION MEASURE	ID NO. LOCATION IN DOC.	RESPONSIBILITY FOR IMPLEMENT.	CERTIFIED INITIAL/DATE	COMMENTS
Potential Direct and Indirect Impacts to Sensitive Animal Species	<b>Bio-4:</b> In areas adjacent to sensitive vegetation, the construction and staging area limits shall be clearly demarcated with temporary construction (orange blaze) fencing under the supervision of a qualified biologist to ensure that construction activity remains within the defined limits of work. This fencing shall be erected prior to commencement of brushing or grading activities and shall demarcate areas where human and equipment access and disturbance from grading are prohibited adjacent to sensitive habitat. In addition, appropriate signs shall be erected noting the restricted areas. All project grading permits, improvements plans and final maps shall incorporate the above requirements.	Bio -4 in Section III, Biological Resources	City of Escondido Utilities-Water Department  City of Escondido Planning Division		The City will coordinate mitigation monitoring and reporting with the County of San Diego.
Potential Impacts to Noise-Sensitive Receptors	<b>Noise-1:</b> A temporary 12-foot-high noise control barrier shall be constructed along the western and southern boundaries of project-related equipment operations to provide noise shielding for nearby residences. The location of this barrier shall be in close proximity to equipment operations to break the line of sight to nearby residences, and shall continue past the location of the horizontal construction line-of-sight by a minimum of 12 feet. The barrier shall be constructed of a double layer of 0.5-inch thick plywood arranged in a ships lap, or a single layer of 0.75-inch plywood with no cracks or gaps. Noise blankets or other temporary noise control fencing are acceptable replacements if they provide a Sound Transmission Control (STC) noise control rating of 18 or greater. The location, composition, and design of the project noise barrier(s) shall be reviewed and approved by a qualified acoustician prior to commencement of project construction.	Noise-1 in Section XI, Noise	City of Escondido Utilities-Water Department  City of Escondido Planning Division		The City will coordinate mitigation monitoring and reporting with the County of San Diego.

**CODE COMPLIANCE**

Ongoing monitoring to ensure compliance with all mitigation measures, operational requirements, standards, codes and regulations.	City of Escondido Utilities-Water Department City of Escondido Planning Division	The City will coordinate mitigation monitoring and reporting with the County of San Diego.
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ATTACHMENT B  
IS CHECKLIST



**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED**

The environmental factors checked below will be potentially affected by this project, involving at least one impact that is "Potentially Significant Impact" as indicated by the checklist on the following pages.

<input type="checkbox"/> Aesthetics	<input type="checkbox"/> Agriculture & Forestry Resources	<input type="checkbox"/> Air Quality
<input checked="" type="checkbox"/> Biological Resources	<input type="checkbox"/> Cultural Resources	<input type="checkbox"/> Geology/Soils
<input type="checkbox"/> Hazards & Hazardous Materials	<input type="checkbox"/> Hydrology/Water Quality	<input type="checkbox"/> Land Use/Planning
<input type="checkbox"/> Mineral Resources	<input checked="" type="checkbox"/> Noise	<input type="checkbox"/> Population/Housing
<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation	<input type="checkbox"/> Transportation/Traffic
<input checked="" type="checkbox"/> Utilities/Service Systems	<input type="checkbox"/> Mandatory Findings of Significance	

**DETERMINATION**

On the basis of this initial evaluation that follows:

<input type="checkbox"/> The proposed project is exempt from CEQA pursuant to the general exemption (CEQA Guidelines, 15061 (b)(3)), a statutory exemption, and/or a categorical exemption, and that if a categorical exemption, none of the exceptions to the exemption apply. A NOTICE OF EXEMPTION will be prepared.	
<input type="checkbox"/> I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.	
<input checked="" type="checkbox"/> I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.	
<input type="checkbox"/> I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.	
<input type="checkbox"/> I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental document is required. FINDINGS consistent with this determination will be prepared.	
Jay Paul, Associate Planner <hr/> Signature	 June 30, 2014 <hr/> Date

**EVALUATION OF ENVIRONMENTAL IMPACTS**

This section evaluates the potential environmental effects of the proposed project using the environmental checklist from the State CEQA Guidelines as amended. The definitions of the response column headings include the following:

- A. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- B. “Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures and briefly explain how they reduce the effect to a less than significant level (mitigation measures from earlier analyses may be cross-referenced).
- C. “Less Than Significant Impact” applies where the project creates no significant impacts, only less than significant impacts.
- D. “No Impact” applies where a project does not create an impact in that category. “No Impact” answers do not require an explanation if they are adequately supported by the information sources cited by the lead agency which show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors, as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

**I. Agriculture and Forestry Resources**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
<p>In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:</p>				

Issues	Less Than Significant			
	Potentially Significant Impact	With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## II. Air Quality

Issues	Less Than Significant			
	Potentially Significant Impact	With Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a. Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### III. Biological Resources

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### IV. Cultural Resources

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

#### V. Geology and Soils

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii. Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii. Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv. Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## VI. Greenhouse Gas Emissions

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## VII. Hazards and Hazardous Materials

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. For a project located within an airport land use plan or, where such a plan has not been adopted within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

### VIII. Hydrology and Water Quality

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Issues	Less Than Significant			
	Potentially Significant Impact	With Mitigation Incorporated	Less Than Significant Impact	No Impact
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Cause significant alteration of receiving water quality during or following construction?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Cause an increase in impervious surfaces and associated runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
h. Cause potentially significant adverse impact on groundwater quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
i. Cause or contribute to an exceedance of applicable surface or groundwater receiving water quality objectives or degradation of beneficial uses?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
j. Is the project tributary to an already impaired water body, as listed on the Clean Water Act Section 303(d) list? If so, can it result in an increase in any pollutant for which the water body is already impaired?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
k. Create or exacerbate already existing environmentally sensitive areas?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
l. Create potentially significant environmental impacts on surface water quality to either marine, fresh, or wetland waters?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
m. Impact aquatic, wetland, or riparian habitat?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
n. Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
o. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
p. Place within a 100-year flood hazard area, structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
q. Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
r. Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**IX. Land Use and Planning**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e. Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**X. Mineral Resources**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## XI. Noise

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. For a project located within an airport land use plan or where such a plan has not been adopted within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

## XII. Population and Housing

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIII. Public Services**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XIV. Recreation**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XV. Transportation/Traffic**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Cause the level of service (LOS) of a circulation element street to fall below a mid-range of LOS “D” and/or add more than 200 ADT to a circulation element street with a level of service (LOS) below the mid-range “D” yet above LOS “F?” According to the Escondido General Plan, the minimum acceptable LOS is “C”	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b. Exceed, either individually or cumulatively, a level of service established by the county congestion management agency for designated roads and highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
f. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**XVI. Utilities and Service Systems**

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
g. Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

## XVII. Mandatory Findings of Significance

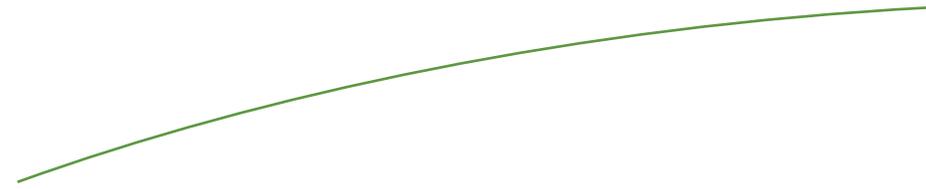
Issues	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Does the project have impacts that are individually limited, but cumulatively considerable ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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APPENDIX A

BIOLOGICAL TECHNICAL REPORT AND  
COASTAL CALIFORNIA GNATCATCHER  
SURVEY REPORT



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June 24, 2014

MWHA-01

Mr. Parag Kalaria  
MWH Global, Inc.  
9444 Farnham Street, Suite 300  
San Diego, CA 92123

Subject: Biological Resources Letter Report for the Lindley Tank Reservoir Project  
PDS2013- HLP-13-001

Dear Mr. Kalaria:

This letter presents the results of a biological resources study conducted by HELIX Environmental Planning, Inc. (HELIX) for the City of Escondido's (City's) proposed Lindley Tank Reservoir project. The study was conducted to provide the City, resource agencies, and the public with current biological data to satisfy review of the proposed project under the California Environmental Quality Act (CEQA) and to demonstrate compliance with federal, state, and city regulations. This report describes the project site's current biological conditions, vegetation communities, and plant and wildlife species observed or detected during surveys. It also identifies any sensitive resources that occur on site or have potential to occur within the project site. In addition, project impacts are assessed and mitigation is proposed to offset the proposed project's unavoidable significant impacts to sensitive biological resources.

## **INTRODUCTION**

### **Project Location**

The 3.56-acre project site is located east of Interstate 15, north of El Norte Parkway, west of North Ash Street, north of Leslie Lane, off Hubbard Avenue within unincorporated County of San Diego (County; Figures 1, 2, and 3). The project site is located within the unincorporated County immediately adjacent to the City (Figure 4). The project site is situated in Township 12 South, Range 2 West on the U.S. Geological Survey Valley Center quadrangle map, Assessor's Parcel Numbers (APNs) 227-010-55 and 58 (Figure 2).

## **Project Description**

The City would like to demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 million gallons (mg). The City would like to increase the high water level of the replacement tanks by 3 to 4 feet, if feasible. The two tanks would be piped to allow isolation of one tank for maintenance shutdown while leaving the other tank in service. Replacement tanks shall be prestressed and post-tensioned concrete reservoirs, per AWWA D110. The City's preference is for the tanks to be partially or fully buried. The existing steel tank is to remain in service until one of the two replacement tanks can be put into service. Off site trenching and pipe connections include impacts to 0.53 acre of offsite developed habitat along Hubbard Avenue.

## **Existing Conditions**

The project site contains an existing buried reclaimed water reservoir at the north end of the site and the Lindley water tank at the southeastern corner of the site. There is an associated paved road within a 50-foot easement leading up to both the existing reservoir and tank. The rest of the site is predominantly undeveloped, containing native habitats. It is immediately surrounded by residential development on all sides. Elevations within the study area range from approximately 880 to 960 feet above mean sea level (AMSL). Soils within the project site include Las Posas fine sandy loam with 9 to 15 percent slopes; Las Posas fine sandy loam, 15 to 30 percent slopes; Las Posas stony fine sandy loam, 30 to 65 percent slopes; and Wyman loam, 5 to 9 percent slopes (Bowman 1973).

## **METHODS**

### **Literature Review**

Prior to conducting biological field surveys, searches of the California Natural Diversity Database (CNDDDB) and California Native Plant Society (CNPS) online database for the Valley Center USGS quadrangle map, and review of the Draft Escondido Subarea Plan and Draft North County Subarea Plan were conducted for information regarding sensitive species known to occur within the vicinity of the project site.

### **General Biological Survey**

A general biological survey of the project site, which included the proposed limits of work for the two reservoirs and all associated inlet and outlet pipelines, appurtenances, and access road, was conducted by HELIX biologist Stacy Nigro on October 16, 2012. Vegetation communities within the project site were mapped on a 1"=100' scale aerial image. The area was surveyed on foot with the aid of binoculars and all detected plant and animal species were recorded. Animal identifications were made in the field by direct, visual observation or indirectly by detection of calls, burrows, tracks, or scat. The animal list that was recorded is not necessarily a comprehensive account of all species that occur within the project site, as nocturnal, secretive, or

seasonally restricted species may not have been observed. All plant identifications were made in the field or in the lab through comparison with voucher specimens or photographs.

### **Focused Species Surveys**

#### **Coastal California Gnatcatcher**

In November 2012, a coastal California gnatcatcher protocol survey was conducted by HELIX biologist Jason Kurnow (Permit TE778195). The focused survey followed protocol (U.S. Fish and Wildlife Service [USFWS] 1997) for presence/absence of this species (HELIX 2012; Attachment F). Surveys were conducted on foot and the survey route followed dirt roads and trails where available, and traversed brushy areas where roads or trails were not available. Binoculars were used when necessary. Taped gnatcatcher vocalizations were played infrequently to elicit a response from potentially present, non-vocal gnatcatchers. The tape was used only in areas where birds could not be located without it.

### **Nomenclature**

Nomenclature used in this report follows Baldwin et al. (2012) for scientific names of plants, while common names follow CNPS (CNPS 2010). Other conventions used are Holland (1986) and Oberbauer (2008) for vegetation communities, Heath (2004) for butterflies, Collins and Taggart (2011) for reptiles, American Ornithologist's Union (2011) for birds, and Baker et al (2003) for mammals. Plant species status is taken from the CNPS (2010). Animal species status is from California Department of Fish and Wildlife (CDFW; 2011).

## **RESULTS**

### **Regional Context**

The proposed project site is owned by the City, but is within the jurisdiction of the County. The site is located within the Draft North County Multiple Species Conservation Program (DNCMSCP; County 2009), in which the parcel is located outside of the Pre-Approved Mitigation Area.

### **Vegetation Communities**

Four vegetation communities were mapped within the project site: Diegan coastal sage scrub, non-native grassland, disturbed habitat, and developed land (Table 1; Figure 3).

<b>Table 1 EXISTING VEGETATION COMMUNITIES WITHIN THE LINDLEY TANK PROJECT SITE</b>	
<b>VEGETATION COMMUNITY<sup>1</sup></b>	<b>ACRES</b>
Diegan coastal sage scrub (32500)	2.39
Non-native grassland (42200)	0.0
Disturbed habitat (11300)	0.65
Developed (12000)	0.52
<b>Total</b>	<b>3.56</b>

<sup>1</sup>Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008)

### **Diegan Coastal Sage Scrub (32500)**

Coastal sage scrub is one of the two major shrub types that occur in southern California, occupying xeric sites characterized by shallow soils (the other is chaparral). Four distinct coastal sage scrub geographical associations (northern, central, Venturan, and Diegan) are recognized along the California coast. Despite the fact that it has been greatly reduced from its historical distribution (Oberbauer 1991), the Diegan association is the dominant coastal sage scrub in coastal southern California from Los Angeles to Baja California, Mexico (Holland 1986). Diegan coastal sage scrub was listed as the third most extensive vegetation community in the County in 1965 (CDFW 1965). Oberbauer (1977) and Oberbauer and Vanderwier (1991) suggest that nearly 72 percent of the San Diego County’s original sage scrub habitat has been destroyed or modified, primarily as a result of urban expansion.

Diegan coastal sage scrub is dominated by subshrubs with leaves that abscise during drought and are replaced by a lesser amount of smaller leaves. This adaptation of drought evasion allows these species to better withstand the prolonged drought period in the summer and fall in areas of low precipitation. Coastal sage scrub occurs on a variety of soil types, both chemically and physically, from sandy lithosols on siliceous sandstone to clay-rich chernozems on volcanic ash. Water is less likely to penetrate to depth in clay soils than in siliceous soils. Clay soils generally lose more moisture through runoff, have lower infiltration rates, store more moisture in an equivalent depth of soil, and are likely to lose a greater proportion of moisture through capillary action and transpiration from shallow-rooted species than siliceous soils. Thus, in areas of relatively low precipitation, fine-textured soils are more likely to favor the success of shallow-rooted species rather than deep-rooted species (Kirkpatrick and Hutchinson 1980).

Diegan coastal sage scrub may be dominated by a variety of species depending upon soil type, slope, and aspect. Typical species found within Diegan coastal sage scrub include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum* ssp. *fasciculatum*), laurel sumac (*Malosma laurina*), and black sage (*Salvia mellifera*).

Diegan coastal sage scrub is considered a sensitive habitat by USFWS, CDFW, and the City, and is given the highest inventory priority in the CNDDDB. This habitat type supports a number of federally and state endangered, threatened, and rare plants, as well as several bird, reptile, and insect species that are federally listed or are candidates for federal listing, including the coastal California gnatcatcher.

Dominant species within this vegetation community in the project site include California buckwheat, laurel sumac, and California sagebrush. Approximately 2.39 acres of Diegan coastal sage scrub occurs within the project site.

### **Non-native Grassland (42200)**

Non-native grassland is a dense to sparse cover of annual grasses, often associated with native annual forbs. This vegetation community occurs on gradual slopes with deep, fine-textured, usually clay soils. Most of the annual introduced species that comprise non-native grassland originated from the Mediterranean region of Europe, an area with a climate similar to that in California and a long history of agriculture. These two factors have contributed to the successful invasion and establishment of these species and the replacement of native grasslands with annual dominated non-native grassland (Jackson 1985). Typical invasive species such as black mustard (*Brassica nigra*), foxtail chess (*Bromus madritensis* ssp. *rubens*), and common ripgut grass (*B. diandrus*) are common within this habitat.

Within the parcel adjacent to the project site, this habitat is dominated by foxtail chess and other annual non-native grasses that were not identifiable because they did not contain flowering heads. No non-native grassland occurs within the project site but within the parcel boundaries of the tank site.

### **Disturbed Habitat (11300)**

Disturbed habitat includes land that has little or no habitat value because it has been cleared of vegetation for agricultural purposes or contains heavily compacted soils following disturbance such as grading. Within the project site, disturbed habitat occurs around the existing tank sites along existing dirt roads, and adjacent to off-site residential development on the southern boundary. This vegetation type covers approximately 0.65 acre of the project site.

### **Developed Lands (12000)**

Developed land is where permanent structures and/or pavement have been placed, which prevents the growth of vegetation, or where landscaping is clearly tended and maintained. Developed land within the project site consists of existing paved road leading up to both existing tank sites. Developed land accounts for approximately 0.52 acre within the Project Site. Off-site improvements to Hubbard Avenue including new pipeline connections will result in impacts to 0.53 acre.

## **Plants**

A total of 22 plant species were observed during the biological survey (Attachment A). Ornamental species occurring within developed land are not included in the species tally or in Attachment A.

## **Animals**

A total of 18 animal species, including 2 butterfly, 2 reptile, 11 bird, and 3 mammal species, were observed or detected during the biological surveys (Attachment B).

## **Sensitive Resources**

### **Sensitive Habitat**

Sensitive habitat is defined as land that supports unique vegetation communities or the habitats of rare or endangered species or subspecies of animals or plants as defined by Section 15380 of the CEQA Guidelines. Two sensitive vegetation communities occur within the study area: Diegan coastal sage scrub and non-native grassland. Diegan coastal sage scrub is considered a sensitive habitat by the USFWS, CDFW, and City, and is given the highest inventory priority in the CNDDB.

### **Sensitive Plants**

No threatened or endangered plant species were observed on site. Sensitive species are those considered unusual or limited in that they are: (1) only found in the San Diego region; (2) a local representative of a species or association of species not otherwise found in the region; or (3) severely depleted within their ranges or within the region. Attachment C presents listed or County sensitive plant species with potential to occur on site and off site near the project.

### **Sensitive Animals**

One sensitive animal species, coastal California gnatcatcher, was observed/detected within project boundaries. The coastal California gnatcatcher is a federally listed as threatened species and was detected during vegetation surveys in October 2012. Protocol surveys for coastal California gnatcatchers were completed within the study area in November 2012 with negative results.

Attachment B presents County sensitive animal species that have a potential to occur on or off site based on proximity to known populations and the vegetation communities present.

**Coastal California gnatcatcher (*Poliophtila californica californica*)**

**Status:** FT/SSC; County Group 1; County MSCP Covered

**Distribution:** Southern Los Angeles, Orange, western Riverside, and San Diego counties south into Baja.

**Habitat(s):** Coastal sage scrub

**Status on site:** One observed in southeastern portion of site (Figure 5). Protocol surveys were negative. Individual species was presumed to be migrating through site. The site is not ideal for resident species.

**Potentially Jurisdictional Features**

Potential jurisdictional features were not identified during the survey.

**Wildlife Corridors and Movement**

Wildlife corridors can be local or regional in scale. Their functions may vary temporally and spatially based on conditions and species presence. Wildlife corridors represent areas where wildlife movement is concentrated due to natural or anthropogenic constraints. Local corridors provide access to resources such as food, water, and shelter, and animals use these corridors to move between different habitats. Regional corridors provide these functions as well by linking two or more large habitat areas. Regional corridors provide avenues for wildlife dispersal, migration, and contact between otherwise distinct populations.

Neither the North County MSCP nor the Draft Escondido Subarea Plan identify any Biological Core and Linkage Area either within or adjacent to the project site. The study area does, however, contain undeveloped lands that can be used by wildlife as habitat for foraging. Because native habitat within the study area is surrounded by development, these areas do not provide ideal habitat for larger species; however, they are still likely used for foraging and likely used extensively by smaller native species, particularly birds and reptiles.

**REGULATORY CONTEXT**

Biological resources within the parcel are subject to regulatory administration by the federal government, State of California and City.

**Federal**

**Endangered Species Act**

The USFWS regulates impacts on listed species and their habitats through the Endangered Species Act (ESA). Projects that affect listed species or their habitats require mitigation of those effects in accordance with USFWS standards. The City does not have incidental take authorization from USFWS for any sensitive species because the Escondido Subarea Plan has not been approved.

The USFWS identifies critical habitat for endangered and threatened species. Critical habitat is defined as areas of land that are considered necessary for endangered or threatened species to recover. The ultimate goal is to restore healthy populations of listed species within their native habitat so they can be removed from the list of threatened or endangered species. Once an area is designated as critical habitat pursuant to the federal ESA, all federal agencies must consult with the USFWS to ensure that any action they authorize, fund, or carry out is not likely to result in destruction or adverse modification of the critical habitat. No critical habitat is found on-site.

### **Migratory Bird Treaty Act**

All migratory bird species that are native to the United States or its territories are protected under the federal Migratory Bird Treaty Act (MBTA) as amended under the Migratory Bird Treaty Reform Act (MBTRA) of 2004 (FR Doc. 05-5127). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, USFWS places restrictions on disturbances allowed near active raptor nests.

### **Clean Water Act**

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and the Clean Water Act (CWA). The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting for projects filling waters of the U.S. (including wetlands) is overseen by the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA. Projects could be permitted on an individual basis or be covered under one of several approved Nationwide Permits. Individual permits are assessed individually based on the type of action, amount of fill, etc. Individual permits typically require substantial time (often longer than 6 months) to review and approve, while nationwide permits are pre-approved if a project meets appropriate conditions. A Section 404 Permit would be required if impacts occur to USACE jurisdictional areas. In addition, under Section 401 of the federal CWA, an applicant for a federal permit for an activity that may result in a discharge to a water body must obtain certification from the state that the proposed activity will comply with state water quality standards and water quality objectives. Section 401 provides the Regional Water Quality Control Board (RWQCB) with regulatory authority to certify or deny the proposed activity. A Section 401 Certification must be obtained prior to issuance of a 404 Permit.

### **State of California**

#### **California Environmental Quality Act**

Primary environmental legislation in California is found in CEQA and its implementing guidelines (State CEQA Guidelines). This legislation requires that projects with potential adverse effects or impacts on the environment undergo environmental review. Adverse impacts to the environment are typically mitigated as a result of the environmental review process in accordance with existing laws and regulations.

### **California Endangered Species Act**

The California ESA is similar to the federal ESA in that it contains a process for listing of species and regulating potential impacts to listed species. Section 2081 of the California ESA authorizes the CDFW to enter into a memorandum of agreement for take of listed species for scientific, educational, or management purposes.

### **Native Plant Protection Act**

The Native Plant Protection Act (NPPA) enacted a process by which plants are listed as rare or endangered. The NPPA regulates collection, transport, and commerce in listed plants. The California ESA followed the NPPA and covers both plants and animals determined to be endangered or threatened with extinction. Plants listed as rare under NPPA were designated rare under the California ESA.

### **California Fish and Wildlife Code**

Pursuant to California Fish and Wildlife Code Section 3503, it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. Raptors and owls and their active nests are protected by California Fish and Wildlife Code Section 3503.5, which states that it is unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird unless authorized by the CDFW.

The California Fish and Wildlife Code (Sections 1600 et seq.) requires issuance of a Lake and Streambed Alteration Agreement by CDFW for projects affecting riparian and wetland habitats.

### **County of San Diego**

The California Natural Communities Conservation Plan (NCCP) Act (Section 2835) allows the CDFW to authorize take of species covered by plans in agreement with NCCP guidelines. An NCCP initiated by the State of California under Section 4(d) of the federal ESA focuses on conserving coastal sage scrub in order to avoid the need for future federal and state listing of coastal sage scrub dependent species. The coastal California gnatcatcher is presently listed as threatened under the federal ESA, while several additional species inhabiting coastal sage scrub are candidates for federal listing. Findings in support of issuance of a habitat loss permit under Section 4(d) of the federal ESA would need to be made if Section 4(d) is relied upon for this project. These findings need to show that the project's loss of Diegan coastal sage scrub does not exceed the County's five percent loss limit. It would also have to demonstrate that habitat loss would not preclude connectivity between high habitat value areas or prevent preparation of a subregional NCCP. Additionally, the findings must show that habitat loss has been minimized and mitigated to the maximum extent practicable in accordance with Section 4.3 of the NCCP Process Guidelines and that the habitat loss would not appreciably reduce the likelihood of survival and recovery of listed species in the wild. Finally, the habitat loss must be incidental to otherwise lawful activities. The County regulates coastal sage scrub habitat loss through the

Habitat Loss Permit (HLP) Ordinance. An HLP application must be filed with the County and approval requires concurrence from USFWS and CDFW. Approval is based on findings made pursuant to the County's HLP Ordinance (County 1993) as required by the NCCP Process Guidelines.

### **City of Escondido**

The Draft Escondido Subarea Plan is intended to be a completed subarea plan under the NCCP and Habitat Conservation Plan (HCP) processes. The City circulated a Draft Escondido Subarea Plan for public review in June 2001, but it has not yet been approved. The Draft Escondido Subarea Plan addresses the City's plans for conservation of natural biotic communities and sensitive plant and wildlife species, and represents the City's contribution to the MHCP and to regional NCCP conservation goals.

According to the draft plan, the City is allowed a loss of up to 5 percent of its coastal sage scrub habitat if it is actively developing a NCCP. The City has reached the 5-percent limit of allowable take of coastal sage scrub. Until recently, any impacts to coastal sage scrub could have been dealt with by applying to the County (under County Board of Supervisors Policy I-122) for allocation of portions of the County's 5 percent take allowance of Diegan coastal sage scrub. However, the resource agencies no longer allow this option. Instead, protocol surveys for the gnatcatcher must be performed to determine if the habitat is occupied. If not occupied, then permits related to the ESA are not required, however, if occupied, then the project applicant must obtain authorization for impacts to the species, likely via a Section 10(a) permit from the USFWS.

### **CRITERIA FOR DETERMINING IMPACT SIGNIFICANCE**

Thresholds for significant biological resource impacts are based on State CEQA Guidelines Appendix G and City policies and regulations. A significant impact would occur if the proposed project would:

- Have a substantial adverse effect either directly or through habitat modifications on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the USFWS or CDFW.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the USFWS or CDFW.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

- Conflict with any local policies or ordinances protecting biological resources.
- Conflict with provisions of an adopted HCP, NCCP, or other approved state, regional, or local HCP.

**PROJECT EFFECTS**

This section describes potential direct and indirect impacts associated with implementation of the proposed project. Direct impacts immediately alter the affected biological resources such that those resources are eliminated temporarily or permanently. Indirect impacts consist of secondary effects of a project, including drainage and toxins (water quality), lighting, noise, invasive plant species, and errant construction impacts. The subject property and mitigation requirements for impacts to sensitive resources are discussed in terms of compliance with both the City and County Subarea plans.

**Direct Impacts**

**Vegetation Communities**

The proposed project’s direct impacts to vegetation were quantified by overlaying the limits of grading on the biological resources map (Figure 6). The project would result in permanent impacts to 2.39 acres of Diegan coastal sage scrub (Table 2). No other permanent impacts to sensitive vegetation communities would occur. No additional temporary impacts would occur.

<b>Table 2 IMPACTS AND MITIGATION TO VEGETATION COMMUNITIES</b>					
<b>VEGETATION COMMUNITY<sup>1</sup></b>	<b>ACREAGE</b>			<b>MITIGATION</b>	
	<b>Existing</b>	<b>On-site Impacts</b>	<b>Off-site Impacts</b>	<b>Mitigation Ratio</b>	<b>Off-site Mitigation</b>
Diegan coastal sage scrub (32500)	2.39	2.39	0.0	2:1	4.78
Non-native grassland (42200)	0.0	0.0	0.0	0.5:1	0.0
Disturbed habitat (11300)	0.65	0.65	0.0	--	N/A
Developed (12000)	0.52	0.52	0.53	--	N/A
<b>TOTAL</b>	<b>3.56</b>	<b>3.56</b>	<b>0.53</b>	<b>--</b>	<b>4.78</b>

<sup>1</sup>Vegetation categories and numerical codes are from Holland (1986) and Oberbauer (2008)

Impacts also would occur to disturbed habitat a non-sensitive vegetation community (Table 2). Impacts to these vegetation communities are not considered significant because they are not considered sensitive.

**Sensitive Plant Species**

No sensitive plant species are proposed or anticipated to be directly impacted by the project.

### **Sensitive Animal Species**

The proposed project could impact a portion of the coastal California gnatcatcher territory (Figure 6). Impacts to this species would be significant under the first CEQA Threshold listed above.

### **Jurisdictional Areas**

Although a jurisdictional delineation was not conducted within the project site, no potential jurisdictional areas were identified during the initial site survey, and no impacts to any jurisdictional areas are anticipated.

### **Wildlife Corridors and Movement**

The project would not impact wildlife corridors, as no barriers to wildlife movement would be constructed. The project may temporarily interfere with local wildlife movement during construction, but these impacts are considered less than significant since construction would occur during daylight hours, thus minimizing disruption to animal species that may be present in the vicinity. Substantial interference with local wildlife movement would not occur because of the small area of proposed disturbance (outside of which wildlife movement could still occur), combined with the temporary nature of some of the project impacts.

### **Local policies, Ordinances and Adopted Plans**

The project would not conflict with the provisions of any adopted Habitat Conservation Plan, NCCP, other approved local, regional, or state habitat conservation plan or any other local policies or ordinances that protect biological resources. The project is, however, impacting coastal sage scrub subject to the NCCP. An HLP application must be filed with the County and approval requires concurrence from USFWS and CDFW.

### **Indirect Impacts**

Since the project site is not located within or adjacent to designated preserve areas, potential indirect impacts (e.g., drainage/toxins, lighting, and invasive plant species) from the project were not analyzed. There is a potential for construction noise to impact sensitive species outside of the project limits, which is further discussed below.

### **Construction Noise**

Noise from such sources as grubbing, earthwork, and construction would be a temporary impact to local wildlife. Noise-related impacts would be considered significant if listed species were displaced and failed to breed. Listed species (e.g., coastal California gnatcatcher) nesting within any area impacted by construction noise exceeding 60 dB  $L_{eq}$  may be significantly impacted. Any such impacts would be considered significant.

**Cumulative Impacts**

The area of consideration for cumulative biological projects impacts was restricted to projects occurring within a one-mile radius of the Project site (Figure 7). No projects were indentified within the City of Escondido Projects which surrounds the site on the East and West. A total of seven projects were reviewed for this cumulative analysis within the County of San Diego (Figure 7; Table 3). Of these 7 cumulative projects, none would result in significant or potentially significant cumulative impacts to sensitive biological resources. Of these projects all have been approved, closed, or withdrawn, there were no open projects in the immediate vicinity.

In accordance with County guidelines, the proposed Project would mitigate for these impacts through the off-site preservation of 4.78 acres of occupied coastal sage scrub habitat in accordance with the County and Wildlife Agencies. Thus the proposed Project’s impacts to Coastal sage scrub and habitat for California Gnatcatcher, while significant at the project level, are fully mitigated through acquisition of appropriate habitat off site. As the Project would be in conformance with County and City guidelines and mitigation ratios, cumulative impacts would be considered fully mitigated. Accordingly, the proposed Project’s contribution to cumulative impacts to sensitive wildlife would be less than significant.

**Table 3  
 CUMULATIVE IMPACTS TO BIOLOGICAL RESOURCES**

<b>MAP REFERENCE NO.</b>	<b>PROJECT NO.</b>	<b>PROJECT NAME/ STATUS</b>	<b>IMPACTS TO RESOURCE COASTAL SAGE SCRUB</b>
1	PDS2001-3000-01-055	Administrative Permit Closed	0
2	PDS2002-3100-5240	Jack Rabbit Acres TM Closed	0
3	PDS2011-3300-86-009	Rincon Del Diablo MWD Office Addition MUP Approved by PERB 4/24/86	0
4	PDS2009-3200-20208	Doug Logan TPM Approved by Director 8/22/95	0
5	PDS2009-3200-19942	Nelson TPM Approved 4/3/92	0
6	PDS2001-3300-01-022	Buddhist Sanctuary MUP Approved	0
7	PDS2004-3200-20761	Groenberg Approved	0
<b>TOTAL</b>	--	--	<b>0.0</b>

## **MITIGATION**

The project would significantly impact sensitive biological resources. The following measures are proposed to mitigate for these impacts.

### **Direct Impacts**

#### **Sensitive Vegetation Communities**

Permanent impacts to Diegan coastal sage scrub would be mitigated according to the ratios presented in the City's draft Subarea Plan and County's Biological Guidelines (County 2010). Mitigation ratios are based on City of Escondido non-preserve designated areas (i.e., outside of the Focused Planning Areas (FPA), and mitigation is assumed to occur within the FPA, possibly within the Red Mountain Mitigation Bank. Accordingly, impacts to Diegan coastal sage scrub would be mitigated at a 2:1 ratio, for a total of 4.78 acre of mitigation (Table 2).

#### **Sensitive Plants**

No impacts to sensitive plants are anticipated. Given the low potential for any sensitive plants to occur within the project site (Attachment C), a rare plant survey would not be necessary.

#### **Sensitive Animals**

A single coastal California gnatcatcher was detected on site during vegetation surveys, although protocol gnatcatcher surveys were negative. The subject property will mitigate potential impacts to gnatcatcher territory at a 2:1 ratio in accordance with the NCCP, for a total of 4.78 acres of occupied Diegan coastal sage scrub mitigation.

To avoid potential direct impacts to California gnatcatchers within the limits of grading, vegetation clearing prior to grading shall take place outside of the breeding season (February 15 through August 31).

In addition, in order to maintain compliance with the MBTA and to avoid potential significant impacts to nesting birds, vegetation clearing shall take place outside of the general avian breeding season (February 1 through July 31), if feasible. If vegetation clearing must occur during the avian breeding season, a qualified biologist would conduct a pre-construction survey for nesting birds no more than 7 days prior to vegetation clearing. If no active nests are found, clearing can proceed. If active nests are found, no clearing may take place within 100 feet of any active nest until a qualified biologist determines that the nest is no longer active or has failed.

In order to prevent inadvertent disturbance to Diegan coastal sage scrub temporary construction fencing shall be installed along the project footprint prior to the commencement of any grading and or clearing in association with this project.

### **Jurisdictional Areas**

No impacts to jurisdictional areas are anticipated to occur and no mitigation measures are proposed.

### **Wildlife Corridors and Movement**

No permanent impacts to wildlife corridors and movement would occur and no mitigation measures are proposed.

### **Indirect Impacts**

#### **Construction Noise**

Noise from such construction-related sources as grubbing, clearing, and grading, as well as construction-related vehicular traffic, would impact local wildlife. Noise-related impacts would be considered significant if sensitive species (such as coastal California gnatcatchers or raptors) were displaced from their nests and failed to breed. Birds nesting within any area impacted by noise exceeding 60 dB  $L_{eq}$  or ambient levels (if ambient is greater than 60 dB  $L_{eq}$ ) may be significantly impacted.

There is potential for coastal California gnatcatchers to nest in Diegan coastal sage scrub located outside of the limits of grading. In order to avoid potential indirect noise impacts to this species, construction would take place outside of the gnatcatcher breeding season (February 15 to August 31). If construction must occur during the breeding season, and habitat within 300 feet of the limits of work is determined to be occupied during protocol surveys, then additional measures (e.g., noise walls) would be implemented to bring average noise levels to below 60 dB  $L_{eq}$  per hour.

### **SUMMARY OF PROJECT IMPACTS AND MITIGATION**

The proposed project is located on a hilltop containing developed, disturbed, and native habitat, including sensitive Diegan coastal sage scrub and non-native grassland. Impacts to these native vegetation types are significant and would require mitigation. Total impacts to sensitive vegetation include 2.39 acres of Diegan coastal sage scrub. Total proposed mitigation would consist of 4.78 acres of occupied Diegan coastal sage scrub or other habitat of similar quality, to be purchased from a mitigation bank. Final mitigation will need to be determined in coordination with the County and Wildlife Agencies. A potential mitigation site identified by the Wildlife Agencies on December 19, 2013 was Red Mountain Mitigation Bank.

In order to avoid direct impacts to California gnatcatchers within the limits of grading, vegetation clearing prior to grading will be restricted during the California gnatcatcher breeding season (February 15 through August 31).

In addition, in order to maintain compliance with the MBTA and to avoid potential significant impacts to nesting birds, vegetation clearing should take place outside of the general avian breeding season (February 1 through July 31).

Temporary construction fencing will be placed around the project footprint prior to any clearing and or grading in order to prevent inadvertent disturbance to Diegan coastal sage scrub adjacent to the project boundaries.

Implementation of the mitigation measures listed above would reduce all impacts to below a level of significance. Please do not hesitate to contact me or Monica Bilodeau (Project Manager) at (619) 462-1515 if you have any questions.

Sincerely,



Karl Osmundson  
County-approved Biologist



Monica Bilodeau  
Project Manager

Enclosures:

- Figure 1 Regional Location Map
- Figure 2 Project Location Map
- Figure 3 Aerial Photograph
- Figure 4 Jurisdiction
- Figure 5 Vegetation and Sensitive Resources
- Figure 6 Vegetation and Sensitive Resources /Impacts
- Figure 7 Cumulative Impacts
- Figure 8 Grading Plan

- Attachment A Plant Species Observed
- Attachment B Animal Species Observed or Detected
- Attachment C Sensitive Plant Species with Potential to Occur
- Attachment D Explanation of Status Codes for Plant and Animal Species
- Attachment E Sensitive Animal Species with Potential to Occur
- Attachment F California Gnatcatcher Presence/Absence Survey Report

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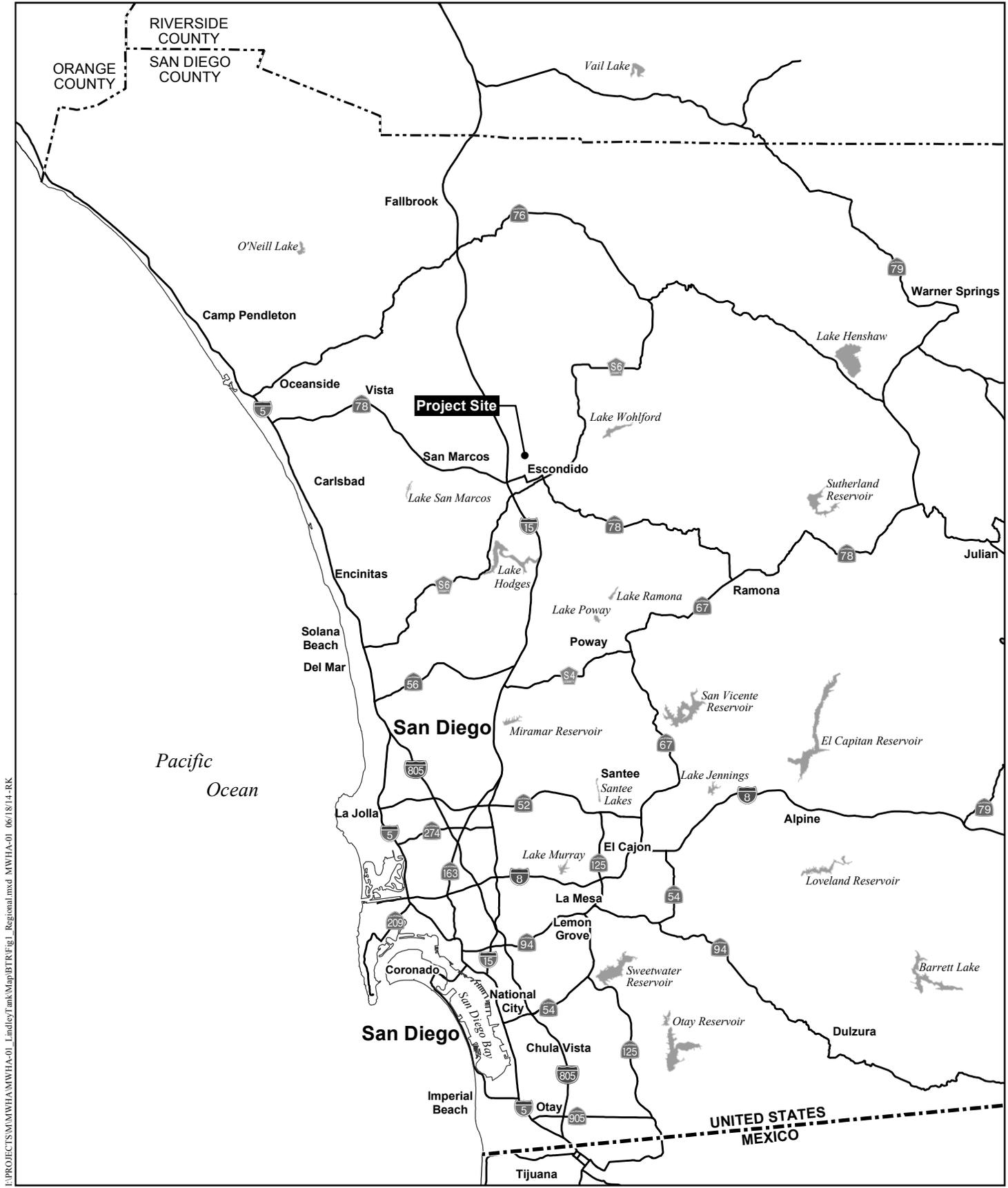
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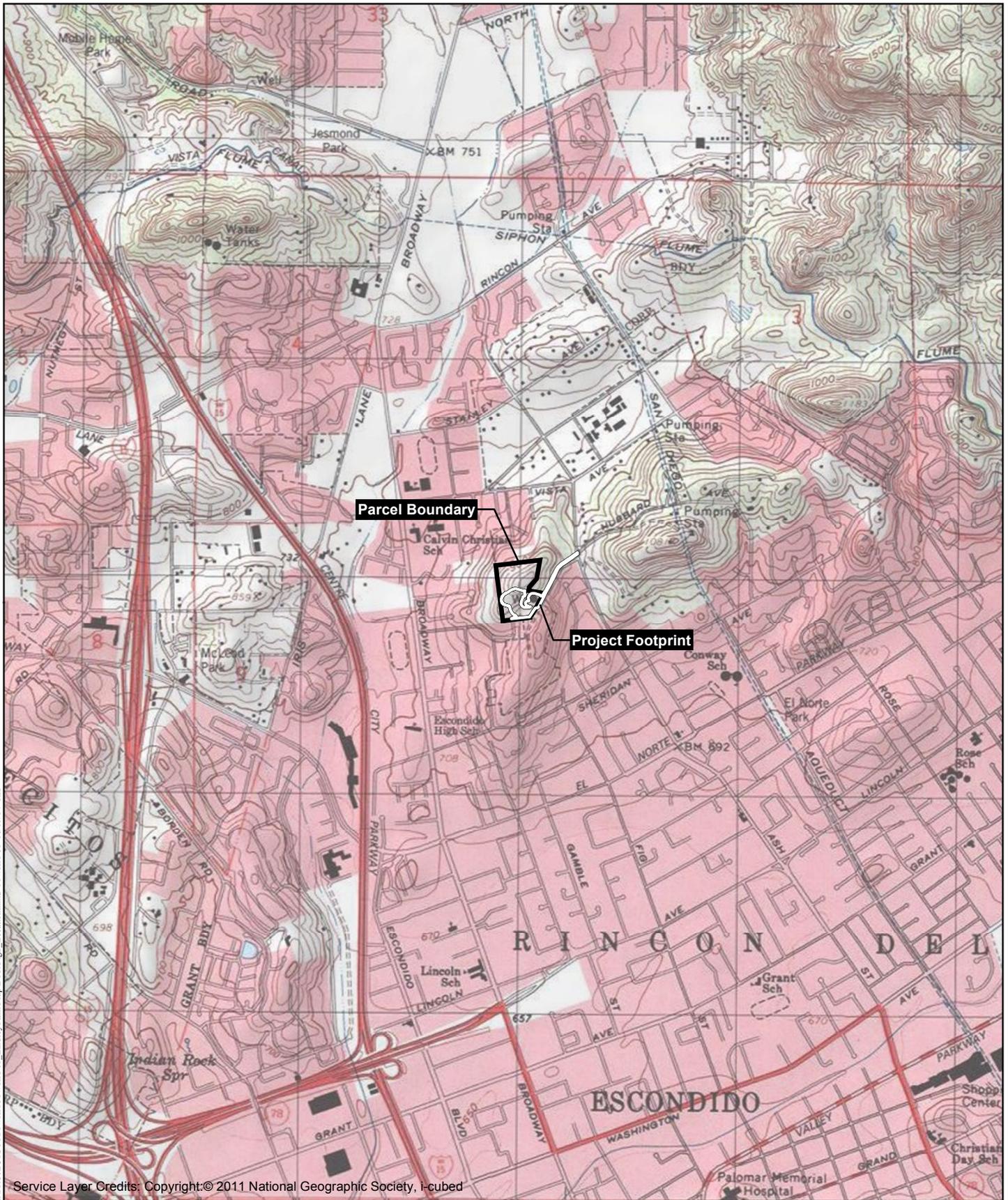


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## Regional Location Map

LINDLEY TANK

Figure 1



## Project Location Map

LINDLEY TANK

Figure 2



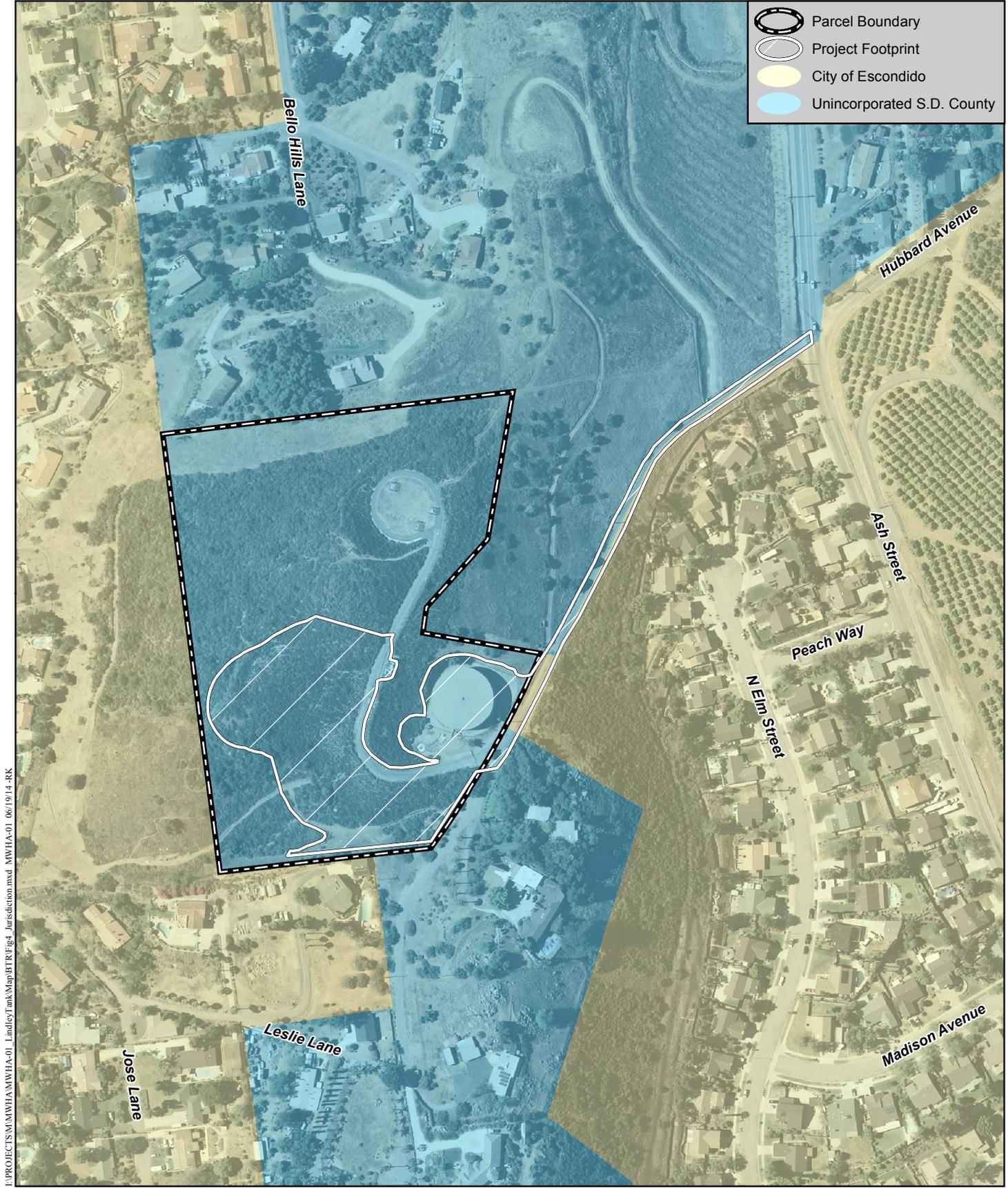
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# Aerial Photograph

LINDLEY TANK

Figure 3



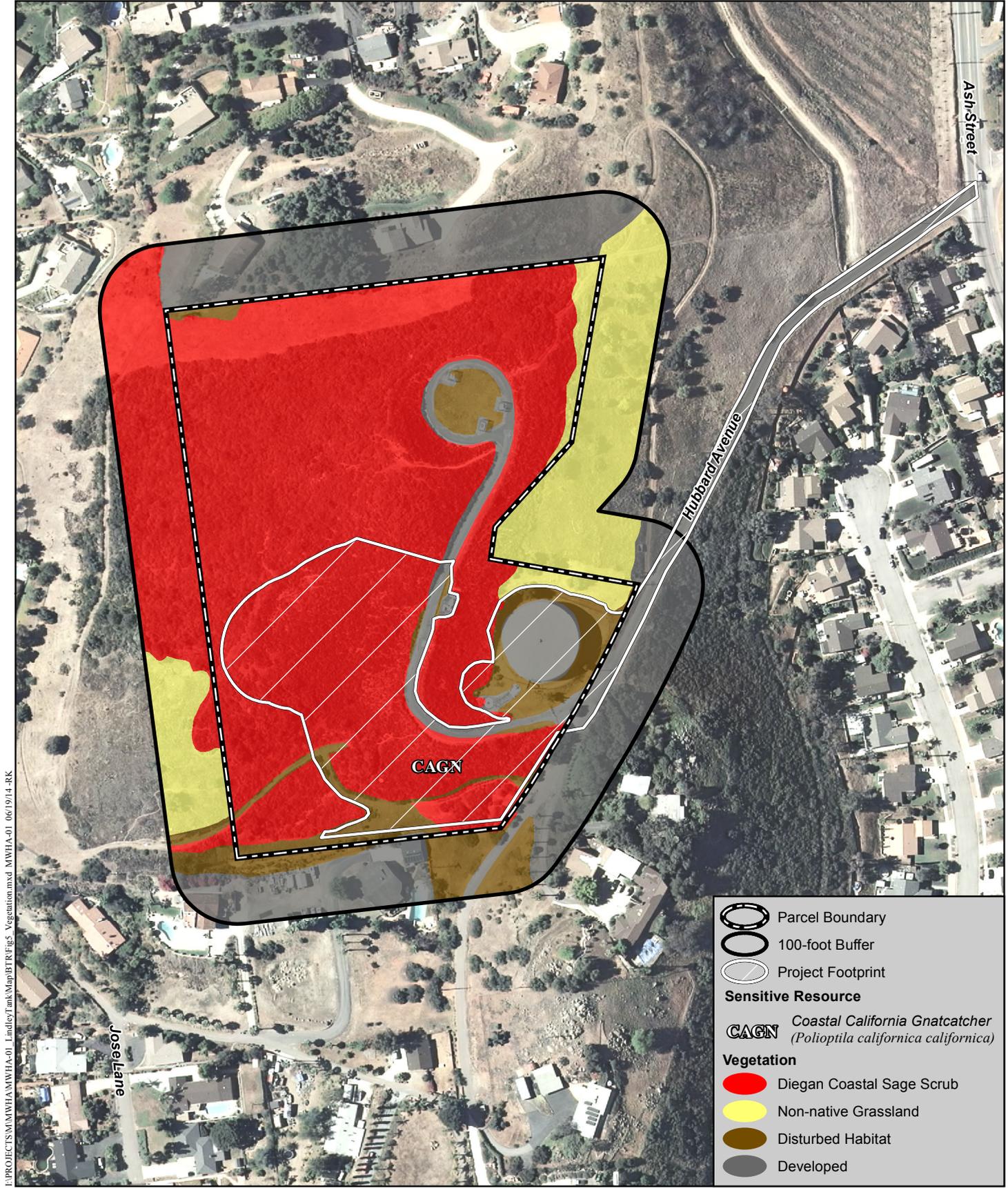


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# Jurisdiction

LINDLEY TANK

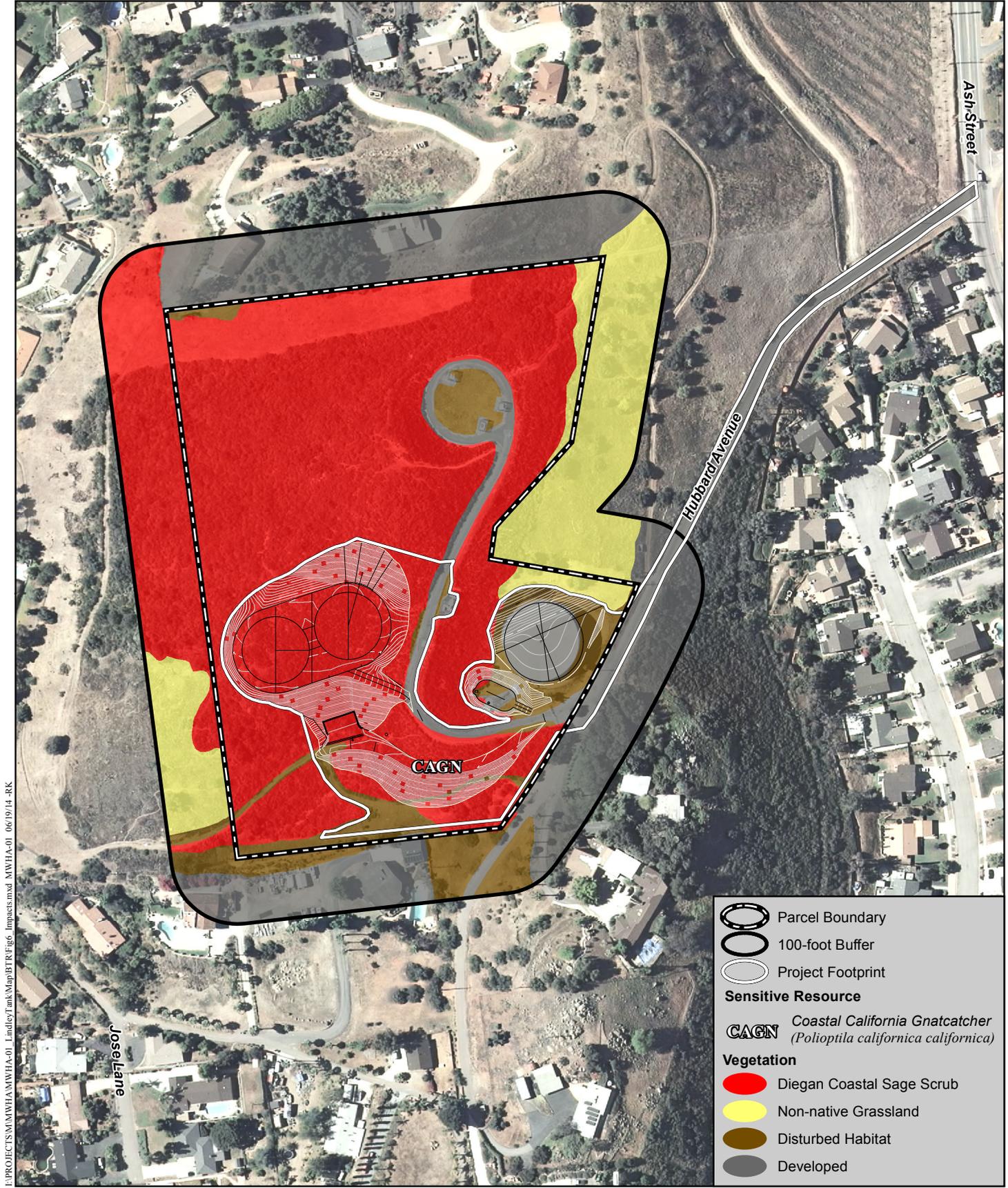
Figure 4



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**Vegetation and Sensitive Resources**

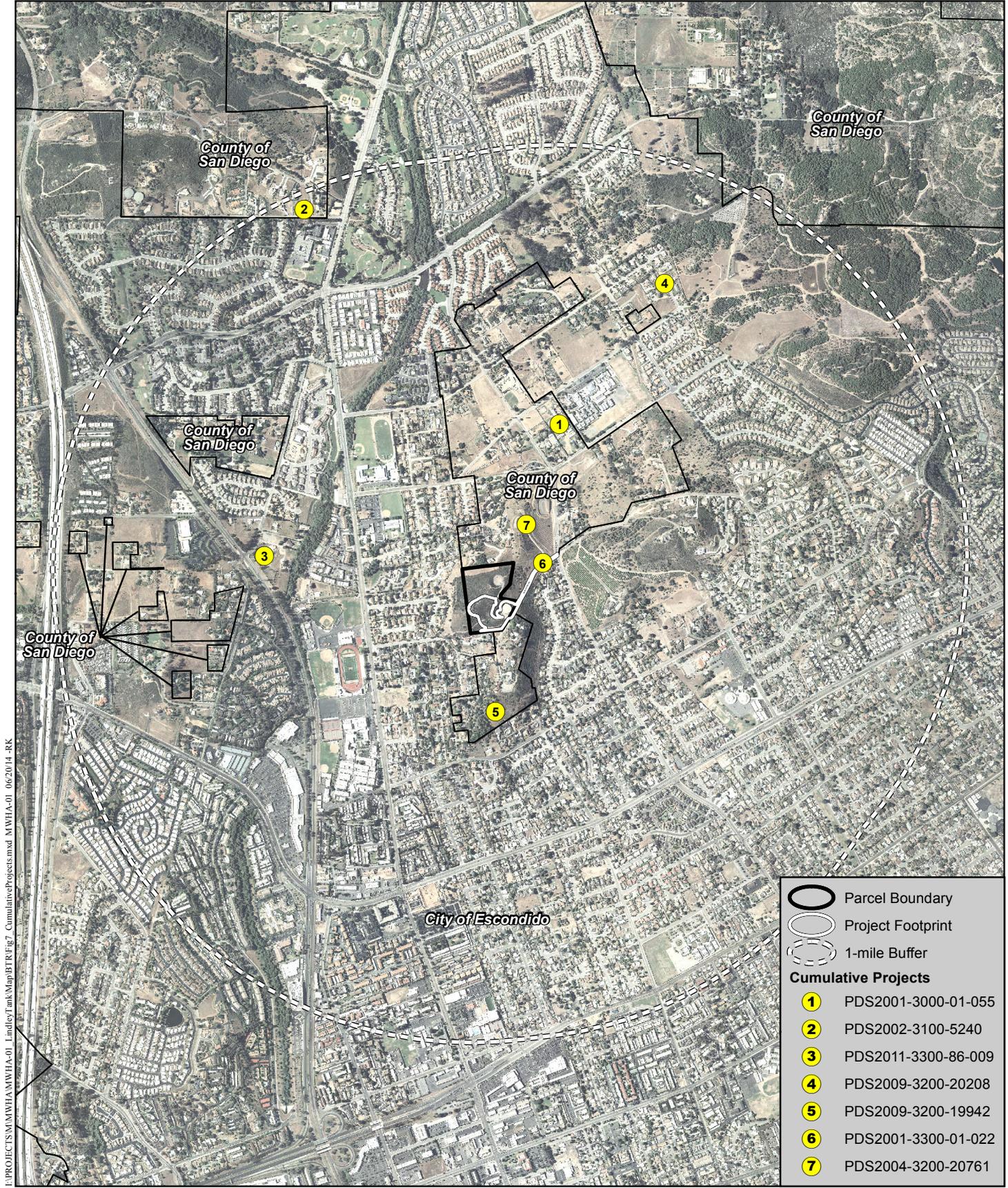
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**Vegetation and Sensitive Resources/Impacts**

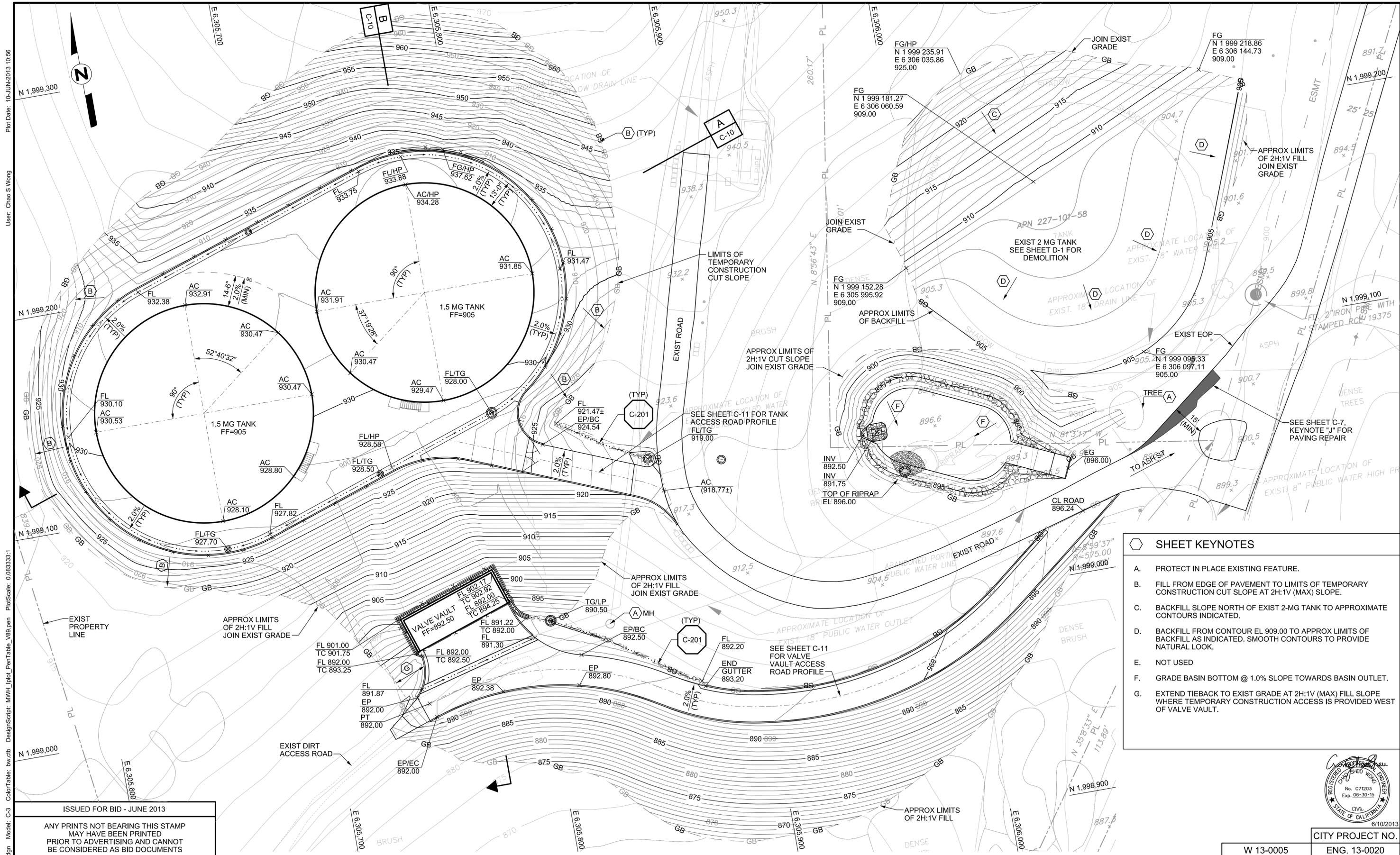
LINDLEY TANK



# Cumulative Projects

LINDLEY TANK

Figure 7



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 File: LINDY-C-01.dgn Model: C-3 ColorTable: bw.ctb DesignScript: MWH\_Iplot\_PenTable\_V89.pen PlotScale: 0.08333331

ISSUED FOR BID - JUNE 2013

ANY PRINTS NOT BEARING THIS STAMP  
MAY HAVE BEEN PRINTED  
PRIOR TO ADVERTISING AND CANNOT  
BE CONSIDERED AS BID DOCUMENTS

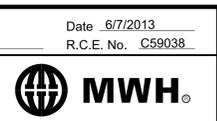
REV	DATE	BY	DESCRIPTION

SCALE  
1" = 20'

WARNING  
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE

Plans Prepared Under Supervision Of  
John E. Kearney  
Date 6/7/2013  
R.C.E. No. C59038

DESIGNED C. WONG  
DRAWN C. WONG  
CHECKED S. WILLIAMS



Approved \_\_\_\_\_  
By Deputy Director of Utilities  
Construction and Maintenance

CONSTRUCTION RECORD  
Contractor \_\_\_\_\_  
Inspector \_\_\_\_\_  
Date Completed \_\_\_\_\_

LINDLEY RESERVOIR 2013  
CIVIL  
FINAL GRADING PLAN

DRAWING  
C-3  
SHEET NO 14 OF 60

- SHEET KEYNOTES**
- A. PROTECT IN PLACE EXISTING FEATURE.
  - B. FILL FROM EDGE OF PAVEMENT TO LIMITS OF TEMPORARY CONSTRUCTION CUT SLOPE AT 2H:1V (MAX) SLOPE.
  - C. BACKFILL SLOPE NORTH OF EXIST 2-MG TANK TO APPROXIMATE CONTOURS INDICATED.
  - D. BACKFILL FROM CONTOUR EL 909.00 TO APPROX LIMITS OF BACKFILL AS INDICATED. SMOOTH CONTOURS TO PROVIDE NATURAL LOOK.
  - E. NOT USED
  - F. GRADE BASIN BOTTOM @ 1.0% SLOPE TOWARDS BASIN OUTLET.
  - G. EXTEND TIEBACK TO EXIST GRADE AT 2H:1V (MAX) FILL SLOPE WHERE TEMPORARY CONSTRUCTION ACCESS IS PROVIDED WEST OF VALVE VAULT.



CITY PROJECT NO.  
W 13-0005 ENG. 13-0020

**Attachment A  
PLANT SPECIES OBSERVED  
LINDLEY TANK RESERVOIR**

<u>FAMILY</u>	<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>	<u>HABITAT</u> ‡
<b>MONOCOTS</b>			
Poaceae	<i>Avena sp.</i>	oats	DCSS, NNG
	<i>Bromus diandrus</i>	common ripgut grass	NNG
	<i>Bromus madritensis</i> *	foxtail chess	DH, NNG
	<i>Pennisetum setaceum</i>	fountain grass	NNG
<b>EUDICOTS</b>			
Anacardiaceae	<i>Malosma laurina</i>	laurel sumac	DCSS
Asteraceae	<i>Artemisia californica</i>	California sagebrush	DCSS
	<i>Baccharis pilularis</i>	coyote brush	DCSS
	<i>Centaurea melitensis</i> *	star thistle	DCSS, NNG
	<i>Conyza sp.</i>	fleabane	DCSS
	<i>Sonchus asper</i> *	prickly sow thistle	DCSS, DH
			DCSS, NNG
Brassicaceae	<i>Brassica nigra</i> *	black mustard	DH
Cactaceae	<i>Opuntia littoralis</i>	coastal prickly pear	DCSS
Cucurbitaceae	<i>Marah macrocarpa</i>	wild cucumber	DCSS
Crassulaceae	<i>Dudleya pulverulenta</i>	chalk-lettuce	DCSS
Euphorbiaceae	<i>Chamaesyce sp.</i>	spurge	DH
	<i>Croton setigerus</i>	dove weed	DH
Fabaceae	<i>Acmispon glaber</i>	deerweed	DCSS
Hydrophyllaceae	<i>Phacelia sp.</i>	phacelia	DCSS
Lamiaceae	<i>Salvia apiana</i>	white sage	DCSS
	<i>Salvia mellifera</i>	black sage	DCSS
Polygonaceae	<i>Eriogonum fasciculatum</i>	buckwheat	DCSS
Primulaceae	<i>Anagallis arvensis</i>	scarlet pimpernel	DH

‡Habitat acronyms: DCSS=Diegan coastal sage scrub, NNG=non-native grassland, DH=disturbed habitat

\* Non-native species

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**Attachment B**  
**ANIMAL SPECIES OBSERVED OR DETECTED**  
**LINDLEY TANK RESERVOIR**

**SCIENTIFIC NAME**

**COMMON NAME**

**INVERTEBRATE**

Lepidoptera – Butterflies and Moths

Nymphalinae

*Precis coenia*

buckeye butterfly

Papilioninae

*Papilio rutulus*

Western tiger swallowtail

**VERTEBRATES**

**Reptile**

Phrynosomatidae – Earless, Spiny, Tree, Side-blotched, and Horned Lizards

*Uta stansburiana*

side-blotched lizard

*Sceloporus occidentalis*

Western fence lizard

**Birds**

Accipitridae – Hawks, Old World Vultures, Kites, Harriers, and Eagles

*Buteo jamaicensis*

red-tailed hawk

Columbidae – Doves and Pigeons

*Zenaida macroura*

mourning dove

Corvidae – Jays, Magpies, and Crows

*Corvus corax*

common raven

Emberizidae – Sparrows, Longspurs, and Emberiza Buntings

*Pipilo crissalis*

California towhee

Fringillidae – Finches

*Carpodacus mexicanus*

house finch

Mimidae – Mimic Thrushes

*Mimus polyglottos*

northern mockingbird

Parulidae – Songbirds and Warblers

*Dendroica coronata*

yellow-rumped warbler

Sylviidae

*Polioptila californica californica*†

Coastal California gnatcatcher

Trochilidae – Hummingbirds

*Calypte anna*

Anna's hummingbird

Tyrannidae – Flycatchers

*Sayornis nigricans*

black phoebe

**Attachment B (cont.)**  
**ANIMAL SPECIES OBSERVED OR DETECTED**  
**LINDLEY TANK RESERVOIR**

**SCIENTIFIC NAME**

**COMMON NAME**

**VERTEBRATES (cont.)**

**Mammals**

Canidae – Foxes, Wolves, and Relatives

*Canis latrans*

coyote (scat)

Geomyidae – Gophers

*Thomomys* sp.

pocket gopher (burrow)

Sciuridae – Squirrels, Chipmunks, and Marmots

*Spermophilus beecheyi*

California ground squirrel (burrow)

†Sensitive species

**Attachment C**  
**SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR/COMMENTS
San Diego thornmint ( <i>Acanthomintha ilicifolia</i> )	FT/SE CNPS List 1B.1 MHCP Narrow Endemic	Very low. Grassy openings in the chaparral or sage scrub, or near vernal pools, with friable or broken clay soils are the preferred habitat. This species occurs within Escondido; however, limited suitable habitat occurs within the project site.
San Diego ambrosia ( <i>Ambrosia pumila</i> )	FE/-- CNPS List 1B.1	Very low. Found in a variety of habitats, including sage scrub, grasslands, wetlands, disturbed habitat, and sloped areas. Known in California from fewer than 20 occurrences. Critical habitat for this species occurs near Lake Hodges.
San Diego sagewort ( <i>Artemisia palmeri</i> )	--/-- CNPS List 4.2	Low. Occurs in stream courses or moist slopes, often within coastal sage scrub and southern mixed chaparral. Minimal suitable habitat occurs within the project site.
San Diego milk-vetch ( <i>Astragalus oocarpus</i> )	--/-- CNPS List 1B.2 CA Endemic	Very low. Occurs in open or disturbed areas of cismontane woodland and chaparral. Suitable habitat is limited within the project site.
Encinitas baccharis ( <i>Baccharis vanessae</i> )	FT/SE CNPS List 1B.1 CA Endemic MHCP Narrow Endemic	None. Mature but relatively low-growing chaparral is the primary habitat. Also found in southern maritime and southern mixed chaparrals. Suitable habitat does not occur within the project site.
Thread-leaved brodiaea ( <i>Brodiaea filifolia</i> )	FT/SE CNPS List 1B.1 CA Endemic MHCP Narrow Endemic	None. Clay soils in vernal moist grasslands and vernal pool periphery are typical locales. Appropriate habitat does not occur within the project site.
Orcutt's brodiaea ( <i>Brodiaea orcuttii</i> )	--/-- CNPS List 1B.1	None. Vernal moist grasslands, mima mound topography, and vernal pool periphery are preferred habitat. Occasionally will grow on streamside embankments in clay soils. Suitable habitat does not occur within the project site.
Southern tarplant ( <i>Centromadia parryi</i> ssp. <i>australis</i> )	--/-- CNPS List 1B.1	None. Occurs in seasonally moist (saline) grasslands and peripheral salt marsh. Although grasslands occur within the project site, appropriate soils do not.

**Attachment C (cont.)**  
**SENSITIVE PLANT SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR/COMMENTS
Smooth tarplant ( <i>Centromadia pungens</i> ssp. <i>laevis</i> )	--/-- CNPS List 1B.1 CA Endemic	None. Prefers valley and foothill grasslands, particularly near alkaline locales. Although grasslands occur within the project site, appropriate soils do not.
Delicate clarkia ( <i>Clarkia delicata</i> )	--/-- CNPS List 1B.2	Low. Prefers shaded areas or the periphery of oak woodlands and cismontane chaparral. Minimal suitable habitat occurs within the project site.
Summer holly ( <i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i> )	--/-- CNPS List 1B.2	None. Mesic north-facing slopes in southern mixed chaparral are the preferred habitat of this large, showy shrub. Suitable habitat does not occur within the project site.
Palmer's goldenbush ( <i>Ericameria palmeri</i> var. <i>palmeri</i> )	--/-- CNPS List 2.2	Very low. This sizeable shrub grows along coastal drainages, in mesic chaparral sites, or rarely in Diegan coastal sage scrub. Occasionally occurs as a hillside element (usually at higher elevations inland on north-facing slopes). Known in California from only 6 occurrences. Some suitable habitat occurs within the project site.
Engelmann oak ( <i>Quercus engelmannii</i> )	--/-- CNPS List 4.2	None. Oak woodland and southern mixed chaparral. Larger oaks sometimes occur in vast savannah grasslands. In foothills, may also occur as a shrubby element within the chaparral.

\*Refer to Attachment D for an explanation of status codes.

**Attachment D**  
**EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES**

**FEDERAL AND STATE CODES**

**U.S. Fish and Wildlife Service (USFWS)**

FE	Federally listed endangered
FC	Federal candidate species (discussed in more detail, below)
FT	Federally listed threatened
BCC	Birds of Conservation Concern (discussed in more detail, below)

**California Department of Fish and Wildlife (CDFW)**

SE	State listed endangered
ST	State listed threatened
SSC	State species of special concern
Fully Protected	Fully Protected species refers to all vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.

**OTHER CODES AND ABBREVIATIONS**

**USFWS Federal Candidate (FC) Species**

Federal candidate species are those for which the USFWS has on file “sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened, but for which preparation and publication of a proposal is precluded by higher-priority listing actions. [The USFWS] maintain[s] this list for a variety of reasons: to notify the public that these species are facing threats to their survival; to provide advance knowledge of potential listings that could affect decisions of environmental planners and developers; to provide information that may stimulate conservation efforts that will remove or reduce threats to these species; to solicit input from interested parties to help us identify those candidate species that may not require protection under the [Endangered Species Act] or additional species that may require the Act’s protections; and to solicit necessary information for setting priorities for preparing listing proposals” (Federal Register 70:90 [May 11, 2005]).

**USFWS Birds of Conservation Concern (BCC)**

This report from 2002 aims to identify accurately the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS’ highest conservation priorities and draw attention to species in need of conservation action. USFWS hopes that by focusing attention on these highest priority species, the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. The report is available online at <http://migratorybirds.fws.gov/reports/bcc2002.pdf>.

**Attachment D (cont.)**  
**EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES**

**OTHER CODES AND ABBREVIATIONS (cont.)**

**Multiple Habitat Conservation Program (MHCP) Covered Species (City of Escondido)**

Species listed as MHCP covered species indicate that these species would receive formal protection and take authorization upon MHCP approval under the federal and state and Endangered Species acts.

**MHCP Narrow Endemic**

Narrow Endemic is a sensitivity rating given by the MHCP to indicate “those species considered so restricted in distribution and abundance that substantial loss of their populations or habitat might jeopardize the species’ continued existence or recovery.”

**County of San Diego**

**Plant Sensitivity**

- Group A     Plants rare, threatened, or endangered in California and elsewhere
- Group B     Plants rare, threatened, or endangered in California but more common elsewhere
- Group C     Plants that may be quite rare but need more information to determine true rarity status
- Group D     Plants of limited distribution and are uncommon but not presently rare or endangered

**Animal Sensitivity**

- Group 1     Animals that have a very high level of sensitivity either because they are listed as threatened or endangered or because they have very specific natural history requirements.
  
- Group 2     Animal species that are becoming less common, but are not yet so rare that extirpation or extinction is imminent without immediate action. These species tend to be prolific within their suitable habitat types.

**Multiple Species Conservation Program (MSCP) Covered**

Multiple Species Conservation Program covered species for which the County has take authorization within MSCP area.

**Attachment D (cont.)**

**EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES**

**OTHER CODES AND ABBREVIATIONS (cont.)**

**California Native Plant Society (CNPS) Codes**

**Lists**

**List/Threat Code Extensions**

1A = Presumed extinct.	.1 = Seriously endangered in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)
1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.	.2 = Fairly endangered in California (20 to 80 percent occurrences threatened)
2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.	.3 = Not very endangered in California (less than 20 percent of occurrences threatened, or no current threats known)
3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.	A CA Endemic entry corresponds to those taxa that only occur in California.
4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.	All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no threat code extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

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**Attachment E**  
**SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

<b>SPECIES</b>	<b>LISTING OR SENSITIVITY*</b>	<b>POTENTIAL TO OCCUR/COMMENTS</b>
<b>INVERTEBRATES</b>		
Quino checkerspot butterfly ( <i>Euphydryas editha quino</i> )	FE/--	None. Potential habitat includes vegetation communities with areas of low-growing and sparse vegetation. These habitats include open stands of sage scrub and chaparral, adjacent open meadows, old foot trails and dirt roads. The project site is outside the U.S. Fish and Wildlife Service (USFWS) Survey Area for this species.
Harbison dun skipper ( <i>Euphyes vestris harbisoni</i> )	--/--	None. Occurs in riparian habitats and chaparral with narrow canyons or drainages, where perennial sources of water provide adequate habitat for the larval foodplant, San Diego sedge ( <i>Carex spissa</i> ). San Diego sedge not observed within the project site.
<b>VERTEBRATES</b>		
<b>Reptiles and Amphibians</b>		
Arroyo toad ( <i>Anaxyrus californicus</i> )	FE/SSC	None. Found on banks with open-canopy riparian forest characterized by willows, cottonwoods, or sycamores; breeds in areas with shallow, slowly moving streams, but burrows in adjacent uplands during dry months. No suitable habitat occurs within the project site.
Orange-throated whiptail ( <i>Aspidoscelis hyperythra</i> )	--/SSC	Moderate. Occurs in coastal sage scrub, chaparral, edges of riparian woodlands, and washes. Important habitat requirements include open, sunny areas, shaded areas, and abundant insect prey base, particularly termites ( <i>Reticulitermes</i> sp.). Suitable habitat occurs within the project site.
Coastal whiptail ( <i>Aspidoscelis tigris stejnegeri</i> )	--/--	Moderate. Open coastal sage scrub, chaparral, and woodlands. Important habitat components include open, sunny areas, shrub cover with accumulated leaf litter, and an abundance of insects, spiders, or scorpions. Suitable habitat occurs within the project site.
Coastal rosy boa ( <i>Charina trivirgata</i> )	--/--	Low. Occurs in rocky Diegan coastal sage scrub. Minimal habitat occurs within the project site.

**Attachment E (cont.)**  
**SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR/COMMENTS
<b>VERTEBRATES (cont.)</b>		
<b>Reptiles and Amphibians (cont.)</b>		
Northern red-diamond rattlesnake ( <i>Crotalus ruber ruber</i> )	--/SSC	Moderate. Occurs in dense chaparral or coastal sage scrub, often near large rocks or boulders. Habitat occurs within the project site.
Coronado skink ( <i>Eumeces skiltonianus interparietalis</i> )	--/SSC	Moderate. Grasslands, coastal sage scrub, open chaparral, oak woodland, and coniferous forests, usually under rocks, leaf litter, logs, debris, or in the shallow burrows it digs (Zeiner et al. 1988). Potential habitat occurs within the project site.
San Diego horned lizard ( <i>Phrynosoma coronatum</i> )	--/SSC	Moderate. Coastal sage scrub and open areas in chaparral, oak woodlands, and coniferous forests with sufficient basking sites. Require native ants, especially harvester ants ( <i>Pogonomyrmex</i> sp.), and are generally excluded from areas invaded by Argentine ants ( <i>Linepithema humile</i> ).
Western spadefoot ( <i>Spea hammondi</i> )	--/SSC	None. Occurs in open coastal sage scrub, chaparral, and grassland, along sandy or gravelly washes, floodplains, alluvial fans, or playas; require temporary pools for breeding and friable soils for burrowing; generally excluded from areas with bullfrogs ( <i>Rana catesbiana</i> ) or crayfish ( <i>Procambarus</i> sp.). Appropriate habitat not observed within the project site.
<b>Birds</b>		
Burrowing owl ( <i>Athene cunicularia</i> )	--/SSC (burrow sites)	Very low. Grassland or open scrub habitats. Appropriate habitat within the project site is minimal.
Southern California rufous-crowned sparrow ( <i>Aimophila ruficeps canescens</i> )	--/WL	Moderate. Coastal sage scrub and open chaparral as well as shrubby grasslands. Some suitable habitat occurs within the project site.
Cooper's hawk ( <i>Accipiter cooperii</i> )	--/WL	Moderate. Oak groves, mature riparian woodlands, and eucalyptus stands or other mature forests. No suitable nesting habitat occurs in the project site.

**Attachment E (cont.)**  
**SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR/COMMENTS
<b>VERTEBRATES (cont.)</b>		
<b>Birds (cont.)</b>		
San Diego cactus wren ( <i>Campylorhynchus brunneicapillus sandiegensis</i> )	BCC/SSC	None. Occurs in cactus thickets. No suitable habitat occurs within the project site.
White-tailed kite ( <i>Elanus leucurus</i> )	--/Fully Protected	Moderate. Riparian woodlands and oak or sycamore groves adjacent to grassland. Some suitable habitat occurs within the project site.
Southwestern willow flycatcher ( <i>Empidonax traillii extimus</i> )	FE/SE	None. Breeds within thickets of willows or other riparian understory usually along streams, ponds, lakes, or canyons. Migrants may be found among other shrubs in wetter areas. No suitable habitat occurs within the project site.
Yellow-breasted chat ( <i>Icteria virens</i> )	--/SSC	None. Mature riparian woodland. No suitable habitat occurs within the project site.
White-faced ibis ( <i>Plegadis chihi</i> )	--/WL	None. Nests in freshwater marshes and forages in shallow waters and wet, grassy habitats. No suitable habitat occurs in the project site.
Coastal California gnatcatcher ( <i>Polioptila californica californica</i> )	FT/SSC	Present. Detected on site during vegetation surveys but was not present during protocol level surveys.
Western bluebird ( <i>Sialia mexicana</i> )	--/--	Moderate. Montane coniferous and oak woodlands. Some suitable habitat occurs within the project site.
Barn owl ( <i>Tyto alba</i> )	--/--	Moderate. Woodland habitats and open areas with trees or other structures that can offer shelter. The project site contains suitable habitat.
Least Bell's vireo ( <i>Vireo bellii pusillus</i> )	FE, BCC/SE	None. Occurs in mature riparian woodland. No suitable habitat occurs within the project site.

**Attachment E (cont.)**  
**SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

SPECIES	LISTING OR SENSITIVITY*	POTENTIAL TO OCCUR/COMMENTS
<b>VERTEBRATES (cont.)</b>		
<b>Mammals</b>		
Pallid bat ( <i>Antrozous pallidus</i> )	--/SSC	Very low. Deserts and canyons. Daytime roosts in buildings, crevices; less often in caves, mines, hollow trees, and other shelters. Project area lacks appropriate habitat.
Dulzura pocket mouse ( <i>Chaetodipus californicus femoralis</i> )	--/SSC	Low. Primarily associated with mature chaparral. It has, however, been trapped in mule fat scrub and is known to occur in coastal sage scrub.
Stephens' kangaroo rat ( <i>Dipodomys stephensi</i> )	FE/ST	Very low. Sparsely vegetated habitats of sagebrush or annual grasses. Minimal suitable habitat occurs within the project area.
Western yellow bat ( <i>Lasiurus xanthinus</i> )	--/--	Low. Found in wooded areas and desert scrub. Roosts in foliage, particularly in thorny vegetation palms and other desert riparian habitats. Appropriate habitat on site is limited.
San Diego black-tailed jackrabbit ( <i>Lepus californicus bennettii</i> )	--/SSC	Low. Occurs primarily in open habitats including coastal sage scrub, chaparral, grasslands, croplands, and open, disturbed areas if there is at least some shrub cover present. Limited suitable habitat occurs within the project area.
San Diego desert woodrat ( <i>Neotoma lepida intermedia</i> )	--/SSC	Moderate. Open chaparral and coastal sage scrub, often building large, stick nests in rock outcrops or around clumps of cactus or yucca. Some suitable habitat occurs within the project area.
Pocketed free-tailed bat ( <i>Nyctinomops femorosaccus</i> )	--/SSC	Very low. Desert habitat. Daytime roosts in rock outcrops. Project site lacks appropriate habitat.

**Attachment E (cont.)**  
**SENSITIVE ANIMAL SPECIES WITH POTENTIAL TO OCCUR**

<b>SPECIES</b>	<b>LISTING OR SENSITIVITY*</b>	<b>POTENTIAL TO OCCUR/COMMENTS</b>
<b>VERTEBRATES (cont.)</b>		
<b>Mammals (cont.)</b>		
Big free-tailed bat ( <i>Nyctinomops macrotis</i> )	--/SSC	Low. Rocky areas, in day they roost in rocky cliffs, sometimes caves, buildings, or tree holes. Minimal suitable habitat occurs within the project site.
American badger ( <i>Taxidea taxus</i> )	--/SSC	Very low. Open plains and prairies, farmland, and sometimes edges of woods. Some suitable habitat occurs within the project site.

\*Refer to Appendix D for an explanation of status codes.

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January 10, 2013

MWHA-01

Ms. Susie Tharratt  
U.S. Fish and Wildlife Service  
6010 Hidden Valley Rd.  
Carlsbad, California 92011

Subject: Year 2012 Coastal California Gnatcatcher Survey Report for the Lindley Tank Reservoir Project

Dear Ms. Tharratt:

This letter presents the results of a U.S. Fish and Wildlife Service (USFWS) protocol presence/absence survey conducted for the coastal California gnatcatcher (*Polioptila californica californica*; [CAGN]) by HELIX Environmental Planning, Inc. (HELIX) for the City of Escondido's (City's) proposed Lindley Tank Reservoir project. This report describes the methods used to perform the survey and the results. It is being submitted to the USFWS as a condition of HELIX's Threatened and Endangered Species Permit TE778195.

## **PROJECT LOCATION**

The 10.8-acre project site is located east of State Route 15, north of El Norte Parkway, west of north Ash Street, north of Leslie Lane, off Hubbard Avenue in the City of Escondido, California (Figures 1, 2, and 3). The project site is located within the unincorporated County of San Diego (County) immediately adjacent to the City of Escondido (City). The project site is situated in Township 12 South, Range 2 West on the U.S. Geological Survey Valley Center quadrangle map, APN 227-101-58 (Figure 2).

## **PROJECT DESCRIPTION**

The City would like to demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 million gallons (mg). The City would like to increase the high water level of the replacement tanks by 3 to 4 feet, if feasible. The two tanks would be piped to allow isolation of one tank for maintenance shutdown while leaving the other tank in service. Replacement tanks shall be prestressed and post-tensioned concrete reservoirs, per

AWWA D110. The City’s preference is for the tanks to be partially or fully buried. The existing steel tank is to remain in service until one of the two replacement tanks can be put into service.

**METHODS**

The survey consisted of three site visits that were performed by HELIX biologist Jason Kurnow (TE 778195) in accordance with the current (1997) USFWS protocol. The CAGN survey area encompassed approximately 10.1 acres of potential CAGN habitat. The survey was conducted on foot (Figure 3) with the aid of binoculars. Taped gnatcatcher vocalizations were played for approximately 10 seconds at approximate 5-minute intervals, unless gnatcatchers were heard before playing the tape. In those instances, the tape was not played. The tape also was not played after a gnatcatcher was detected. Table 1 details the survey locations, times, and conditions.

<b>Table 1 SURVEY INFORMATION</b>				
<b>DATE</b>	<b>BIOLOGIST</b>	<b>TIME (start/stop)</b>	<b>ACRES (ac) SURVEYED/ SURVEY RATE (ac per hour)</b>	<b>WEATHER CONDITIONS (start/stop)</b>
11/20/12	Jason Kurnow Erica Harris (supervised)	0745/1000	10.1 ac/4.49 ac	55.0°F, 0% cloud cover, wind 0-1mph/ 73.0°F, 0% cloud cover, wind 1-3mph.
11/29/12	Jason Kurnow	0745/0935	10.1 ac/5.52 ac	59.8°F, 100% cloud cover, wind 1-3mph/ 64.2°F, 100% cloud cover, wind 1-3mph.
12/6/12	Jason Kurnow	0800/1000	10.1 ac/5.05 ac	58.4°F, 20% cloud cover, wind 1-3mph/ 61.2°F, 45% cloud cover, wind 1-3mph.

**VEGETATION COMMUNITIES**

Three vegetation communities occur on the site: Diegan coastal sage scrub, non-native grassland, and disturbed habitat. In addition, the site contains developed land (Figure 3).

### **Diegan Coastal Sage Scrub (DCSS)**

DCSS occurs on xeric sites characterized by shallow soils and steep slopes. Dominated by drought-deciduous shrub species with relatively shallow root systems and open canopies, coastal sage scrub communities often contain a substantial herbaceous component. Characteristic species include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), lemonadeberry (*Rhus integrifolia*), and laurel sumac (*Malosma laurina*).

Within the survey area, this community consisted primarily of California sagebrush, California buckwheat, and black sage. Patches of laurel sumac occurred throughout this community in low densities as well.

### **Non-native Grassland (NNG)**

Non-native grassland is a dense-to-sparse cover of annual grasses, often associated with native annual forbs. This association occurs on gradual slopes with deep, fine-textured, usually clay soils. Most of the introduced annual species that comprise non-native grassland originated from the Mediterranean region of Europe, an area with a climate similar to that of California and a long history of agriculture. Characteristic species within this vegetation community on the project site include oats (*Avena* spp.), red brome (*Bromus madritensis* ssp. *rubens*), and wild mustard (*Brassica* sp.).

### **Disturbed Habitat (DH)**

Disturbed habitat includes land that has been cleared of vegetation (e.g., dirt roads), contains a preponderance of non-native plant species (such as ornamentals or ruderal, exotic species) that take advantage of disturbance (previously cleared land or abandoned landscaping), or shows signs of past or present animal usage, which has removed any capability of providing viable habitat.

### **Developed Land (DEV)**

Developed land exists where permanent structures and/or pavement has been placed (preventing the growth of vegetation) or where landscaping is clearly tended and maintained.

## **RESULTS**

The coastal California gnatcatcher (*Polioptila californica californica*) was not observed or detected during the course of this presence/absence survey.

Letter to Ms. Susie Tharratt  
January 10, 2013

Page 4 of 5

### **CERTIFICATION**

I certify that the information in this survey report and enclosed exhibit fully and accurately represents my work.

Please contact me at (619) 462-1515 if you have any questions.

Sincerely,



Jason Kurnow  
Biologist

### Enclosures:

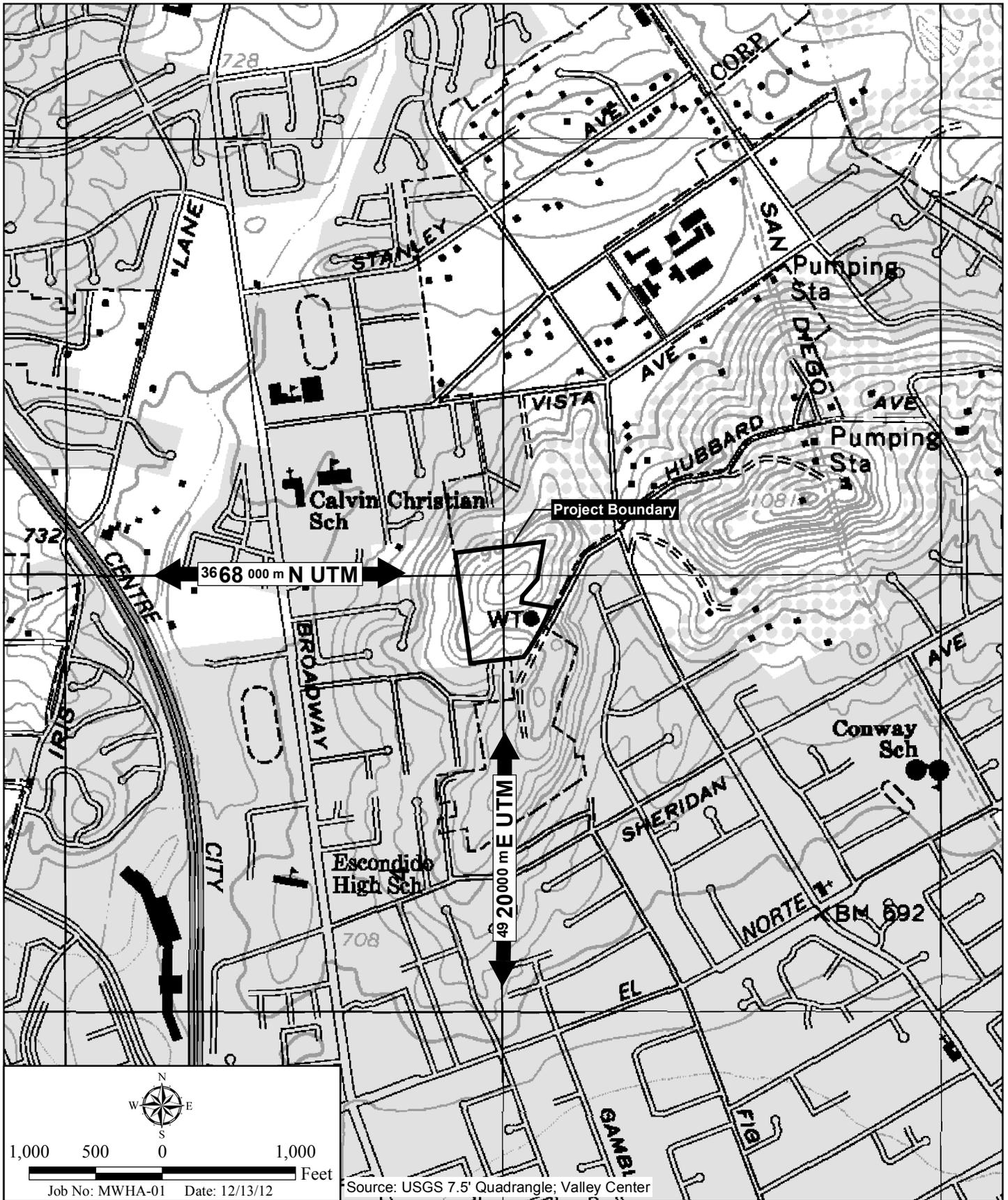
- Figure 1 Regional Location Map
- Figure 2 Project Location
- Figure 3 Vegetation and Sensitive Resources

**REFERENCES**

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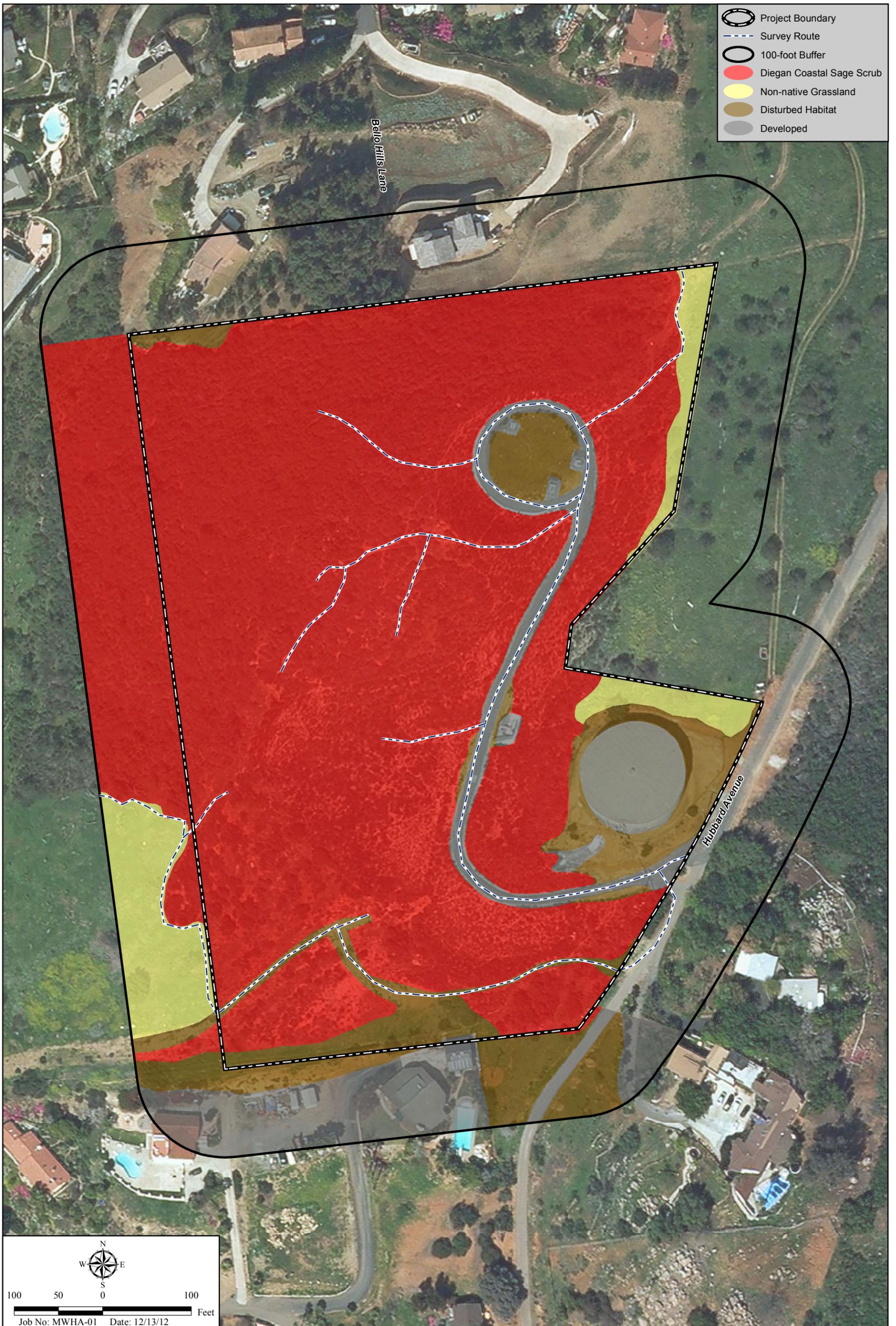




## Project Location Map

LINDLEY TANK

Figure 2



**Vegetation and Sensitive Resources**

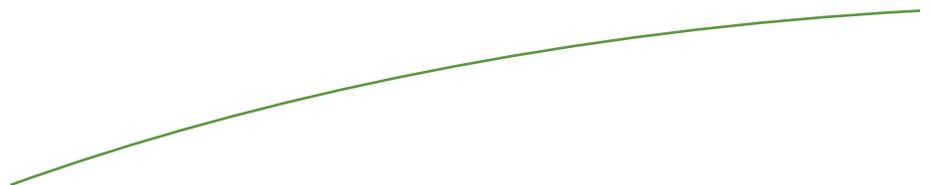
LINDLEY TANK

Figure 3



APPENDIX B

INVENTORY AND EVALUATION OF  
CULTURAL RESOURCES



**INVENTORY AND EVALUATION OF CULTURAL  
RESOURCES**  
*for the*  
**LINDLEY TANK REPLACEMENT PROJECT  
IN ESCONDIDO, SAN DIEGO COUNTY, CALIFORNIA**

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November 2012  
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## NADB TITLE PAGE

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**Date:** November 2012

**Report title:** Inventory and Evaluation of Cultural Resources for the Lindley Tank Replacement Project, in Escondido, San Diego County, California

**Submitted by:** ASM Affiliates, Inc.

**Submitted to:** Helix Environmental, 7578 El Cajon Blvd., Ste. 200, La Mesa CA 91942

**USGS Quadrangle:** Valley Center

**Acres:** Approximately 10 acres

**Keywords:** Lindley Reservoir Water Tank, City of Escondido

**New Sites:** Lindley Reservoir Water Tank (P-37-032874)

**Updated Sites:** none

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## EXECUTIVE SUMMARY

The City of Escondido Lindley Tank Replacement Project (Project) consists of the replacement of the existing Lindley Reservoir, which is approximately 60 years old and has reached the end of its service life. The City of Escondido proposes to demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 mg. As part of the project, a record search was conducted at the South Coastal Information Center (SCIC) of the California Historical Resources Information System (CHRIS) and with the Sacred Lands Files of the Native American Heritage Commission (NAHC). A field survey was carried out by ASM Affiliates, Inc. (ASM) on November 12, 2012 that covered the entire project area.

The area of potential effect (APE) was delineated by the City of Escondido and includes approximately 10 acres in a rural residential area adjacent to Leslie Lane and Hubbard Avenue, off North Ash Street in Escondido, California, on APNs 227-101-58 and 227-101-55. The City of Escondido is the lead agency for the project, and the State Water Resources Control Board (SWRCB) is the consulting agency.

This study included a cultural resource record search, literature reviews, archival research, Native American correspondence, field survey, and resource documentation of the project APE, as well as an evaluation of the Lindley Reservoir Water Tank for eligibility for the National Register of Historical Places (NRHP) and the California Register of Historical Resources (CRHR).

The record search revealed that no previously recorded cultural resources were located within the APE. No new sites or isolates were identified. The current Lindley Reservoir Water Tank (P-37-032874) was identified and recorded as a historic property. The Lindley Reservoir Water Tank was not recommended as eligible for the NRHP, the CRHR, or any local registers.

Survey and documentation of sites complied with the reporting specifications in the California Office of Historic Preservation Planning Bulletin Number 4(a), December 1989, *Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (ARMR Guidelines) for the Preparation and Review of Archaeological Reports*.

# 1. INTRODUCTION

## PROJECT DESIGN AND LOCATION

The City of Escondido (City) proposes to replace the existing Lindley Reservoir, which is approximately 60 years old, and has reached the end of its service life. The existing tank is a 2.0-mg steel potable water tank serving the Lindley zone. The 120-ft.-diameter tank has a floor elevation of 905.0 ft. above mean sea level (amsl) and a high water level of elevation 928 ft. amsl. The existing tank has a single 18-in. inlet/outlet line with a control valve on the inlet line. The existing tank overflow and drain lines discharge to a riprap basin and drain to a surface discharge on site. The City proposes to demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 mg. The two tanks would be piped to allow the isolation of one tank for maintenance shutdown while leaving the other tank in service. City preference is for tanks to be partially or fully buried.

The proposed project is located within the City of Escondido, San Diego County, California (Figure 1). The project area is shown on the USGS 7.5' Valley Center quadrangle, in Township 12 South, Range 2 West, unsectioned Rincon del Diablo Land Grant (Figure 2). More specifically, the APE is in a rural residential area adjacent to Leslie Lane and Hubbard Avenue, off North Ash Street in Escondido, on APNs 227-101-58 and 227-101-55. The APE was defined by the City and is approximately 10 acres

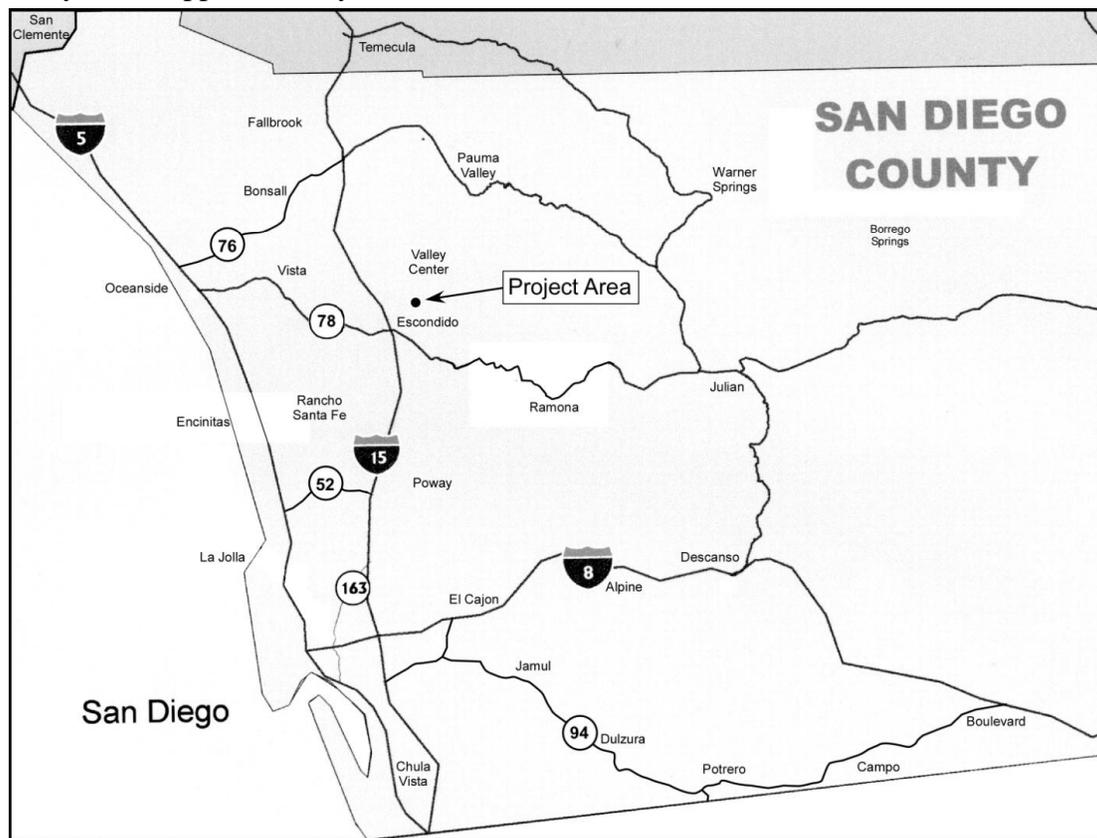


Figure 1. Project vicinity map.

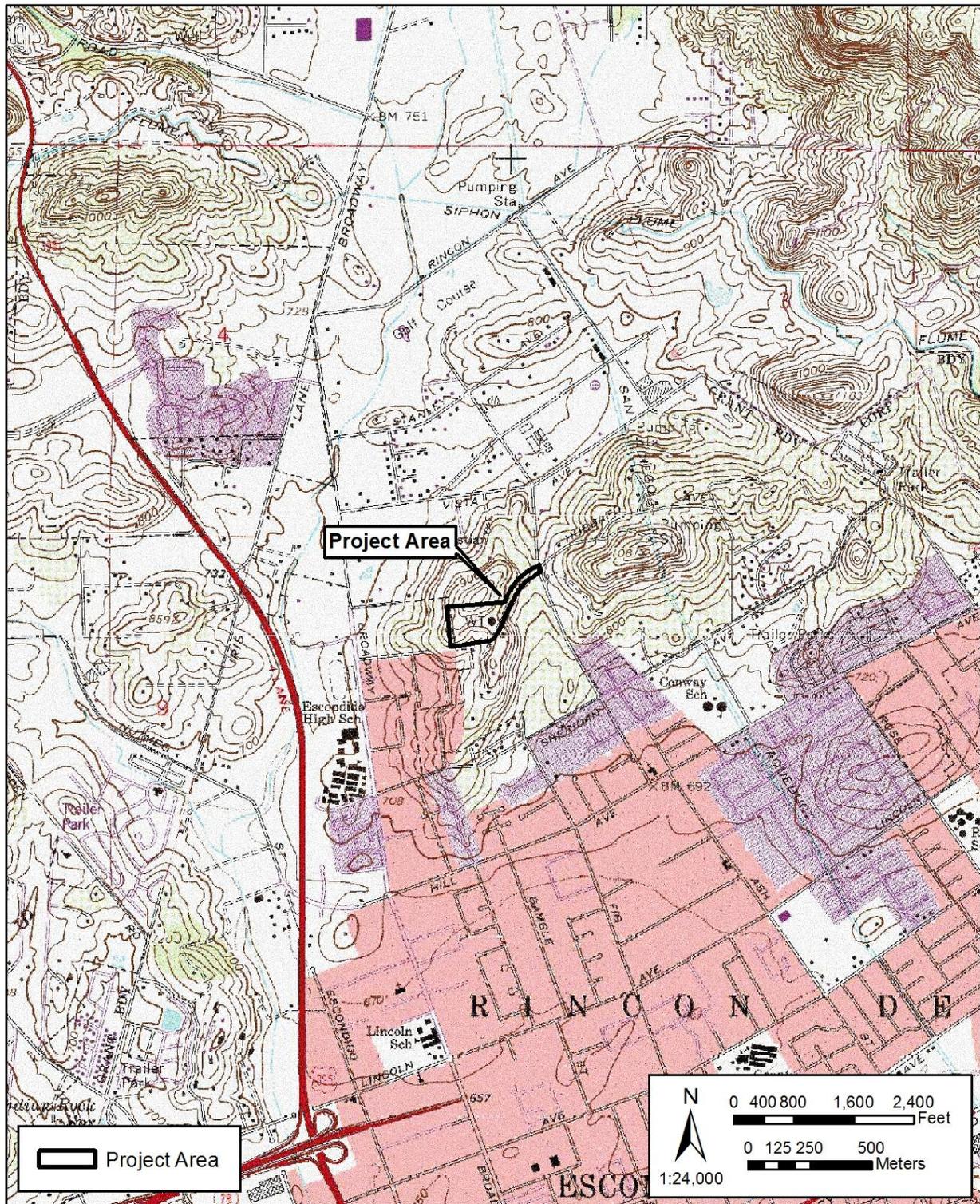


Figure 2. Project location map.

The purpose of the cultural resources survey was to aid in compliance with the California Environmental Quality Act (CEQA) and Section 106 of the National Historic Preservation Act (NHPA). The City of Escondido is the lead agency and the SWRCB is the consulting agency. As the project will expand the current water storage capacity and be located adjacent to the existing reservoir, it is anticipated that an Initial Study and Mitigation Negative Declaration will be required by the City. Section 106 is applicable to federal undertakings, including projects financed or permitted by federal agencies, regardless of whether the activities occur on land that is managed by federal agencies, other government agencies, or private landowners. In practice, the NRHP criteria for significance applied under Section 106 are generally (although not invariably) concordant with CRHR criteria. In addition to this report, ASM has prepared an APE map for submittal by the City of Escondido to support their consultation with the State Historic Preservation Officer for NHPA compliance (Appendix A).

## EXISTING CONDITIONS

### Environmental Setting

The APE is contained within the City of Escondido. The location is approximately 15 mi. east of the Pacific Ocean, 1 mi. east of Interstate 15, and 0.5 mi north of El Norte Parkway. The APE is located in the lower chaparral biotic zone in the Peninsular Ranges of southern California. Elevations in the APE range from 880 to 960 ft. amsl.

Over the past 2.5 million years, erosion has cut canyons through the terraces in northern San Diego County, creating the Escondido Valley and the nearby San Pasqual Valley. Geologically, the APE lies within the Southern California Batholith and the Peninsular Ranges. The designation for the formation in the APE is Pleistocene period *Qoa*, which contains “older alluvial flood plain deposits, which are mostly moderately well consolidated, poorly sorted, and permeable flood plain deposits” (Kennedy 1999).

The soils within the APE are classified as Las Posas fine sandy loam with 9 to 15 percent slopes; Las Posas fine sandy loam, 15 to 30 percent slopes; Las Posas stony fine sandy loam, 30 to 65 percent slopes; and Wyman loam, 5 to 9 percent slopes (U.S. Department of Agriculture n.d.).

## CULTURAL AND HISTORICAL OVERVIEW

### Prehistory

Archaeological fieldwork along the southern California coast has documented a diverse range of human occupation extending from the terminal Pleistocene into the Ethnohistoric period (Erlandson and Colten 1991; Jones 1992; Moratto 1984). A variety of different regional chronologies, often with overlapping terminology, have been used in coastal southern California, and they vary from region to region (Moratto 1984). Today, the prehistory of San Diego County is generally divided into three major temporal periods: Paleo-Indian, Archaic, and Late Prehistoric. These time periods are characterized by patterns in material culture that are thought to represent distinct regional trends in the economic and social organization of prehistoric

groups. In addition, particular scholars referring to specific areas utilize a number of cultural terms synonymously with these temporal labels: San Dieguito for Paleo-Indian, La Jolla for Archaic, and Yuman for Late Prehistoric (Meighan 1959; Moriarty 1966; Rogers 1939, 1945; True 1966, 1970; Wallace 1978; Warren 1964).

### **Paleo-Indian Period**

The antiquity of human occupation in the New World has been the subject of considerable debate over the last few decades. A widely accepted model is that humans first entered the Western Hemisphere between 12,000 and 15,000 years B.P. While there is no firm evidence of human occupation in coastal southern California prior to 12,000 B.P., dates as early as 23,000 B.P. and even 48,000 B.P. have been reported (Bada et al. 1974; Carter 1980; Rogers 1974). The amino acid racemization technique used to date these sites has been largely discredited, however, by more recent accelerator radiocarbon dating of early human remains along the California coast (Taylor et al. 1985). Despite intense interest and a long history of research, no widely accepted evidence of human occupation of North America dating prior to 15,000 B.P. has emerged.

As in most of North America, the earliest recognized period of California prehistory is termed Paleo-Indian. In San Diego County, this period is usually considered to date from at least 10,000 B.P. until 8500 to 7200 B.P. (Moratto 1984; Warren et al. 2008), and is represented by what is known as the San Dieguito complex (Rogers 1966). Within the local classificatory system, San Dieguito assemblages are composed almost entirely of flaked stone tools, including scrapers, choppers, and large projectile points (Warren 1987; Warren et al. 2008). Until recently, the near absence of milling tools in San Dieguito sites was viewed as the major difference between Paleo-Indian economies and the lifeways which characterized the later Archaic period.

### **Archaic Period**

The Archaic period (also referred to as the Early Milling period) extends back at least 7,200 years, possibly to as early as 9000 B.P. (Moratto 1984; Rogers 1966; Warren et al. 2008). Archaic subsistence is generally considered to have differed from Paleo-Indian subsistence in two major ways. First, gathering activities were emphasized over hunting, with shellfish and seed collecting of particular importance. Second, milling technology, frequently employing portable ground stone slabs, was developed. The shift from a land-based subsistence focus to a mostly littoral focus is traditionally held to mark the transition from the Paleo-Indian period to the Archaic period. In reality, the implications of this transition are poorly understood from both an economic and cultural standpoint (see Warren et al. 2008 for an excellent review).

Early Archaic occupations in San Diego County are most apparent along the coast and the major drainage systems that extend inland from the coastal plains (Moratto 1984). Coastal Archaic sites are characterized by cobble tools, basin metates, manos, discoidals (disk-shaped grinding stones), a small number of “Pinto” and “Elko” series dart points, and flexed burials. Together, these elements typify what is termed the La Jolla complex in San Diego County, which appears as the early coastal manifestation of a more diversified way of life (Byrd and Reddy 2002).

Inland Middle Holocene sites have been less extensively studied, although D. L. True and his associates established an important foundation for such studies (True 1958, 1980; True and Beemer 1982; True and Pankey 1985; Warren et al. 1961). The Pauma complex had its

geographical focus on the upper San Luis Rey River, with extensions to the Valley Center area, middle San Luis Rey River, upper Santa Margarita River, and Escondido-San Marcos area. Pauma complex characteristics suggested by True included (1) a high frequency of shaped manos, (2) the presence of finely worked small domed scrapers, (3) the presence of knives and points, (4) the presence of discoidals and coggled stones, (5) a predominance of grinding tools over flaked tools, (6) a predominance of deep basin metates over slab metates, (7) a predominance of cobble hammers over core hammers, (8) a low frequency of cobble tools, (9) a scarcity of cobble choppers and cobble scrapers, (10) a predominance of volcanic rock over quartzite as a source material for flaked lithics, and (11) an extreme scarcity of obsidian. The coastal La Jolla and inland Pauma complexes have been variously interpreted as separate, contemporaneous socio-cultural units and as seasonal/functional manifestations of a single society and culture.

### **Late Prehistoric Period**

In his later overviews of San Diego prehistory, Malcolm Rogers (1945) hypothesized that around 2000 B.P. Yuman-speaking people from the Colorado River region began migrating into southern California. This hypothesis was based primarily on patterns of material culture in archaeological contexts and his reading of ethnolinguistics. This “Yuman invasion” is still commonly cited in the literature, but some later linguistic studies suggest that the movement may have actually been northward from Baja California (Laylander 2007).

Assemblages derived from Late Prehistoric sites in San Diego County differ in many ways from those in the Archaic tradition. The occurrence of small, pressure-flaked projectile points, the replacement of flexed inhumations with cremations, the introduction of ceramics, and an emphasis on collection, processing, and storage of inland plant food (especially acorns) are only a few of the cultural patterns that were well established by the second millennium A.D. The centralized and seasonally permanent residential patterns that had begun to emerge during the Archaic period became well established in most areas. Inland semisedentary villages appeared along major watercourses in the foothills and in montane valleys where seasonal exploitation of acorns and piñon nuts was common, resulting in permanent milling stations on bedrock outcrops. Mortars for acorn processing increased in frequency relative to seed-grinding basins (Rogers 1945; Wallace 1955; Warren et al. 2004).

### **Ethnohistoric Period**

In ethnohistoric times, two main cultural groups occupied coastal San Diego County: the Uto-Aztecan-speaking Luiseño (including Juaneño) in the north and the Kumeyaay, Ipai, Tipai, or Diegueño in the south. As recorded ethnohistorically, Luiseño territory encompassed an area from roughly Agua Hedionda Lagoon on the coast, east to Lake Henshaw, north into Riverside County, and west through San Juan Capistrano to the coast (Bean and Shipek 1978; Kroeber 1925; Rivers 1993). The region inhabited by various bands of the Kumeyaay was much larger and probably extended from Agua Hedionda Lagoon eastward into the Imperial Valley and southward into northern Baja California (Almstedt 1982; Gifford 1931; Hedges 1975; Luomala 1978; Shipek 1982; Spier 1923). The area surrounding the APE was associated with both the Ipai and the Luiseño (Kroeber 1925). Ethnographic information concerning the Kumeyaay and the Luiseño is generalized, rather than referring specifically to the APE or project vicinity.

## **Kumeyaay (Ipai)**

The people living in the southern part of San Diego County at the time of Spanish contact were called the Diegueño, after the mission at San Diego (Mission San Diego de Alcalá). Many people living in the region were not affiliated specifically with the mission. The term Kumeyaay has come into common usage to identify the Yuman-speaking people who lived and still live in the central and southern part of the county. Luomala (1978) used the terms Tipai and Ipai to refer to the southern and northern Kumeyaay respectively. The dividing line between the Tipai and the Ipai runs approximately from Point Loma to Cuyamaca Peak and Julian.

The Ipai spoke a language (or possibly a dialect) belonging to the Diegueño group, together with the closely related Kumeyaay and Tipai languages or dialects to the south, within the larger Yuman linguistic family. According to the debatable technique of glottochronology, the separation of the Diegueño languages from their closest relative, Cocopa in the Colorado River's delta, may date back about 1,000-1,200 years, and the separation from other Yuman groups represented in western Arizona and northern Baja California may have occurred around 1,500-2,000 years ago (Laylander 1985, 2007).

Aboriginal Ipai subsistence was largely or entirely based on harvesting natural plants and animals, rather than on growing agricultural crops. Acorns were a staple for the western groups, as were agave and mesquite for eastern groups. Numerous other plants were valued for the dietary contributions from their seeds, fruit, roots, stalks, or greens, and a still larger number of species had known medicinal uses. Game animals included deer, first and foremost, but mountain sheep and pronghorn antelope were also present, as well as bears, mountain lions, bobcats, coyotes, and other medium-sized mammals. Small mammals were probably as important in aboriginal diets as larger animals, with jackrabbits and cottontails being preeminent, but woodrats and other rodents were commonly exploited. Various birds, reptiles, and amphibians were caught and eaten; food taboos were few in number and inconsistent, to judge from the surviving ethnographic record. The only pre-contact domesticated animal was the dog. It is not clear whether marine fish and shellfish were a mainstay for some coastal groups or merely provided supplemental or emergency food sources for groups that were oriented primarily toward terrestrial resources. Interregional exchange systems are known to have linked the coast with areas to the east in particular, but exchange may have been more concerned with facilitating social and ceremonial matters than with meeting material needs (Heizer 1978).

The Ipai people established a rich cultural heritage and were organized into groups that had base camps and surrounding territory that was exploited for specific resources. Based on ethnohistoric and ethnographic information, a large number of village sites have been identified throughout San Diego County. Some of these villages were located along the coast near river mouths; the varied resources offered by the ocean and riparian areas attracted large numbers of people to these areas. However, a study by Christenson (1992) indicates that maritime resources were not as large a part of the diet as previously believed.

The Ipai were subdivided into essentially sovereign local communities or tribelets. Community membership was generally inherited in the male line. However, in practice some degree of intermixing of these patrilines was certainly present during the historic period, particularly among the Ipai, and this may have reflected a considerable degree of flexibility in community

membership during prehistoric times as well. Later descriptions of the settlement systems have been inconsistent, and there may have been considerable variability in practice (cf. Laylander 1991, 1997; Owen 1965; Shipek 1982; Spier 1923). In some areas, substantially permanent, year-round villages seem to have existed, with more remote resources beyond the daily foraging range being acquired by special task groups. In other areas, communities appear to have followed an annual circuit among seasonal settlements, or to have oscillated between summer and winter villages, often with the group splitting up into its constituent families during certain seasons. Some differences in settlement strategies may have reflected local differences in resource availability or cyclical effects of variability between times of plenty and times of stress. Rights of ownership over the land and its various resources were vested both in individual families and in the clans or communities as a whole. Leadership within communities had at least a tendency to be hereditary, but it was relatively weak; authority was more ceremonial and advisory than administrative or judicial. Headmen had assistants, and shamans exerted an important influence in community affairs, beyond their role in curing individual illness.

The Ipai had developed a varied material culture. An array of tools were made from stone, wood, bone, and shell, and these served to procure and process the region's resources. Needs for shelter and clothing were minimal, but considerable attention was devoted to personal decoration in ornaments, painting, and tattooing. The local pottery was well made, although infrequently decorated. Basketry was a craft that was particularly refined (Elsasser 1978).

## **Luiseno**

Luiseno groups, speaking a language within the Takic branch and Cupan subgroup of Uto-Aztecan, occupied the northern San Diego, southern Orange, and southeastern Riverside counties through the ethnohistoric period into the twenty-first century. They are linguistically and culturally related to the Cahuilla, Cupeño, Serrano, and Gabrielino.

The Luiseno inhabited areas near the APE. Settlement patterns of hunter-gatherers such as the Luiseno were influenced by subsistence factors. The effective exploitation of any particular resource used for food, medicine, or manufacture was tied to the seasonal availability of primary resources. The flora and fauna exploited by Native American populations of this area of southern California were diverse. The Luiseno divided the year into eight seasons (10 months) by when certain seeds and fruit were available. The season or month was named for the environmental characteristics that manifested themselves in that season or month (DuBois 1908:165; Boscana 2005:66).

Both plant and animal foods played a major part in Luiseno subsistence. The plant foods were high in fat, carbohydrates, and protein, and thus provided a high-energy diet. Some of the plants exploited for food included acorns, annual grass seeds, yucca, manzanita, sage, sunflowers, lemonade berry, chia, and various wild greens and fruits. These plants were available seasonally: elderberries are available during July and August, chia is available mainly in June, acorns are available in the fall, and many grasses are available in the spring, summer, and fall. Storage allowed these resources to be consumed throughout the year. Most ethnohistoric accounts emphasize that acorns, gathered in the highlands, were the most important food source for the Luiseno.

Exploited animal resources included deer, antelope, bear, rabbit, jackrabbit, woodrat, mice, ground squirrels, valley and mountain quail, doves, ducks and other birds, fish, and marine shellfish. The Luiseño avoided hunting all predator animals, as well as tree squirrels and most reptiles (Bean and Shipek 1978). Hunting in recent times employed a bow and arrow and was carried out individually or in groups. As in many other areas of California, deer were tracked and stalked, while smaller game, including rabbit, was caught with curved throwing sticks, nets, slings, traps, or deadfalls, or through game drives. Bones of rabbit and other small animals were dried and pounded into a powder to mix into other foods as seasoning and additional nourishment (Waugh 1986).

Coastal marine animals utilized as food included sea mammals, crustaceans, fish, and mollusks. Some fish were only available seasonally, while other fish were available throughout the year. Trout and other fish, when available in inland drainages and in mountain streams, were captured with traps, nets, or poison.

Luiseño settlement followed a pattern of permanent villages and temporary hunting and gathering camps. Houses were conical structures of willow frames covered with brush, with subterranean floors and central hearths. Other structures included sweathouses, ceremonial enclosures, ramadas, and acorn granaries. Domestic implements included wooden utensils, baskets, and ceramic cooking and storage vessels, and stone milling equipment.

Seasonality and scheduling of resource exploitation were critical elements of the cultural adaptive system interwoven with the settlement patterns. Storage of both plants and animals was practiced regularly among the Luiseño and was often considered a necessity. The seasonal availability of acorns, yucca, and grasses dictated long-term planning of resource exploitation. Ethnohistoric accounts emphasize the dearth of winter resources and how people were forced to depend on stored foods, including acorns, dried fish, and other plant foods. Some fish species were available in the winter but they were mainly bottom-dwelling species, small sardine schools, and mackerels (Tartaglia 1976:46). Some accounts indicate that coastal communities exploited local shellfish in the winter (Sparkman 1908). During times of scarce resources, the interior Luiseño traveled to the coast to obtain shellfish, fish, and even some land mammals (White 1963). Bean and Shipek (1978) note that most inland groups had fishing and gathering locations on the coast that they visited annually when the tides were low or when the inland resources were scarce, typically during the months of January through March.

All accounts emphasize that populations were concentrated within the highlands during the acorn harvest in October and November. Adaptations included management of resources, food storage, and migration in response to changing availabilities of resources. Fire was employed as a crop-management and path-clearing technique and for community game drives. The annual produce return from various plant resources such as grass seeds, some greens, and yucca was maintained by burning the landscape at least every third year (Bean and Shipek 1978). These techniques prevailed throughout southern California.

The settlement pattern and subsistence systems of the Luiseño, like those of other California groups, were tailored to exploit the seasonal fluctuations in resources and employed movements of populations from mountain slopes and highlands to valley floors and coastal strips. The

duration and location of settlement areas were dependent on the availability of plant and animal resources. The settlement pattern was characterized by aggregation and segregation of people around plant and animal resources.

## Historic Period

Although the earliest historical exploration of the San Diego area can be traced to 1542 with the arrival of the first Europeans, particularly the exploration of San Miguel Bay (i.e., San Diego Bay) by Juan Rodríguez Cabrillo, the widely accepted start of the historical period is 1769 with the founding of the joint Mission San Diego de Alcalá and royal presidio. The Hispanic period in California's history includes the Spanish Colonial (1769-1821) and Mexican Republic (1821-1846) periods. This era witnessed the transition from a society dominated by religious and military institutions consisting of missions and presidios to a civilian population residing on large ranchos or in pueblos (Chapman 1925).

The first intensive encounter of Spanish explorers and coastal villages of Native Americans was in 1769 with the establishment of Mission San Diego de Alcalá. The Mission of San Juan Capistrano was subsequently established in 1776, followed by San Luis Rey de Francia in 1798. The missions "recruited" the Native Americans to use as laborers and to convert them to Catholicism. Local Native Americans rebelled briefly against Spanish control in 1775. Most of the individuals who participated in the attack were from Tipai settlements south of the San Diego River valley. The Ipai to the north apparently did not participate in the rebellion, reflecting possible political affiliations at the time of the attack (Carrico 1981:Figure 2).

The effects of missionization and introduction of European diseases, greatly reduced the Native American population of southern California. Estimates for Luiseño population at the time of contact range from 5,000 to as many as 10,000 individuals. Kumeyaay population levels were probably similar or somewhat higher. Many of the local Kumeyaay were incorporated into the Spanish sphere of influence at a very early date. Inland Luiseño groups were not heavily affected by Spanish influence until 1816, when an outpost of the mission was established 20 mi. further inland at Pala (Sparkman 1908). Most villagers, however, continued to maintain many of their aboriginal customs and simply adopted the agricultural and animal husbandry practices learned from Spaniards.

By the early 1820s, California came under Mexico's rule, and in 1834, the missions were secularized. This resulted in political instability and Indian uprisings against the Mexican rancheros. Many of the Kumeyaay left the missions and ranchos and returned to their original village settlements (Shipek 1991). When California became a state in 1850, the Kumeyaay were heavily recruited as laborers and experienced even harsher treatment (Carrico 1981). Conflicts between Native Americans and encroaching Anglos finally led to the establishment of reservations for some villages, such as Pala and Sycuan. Other Mission Indian groups were displaced from their homes, moving to nearby towns or ranches. The reservation system interrupted the social organization and settlement patterns, yet many aspects of the original culture still persist today. Certain rituals and religious practices are maintained, and traditional games, songs, and dances continue, as well as the use of foods such as acorns, yucca, and wild game.

The subsequent American period (1846 to present) witnessed the development of San Diego County in various ways. This time period includes the rather rapid dominance over Californio culture by Anglo-Victorian (Yankee) culture and the rise of urban centers and rural communities. A Frontier period from 1845 to 1870 saw the region's transformation from a feudal-like society to an aggressive capitalistic economy in which American entrepreneurs gained control of most large ranchos and transformed San Diego into a merchant-dominated market town. Between 1870 and 1930, urban development established the cities of San Diego, National City, and Chula Vista, while a rural society based on family-owned farms organized by rural school district communities also developed. The Army and Navy took an increased interest in the San Diego harbor between 1900 and 1940. The Army established coastal defense fortifications at Fort Rosecrans on Point Loma, and the Navy developed major facilities in the bay (Fredericks 1979; Moriarty 1976; Van Wormer and Roth 1985). The 1920s brought a land boom (Robinson 1942) that stimulated development throughout the city and county. Development stalled during the depression years of the 1930s, but World War II ushered in a period of growth based on expanding defense industries.

## **RECORDS SEARCH RESULTS**

In order to review all available archaeological data within the APE and a 1-mi. search radius around it, a record search was performed on October 24, 2012, at the SCIC at San Diego State University, which holds the CHRIS records. The records search area included a 1-mi. buffer zone around the APE. The records search included a search of all relevant site records on file with the SCIC, as well as a search of the NRHP, CRHR, and local registers, to determine if significant archaeological or historical sites had previously been recorded within or near the project survey area (Appendix B).

Forty-one technical reports have addressed cultural resources within the 1-mi. search radius of the APE. Three of the previous studies have evaluated the entire area of the APE. Descriptions of the previously conducted cultural resource studies within the APE and the 1-mi. search radius are provided in Table 1.

The record search indicated that 17 cultural resources have been previously identified within the 1-mi. search radius of the APE. None of the cultural resources are located within or adjacent to the APE. Descriptions of all of the 17 previously recorded resources located within the study area and 1-mi. search radius are provided in Table 2.

A search of the historic addresses on file at the SCIC identified 18 previously recorded historic structures within the 1-mi. search radius. Descriptions of the previously recorded historic structures within the search radius are provided in Table 3. None of the structures are within the APE.

Table 1. Cultural Resources Reports Addressing Areas within the APE  
and 1-mi. Search Radius

<b>NADB No.</b>	<b>Authors</b>	<b>Date</b>	<b>Title</b>	<b>Relation To The APE</b>
1120073	American Pacific Environmental Consultants, Inc.	1980	An Archaeological Test Excavation at Oak Creek	Outside
1120215	Cardenas, Sean D., and Mary Robbins Wade	1985	Cultural Resources Inventory and Significance Assessment: Eagles Bluff, Oceanside	Outside
1120429	Chace, Paul G.	1977	An Archaeological and Historical Survey of the Lincoln Ash Interim Facility, in the City of Escondido, California	Outside
1120434	Chace, Paul G.	1977	An Archaeological Survey of the Fig and Sheridan Tract, Escondido, California	Outside
1120438	Chace, Paul G.	1977	An Archaeological Survey, Sheridan Manor	Outside
1120480	Chace, Paul G.	1977	An Archaeological Assessment of the McKellar Development, City of Escondido	Outside
1120691	Fink, Gary R.	1974	Archaeological Survey for the Proposed Realignment of Valley Center Road, Valley Center, California	Outside
1120792	Chace, Paul G.	1988	An Archaeological Survey for the North Reidy Creek Channel Improvement	Outside
1120844	Laylander, Don, and Paul G. Chace	1980	An Archaeological Assessment of the Concordia Development, City of Escondido	Outside
1121213	Corum, Joyce M.	1987	Negative Archaeological Survey Report: Park and Ride Lot 11-Sd-15 P.M. R32.9 11823-90-8067	Outside
1121275	Olmo, Richard Keith	1981	Oak Creek (Escondido Tract 391) Archaeological Mitigation Report City of Escondido	Outside
1121398	Eidsness, Janet, Douglas Flower, Darcy Ike, and Linda Roth	1979	Archaeological Investigation of Escondido Tract 16. 348 SDM-W-2177 Escondido	Outside
1121404	Eckhardt, William T.	1977	Archaeological Investigations of the Von Seegern Annexation Project Escondido, California	Outside
1121406	Chace, Paul G.	1982	An Archaeological Survey of Meadowview Estates, Escondido, California	Outside
1121586	Sutton, Mark Q.	1978	The Archaeology of Escondido Woods SDI-4942 and SDI-4943	Outside
1121623	Westec Services, Inc.	1980	Archaeological Survey of the Unitai 84 Unit Condominium Project, Escondido, California	Outside
1121689	Walker, Carol J., and Charles S. Bule	1979	A Cultural Resource Study of Proposed Access Roads Between the Escondido Substation and the Proposed Substation Site at Rainbow	Outside
1121776	Smith, Brian F.	1989	Results of an Archaeological Evaluation of Cultural Resource W-3461/SDI-9907 at the Sheridan Colony Project	Outside
1122648	Smith, Brian F.	1990	An Archaeological Survey of the Malone Lot Split Project Escondido, County of San Diego	Outside
1123621	Hunt, Kevin P., and Brian F. Smith	1998	An Archaeological Survey and Evaluation of Cultural Resources at the Alta Vista Apartments Project	Outside
1124119	Recon	1976	Draft Environmental Impact Report for San Marcos Assembly Hall	Outside
1124172	Gallegos, Dennis R., and Nina Harris	1999	Cultural Resource Survey for Iskcon Cultural Center Escondido, California	Outside
1124306	Westec Services and Richard Carrico	1976	Archaeological Survey of the Daley Ranch North of Escondido, San Diego County	Outside
1124757	Westec Services	1980	Archaeological Survey of Unitai 84 Unit Condominium Project Escondido	Outside

1. Introduction

<b>NADB No.</b>	<b>Authors</b>	<b>Date</b>	<b>Title</b>	<b>Relation To The APE</b>
1125712	Anderson, Shanna	1993	Archaeological Survey for Escondido Master Plan Correction of Discrepancy for Parcel P11, Site Eps-30h/SDI-12547H	Outside
1125776	Corum, Joyce	1987	Negative Archaeological Survey Report 11-SD-15 P.M. R32.9.	Outside
1126796	Tuma, Brian	2001	An Archaeological Survey for the Hidden Valley Ranch Project Escondido, California	Outside
1128309	Clifford, James, and Brian F. Smith	2003	An Archaeological Survey for the Glenbrook Village Project, Escondido, California	Outside
1128588	City of Escondido	1980	Draft Environmental Impact Report for Expansion of Wastewater Treatment Facility	Inside
1128596	Keller Environmental Associates, Inc	1992	Appendices-Reclaimed Water Distribution System Project: Draft Environmental Impact Report	Inside
1128868	Wright, Gail	2003	Negative Cultural Resources Survey Report for TPM 20761, Log No. 03-08-043, Eaton/Groenenberg APN 227-010-56, County of San Diego	Inside
1128874	Eckhardt, William T.	1977	Archaeological Investigations of the Von Seggern Annexation Project, Escondido, California	Outside
1128909	Breece, William H.	1978	Archaeological Survey for Escondido Woods Escondido, California	Outside
1128951	Archaeological Associates	1978	Archaeological Survey Report for the E.I.R. of the Proposed Escondido Regional Shopping Center North West of Rts. 78 and 395, Escondido, CA	Outside
1129076	Kyle, Carolyn	2002	Cultural Resource Assessment for Cingular Wireless Facility Sd728-01 City of Escondido, California	Outside
1129205	Kyle, Carolyn	2004	Cultural Resource Survey for a Parcel Located on Lehner Avenue, City of Escondido, California	Outside
1130308	Kyle, Carolyn	2006	Cultural Resource Survey for Approximately 13 Acres Located in the City of Escondido, California	Outside
1130426	Robbins-Wade, Mary	2006	Archaeological Resources Survey, Booker Escondido Property, Escondido, San Diego County, California	Outside
1130432	Hector, Susan M.	2006	Cultural Resources Sensitivity Analysis for the Carryover Storage and San Vicente Dam Raise Project (Csp) Alternatives Analysis	Outside
1132655	Robbins-Wade, Mary, Andrew Giletti, and Stephen Van Wormer	2009	Historic and Archaeological Resources Survey, Vista Flume Study, Vista, San Marcos, and Escondido San Diego County, California	Outside
1132987	Robbins-Wade, Mary	2011	El Norte Property Affordable Housing Project-Cultural Resources	Outside

Table 2. Previously Recorded Resources within the APE and 1-mi. Search Radius

Designation		Contents	Recorder, Date	Cultural Resource Location in Relation to the APE
Primary Number P-37-	Trinomial CA-SDI-			
030889	-	HP20. Canal/aqueduct – flume; HP11. Engineering structure	S. Van Wormer, 2009	Outside
000151	151	AP1. Unknown prehistoric site	Treganza, n.d.	Outside
001036	1036	AP2. Lithic scatter; AP4. Bedrock milling feature	True, 1962	Outside
001049	1049	AP2. Lithic scatter; AP4. Bedrock milling feature; AP16. Shell scatter	Robbins-Wade, 1985; True, 1962	Outside
001050	1050	AP2. Lithic scatter	True, 1962	Outside
001057	1057	AP2. Lithic scatter; AP15. Habitation debris	True, 1962	Outside
004488	4488	AP2. Lithic scatter; AP4. Bedrock milling feature	Eidsness, 1979	Outside
004944	4944	AP2. Lithic scatter	Eckhardt, 1977	Outside
006726	6726	AP4. Bedrock milling feature	Bickford, 1978	Outside
006727	6727	AP2. Lithic scatter	Bickford, 1978	Outside
006728	6728	AP2. Lithic scatter	Bickford, 1978	Outside
006789	6789	AP2. Lithic scatter; AP4. Bedrock milling feature	Bickford, 1978	Outside
009907	9907	AP4. Bedrock milling feature	Carrico, 1984	Outside
012545	12,545 (combined with SDI-1052 and SDI-1051)	AP2. Lithic scatter; AP3. Ceramic scatter; AP4. Bedrock milling feature; AP16. Shell scatter and FAR; HP2. Single family property; HP44. Adobe building	Glenn et al., 1991	Outside
012548	12,548	AP4. Bedrock milling feature	Glenn et al., 1991	Outside
017523	15,357	AP2. Lithic scatter; AP4. Bedrock milling feature	Harris and Tift, 1998	Outside

Table 3. Previously Recorded Historical Addresses within the APE and 1-mi. Search Radius

Address	Common/Historic Name	Primary Number	Location in Relation to the APE
145 E El Norte Pkwy	-	P-37-018899	Outside
225 W El Norte Pkwy	-	P-37-018745	Outside
240 E El Norte Pkwy	Lyons House	P-37-018746	Outside
650 E El Norte Pkwy	Lehner House	-	Outside
700 E El Norte Pkwy	-	-	Outside
705 E Lincoln Ave	-	-	Outside
853 Farr Ave	-	-	Outside
1068 N Broadway	-	P-37-018704	Outside
1072 N Broadway	-	P-37-018705	Outside
1132 N Broadway	-	P-37-018706	Outside
1184 N Escondido Blvd	-	-	Outside
1325 Rimrock Dr	Prior House		Outside
1355 E El Norte Pkwy	-	P-37-018749	Outside
1410 Sheridan Ave	Conway House	-	Outside
1432 E El Norte Pkwy	-	P-37-018750	Outside
1450 E El Norte Pkwy	-	P-37-018751	Outside
1460 Conway Dr	-	P-37-018738	Outside
1460 E El Norte Pkwy	-	P-37-018752	Outside

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## 2. METHODS AND RESULTS

### SURVEY METHODS

An intensive pedestrian survey was conducted on November 12, 2012 by ASM Senior Archaeologist Shelby Castells, who also prepared this technical report. ASM Principal Mark Becker served as the Project Manager. ASM Senior Historian Sarah Stringer-Bowsher prepared the evaluation of the Lindley Reservoir Water Tank. (Qualifications of key personnel are summarized in Appendix C.)

The survey was conducted by the archaeologist who transected the APE at 15-m intervals, as the terrain permitted. All areas with slopes of less than 20 percent were completely inventoried, while areas with greater slopes were inventoried in a less intensive manner.

Survey forms summarizing the progress, condition, and findings of the survey were completed. These forms included a description of vegetation, as well as estimates of ground surface visibility, rated as poor (0-25 percent), fair (26-50 percent), good (51-75 percent), or excellent (76-100 percent). Evidence for buried cultural deposits was opportunistically sought through inspection of natural or artificial erosional exposures and the spoils from rodent burrows.

The pedestrian surveys complied with the California Office of Historic Preservation (1995) instructions for recording cultural resources. Photographs were taken of the APE and are curated at ASM's Carlsbad office.

### NATIVE AMERICAN PARTICIPATION/CONSULTATION

A Sacred Lands File records search with the NAHC was requested by ASM on October 17, 2012. A response was provided by Dave Singleton, the NAHC's Program Analyst, on October 22, 2012. The NAHC did indicate the presence of Native American cultural resources within 0.5 mi. of the study area. The NAHC recommended that nine local tribal groups or individuals to be contacted regarding potential sacred sites in the area. The City will perform direct consultation with tribal entities. All correspondence pertaining to the Native American Heritage Commission is included in Appendix D.

### SURVEY RESULTS

During the current intensive pedestrian survey, the entire APE was surveyed for cultural resources. The APE is characterized by moderate and steep slopes, which are bisected by firebreaks where the vegetation has been cleared (Figure 3), by the current Lindley Reservoir Water Tank and associated features, and by Hubbard Avenue. The areas within the APE adjacent to the water tank and Hubbard Avenue have been modified and include an asphalt road and evidence of a disturbed landscape. The remainder of the APE contains a native landscape. The APE contains dense vegetation covering the majority of the Project area, including buckwheat,

dry nonnative grasses, chamise, white sage, beavertail cactus, and sugar bush. Ground surface visibility within the APE was predominately poor, due to the dense vegetation. Modern impacts, such as trash, imported gravel, irrigation pipes, and erosion control items, were identified across the APE.



Figure 3. View of the thick vegetation, cleared fire break and slopes within the project area, facing east.

## **Prehistoric Archaeological Sites**

There are no previously recorded cultural resources sites within the APE. No newly discovered prehistoric sites or isolates were identified during the survey.

## **Historical Structures**

### **Lindley Reservoir Water Tank (P-37-032874)**

The Lindley Reservoir Water Tank was identified during the survey as a historic structure. The water tank has not been previously recorded. The water tank is a 2.0-mg welded steel potable water tank that is 120 ft. in diameter. It has a floor elevation of 905.0 ft. amsl. It has buried inlet and outlet pipes (Figure 4). On the southwest side of the tank there is an 18-in. outlet line with a control valve on the outlet line. The tank overflow and drain lines discharge into a riprap lined basin. Associated metal and PVC pipes run downhill into the water tank (Figure 5). The area surrounding the water tank is fenced with chain-link fencing and barbed wire. Two associated concrete cinder block structures are abandoned drain and pressure-reducing stations, and are located west of the water tank along Hubbard Avenue. The two structures no longer have roofs



Figure 4. Overview of the Lindley Reservoir Water Tank, the outlet line and riprap lined drainage basin, facing east.



Figure 5. Metal and PVC pipes running downhill into the Lindley Reservoir Water Tank, facing north.

and contain rubble and the remains of a piping system (Figure 6). On the northwest side of the tank is a recycled water control valve and landscape irrigation booster pump enclosed behind fencing (Figure 7). There are two buried recycled water tank access hatches and a raw water connection point at the top of the hill outside the APE, but they are not part of the reservoir system. They are part of the Leslie Lane Recycled Water Reservoir system constructed in 2001 and the raw water line installed between 2006 and 2008 (John Kearney, personal communication 2012).



Figure 6. Associated but abandoned drain and pressure reducing stations (concrete cinder block structures) and the Lindley Reservoir Water Tank, facing west.



Figure 7. A recycled water control valve and landscape irrigation booster pump behind enclosed fencing, facing north.

### **3. EVALUATION**

#### **EVALUATION OF THE LINDLEY RESERVOIR WATER TANK**

ASM was charged with evaluating the potential historical significance of the Lindley Reservoir Water Tank (P-37-032874) because it is more than 50 years old and is associated with the Escondido Municipal Water District (EMWD), which has provided water to the greater Escondido area since the early twentieth century. ASM evaluated the Lindley Reservoir Water Tank in compliance with the Section 106 of the NHPA, CRHR, and other applicable federal, state, or local laws, ordinances, rules, regulations, and policies.

##### **Previous Studies**

The Lindley Reservoir Water Tank has not been previously documented or evaluated.

##### **Archival Research**

ASM had completed a previous evaluation on another segment of the EMWD system and had already prepared a historic context for that system. Additional research to gather drawings and data concerning the purpose and use of the reservoir system was completed by contacting the EMWD. John Kearney Principal Engineer of MWH Global (a contracted company working for the EMWD) provided necessary primary sources, and secondary sources were gathered as appropriate to explain the reservoir's association with later developments in the EMWD's water system.

##### **Field work**

ASM located and documented the Lindley Reservoir Water Tank on November 12, 2012. The entire area surrounding the water tank was surveyed and photographed. The resource is evaluated below and recorded on a California Department of Parks and Recreation Building Structure and Object Form, attached as Appendix E. All records, maps, and photographs are archived at the ASM Carlsbad office.

##### **Historical Context for Escondido and Lindley Reservoir Water Tank**

The history of most western towns begins with water, especially towns with an agricultural beginning. The greater Escondido area is one such area. From Escondido's inception as a town in 1886 to the present day, the area has become a major contributor to the agricultural economy of San Diego County. An assured water supply was essential for a growing and thriving agricultural town. It was the Escondido Irrigation District and its successor, Escondido Mutual Water Company, that initiated and facilitated early water development for the greater Escondido area by conveying water from the San Luis Rey River through the Escondido Canal (1895). Today, water from Lake Henshaw and the San Luis Rey River still passes through the Escondido Canal, providing water to Escondido and Vista, as well as Rincon Reservation. Water is also obtained from the Colorado River and from the State Water Project through the Metropolitan Water District (MWD) and San Diego County Water Authority (SDCWA).

### **Escondido: Settlement and Growth**

Confirmation of rancho boundaries across the county in the late 1860s and early 1870s drew additional settlers as land became officially conveyable. Thereafter, small farming communities were established. Around 1886, El Rincon del Diablo Rancho, now generally occupied by the City of Escondido, was opened to settlement. By that time, horticulture had already begun around the county with many of the earliest plantings in fruit trees and grapes. Escondido developed during that boom time as a new citrus-growing community that also developed grapes, hay, and grain, and is credited with planting the first avocado tree in the county (Heilbron 1936:207). By 1890, the city had grown to 541 residents (U.S. Census Bureau, 1900:439). While ranching and farming had been important livelihoods in San Diego County, agriculture increasingly became an important economy. Water projects developed across the county in the late nineteenth and early twentieth centuries that made this possible. Agricultural crops centered on avocado and other subtropical fruits primarily grown in near-coastal areas, such as Vista and Escondido. Honey and winter vegetables were grown in other parts of the county. In 1935, the primary county exports were citrus, poultry, and dairy with Escondido supplying almost half of the county's exports. By 1936, Escondido led the county in citrus production and was the foremost producer of avocados and citrus for the state. An assured water supply for irrigation and domestic use was pivotal to the area's success. In addition to ranching, San Diegans began producing chicken eggs. Large producers during the heyday of chicken production (1908-1935) were in Lemon Grove, La Mesa Heights, Spring Valley, Sunnyside, Chula Vista, El Cajon, Lakeside, Escondido, and Ramona (Heilbron 1936). Escondido transitioned from a rural town of 755 in 1900 to a growing agriculturally based city of 3,421 in 1930, a significant increase of 353 percent (U.S. Census Bureau, 1900:439, 1930:137).

Farmers across San Diego County contributed greatly during World War II, and by 1943, the farmers' income in the county had increased 230 percent (Day and Zimmerman Report 1945:136). During and following World War II, military work brought more commercial companies to the county and drew civilians and military works from all over the United States. Agricultural communities flourished and population centers expanded with an assurance of a greater water supply through the First San Diego Aqueduct that tapped the Metropolitan Water District's Colorado River Aqueduct at San Jacinto, California. It was in operation in 1947, and the second aqueduct was completed in 1958 (Sholders 2002; USDI Bureau of Reclamation 2009). By 1960, over one million people lived in the county, and between 1950 and 1970, bedroom communities such as El Cajon, Escondido, Chula Vista, and Oceanside experienced a tremendous growth rate (between 214 and 833 percent) (Engstrand 2005:166; U.S. Census Bureau 1960).

### **Water Development for Escondido**

Early homesteaders and early investors ranched, farmed, and made a profit from the old Rancho Rincon del Diablo before a local corporation, Escondido Land and Town Company, acquired the property in 1885. As was common with many early settlements in the drier regions of the western United States, water quickly became a catalyst for sustained development. Seasonal rainfall could not support an agricultural community set on growing citrus, deciduous fruits, and grapes, and quickly prompted the organization of a water company. The first attempt made by the San Luis Rey Flume Company was a large endeavor, an attempt to supply water to Escondido, San Marcos, Vista, the entire San Luis Rey valley, Carlsbad, and Encinitas. Surveys

of the area identified the possible routes for the canal and location for the main dam at Warner Ranch. Despite the extensive planning, the boom in San Diego busted, and raising capital became difficult. Those settlers who homesteaded in Escondido with the promise of water had already planted crops that were in jeopardy. In response, local pioneers organized under the Wright Irrigation Act (1887) as the Escondido Irrigation District (EID) in 1889 (Escondido Mutual Water Company 1932; Don Lincoln [Endeman, Lincoln, Turek, & Heater law firm], personal communication 2010). EID was one of the few successful irrigation districts that organized in the nineteenth century under that act (JRP Historical Consulting Services 2000:14; Schuyler 1901:2).

Early on, the EID floundered as the board tried to identify a plan that would work and that they could agree to fund. While several other water sources were considered, it was not until 1893 that S. M. Stewart led the charge to develop the San Luis Rey for the Bear Valley at a reasonable price. W. A. Sickler surveyed a conveyance route that grew out of the survey done years earlier by engineer James Schuyler and his assistants E. L. Dorn and E. F. Tabor. Once the plan had been outlined, the EMWC filed for the water rights necessary to operate the system. Bonds were then secured and bids made on the project in the summer of 1893. A Midwestern contractor, E. I. Doty, won the bid and signed the contract in June 1894. Securing right-of-ways through newly designated Indian reservation lands of Rincon and La Jolla meant that the EID agreed in turn to provide water to the reservations for agricultural and domestic use via a flume. Work began in full force in fall 1894 with the intent to have stored water by 1895 (Escondido Mutual Water Company 1932). A brush-and-rock dam diverted water that was conveyed via the Escondido Canal and terminated at the new rock-fill dam and reservoir (later known as Bear Valley/Wohlford Reservoir) in Bear Valley (Don Lincoln, personal communication 2010).

The original 15.56-mi. canal included a large earthen ditch section, along with flume and tunnel sections (Schuyler 1901:5). Temporary camps were erected for the workers along the ditch as they excavated the land by hand and hauled the materials by horse-drawn wagons over difficult granitic terrain. Seventy-five men were assigned to the construction of the new reservoir's 76-ft.-high dam comprised of blasted granite rock from the nearby mountain side. By March 1895, the canal and reservoir were ready to receive water, but the first delivery from the reservoir was made on July 5, 1895 (Escondido Mutual Water Company 1932). Given the difficult path of the canal, construction costs had doubled to \$80,000. After exhausting the \$250,000 bond, another \$100,000 was needed for finishing the project, acquiring necessary lands and purchasing the existing water distribution system of the City of Escondido (Escondido Mutual Water Company 1932). Releases were made along the canal for Rincon Reservation as the canal passed through the La Jolla and Rincon Indian reservations (Don Lincoln, personal communication 2010). Construction of the canal opened up Escondido to growth and development.

Mounting costs and frustrations with water delivery prompted the election of another EID board in 1895. The project was burdened with a number of concerns: the legitimacy of the Wright Act, 1897-1899 project improvements costs, and farmers strapped with tremendous debt. By 1898, the City of Escondido began pumping water for the city and the EID ran out of money. No one wanted to move to Escondido with its compounding interest and water tolls. The dire situation became worse with a massive fire in fall 1904 that consumed a large portion of the wooden flume of the canal and meant the end of the EID. A new organization, Escondido Mutual Water

Company, found the necessary funding to secure EID's assets and gave the EID stock in the new company that officially met in May 1905. Key figures in the transition period were A. W. Wohlford, W. M. Sickler, and Albert Bevan. The burned flume sections were repaired or replaced, and water was finally delivered again (Escondido Mutual Water Company 1932). Some have indicated that Chinese immigrants and Native Americans may have aided in reconstructing damaged portions of the canal (Don Lincoln, personal communication 2010).

Once the EMWC took over, it became apparent that the neglected canal required immediate improvements to sections of the flume. Non-customer investors opposed the idea, but the EMWC won out and secured additional funds through a series of stockholder assessments beginning in 1909. Flume sections were replaced by wide cement-lined ditches, tunnels through rock instead of around rocky ridges and old ditches were enlarged and relined, and the distribution system around the valley was also improved in an effort to upgrade the system so that it could continue to supply the amount of water it had been designed to convey (Escondido Mutual Water Company 1932). One of the improvements was a 1,900-ft. tunnel blasted through Rodriguez Mountain in 1912 (*Daily Times Advocate* 1912). This series of improvements finally provided the greater Escondido area with a permanent and stable water system. Although country users reaped the benefits of the improvements, those in the city complained that needed improvements to the city distribution system were not forthcoming. EMWC agreed to sell its city infrastructure back to Escondido, but a deal was not struck until 1923 (Escondido Mutual Water Company 1932).

Harnessing hydro-electric energy from canal drops was another possible benefit that could further stabilize the EMWC system and provide infrastructure for future growth. While a fledgling Escondido Utilities company attempted to provide limited electricity to the city through steam generation, it was not until 1915-1916 that the Bear Valley and Rincon Powerplants began providing energy to EMWC stockholders (Escondido Mutual Water Company 1932). Construction on the Rincon Penstock began in June 1914, following a February 1914 contact between the EMWC and the United States on behalf of the Rincon Indians that stipulated a water delivery agreement and the need for the penstock and power plant that would generate hydroelectricity. The agreement also provided for transmission lines across the Rincon and San Pasqual Indian reservations. Power provided to Rincon was for pumping water that, in combination with the delivery from the penstock, was to provide the reservation with its agreed-upon water delivery (United States 1914). In 1915, the Rincon penstock, power plant, and service road were completed, and the Bear Valley and Rincon power plants were linked by an EMWC transmission line by September 1915. Bear Valley Powerplant provided the first electricity in September 1915, and Rincon Powerplant came on line in May 1916 via trunk distribution lines (*Daily Times Advocate* 30 May 1914; Escondido Mutual Water Company 1932; Pete Klein and Lori Vereker [City of Escondido] personal communication 2011; Don Lincoln, personal communications 2010, 2011). Together, Bear Valley and Rincon Powerplants quickly increased the valley's access to electricity by 1931, providing electrification for stoves, water heaters, refrigerators, and other appliances. Electrification not only provided an additional service to stockholders, but it provided an important revenue source for water operations (Escondido Mutual Water Company 1932).

During the 1920s, there were a number of changes to the EMWC system. In 1922, a new siphon constructed in Hellhole Canyon bypassed an estimated 2 to 3 mi. of the original canal. This approximately 2,000-ft. siphon was constructed to avoid the breaks and slides in that area. That same year, Henshaw Dam and Lake were created as a supplemental water supply for the EMWC system. William G. Henshaw had acquired the historic Warner's Ranch and its water rights under the San Diego County Water Company years earlier, in 1911. Ed Fletcher and Henshaw had collected water rights from the ranch to the ocean, acquiring forms and deeds whereby owners of riparian water rights agreed for a sum of money not to contest the planned dam on the San Luis Rey River. Two groups held out: the Bureau of Indian Affairs, which represented the Rincon and Pala reservations, and the EMWC. The EMWC had begun seeking an expansion in its water rights in 1920 and finally made an agreement with the San Diego County Water Company. The deal gave the EMWC more water and the newly established Vista Irrigation District (VID) became a customer of the EMWC. San Diego County Water Company had water rights at Warner Ranch and also beyond Escondido, but did not hold water rights between the diversion dam through Escondido, since that was EMWC territory. VID acquired the water after it went through the EMWC system, below the reservoir, via the VID's flume constructed ca. 1924-1925. More water prompted the need for upgrading the EMWC system by raising the Bear Valley/Lake Wohlford Dam to 95 ft. by adding hydraulic fill to the top of the rock-fill dam and improving and enlarging the Escondido Canal during the summers of 1923-1925. A small, 15-ft. concrete diversion dam replaced the brush-and-rock dam. It helped capture and divert the timed release from Lake Henshaw (Escondido Mutual Water Company 1932; Patterson 2001; Vista Irrigation District 2011; Don Lincoln, personal communication 2010).

In the years that followed, improvements were made to the water and power systems as demand dictated. In June 1946, VID purchased the San Diego County Water Company and its assets: Henshaw Dam, Lake Henshaw, and Warner Ranch (Vista Irrigation District 2011). Following a four-year drought and increasing demands on the San Luis Rey River system, VID began supplementing its water supply in 1951 by drilling 38 wells and pumping the water into Lake Henshaw (Patterson 2001). The City of Escondido had already joined the SDCWA in 1950 for delivery of Colorado River water from the San Diego Aqueducts, supplementing its water system. Growth in the Escondido area prompted its residents to back the EMWC's application to be a member of the SDCWA (Escondido Mutual Water Company 1952). Since only public companies could access the water, Escondido Mutual Water Company was not eligible. This prompted the formation of Rincon del Diablo Municipal Water District in 1954 and the sharing of deliveries between the water district and water company. The new water district provided water to the Escondido valley lands not served by EMWC. VID also became a member of the SDCWA in 1954 (City of Escondido 2011; McGrew 1988:42; Vista Irrigation District 2011). In the early 1960s, the City of Escondido wanted to purchase the EMWC, but the water company did not become owned by the City until 1970. By that time, a law suit had been brought against the EMWC by the Rincon and La Jolla Indians alleging breaches of certain of the water rights contracts on the San Luis Rey River and seeking to void certain rights-of-way and water contracts. This law suit, together with the FERC proceeding, is proposed to be resolved by the Settlement Agreement (City of Escondido 2011; McGrew 1988:39). Additions to the water system in the 1970s were Dixon Dam and Lake, and a filtration plant (McGrew 1988:40). By 1982, it is estimated that the Escondido Canal was providing residents of Escondido and VID

with one-third of their water but at a fraction of the cost of Colorado River and Feather River water (Knight 1982).

### **The Lindley Reservoir Water Tank**

The Lindley Reservoir Water Tank was constructed in 1950 by the EMWD as part of its water system (Figure 08) (John Kearney, personal communication 2012). The Lindley Reservoir Water Tank and the EMWD was finally acquired by the City of Escondido in 1970, the same year the Escondido-Vista Water Treatment Plant was constructed (City of Escondido 2012). Today, the Lindley Reservoir is one of 11 reservoirs that are part of the Escondido-Vista Water Treatment Plant (1970) system that serves the City of Escondido (John Kearney, personal communication 2012).

### **Criteria for Historic Resource Evaluations**

The evaluation of the Lindley Reservoir Water Tank was completed in compliance with the Section 106 of the NHPA, CRHR, and other applicable federal, state, or local laws, ordinances, rules, regulations, and policies.

#### **National Register Criteria for Evaluation**

Sections 106 and 110 of the NHPA are the primary directives for cultural resource preservation. Section 106 mandates compliance with NHPA through the identification, evaluation of cultural resources and the consideration of effects to NRHP-eligible resources. Regulations that govern the Section 106 review process are stipulated in 36 CFR Part 800. These regulations specify that each Federal agency consult with the State Historic Preservation Officer (SHPO) to determine if a property is eligible for the NRHP (36 CFR 800.4). Section 110 established procedures for Federal agencies managing or controlling property. Among other things, agencies must assume responsibility for the preservation of historic properties under their jurisdiction and, to the maximum extent feasible, use historic properties available to the agency. Amendments to Section 110 made in 1992 require each Federal agency to establish a historic preservation program. The program must provide for the identification and protection of the agency's historic properties and ensure that such properties are maintained and managed with due consideration for preservation of their historic values [16 U.S.C. § 470h-2(a)(2) (1994)].

Pursuant to the NHPA, NRHP eligibility criteria have become the standard for evaluating significance. As published in the Federal Register (November 16, 1981, 46 (220):50189) they are stated as follows:

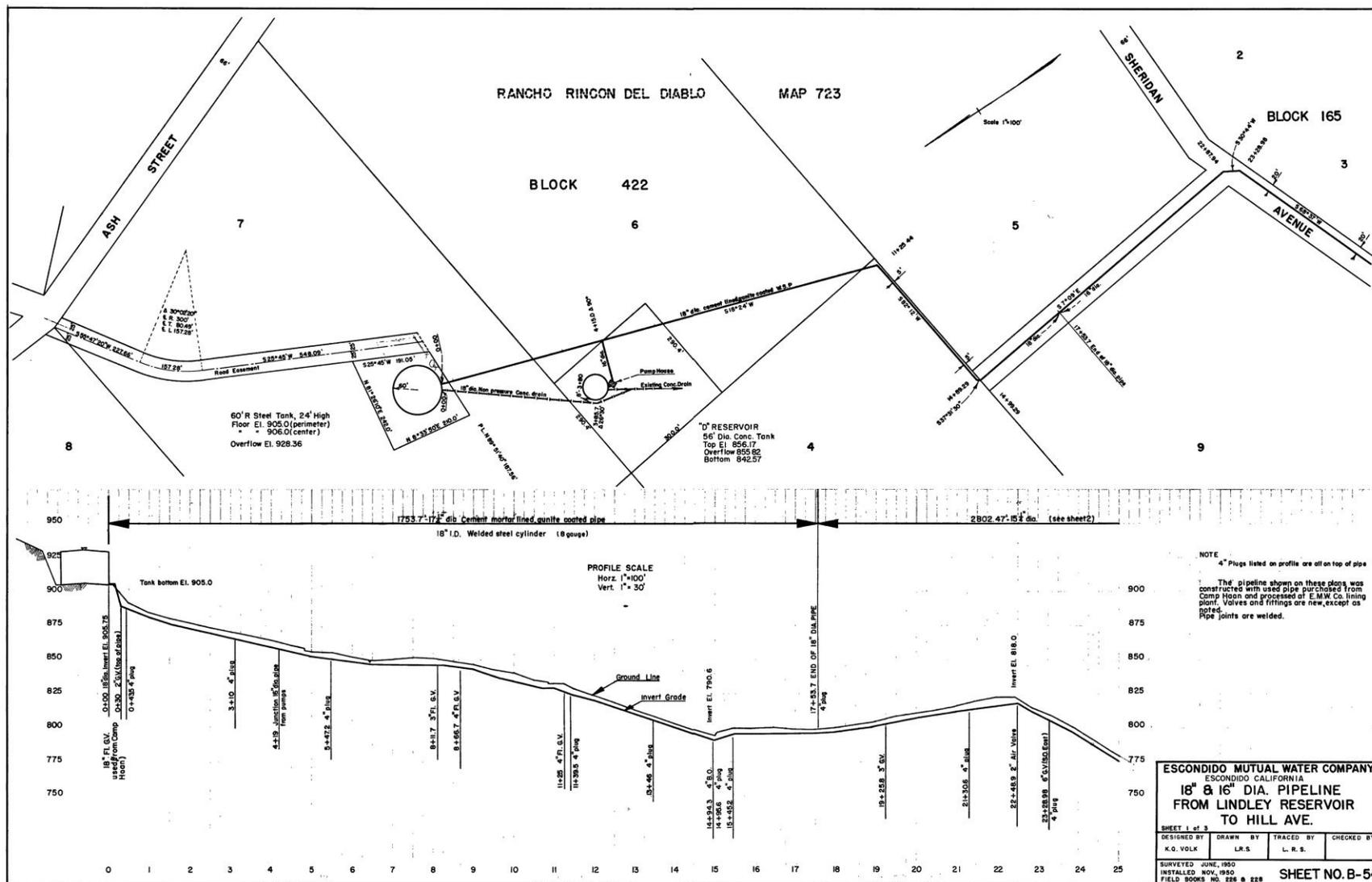


Figure 8. Drawing showing the Lindley Reservoir Water Tank (60-ft. Steel tank, 24-ft high) and its outlet/overflow drain to "D" Reservoir and Pump House. Only the Lindley is located within the APE.

The quality of significance in American history, architecture, archaeology, 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 that:

- (a) Are associated with events that have made a significant contribution to the broad patterns of our history; or
- (b) Are associated with the lives of persons significant in our past; or
- (c) 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) Have yielded or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

In addition to meeting at least one of the eligibility criteria, a property must also retain sufficient integrity to convey its significance. Integrity is a quality that relates to the historic authenticity of a property. The NRHP defines seven elements of integrity: location, design, setting, workmanship, materials, feeling, and association. Location and setting relate to the relationship of a property to its environment. Design, materials, and workmanship relate to construction methods and stylistic details. Feeling and association relate to the ability of the property to convey a sense of historical time and place. A significant loss of integrity will render a property ineligible for the NRHP, regardless of its level of historical significance. Evaluation of a property for listing on the NRHP requires a consideration of both historical significance as defined by the evaluation criteria and integrity. The criteria under which a property is significant are relevant to the issue of integrity, because the property must retain sufficient integrity of those elements relevant to the qualifying criteria. For example, for an engineering structure that qualifies for listing under Criterion C, integrity of design, workmanship, and materials is paramount.

#### **The California Register Criteria for Evaluation**

Lead agencies have a responsibility to evaluate historical resources against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources. Mitigation of adverse impacts is required if the proposed project will cause substantial adverse change. Substantial adverse change includes demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired. While demolition and destruction are fairly obvious significant impacts, it is more difficult to assess when change, alteration, or relocation crosses the threshold of substantial adverse change.

The CRHR includes resources listed in, or formally determined eligible for listing in, the NRHP, as well as some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts), or that have been identified in a local historical resources inventory, may be eligible for listing in the CRHR and are presumed to be significant resources unless a preponderance of evidence indicates otherwise.

Generally, a resource shall be considered by the lead agency to be “historically significant” if the resource meets the criteria for listing on the CRHR, cited as Pub. Res. Code SS5024.1, Title 14 CCR, Section 4852, consisting of the following:

- (1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
- (2) It is associated with the lives of persons important to local, California, or national history; or
- (3) It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or
- (4) It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

### **City of Escondido Municipal Code**

The City of Escondido Municipal Code (Chapter 33 Zoning, Article 40 – Historical Resources, Sec. 33-794) states that historical resources eligible for the local register or historical landmark status must conform to one or more of the criteria listed below. Structural resources eligible for the local register must be evaluated against Criteria 1-7 and must meet two of those criteria. Signs eligible for listing on the local register must meet one of Criteria 8-10. Landscape features must meet Criterion 11. The Criteria are as follows:

- (1) Escondido historical resources that are strongly identified with a person or persons who significantly contributed to the culture, history, prehistory, or development of the City of Escondido, region, state or nation;
- (2) Escondido building or buildings that embody distinguishing characteristics of an architectural type, specimen, or are representative of a recognized architect’s work and are not substantially altered;
- (3) Escondido historical resources that are connected with a business or use that was once common but is now rare;
- (4) Escondido historical resources that are the sites of significant historic events;
- (5) Escondido historical resources that are fifty (50) years old or have achieved historical significance within the past fifty (50) years;
- (6) Escondido historical resources that are an important key focal point in the visual quality or character of a neighborhood, street, area or district;
- (7) Escondido historical building that is one of the few remaining examples in the city possessing distinguishing characteristics of an architectural type;
- (8) Sign that is exemplary of technology, craftsmanship or design of the period when it was constructed, uses historical sign materials and is not significantly altered;
- (9) Sign that is integrated into the architecture of the building, such as the sign pylons on buildings constructed in the Modern style and later styles;
- (10) Sign that demonstrates extraordinary aesthetic quality, creativity, or innovation;

- (11) Escondido landscape feature that is associated with an event or person of historical significance to the community or warrants special recognition due to size, condition, uniqueness or aesthetic qualities.

### **Evaluation of the Lindley Reservoir Water Tank**

The Lindley Reservoir Water Tank was evaluated for NRHP eligibility since it was constructed in 1950. Its construction was part of an expansion of the EMWD's water system during a period of transition when a greater water supply was needed for agricultural, residential and some commercial customers in a growing community after World War II. Today, the Lindley Reservoir is one of 11 reservoirs that are part of the Escondido-Vista Water Treatment Plant (1970) system that serves the City of Escondido (John Kearney, personal communication 2012). Reservoirs or water tanks were added over time as service areas expanded and new water sources were added. Improvements of water features, such as a water tank, are necessary and are a common occurrence in water systems. While the Lindley Reservoir Water Tank is the original water tank (John Kearney, personal communication 2012) and its integrity is largely intact, its historical importance under Criterion A of the NRHP does not rise to the level of significant that would make it eligible to the NRHP.

The Lindley Reservoir Water Tank was constructed by the EMWD in 1950 and was acquired by the City of Escondido in 1970, the same year the Escondido-Vista Water Treatment Plant was constructed. It is not recommended as eligible under Criterion B because there is no association with any historically important individual. The materials and construction of the Lindley Reservoir Water Tank are not uniquely characteristic of its time of construction. Instead, water tanks are fairly common structures often utilized to serve growing communities after World War II. Since the tank is a structure that is commonplace, it is not recommended as eligible under Criterion C. The resource is not recommended eligible under Criterion D because data recovery would likely not yield important historical data.

Similarly, these segments of the Lindley Reservoir Water Tank are not recommended as eligible to the CRHR under Criteria 1-4 or the Escondido local register under Criteria 1-7.

## **4. MANAGEMENT CONSIDERATIONS – MITIGATION MEASURES AND DESIGN CONSIDERATION**

### **NO SIGNIFICANT ADVERSE EFFECTS**

No significant cultural resources were identified during the survey. The Lindley Reservoir Water Tank meets the age threshold for eligibility; however, it is not recommended eligible for listing on the NRHP, the CRHR, or the local register. Therefore, there will be no adverse effects to cultural resources from the proposed project.

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## **6. LIST OF PREPARERS AND PERSONS AND ORGANIZATIONS CONTACTED**

Shelby Gunderman Castells (ASM Affiliates): Acted as Principal Investigator and Field Director, and prepared the technical report.

Sarah Stringer-Bowsher (ASM Affiliates): Research and prepared the evaluation of the Lindley Reservoir Water Tank.

Mark Becker (ASM Affiliates): Acted as Project Manager.

Nick Doose (SCIC): Conducted the CHRIS records search

David Singleton (NAHC): Conducted the Sacred Lands record search.

# APPENDICES

**APPENDIX A**  
**Area of Potential Effect Map**



The Area of Potential Effect (APE) for the Lindley Tank Replacement Project.

**APPENDIX B**  
**SCIC Record Search – *Confidential***

**APPENDIX C**  
**Personnel Qualifications**

**Shelby M. Castells, M.A., RPA**  
**Senior Archaeologist**

**Start date:** March 9, 2009

**Firm Name:** ASM Affiliates, Inc., Carlsbad, California

**Total Years of Experience:** 6

**Employment History:**

2009 Associate Archaeologist, ASM Affiliates, Inc., Carlsbad, California  
2008–2009 GIS Specialist/Archaeologist, County of San Diego, Parks and Recreation  
Department, San Diego, California  
2007-2008 Archaeologist, URS Corporation, San Diego, California  
2007-2008 Collections Manager, San Diego State University- Anthropology Department,  
San Diego, California  
2007-2008 Field Archaeologist, ASM Affiliates, Inc., Carlsbad, California  
2006-2007 Field Archaeologist, EDAW, San Diego, California  
2006 Archaeology Intern, George Washington Fredericksburg Foundation,  
Fredericksburg, Virginia  
2005-2006 Archaeologist, Professional Archaeological Services, San Marcos, California

**Education:**

M.A. 2010/Anthropology/San Diego State University  
B.A. 2003/Anthropology/University of California, San Diego

**Registrations:**

2010 Register of Professional Archaeologists

**Professional Memberships or Affiliations:**

Society for Historical Archaeology  
Society for California Archaeology

**Computer Skills:**

ArcGIS  
Pathfinder  
SPSS  
Past Perfect  
Trimble data collection and post processing  
Microsoft Office Suite

**Awards/Commendations:**

Graduate Equity Fellowship Grant, San Diego State University, 2007  
Norton Allen Scholarship, San Diego State University, Anthropology Department, 2008

**Clearances:** 40-Hour HAZWOPER

**Citizenship:** USA

**Presentations:**

2011 Society for Historical Archaeology Conference on Historical and Underwater  
Archaeology, January 2011  
Spring Valley Historical Society, February 2011  
2010 Society for California Archaeology 2010 Southern California Data Sharing  
Meeting, October 2010

**Languages:** none

**References:**

Dr. Lynne Christenson, County Historian, San Diego County Parks and Recreation,  
(619) 472-2734

Brian Glenn, Cultural Resources Group Leader, URS, (714) 345-9883

Dr. Seth Mallios, Professor, San Diego State University, smallios@mail.sdsu.edu

David Muraca, Director of Archaeology, George Washington's Fredericksburg Foundation,  
(540) 370-0742

**Professional Profile:**

Ms. Castells has six years of experience in all manners of professional archaeology in southern California and Virginia. She earned her B.A. degree in Anthropology from the University of California, San Diego in 2003, and received a M.A. in Anthropology, concentration Archaeology, at San Diego State University in 2010. Her interests focus on historical archaeology and regional history of southern California. She has been involved with multiple survey, monitoring, testing, and data recovery projects within the City of San Diego and the counties of San Diego, Imperial, Orange, Los Angeles, Riverside, San Bernardino, and Kern, as well as in the Puget Sound region of Washington and the Chesapeake region of Virginia. Ms. Gunderman serves ASM as Senior Archaeologist.

**Selected Project Experience:**

A Cultural Resources Assessment of the Puget Sound Nearshore Ecosystem Restoration Projects (PSNERP) Area - Literature and Data Review and Synthesis, U.S. Fish & Wildlife

Service (USFWS), NW Washington, 2011. As Project Archaeologist, conducted a cultural resource records/literature search for the project area, including a review and compilation of archaeological reports, field notes, and site records forms on file at the Washington State Department of Archaeology and Historic Preservation (DAHP); General Land Office (GLO) maps, notes, and surveys; government land patent records; and ethnographic notes, histories, historic maps, and environmental documentation. Assessed the potential for cultural resources in the project area based on the records search data. Provided recommendations on where future archaeological efforts should be made within the project area in the project technical report. Client Reference: Jorie Clark, U.S. Fish and Wildlife Service, (541) 737-1575.

Cultural Resources Study for the Silurian Valley Wind Project, Iberdrola Renewables, San Bernardino County, California, 2011. As Crew Chief, organized and led archaeological surveys of the project area. Identified, recorded, and mapped prehistoric and historical archaeological sites, including a historic railroad town. Prepared DPR site forms and site documentation for incorporation into a technical report. Client Reference: Harley McDonald, Iberdrola Renewables, (760) 445-3081.

Cultural and Historical Resources Survey and Evaluation Report for the San Luis Rey Indian Water Rights Settlement Agreement, Escondido Canal Undergrounding, Atkins, San Diego County, California, 2011. As Field Director organized and led archaeological field crews for survey of the project area. Documented and evaluated the Escondido Canal and the Rincon Penstock. Identified and recorded archaeological sites within the project area. Directed correspondence between the San Pasqual Indian Reservation, the Rincon Indian Reservation, the Bureau of Indian Affairs (BIA), and Atkins. Prepared DPR site forms and a technical report regarding the project findings. Client Reference: Diane Sandman, Atkins, (858) 514-1068

San Diego Gas & Electric (SDG&E) Cultural Resources On-Call Contract, San Diego Gas & Electric Company, San Diego, Riverside, Imperial, and Orange Counties, California, 2009-2012. As Field Director organized and led archaeological surveys of project areas on an as-needed basis. Identified, recorded, and mapped sites within the project areas. Provided management recommendations, pole placement recommendations, and cultural resources monitoring. Wrote DPR forms and technical reports regarding project findings. Client Reference: Dr. Susan Hector, San Diego Gas & Electric, (858) 654-1279.

Archaeological Survey Report for the San Luis Rey River Park, Dudek, San Diego County, California, 2011. As Field Director, organized surveys of the project area; identified, and documented prehistoric and historical sites within the project; performed historical research at several archives and repositories. Consulted with the Native American Heritage Commission (NAHC). Wrote DPR forms and researched and wrote a technical report regarding project findings. Client Reference: Brock Ortega, Dudek, (760) 479-4254; Jessica Norton, County of San Diego, Department of Parks and Recreation, (858) 966-1379.

Archaeological and Historical Resources Survey and Testing Report for the Rabago Otay Technology Business Park, RBF Consulting, San Diego County, California, 2010. As Field Director, organized field crew and a Native American monitor to perform surveys and subsequent excavations in the project area. Identified and documented sites within the project area. Photographed and recorded historical buildings. Researched building dates and wrote building descriptions. Consulted with the NAHC. Performed laboratory work, artifact analysis, and prepared the collection for curation. Prepared DPR forms and researched and wrote a report regarding project findings Client Reference: Alex Jewell, RBF Consulting, (949) 472-3505.

Archaeological Survey Report for the Escondido Creek Properties, Dudek and Associates, San Diego County, California, 2010. As Field Director, organized surveys of the project area; identified, recorded, and mapped prehistoric and historical sites; performed background historical research at several archives and repositories. Consulted with the NAHC. Wrote DPR forms and researched and wrote a technical report regarding the project findings. Client Reference: Brock Ortega, Dudek, (760) 479-4254; Jessica Norton, County of San Diego Department of Parks and Recreation, (858) 966-1379.

Archaeological Survey Report for the Pascoe, Helix-Lambron, and Cielo Azul Parcel Additions to the Del Dios Highlands Preserve, Dudek and Associates, San Diego County, California, 2010. As Field Director, organized surveys of the project area; identified and documented prehistoric and historical sites within the project area; performed background research at several archives and repositories. Consulted with the NAHC. Wrote DPR forms and researched and wrote a technical report regarding the project findings. Client Reference: Brock Ortega, Dudek, (760) 479-4254; Jessica Norton, County of San Diego Department of Parks and Recreation, (858) 966-1379.

Archaeological Monitoring of the Downtown Library Site Remediation Project, City of San Diego, San Diego, California, 2010. As Field Director, organized and scheduled archaeological and Native American monitoring of construction activities for the new City of San Diego Public Library. Performed historical research, consulting archives and historic maps, to evaluate the discovery of any cultural resources uncovered during construction. Researched and wrote a technical report regarding project findings. Client Reference: Myra Hermann, City of San Diego Development Services Department, (619) 446-5372.

Cultural and Historical Inventory and Impacts Assessment Report for San Diego Association of Governments Sorrento-to-Miramar Double Track Project, David Evans and Associates, San Diego County, California, 2010. As Crew Chief, organized and led field crews during testing and data recovery on the ethnohistoric village site of *Ystagua*. Excavated test units to a depth of 150 cm and wet-screened all excavated material. Used GPS to map excavations. Performed laboratory work including cleaning, sorting, and cataloging artifacts. Analyzed the artifact collection, produced report quality tables and graphs describing the collection, and prepared the collection for curation. Client Reference: David Evans & Associates, Inc., (858) 614-4360.

Archaeological Resources Survey Report for the Market Street Row Homes Project, Thamyco, LLC, San Diego, California, 2010. As Project Manager and Field Director, conducted a pedestrian field survey of the project area to assess the presence or absence of potentially significant historical and prehistoric resources within the project area. Consulted with the NAHC and performed subsequent historical research. Researched and wrote a technical report regarding project findings. Client Reference: Lien Vu, Thamyco, LLC.

Cultural Resource Study for the Hudson Ranch II Project, Environmental Management Associates, Imperial County, California, 2010. As Field Director, organized the archaeological field crew, conducted survey to assess the presence or absence of potentially significant resources within the project and contributed to a report regarding the project findings. Client Reference: Dwight L. Carey, Environmental Management Associates, Inc., (714) 529-3695.

Cultural and Historical Resources Survey and Evaluation Report for the City of San Marcos Public Works Channel Maintenance Permit Project, City of San Marcos, San Diego County, California, 2010. As Project Manager and Field Director, conducted pedestrian field surveys to assess the presence or absence of potentially significant resources and performed historical research. Consulted with the City regarding Section 106 and CEQA compliance. Wrote a technical report regarding the project findings. Evaluated public works for the NRHP and CRHR. Client Reference: Susan Vandrew-Rodriguez, City of San Marcos, (760) 744-1050.

Cultural And Historical Resources Existing Conditions Report for the North County Transit District's (NCTD's) Sorrento Valley Double Track And Bridge Replacement Project, BRG Consulting, Inc., San Diego, California, 2010. As Report Author, compiled record and literature search information, and historical documentation to produce a cultural and historical resource inventory, railroad bridge evaluation and recommendations for future work. Evaluated three railroad bridges for the NRHP and CRHR. Client Reference: Mary Bilse, BRG Consulting, Inc, (619) 298-7127.

Survey, Evaluation, and Update of NRHP Eligibility at Naval Weapons Station Seal Beach, Detachment Corona, NAVFAC Southwest, Norco, Riverside County, California, 2010. As Associate Archaeologist, conducted a survey of the architectural elements within the project area, including photography and GPS mapping of the buildings, structures, and landscape, developed GIS data layers, and produced report quality maps of the project area, architectural elements and landscape. Client Reference: Alex Bethke, NAVFAC Southwest, (619) 532-2789.

Sunrise Powerlink Assessment of Indirect Visual Impacts on the Historic Built Environment Properties, San Diego Gas & Electric, San Diego and Imperial counties, California, 2009-2011. As Field Director, surveyed potential historic buildings and structures for the assessment of indirect visual impacts along the area of indirect effects. Performed subsequent historical research on the structures with the project area and evaluated buildings and structures for significance. Contributed to the final technical report and prepared over 90 DPR site forms. Client Reference: Dayle Cheever, SDG&E, (858) 654-1856.

Inventory of Cultural Resources for the La Mesa Sewer Repair and Replacement, State Revolving Fund Project, Atkins, La Mesa, San Diego County, California, 2010. As Project Manager and Field Director, conducted pedestrian field surveys of the project area to assess the presence or absence of potentially significant historical and prehistoric resources. Consulted with the City of La Mesa and the State Water Resources Control Board regarding Section 106 and CEQA compliance. Wrote a technical report regarding the project findings. Client Reference: Diane Sandman, Atkins, (858) 514-1010.

Class III Inventory of the Cultural Resources along the Approved Sunrise Powerlink Final Environmentally Superior Southern Route, San Diego Gas & Electric, San Diego and Imperial counties, California, 2009-2011. As Associate Archaeologist, conducted pedestrian surveys within the project area to assess the presence or absence of potentially significant historical and prehistoric resources. Monitored preconstruction and construction activities within the project area. Client Reference: Dayle Cheever, SDG&E, (858) 654-1856.

San Ysidro Railroad Yard Improvement Project, Helix Environmental Planning, Inc., San Diego, California, 2009-2010. As Associate Archaeologist, conducted a field survey of the 54-acre project area to assess the presence or absence of potentially significant historical and prehistoric resources for the expansion of the rail yard freight capacity. Conducted subsurface testing of prehistoric and historic sites in the project area. Identified prehistoric and historic artifacts and recorded new and previously identified sites. Performed laboratory and artifact analysis of excavated material. Client Reference: Tim Belzman, Helix Environmental Planning, Inc., (619) 462-1515.

Sunrise Powerlink Assessment of Indirect Visual Impacts on the Historic Built Environment Properties, San Diego Gas and Electric, San Diego and Imperial counties, California, 2009-2010. As Associate Archaeologist surveyed potential historic buildings and structures for the assessment of indirect visual impacts along the area of indirect effects. Performed subsequent historical research on the structures with the project area. Client Reference: Dayle Cheever, SDG&E, (858) 654-1856.

Cultural Resource Monitoring and Discovery for the El Cajon Public Safety Center Project, San Diego Natural History Museum, City of El Cajon, San Diego County, California 2009-2010. As Associate Archaeologist, performed construction monitoring and excavated the discovery of an historic-era well. Performed laboratory and artifact analysis on recovered artifacts. Client Reference: Dr. Thomas A. Demere, San Diego Natural History Museum, (619) 232-3821 ext 232.

English Road Siphon Documentation, Imperial Irrigation District, Niland, Imperial County, California, 2009. As Associate Archaeologist, recorded and photographed an historic siphon and associated canal. Performed subsequent historical research on the siphon and canals within the project area. Client Reference: Michel D. Remington, Imperial Irrigation District, (760) 339-9279.

Cultural Resource Record Search for the El Cajon Boys and Girls Club Expansion Project, Boys and Girls Club of San Diego East County, El Cajon, San Diego County, California, 2009. As Associate Archaeologist, performed a cultural resource record search to assess the presence or absence of potentially significant historical or prehistoric resources for the construction of the El Cajon Boys and Girls Club. Client Reference: Jerry Fazio, Boys and Girls Club East County, (619) 440-1600.

Cultural Resources Inventory of the Twin Oaks Valley Elementary School Project Area, The Planning Center, San Marcos, San Diego County, California, 2009. As Associate Archaeologist, conducted survey to assess the presence or absence of potentially significant historical and prehistoric resources for the expansion and construction of the Twin Oaks Valley Elementary School by the San Marcos Unified School District. Client Reference: Andy Minton, The Planning Center, (714) 966-9220 ext 314.

Historical Resources Evaluation Report for Caltrans 805 South Segment, Caltrans District 11, San Diego County, California, 2009. As Associate Archaeologist, worked with Caltrans to produce an HRER of the built environment within the nine-mile-long project area corridor. Surveyed, screened and photographed architectural resources within the project area. Client Reference: Debra Dominici, Caltrans District 11, (619) 688-0187.

Cultural Resources Inventory of the OWD Pipeline Construction Project within Dehesa Road, Dudek, El Cajon, San Diego County, California, 2009. As Associate Archaeologist, performed a cultural resources study for the construction of a water pipeline to be included in an EIR under CEQA produced by the Otay Water District. Client Reference: Shawn Shamlou, Dudek, (760) 479-4228.

University District Survey, HDR Engineering, Inc., San Marcos, San Diego County, California, 2008. As Associate Archaeologist, conducted fieldwork, concentrating on the built environment, for the proposed City of San Marcos General Plan and Heart of the City Specific Plan to allow mixed-use development on approximately 187.38 acres. The study area lies within the Heart of the City Specific Plan area in the Barham Drive/Discovery Neighborhood; CEQA compliance. Client Reference: Sophia Mitchell, HDR Inc., (858) 712-8358.

Ramona Branch Library, HDR Engineering, Inc., County of San Diego, California, 2009. As Associate Archaeologist, conducted a field survey of the 7-acre project to assess the presence or absence of potentially significant historical and prehistoric resources for County of San Diego CEQA compliance. Client Reference: Sophia Hahl-Mitchell, HDR Engineering, Inc. (858) 712-8358.

Cultural and Historical Resources Survey for the Downtown Vista Specific Plan Update Program Environmental Impact Report, Atkins, City of Vista, San Diego County, California, 2009. As Associate Archaeologist, assisted in the identification of potential historical and prehistoric resources in the Downtown Vista Specific Plan project area through a field survey

and historical research. The historical resources survey identified three buildings out of over 300 located within the project area to evaluate for the CRHR. Client Reference: Diane Sandman, Atkins, (858) 514-1010.

Archaeological Resources Survey for the McAuliffe Park Vernal Pool Mitigation Project, BRG Consulting, Inc., San Diego County, California, 2009. As Associate Archaeologist, performed an archaeological survey of the 33-acre project area for the San Diego Unified School District within the Mira Mesa Community Planning area vernal pool mitigation site. Client Reference: Kathie Washington, BRG Consulting, Inc., (619) 298-7127 ext. 104.

Archaeological Resources Survey for the Jonas Salk Elementary School, BRG Consulting, Inc., San Diego County, California, 2009. As Associate Archaeologist, performed an archaeological survey of the 13-acre project area for the San Diego Unified School District within the Mira Mesa Community Planning area development of a new elementary school and mixed-use park. Client Reference: Kathie Washington, BRG Consulting, Inc., (619) 298-7127 ext. 104.

Historical Resource Study for the Proposed Land Acquisition Areas, Marine Corps Air Training Area, NAVFAC Southwest, Twentynine Palms, San Bernardino County, California, 2009. As Associate Archaeologist, conducted a guided historical survey within the 340,403-acre project area, to assess the presence or absence of potentially significant historical resources. Photographed and mapped resources. Performed historical research at several southern California repositories. Client Reference: George Herbst, NAVFAC Southwest, (619) 532-3146.

Historical Evaluation of the Valencia Park Library, Southeast Economic Development Corporation, Inc., City of San Diego, California, 2009. As Associate Archaeologist, conducted historical research to assess the significance of the historic building. Researched and prepared a historic context of the surrounding area. Client Reference: Chris Jones, Southeast Economic Development Corporation, Inc., (619) 527-7345.

University Avenue Mobility Plan, Helix Environmental Planning, Inc., City of San Diego, California, 2009. As Associate Archaeologist, conducted a survey of the project area to assess the presence or absence of potentially significant prehistoric and historic sites, performed historical research and inventoried historical buildings and the historic built environment within the project area, prepared for Helix Environmental Planning, Inc. and the Federal Highway Administration. Client Reference: Tim Belzman, Helix Environmental Planning, Inc., (619) 462-1515.

Survey and Testing for the Yokhol Ranch, Atkins, Kern and Tulare counties, California, 2008, As Archaeological Technician, conducted subsurface testing and pedestrian survey of the Yokhol Ranch, identified and recorded prehistoric sites and artifacts and bedrock milling features.

Survey and Testing for the All American Canal Lining Project, USDI Bureau of Reclamation, Imperial County, California, 2007. As Archaeological Technician, performed a pedestrian survey and subsurface testing of prehistoric sites. Identified prehistoric artifacts, and located and re-recorded previously identified sites. Performed data recovery in a quarry area.

**Other:**

Monitoring for Rancho Guajome Tree Planting, County of San Diego Parks and Recreation, San Diego County, California, 2009. As Archaeological Monitor, monitored the planting of approximately 30 fruit trees, in the vicinity of a known archaeological site within the Rancho Guajome County Park. Identified historic artifacts. Wrote a Monitoring Log and Report for the County of San Diego. Under the direction of Dr. Lynne Christenson.

Monitoring for Rancho Penasquitos Tree Planting, County of San Diego Parks and Recreation, San Diego County, California, 2009. As Archaeological Monitor, monitored the planting of approximately 30 fruit trees, in the vicinity of a known archaeological site within the Rancho Penasquitos County Park. Identified prehistoric and historic artifacts. Wrote a Monitoring Log and Report for the County of San Diego. Under the direction of Dr. Lynne Christenson.

Monitoring for the Rancho Penasquitos Palm Tree Removal, County of San Diego Parks and Recreation, San Diego County, California, 2009. As Archaeological Monitor, monitored the removal of palm trees within a known archaeological site and current excavation within the Rancho Penasquitos County Park. Identified prehistoric and historic artifacts and historic foundation features. Directed the tree removal crew on avoiding sensitive areas and equipment use. Wrote a Monitoring Log and Report for the County of San Diego. Under the direction of Dr. Lynne Christenson.

San Diego County Site Stewardship Program, County of San Diego Parks and Recreation, San Diego County, California, 2008-2009. As Archaeologist, researched and developed a Site Stewardship Program for volunteers to participate in monitoring and managing archaeological sites within County Parks. Includes reviewing similar programs throughout the country, creating education materials for volunteers to help identify sites and artifacts, and creating forms for recording changes within known archaeological sites. Under the direction of Dr. Lynne Christenson.

GIS Mapping of Archaeological Sites within San Diego County Parks, County of San Diego Parks and Recreation, San Diego County, California, 2008-2009. As Archaeologist, created maps of archaeological surveys and sites within County Parks using GIS software. Worked with other park employees to help preserve archaeological sites and mitigate damage from activities taking place in the parks. Under the direction of Dr. Lynne Christenson.

Records Search for the Kinder Morgan Calnev Expansion Project, URS Corporation, San Bernardino County, California, 2008. As Archaeologist, compiled the CHRIS records search data and reviewed primary and secondary historic documents to develop a historic context of the project area in San Bernardino County. The report was submitted to the BLM as the lead

agency for NEPA and the County of San Bernardino as the lead agency for CEQA. Under the direction of Brian Glenn and Jeremy Hollins.

Solar One Cultural Resources Assessment Report, URS Corporation, San Bernardino County, California, 2008. As Archaeologist, contributed to the Cultural Resources Assessment Report, submitted to the CEC for the Solar One Project in the Mojave Desert. Compiled the cultural resources section of the report including writing the LORS, the environmental setting, the cultural context, the records search and literature review sections, and compiling the CHRIS record search data. Under the direction of Brian Glenn and Jeremy Hollins.

Grand Avenue Widening Section 106 Compliance, URS Corporation, Orange County, California, 2008. As Archaeologist, performed the CHRIS records search at South Central Coastal Information Center for the project within the City of Santa Ana, California. Prepared a HPSR per the Caltrans guidelines. Developed and wrote a historic context. Under the direction of Jeremy Hollins.

Carrizo Energy Solar Farm AFC, URS Corporation, San Luis Obispo County, California, 2008. As Archaeologist, contributed to the Archaeology Survey Report, submitted to the CEC for the Carrizo Energy Solar Farm in San Luis Obispo County, California. Compiled the CHRIS records search data, performed the Native American consultation, reviewed primary and secondary historic research to develop and write a historic context, and completed DPR 523 series forms. Under the direction of Brian Glenn and Jeremy Hollins.

North Harbor Drive Demolition Project Survey for EIR, URS Corporation, San Diego County, California, 2008. As Archaeologist, performed a field survey for this CEQA level project regarding the Demolition of 50 structures at the San Diego International Airport. Project considered potential effects to a National Register-eligible historic district. Compiled the CHRIS records search data and the historic context for the EIR submitted to the San Diego Unified Port District. Under the direction of Jeremy Hollins.

Cavallo Farms Development Project, URS Corporation, San Diego County, California, 2007. As Archaeologist, performed a 21-acre pedestrian survey of the project area. Identified prehistoric artifacts and re-located a known site. Completed a cultural resources technical report for submission to the City of San Diego, California. Under the direction of Kevin Mock.

Technical Report for Palomar Road Widening Project, URS Corporation, Riverside County, California, 2007. As Archaeologist, contributed to a Cultural Resources Technical Report for submission to the Riverside County Department of Transportation for a proposed widening of Palomar Road in an unincorporated area of Riverside County, California. Under the direction of Kevin Mock.

Survey for the I-215/Newport Road Interchange Improvement, URS Corporation, Riverside County, California, 2007. As Archaeologist, performed a pedestrian field survey of the project

area in an unincorporated area of Riverside County, California. Completed a HPSR and an Archaeological Survey Report for Caltrans District 8. Under the direction of Kevin Mock.

Survey for the Coastal Rail Trail San Diego Segment, URS Corporation, San Diego County, California, 2007. As Archaeologist, performed a pedestrian field survey of portions of the approximately 10 mile long project area within the City of San Diego and La Jolla, California. Identified prehistoric and historic artifacts within the project area. Aided in the completion of a Preliminary Environmental Study for Caltrans and an Initial Study for the City of San Diego. Under the direction of Kevin Mock.

FEMA San Diego Vegetation Management Section 106 Compliance, URS Corporation, San Diego County, California, 2007. As Archaeologist, contributed to a Section 106 technical report for submission to FEMA and the California SHPO regarding a vegetation management project of approximately 680 acres within the City of San Diego, California. Under the direction of Kevin Mock.

Willow Street Bridge Section 106 Compliance, LADPW, URS Corporation, Los Angeles County, California, 2007. As Archaeologist, performed historical research regarding the seismic retrofit of a 1932 Warren Truss Bridge and the Union Pacific Railroad within Los Angeles County, California. Prepared a HPSR per the Caltrans guidelines and aided in the development of a historic context. Under the direction of Jeremy Hollins and Kevin Mock.

Long Beach Blvd. Bridge Section 106 Compliance, LADPW, URS Corporation, Los Angeles County, California, 2007. As Archaeologist, performed historical research regarding the seismic retrofit of a 1932 Warren Truss Bridge and the Union Pacific Railroad within Los Angeles County, California. Prepared a HPSR per the Caltrans guidelines and aided in the development of a historic context. Under the direction of Jeremy Hollins and Kevin Mock.

Monitoring for the Headlines Reserve, LLC. Development Project, URS Corporation, San Diego County, California, 2007. Archaeologist. Acted as an archaeological monitor for a 60-acre housing project. Completed an archaeological monitoring log and contributed to a monitoring report. Under the direction of Kevin Mock.

Waterman Junction 7,000 Acre Survey, EDAW, San Bernardino County, California, 2007. As Archaeological Technician, performed a pedestrian survey covering 7,000 acres in the Mojave Desert, near Barstow, California. Identified new sites and located and re-recorded previously identified sites. Identified both prehistoric and historical artifacts and features. Various responsibilities included operating GPS handheld units, drawing sketch maps, drawing features, and photography of survey area, artifacts and features. Under the direction of Anamay Melmed.

Tertiary Treatment Plant Project Data Recovery at Camp Pendleton, EDAW, San Diego County, California, 2006. As Archaeological Technician, conducted Phase III data recovery, excavation of 30 units in Camp Pendleton, Oceanside, California. Excavated test units to an

average depth of 150 cm. Water screened in addition to dry screening. Under the direction of Anamay Melmed.

Ferry Farm Excavation, George Washington's Boyhood Home, George Washington Fredericksburg Foundation, Fredericksburg, Virginia, 2006. As Archaeology Intern, participated in a five month paid internship excavating a 1740s colonial plantation home, the childhood home of George Washington, funded by National Geographic. Gained experience in excavation techniques, recording methods, artifact identification, and local history. Excavated 18th century features. Performed transit work. Provided interpretation of the site to visitors. Also gained laboratory experience cleaning and labeling both prehistoric and historic artifacts. Under the direction of David Muraca and Paul Nasca.

Various Projects, Professional Archaeological Services, San Diego, Orange, Riverside, and San Bernardino counties, California, 2005-2006. As Archaeological Technician, performed archaeological surveys and recorded historic and pre-historic sites throughout southern California. Cataloged and curated historic and prehistoric collections. Under the direction of Dr. Phil DeBarros.

#### **Technical Reports:**

- 2011 Dave Iverson and Shelby Gunderman  
A Cultural Resources Assessment of the Puget Sound Nearshore Ecosystem Restoration Projects (PSNERP) Area, NW Washington, Task 1: Literature and Data Review and Synthesis. U.S. Fish and Wildlife Service.
- 2011 Shelby Gunderman, Sarah Stringer-Bowsher, and Micah Hale  
Cultural and Historical Resources Survey and Evaluation Report for the San Luis Rey Indian Water Rights Settlement Agreement, Escondido Canal Undergrounding, San Diego County, California.
- 2011 Sinéad Ní Ghabhláin, Sarah Stringer-Bowsher, and Shelby Gunderman  
Archaeological Survey Report for the San Luis Rey River Park, San Diego County, California. County of San Diego Department of Parks and Recreation.
- 2011 Jerry Schaefer, Sinéad Ní Ghabhláin, Shelby Gunderman and Shannon Davis  
Archaeological and Historical Resources Survey and Phase I Testing Report for the Rabago Otay Technology Business Park San Diego County, California.
- 2011 Sinéad Ní Ghabhláin, Sarah Stringer-Bowsher, Shelby Gunderman and Michelle Dalope  
Archaeological Survey Report for Pascoe, Helix-Lambron, and Cielo Azul Parcel Additions to the Del Dios Highlands Preserve San Diego County. California, County of San Diego Department of Parks and Recreation.
- 2011 Sinéad Ní Ghabhláin, Sarah Stringer-Bowsher, Shelby Gunderman and Michelle Dalope

Archaeological Survey Report for Escondido Creek Preserve San Diego County, California. County of San Diego Department of Parks and Recreation.

- 2011 Sinéad Ní Ghabhláin, Michael P. Pumphrey, Sarah Stringer-Bowsher, and Shelby Gunderman  
Assessment of Indirect Visual Impacts on the Historic Built Environment Properties Falling Within the One-Half Mile Area of Potential Indirect Effect, San Diego Gas and Electric Sunrise Powerlink, San Diego and Imperial Counties, California.
- 2010 Shelby Gunderman, Sarah Stringer-Bowsher, and Sinéad Ní Ghabhláin  
Cultural And Historical Resources Existing Conditions Report for the North County Transit District Sorrento Valley Double Track And Bridge Replacement Project, San Diego, California.
- 2010 Micah Hale and Shelby Gunderman  
Archaeological Resources Survey Report for the Market Street Row Homes Project, San Diego, California.
- 2010 Shelby Gunderman and Sinéad Ní Ghabhláin  
Inventory of Cultural Resources for the La Mesa Sewer Repair and Replacement, State Revolving Fund Project, La Mesa, San Diego County, California.
- 2010 Shelby Gunderman and Sinéad Ní Ghabhláin  
Cultural and Historical Resources Survey and Evaluation Report for the City of San Marcos Public Works Channel Maintenance Permit Project, San Marcos, San Diego County, California.
- 2010 Jerry Schafer, Shelby Gunderman, and Don Laylander  
Cultural Resource Study for the Hudson Ranch II Project, Imperial County, California.
- 2010 Shelby Gunderman and Mark Becker  
Cultural Resource Monitoring and Discovery Report for the El Cajon Public Safety Center Project, City of El Cajon, San Diego County, California.
- 2009 Michael P. Pumphrey, Michelle Dalope, Shelby Gunderman  
Assessment of Indirect Visual Impacts on the Historic Built Environment Properties in the Mountain Springs Grade Area (Milepost 23-29) Falling Within the One-Half Mile Area of Potential Indirect Effect, San Diego Gas and Electric Sunrise Powerlink, San Diego and Imperial Counties, CA.
- 2009 Shelby Gunderman  
Cultural Resources Inventory of the OWD Pipeline Construction Project within Dehesa Road, El Cajon, California. Letter Report.

- 2009 Jill Gardner and Shelby Gunderman  
Archaeological Resources Survey for the McAuliffe Park Vernal Pool Mitigation Project, San Diego California.
- 2009 Jill Gardner and Shelby Gunderman  
Archaeological Resources Survey for the Jonas Salk Elementary School, San Diego California.
- 2009 Michael P. Pumphrey and Shelby Gunderman  
Historical Evaluation Report for the Valencia Park Library, 101 50<sup>th</sup> Street, San Diego, California.
- 2009 Don Laylander and Shelby Gunderman  
Archaeological Survey for the University Avenue Mobility Plan, San Diego, California.
- 2009 Jerry Schaefer and Shelby Gunderman  
Cultural Resource Survey for the County Center II Expansion EIR, Imperial County, California.
- 2009 Shelby Gunderman, Sarah Stringer-Bowsher, and Sinéad Ní Ghabhláin  
Historic Resource Inventory and Evaluation Report for the Operations Access Red Beach Project (p-159), MCB Camp Pendleton, California. Prepared by ASM Affiliates for NAVGAC Southwest, San Diego.

### **Teaching Experience:**

Teaching Assistant, Introduction to Cultural Anthropology, August to December 2007, SDSU. Led two discussion sections a week based on class lectures and readings. Created my own curriculum and assignments. Graded exams and held study review sessions.

Teaching Assistant, Introduction to Physical Anthropology, January to March 2003, UCSD. Assisted the professor with lectures and research, wrote test questions, and led discussion and review sessions with students. Led field trips to the San Diego Zoo for primate observations.

### **Laboratory and Academic Field Experience:**

SCrI-333 (El Monton) Research Project, University of California Santa Barbara, August 2010. Excavated and mapped an early period Chumash house pit village on Santa Cruz Island. Excavation focused on stratigraphic layers within a Chumash house pit and a detailed mapping of the house pits and different elements of the village site. Under the direction of Dr. Lynn Gamble.

Collections Management, San Diego State University, Anthropology Department, 2007 to 2008, Collections Manager. Identified, sorted, and cataloged artifacts, worked with Microsoft

Access. Prepared collections for curation and wrote site reports for collections housed at San Diego State University.

Whaley House Archaeology Project, San Diego State University, July 2008. Used a total station for archaeological mapping, datum/baseline establishment and unit layout. Excavated a well and privy area associated with the Whaley House in Old Town San Diego. Directed and assisted undergraduate students in excavation and recordation techniques. Field school directed by Dr. Seth Mallios.

Nate Harrison Historical Archaeology Project, San Diego State University, June 2008. Excavated a late 19th and early 20th century homesteader cabin on Palomar Mountain. Performed survey work to identify other features associated with the site. Curated and cataloged artifacts. Performed subsequent research focusing on ethnicity, GIS mapping, and historical settlement patterns throughout San Diego County. This research will be the basis of my thesis. Field school directed by Dr. Seth Mallios.

Cuyamaca State Park Archaeology, San Diego State University, January to May 2008. Surveyed and excavated the late prehistoric/contact period Kumeyaay village site of Dripping Springs (CA-SDI-860) in the Cuyamaca Mountains, California. Used a total station for archaeological mapping datum/baseline establishment and unit layout. Taught undergraduate students the processes of survey, excavation, flotation, and water screening. Prepared DPR forms and completed a site report. Field school directed by Dr. Lynn Gamble.

Intern to the Curator, San Diego Museum of Man, January to March 2003. Worked with the curator to inventory museum collections, proofread articles, and performed library research. Learned to identify all bones in the human skeleton, determine the age and sex of the individual, and identified many pathologies visible on the skeletal remains by participating in an osteology project studying a Native American skeletal collection from San Nicholas Island.

**Mark S. Becker, Ph.D., RPA**  
**Principal and Laboratory Manager**

**Firm Name:** ASM Affiliates, Inc., Carlsbad, California

**Total Years of Experience:** 27

**Employment History:**

2011 Principal/Laboratory Manager, ASM Affiliates, Inc., Carlsbad, California  
2007 Principal/Laboratory Director, ASM Affiliates, Inc., Carlsbad, California  
2002-2007 Senior Archaeologist/Laboratory Director, ASM Affiliates, Inc., Carlsbad, California  
2001-2002 Fellow, American School of Archaeology, Jerusalem, Israel  
2000-2001 Lithic Analyst, Science Applications International Corp., Santa Barbara, California  
1999-2000 Co-Project Director, TRC Garrow, Chapel Hill, North Carolina

**Education:**

Ph.D. 1999/Anthropology/University of Colorado, Boulder  
M.A. 1990/Anthropology/University of Illinois, Chicago  
B.A. 1986/Anthropology/Ohio State University

**Additional Training:**

2011 First Aid and CPR Certification  
2010 NLF RSO Certification for MCB Camp Pendleton, California  
2007 RSO with munitions Certification for MCB Camp Pendleton, California  
2007 First Aid and CPR Certification  
2007 30-hr OSHA Construction Industry Training Program  
2007 UXO Training for contractors, MCAS Miramar, California  
2007 UCSB Summer Extension Course on Ground Penetrating Radar, Santa Cruz Island  
2005 Ground Penetrating Radar, Basic I  
Ground Penetrating Radar, Basic II  
Ground Penetrating Radar, Advanced  
2005 NLF RSO Certification for MCB Camp Pendleton, California  
2000 UXO Training for contractors, Ft. Irwin, California  
1999 UXO Training for contractors, Ft. Bragg, North Carolina

**Registrations:**

1999 Register of Professional Archaeologists

**Professional Memberships:**

1996 Member/Society for American Archaeology  
2000 Member/American Schools of Oriental Research

2005 Member/Society for California Archaeology  
1998-2007 Member/American Anthropological Association

**Other Capabilities:** Expertise in lithic microwear analysis, lithic refitting, MS Word, Corel, WordPerfect, MS Excel, MS Access, Golden Software Surfer, GPR-Slice

**Awards/Commendations:**

2002 Education and Cultural Affairs Fellowship  
2001-2002 National Endowment for the Humanities Fellowship  
2000 Nomination for Society of American Archaeology Dissertation Award  
1998-1999 National Science Foundation Dissertation Improvement Grant  
1998-1999 Van Riper Fund, University of Colorado Museum  
1998-1999 Fellowship, University of Colorado  
1998 Earl Morris Award in Archaeology, University of Colorado  
1997-1998 Fellowship, University of Colorado  
1997 Travel Grant, University of Colorado School of Arts and Sciences  
1997 Travel Grant, University of Colorado Graduate School  
1997 Tour Scholarship, University of Colorado  
1996 Travel Grant, University of Colorado Graduate School  
1994 Graduate School Dean's Small Grant, University of Colorado

**Clearances:** N/A

**Citizenship:** USA

**Languages:** N/A

**References:**

Douglas B. Bamforth, Professor, Department of Anthropology, University of Colorado, (303) 492-7586

Lawrence H. Keeley, Professor, Department of Anthropology, University of Illinois, (312) 413-3732

Steve L. Harvey, Program Manager, Cleveland National Forest, San Diego, California, (858) 674-2973

**Professional Profile:**

Dr. Becker has over 25 years of professional and academic experience in archaeological fieldwork, research, and publication in the American Midwest, Mid-Atlantic, Upper South, Southeast, Plains, Rocky Mountains, Great Basin, southern California, southwest Asia, and northern Africa. He earned his Ph.D. in Anthropology with an emphasis in archaeology, hunter-gatherers, methodology, and lithic analysis. His ongoing research focuses on prehistoric settlement systems and how mobility is reconstructed from the archaeological record through an examination of technology, function, and spatial analysis. Since 1989, Dr. Becker has specialized

in lithic use-wear, refitting, and spatial analysis. In conjunction with other classes of data, such as features and faunal remains, he has used his skills in lithic analysis to reconstruct site function and prehistoric behavior.

Dr. Becker has directed or participated in archaeological field survey, testing, and data recovery projects in Ohio, Illinois, Indiana, West Virginia, Kentucky, Pennsylvania, North Carolina, Colorado, Wyoming, Utah, Nevada, California, Sinai, and the Egyptian Sahara. He has expertise with the analysis of ceramics, ground stone, faunal remains, human osteology, and historic materials. Since joining ASM as Laboratory Director in 2002, Dr. Becker has processed and analyzed artifacts from the Great Basin and California coastal and desert projects. He has also authored more than 100 project reports and specialized studies. Dr. Becker currently serves as ASM's Program Manager for ASM's Department of Defense contracts for cultural resource studies throughout the West, including Multiple Award Services Contracts for NAVFAC Southwest and the Army Environmental Center. In this role, he is responsible for oversight of technical studies, project budgets, and the preparation of deliverables per contract terms.

### **Selected Project Experience:**

Red Beach MOU Monitoring, NAVFAC Southwest, MCAS Camp Pendleton, California, 2012. As Project Manager, oversaw all aspects of a monitoring program for the Red Beach training area that included the preparation of a complex work plan, fieldwork, technical report, and client coordination. Client Reference: Scott Mattingly, NAVFAC Southwest, (619) 532-3745.

Silver Strand State Park Survey and Testing, State of California Department of Parks and Recreation, San Diego, California, 2012. As Project Manager, oversaw fieldwork, data analysis, technical reports, and client coordination for improvements to the park. Client Reference: Dr. Therese Muranaka, California State Parks (619) 778-2553.

AFA-17 Survey, NAVFAC Southwest, MCB Camp Pendleton, California, 2011-2012. As Project Manager, oversaw all aspects of this survey for the AFA-17 Training Area that included preparation of a work plan, accident prevention plan, fieldwork, data analysis, technical report, and client coordination. Client Reference: Scott Mattingly, NAVFAC Southwest, (619) 532-3745.

P-116 Monitoring, NAVFAC Southwest, MCAS Camp Pendleton, California, 2011-2012. As Project Manager, oversaw all aspects of monitoring program on the airfield that included a work plan, fieldwork, technical report, and client coordination. Client Reference: Scott Mattingly, NAVFAC Southwest, (619) 532-3745.

Ysidora Basin Survey, NAVFAC Southwest, MCAS Camp Pendleton, California, 2011-2012. As Project Manager, oversaw all aspects of this survey for treatment pond maintenance that included a work plan, accident prevention plan, fieldwork, data analysis, technical report, and client coordination. Client Reference: Scott Mattingly, NAVFAC Southwest, (619) 532-3745.

P-214 KD Training Survey, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2011-2012. As Project Manager, oversaw a full analysis and completion of archaeological survey

for improvements to two training ranges on Camp Pendleton, and performed all client coordination. Client Reference: Ryan Pingree, Cardno TEC, (858) 509-3157.

MCB Camp Pendleton Bridges Survey, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2011-2012. As Project Manager, oversaw archaeological survey around eight bridges in need of maintenance on Camp Pendleton, and performed all client coordination. Client Reference: Ryan Pingree, Cardno TEC, (858) 509-3157.

Stuart Mesa Survey, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2011-2012. As Project Manager, oversaw a archaeological survey around water treatment ponds on Camp Pendleton, and performed all client coordination. Client Reference: Ryan Pingree, Cardno TEC, (858) 509-3157.

45-WH-253 Data Recovery, Ross Lake, North Cascades National Park Service Complex, Whatcom County, Washington, 2011. Lithic microwear analyst for the the Ross Lake Data Recovery Assemblage. Conducted a pilot study to assess the feasibility of doing additional work in the future. The results indicate that the chert materials are suitable for additional studies while other lithic materials have low potential for preserving microwear traces. Client Reference: Robert Mierendorf, North Cascades National Park Service Complex, (360) 854-7341

MCB Camp Pendleton Basewide Historic Context Study, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager, oversaw completion of basewide revision to historic context study, and conducted all coordination with client. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

El Camino Real Evaluation, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager, oversaw survey of the portion of this historic route on Camp Pendleton, and performed all client coordination. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

Condition Assessment, Site Monitoring, and Effects Treatment Plan (CASMET), MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager, oversaw client coordination, the CASMET fieldwork, and preparation of a technical report on Camp Pendleton. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

SDI-12100 and SDI-19406 Additional Evaluations, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager, oversaw all aspects of the project, including client coordination, preparation of a work plan, fieldwork, data analysis, and technical report for two Archaic period sites on Camp Pendleton. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

SDI-12100 and SDI-19406 Limited Data Recovery, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager, oversaw all aspects of the project including client coordination, work plan, fieldwork, data analysis, and technical report for two Archaic period sites on Camp Pendleton. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

LaPozz No. 5 Load Claim Evaluation, Enviroscientists, Kern County, California, 2011. As Project Manager, oversaw the evaluation of three prehistoric sites including a large lithic quarry for the BLM. Produced a work plan, conducted onsite lithic analysis for the quarry material, performed lab analysis on the artifacts, and produced a technical report. Client Reference: Melissa Sherman, Enviroscientists Inc., (775) 826-8822

MCLB Barstow Survey, NAVFAC Southwest, San Bernardino County, California 2010-2011. As Project Manager, oversaw all aspects of this station-wide survey that included historical research, a work plan, accident prevention plan, fieldwork, data analysis, technical report, and client coordination. Client Reference: George Herbst, NAVFAC Southwest, (619) 532-4185

Camp De Luz Refurbishment Survey, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Project Manager for survey of Camp De Luz training facility, produced proposal, work plan, supervised field effort, wrote technical report, and conducted all coordination with client. Client Reference: Ryan Pingree, Cardo TEC, (858) 509-3157

P-214 Range Development Survey, Cardo TEC, MCB Camp Pendleton, San Diego County, California, 2010-2011. As Principal Investigator for survey at the P-214 training facility, produced proposal, work plan, accident prevention plan/activity hazard analysis, conducted field effort, supervised technical report, and coordination with client and Base Archaeologist. Client Reference: Ryan Pingree, TEC, Inc., (858) 509-3157

Eagle Mountain Class I and Class III Inventories, GH Energy, Palm Springs California, 2010. As Project Manager, oversaw all aspects of project, and coordination with BLM and client. The Class III Inventory involved Met Tower surveys. Client Reference: Gil Howard, GH Energy Limited, (909) 794-6900

Gold Basin Class I and Class III Inventories, GH Energy, El Centro California, 2010. As Project Manager, oversaw all aspects of project, and coordination with BLM and client. The Class III Inventory involved Met Tower surveys. Client Reference: Gil Howard, GH Energy Limited, (909) 794-6900

Sawtooth/Chariot Class III Inventories for Met Tower Installations, Enviromine, El Centro California, 2010. As Project Manager, oversaw all aspects of project, and coordination with BLM and client. Client Reference: Dennis Fransway, Enviromine, (619) 284-8515

Mission San Luis Rey GPR Survey, Mission San Luis Rey, Oceanside, California, 2010. As ground penetrating radar specialist, oversaw a one-day GPR survey and technical report for the historic mission that identified potential buried archaeological features. Mapping produced from this project will help guide future archaeological investigations. Client Reference: Bradford Clayborne, Mission San Luis Rey

GWOT Sierra Geomorphology Archaeological Investigations, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2007-2011. As Principal Investigator, supervised the geomorphological study of the site settings, geophysical study, and archaeological investigation around two eligible sites in the project area. Produced proposal and work plan,

supervised field effort, prepared technical report, and coordination with Base Archaeologist. Client Reference: Joseph Baumann, Department of the Navy NAVFAC Southwest, (619) 532-2787

Breacher Facility Survey, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2009. As Principal Investigator for 5-acre survey, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Prepared technical report. Client Reference: Joseph Baumann, Department of the Navy NAVFAC Southwest, (619) 532-2787

El Cajon Public Safety Center GPR Survey, San Diego Natural History Museum on behalf of City of El Cajon, California, 2009. As ground penetrating radar specialist, conducted a one-day GPR survey for two historic residences next to El Cajon City Hall. Also conducted data analysis and prepared a brief technical report. Client Reference: Dr. Thomas Demere, San Diego Natural History Museum (619) 232-3821

Santa Margarita Conjunctive Use Project, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2008-11. As Principal Investigator for water pipeline running from the coast of Camp Pendleton to City of Fallbrook, produced work plan, supervised field effort, literature search, and historical documentation, report author, and coordination with client and Base Archaeologist. Client Reference: Doug Billings, Cardno TEC, (805) 564-4940

Juliett Burn Survey, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2008-09. As Principal Investigator for 2,000-acre survey for the 2008 Wildland fires on Camp Pendleton, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Prepared technical report. Client Reference: Danielle Page, Department of the Navy NAVFAC Southwest, (619) 532-5090

MCAS Miramar Survey and ICRMP, NAVFAC Southwest, Marine Corps Air Station Miramar, San Diego County, California, 2008-11. As Principal Investigator for 2,059-acre survey, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Prepared technical report. Client Reference: George Herbst, NAVFAC Southwest, (619) 532-3146

LaPozz No. 5 Load Claim Survey, Kern County, California 2008. As Field Director, conducted survey for area of potential effect for BLM. The survey included one large prehistoric lithic quarry with known rock hounding activities. Client Reference: Opal Adams, Enviroscientist Inc., (775) 826-8822

SOTG Battle Course, Area 41 Survey, Helix Environmental Planning, MCB Camp Pendleton, San Diego County, California, 2008. As Principal Investigator for 200-acre survey on Camp Pendleton, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Client Reference: Sheryl Horn, HELIX Environmental Planning, Inc., (951) 328-1700

Los Angeles State Historic Park GPR Survey, State of California Department of Parks and Recreation, Los Angeles, California, 2008. As ground penetrating radar specialist, conducted a

two-phase GPR survey of a historic railroad depot. Client Reference: Michael Sampson, California State Parks, (619) 220-5323

27 Sites Evaluation, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2007-11. As Principal Investigator and Laboratory Director, managed Phase II testing of 27 prehistoric sites in the central portion of MCB Camp Pendleton. Coordinated the examination of artifacts and ecofacts to investigate site function and subsistence-settlement patterning along Las Flores, Las Pulgas, and Aliso creeks. Prepared a synthesis of this data within a regional context. Supervised field effort and coordinated with Base Archaeologist. Prepared technical report. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

Horno/Ammo Burn Survey, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2007-11. As Principal Investigator for 3,500-acre survey for the 2007 Firestorm on Camp Pendleton, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

Ocotillo Class I and Class III Inventories, Power Engineers, El Centro California, 2006-08. As Project Manager, oversaw all aspects of project, and coordination with BLM and client. The Class III Inventory involved Met Tower surveys. Client Reference: Jim Rudolph, POWER Engineers, Inc., (208) 685-6323

P-159A Green Beach Access, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2007-08. As Principal Investigator for intensive testing at Interstate 5 and San Onofre Creek, produced proposal and work plan, supervised field effort, and coordination with client and Base Archaeologist. Client Reference: Doug Billings, Cardno TEC, (805) 564-4940

IWP Data Recovery and Ground Penetrating Radar Survey, Nevada, 2007. As ground penetrating radar specialist, conducted a four-day GPR survey of a prehistoric and historic ranch sites. The work consisted of collecting data in the field, and immediately post-processing that data with GPR-Slice software to provide potential target (anomaly) locations for investigation during the data recovery. The historic sites were investigated through a series of grids and transects to help identify buried foundations and other features. The prehistoric site was examined through a series of transects.

San Mateo Ag Fields, Helix Environmental Planning , MCB Camp Pendleton, San Diego County, California, 2007. As Principal Investigator, supervised the evaluation of four archaeological sites, a geomorphological study of the site settings, and a GPR investigation of two eligible sites in the project area. Produced proposal and work plan, supervised field effort, conducted GPR and geomorphology studies, and coordination with client and Base Archaeologist. Client Reference: Mike Schwerin, HELIX Environmental Planning, Inc., (619) 462-1515

MCAS Miramar 17 Sites Evaluation, Marine Corps Air Station Miramar, San Diego County, California, 2007. As Principal Investigator, directed the evaluation of 17 archaeological sites (historic and prehistoric) located throughout MCAS Miramar. As Laboratory Director,

supervised all artifacts analysis and curation at the San Diego Archaeological Center. Client Reference: David Boyer, MCAS Miramar, (858) 577-1125

Stonewall Historic Mine GPR Survey, State of California Department of Parks and Recreation, Lake Cuyamaca California, 2007. As ground penetrating radar specialist, conducted a two-day GPR survey of a historic mine. Client Reference: Michael Sampson, California State Parks (619) 220-5323

Quarters A GPR Survey, Shaw Environmental for Commander, Navy Region Southwest, Naval Base Point Loma, San Diego California, 2007. As ground penetrating radar specialist, conducted a two-day GPR survey of a potential historic site on Naval Base Point Loma. Client Reference: Christopher Corey, Shaw Environmental & Infrastructure, Inc., (619) 533-7330

Fallbrook LDS Project, Robert F. Tuttle Architects, Fallbrook, California, 2007. Conducted a GPR survey to investigate the possibility of a California Indian cemetery. Client Reference: Linda Patel, Robert F. Tuttle Architects, Inc., (949) 338-2375

NAWS Survivability Ground Penetrating Radar Survey, Naval Air Weapons Station China Lake, San Bernardino County, California, 2007. As ground penetrating radar specialist, conducted the GPR survey, analysis, and reporting for two Paleoindian sites and one historic graveyard. Client Reference: Russell Kaldenberg, NAWS China Lake, (760) 939-1350

P-159 Red Beach Access, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2007. As Principal Investigator for intensive testing at Interstate 5 and Las Flores Creek, produced proposal and work plan, supervised field effort, and coordination with client and Base Archaeologist. Client Reference: Doug Billings, Cardno TEC, (805) 564-4940

P-110 Water Conveyance, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2006. As Principal Investigator for linear survey of basewide construction, produced proposal and work plan, supervised field effort, and coordination with client and Base Archaeologist. Client Reference: Doug Billings, Cardno TEC , (805) 564-4940

Yuma Pivot Point Ground Penetrating Radar Survey, Yuma Crossing National Heritage Area, Yuma, Arizona, 2006. Conducted a GPR survey to locate buried portions of a historic railroad bridge that once spanned the Colorado River. Client Reference: Tina Clark, Yuma Crossing National Heritage Area, (928) 210-3328

MET Tower Survey on BLM Land, GH Energy Limited, Imperial County, California, 2006. As Project Archaeologist, conducted survey of four proposed MET Tower locations, and drafted report. Client Reference: Gil Howard, GH Energy Limited, (909) 794-6900

MARSOC Survey, Cardno TEC, MCB Camp Pendleton, San Diego County, California, 2006. As Principal Investigator for 72-acre survey of Range 108 Training Area and Area 41, produced proposal and work plan, supervised field effort, and coordination with client and Base Archaeologist. Client Reference: Doug Billings, Cardno TEC, (805) 564-4940

Lima Survey, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2006. As Principal Investigator for 606-acre survey of Lima Training area, produced work plan, supervised field personnel, and coordination with Base Archaeologist. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

SDI-10723 Data Recovery, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2005-2007. Principal Investigator and Laboratory Director for the data recovery at a multi-component prehistoric site dating between 8400-300 B.P. Supervised GPR survey, fieldwork, lab analysis, curation, and a technical report, and coordination with Base Archaeologists. The project relied on special methods to recover the Early Archaic material remains, and used innovative spatial analysis techniques to help interpret the data. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

Archaeological Testing for the Viejas Northwest Grade Project, BRG Consulting, San Diego County, California, 2006. As Principal Investigator and Laboratory Director, oversaw the testing, analysis, and evaluation of three prehistoric sites. Client Reference: Ralph Kingery, BRG Consulting, Inc., (619) 298-7127

Archaeological Ground Penetrating Radar Survey for Duncan Canyon, David Evans and Associates, Fontana, California, 2006. Principal Investigator for the examination of two historic sites. Conducted field investigation, post-field data processing, three dimensional mapping, and interpretation of data. Client Reference: David Evans and Associates, Inc., (909) 481-5750

Archaeological Testing for the Tank Farm Evaluation, Shaw Environmental for Commander, Navy Region Southwest, Naval Base Point Loma, San Diego California, 2006. As Principal Investigator, coordinated with client, oversaw the testing, evaluation, and analysis of one prehistoric site exposed by erosion on Naval Base Point Loma. Client Reference: Christopher Corey, Shaw Environmental & Infrastructure, Inc., (619) 533-7330

Archaeological Testing at Border Field State Park, California State Parks, San Diego County, California, December 2005-06. As Principal Investigator and Lab Director, oversaw the testing, analysis, and evaluation of two prehistoric sites (CA-SDI-222 and CA-SDI-4281) located along the U.S./Mexico border in San Diego County. Efforts included the excavation four 1-x-1 m units at each site, and the recovery of 1,378 artifacts and 901.8 g of ecofacts at CA-SDI-222, and 149 artifacts and 21.4 g of ecofacts at CA-SDI-4281. A series of radiocarbon samples on shell produced dates ranging from 7680 to 2100 B.P., indicating occupation throughout the Archaic period. Also managed lithic analysis of collections from excavation. Client Reference: Therese Muranaka, California State Parks, (619) 778-2553

MCAS Miramar Housing Evaluation, NAVFAC Southwest, Marine Corps Air Station Miramar, San Diego County, California, June-September 2005. As Principal Investigator, directed survey, testing, analysis, and evaluation of three prehistoric sites. Supervised crew of two field archaeologists. Coordinated with UXO personnel. Conducted artifact analysis and prepared technical report. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

Red Oak Archaeological Testing, BRG Consulting, Alpine, San Diego County, California, 2005.

As Principal Investigator, oversaw the testing, analysis, and evaluation of two prehistoric sites located on the Viejas Indian Reservation in San Diego County. Client Reference: Ralph Kingery, BRG Consulting, Inc., (619) 298-7127

Archaeological Inventory of the Northwest Base Boundaries Edwards Air Force Base, Kern County, California, 2005. As Laboratory Director, oversaw the processing and analysis of artifact collections from 12 prehistoric and 10 historic sites located along the northwestern boundaries of Edwards Air Force Base. Directed laboratory crew of two assistant archaeologists. Oversaw lithic analysis, analysis of historic artifacts, submitted charcoal samples for C<sup>14</sup> dating. Client Reference: Rick Norwood, Edwards Air Force Base, (661) 277-7077

Las Pulgas Corridor Study, MCB Camp Pendleton, San Diego County, California, 2004-2005. As Principal Investigator and Laboratory Director, managed Phase II testing of 24 prehistoric sites in the central portion of MCB Camp Pendleton. Coordinated the examination of artifacts and ecofacts to investigate site function, subsistence-settlement patterning, and geomorphology along Las Flores, Las Pulgas, and Aliso creeks. Prepared a synthesis of this data within a regional context. Supervised field effort and coordinated with Base Archaeologist. Managed laboratory crew of five assistant archaeologists in preparing material remains for analysis and curation. Prepared technical report. Client Reference: Stan Berryman, MCB Camp Pendleton, (760) 725-9738

Spangler Hills Survey, Bureau of Land Management, Ridgecrest, San Bernardino County, California, 2003. As Project Archaeologist, coordinated fieldwork and artifact analysis. The study entailed compilation of an artifact chronology and obsidian hydration analyses. Client Reference: Judyth Reed, USDI Bureau of Land Management, (760) 384-5422

Coso Transmission Line, UltraSystems Environmental, Coso Junction, Inyo County, California, 2004-2005. As Field Director and report author, supervised a survey through the Sugarloaf Archaeological District to determine potential impacts on cultural resources. Coordinated with the Bureau of Land Management and the Naval Air Weapons Station. Client Reference: Robert Motschall, UltraSystems Environmental, (858) 792-7686

MCAS Miramar Evaluation, Marine Corps Air Station Miramar, San Diego County, California, 2003-2004. As Project Director and report author, directed a survey in the southeastern portion of MCAS Miramar and evaluation of 19 sites, with an emphasis on prehistoric site analysis. As Laboratory Director, prepared all artifacts for curation with the San Diego Archaeological Center. Client Reference: David Boyer, MCAS Miramar, (858) 577-1125

Hardrock Hotel Archaeological Monitoring, 5<sup>th</sup> Rock LLC, downtown San Diego California, 2005. As Laboratory Director, tracked and directed the processing of a large sample of historic artifacts derived from testing of historic urban sites found during construction monitoring in downtown San Diego. Client Reference: Alkesh Patel, Solana Vista Development, (858) 232-3831

Papa Two and Papa Three Testing, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2003-2004. As Laboratory Director and Lithic Analyst, examined collections

derived from 10 prehistoric sites near the prehistoric Piedra del Lumbre lithic quarry. Used an innovative method of core-biface ratios to examine and compare lithic technology of sites throughout San Diego County for report. Prepared all artifacts for curation with the San Diego Archaeological Center. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-5090

Little Lake Testing, Caltrans District 6, Little Lake, Inyo County, California, 2003-2004. As Lab Director and Lithic Analyst, examined collections derived from four prehistoric sites around Little Lake. The analysis entailed a technological study, artifact chronology, and an obsidian hydration analysis. The report examined the project data within a regional context. Prepared all artifacts for curation with University of California, Davis. Client Reference: Lynn Farone, Caltrans District 6, (559) 243-8223

Christmas Canyon Survey, Naval Air Weapons Station China Lake, San Bernardino County, California, 2003. As Principal Investigator, oversaw the survey, analysis, and reporting of a 3,800-acre survey where 32 sites and 78 isolates were recorded for the northern portion of the base. The report examined the project data within an extra-regional context, produced a predictive model of the archaeological landscape, and evaluated concepts of Early Man in the Mojave Desert. Client Reference: Russell Kaldenberg, NAWA China Lake, (760) 939-1350

Salt Creek Data Recovery, McMillin Companies, Chula Vista, San Diego County, California, March-September 2003. As Principal Investigator, oversaw the data recovery, analysis, and reporting of three prehistoric and two historic sites. The report compared the project data to extra-local sites to determine upland exploitation patterning. Later, assisted with the management of construction monitoring of the project area. Monitoring identified two archeological deposits later evaluated as not significant. Provided an analysis of lithic material collected during monitoring and assisted in preparation of monitoring report. Client Reference: Todd Galarneau, McMillin Companies, (619) 477-4117

Coachella Canal Survey, Bureau of Reclamation and Coachella Valley Water District, Hot Mineral Springs, Riverside County, California, 2003. As Field Director and Laboratory Director, managed six crew members for a 33-mile survey along the Coachella Canal in support of the Coachella Canal Lining Project in Riverside County. Client Reference: Laureen Perry, USDI Bureau of Reclamation, (702) 293-8619

Cartago/Olancha Four-Lane Project, Caltrans, District 6, Inyo County, California, October 2002-November 2003. As Laboratory Director and Lithic Analyst, examined collections derived from evaluation of 15 prehistoric sites around southern Owens Lake. The analysis entailed a technological study, artifact chronology, and an obsidian hydration analysis. The report examined the project data within a regional context. Prepared all artifacts for curation with California State University, Bakersfield. Client Reference: Chris Ryan, Caltrans District 6, (559) 542-4610

Interstate 5 Widening Test Excavations, Caltrans District 11, San Diego County, California, 2002. As Lab Director and Lithic Analyst, examined collections derived from testing of 12 prehistoric sites along the I-5 right-of-way in northern San Diego County. The analysis utilized a technological study. Prepared all artifacts for curation with the San Diego Archaeological Center.

Client Reference: Chris White, Caltrans District 11, (858) 616-6611

Boudreau Archaeological Testing, BRG Consulting, Inc., Del Mar, San Diego County, California, August-September 2002. As Laboratory Director and Lithic Analyst, examined materials derived from the testing of a single, multi-locus site. Prepared all artifacts for curation with the San Diego Archaeological Center. Client Reference: Tim Gnibus, BRG Consulting, (619) 298-7127

Langford Well Data Recovery, U.S. Army Corps of Engineers, Los Angeles District, Fort Irwin, California, October 2000-June 2001. As Lithic Analyst and report author, examined collections from five sites situated around Langford Well. The analysis entailed a technological, functional, and typological study, and used the innovative methods of lithic use-wear analysis, lithic refitting, lithic spatial analysis, and core-biface ratios. The report compared the project data to other data derived from Fort Irwin, and placed this within a regional framework.

Fort Bragg Survey, U.S. Army Corps of Engineers, Fort Bragg, North Carolina, October 1999-June 2000. As co-Principal Investigator, oversaw the survey, analysis, and reporting of a 4,000-acre survey where over 60 sites were recorded for the base. The report examined the project data within a regional context, and produced a predictive model of the archaeological landscape.

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Hale, Micah J., and Mark S. Becker

2006 *From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California.* Prepared for Department of the Navy NAVFAC Southwest.

Hector, Susan M., Sinéad Ní Ghabhláin, Mark S. Becker, and Ken Moslak

2004 *Archaeological Evaluation of 19 Sites on Marine Corps Air Station Miramar, San Diego County, California.* ASM Affiliates, Inc. Prepared for Department of the Navy under contract to the General Services Administration.

Hector, Susan, Drew Pallette, and Mark S. Becker

2002 *Archaeological Site Testing on the Boudreau Property: Maritime Resource Exploitation in the Lower San Dieguito River Valley.* ASM Affiliates, Inc. Prepared for BRG Consulting, Inc.

Idol, Bruce S., and Mark S. Becker

2000 *Phase I Archaeological Reconnaissance of 2,945 Acres (1,193 Hectares) along the Flat Creek Drainage, Fort Bragg, Hoke County, North Carolina.* TRC Garrow Associates, Inc. Prepared for U.S. Army Construction Engineering Research Laboratories, Champaign, Illinois.

Iversen, David R., and Mark S. Becker

2008 *Geomorphological and Archaeological Investigations for the Establishment of the Sierra Training Area, Marine Corps Base Camp Pendleton, San Diego County, California.* Prepared for the Department of the Navy, NAVFAC Southwest. Submitted to HELIX Environmental Planning, Inc.

2007 *Archaeological Testing of Selected Portions of SDI-811 and SDI-10731 for the Operations Access Points - Red Beach Project (P-159), MCB Camp Pendleton, California.* Prepared for Department of the Navy, NAVFAC Southwest. Submitted to TEC, Inc.

2006 *Evaluation of Three Prehistoric Sites for the Proposed Northwest Grade Project, Viejas Indian Reservation, San Diego County, California.* ASM Affiliates, Inc. Prepared for BRG Consulting, Inc.

Iversen, Dave, Sinead Ni Ghabhlain, Sarah Stringer-Bowsher, and Mark S. Becker

2008 *Archaeological Evaluation of 17 Sites on Marine Corps Air Station Miramar, San Diego County, California.* Submitted to David A. Boyer, MCAS Miramar.

Iversen, Dave, Mark S. Becker, Sarah Stringer-Bowsher, and Sinead Ni Ghabhlain

2008 *Archaeological Testing Near SDI-1074 and Historic Evaluation of Two Bridges for the Operations Access Points Green Beach Project (P-159A), MCB Camp Pendleton, California.* Prepared for the Department of the Navy, NAVFAC Southwest. Submitted to TEC, Inc.

Iversen, David R., Mark S. Becker, and Susan M. Hector

2006 *Archaeological Testing and Evaluation of CA-SDI-16069 and CA-SDI-17526 for the Red Oak Project, Viejas Indian Reservation, San Diego County, California.* ASM Affiliates, Inc. Prepared for BRG Consulting, Inc.

Laylander, Don, and Mark S. Becker

2003 *Archaeological Testing at Twelve Prehistoric Sites (SDI-603, -628, -4553, -6831, -6882, -10965, -12120, -12670, -13484, -15678, -15679, and -15680) on the Central San Diego Coast, San Diego County California.* ASM Affiliates, Inc. Prepared for Caltrans District 11.

Ní Ghabhláin, Sinéad, and Mark S. Becker

2003 *Archaeological Testing and Data Recovery on the Salt Creek Ranch Property: Prehistoric Resource Exploitation and Historic Occupation near the Otay River Valley, San Diego County, California.* ASM Affiliates, Inc. Prepared for Corky McMillin Companies.

Quach, Tony, and Mark S. Becker

2012 *A Cultural Resource Survey for Stuart Mesa Ponds Ecosystem Evaluation and Restoration Preliminary Environmental Planning, Marine Corps Base Camp Pendleton San Diego County, California.* ASM Affiliates, Inc. Prepared for NAVFAC Southwest.

Reddy, Seetha N., Mark S. Becker, and Sherri Andrews

2005 *Evaluation of Five Sites Along Roblar Road on Marine Corps Base Camp Pendleton, California.* Prepared for Department of the Navy, NAVFAC Southwest.

Schaefer, Jerry, Scott Wolf, and Mark S. Becker

2008 *Archaeological Testing and Evaluation of the Quarters A/Milcon P-401 U.S. Naval Complex, Point Loma, California.* ASM Affiliates, Inc. Prepared for Shaw Environmental, Inc.

Schaefer, Jerry, and Mark Becker

2007 *The Search for Archaeological Remains of the Southern Pacific Railroad Bridge Across the Colorado River, Yuma Crossing National Heritage Area, Arizona.* ASM Affiliates, Inc. Prepared for Yuma Crossing National Heritage Area.

Stringer-Bowsher, Sarah, and Mark S. Becker

2011 *Cultural Resource Evaluation and Eligibility Investigations for Historic El Camino Real (CA-SDI-14006H), Marine Corps Base Camp Pendleton, San Diego County, California.* ASM Affiliates, Inc., Prepared for Department of the Navy, NAVFAC Southwest.

## **Presentations:**

Becker, Mark S., and Danielle Page

2012 California's Acorn Mythology? Some Suggestive Evidence from Protein Residue Analysis and Paleobotany Studies at MCB Camp Pendleton. 46<sup>th</sup> Annual Meeting for Society of California Archaeology, San Diego.

Becker, Mark S.

2010 Identifying stone chisels through use-wear analysis at coastal sites in San Diego County. Symposium: Brief Adventures in Alta and Baja California. 44<sup>th</sup> Annual Meeting for Society of California Archaeology, Riverside.

2009 A Residue Analysis of Bedrock Milling Features at MCB Camp Pendleton and the Implications for Investigating Acorn Use. 43<sup>rd</sup> Annual Meeting for the Society for California Archaeology, Modesto.

Becker, Mark S.

2008 An Early Archaic and Late Prehistoric Residential Site from the Coast of Camp Pendleton: a Perspective Through Spatial Analysis. Invited lecture presented at the San Diego County Archaeological Society.

Becker, Mark S., and Steve Harvey

2007 Symposium Chairs: A Reexamination of Identified Temporal Trends in Prehistoric Coastal Southern California. 41st Annual Meeting for the Society for California Archaeology, San Jose.

Becker, Mark S.

2007 Myths in Southern California Archaeology: Examining Technological Trends at Coastal Prehistoric Sites. Symposium: A Reexamination of Identified Temporal Trends in Prehistoric Coastal Southern California. 41st Annual Meeting for the Society for California Archaeology, San Jose.

Becker, Mark S., Susan Hector, and John R. Cook

2006 Research and Innovative Methods in Archaeology: Seeing Archaeological Landscapes through Spatial Analysis. Poster Session. 40<sup>th</sup> Annual Meeting for the Society for California Archaeology, Ventura.

Becker, Mark S., and David R. Iversen

2005 Lithic Toolkits from San Elijo Lagoon and Camp Pendleton in San Diego County, and the Implications for Understanding Subsistence-Settlement Patterning. Symposium: The Archaeology of Camp Pendleton in a Regional Context. 39th Annual Meeting for the Society for California Archaeology, Sacramento.

Becker, Mark S.

2004 Reexamining Mobility Practices Around Owens Lake: A Look at Lithic Artifacts from the U.S. Route 395 Olancho/Cartago Project. In symposium: From Highstand to Desiccation: Lacustrine Adaptations in the Western Great Basin. 29<sup>th</sup> Great Basin

- Anthropological Conference, Sparks, Nevada.
- 2004 Do Standard Bifaces Really Make Good Cores? 69<sup>th</sup> Annual Meeting of the SAA, Montreal, Quebec, Canada.
- 2003 The Problem with Big Sites: Determining Single vs. Multiple Occupations Through Lithic Refitting and Spatial Analysis. 68<sup>th</sup> Annual Meeting of the SAA, Milwaukee, Wisconsin.
- 2002 Reconstructing Prehistoric Site Function using the Meer Approach (Lithic refitting, usewear, and spatial analysis). Invited lecture presented at Hebrew University, Mount Scopus, Jerusalem.
- 2002 Reconstructing Prehistoric Settlement Patterning for Levantine Sites. Invited lecture presented at the W.F. Albright Institute of Archaeological Research, Jerusalem.
- 2000 Exploring Spatial Patterning at Early Upper Palaeolithic Sites in the Levant and the Evidence for Early Modern Human Behavior. In symposium: The Upper Palaeolithic of the Levant: The Current State of Research. 65<sup>th</sup> Annual Meeting of the SAA, Philadelphia, Pennsylvania.
- 1999 Modeling Site Function for Prehistoric Hunter-Gatherers through Lithic Usewear Analysis. 64<sup>th</sup> Annual Meeting of the SAA, Chicago, Illinois.
- 1998 The Origins of Blade/bladelet Technology in the Levant: A Test of the Lithic Efficiency Hypothesis. Symposium: Refitting Studies in New and Old World Lithic Analyses. 63<sup>rd</sup> Annual Meeting of the SAA, Seattle, Washington.
- 1997 The Function of Microliths? A Perspective from the Early Epipalaeolithic of the Southern Levant. 62<sup>nd</sup> Annual Meeting of the SAA, Nashville, Tennessee.

Becker, Mark S., and Douglas B. Bamforth

- 1997 Preliminary Microwear Results from an Analysis of the Hell Gap Lithic Assemblage. 55<sup>th</sup> Annual Plains Anthropological Conference, Boulder, Colorado.

Bamforth, Douglas B., and Mark S. Becker

- 1997 Core/Biface Ratios, Mobility, Refitting, and Artifact Use-Lives: A Paleoindian Example. 62<sup>nd</sup> Annual Meeting of the SAA, Nashville, Tennessee.

**Independent Research:** N/A

**Teaching Experience:**

- 1998 Graduate Teaching Instructor, Physical Anthropology, University of Colorado
- 1997 Graduate Teaching Instructor, Introduction to Archaeology, University of Colorado
- 1997 Teaching Assistant, Department of Anthropology, University of Colorado
- 1997 Graduate Teaching Instructor, Physical Anthropology, University of Colorado
- 1996 Graduate Teaching Instructor, Archaeological Methods, University of Colorado
- 1995 Teaching Assistant, Archaeological Field School in Central Colorado, University of Colorado
- 1995 Graduate Teaching Instructor, Archaeological Methods, University of Colorado

1994 Colorado Graduate Teaching Instructor, Archaeological Methods, University of Colorado  
1990 Graduate Teaching Instructor, Physical Anthropology, University of Illinois  
1990 Teaching Assistant, Department of Anthropology, University of Illinois  
1989 Graduate Teaching Instructor, Physical Anthropology, University of Illinois

**Laboratory Experience:**

1985-1986 Research Assistant in Human Osteology Lab, Department of Anthropology, Ohio State University

**Other:** N/A

**Sarah Stringer-Bowsher, M.A.**  
**Senior Historian**

**Firm Name:** ASM Affiliates, Inc., Carlsbad, California

**Total Years of Experience:** 8

**Employment History:**

2007-present Associate/Project/Senior Historian, ASM Affiliates, Inc., Carlsbad, California  
2005-2006 Research Intern, Salt River Project (SRP), Tempe, Arizona  
2004-2005 Teaching Assistant, Arizona State University, Tempe, Arizona  
2004 Human Resources Assistant, United States Gypsum (USG), El Centro, California  
2003 Liaison, Downtown El Centro Association, El Centro, California  
2003-2004 Volunteer, Arizona Historical Society, Yuma, Arizona

**Education:**

M.A. 2007/History/ Public History Program/Arizona State University, Tempe  
B.A. 2000/History/University of Arizona, Tucson

**Additional Training:**

2011 Architectural Styles, California Preservation Foundation  
2008 The Advisory Council on Historic Preservation, The Section 106 Essentials  
2007 American Association for State and Local History (AASLH), The Basics of Archives  
2007 The Advisory Council on Historic Preservation, The Section 106 Essentials  
2006 Short course on museum issues with Andy Ambrose, Atlanta History Center  
2005 Short course on museum issues with James B. Gardner, Smithsonian Institution, National Museum of American History, Behring Center  
2005 Short course on museum issues with Martin Sullivan, Historic St. Mary's City Commission  
2006 Short course on museum issues with Patricia West, National Park Service

**Registrations:**

2009 Register of Professional Historians, No. 602, California Council for the Promotion of History (CCPH)

**Professional Memberships:**

National Council on Public History (NCPH)  
American Association for State and Local History (AASLH)  
Organization of American Historians (OAH)  
California Council for the Promotion of History (CCPH)  
Save Our History Organisation (SOHO)

**Other Capabilities:** Word, Excel, and Photoshop Elements

**Awards/Commendations:**

2004-2006 Graduate College Tuition Award, Arizona State University (ASU)  
2006 Max Millet Family Fund Award, Arizona State University (ASU)  
2006 Special Recognition Award, Salt River Project (SRP)  
1996-2000 Arizona Regents Tuition Award, University of Arizona

**Clearances:** N/A

**Citizenship:** USA

**Languages:** N/A

**Professional Profile:**

Ms. Stringer-Bowsher has eight years of professional experience as a historian. She earned her M.A. through public history course work in historic research methods, applied history, museology, and historic preservation. Ms. Stringer-Bowsher's thesis was an original case study of Arizona's first female Civil Engineer who worked as a sanitarian at the state laboratory and was also a director of the women's projects of the Works Progress Administration during the Great Depression. Ms. Stringer-Bowsher's thesis, now archived at the Arizona State Library, required research at local, state, and national repositories, including extensive research at the National Archives and Records Administration in College Park, Maryland. Ms. Stringer-Bowsher's professional duties have included land use histories and heritage projects for a water and power company in Arizona, archival research in small and large repositories, and numerous papers and reports written for various private and public clients. Each deliverable required that she create or implement a project design, collect pertinent primary and secondary sources, and analyze and synthesize the information into a client-appropriate product. As the Senior Historian for ASM, Ms. Stringer-Bowsher focuses on developing research-based historic contexts, which is the essential foundation for historic site assessment and evaluation. In addition to creating local, project-specific histories and historic contexts, Ms. Stringer-Bowsher prepares land use histories for a multitude of applications including ESA Phase I site assessment reports and cultural resource site assessments.

**Selected Project Experience:**

Archaeological Survey and Evaluation for the Tierra del Sol LLC Project, Dudek, San Diego County, California, 2012. As ASM's Senior Historian, conducted research on two extant buildings including gathering land patent file information from the National Archives and Records Administration in College Park, Maryland. Prepared both a local and site-specific context for the greater Campo area and the land use of the property. Worked with ASM's Architectural Historian, Jennifer Krintz, on the evaluation of the two extant homestead buildings, one 1930s and the other circa early 1940s. Client Reference: Micah Hale, Dudek, (760) 479-4271.

Archaeological Evaluation for the Rugged Solar Project, Dudek, San Diego County, California, 2012. As ASM's Senior Historian, conducted research on the extant building including gathering land patent file information from the National Archives and Records Administration in College Park, Maryland. Prepared both a local and site-specific context for the greater Campo area and the land use of the property. Worked with ASM's Architectural Historian, Jennifer Krintz, on the evaluation of the extant homestead building that consisted of two nineteenth century buildings that were interconnected and utilized as one building. Client Reference: Micah Hale, Dudek, (760) 479-4271.

Historic Resources Survey Chula Vista, City of Chula Vista, San Diego County, California, 2012. As ASM's Senior Historian, conducted limited research, per the scope, and prepared a city-wide context that focused on the project area. The context considered agricultural development, city incorporation, industrial and military development, and commercial expansion that replaced agriculture as a primary economy. Limited research, per the scope, was also conducted on potentially eligible buildings and their potential association with significant persons in the community. Client Reference: Lynnette Tessitore-Lopez, City of Chula Vista.

Cultural Resources Survey for the 2012/2013 Construction Season of the East Columbia Basin Irrigation District Water SMART Grant Project, USDI Bureau of Reclamation, Adams, Franklin, and Grant Counties, Washington, 2012. The laterals that were surveyed were either associated with the Columbia Basin Project (CBP) East Low Canal or the CBP Potholes East Canal. The BOR had already determined that both the East Low and the Potholes East canals are eligible for the National Register of Historic Places (NRHP). As such, ASM was tasked with evaluating the laterals for their eligibility to the NRHP. As ASM's Senior Historian, conducted research by gathering primary documents on file with the BOR and the ECBID, and secondary materials available in universities and other repositories. Ms. Stringer-Bowsher prepared a historic context from her research that considered the regional significance of the CBP and evaluated the laterals for their eligibility to the NRHP based on that context and familiarity with water projects throughout the west. Client Reference: Warren Hurley, Bureau of Reclamation (BOR) Columbia Cascades Area Office, (509)575-5848 ext. 320.

National Register of Historic Places Nomination for Highway 80 in California, San Diego Gas & Electric Company, San Diego County, California, 2012. As ASM's Senior Historian, prepared a historic context that considered the national, state, and local significance of

Highway 80 that originally stretched from the Pacific to the Atlantic, from San Diego to Savannah. The historic context considers the national and state road movements, construction methods, and social and political changes that impacted the highway over time from the late nineteenth century of the Good Roads movement to the incoming federal freeway system funded by the 1956 Federal Aid Highway Act. Client Reference: Dayle Cheever, SDG&E, (858) 654-1856.

Archaeological Survey Report for the Stoneridge Preserve, County of San Diego Department of Parks and Recreation, San Diego County, California, 2012. As ASM's Senior Historian, conducted research and prepared a local context and land use history of the Preserve. The context considered settlement, mining, transportation corridors, and general development. The land use history specifically considered the changes to the Preserve over time from settlement to the present day. Client Reference: Jennifer Price, County of San Diego Department of Parks and Recreation, (858) 966-1379.

Archaeological Survey Report for the Potrero-Mason Property, County of San Diego Department of Parks and Recreation, San Diego County, California, 2012. As ASM's Senior Historian, conducted research and prepared a local context and land use history of the Preserve. The context considered settlement, mining, transportation corridors, and general development. The land use history specifically considered the changes to the Preserve over time from settlement to the present day. Client Reference: Jennifer Price, County of San Diego Department of Parks and Recreation, (858) 966-1379.

Archaeological Survey Report for the Hagey and Sycamore South Properties, Additions to the Sycamore Canyon and Goodan Ranch Preserves, County of San Diego Department of Parks and Recreation, San Diego County, California, 2012. As ASM's Senior Historian, conducted research and prepared a local context and land use history of the Preserve. The context considered settlement, mining, transportation corridors, and general development. The land use history specifically considered the changes to the Preserve over time from settlement to the present day. Client Reference: Jennifer Price, County of San Diego Department of Parks and Recreation, (858) 966-1379.

Historic Resources Evaluation Report For Fenton Dairy Houses and Office San Diego, San Diego County, California, 2012. As ASM's Senior Historian, conducted research on the land owners and land use of the property over time. Research focused on dairy development in the local area and on the property.

Cultural Resource Survey Report for the Recht Property, San Diego Gas & Electric Company, Jacumba, California, 2012. As Senior Historian, researched and prepared a land use history of the parcel. Client Reference: Dr. Susan Hector, SDG&E, (858) 654-1279.

Summary Report for the Historical Resources Evaluation of Oak Ridge Ranch Parcels for the Sunrise Powerlink Phase I ESA, San Diego Gas & Electric Company, Lakeside, California,

2012. As Senior Historian, researched and prepared a land use history of the parcels. Client Reference: Dr. Susan Hector, SDG&E, (858) 654-1279.

Historical Resource Evaluation Report for the Jeff Valley Parcels, San Diego Gas & Electric Company, Palomar Mountain, California, 2012. As Senior Historian, researched and prepared a land use history of the parcels. Client Reference: Dr. Susan Hector, SDG&E, (858) 654-1279.

Historical Resources Evaluation Report for Rancho Lilac, Valley Center, California, 2012. As ASM's Senior Historian, conducted all necessary research regarding the development of Rancho Lilac from early settlement of the area, potential mining, the schools and post office to the various occupants and uses of the Rancho Lilac over time. Client Reference: Kim T. Smith, Caltrans District 11.

Historic Resource Evaluation Report for the Pine Valley Bath House, RBF Consulting, Pine Valley, San Diego County, California, 2012. As ASM's Senior Historian, conducted all research for a 1920s-era bath house originally part of a larger resort complex of historic Highway 80 in Pine Valley. Client Reference: Steve Wragg, RBF Consulting, (858) 614-5059

Historic Resources Evaluation of a Mining Site, Southern California Edison, Banning, California, 2012. An evaluation was prepared as an addendum to archeological work completed in the project area. As ASM's Senior Historian, worked collaboratively with ASM's Architectural Historian in evaluating the historical significance of a 1942-era small mine for its eligibility to the NRHP and CRHR. Research conducted focused on creating a context of mining in the region, the identification of the type of mining potentially conducted on the site, and considered potentially significant local persons associated with the site. Client Reference: Audry Williams, Southern California Edison, 626-462-8681.

Palomar Gateway District Specific Plan Cultural Resources Report, Atkins, Chula Vista, California, 2012. As ASM's Senior Historian, completed a brief context and land use history of the project area to show changes over time. Client Reference: Kim Howlett, Atkins, (858) 514-1018.

Cultural Resource Evaluation Report for Alternative 1C and 6, Sorrento to Miramar Curve Straightening and Double Track Project, David Evans and Associates, San Diego County, California, 2012. As ASM's Senior Historian, conducted preliminary research on the Pierre Bovet adobe and prepared a brief site-specific context for the property. Client Reference, David Evans & Associates, Inc

Historic Resource Evaluation Report for the Santa Ysabel Barn, PMC, Santa Ysabel, California, 2012. As ASM's Senior Historian, conducted research on a nineteenth century barn at local repositories. Client Reference: Mark Teague, PMC, (858) 453-3602 ext 15201.

Historic Context of Ranching in Northeastern Nevada for Projects in Long Canyon, Newmont Mining Corporation, Elko County, Nevada, 2012. As ASM's Senior Historian, conducted research on and prepared a context for ranching in the nineteenth and twentieth century. Additional research interests for the project included Chinese immigrants and a site-specific context. Client Reference: Dan Anderson, Newmont Mining Corporation, (775) 778-2138

Evaluation of SDI-13,077H and Data Recovery at SDI-13,078 for the Rhodes Crossing Project, RBF Consulting, San Diego County, California, 2011. As ASM's Senior Historian, conducted research for a local and site-specific contexts. Resources gathered included land patent file records from the National Archives and Records Administration in College Park, Maryland; a chain of title; and other primary and secondary sources, as appropriate. Client Reference: Steve Wragg, RBF Consulting, (858) 614-5059

Inventory and Preliminary Evaluations of Archeological and Historical Resources within Selected PSNERP Project Areas, U.S. Fish and Wildlife Service (FWS) Puget Sound, Whatcom, Skagit, Snohomish counties, Washington, 2011. As Senior Historian and History team lead on the project, researched and analyzed agricultural dikes for their potential eligibility to the NRHP and the WA Heritage Register. Client Reference: Jorie Clark, FWS, (541) 737-1575.

Inventory, Evaluation and Analysis of Impacts on Historic Resources on Private Lands Within the Area of Potential Effect of the Campo Verde Solar Project, KP Environmental, Imperial County, California, 2011. As Senior Historian, researched the development of the area and created an area-specific context for the evaluation of resources and potential associations with historical events, trends, and individuals. Client Reference: Patricia Mitchell, KP Environmental, (619) 241-3330.

Historical Evaluation of the Hamlet Parcel, San Diego Gas & Electric (SDG&E), Wildcat Canyon, San Diego County, California, 2011. As Senior Historian, researched and prepared a land use history of the parcel. Client Reference: Dr. Susan Hector, SDG&E, (858) 654-1279.

First San Diego Aqueduct Evaluation, PCR Services, North San Diego County, California, 2011. As Senior Historian, researched and prepared the context and evaluation for the First San Diego Aqueduct, which supplied the first dependable and consistent water supply to San Diego County and facilitated post-World War II growth. Client Reference: Luci Hise, PCR Services, (310) 451-4488.

Camp Pendleton Historic Context Study, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2011-present. As Senior Historian, shaping a master context that will be used as the base pre-installation context from 1769 to 1942. Three historical time periods (Spanish, Mexican, and American) will be developed with specific attention to three important themes on the base: transportation (trails, roads, and railroads), settlement (camps, squatters, ranch house, estancia), and land use (fishing, ranching, farming). Archival research

will answer questions posed by management. This context will aid future compliance projects. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

Camp Pendleton Survey and Evaluation of El Camino Real, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2011-present. As Senior Historian, created a context for “El Camino Real” showing its evolution and changes through three historical time periods (Spanish, Mexican, and American). Archival research yielded maps, insights through diaries, and other documentary materials. Client Reference: Danielle Page, MCB Camp Pendleton, (760) 725-9738.

Phase I Cultural Resource Survey for Furby-North Property for County of San Diego Department of Parks and Recreation, TAIC, Otay Mesa, San Diego County, California, 2011. As Senior Historian, prepared a site-appropriate historic context for the property. The historic context provided a snapshot of the general development in the area. Reference: Christina Schaefer, TAIC, (858) 300-2346.

Cultural and Historical Resources Survey and Evaluation Report for the San Luis Rey Indian Water Rights Settlement Agreement, Atkins, San Diego County, California, 2011. As Senior Historian, wrote the context of water development in the Escondido area and the role the Escondido Canal played in local development. Evaluated two segments of the canal, one of which included the Rincon Penstock, constructed circa 1915. Client Reference: Diane Sandman, Atkins, (858) 514-1010

Cultural Resources Study for the Rodriguez Solar Project, Iberdrola Renewables, King County, California, 2011. As Senior Historian, prepared a brief historic context of water development in the area. Client Reference: Amy Parsons, Iberdrola Renewables, (503) 796-7082

Cultural Resources Survey and Historic Assessment of the Escondido Canal Undergrounding Project, Atkins, San Diego County, California, 2010-2011. As Senior Historian, prepared a site-specific historic context and evaluated the Escondido Canal and Rincon Penstock for their eligibility to the CRHR and NRHP. Client Reference: Diane Sandman, Atkins, (858) 514-1010.

Cultural Resources Assessment of the Puget Sound Nearshore Ecosystem Restoration Project, U.S. Fish and Wildlife Service, Washington, 2010-2011. As Senior Historian and Project Manager, prepared the stand-alone historic context for agricultural levee development in Puget Sound during the late nineteenth and early twentieth centuries and developed criterion for evaluating such resources to the NRHP. Client Reference: Jorie Clark, U.S. Fish and Wildlife Service, (541) 737-1575.

Cultural Resource Assessment at Marine Corps Logistics Base (MCLB), NAVFAC Southwest, Barstow, San Bernardino County, California, 2011. As Senior Historian, prepared a site-appropriate historic context for two water features by answering specific questions posed by

the base regarding potential eligibility. This context explained the development of the Minneola Canal/Daggett Ditch, which confirmed that the two water features were not associated with that historic water system. Client reference: George Herbst, NAVFAC Southwest, (619) 532-3146.

Phase I Cultural Resource Survey for Escondido Creek Properties for County of San Diego Department of Parks and Recreation, Dudek, Escondido, San Diego County, California, 2011. As Senior Historian, prepared a site-appropriate historic context for properties near Harmony Grove. The historic context provided a snapshot of the general development in the area. Client reference: Brock Ortega, Dudek Engineering + Environmental (760) 942-5147.

Phase I Cultural Resource Survey of an Additional 100 Acres for Pascoe and Helix-Lambron Parcels for County of San Diego Department of Parks and Recreation, Dudek, Escondido, San Diego County, California, 2011. As Senior Historian, prepared a site-appropriate historic context for properties near Del Dios. The historic context provided a snapshot of the general development in the area. Client Reference: Brock Ortega, Dudek Engineering + Environmental (760) 942-5147.

Phase I Cultural Resource Survey for San Luis Rey River Park for County of San Diego Department of Parks and Recreation, Dudek, Oceanside, San Diego County, California, 2011. As Senior Historian, prepared a site-appropriate historic context for properties near Bonsall. The historic context provided a snapshot of the general development in the area. Client Reference: Brock Ortega, Dudek, (760) 942-5147.

Historic Context of China Lake Propulsion Laboratories, Epsilon Systems Solutions, NAWS China Lake, San Bernardino County, California, 2010. As author, prepared a historic context of China Lake Propulsion Laboratories (CLPL), comprised of two operational areas historically known as China Lake Pilot Plant (CLPP) and Salt Well Pilot Plant (SWPP). These plants first produced propellants and explosives during World War II, and then, during the Cold War, advanced them and began a new focus on propulsion systems and explosives applications. Client Reference: Phillip Esser, Epsilon Systems Solutions, (760) 446-6400.

Class III Intensive Cultural Resources Inventory near Mountain Pass, Ecology and Environment, Inc. (E&E), San Bernardino County, California. As Senior Historian, prepared a brief historical narrative on the Desert Antimony Mine. Client Reference: Ryan Clerico, Ecology and Environment, (801) 990-3320.

DET. Corona Historic Resources Survey, Evaluation, and Update, NAVFAC Southwest, NWS Seal Beach, Detachment Corona, Riverside County, California, 2010-present. As Senior Historian, prepared three historic contexts for three periods of significance that included a 1920s resort period, a 1940s-1950s Naval hospital period, and a Cold War period, and prepared a land use history to explain the general development of the property and reuse trends. The report focused on the Cold War period because potential historic resources from that time had not been evaluated. The report discussed the national trends for missile

development; the Navy's role in research, development, testing, and evaluation (RDT&E); and how the installation contributed to RDT&E during the Cold War period. Client Reference: Alex Bethke, NAVFAC Southwest, (619) 532-2789.

Sunrise Survey and Evaluation for Indirect Impacts to the Sunrise Powerlink Project, SDG&E, Imperial and San Diego counties, California, 2009-present. As Project Historian, prepared a broad historic context for portions of San Diego County that would be potentially impacted by visual effects of the planned power line. Prepared resource-specific contexts for identified historic resources that could be affected by the project. This portion of the power line project stretches from Plaster City in Imperial County to Beeler Canyon in Poway. Client Reference: Dayle Cheever, SDG&E, (858) 654-1856.

Historic Documentation Package Wullenweber Antenna Array (AN/FRD 10) and Building 1, NAVFAC Southwest, Imperial Beach, San Diego County, California, 2008-2010. As Project Historian and author, prepared the historical documentation package for the Navy's antenna array at Naval Radio Receiving Facility (NRRF), Imperial Beach as mitigation for its demolition. Historic documentation package included creating a HAER-based document and broadening an existing historic context for the Cold War era technology with appropriate historic photographs and drawings. Client Reference: Alex Bethke, NAVFAC Southwest, (619) 532-2789.

Herrmann Hall Maintenance Plan, NAVFAC Southwest, Monterey County, California 2010. As Project Historian, prepared a brief historic context for a historically significant building, Herrmann Hall, located on the campus of the Naval Postgraduate School. Client Reference: Alex Bethke, NAVFAC Southwest, (619) 532-2789.

Simon Open-Space Preserve Historic Research Project, Dudek for County of San Diego Parks and Recreation, San Diego, California, 2009-2010. As Project Historian, prepared a historic research report based on the client's need to interpret the county preserve. Themes researched included: early ranchos, ranching, farming, mining, and general development of the San Diego Country Estates. Offered recommendations for interpreting the site based on the historic evidence. Client Reference: Anita Hayworth, Dudek, (760) 479-4239

Evaluation of a Southern California Edison (SCE) 33kV Transmission Line, TEC, Inc., Twentynine Palms, San Bernardino County, California, 2009. As Project Historian and author, prepared an evaluation of the 33kV transmission line for eligibility to the National Register of Historic Places (Section 106) and the California Register of Historical Resources (CEQA). Client Reference: Craig Bloxam, TEC, Inc., (805) 564-4940.

Cultural Resource Survey, Harvey Meyerhoff Group, Irwindale, Los Angeles County, California, 2009. As Project Historian, prepared a brief context of the United Concrete Pipe Corporation and its use of the industrial site, as requested. Client reference: Elizabeth Meyerhoff, Harvey Meyerhoff Group, (760) 449-7659.

Yuima Historic Road Evaluation, Atkins, San Diego County, California, 2009. As Project Historian and author, prepared an evaluation of a road associated with Stewart Mine within the Pauma/Yuima Indian Reservation for eligibility to the National Register of Historic Places (Section 106) and the California Register of Historic Resources (CEQA). Client reference: Diane Sandman, Atkins, (858) 514-1010.

Twentynine Palms Historic Resources Context, MCAGCC Twentynine Palms, San Bernardino County, California, 2009. As Project Historian and co-author, prepared segment of a Historic Resources Context on settlement in the project area and provided oversight on the preparation of the military segment. Client Reference: Dr. Marie Cottrell, MCGACC, (760) 830-5200.

Yuma Main Canal and Yuma Valley Railroad HAER, Principle Engineering Group, Inc., Yuma County, Arizona, 2009. As Project Historian and author, prepared document based on Level II HAER documentation standards for a portion of the Yuma Main Canal and the Yuma Valley Railroad that would be impacted by a proposed bikeway project. Bureau of Reclamation required the mitigation document and provided a final review because both the canal and the railroad had originally been created and owned by the agency. Client Reference: Triguna Israel, Principle Engineering Group, Inc., (928) 782-5700

Historic Resources Survey and Evaluation of Naval Security Group Activity Skaggs Island, NAVFAC Southwest, Sonoma County, California, 2008-2009. As Cultural Resources Field Supervisor and Research Director for historical services, charged with researching the historic context of the installation as well as the buildings, structures, and objects for a survey and evaluation of Cold War-era usage. Co-authoring a report and creating the historic Cold War-era context for Skaggs Island. Client Reference: Alex Bethke, NAVFAC Southwest, (619) 532-2789.

Preserving a Record of the Coachella Canal: Documents Data Recovery for the Concrete-Lined Reach between Siphon 32 and Lake, Coachella Valley Water District and USDI Bureau of Reclamation, Coachella, Riverside County, California 2007-2009. As Project Historian, co-authored HAER-level report for data recovery for the final reaches of the 123-mile Coachella Canal and its unique underground piped irrigation system. Co-author of the HAER-level report details the construction phases of the project, including specifications, description of unique features, construction, building materials, and responsible contractors. Client Reference: Lauren Perry, Bureau of Reclamation, (702) 293-8392.

Colorado River Programmatic Agreement, USDI Bureau of Reclamation, Yuma, Arizona, 2007-present. As Project Historian, researching the histories of various Reclamation-managed projects on the Colorado River in support of establishing a Programmatic Agreement for maintaining historical resources. Preparing historical contexts and gathering research materials. Client Reference: Lauren Perry, Bureau of Reclamation, (702) 293-8392.

Documenting the Colorado River Front Work and Levee System (CRFWLS): A Historic Context and Inventory, USDI Bureau of Reclamation, Yuma, Arizona, 2007-present. As

Project Historian and primary author, prepared documentation of the protective works system of the Lower Colorado River stretching nearly 253 miles. This protective works program includes levees, channel stabilization, settling basins, inlet and outlet works, maintenance roads, improved backwater areas for fish and wildlife and recreation, drainage and pumping plants, a reservoir and dam, and other smaller features. Gathered pertinent literature and primary sources for a historical context and explanation of the system, and conducted an aerial photographic inventory of the features of the CRFWLS. Client Reference: Lauren Perry, Bureau of Reclamation, (702) 293-8392

O'Neill Ditch Historic Evaluation, Proposed Santa Margarita River Conjunctive Use Project (SMRCUP), NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2009. As Project Historian, responded to an urgent research request and evaluated the historic integrity of an 1883-era ditch associated with the Santa Margarita Ranch.

San Marcos Elementary School and Mary Young Connor Hall Historic Context and Eligibility, Helix Environmental, San Diego County, California, 2009. As Project Historian, conducted research for the elementary school designed by a master architect and the WPA-constructed Mary Young Connor Hall building as potentially eligible historic resources. Co-authored the report that included creating separate, but associated, historic contexts for the elementary school and the WPA building, and assessed the significance of the WPA building based on the historic context. Client Reference:

San Ysidro Land Point of Entry (LPOE) Historic Context Study, Helix Environmental, San Diego County, California, 2009. As Project Historian, researched 12 buildings near the border surrounding the San Ysidro LPOE and crafted a concise historic context for evaluation of the buildings. Client Reference: Tim Belzman, Helix Environmental, Inc., (619) 462-1515.

Gheen and Martin Reservoirs Historic Evaluation, Proposed Santa Margarita River Conjunctive Use Project (SMR CUP), NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2008-2009. As Project Historian, responded to a research request on the historicity of Gheen and Martin reservoirs as part of the Fallbrook Public Utility District's water operations. Authored a response pertaining to the Martin Reservoir as a possible WPA-era reservoir built between 1939 and 1943, respectively. Client Reference:

Yokohl Ranch Historic Evaluation, Boswell, Atkins, Tulare County, California, 2008-2009. As Project Historian, extended previous research efforts and focused on land settlement and mining by gathering historical documentation through Land Patent Files obtained from the National Archives and Records Administration (NARA) in College Park, Maryland, and in local libraries, the historical society, and the Tulare County Assessor and Recorder's Offices. Co-author of the final report. Client reference: Kim Howlett, Atkins, (858) 874-1810.

Palmdale Ditch Historic Context Study, P&D Consultants, Palmdale, Los Angeles County, California, 2008. As Project Historian, conducted research at the Palmdale Water District

office and local repositories. Crafted a historical context of the ditch for a letter report. Client Reference: John Shih, P&D Consultants, (619) 291-1475 x 215

Green Beach Historic Context Study, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2008. As Project Historian, created a historic context of the construction of two bridges built during the 1920s, one was a Santa Fe Railway bridge and the other was a bridge built as part of a Highway 101 project. Co-author of the historic evaluation report. Client Reference: Doug Billings, TEC, Inc., (805) 564-4940

Poway Site Land Use History, City of Poway, San Diego County, California, 2008. As Project Historian, researched the land use of a parcel in Poway, California to determine when known foundations may have been constructed on the land. Authored a section of the report detailing findings.

Caretaker's Residence HABS, USDI Bureau of Reclamation, Yuma, Arizona, 2008. As Project Historian, visited the site, crafted the historic context, and updated the information made available in the DPR 523. Co-author of the HABS report. Client Reference: Lauren Perry, Bureau of Reclamation, (702) 293-8392.

111 Calexico Place Historic Resource Inventory and Evaluation, City of Calexico, Imperial County, California, 2008. As Project Historian and co-author of the report, assessed the possible impacts of a new bridge and the expansion of an existing bridge to the Central Main and Dogwood canals. Client Reference: Kathie Washington, BRG Consulting, (619) 298-7127

Johnson Valley Historic Evaluation, MCAGCC Twentynine Palms, San Bernardino County, California, 2008. As Project Historian and contributing author, researched the history of mining in a large expanse near 29 Palms, specifically in the Johnson Valley area. Gathered information from various sources such as the Register of Mines and Minerals for San Bernardino County and bulletins, reports, and journals produced by the California Journal of Mines and Geology and the California State Mining Bureau/Division of Mines. Created historical context for mining in this segment of the Western Mojave Desert. Client Reference: Dr. Marie Cottrell, MCGACC, (760) 830-5200.

Edwards Phase I Cultural Resources Survey of 2,500 Acres and Phase II Evaluation of Selected Archaeological Sites, Edwards Air Force Base (EAFB), Kern and Los Angeles counties, California, 2008. As Project Historian, authored segments of site forms regarding homesteads. Research focused on Land Patent Files obtained from the National Archives and Records Administration (NARA) in College Park, Maryland. Additional supporting research may also be necessary. Client Reference: Richard Bark, JT3, (661) 277-9144

Edwards Phase I Cultural Resources Survey of 8,100 Acres, EAFB, Kern and Los Angeles counties, California, 2008. As Project Historian, authored segments of site forms regarding homesteads. Research focused on Land Patent Files obtained from the National Archives and

Records Administration (NARA) in College Park, Maryland. Client Reference: Richard Bark, JT3, (661) 277-9144

Sweetwater Union High School District Cultural Resources Inventory and Assessment, National City and Chula Vista, San Diego County, California, 2008. As Project Historian, authored the historic context for the developing Sweetwater Union High School District in National City and Chula Vista. Conducted limited research on specific school buildings selected for alterations or demolition.

Land Use Study for the San Mateo Agricultural Fields, NAVFAC Southwest, MCB Camp Pendleton, San Diego County, California, 2007-2008. As Project Historian, researched the land use history of a portion of Camp Pendleton. Research determined when land use changed from cattle ranching to agricultural production and determined the possibility of San Diegan Japanese leasing a portion of Camp Pendleton land for agricultural production. Conducted surveys of literature, current and historic maps, and other primary and secondary materials. Authored the historical context. Client Reference: Danielle Page, NAVFAC Southwest, (619) 532-2090.

Sonny Bono Salton Sea National Wildlife Refuge and Coachella Valley National Wildlife Refuge Historic Overview, San Diego Wildlife Refuge Complex, Coachella Valley, Riverside County, California, 2007-2008. As Project Historian, conducted research for an introductory history of the Coachella Valley, the Salton Sea, and the two National Refuges. Authored introductory history section. Client Reference: Victoria Aires, San Diego National Wildlife Refuge Complex, (760) 431-9440 ex. 349.

Historic Context Study for the North County Transit District Eight Bridges Project, BRG Consulting, Oceanside, San Diego County, California, 2007-2008. As Project Historian, researched the historical context of transportation development prior to the United States' entrance into World War II and the early 1940s to explain the interaction of the 8 bridges with war-prompted changes and other pertinent historical changes in the general vicinity. Responsible for the historical context section of the report. Client Reference: Erich Lathers, BRG Consulting, (619) 298-7127.

Evaluation of 17 Sites at MCAS Miramar, MCAS Miramar, Miramar, San Diego County, California, 2007-2008. As Project Historian, researched the settlement of the area in an effort to determine the significance of several structures on the property. Conducted surveys of literature, current and historic maps, land patent files, and other primary and secondary materials. Authored historic context section of the report. Client Reference: David Boyer, MCAS Miramar, (858) 577-1125.

Historic Context Study for the Bridge 207.6 Project, BRG Consulting for North County Transit Department, Oceanside, San Diego County, California, 2007. As Project Historian, researched the historical context of transportation development prior to the United States' entrance into World War II and the early 1940s to explain the interaction of the bridge with

war-prompted changes and other pertinent historical changes in the general vicinity. Authored the historical context section of the report. Client Reference: Erich Lathers, BRG Consulting, (619) 298-7127.

Historic Context Study for the Madison Street Bridge Project, Coachella Canal Evaluation, USDI Bureau of Reclamation, Boulder City, Clark County, Nevada, 2007. As Associate Historian, researched the history of Coachella Valley. The architectural historian evaluated the structure and the Associate Historian provided the historical context and the research materials. Authored Coachella Valley portion of the report. Client Reference: Mark Slaughter, Bureau of Reclamation, (702) 293-8143.

Historic Evaluation for the Padre Dam, Padre Dam Municipal Water District, Lakeside, San Diego County, California, 2007. As Associate Historian, researched the land use of the area to understand local development by using readily-available historical documents, including maps. Findings in the field indicated the possibility of a historic structure and prompted the research conducted. Provided information on the dates of possible construction for the Senior Archaeologist to determine the site's eligibility. Authored a portion of the report. Client Reference: Al Lau, Lead Engineer, PDMWD, (619) 596-1804

Historic Context Study for the Yokohl Ranch Project, Atkins, Tulare County, California, 2007. As Associate Historian, conducted an initial research phase for an introductory survey of 36,000 acres in the greater Yokohl Valley area in Tulare County. Collected appropriate materials to formulate a background history of the settlement patterns of the Yokohl Valley area in connection with the surrounding towns. Authored the historical section of the preliminary report. Client reference: Kim Howlett, Atkins, (858) 874-1810.

Historical Survey for the Mohave Mine Project, Fisher Sand and Gravel, Tempe, Maricopa County, Arizona, 2007. As Associate Historian, conducted a brief survey of resources for previous mining operations within an initial survey of 80 acres. Located initial information on the unknown mine in a timely resource search.

Yaqui Pass/Viking Farm Project Assessment, BRG Consulting for the San Diego County Department of Planning and Land Use, San Diego County, California, 2007. As Associate Historian, participated in the initial assessment of lands near Yaqui Pass by researching the early land use after the preliminary survey in the Anza Borrego State Park indicated possible early 1900s settlement. Researched the general history of the area, found historical information on previous owners, and retrieved land patent file information from the NARA in Washington, D.C. Authored a portion of the historical section of the report based on findings. Client Reference: Tim Gnibus, BRG Consulting, (619) 298-7127.

Brochures for San Diego Family Housing, San Diego Military Family Housing, LLC, San Diego County, California, 2007. As Associate Historian, assisted with deliverables in facilitating appropriate use of Naval housing facilities according to the established Programmatic Agreement for private operation and maintenance. Assisted the architectural

historian in fashioning informational brochures for the occupants of the housing facilities detailing the history of the facility, responsibilities of SDFH and the occupants, and information outlining the NHPA as it applies to SDFH and the occupants of its facilities. Client Reference: Dane Baker, San Diego Military Family Housing, (858) 874-8100.

**APPENDIX D**  
**NAHC Correspondence**



October 17, 2012

Dave Singleton  
California Native American Heritage Division  
915 Capitol Mall, RM 364  
Sacramento, CA 95814

Re: Sacred Lands File and Native American Contacts List Request for the Lindley Tank Replacement Project, City of Escondido, San Diego County, California

Dear Mr. Singleton,

ASM Affiliates, Inc. (ASM) is conducting an archaeological study for the Lindley Tank Replacement Project, located in Escondido, California directly northwest of the intersection of N. Ash St. and Pleasantwood Lane/Hubbard Ave. This study is being undertaken under the current framework in compliance with CEQA for the City of Escondido and Section 106 of the National Historic Preservation Act (NHPA) for the State Water Resources Control Board. The current project will entail a one day pedestrian survey of the proposed project parcel. ASM has already conducted a records search with the South Coast Information Center in San Diego County.

I am writing to place a request for a Sacred Lands File and Native American Contacts List Request from the California Native American Heritage Commission in order to identify and locate any previously documented cultural resources or areas of concern within the Lindley Tank Replacement Project area depicted below as a means to assess potential adverse affects to cultural resources in the area. The search should include the project area and a half-mile radius surrounding it. The project area is located on the 7.5 USGS Quadrangle of Valley Center in an unsectioned portion of Township 12 South, Range 2 West. Attached to this request are maps of the project area.

Our investigation will include direct consultation with local tribal entities in a manner that ensures complete confidentiality. To facilitate this dialogue I would like to make a request for a listing of the appropriate individuals to contact for this project. You can reply to me at the ASM Carlsbad office, listed above or through any of the other means of contact listed below. Feel free to call, write, Fax, or e-mail if you have any questions.

Thank you for your help in this endeavor.

Sincerely,



Tony T. Quach

Associate Archaeologist  
ASM Affiliates Inc.,  
2034 Corte del Nogal  
Carlsbad, CA 92011  
(760) 804-5757  
[tquach@asmaffiliates.com](mailto:tquach@asmaffiliates.com)

Attachment:

Figure 1. Location map of the project area.

Figure 2. Vicinity map of the project area.

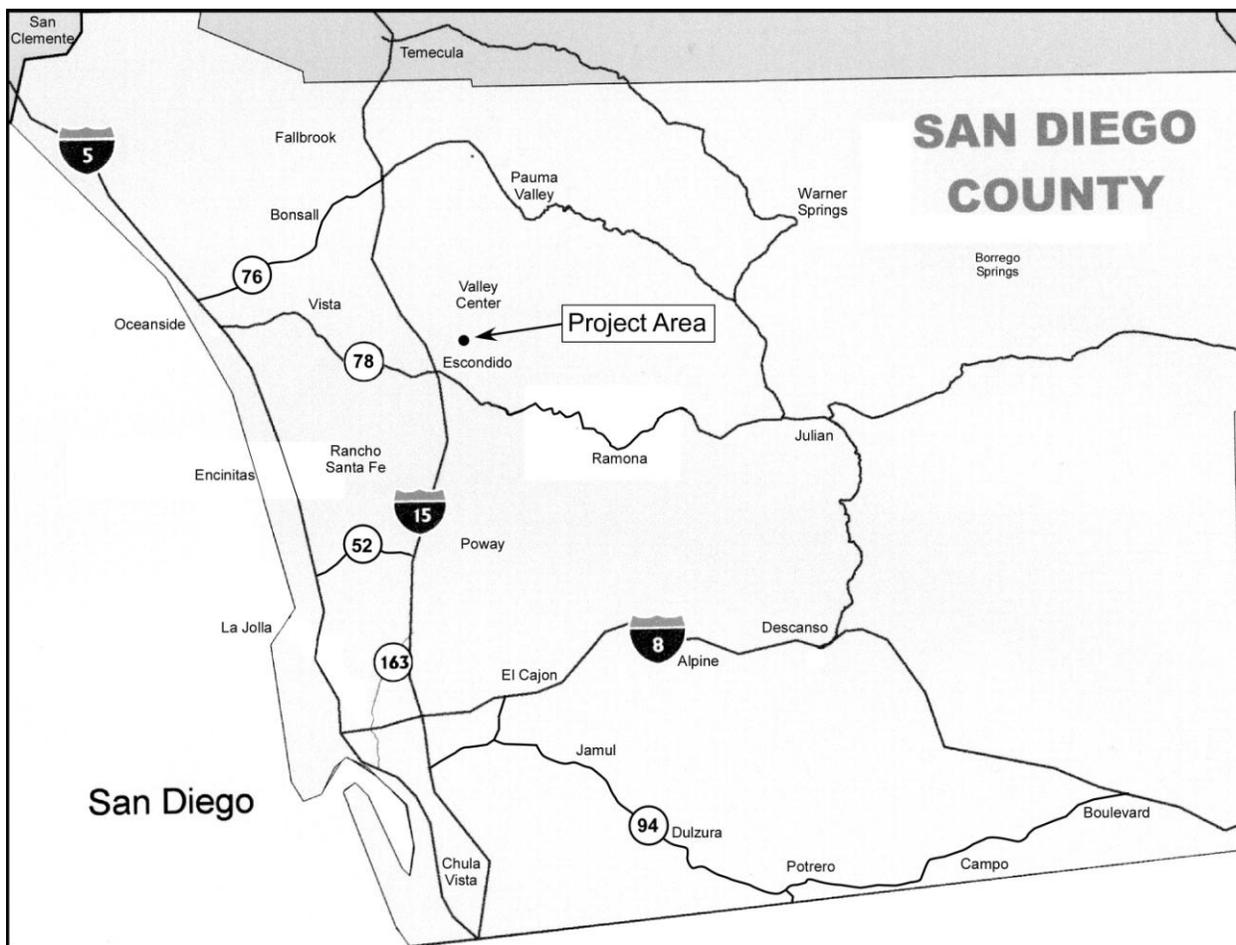


Figure 1. Vicinity map of the project area.

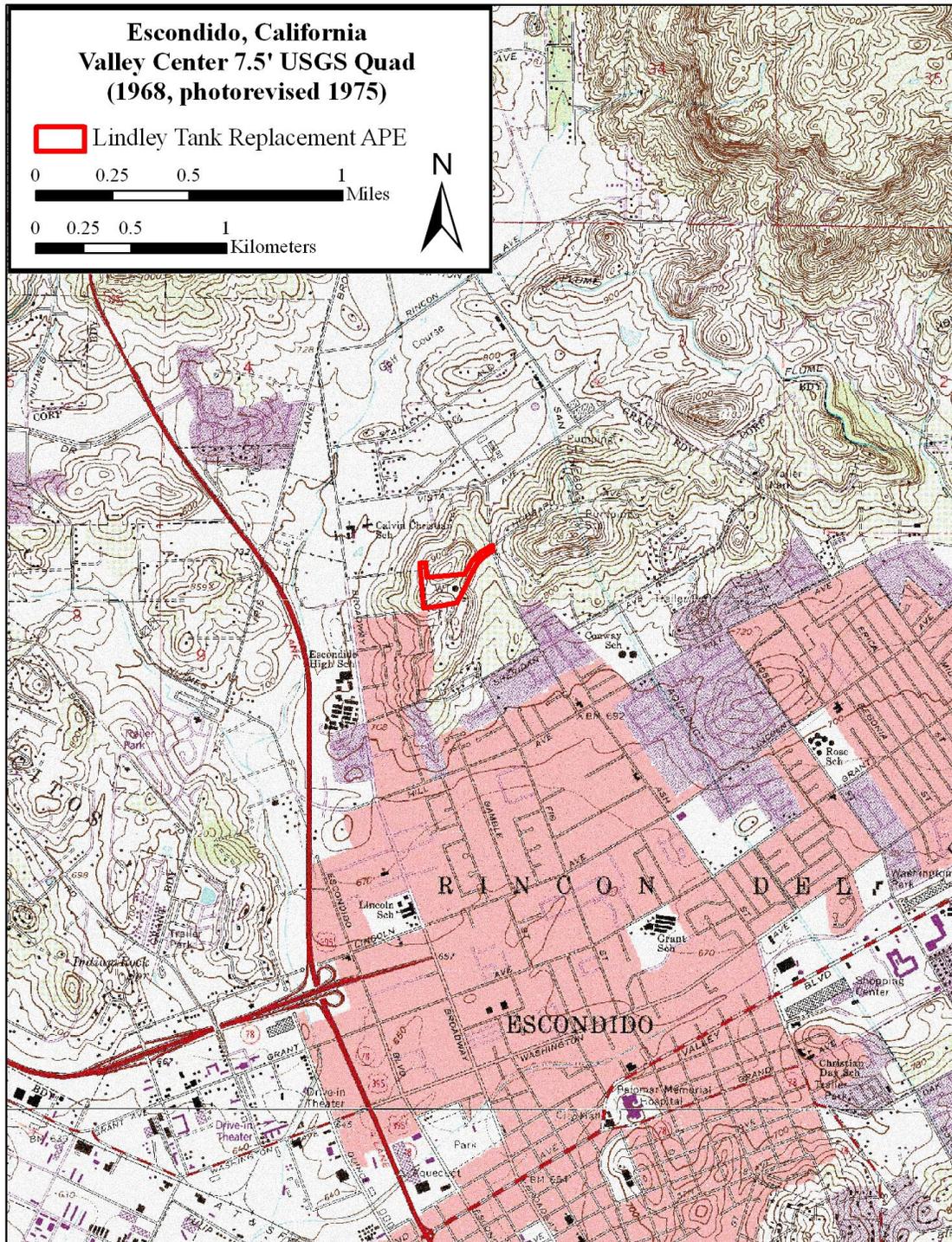


Figure 2. Location map of the project area.

## Sacred Lands File & Native American Contacts Request

### NATIVE AMERICAN HERITAGE COMMISSION

915 Capitol Mall, RM 364  
 Sacramento, CA 95814  
 (916) 653-4082  
 (916) 657-5390 – Fax  
 nahc@pacbell.net

*Information Below is Required for a Sacred Lands File Search*

Project: Lindley Tank Replacement Project  
 County: San Diego County  
 USGS Quadrangle: 7.5 Minute USGS Quadrangle  
 Quad Name: Valley Center  
 Township: 12 S, Range: 2 W  
 Section (s): Unsectioned  
 Company/Agency: ASM Affiliates Inc.  
 Contact Person: Tony Quach  
 Street Address: 2034 Corte del Nogal  
 City: Carlsbad, CA 92011  
 Phone: 760-804-5757  
 Fax: 760-804-5755  
 Email: tquach@asmaffiliates.com

Project Description: The Lindley Tank Replacement Project, proposes to augment and replace the current existing water storage facilities. In lieu of the current two-million gallon potable water storage tank, two additional storage tanks (1.5 million gallon capacity each) will be placed on an adjacent structure pad. The City would demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 mg. The two tanks would be piped to allow isolation of one tank for maintenance shutdown while leaving the other tank in service. Replacement tanks shall be pre-stressed and post tensioned concrete reservoirs per AWWA D110. City preference is for tanks to be partially or fully buried. Associated construction activities, as proposed, will entail grading, structure pad emplacement, tank construction, access road creation, as well as pipeline placement.

Additional Location Information:

UTM's (NAD83): 492006 mE, 3667919 mN

Road Intersection: North Ash Street and Hubbard Avenue/Pleasantwood Lane

STATE OF CALIFORNIA

Edmund G. Brown, Jr., Governor

**NATIVE AMERICAN HERITAGE COMMISSION**

916 CAPITOL MALL, ROOM 364  
SACRAMENTO, CA 95814  
(916) 653-6251  
Fax (916) 657-5380  
Web Site [www.nahc.ca.gov](http://www.nahc.ca.gov)  
da\_nahc@pscbell.net



October 22, 2012

Mr. Tony Quach, RPA

**ASM Affiliates, Inc.**

2034 Corte del Nogal  
Carlsbad, CA 92011

Sent by FAX to: 760-804-5755  
No. of Pages: 5

Re: Sacred Lands File Search and Native American Contacts list for the proposed Sacred Lands File Search and Native American Contacts list for the proposed "Lindley Tank Replacement Project;" located near the City of Escondido in the Valley Center USGS Quadrangle; North Motro;; San Diego County, California

Dear. Mr. Quach:

The Native American Heritage Commission (NAHC) conducted a Sacred Lands search based on the data provided and **Native American cultural resource sites were identified** within one-half mile of the project site, the 'area of potential effect' (e.g. APE): you specified. Also the absence of archaeological fixtures and other cultural resource items does not preclude their existence at the subsurface level. In addition, please note; the NAHC Sacred Lands Inventory is not exhaustive and does not preclude the discovery of cultural resources during any project groundbreaking activity.

California Public Resources Code §§5097.94 (a) and 5097.96 authorize the NAHC to establish a Sacred Land Inventory to record Native American sacred sites and burial sites. These records are exempt from the provisions of the California Public Records Act pursuant to. California Government Code §6254 (r). The purpose of this code is to protect such sites from vandalism, theft and destruction.

In the 1985 Appellate Court decision (170 Cal App 3rd 604), the court held that the NAHC has jurisdiction and special expertise, as a state agency, over affected Native American resources, impacted by proposed projects including archaeological, places of religious significance to Native Americans and burial sites

The California Environmental Quality Act (CEQA – CA Public Resources Code §§ 21000-21177, amendments effective 3/18/2010) 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 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. CA Government Code §65040.12(e) defines "environmental justice" provisions and is applicable to the environmental review processes. The NAHC recommends *avoidance* as defined by CEQA Guidelines §15370(a) to pursuing a project that would damage or destroy Native American cultural resources and California Public Resources Code Section 21083.2 (Archaeological Resources) that requires documentation, data recovery of cultural resources, construction to avoid sites and the possible use of covenant easements to protect sites.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Local Native Americans may have knowledge of the religious and cultural significance of the historic properties of the proposed project for the area (e.g. APE). Consultation with Native American communities is also a matter of environmental justice as defined by California Government Code §65040.12(e). We urge consultation with those tribes and interested Native Americans on the list that the NAHC has provided in order to see if your proposed project might impact Native American cultural resources. Lead agencies should consider *avoidance* as defined in §15370 of the CEQA Guidelines when significant cultural resources as defined by the CEQA Guidelines §15064.5 (b)(c)(f) may be affected by a proposed project. If so, Section 15382 of the CEQA Guidelines defines a significant impact on the environment as "substantial," and Section 21083.2 which requires documentation, data recovery of cultural resources.

The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The aforementioned Secretary of the Interior's *Standards* include recommendations for all 'lead agencies' to consider the historic context of proposed projects and to "research" the cultural landscape that might include the 'area of potential effect.'

Partnering with local tribes and interested Native American consulting parties, on the NAHC list, should be conducted in compliance with the requirements of federal NEPA (42 U.S.C 4321-43351) and Section 106 4(f), Section 110 and (k) of the federal NHPA (16 U.S.C. 470 *et seq*), Section 4(f) of the Department of Transportation Act of 1966 (23 CFR 774); 36 CFR Part 800.3 (f) (2) & .5, the President's Council on Environmental Quality (CSQ, 42 U.S.C 4371 *et seq.* and NAGPRA (25 U.S.C. 3001-3013) as appropriate. The 1992 *Secretary of the Interiors Standards for the Treatment of Historic Properties* were revised so that they could be applied to all historic resource types included in the National Register of Historic Places and including cultural landscapes. Also, federal Executive Orders Nos. 11593 (preservation of cultural environment), 13175 (coordination & consultation) and 13007 (Sacred Sites) are helpful, supportive guides for Section 106 consultation. The NAHC remains concerned about the limitations and methods employed for NHPA Section 106 Consultation.

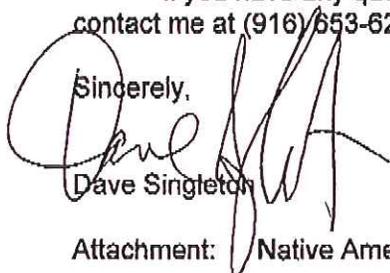
Also, California Public Resources Code Section 5097.98, California Government Code §27491 and Health & Safety Code Section 7050.5 provide for provisions for accidentally discovered archeological resources during construction and mandate the processes to be followed in the event of an accidental discovery of any human remains in a project location other than a 'dedicated cemetery', another important reason to have Native American Monitors on board with the project.

To be effective, consultation on specific projects must be the result of an ongoing relationship between Native American tribes and lead agencies, project proponents and their contractors, in the opinion of the NAHC. An excellent way to reinforce the relationship between a project and local tribes is to employ Native American Monitors in all phases of proposed projects including the planning phases.

Confidentiality of "historic properties of religious and cultural significance" may also be protected under Section 304 of the NHPA or at the Secretary of the Interior discretion if not eligible for listing on the National Register of Historic Places. The Secretary may also be advised by the federal Indian Religious Freedom Act (cf. 42 U.S.C., 1996) in issuing a decision on whether or not to disclose items of religious and/or cultural significance identified in or near the APE and possibility threatened by proposed project activity.

If you have any questions about this response to your request, please do not hesitate to contact me at (916) 653-6251.

Sincerely,



Dave Singleton

Attachment: Native American Contact List

**Native American Contacts  
San Diego County  
October 22, 2012**

Pala Band of Mission Indians  
Historic Preservation Office/Shasta Gaughen  
35008 Pala Temecula Road, Luiseno  
Pala, CA 92059 Cupeno  
PMB 50  
(760) 891-3515  
sgaughen@palatribe.com  
(760) 742-3189 Fax

Pauma & Yuima Reservation  
Randall Majel, Chairperson  
P.O. Box 369 Luiseno  
Pauma Valley CA 92061  
paumareservation@aol.com  
(760) 742-1289  
(760) 742-3422 Fax

Pechanga Band of Mission Indians  
Paul Macarro, Cultural Resources Manager  
P.O. Box 1477 Luiseno  
Temecula, CA 92593  
**(951) 770-8100**  
pmacarro@pechanga-nsn.  
gov  
(951) 506-9491 Fax

Rincon Band of Mission Indians  
Vincent Whipple, Tribal Historic Preservation Officer  
P.O. Box 68 Luiseno  
Valley Center, CA 92082  
twolfe@rincontribe.org  
(760) 297-2635  
(760) 297-2639 Fax

Rincon Band of Mission Indians  
Bo Mazzetti, Chairperson  
P.O. Box 68 Luiseno  
Valley Center, CA 92082  
bomazzetti@aol.com  
(760) 749-1051  
(760) 749-8901 Fax

San Pasqual Band of Indians  
Kristie Orosco, Environmental Coordinator  
P.O. Box 365 Luiseno  
Valley Center, CA 92082 Diegueno  
**(760) 749-3200**  
council@sanpasqualtribe.org  
(760) 749-3876 Fax

San Luis Rey Band of Mission Indians  
Cultural Department  
1889 Sunset Drive Luiseno  
Vista, CA 92081 Cupeno  
760-724-8505  
  
760-724-2172 - fax

La Jolla Band of Mission Indians  
Lavonne Peck, Chairwoman  
22000 Highway 76 Luiseno  
Pauma Valley CA 92061  
rob.roy@lajolla-nsn.gov  
(760) 742-3796  
(760) 742-1704 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed Lindley Tank Replacement Project, City of Escondido, San Diego County, California for which a Sacred Lands File search and Native American Contacts list were requested.

**Native American Contacts  
San Diego County  
October 22, 2012**

Pechanga Cultural Resources Department  
Anna Hoover, Cultural Analyst  
P.O. Box 2183 Luiseño  
Temecula , CA 92593  
ahoover@pechanga-nsn.gov  
951-770-8104  
(951) 694-0446 - FAX

This list is current only as of the date of this document.

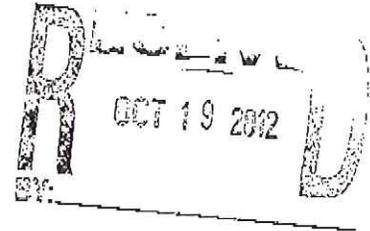
Distribution of this list does not relieve any person of the statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is applicable for contacting local Native Americans with regard to cultural resources for the proposed Lindley Tank Replacement Project, City of Escondido, San Diego County, California for which a Sacred Lands File search and Native American Contacts list were requested.

## Sacred Lands File & Native American Contacts Request

### NATIVE AMERICAN HERITAGE COMMISSION

915 Capitol Mall, RM 364  
 Sacramento, CA 95814  
 (916) 653-4082  
 (916) 657-5390 - Fax  
 nahc@pacbell.net



*Information Below is Required for a Sacred Lands File Search*

Project: Lindley Tank Replacement Project  
 County: San Diego County  
 USGS Quadrangle: 7.5 Minute USGS Quadrangle  
 Quad Name: Valley Center  
 Township: 12 S, Range: 2 W  
 Section (s): Unsectioned  
 Company/Agency: ASM Affiliates Inc.  
 Contact Person: Tony Quach  
 Street Address: 2034 Corte del Nogal  
 City: Carlsbad, CA 92011  
 Phone: 760-804-5757  
 Fax: 760-804-5755  
 Email: tquach@asmaffiliates.com

**Project Description:** The Lindley Tank Replacement Project, proposes to augment and replace the current existing water storage facilities. In lieu of the current two-million gallon potable water storage tank, two additional storage tanks (1.5 million gallon capacity each) will be placed on an adjacent structure pad. The City would demolish the existing steel tank and replace it with two tanks with a combined storage capacity of 2.5 to 3.0 mg. The two tanks would be piped to allow isolation of one tank for maintenance shutdown while leaving the other tank in service. Replacement tanks shall be pre-stressed and post tensioned concrete reservoirs per AWWA D110. City preference is for tanks to be partially or fully buried. Associated construction activities, as proposed, will entail grading, structure pad emplacement, tank construction, access road creation, as well as pipeline placement.

#### Additional Location Information:

UTM's (NAD83): 492006 mE, 3667919 mN  
 Road Intersection: North Ash Street and Hubbard Avenue/Pleasantwood Lane

**APPENDIX E**  
**DPR Form**

Other Listings  
Review Code \_\_\_\_\_ Reviewer \_\_\_\_\_ Date \_\_\_\_\_

Page 1 of 4

\*Resource Name or #: Lindley Reservoir Water Tank

P1. Other Identifier:

\*P2. Location:  Not for Publication  Unrestricted

a. County: San Diego County

b. USGS 7.5' Quad Valley Center Date 1968 T 12S; R 2E; unsectioned Rincon del Diablo Land Grant; S.B. **B.M.**

c. Address: Hubbard Avenue City Escondido Zip \_\_\_\_\_

d. UTM: Zone 11, 492077.62 mE / 3667896.38 mN

e. Other Locational Data: The Lindley Reservoir Water Tank is located on APNs 227-101-58 and 227-101-55.

\*P3a. Description:

The Lindley Reservoir Water Tank is a 2.0 mg welded steel potable water tank that is 120 ft. in diameter. It has a floor elevation of 905.0 ft above sea level. It has buried inlet and outlet pipes. On the southwest side of the tank there is an 18-in. outlet line with a control valve on the outlet line. The tank overflow and drain lines discharge into a riprap lined basin. Associated metal and PVC pipes run downhill into the water tank. The area surrounding the water tank is fenced with chain link fencing and barbed wire. Two associated concrete cinder block structures are abandoned drain and pressure reducing stations, and are located west of the water tank along Hubbard Avenue. The two structures no longer have roofs and contain rubble and the remains of a piping system. On the northwest side of the tank is a recycled water control valve and landscape irrigation booster pump behind enclosed fencing. There are two buried recycled water tank access hatches and a raw water connection point at the top of the hill outside the APE, but they are not part of the reservoir system. They are part of the Leslie Lane Recycled Water Reservoir system constructed in 2001 and the raw water line installed between 2006 and 2008.

\*P4. Resources Present:  Building  Structure  Object  Site  District  Element of District  Other (Isolates, etc.)

P5a. Photograph or Drawing:



P5b. Description of Photo:

Overview of the Lindley Reservoir Water Tank, facing north, November 12, 2012, 001.jpg

\*P6. Date Constructed/Age and Source:

Historic  Prehistoric  Both

\*P7. Owner and Address:

City of Escondido  
201 North Broadway  
Escondido, CA 92025

\*P8. Recorded by:

Shelby Gunderman Castells  
ASM Affiliates, 2034 Corte del Nogal,  
Carlsbad, CA 92011

\*P9. Date Recorded: November 12, 2012

\*P10. Survey Type:

Intensive Pedestrian

\*P11. Report Citation: Shelby Gunderman Castells and Sarah Stringer-Bowsher, 2012, *Inventory and Evaluation of Cultural Resources for the Lindley Tank Replacement Project, in Escondido, San Diego County, California*. ASM Affiliates, Inc., Carlsbad, California. Helix Environmental

\*Attachments:  NONE  Location Map  Sketch Map  Continuation Sheet  Building, Structure, and Object Record  
 Archaeological Record  District Record  Linear Feature Record  Milling Station Record  Rock Art Record  
 Artifact Record  Photograph Record  Other (List):

Page 2 of 4

**\*Resource Name or #: Lindley Reservoir Water Tank**  
**\*NRHP Status Code 6Z**

B1. Historic Name: Lindley Reservoir Water Tank  
B2. Common Name: Lindley Reservoir Water Tank  
B3. Original Use: Water Tank

B4. Present Use: Water Tank

**\*B5. Architectural Style:** Water Infrastructure

**\*B6. Construction History:** The Lindley Reservoir Water Tank was original constructed in 1950.

**\*B7. Moved?** No Yes Unknown **Date:** **Original Location:**

**\*B8. Related Features:** Escondido-Vista Water Treatment Plant System

B9a. Architect: unknown

b. Builder: Escondido Mutual Water Company

**\*B10. Significance:** **Theme:** Water Infrastructure

**Area:** San Diego County

**Period of Significance:** 1950

**Property Type:** Water Tank

**Applicable Criteria:**

The Lindley Reservoir Water Tank meets the age threshold for eligibility for listing on the NRHP as water infrastructure constructed in 1950. It was constructed as part of an expansion of the EMWD's water system during a period of transition when a greater water supply was needed for agricultural, residential, and some commercial customers in a growing community post World War II. Today, the Lindley Reservoir is one of 11 reservoirs that are part of the Escondido-Vista Water Treatment Plant (1970) system that serves the City of Escondido (Kearney 2012). Reservoirs or water tanks were added over time as service areas expanded and new water sources were added. Improvements of water features, such as a water tank, are necessary and are a common occurrence in water systems. While the Lindley Reservoir Water Tank is the original water tank (Kearney 2012) and its integrity is largely intact, its historical importance under Criterion A of the NRHP does not rise to the level of significant that would make it eligible to the NRHP, the CRHR or the City of Escondido Municipal Code.

The Lindley Reservoir Water Tank was constructed by the EMWD in 1950 and was acquired by the City of Escondido in 1970, the same year the Escondido-Vista Water Treatment Plant was constructed. It is not recommended eligible under Criterion B because there is no association with any historically important individual. The materials and construction of the Lindley Reservoir Water Tank are not uniquely characteristic of its time of construction. Instead water tanks are fairly common structures often utilized to serve growing communities in a post World War II society. Since it is a structure that is commonplace, it is ineligible under Criterion C. The resource is not recommended eligible under Criterion D as data recovery would likely not yield important historical data.

Similarly, these segments of the Lindley Reservoir Water Tank are not recommended eligible to the CRHR under Criteria 1-4 or the City of Escondido Municipal Code (Chapter 33 Zoning, Article 40 – Historical Resources, Sec. 33-794) Criteria 1-7.

B11. Additional Resource Attributes:

**\*B12. References:**

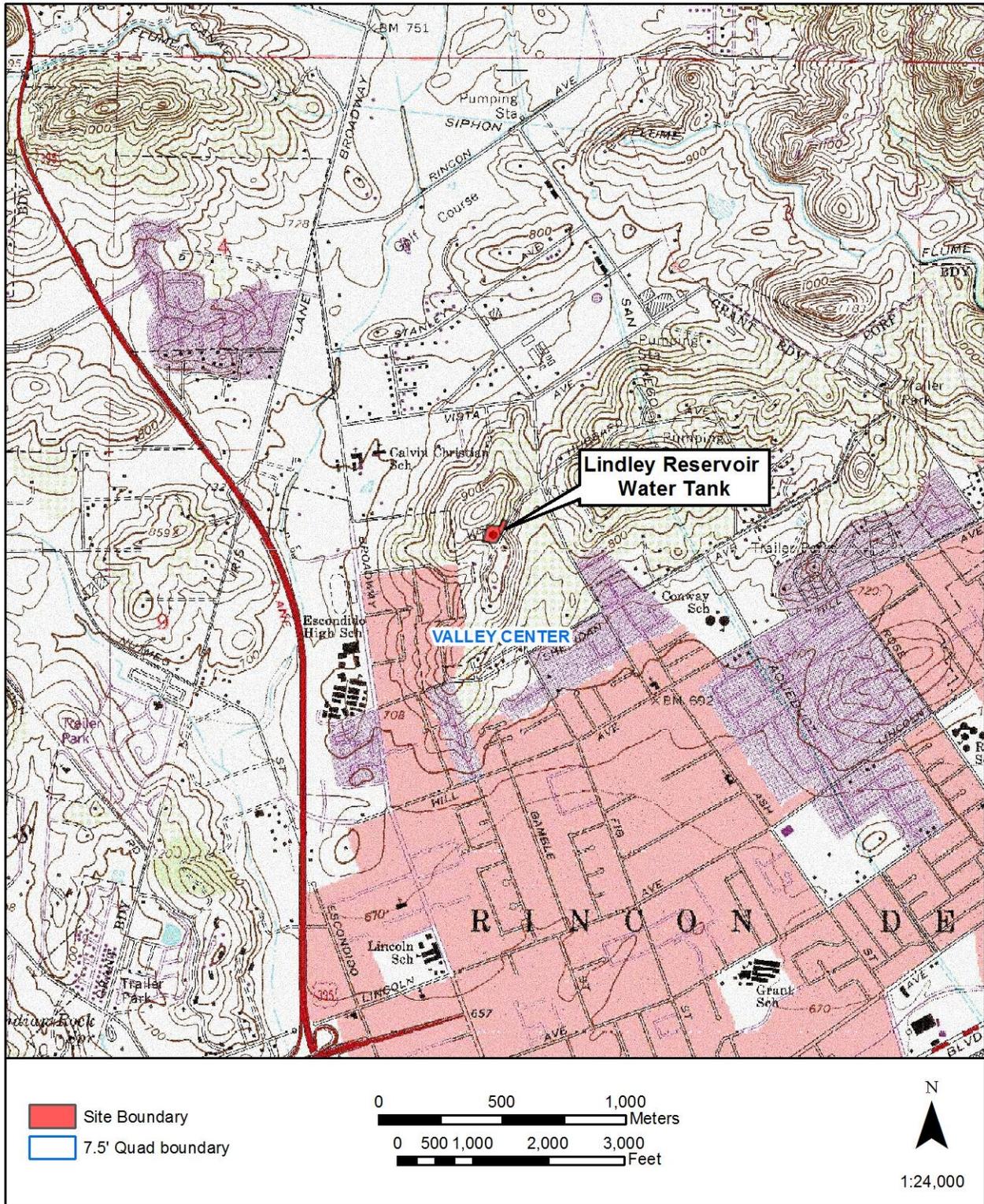
Kearney, John  
2012 Personal communication with Sarah Stringer-Bowsher. On file with ASM Affiliates.

**\*B14. Evaluator:** Sarah Stringer-Bowsher, M.A., RPH  
ASM Affiliates, Inc.

**\*Date of Evaluation:** November 12, 2012

(Sketch Map with north arrow required.)  
See attached

(This space reserved for official comments.)



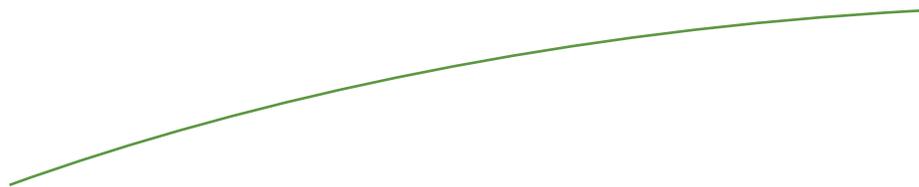






# APPENDIX C

# GEO TECHNICAL EVALUATION



**GEOTECHNICAL EVALUATION  
LINDLEY RESERVOIR  
REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA**

**PREPARED FOR:**

MWH  
9444 Farnham Street, Suite 300  
San Diego, California 92123

**PREPARED BY:**

Ninyo & Moore  
Geotechnical and Environmental Sciences Consultants  
5710 Ruffin Road  
San Diego, California 92123

December 14, 2012  
Project No. 107424001

December 14, 2012  
Project No. 107424001

Mr. John Kearney  
MWH  
9444 Farnham Street, Suite 300  
San Diego, California 92123

Subject: Geotechnical Evaluation  
Lindley Reservoir Replacement Project  
Escondido, California

Dear Mr. Kearney:

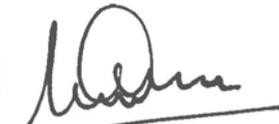
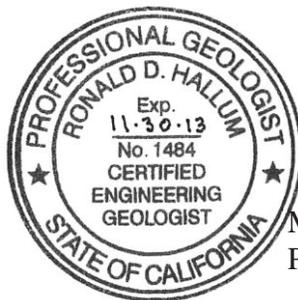
In accordance with your authorization, we have performed a geotechnical evaluation for the City of Escondido's Lindley Reservoir Replacement Project in Escondido, California. This report presents our geotechnical findings, conclusions, and recommendations regarding the proposed project.

We appreciate the opportunity to be of service on this project.

Sincerely,  
**NINYO & MOORE**



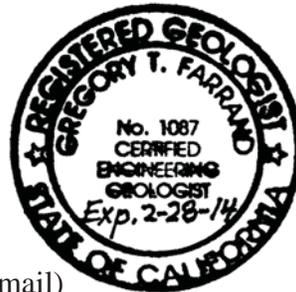
Ronald D. Hallum, PG, CEG  
Senior Geologist



Madan Chirumalla, PE  
Project Engineer



Gregory T. Farrand, CEG  
Principal Geologist



Soumitra Guha, PhD, PE, GE  
Principal Engineer



NMM/RDH/MAC/SG/GTF/gg

Distribution: (1) Addressee (via e-mail)

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## **1. INTRODUCTION**

In accordance with your request, we have performed a geotechnical evaluation for the proposed Lindley Reservoir Replacement Project located in Escondido, California (Figure 1). The project consists of construction of two new water storage tanks with a combined capacity of 2.5 to 3.0 million gallons (mg). This report presents our findings and conclusions regarding the geotechnical conditions at the subject site, and our recommendations for the design, earthwork, and construction of this project.

## **2. SCOPE OF SERVICES**

Our scope of services for this evaluation included the following:

- Project coordination and review of readily available background materials pertaining to the site, including geologic and topographic maps, geotechnical reports, faulting and seismic hazard reports, and stereoscopic aerial photographs.
- Review of engineering plans, previous reports, utility maps, and other data provided by the client.
- Performance of a site reconnaissance to observe and document existing conditions.
- Acquisition of County of San Diego Department of Environmental Health (DEH) boring permits.
- Performance of a geophysical study consisting of two seismic traverses in the area of the proposed tanks.
- Performance of a subsurface exploration consisting of the drilling, logging, and sampling of three rock-core borings in the area of the proposed tanks and associated improvements. Bulk and in-place samples were collected and transported to our in-house geotechnical laboratory for testing.
- Laboratory testing on selected samples to evaluate grain size, soil corrosivity, and R-value.
- Compilation and geotechnical analysis of data.
- Preparation of this geotechnical report presenting our findings, conclusions, and recommendations for the design and construction of the proposed project.

### **3. SITE AND PROJECT DESCRIPTION**

The project site is located west of Hubbard Avenue and north of Leslie Lane in Escondido, California (Figure 1). The site consists of a rocky hillside that currently supports an above-ground, 2.0 mg potable water reservoir, a buried 2.0 mg recycled water reservoir, and a paved access road (Figure 2). Elevations across the site range from approximately 860 to 1000 feet above mean sea level (MSL). The project area is located on a south-facing hillside in an undeveloped area covered with low-lying chaparral and succulents. Drainage at the site is by sheet flow downhill to the south and west.

Based on review of documents provided by MWH (MWH, 2012), we understand that the current plans for the site include construction of two new reservoir tanks located approximately 200 to 400 feet west of the existing above-ground water tank (Figure 3). The proposed tanks will each have a storage capacity of 1.0 or 1.5 mg and will either be partially or fully buried. As part of construction of the tanks into the hillside, cuts of up to roughly 50 feet are proposed. Finished cut slopes up to 30 feet in height at slope inclinations of 1:1 (horizontal:vertical) are planned. Fill slopes up to 40 feet in height at slope inclinations of 2:1 are also proposed. The tanks are anticipated to be prestressed and post-tensioned concrete structures. The project includes construction of above-grade inlet and outlet valves and drain valves. Retaining walls up to approximately 10 feet in height will be constructed at the valve locations. An access road consisting of asphalt concrete (AC) will be constructed. We understand that the existing 2.0 mg potable water reservoir will be demolished after completion of the new reservoirs.

### **4. SUBSURFACE EXPLORATION AND LABORATORY TESTING**

Our subsurface exploration was conducted on October 30, October 31, and November 1, 2012, and consisted of the drilling, logging, and sampling of three rock core borings in the area of the proposed reservoirs and a valve structure west of the existing access road. The rock core borings were drilled with a limited access, skid-mounted rock core drill rig to depths ranging from approximately 19 to 40 feet below the existing grades. Rock cores were collected from each boring, photographed, stored in rock core boxes, and transported to our office for additional logging and

analyses. The approximate locations of the rock core borings are presented on Figure 3. Logs of the borings are presented in Appendix A.

Laboratory testing of representative soil samples included tests to evaluate grain size, soil corrosivity, and R-value. Laboratory test results are presented in Appendix B.

As part of our subsurface evaluation, a geophysical study was conducted by our subcontractor (Southwest Geophysics, Inc.). Two seismic refraction lines were performed in the areas of the proposed reservoirs on October 29, 2012. The approximate locations of the seismic lines are presented on Figure 3. Detailed results and the methodology used are presented in Appendix C.

## **5. GEOLOGY AND SUBSURFACE CONDITIONS**

Our findings regarding regional and site geology, including rippability (excavatability), groundwater conditions, faulting and seismicity, and landslides at the subject site are provided in the following sections.

### **5.1. Regional Geologic Setting**

The project area is situated in the coastal foothill section of the Peninsular Ranges Geomorphic Province. This geomorphic province encompasses an area that extends approximately 900 miles from the Transverse Ranges and the Los Angeles Basin south to the southern tip of Baja California (Norris and Webb, 1990; Harden, 1998). The province varies in width from approximately 30 to 100 miles. In general, the province consists of rugged mountains underlain by Jurassic metavolcanic and metasedimentary rocks, and Cretaceous igneous rocks of the southern California batholith.

The Peninsular Ranges Province is traversed by a group of sub-parallel faults and fault zones trending roughly northwest. Several of these faults, which are shown on Figure 4, are considered active faults. The Elsinore, San Jacinto and San Andreas faults are active fault systems located northeast of the project area and the Rose Canyon, Coronado Bank, San Diego Trough, and San Clemente faults are active faults located west of the project area.

The Julian segment of the Elsinore Fault Zone, the nearest active fault system, has been mapped approximately 15 miles northeast of the project site. Major tectonic activity associated with these and other faults within this regional tectonic framework consists primarily of right-lateral, strike-slip movement. Further discussion of faulting relative to the site is provided in the Faulting and Seismicity section of this report.

## **5.2. Site Geology**

Geologic units encountered during our subsurface exploration included colluvium and granitic rock. Generalized descriptions of the earth units encountered during our field reconnaissance and subsurface exploration are provided in the subsequent sections. Surface outcrops of granitic rock were observed across the site. Additional descriptions of the subsurface units are provided on the rock core logs in Appendix A.

### **5.2.1. Fill**

While not encountered in our rock core borings, fill soils are expected to underlie portions of the project site. These fill soils are associated with temporary access roads created for construction of the existing buried water reclamation reservoir as well as the existing paved road (City of Escondido, 1999). We anticipate these fills to be relatively shallow and generally composed of locally derived, reworked granitic rock and colluvial material. Existing fill soils are assumed to be undocumented.

### **5.2.2. Colluvium**

Colluvium was encountered in our rock core borings from the surface to depths of approximately 6 feet. The colluvium encountered generally consisted of grayish brown to reddish brown, damp, loose to dense, silty sand and silty and sandy gravel. Cobble-size pieces of granitic rock were encountered in the colluvial material.

### **5.2.3. Granitic Rock**

Granitic rock was encountered underlying the colluvial materials in our rock core borings to the explored depths. This bedrock unit is mapped as Cretaceous-age, quartz-bearing diorite (Kennedy, 1999). As encountered on the site, the bedrock generally consisted of reddish gray, gray, and dark gray, weathered, fine- and medium-grained diorite. Surface outcrops of granitic rock were observed across the site. As observed in our rock cores, the granitic rock contains numerous high to low angle joints and fractures.

### **5.3. Rippability and Excavation Characteristics**

Based on our site reconnaissance and subsurface exploration, the on-site fill and colluvial materials are expected to be excavatable using heavy-duty earthmoving equipment in good working condition. Based on the results of the seismic refraction survey and subsurface exploration, areas underlain by weathered granitic rock may be moderately rippable to depths of roughly 5 to 10 feet below the existing surface. Heavy ripping, rock breaking, and blasting are anticipated at greater depths. Depths of rippable materials will vary across the site. As shown in the seismic refraction lines included in the geophysical report (Appendix C), resistant rock masses or core stones at various depths should be anticipated. Rippability of a rock mass will also be dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations, the rippability estimates should be scaled downward. It is anticipated that trenches in granitic rock areas may not be excavatable with conventional trenching equipment. The presence of boulders, rock masses, and/or core stones can be problematic in a narrow trench and should be anticipated.

#### 5.4. Groundwater

Groundwater was not encountered in our rock core borings. Accordingly, we do not anticipate that groundwater will be a constraint for the proposed construction. However, fluctuations in the groundwater level and perched conditions may occur due to variations in ground surface topography, subsurface geologic conditions and structure, rainfall, irrigation, and other factors.

#### 5.5. Faulting and Seismicity

Like other areas of southern California, the project area is considered to be seismically active. Based on our review of the referenced geologic maps and stereoscopic aerial photographs, as well as on our geologic field mapping, the subject site is not underlain by known active or potentially active faults (i.e., faults that exhibit evidence of ground displacement in the last 11,000 years and 2,000,000 years, respectively). However, the site is located in a seismically active area, as is the majority of southern California, and the potential for strong ground motion is considered significant during the design life of the proposed structure. The nearest known active fault is the Elsinore fault, located approximately 15 miles northeast of the site. Table 1 lists selected principal known active faults that may affect the subject site, the maximum moment magnitude ( $M_{max}$ ) and the fault types as published for the California Geological Survey (CGS) by Cao et al. (2003). The approximate fault to site distance was calculated by the computer program FRISKSP (Blake, 2001).

**Table 1 – Principal Active Faults**

<b>Fault</b>	<b>Distance miles (kilometers) <sup>1</sup></b>	<b>Moment Magnitude/ Fault Type <sup>1,2</sup></b>
Elsinore (Julian Segment)	15 (24)	7.1/A
Elsinore (Temecula Segment)	16 (26)	6.8/A
Rose Canyon	17 (27)	7.2/B
Newport-Inglewood (Offshore)	20 (32)	7.1/B
Earthquake Valley	29 (47)	6.5/B
Coronado Bank	31 (51)	7.6/B
Elsinore (Glen Ivy Segment)	37 (60)	6.8/A
San Jacinto (Anza Segment)	38 (61)	7.2/A
San Jacinto (Coyote Creek Segment)	40 (64)	6.8/A
San Jacinto (San Jacinto Valley Segment)	42 (67)	6.9/A
Elsinore (Coyote Mountain)	44 (71)	6.8/A
San Joaquin Hills	46 (74)	6.6/B

**Table 1 – Principal Active Faults**

<b>Fault</b>	<b>Distance miles (kilometers) <sup>1</sup></b>	<b>Moment Magnitude/ Fault Type <sup>1,2</sup></b>
Palos Verdes	50 (81)	7.3/B
San Jacinto (Borrego Segment)	52 (83)	6.6/A
Chino-Central Ave (Elsinore)	54 (87)	6.7/B
Newport-Inglewood (L.A. Basin)	58 (93)	7.1/B
Whittier	58 (93)	6.8/A
San Jacinto (San Bernardino Segment)	60 (97)	6.7/A
San Andreas	60 (97)	7.5/A
<b>Notes:</b>		
<sup>1</sup> Blake (2001)		
<sup>2</sup> Cao, et al. (2003)		

In general, hazards associated with seismic activity include strong ground motion, ground surface rupture, liquefaction, and seismically induced settlement. These hazards are discussed in the following sections.

### 5.5.1. Strong Ground Motion

Based on our review of background information, data pertaining to the historical seismicity of the San Diego area are summarized in Table 2 below. This table presents historic earthquakes within a radius of approximately 62 miles (i.e., 100 kilometers) of the site with a magnitude of 6.0 or greater.

**Table 2 – Historical Earthquakes that Affected the Site**

<b>Date</b>	<b>Magnitude (M)</b>	<b>Approximate Epicentral Distance miles (kilometers)</b>
November 22, 1800	6.5	16 (25)
December 8, 1812	6.9	60 (97)
February 9, 1890	6.8	48 (78)
February 24, 1892	6.7	55 (88)
May 28, 1892	6.3	51 (82)
December 25, 1899	6.4	45 (72)
May 15, 1910	6.0	42 (67)
April 21, 1918	6.8	41 (66)
June 23, 1923	6.2	59 (95)
March 11, 1933	6.3	60 (96)
March 25, 1937	6.0	50 (81)
March 19, 1954	6.2	53 (85)
April 9, 1968	6.4	55 (89)

The 2010 California Building Code (CBC) recommends that the design of structures be based on the horizontal peak ground acceleration (PGA) having a 2 percent probability of exceedance in 50 years which is defined as the Maximum Considered Earthquake (MCE). The statistical return period for  $PGA_{MCE}$  is approximately 2,475 years. In evaluating the seismic hazards associated with the project site, we have used a Site Class B (average shear wave velocity ranging from approximately 2,500 to 5,000 feet per second) based on the review of our rock core logs and geophysical study, and in accordance with CBC. The  $PGA_{MCE}$  for the site was evaluated as 0.44g using the United States Geological Survey (USGS) (USGS, 2012) ground motion calculator (web-based). The design PGA, which is considered  $\frac{2}{3}$  of the  $PGA_{MCE}$ , is 0.30g. These estimates of ground motion do not include near-source factors that may be applicable to the design of structures on site.

#### **5.5.2. Ground Surface Rupture**

Based on our review of the referenced literature and our field evaluation, no active faults are known to cross the project vicinity. Therefore, the potential for ground rupture due to faulting at the site is considered low. However, lurching or cracking of the ground surface as a result of nearby seismic events is possible.

#### **5.5.3. Liquefaction and Seismically Induced Settlement**

Liquefaction of cohesionless soils can be caused by strong vibratory motion due to earthquakes. Research and historical data indicate that loose granular soils and non-plastic silts that are saturated by a relatively shallow groundwater table are susceptible to liquefaction. Based on the dense nature of the underlying bedrock materials and absence of a shallow groundwater table, it is our opinion that liquefaction and seismically induced settlement at the subject site are not design considerations.

### **5.6. Landsliding and Rock Slope Stability**

Based on our review of published geologic literature and aerial photographs and our subsurface exploration, no deep-seated landslides or related features underlie or are adjacent to the site. Due to the proposed temporary steep slopes and the fractured and weathered nature of the granitic rock, the potential for shallow rock falls to impact the site during construction should be anticipated. Slope stability is discussed further in our recommendations.

## **6. CONCLUSIONS**

Based on our review of the referenced background data, subsurface exploration, and laboratory testing, it is our opinion that construction of the proposed reservoirs is feasible from a geotechnical standpoint provided the recommendations presented in this report are incorporated into the design and construction of the project. Due to the preliminary nature of the anticipated depth of the proposed improvements and the variable and challenging subsurface conditions, we recommend that our office re-evaluate our conclusions and recommendations once final plans are available. In general, the following conclusions were made:

- The project area is underlain by fill, colluvium, and granitic bedrock. Fill and colluvial soils are not considered suitable for structural support of the proposed improvements in their current condition. The granitic rock is considered suitable for structural support.
- The fill and colluvium are expected to be generally excavatable with heavy-duty earthmoving equipment. Difficult to very difficult excavation and heavy ripping including the use of rock breaking equipment and/or blasting should be anticipated in the underlying granitic rock .
- The project site is located in a seismically active zone. Accordingly, the potential for strong seismic ground motions should be considered in the project design. A design PGA of 0.30g was calculated for the project site.
- Groundwater was not encountered in our borings. Accordingly, we do not anticipate that groundwater will be a constraint for the proposed construction.
- On-site excavations are anticipated to generate oversized materials. Additional processing (i.e., screening or crushing) should be anticipated prior to usage as engineered fill.

## **7. RECOMMENDATIONS**

Based on our understanding of the project, the following recommendations are provided for the design and construction of the proposed improvements.

### **7.1. Earthwork**

In general, earthwork should be performed in accordance with the recommendations included in this report. Ninyo & Moore should be contacted for questions regarding the recommendations provided herein.

#### **7.1.1. Pre-Construction Conference**

We recommend that a pre-construction conference be held in order to discuss the recommendations presented in this report. The owner and/or their representative, the governing agencies' representatives, the civil engineer, Ninyo & Moore, and the contractor should be in attendance to discuss the work plan, project schedule, and earthwork requirements.

#### **7.1.2. Site Preparation**

Prior to excavation and placement of fill, the project site should be cleared of abandoned utilities (if present), and stripped of rubble, debris, vegetation, any loose, wet, or otherwise unstable soils, as well as surface soils containing organic material. Obstructions that extend below the finished grade, if any, should be removed and the resulting holes filled with compacted soil. Materials generated from the clearing operations should be removed from the site and disposed of at a legal dumpsite away from the project area.

#### **7.1.3. Remedial Grading**

In general, we recommend that the on-site existing fill and colluvium within areas of planned improvements be removed down to competent granitic rock materials. The extent and depths of removals should be evaluated by Ninyo & Moore's representative in the field based on the materials exposed. Where required, the resulting excavation may be filled with engineered fill soils (either on-site derived or imported) that meet the rec-

ommendations presented in the following sections. Precautions should be taken by the contractor when grading adjacent to existing structures.

#### **7.1.4. Excavation Characteristics**

As described in the rock core logs presented in Appendix A, and geophysical study included in Appendix C, the site is underlain by shallow depths of fill and colluvium, which are in turn underlain by granitic rock. The fill and colluvium are generally expected to be excavatable using heavy-duty earthmoving equipment in good working condition. Based on the results of the seismic refraction survey and subsurface exploration, areas underlain by weathered granitic rock may be moderately rippable to depths of roughly 5 to 10 feet below the existing surface. Heavy ripping, rock breaking, and blasting are anticipated at greater depths. Depths of rippable materials will vary across the site. As shown from the seismic refraction lines included in the geophysical report (Appendix C), resistant rock masses or core stones at various depths should be anticipated. Rippability of a rock mass will also be dependent on the excavation equipment used and the skill and experience of the equipment operator.

For trenching operations, the rippability estimates should be scaled downward. It is anticipated that trenches in granitic rock areas may not be excavatable with conventional trenching equipment. The presence of boulders, rock masses, and/or core stones can be problematic in a narrow trench and should be anticipated.

#### **7.1.5. Cut/Fill Transition**

The reservoirs should not straddle a cut/fill transition. In the instance that a cut/fill transition condition is created beneath the reservoirs through grading, one of the two following recommendations may be implemented. The first option consists of the overexcavation of the pad area for the new reservoirs. The overexcavation should extend to a depth of 2 feet below the bottom of the footing elevation or one-third of the greatest fill depth, whichever is deeper. Engineered fill may then be moisture-conditioned, placed in the overexcavation, and compacted in accordance with the recommendations

herein. The reservoir pad area is defined as the structure footprint and extending 5 feet horizontally outside of the structure footprint plus the depth of the overexcavation.

As an alternative to overexcavation, the fill portion of the cut/fill transition may be removed and replaced with a controlled low strength material (CLSM). The reservoir base may be supported on the CLSM.

#### **7.1.6. Materials for Fill**

The on-site soils with an organic content of less than approximately 3 percent by volume (or 1 percent by weight) are suitable for reuse as engineered fill. In general, fill material should not contain rocks or lumps over approximately 3 inches, and not more than approximately 30 percent larger than  $\frac{3}{4}$ -inch. Corestones and oversize material generated during excavations should be disposed of off-site or broken into acceptable size material. Imported fill material, if needed for the project, should generally be granular soils with a very low to low expansion potential (ASTM International [ASTM] 4829). Import material should also be non-corrosive in accordance with the Caltrans (2003) and American Concrete Institute (ACI) 318 corrosion guidelines. Materials for use as fill should be evaluated by Ninyo & Moore's representative prior to filling or importing.

#### **7.1.7. Compacted Fill**

Prior to placement of compacted fill the contractor should request an evaluation of the exposed removal surface by Ninyo & Moore. Unless otherwise recommended, the exposed ground surface should then be scarified to a depth of approximately 8 inches and watered or dried, as needed, to achieve moisture contents generally above the optimum moisture content. The scarified materials should then be compacted to a relative compaction of 90 percent as evaluated in accordance with the ASTM D 1557. The evaluation of compaction by the geotechnical consultant should not be considered to preclude any requirements for observation or approval by governing agencies. It is the contractor's responsibility to notify the geotechnical consultant and the appropriate governing agency when project areas are ready for observation, and to provide reasonable time for that review.

Fill materials should be moisture-conditioned to generally above the laboratory optimum moisture content prior to placement. The optimum moisture content will vary with material type and other factors. Moisture conditioning of fill soils should be generally consistent within the soil mass. As noted, wet soils may be encountered during construction and aeration/processing should be anticipated.

Prior to placement of additional compacted fill material following a delay in the grading operations, the exposed surface of previously compacted fill should be prepared to receive fill. Preparation may include scarification, moisture conditioning, and recompaction.

Compacted fill should be placed in horizontal lifts of approximately 8 inches in loose thickness. Prior to compaction, each lift should be watered or dried as needed to achieve a moisture content generally above the laboratory optimum, mixed, and then compacted by mechanical methods, using sheepfoot rollers, multiple-wheel pneumatic-tired rollers or other appropriate compacting rollers, to a relative compaction of 90 percent as evaluated by ASTM D 1557. Successive lifts should be treated in a like manner until the desired finished grades are achieved.

#### **7.1.8. Fill Slopes**

Fill slopes for the project should be constructed at an inclination of 2:1 or flatter. We performed global slope stability of the proposed 2:1 fill slope shown on Figure 5 using the two-dimensional stability analyses program GSTABL7 with STEDwin (version 2). The slope stability calculations are presented in Appendix D. The results of our analysis indicate that the proposed 2:1 fill slopes will be globally stable if the fills are derived from suitable materials and properly constructed as recommended in this report.

Compaction of the face of fill slopes should be performed by backrolling at intervals of 4 feet or less in vertical height, or as dictated by the capability of the available equipment, whichever is less. Fill slopes should be backrolled utilizing a conventional sheepfoot-type roller. Care should be taken to maintain the desired moisture conditions and/or reestablish them, as

needed, prior to backrolling. The placement, moisture conditioning, and compaction of fill slope materials should be done in accordance with the recommendations presented in the Compacted Fill section of this report. Slopes and other exposed ground surfaces should be appropriately planted with a protective ground cover. To enhance surficial stability, fill slopes should be planted as soon as feasible subsequent to grading. Erosion control and drainage devices should be installed in compliance with the requirements of the local governing agencies as soon as feasible subsequent to grading.

#### **7.1.9. Cut Slopes**

The stability of cut slopes is generally affected by local geologic conditions, the gradient of the overall slope, groundwater seepage conditions and also by the excavation technique used in creating the slope. Based on our subsurface exploration and field observations, it is our opinion that the proposed 1:1 cut slopes in granitic bedrock should be globally and surficially stable. Excavation of cut slopes should include removal of near-surface residual soils and/or weathered materials. It is recommended that cut slopes be observed by Ninyo & Moore during grading to further evaluate their stability, the presence of geologic planes of weakness, and to provide appropriate mitigation recommendations as needed.

Typically, in slopes excavated in shot or ripped granitic rock, loose materials may be present in slope faces. Finish slopes should be groomed to reduce spalling of loose rock materials from the slope faces.

Surface runoff should not be permitted to flow over the tops of slopes. Positive drainage should be established away from the top of slopes. This may be accomplished by utilizing brow ditches placed at the top of cut slopes to divert surface runoff away from the slope face where drainage devices are not otherwise available.

#### **7.1.10. Temporary Excavations and Shoring**

For temporary excavations, we recommend that the following Occupational Safety and Health Administration (OSHA) soil classifications be used:

<i>Colluvium</i>	<i>Type C</i>
<i>Granitic Materials</i>	<i>Type B</i>

Upon making the excavations, the soil classifications and excavation performance should be evaluated in the field by the geotechnical consultant in accordance with the OSHA regulations. Temporary excavations should be constructed in accordance with OSHA recommendations. For trench or other excavations, OSHA requirements regarding personnel safety should be met using appropriate shoring (including trench boxes) or by laying back the slopes to no steeper than 1.5:1 in colluvial materials and 1:1 for granitic bedrock materials. Temporary excavations that encounter seepage may be shored or stabilized by placing sandbags or gravel along the base of the seepage zone. Excavations encountering seepage should be evaluated on a case-by-case basis. On-site safety of personnel is the responsibility of the contractor.

Due to the proposed steep temporary slopes and the fractured and weathered nature of the granitic rock, the potential for rock falls to impact the slopes during construction should be anticipated.

#### **7.1.11. Pipe Bedding and Modulus of Soil Reaction**

It is our recommendation that the new pipelines, where constructed in open excavations, be supported on 6 or more inches of granular bedding material. Granular pipe bedding should be provided to distribute vertical loads around the pipe. Pipe bedding should have a Sand Equivalent (SE) of 30 or greater, and be placed around the sides and the crown of the pipe. In addition, the pipe bedding material should extend 1 foot or more above the crown of the pipe. Bedding material and compaction requirements should be in accordance with the recommendations of this report, the project specifications, and applicable requirements of the appropriate governing agency.

The modulus of soil reaction is used to characterize the stiffness of soil backfill placed at the sides of buried flexible pipes for the purpose of evaluating deflection caused by the weight of the backfill over the pipe (Hartley and Duncan, 1987). A soil reaction modulus of 1,000 pounds per square inch (psi) may be used for an excavation depth of up to about 5 feet when backfilled with granular soil compacted to a relative compaction of 90 percent as evaluated by the ASTM D 1557. A soil reaction modulus of 1,400 psi may be used for trenches deeper than 5 feet.

#### **7.1.12. Trench Zone Backfill**

Based on our subsurface exploration, the on-site earth materials may be generally suitable for re-use as trench zone backfill provided they are free of organic material, clay lumps, debris, and rocks greater than approximately 3 inches in diameter. We recommend that trench backfill materials be in conformance with the “Greenbook” (Standard Specifications for Public Works) specifications for structure backfill. Soils classified as silts or clays should not be used for backfill in the pipe zone. Fill should be moisture-conditioned to generally above the laboratory optimum. Trench backfill should be compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557 except for the upper 12 inches of the backfill in pavement areas that should be compacted to a relative compaction of 95 percent as evaluated by ASTM D 1557. Lift thickness for backfill will depend on the type of compaction equipment utilized, but fill should generally be placed in lifts not exceeding 8 inches in loose thickness. Special care should be exercised to avoid damaging the pipe during compaction of the backfill.

#### **7.1.13. Lateral Earth Pressure for Thrust Blocks**

Thrust restraint for buried pipelines may be achieved by transferring the thrust force to the soil outside the pipe through a thrust block. Thrust blocks may be designed using the magnitude and distribution of passive lateral earth pressures presented on Figure 7. Thrust blocks should be backfilled with granular backfill material and compacted following the recommendations presented in this report.

### 7.1.14. Seismic Design Parameters

The proposed improvements should be designed in accordance with the requirements of governing jurisdictions and applicable building codes. Following Table presents the seismic design parameters for the site in accordance with CBC (2010) and mapped spectral acceleration parameters (USGS, 2012).

**Table 3 – Seismic Design Factors**

<b>Factors</b>	<b>Values</b>
Site Class	B
Site Coefficient, $F_a$	1.0
Site Coefficient, $F_v$	1.0
Mapped Short Period Spectral Acceleration, $S_S$	1.107g
Mapped One-Second Period Spectral Acceleration, $S_1$	0.414g
Short Period Spectral Acceleration Adjusted For Site Class, $S_{MS}$	1.107g
One-Second Period Spectral Acceleration Adjusted For Site Class, $S_{M1}$	0.414g
Design Short Period Spectral Acceleration, $S_{DS}$	0.738g
Design One-Second Period Spectral Acceleration, $S_{D1}$	0.276g

## 7.2. Foundations

Foundation recommendations presented in the following sections are for shallow, spread footings bearing on compacted fill or granitic rock materials. Foundations should be designed in accordance with structural considerations and the following recommendations. Requirements of the appropriate governing jurisdictions and applicable building codes should be considered in the design of the structures..

### 7.2.1. Shallow Footings

Shallow, spread or continuous footings, founded in compacted fill materials may be designed using a net allowable bearing capacity of 3,000 pounds per square foot (psf). Footings founded in granitic rock materials may be designed using a net allowable bearing capacity of 4,500 psf. Spread footings should be founded 24 inches below the lowest adjacent grade. Continuous footings should have a width of 18 inches and isolated footings should be 24 inches in width. The allowable bearing capacity may be increased by 500 psf for every foot of increase in width or depth up to a value of 5,000 psf. These allowable bearing capaci-

ties may be increased by one-third when considering loads of short duration such as wind or seismic forces. The spread footings should be reinforced in accordance with the recommendations of the project structural engineer. If corestones are encountered and removed during footing excavation, the resulting voids may be backfilled with CLSM. Concrete footings may be placed on CLSM.

### **7.2.2. Lateral Resistance**

For resistance of footings to lateral loads, we recommend a passive pressure of 390 psf per foot of depth be used with a value of up to 3,900 psf for footings founded in compacted fill. For portions of the footings embedded in bedrock, we recommend a passive pressure of 500 psf per foot of depth be used with a value of up to 5,000 psf. This value assumes that the ground is horizontal for a distance of 10 feet, or three times the height generating the passive pressure, whichever is greater. We recommend that the upper one-foot of soil not protected by pavement or a concrete slab be neglected when calculating passive resistance.

For frictional resistance to lateral loads, we recommend a that coefficient of friction of 0.40 be used between engineered fill and concrete and 0.45 be used between granitic rock and concrete. The allowable lateral resistance can be taken as the sum of the frictional resistance and passive resistance provided the passive resistance does not exceed one-half of the total allowable resistance. The passive resistance values may be increased by one-third when considering loads of short duration such as wind or seismic forces.

### **7.2.3. Static Settlement**

We estimate that the proposed facilities, designed and constructed as recommended herein, will undergo total settlement on the order of 1 inch. Differential settlement on the order of 1/2 inch over a horizontal span of 40 feet should be expected.

### **7.3. Retaining Wall Earth Pressures**

We understand that the perimeter walls of the reservoirs would act as retaining walls. Retaining walls will also be constructed at the valve locations. For the design of a yielding retaining wall that is not restrained against movement by rigid corners or structural connections, an active pressure represented by an equivalent fluid weight of 57 pounds per cubic foot (pcf) may be assumed for 2:1 backfill and 37 pounds per cubic foot (pcf) may be assumed for level backfill. Restrained walls (non-yielding) may be designed for at-rest pressure represented by an equivalent fluid weight of 82 pcf for 2:1 backfill and 57 pcf for level backfill. Seismic loading can be modeled assuming an inverted triangular loading. Should dynamic earth pressures be considered in the design, an inverse triangular pressure distribution with an equivalent fluid weight of 12 pcf may be used. For retaining walls with heights of 12 feet or less, dynamic earth pressures do not need to be considered in the design. These pressures assume low-expansive, granular backfill as defined in the Materials for Fill section of this report. Wall backfill should be moisture-conditioned and compacted to a relative compaction of 90 percent at a moisture content near the optimum as evaluated by ASTM D 1557. A drain should be provided behind the wall as shown on Figure 8. The drain should be connected to an appropriate outlet.

### **7.4. Slabs on Grade**

We recommend that conventional, slab-on-grade floors, underlain by compacted fill materials of generally very low to low expansion potential, be 5 inches in thickness and be reinforced with No. 4 reinforcing bars spaced 18 inches on center each way. The reinforcing bars should be placed near the middle of the slab. As a means to help reduce shrinkage cracks, we recommend that the slabs be provided with expansion joints at intervals of approximately 12 feet each way. The final slab thickness, reinforcement, and expansion joint spacing should be designed by the project structural engineer.

### **7.5. Concrete Flatwork**

Exterior concrete flatwork should be 4 inches in thickness and should be reinforced with No. 3 reinforcing bars placed at 24 inches on center both ways. To reduce the potential manifestation of distress to exterior concrete flatwork due to movement of the underlying soil, we recommend that such flatwork be installed with crack-control joints at appropriate spacing as designed by the structural engineer. Exterior slabs should be underlain by 4 inches of clean sand. The subgrade soils should be scarified to a depth of 12 inches, moisture-conditioned to generally above the laboratory optimum moisture content, and compacted to a relative compaction of 90 percent as evaluated by ASTM D 1557. Positive drainage should be established and maintained adjacent to flatwork.

### **7.6. Corrosion**

The corrosion potential of the near-surface site soils was evaluated using the results of a representative sample obtained from our borings. Laboratory testing was performed to evaluate pH, minimum electrical resistivity, soluble sulfate and chloride contents. The pH and electrical resistivity tests were performed in accordance with California Test (CT) 643 and the sulfate and chloride content tests were performed in accordance with CT 417 and 422, respectively. The laboratory test results are presented in Appendix B.

The results of the corrosivity testing indicated an electrical resistivity of 2,000 ohm-cm, soil pH of 6.8, chloride content of 55 parts per million (ppm), and a sulfate content of 0.003 percent (i.e., 30 ppm). Based on the laboratory test results and Caltrans (2003) and American Concrete Institute (ACI) 318 corrosion criteria, the project site can be classified as a non-corrosive site. Corrosive soils are defined as soils with more than 500 ppm chlorides, more than 0.20 percent sulfates (i.e., 2,000 ppm), a pH of 5.5 or less, or an electrical resistivity of 1,000 ohm-centimeters or less.

### **7.7. Concrete Placement**

Concrete in contact with soil or water that contains high concentrations of soluble sulfates can be subject to chemical and/or physical deterioration. Based on the CBC criteria (CBC, 2010), the potential for sulfate attack is negligible for water-soluble sulfate contents in soil ranging from 0.00 to 0.10 percent by weight (i.e., 0 to 1,000 ppm). As noted, the soil sample tested for this evaluation had a water-soluble sulfate content of approximately 0.003 percent by weight (i.e., 30 ppm). Accordingly, the on-site soils are considered to have a negligible potential for sulfate attack. Due to the variable nature of the on-site soils and possible changes in the soil conditions during grading, we recommend that Type II/V cement with a water/cement ratio of 0.50 or less, be considered for the project.

### **7.8. Drainage**

Roof, pad, and slope drainage should be directed such that runoff water is diverted away from slopes and structures to suitable discharge areas by nonerodible devices (e.g., gutters, downspouts, concrete swales, etc.). Positive drainage adjacent to structures should be established and maintained. Positive drainage may be accomplished by providing drainage away from the foundations of the structure at a gradient of 2 percent or steeper for a distance of 5 feet or more outside the structure perimeter, and further maintained by a graded swale leading to an appropriate outlet, in accordance with the recommendations of the project civil engineer and/or landscape architect.

Surface drainage on the site should be provided so that water is not permitted to pond. A gradient of 2 percent or steeper should be maintained over the pad area and drainage patterns should be established to divert and remove water from the site to appropriate outlets. Care should be taken by the contractor during final grading to preserve any berms, drainage terraces, interceptor swales or other drainage devices of a permanent nature on or adjacent to the property. Drainage patterns established at the time of final grading should be maintained for the life of the project. The property owner and the maintenance personnel should be made aware that altering drainage patterns might be detrimental to slope stability and foundation performance.

### 7.9. Pavement Design

For design of flexible pavements, we have used Traffic Indices (TI) of 5, 6, and 7 to represent the volume and loading of the traffic for site pavements. If traffic loads are different from those assumed, the pavement design should be re-evaluated. Actual pavement recommendations should be based on R-value tests performed on bulk samples of the soils exposed at the finished subgrade elevations once grading operations have been performed.

The resistance (R-value) characteristics of the subgrade soils were evaluated by conducting laboratory testing on a representative soil sample obtained from our soil boring. The test result indicated an R-value of 53. Due to the variability of on-site soils, we used an R-value of 40 in our analysis. The preliminary recommended flexible pavement sections are as follows:

**Table 4 – Recommended Pavement Sections**

Traffic Index	R-value	Asphalt Concrete (inches)	Class 2 Aggregate Base (inches)
5.0	40	3.0	4.0
6.0	40	3.5	5.5
7.0	40	4.0	7.0

We recommend that the upper 12 inches of the subgrade and aggregate base materials be compacted to 95 percent relative compaction as evaluated by ASTM D 1557. The pavement sections should provide an approximate pavement life of 20 years.

In areas where concrete pavement is anticipated, as well as drainage swales and gutters, we recommend a rigid pavement section consisting of 6 inches of Portland cement concrete underlain by 12 inches of subgrade soils compacted to a relative compaction of 95 percent, as evaluated by ASTM D 1557.

## **8. CONSTRUCTION OBSERVATION**

The recommendations provided in this report are based on our understanding of the proposed project and on our evaluation of the data collected based on subsurface conditions disclosed by widely spaced exploratory borings. It is imperative that the geotechnical consultant checks the interpolated subsurface conditions during construction. We recommend that Ninyo & Moore review the project plans and specifications prior to construction. It should be noted that, upon review of these documents, some recommendations presented in this report may be revised or modified.

During construction, we recommend that the duties of the geotechnical consultant include, but not be limited to the following:

- Observing clearing, grubbing, and removals.
- Observing excavation, placement, and compaction of fill.
- Evaluating imported materials prior to their use as fill (if used).
- Performing field tests to evaluate fill compaction.
- Observing cut slopes for fractures, joints, and other geologic planes of weakness.
- Observing foundation excavations for bearing materials and cleaning prior to placement of reinforcing steel or concrete.
- Performing material testing services, including concrete compressive strength and steel tensile strength tests and inspections.

The recommendations provided in this report assume that Ninyo & Moore will be retained as the geotechnical consultant during the construction phase of this project. If another geotechnical consultant is selected, we request that the selected consultant indicate to the owner and to our firm in writing that our recommendations are understood and that they are in full agreement with our recommendations.

## 9. LIMITATIONS

The field evaluation, laboratory testing, and geotechnical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be encountered during construction. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface evaluation will be performed upon request. Please also note that our evaluation was limited to assessment of the geotechnical aspects of the project, and did not include evaluation of structural issues, environmental concerns, or the presence of hazardous materials.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Ninyo & Moore should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document.

This report is intended for design purposes only. It does not provide sufficient data to prepare an accurate bid by contractors. It is suggested that the bidders and their geotechnical consultant perform an independent evaluation of the subsurface conditions in the project areas. The independent evaluations may include, but not be limited to, review of other geotechnical reports prepared for the adjacent areas, site reconnaissance, and additional exploration and laboratory testing.

Our conclusions, recommendations, and opinions are based on an analysis of the observed site conditions. If geotechnical conditions different from those described in this report are encountered, our office should be notified, and additional recommendations, if warranted, will be provided upon request. It should be understood that the conditions of a site could change with time as a result of natural processes or the activities of man at the subject site or nearby sites. In addition, changes to the applicable laws, regulations, codes, and standards of practice may occur due to government ac-

tion or the broadening of knowledge. The findings of this report may, therefore, be invalidated over time, in part or in whole, by changes over which Ninyo & Moore has no control.

This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

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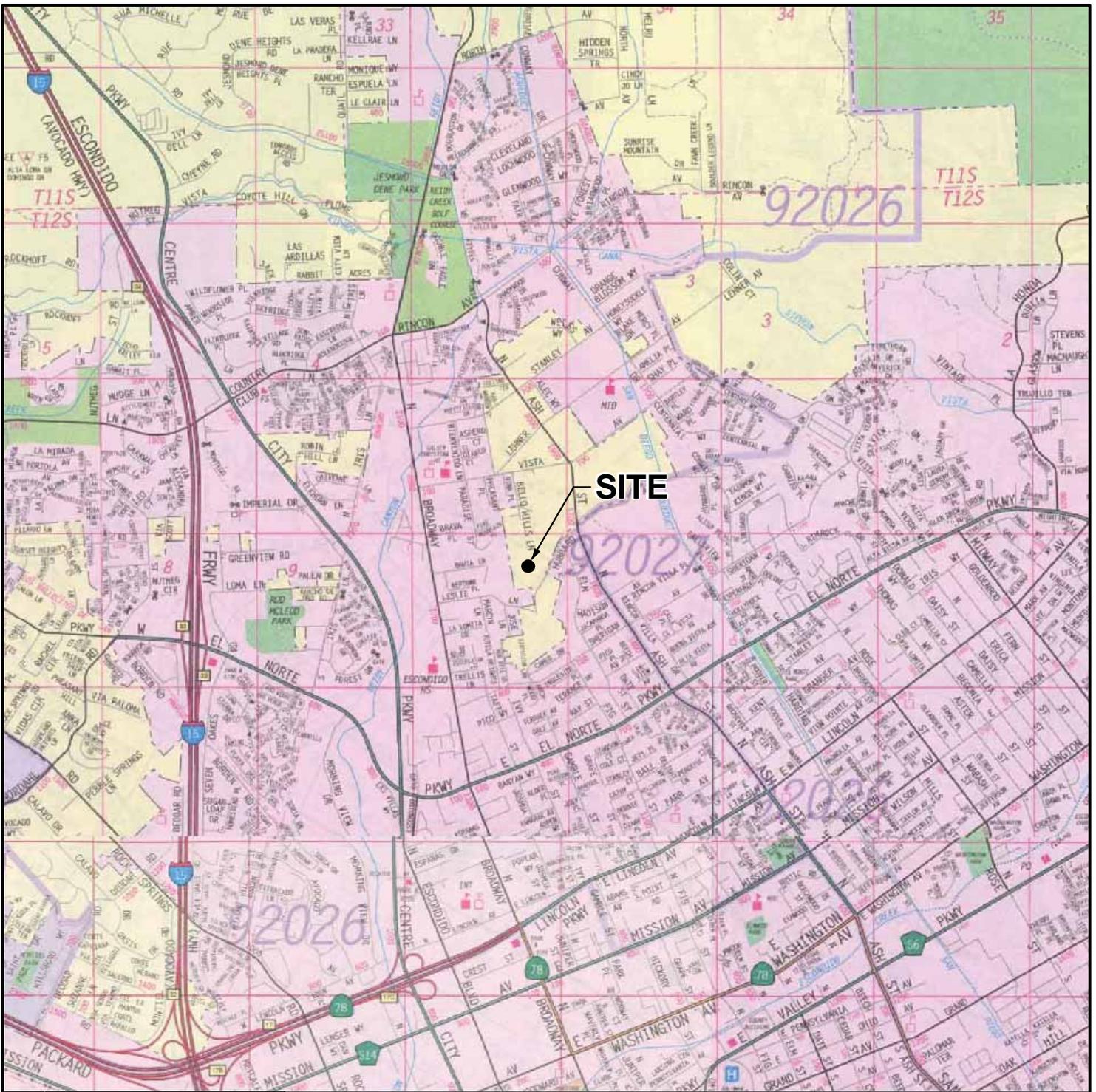
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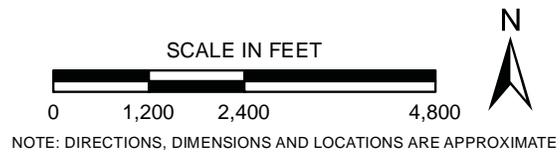
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USDA	5-2-53	AXN-14M	73 and 74	1:20,000



SOURCE: 2008 THOMAS GUIDE FOR SAN DIEGO COUNTY, STREET GUIDE AND DIRECTORY; MAP © RAND MCNALLY, R.L.07-S-129



MAP INDEX



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

**Ninyo & Moore**

**SITE LOCATION**

FIGURE

PROJECT NO.

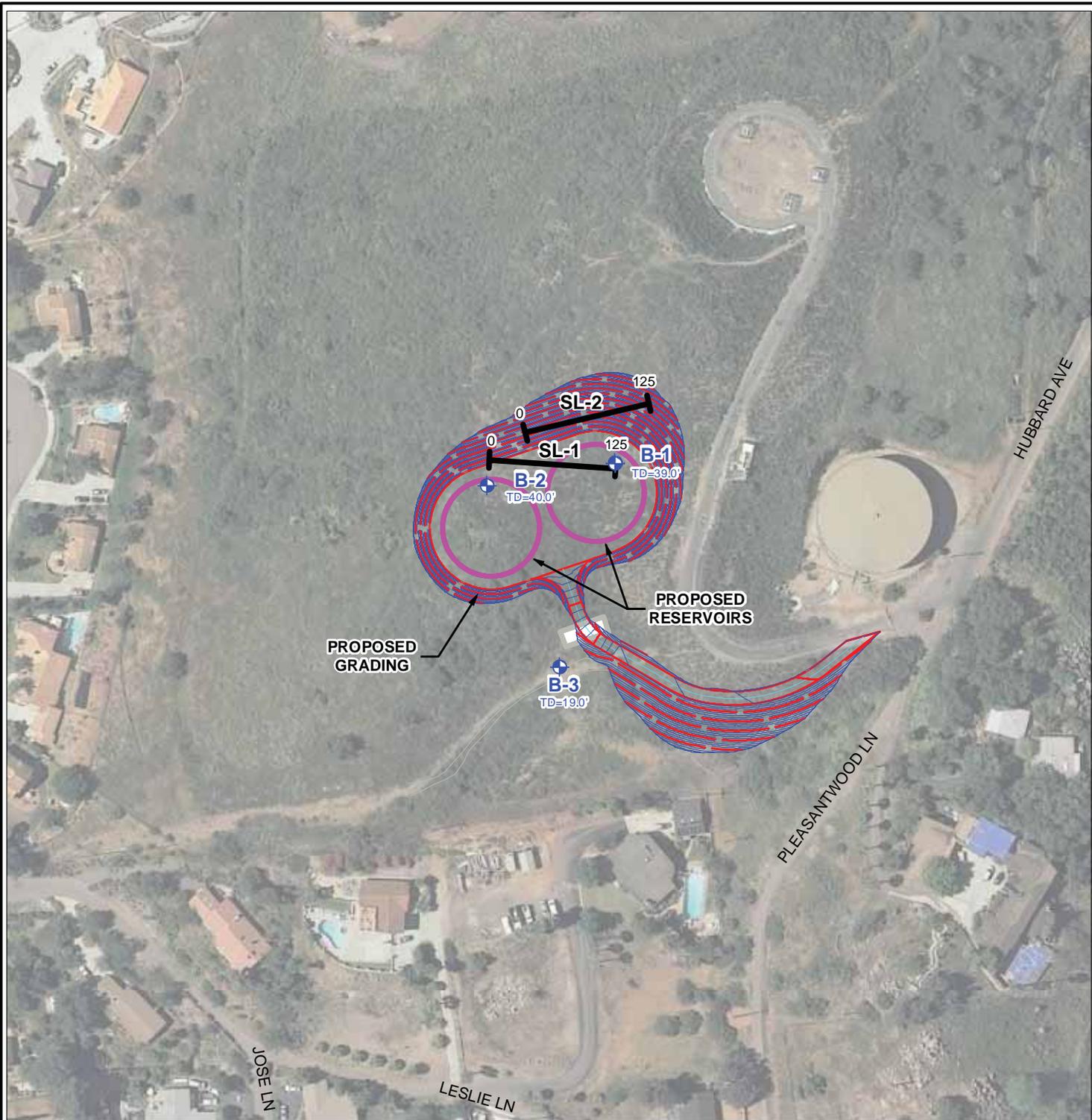
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LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

107424001

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SOURCE: AERIAL IMAGERY - PHOTO DATE: FEB 11, 2010, ESRI, I-CUBED, USDA FSA, USGS, AEX, GEOEYE, GETMAPPING, AEROGRIID, IGP.

**LEGEND**

- 
**B-3** BORING  
 TD=19.0' TD=TOTAL DEPTH IN FEET
- 
**SL-2** SEISMIC LINE



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE

**Ninyo & Moore**

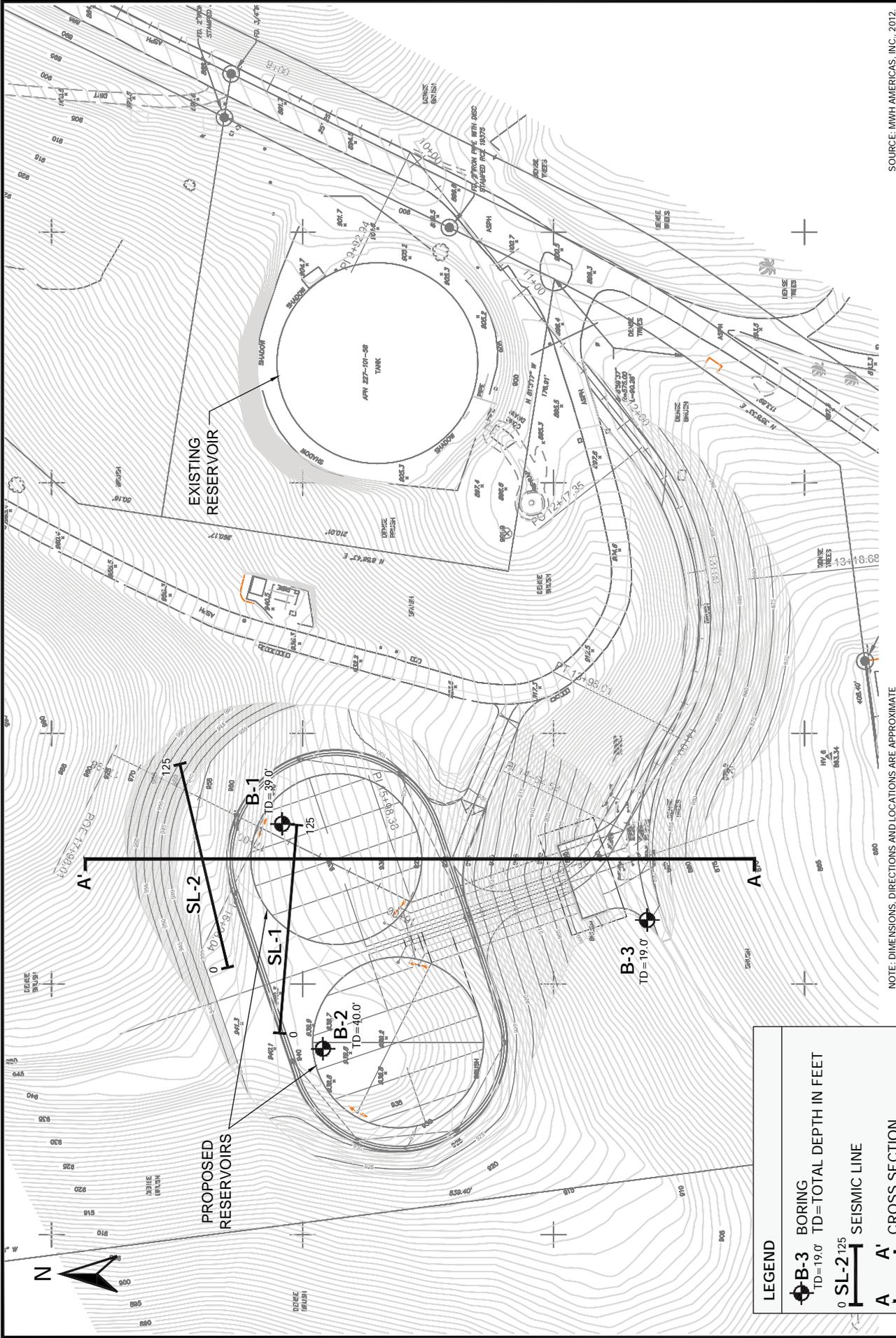
**AERIAL PHOTOGRAPH OF SITE**

FIGURE

PROJECT NO.	DATE
107424001	12/12

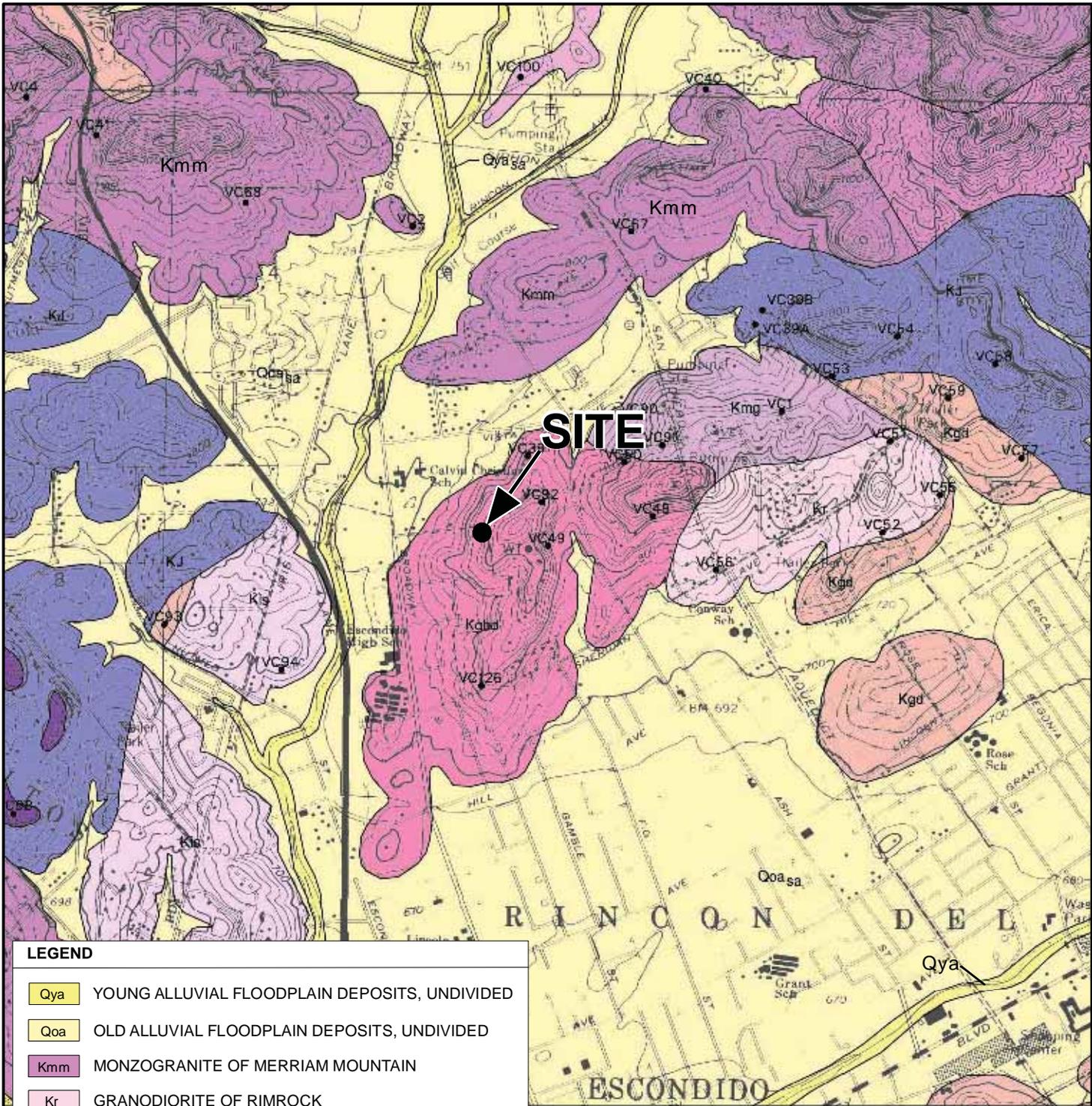
LINDLEY RESERVOIR REPLACEMENT PROJECT  
 ESCONDIDO, CALIFORNIA

**2**



		<b>SITE PLAN</b>		FIGURE
		LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA		<b>3</b>
PROJECT NO.	DATE			
107424001	12/12			

SOURCE: MWH AMERICAS, INC., 2012.



SOURCE: KENNEDY, M.P., 1999, GEOLOGIC MAP OF THE VALLEY CENTER 7.5' QUADRANGLE SAN DIEGO COUNTY, CALIFORNIA

**LEGEND**

- Qya YOUNG ALLUVIAL FLOODPLAIN DEPOSITS, UNDIVIDED
- Qoa OLD ALLUVIAL FLOODPLAIN DEPOSITS, UNDIVIDED
- Kmm MONZOGRANITE OF MERRIAM MOUNTAIN
- Kr GRANODIORITE OF RIMROCK
- Kis GRANITE OF INDIAN SPRINGS
- Kgd GRANODIORITE UNDIVIDED
- Kmg MONZOGRANITE UNDIVIDED
- Kqbd QUARTZ-BEARING DIORITE UNDIVIDED
- KJ METASEDIMENTARY AND METAVOLCANIC ROCKS UNDIVIDED



SCALE IN FEET



NOTES: ALL DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE



**GEOLOGY**

FIGURE

PROJECT NO.	DATE
107424001	12/12

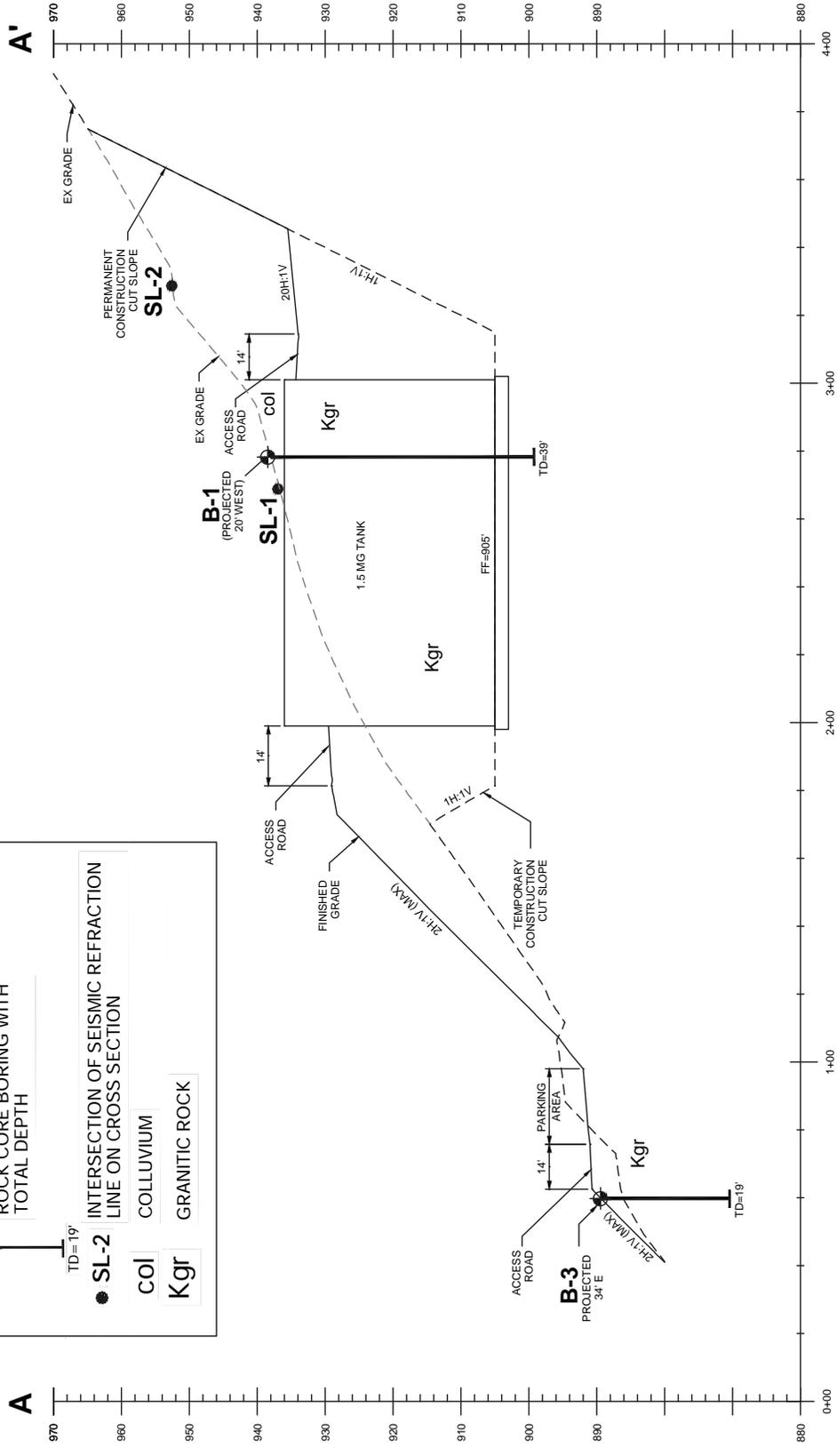
LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

**4**

4\_107424001\_G.mxd AOB

**LEGEND**

- B-3 PROJECTED 34' E  
ROCK CORE BORING WITH TOTAL DEPTH TD=19'
- SL-2 INTERSECTION OF SEISMIC REFRACTION LINE ON CROSS SECTION
- COLLUVIUM
- GRANITIC ROCK



NOTE: DIMENSIONS, DIRECTIONS AND LOCATIONS ARE APPROXIMATE



PROJECT NO.	DATE
107424001	12/12

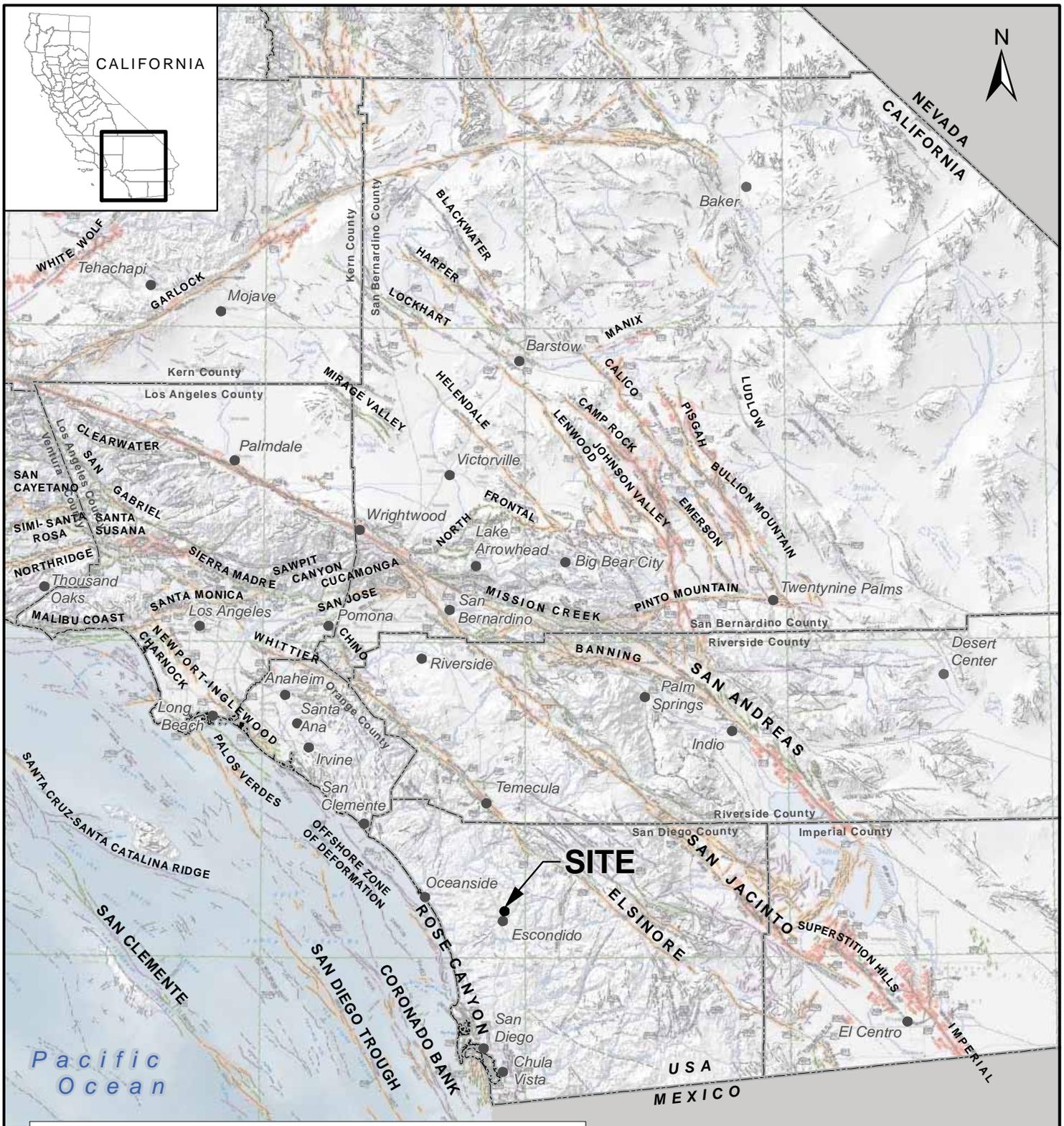
**GEOLOGIC CROSS SECTION A-A'**

LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

FIGURE

**5**

SOURCE: MMH AMERICAS, INC., 2012.



**LEGEND**

**CALIFORNIA FAULT ACTIVITY**

- HISTORICALLY ACTIVE
- HOLOCENE ACTIVE
- LATE QUATERNARY (POTENTIALLY ACTIVE)
- QUATERNARY (POTENTIALLY ACTIVE)
- STATE/COUNTY BOUNDARY

SOURCE: JENNINGS, C.W., AND BRYANT, W.A., 2010, FAULT ACTIVITY MAP OF CALIFORNIA, CALIFORNIA GEOLOGICAL SURVEY.

**SCALE IN MILES**



NOTE: DIRECTIONS, DIMENSIONS AND LOCATIONS ARE APPROXIMATE.

6\_107424001\_FL.mxd AOB



**FAULT LOCATIONS**

FIGURE

PROJECT NO.

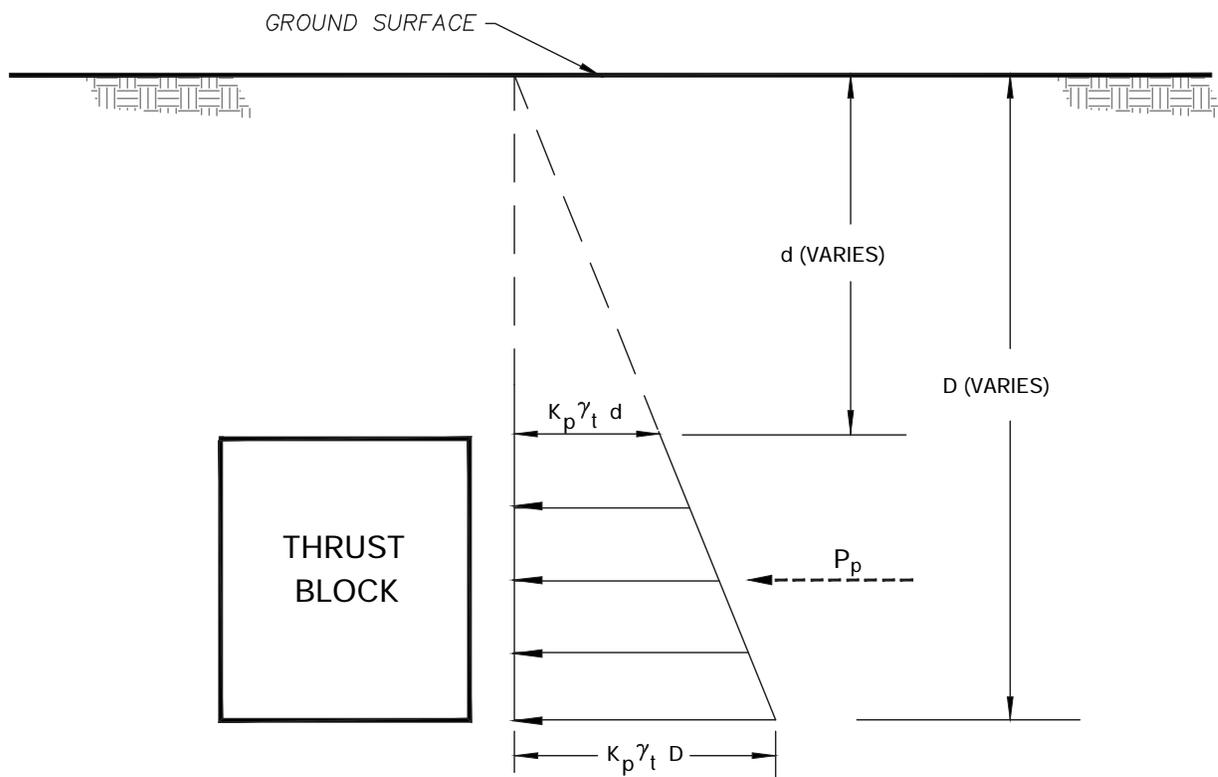
DATE

LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

107424001

12/12

**6**



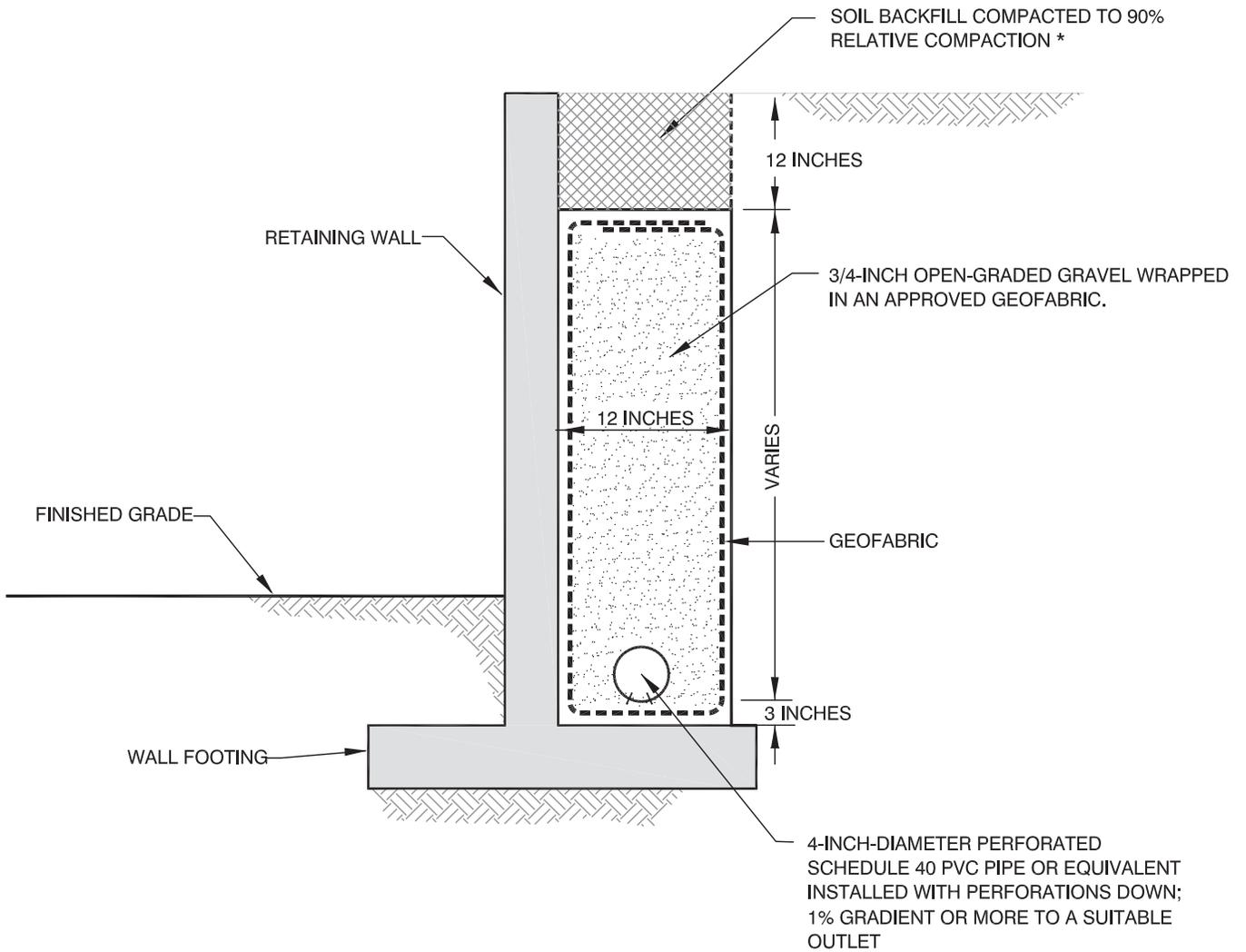
NOTES:

1. GROUNDWATER BELOW BLOCK  
 $P_p = 195 (D^2 - d^2) \text{ lb/ft}$
2. GROUNDWATER ABOVE BLOCK  
 $P_p = 1.6 (D - d)[124.8h + 58(D + d)] \text{ lb/ft}$
3. d AND D ARE IN FEET
4. ASSUMES BACKFILL IS GRANULAR MATERIAL
5. ASSUMES THRUST BLOCK IS ADJACENT TO COMPETENT MATERIAL

NOT TO SCALE

7\_107424001\_c1thr.dwg

<b>Ninyo &amp; Moore</b>		THRUST BLOCK LATERAL EARTH PRESSURE DIAGRAM	FIGURE  <b>7</b>
PROJECT NO.	DATE	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA	
107424001	12/12		



\*BASED ON ASTM D1557

NOT TO SCALE

NOTE: AS AN ALTERNATIVE, AN APPROVED GEOCOMPOSITE DRAIN SYSTEM MAY BE USED.

8\_107424001\_drw.dwg

<b>Ninyo &amp; Moore</b>		<b>RETAINING WALL DRAINAGE DETAIL</b>	FIGURE
PROJECT NO.	DATE		
107424001	12/12	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA	<b>8</b>

## APPENDIX A

### ROCK CORE BORING LOGS

The following tables present the terminology used, along with definitions and abbreviations of the terminology used on the rock core boring logs presented in this appendix (from the Engineering Geology Field Manual published by the U.S. Department of the Interior Bureau of Reclamation).

**Table B-1 – Description of Rock Fracturing**

1. Unfractured	No observed fractures
2 Very slightly fractured	Core length recovery greater than 3'
3 Slightly to very slightly fractured	*
4 Slightly fractured	Core length recovery from 1' to 3'
5 Moderately to slightly fractured	*
6 Moderately fractured	Core length recovery from 0.33' to 1'
7 Intensely to moderately fractured	*
8 Intensely fractured	Core length recovery from 0.1' to 0.33'
9 Very intensely to intensely fractured	*
10 Very intensely fractured	Core length recovery mostly chips and fragments
*Combinations of fracture densities are used where equal distribution of both fracture density characteristics are present over a significant core interval or exposure.	

**Table B-2 – Description Of Rock Weathering**

1 Fresh	No discoloration, surfaces not oxidized.
2 Slightly weathered	Discoloration and oxidation limited to surfaces.
3 Moderately weathered	Discoloration and oxidation extends from fractures, partial chemical alteration of some minerals.
4 Intensely weathered	Discoloration and oxidation throughout; chemical alteration of most minerals; rock is friable.
5 Decomposed	Rock decomposed; resembles a soil.

**Table B-3 – Description Of Rock Hardness**

1 Extremely hard	Can't be scratched with knife; can only be chipped with repeated heavy hammer blows.
2 Very hard	Can't be scratched with knife; core can only be broken with repeated heavy hammer blows.
3 Hard	Can be scratched with a knife with difficulty; core can be broken with heavy hammer blow.
4 Moderately hard	Can be scratched with a knife with light to moderate pressure; core breaks with moderate hammer blow.
5 Moderately soft	Can be grooved 1/16 in. deep by knife with moderate to heavy pressure; core can be broken with light hammer blow.
6 Soft	Can be grooved easily with a knife with light pressure; core breaks with light to moderate manual pressure.
7 Very soft	Can be easily carved with a knife; core breaks with light manual pressure.

**Table B-4 – Description Descriptions and Abbreviations for Fractures**

<b>Surface Roughness</b>		
St	Stepped	Near normal steps and ridges occur on the fracture surface.
R	Rough	Large, angular asperities can be seen.
Mr	Moderately rough	Asperities are clearly visible and fracture surface feels abrasive.
Sm	Smooth	No asperities; smooth to the touch.

**Surface Shape**

Pl	Planar	Flat and uniform.
Un	Undulatory	Wavy and symmetrical.
Irr	Irregular	Non-uniform and symmetrical.

**Aperture**

T	Tight	No visible separation
So	Slightly Open	<1/32 inch
Mo	Moderately Open	1/32 inch – 1/8 inch
O	Open	1/8 inch – 3/8 inch
Mw	Moderately Wide	3/8 inch – 1.2 inches
W	Wide	>1.2 inches

**Type of Infilling**

Cl	Clay
Ca	Calcite
Ch	Chlorite
Fe	Iron Oxide
G	Gypsum
Mn	Manganese Oxide
Q	Quartz

**Thickness of Infilling**

Sta	Surface Staining	---
Vth	Very thin	<1/32 inch
Mth	Moderately thin	1/32 inch – 1/8 inch
Th	Thin	1/8 inch – 3/8 inch
Mtk	Moderately thick	3/8 inch – 1.2 inches
Tk	Thick	>1.2 inches

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>10/30/12</u>	CORE NO. <u>B-1</u>
							GROUND ELEVATION <u>938' ± (MSL)</u>	SHEET <u>1</u> OF <u>3</u>
							METHOD OF DRILLING <u>HQ Rock Core</u>	DRILLER <u>Tri-County</u>
							LOCATION <u>See Figure 3</u>	
							SAMPLED BY <u>NMM</u>	LOGGED BY <u>NMM</u>

							DESCRIPTION/INTERPRETATION	
0						GM	<b>COLLUVIUM:</b> Light grayish brown, damp, fine sandy GRAVEL with cobbles and silt.	
1.5	15	N/A					<b>GRANITIC ROCK:</b> Dark gray, hard to very hard, weathered, medium-grained GRANITIC ROCK; intensely fractured.	
5	5	30	15	5		15 70 60	@6': Mr, Pl, So, Fe+Cl, Vth.  @7.5': Mr, Pl, Fe, Sta.	
10	4	100	50	~8		15, 60 90 20 90 40 75	Gray; moderately fractured. @8.2': Mr, Un, T, Cl+Fe, Sta-Vth. @8.8': R, Irr, Fe, Sta.  @9.6': Subparallel fractures - Mr, Un, Fe, Sta. @9.9': T, Cl, Vth.	
15	3	90	30	7		59 70 40 50	@13.5': Mr, Pl, Fe, Sta.  @15': Mr, Pl, Mn+Cl, Mth.	
	3	80	30	5		65 40 15 60	@15.9': Mr, Uni, Mn+Cl, Sta-Vth. @16.5': R, Pl, Mn+Fe, Sta.  @17.5': Sm, Un, Cl, Vth. @17.7'-18.5': R, Pl, Mn+Fe, Sta.	
20						25 30	@20': St, Pl-Un, Cl+Fe, Sta-Mth.	



**ROCK CORE LOG**

LINDLEY RESERVOIR REPLACEMENT PROJECT  
 ESCONDIDO, CALIFORNIA

PROJECT NO.  
 1074240001

DATE  
 11/12

FIGURE  
 A-1

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>10/30/12</u>	CORE NO. <u>B-1</u>
							GROUND ELEVATION <u>938' ± (MSL)</u>	SHEET <u>2</u> OF <u>3</u>
							METHOD OF DRILLING <u>HQ Rock Core</u>	DRILLER <u>Tri-County</u>
							LOCATION <u>See Figure 3</u>	
							SAMPLED BY <u>NMM</u>	LOGGED BY <u>NMM</u>

DESCRIPTION/INTERPRETATION								
20							40	<b>GRANITIC ROCK: (Continued)</b> Gray, hard to very hard, weathered, medium to fine grained GRANITIC ROCK; moderately fractured.
	5	100	85	2			70	@20.4'-30.0': Mr, Un, Fe+Cl, Sta.
							30	
							65	
							60	
							20	@22.8': St, Pl, Mn+Fe+Cl, Sta.
							10	
25							35	@24.3'-25.5': Mr, P, Fe, Sta.
	5	100	55	3			15	
							20	
							30	@25.9': Mr, Un, Fe+Cl, Sta-Vth.
							15	
							45	
							25	@27.2'-27.8': Weathered.
							30	
							10	
							35	@28.8'-30.4': Mr, F, Fe, Sta.
30							70	@28.9'-29': Weathered.
	5	100	55	7			80	@29'-34': Mr-St, Pl, Fe+Mn, Sta.
							60	
							20	
							70	
							15	
							15	@34'-38.7': Mr, Pl-Un, Fe+Mn, Sta.
35							30	
	5	85	50	6			45	
							50	
							60	
							60	
							15	@38.7'-38.8': Weathered.
40								Total Depth = 39 feet. Groundwater not encountered during drilling.



**ROCK CORE LOG**

LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

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FIGURE  
A-2

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>10/30/12</u> CORE NO. <u>B-1</u>
							GROUND ELEVATION <u>938' ± (MSL)</u> SHEET <u>3</u> OF <u>3</u>
							METHOD OF DRILLING <u>HQ Rock Core</u> DRILLER <u>Tri-County</u>
							LOCATION <u>See Figure 3</u>
							SAMPLED BY <u>NMM</u> LOGGED BY <u>NMM</u> REVIEWED BY <u>RDH/GTF</u>
							<b>DESCRIPTION/INTERPRETATION</b>
40							Backfilled with approximately 14 cubic feet of bentonite shortly after drilling on 10/29/12.
							<u>Note:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
45							
50							
55							
60							



**ROCK CORE LOG**

LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

PROJECT NO.  
1074240001

DATE  
11/12

FIGURE  
A-3

	DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>10/31/12</u> CORE NO. <u>B-2</u>
								GROUND ELEVATION <u>940' ± (MSL)</u> SHEET <u>1</u> OF <u>3</u>
								METHOD OF DRILLING <u>HQ Rock Core</u> DRILLER <u>Tri-County</u>
								LOCATION <u>See Figure 3</u>
								SAMPLED BY <u>NMM</u> LOGGED BY <u>NMM</u> REVIEWED BY <u>JG</u>
								<b>DESCRIPTION/INTERPRETATION</b>

0							GM	<b>COLLUVIUM:</b> Brown to grayish brown, damp, fine sandy GRAVEL with cobbles and silt.
5								
	3	60	20	6		60 60 30 80		<b>GRANITIC ROCK:</b> Gray, soft to hard, weathered, medium-grained GRANITIC ROCK; intensely to moderately fractured. @6'-9': St-Mr, Pl, Mn+Fe, Sta.  @8.5': Weathered.
10								
	3.5	100	25	12		50 60 80 30 20		@9.5'-9.7': Weathered. @10.2': So, Cl, Vth. @10.5': Mr, Un, Mn+Fe, Sta.
							40	Additional drill mud added.
	1.5	85	45	8		15 25		
15								
	5	95	50	10		65 60 30 15 20 60		@14.3': St, Ir, Ma+Fe, Sta. @14.4': Mr-R, P, Mn+Fe+Cl, Sta-Vth.
								@17.4'-17.6': Weathered.
20								

<h1 style="margin:0;">Ninyo &amp; Moore</h1>	<b>ROCK CORE LOG</b>		
	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA		
	PROJECT NO. 1074240001	DATE 11/12	FIGURE A-4

	DATE DRILLED	10/31/12	CORE NO.	B-2	
	GROUND ELEVATION	940' ± (MSL)	SHEET	2	OF 3
	METHOD OF DRILLING	HQ Rock Core	DRILLER	Tri-County	
	LOCATION	See Figure 3			
	SAMPLED BY	NMM	LOGGED BY	NMM	REVIEWED BY JG

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DESCRIPTION/INTERPRETATION
20	3	75	10	8		60 50 45 30 20	<b>GRANITIC ROCK: (Continued)</b> Gray, moderately hard to hard, moderately to intensely weathered, fine and medium grained GRANITIC ROCK; intensely to moderately fractured. @20': Mr, P+Un, Fe+Mn+Cl, Sta-Vth.
	3	90	15	7		60 80 20	Moderately weathered; fine-grained rock.
25	2	10	50	4-12		45 10 70 30	@25'-29': Mr, Un, Fe+Mn, Sta.  @26.6': Highly fractured; medium-grained rock.
	2	100	15	8		60 70 45 15	@28'-29': R-St, Un, Fe, Sta.
30	5	70	0	12		40 50 30 60 70 30	@31'-34': Weathered.
	2	70	45	5		30 50 25 80 65	@34': Quartz vein 3/4" thick. @34.8': Weathered; fine-grained rock. @34.8'-36': St+Mr, Pl, Fe, Sta. @35'-40': Weathered rock.
	4	75	50	3		45 60 15 60 65 60 30	@37': Mr, Pl-Un, Fe, Sta.
40							

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>10/31/12</u> CORE NO. <u>B-2</u>
							GROUND ELEVATION <u>940' ± (MSL)</u> SHEET <u>3</u> OF <u>3</u>
							METHOD OF DRILLING <u>HQ Rock Core</u> DRILLER <u>Tri-County</u>
							LOCATION <u>See Figure 3</u>
							SAMPLED BY <u>NMM</u> LOGGED BY <u>NMM</u> REVIEWED BY <u>JG</u>
							<b>DESCRIPTION/INTERPRETATION</b>
40							Total Depth = 40 feet. Groundwater not encountered during drilling. Backfilled with approximately 14 cubic feet of bentonite shortly after drilling on 10/31/12.
45							<u>Note:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
50							
55							
60							



**ROCK CORE LOG**

LINDLEY RESERVOIR REPLACEMENT PROJECT  
ESCONDIDO, CALIFORNIA

PROJECT NO.  
1074240001

DATE  
11/12

FIGURE  
A-6

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>11/01/12</u> CORE NO. <u>B-3</u> GROUND ELEVATION <u>890' ± (MSL)</u> SHEET <u>1</u> OF <u>2</u> METHOD OF DRILLING <u>HQ Rock Core</u> DRILLER <u>Tri-County</u> LOCATION <u>See Figure 3</u> SAMPLED BY <u>NMM</u> LOGGED BY <u>NMM</u> REVIEWED BY <u>JG</u>
<b>DESCRIPTION/INTERPRETATION</b>							

0						SM	<b>COLLUVIUM:</b> Reddish brown, damp, medium dense to dense, silty SAND; little gravel and cobble.
5	1.5	0	N/A				<b>GRANITIC ROCK:</b> Reddish to brownish gray, very soft to soft, weathered, medium-grained GRANITIC ROCK; intensely fractured; extensive iron staining.  @6.5'-9': St, Irr, Fe, Sta.
	2.5	45	0	6			
10						40 30	@10': R, P, Fe+Mn, Sta.  @11': R, Un, Fe+Mn+Cl, Sta-Vth. @11.3': St, Irr, Mn+Fe, Sta. @11.5'-13.5': R, P-Un, Fe-Vth+Cl, Sta-Vth. @12.3'-12.4': Decomposed.
15	5	90	30	5		65 20 15	@13.5'-14': St, Irr, Mn-Fe, Cl, Sta-Vth. @13.5': Root. @14'-15': St-Mr, P-Irr, Fe+Mn, Sta.
20	5	100	20	6		50-70 60 70	@15'-18.5': R-Mr, P-Un, Fe+Mn, Sta, Cl-Vth.  @18.8': St, Irr, Mn+Fe+Cl, Sta-Th. @18.8'-19': Decomposed.
							Total Depth = 19 feet.

	<b>ROCK CORE LOG</b>		
	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA		
	PROJECT NO. 1074240001	DATE 11/12	FIGURE A-7

DEPTH (feet)	INTERVAL CORED (feet)	RECOVERY (%)	RQD (%)	FRACTURE FREQUENCY (per ft.)	GRAPHIC LOG	FRACTURE DIP (degrees)	DATE DRILLED <u>11/01/12</u> CORE NO. <u>B-3</u>
							GROUND ELEVATION <u>890' ± (MSL)</u> SHEET <u>2</u> OF <u>2</u>
							METHOD OF DRILLING <u>HQ Rock Core</u> DRILLER <u>Tri-County</u>
							LOCATION <u>See Figure 3</u>
							SAMPLED BY <u>NMM</u> LOGGED BY <u>NMM</u> REVIEWED BY <u>JG</u>

DESCRIPTION/INTERPRETATION							
20							Groundwater not encountered during drilling. Backfilled with bentonite shortly after drilling on 11/01/12.
25							<u>Note:</u> Groundwater, though not encountered at the time of drilling, may rise to a higher level due to seasonal variations in precipitation and several other factors as discussed in the report.
30							
35							
40							

	<b>ROCK CORE LOG</b>		
	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA		
	PROJECT NO. 1074240001	DATE 11/12	FIGURE A-8

## **APPENDIX B**

### **LABORATORY TESTING**

#### **Classification**

Soils were visually and texturally classified in accordance with the Unified Soil Classification System (USCS) in general accordance with ASTM D 2488. Soil classifications are indicated on the rock core logs in Appendix A.

#### **Gradation Analysis**

A gradation analysis test was performed on a selected representative soil sample in general accordance with ASTM D 422. The grain-size distribution curve is shown on Figure B-1. This test result was utilized in evaluating the soil classifications in accordance with USCS.

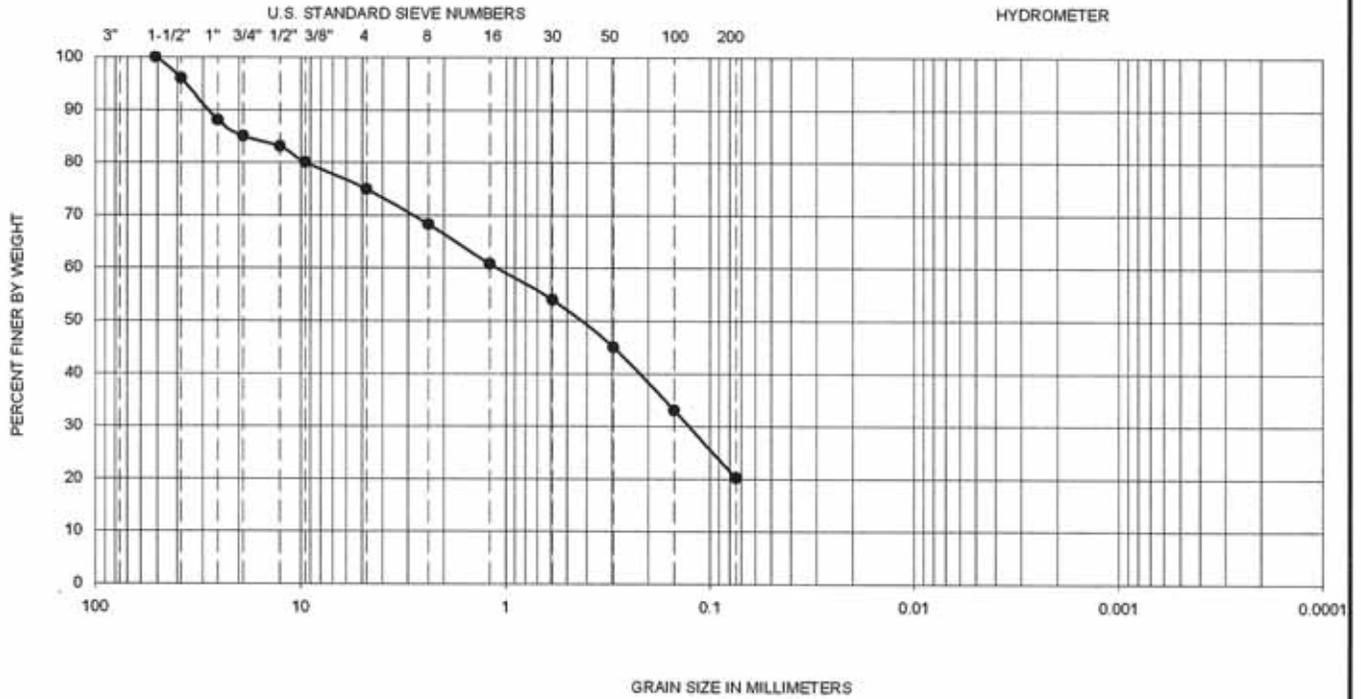
#### **Soil Corrosivity Tests**

Soil pH, and resistivity tests were performed on a representative sample in general accordance with CT 643. The chloride content of the selected sample was evaluated in general accordance with CT 422. The sulfate content of the selected sample was evaluated in general accordance with CT 417. The test results are presented on Figure B-2.

#### **R-Value**

The resistance value, or R-value, for site soils was evaluated in general accordance with CT 301. A representative sample was prepared and evaluated for exudation pressure and expansion pressure. The equilibrium R-value is reported as the lesser or more conservative of the two calculated results. The test results are shown on Figure B-3.

GRAVEL		SAND			FINES	
Coarse	Fine	Coarse	Medium	Fine	Silt	Clay



Symbol	Sample Location	Depth (ft)	Liquid Limit	Plastic Limit	Plasticity Index	D <sub>10</sub>	D <sub>30</sub>	D <sub>60</sub>	C <sub>u</sub>	C <sub>c</sub>	Passing No. 200 (%)	U.S.C.S
●	B-3	0.0-2.0	--	--	--	--	--	--	--	--	20	SM

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 422

<b>Ninyo &amp; Moore</b>		<b>GRADATION TEST RESULTS</b>	FIGURE <b>B-1</b>
PROJECT NO. 107424001	DATE 12/12		
		LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA	

SAMPLE LOCATION	SAMPLE DEPTH (FT)	pH <sup>1</sup>	RESISTIVITY <sup>1</sup> (Ohm-cm)	SULFATE CONTENT <sup>2</sup>		CHLORIDE CONTENT <sup>3</sup> (ppm)
				(ppm)	(%)	
B-1	0.0-1.0	6.8	2,000	30	0.003	55

<sup>1</sup> PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 643

<sup>2</sup> PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 417

<sup>3</sup> PERFORMED IN GENERAL ACCORDANCE WITH CALIFORNIA TEST METHOD 422

<b><i>Ninyo &amp; Moore</i></b>		<b>CORROSIVITY TEST RESULTS</b>	FIGURE
PROJECT NO.	DATE	LINDLEY RESERVOIR REPLACEMENT PROJECT ESCONDIDO, CALIFORNIA	<b>B-2</b>
107424001	12/12		

SAMPLE LOCATION	SAMPLE DEPTH (FT)	SOIL TYPE	R-VALUE
B-3	0.0-2.0	Silty SAND (SM) with Gravel	53

PERFORMED IN GENERAL ACCORDANCE WITH ASTM D 2844/CT 301

<b><i>Ninyo &amp; Moore</i></b>		<b>R-VALUE TEST RESULTS</b>	FIGURE <b>B-3</b>
PROJECT NO. 107424001	DATE 12/12		

**APPENDIX C**  
**GEOPHYSICAL REPORT**

**SEISMIC REFRACTION SURVEY  
LINDLEY RESERVOIR  
ESCONDIDO, CALIFORNIA**

**PREPARED FOR:**

Ninyo & Moore  
5710 Ruffin Road  
San Diego, CA 92123

**PREPARED BY:**

Southwest Geophysics, Inc.  
8057 Raytheon Road, Suite 9  
San Diego, CA 92111

November 8, 2012  
Project No. 112431

November 8, 2012  
Project No. 112431

Mr. Ron Hallum  
Ninyo & Moore  
5710 Ruffin Road  
San Diego, CA 92123

Subject: Seismic Refraction Survey  
Lindley Reservoir  
Escondido, California

Dear Mr. Hallum:

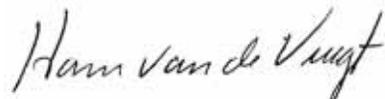
In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed Lindley Reservoir project located in Escondido, California. Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. This data report presents our survey methodology, equipment used, analysis, and results.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned at your convenience.

Sincerely,  
**SOUTHWEST GEOPHYSICS, INC.**



Patrick Lehrmann, P.G., P.Gp.  
Principal Geologist/Geophysicist



Hans van de Vrugt, C.E.G, P.Gp.  
Principal Geologist/Geophysicist

HV/PFL/hv

Distribution: (1) Electronic



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## **1. INTRODUCTION**

In accordance with your authorization, we have performed a seismic refraction survey pertaining to the proposed Lindley Reservoir project located in Escondido, California (Figure 1). Specifically, our survey consisted of performing two seismic refraction traverses at the project site. The purpose of our study was to develop subsurface velocity profiles of the areas surveyed, and to assess the apparent rippability of the subsurface materials. This data report presents our survey methodology, equipment used, analysis, and results.

## **2. SCOPE OF SERVICES**

Our scope of services included:

- Performance of two seismic refraction lines at the project site.
- Compilation and analysis of the data collected.
- Preparation of this data report presenting our results, conclusions and recommendations.

## **3. SITE AND PROJECT DESCRIPTION**

The project site is located just to the west of Hubbard Road and north of Leslie Lane in Escondido (Figure 1). The study area is situated to the west of two existing water reservoirs. The project area is generally undeveloped, although a portion of the site has been graded to create a small relatively flat pad and a dirt road, much of which is over grown with dense brush. Moderately steep slopes flank the study area. Figures 2 and 3 depict the general site conditions in the study area. Based on our discussions with you it is our understanding that a new water tank is planned at the project site and that cuts up to 25 feet deep are planned.

## **4. SURVEY METHODOLOGY**

A seismic P-wave (compression wave) refraction survey was conducted at the site to evaluate the rippability characteristics of the subsurface materials and to develop subsurface velocity profiles of the areas surveyed. The seismic refraction method uses first-arrival times of refracted seismic waves to estimate the thicknesses and seismic velocities of subsurface layers. Seismic P-waves generated at the surface, using a hammer and plate, are refracted at boundaries separating materials of contrasting velocities. These refracted seismic waves are then detected by a series of

surface vertical component geophones and recorded with a 24-channel Geometrics StrataView seismograph. The travel times of the seismic P-waves are used in conjunction with the shot-to-geophone distances to obtain thickness and velocity information on the subsurface materials.

Two seismic lines (SL-1 and SL-2) were conducted in the study area. The general locations and lengths of the lines were selected by your office. Shot points (signal generation locations) were conducted along the lines at the ends, midpoint, and intermediate points between the ends and the midpoint.

The seismic refraction theory requires that subsurface velocities increase with depth. A layer having a velocity lower than that of the layer above will not generally be detectable by the seismic refraction method and, therefore, could lead to errors in the depth calculations of subsequent layers. In addition, lateral variations in velocity, such as those caused by core stones, intrusions or boulders can also result in the misinterpretation of the subsurface conditions.

In general, seismic wave velocities can be correlated to material density and/or rock hardness. The relationship between rippability and seismic velocity is empirical and assumes a homogeneous mass. Localized areas of differing composition, texture, and/or structure may affect both the measured data and the actual rippability of the mass. The rippability of a mass is also dependent on the excavation equipment used and the skill and experience of the equipment operator.

The rippability values presented in Table 1 are based on our experience with similar materials and assumes that a Caterpillar D-9 dozer ripping with a single shank is used. We emphasize that the cutoffs in this classification scheme are approximate and that rock characteristics, such as fracture spacing and orientation, play a significant role in determining rock rippability. These characteristics may also vary with location and depth. For trenching operations, the rippability values should be scaled downward. For example, velocities as low as 3,500 feet/second may indicate difficult ripping during trenching operations. In addition, the presence of boulders, which can be troublesome in a narrow trench, should be anticipated.

<b>Table 1 – Rippability Classification</b>	
<b>Seismic P-wave Velocity</b>	<b>Rippability</b>
0 to 2,000 feet/second	Easy
2,000 to 4,000 feet/second	Moderate
4,000 to 5,500 feet/second	Difficult, Possible Blasting
5,500 to 7,000 feet/second	Very Difficult, Probable Blasting
Greater than 7,000 feet/second	Blasting Generally Required

It should be noted that the rippability cutoffs presented in Table 1 are slightly more conservative than those published in the Caterpillar Performance Handbook (Caterpillar, 2011). Accordingly, the above classification scheme should be used with discretion, and contractors should not be relieved of making their own independent evaluation of the rippability of the on-site materials prior to submitting their bids.

## 5. RESULTS

As previously indicated, two seismic traverses were conducted as part of our study. The collected data were processed using SIPwin (Rimrock Geophysics, 2003), a seismic interpretation program, and analyzed using both SIPwin and SeisOpt Pro (Optim, 2008). Both programs use first arrival picks and elevation data to produce subsurface velocity models. SIPwin uses layer-based modeling techniques to produce a layered velocity model, where changes in velocities are depicted as discrete contacts. SeisOpt Pro uses a nonlinear optimization technique called adaptive simulated annealing. The resulting velocity model provides a tomography image of the estimated geologic conditions. Both vertical and lateral velocity information is contained in the tomography model. Changes in layer velocity are revealed as gradients rather than discrete contacts, which typically are more representative of actual conditions.

Table 2 lists the approximate P-wave velocities and depths calculated from the seismic refraction traverse using the layered modeling method. The approximate locations of the seismic refraction traverses are shown on the Line Location Map (Figure 2). The velocity models are included in Figures 4a and 4b. In general, the effective depth of evaluation for a seismic refraction traverse is approximately one-third to one-fifth the length of the traverse.

<b>Table 2 – Seismic Traverse Results<sup>1</sup></b>			
<b>Traverse No. And Length</b>	<b>P-wave Velocity feet/second</b>	<b>Approximate Depth to Bottom of Layer in feet</b>	<b>Apparent Rippability<sup>2</sup></b>
SL-1 125 feet	V1 = 2,650 V2 = 5,620	2 – 13 ---	Moderate Very Difficult, Probable Blasting
SL-2 125 feet	V1 = 2,200 V2 = 5,790	3 – 6 ---	Moderate Very Difficult, Probable Blasting
1 Results based on the model generated using SIPwin, 2003			
2 Rippability criteria based on the use of a Caterpillar D-9 dozer ripping with a single shank			

## 6. CONCLUSIONS AND RECOMMENDATIONS

The results from our seismic survey revealed distinct layers/zones in the near surface that likely represent soil overlying weathered granitic bedrock. Figures 4a and 4b provide the velocity models calculated from both SIPwin and SeisOpt Pro. Distinct vertical and lateral variations between the two models are evident. In general, the tomography results better characterize the onsite conditions than the layer models.

The cause of the velocity variations revealed in the tomography profiles are likely related to the presence of remnant boulders, intrusions and differential weathering of the bedrock materials. Therefore, variability in the excavatability (including depth of rippability) of the subsurface materials should be expected across the project area.

Based on our results, very difficult conditions where blasting may be required should be expected depending on the excavation depth, location, and desired rate of production. In addition, oversized materials should be expected. A contractor with excavation experience in similar conditions should be consulted for expert advice on excavation methodology, equipment and production rate.

## 7. LIMITATIONS

The field evaluation and geophysical analyses presented in this report have been conducted in general accordance with current practice and the standard of care exercised by consultants performing similar tasks in the project area. No warranty, expressed or implied, is made regarding the conclusions, recommendations, and opinions presented in this report. There is no evaluation

detailed enough to reveal every subsurface condition. Variations may exist and conditions not observed or described in this report may be present. Uncertainties relative to subsurface conditions can be reduced through additional subsurface exploration. Additional subsurface surveying will be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Southwest Geophysics, Inc. should be contacted if the reader requires additional information or has questions regarding the content, interpretations presented, or completeness of this document. This report is intended exclusively for use by the client. Any use or reuse of the findings, conclusions, and/or recommendations of this report by parties other than the client is undertaken at said parties' sole risk.

## **8. SELECTED REFERENCES**

Caterpillar, Inc., 2011, Caterpillar Performance Handbook, Edition 41, Caterpillar, Inc., Peoria, Illinois.

Mooney, H.M., 1976, Handbook of Engineering Geophysics, dated February.

Optim, Inc., 2008, SeisOpt Pro, V-5.0.

Rimrock Geophysics, 2003, Seismic Refraction Interpretation Program (SIPwin), V-2.76.

Telford, W.M., Geldart, L.P., Sheriff, R.E., and Keys, D.A., 1976, Applied Geophysics, Cambridge University Press.



**SITE LOCATION MAP**



Lindley Reservoir  
Escondido, California



Project No.: 112431

Date: 11/12

Figure 1



Figure 2

Lindley Reservoir  
Escondido, California

Project No.: 112431

Date: 11/12



**LINE LOCATION  
MAP**



**SITE PHOTOGRAPHS**

Lindley Reservoir  
Escondido, California

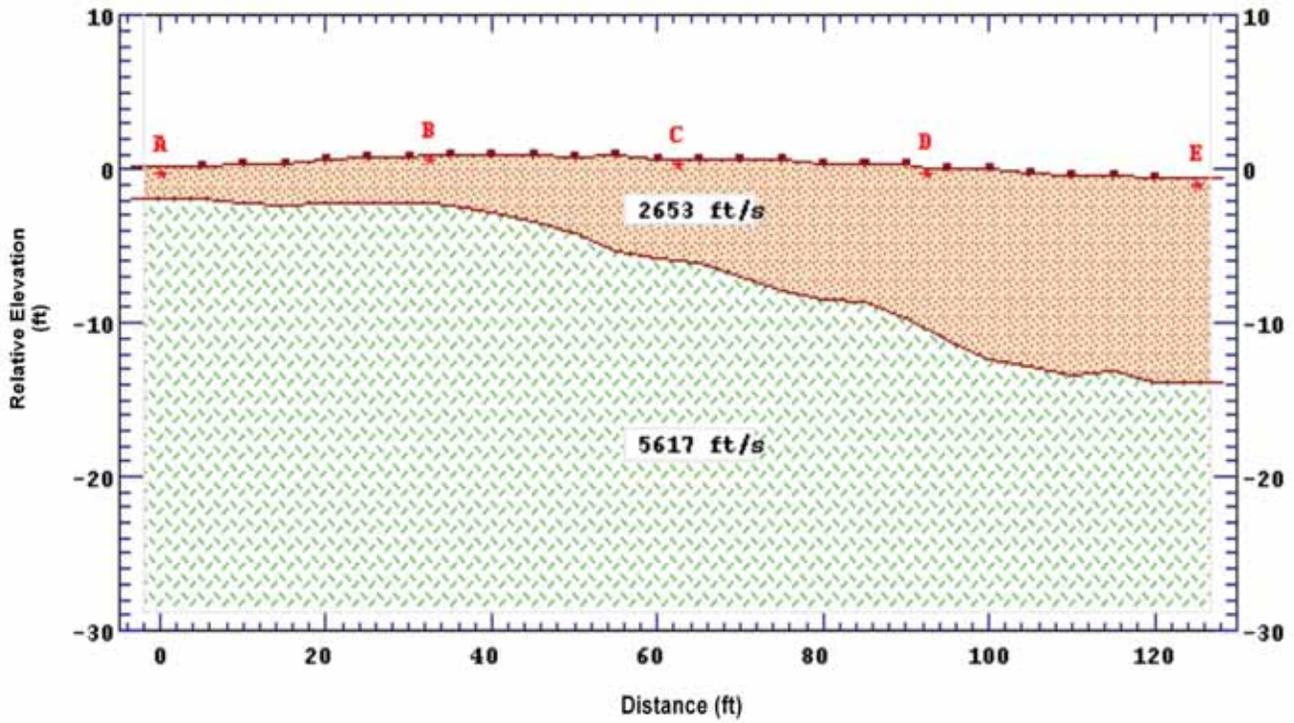
Project No.: 112431

Date: 11/12

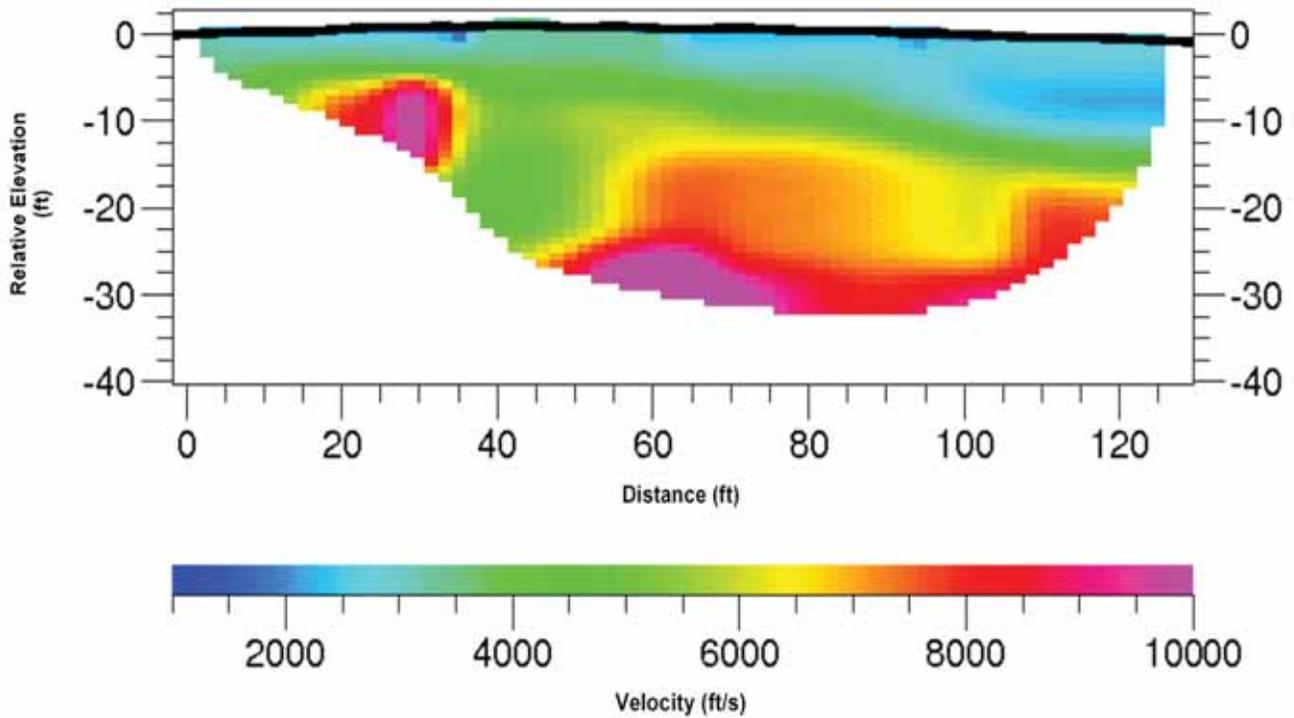


Figure 3

### Layer Model



### Tomography Model



**SEISMIC PROFILE  
SL-1**

Lindley Reservoir  
Escondido, California

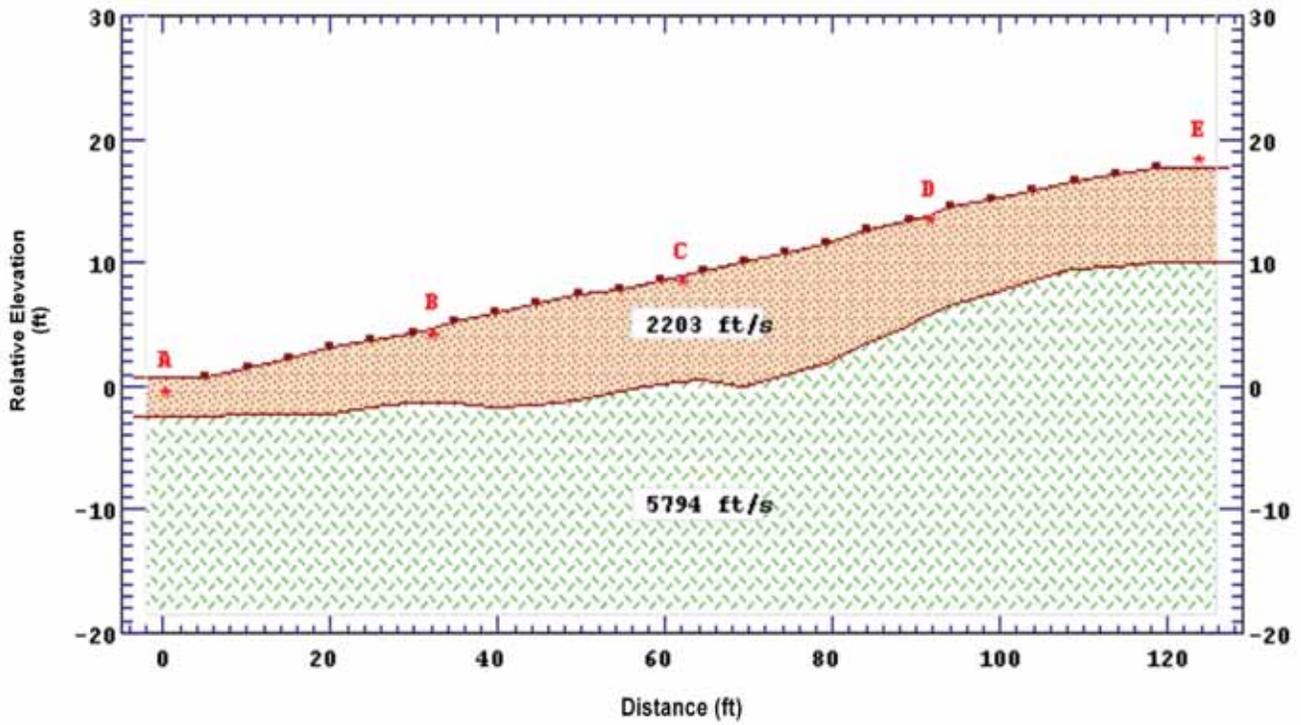
Project No.: 112431

Date: 11/12

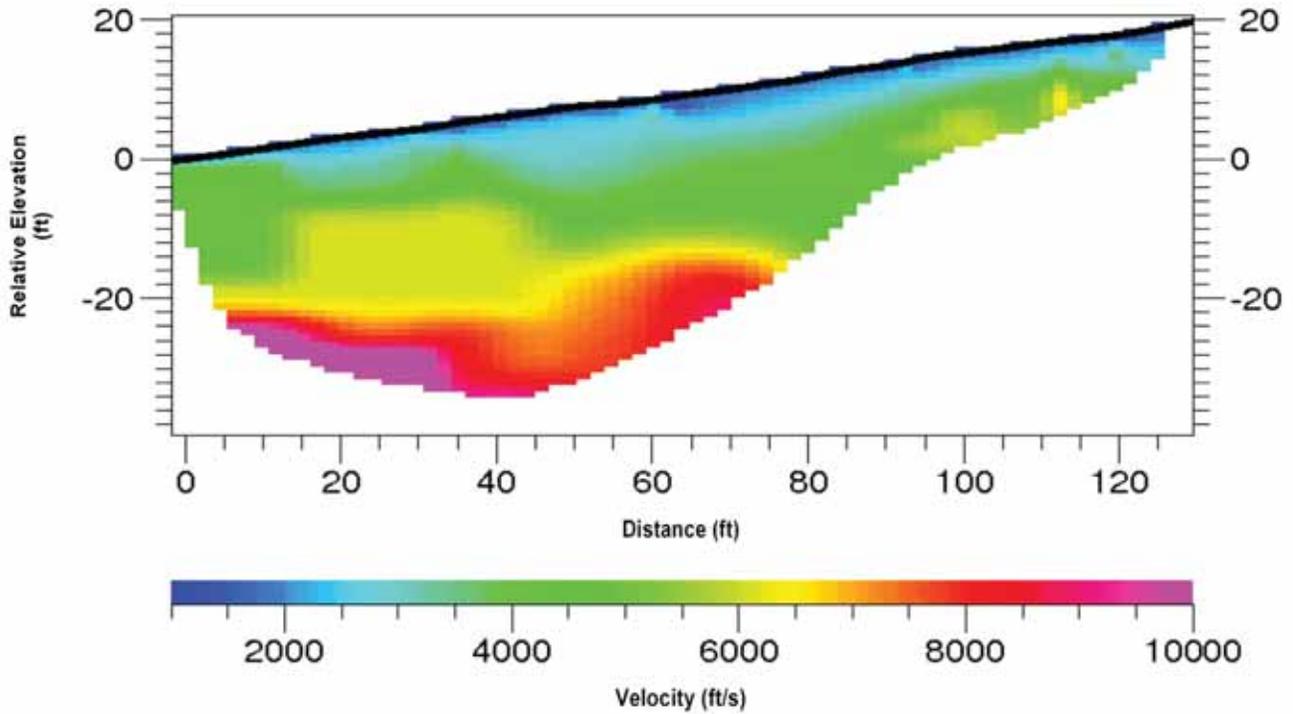


Figure 4a

### Layer Model



### Tomography Model



**SEISMIC PROFILE  
SL-2**

Lindley Reservoir  
Escondido, California

Project No.: 112431

Date: 11/12

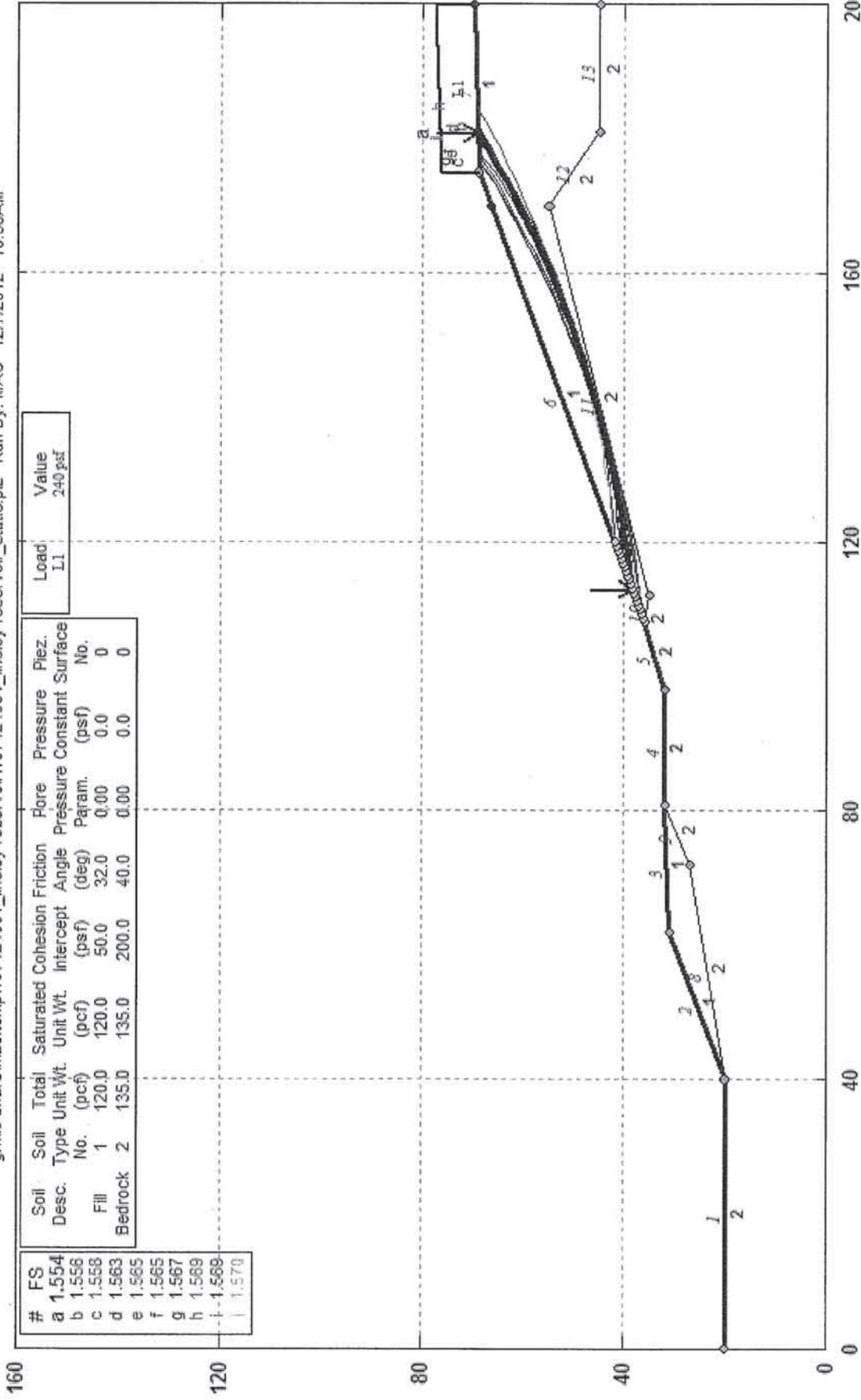


Figure 4b

**APPENDIX D**  
**SLOPE STABILITY ANALYSIS**

# 107424001\_Lindley Reservoir\_A-A'\_Static

g:\file share\mac.temp\107424001\_lindley reservoir\107424001\_lindley reservoir\_static.plt Run By: MAC 12/7/2012 10:56AM



GSTABL7 v.2 F<sub>Smin</sub>=1.554  
 Safety Factors Are Calculated By The Modified Bishop Method



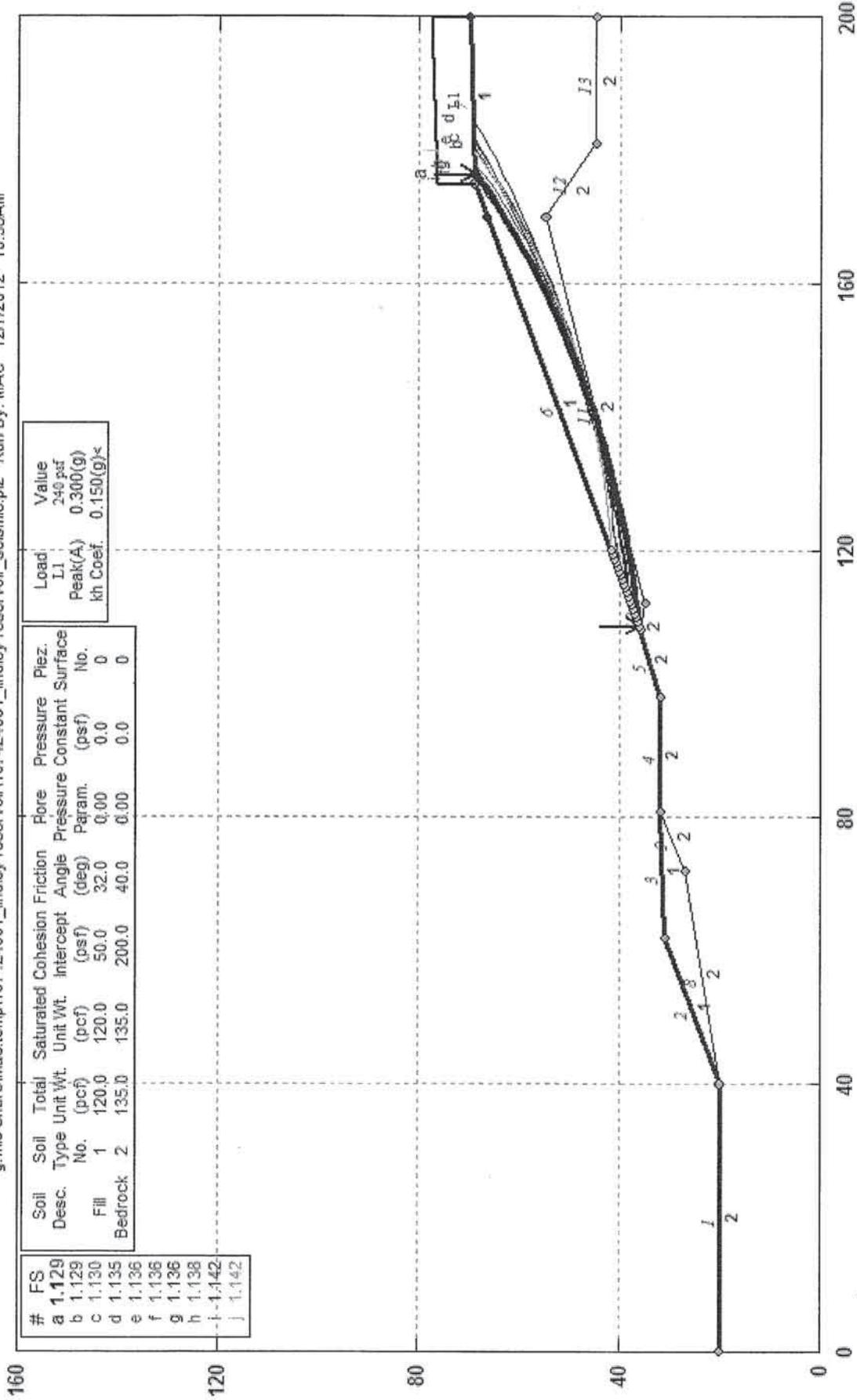
# 107424001\_Lindley Reservoir\_A-A'\_ Seismic

g:\file share\mac.temp\107424001\_lindley reservoir\107424001\_lindley reservoir\_seismic.p12 Run By: MAC 12/7/2012 10:58AM

#	FS
a	1.129
b	1.129
c	1.130
d	1.135
e	1.136
f	1.136
g	1.136
h	1.138
i	1.142
j	1.142

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Fill	1	120.0	120.0	50.0	32.0	0.00	0.0	0
Bedrock	2	135.0	135.0	200.0	40.0	0.00	0.0	0

Load:	Value
L1	240 psf
Peak(A)	0.300(g)
kh Coeff.	0.150(g)<



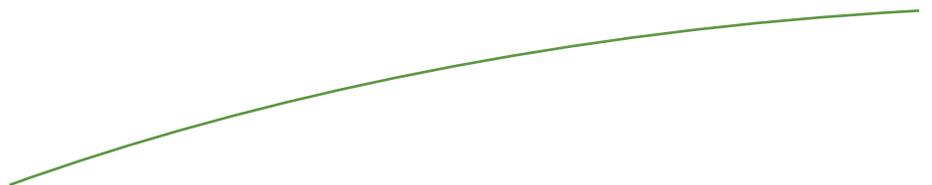
GSTABL7 v.2 F<sub>Smin</sub>=1.129  
Safety Factors Are Calculated By The Modified Bishop Method





APPENDIX D

NOISE/VIBRATION TECHNICAL  
MEMORANDUM



# Memorandum

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---

**Date:** July 9, 2013

**To:** Monica Bilodeau

**Cc:**

**From:** Charles Terry

**Subject:** Lindley Reservoir Construction Noise/Vibration Impact Review (MWAH-01)

**HELIX Proj. No.:** MWAH-01

**Message:**

Per request by Dennis Marcin, I have conducted a brief quantitative construction noise/vibration analysis to determine the potential for the proposed Lindley Reservoir water tank construction to have significant noise or vibration impacts at homes or residences in the vicinity of the project site, as well as along the off-site pipeline corridor and project truck travel routes. Based on the nature of the proposed project (i.e., water storage tanks and related facilities with minimal, maintenance-related, traffic), no associated significant operational noise impacts are anticipated and no operational noise analysis is provided herein. This Memorandum has been prepared as an attachment to the Lindley Reservoir project CEQA analysis, with additional information on the project location, design and other considerations provided in the project Initial Study/Mitigated Negative Declaration (IS/MND).

## Summary of Findings

Without mitigation the construction noise impacts from the Lindley Reservoir construction may exceed the allowable City and/or County construction noise limits.

With the mitigation of a 12-foot high noise control fence breaking the line of sight between the southern residences and equipment (i.e., adjacent to the construction, not down the slope from the equipment), project construction-related noise levels would be reduced to less than significant.

Due to the duration of construction, the potential extended use of impact rock breaking, and the relatively high levels of noise at the western residential locations, it is also recommended that the same noise control measure be implemented for the western residences.

No significant construction-related vibration impacts would result from the proposed project.

# Memorandum (cont.)

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## Project Description and Location

The proposed project consists generally of demolishing and removing the existing 2.0-million gallon (MG), above ground, steel Lindley Reservoir Tank, and construction of two, 1.5-MG partially buried concrete replacement tanks and related facilities (e.g., pipelines, a valve vault, access road spurs, and drainage facilities). Project construction is estimated to require an overall period of approximately 600 calendar days (or 20 months), with a general construction schedule of 7:00 a.m. to 4:30 p.m. on Monday through Friday. Based on this five-day work schedule, project construction would entail approximately 406 workdays, with a maximum of 20 construction personnel anticipated to be on site at any given time.

The project site includes approximately 10.8 acres, with proposed construction to occur within an approximately 5.5-acre area in the southern-most portion of the project site. Along with the proposed off-site pipeline, the project site is located within portions of the Lindley and Clear Well pressure zones in the northwest portion of the City of Escondido (City) Utilities Department, Water Division, service area. Generally bound by Leslie Lane on the south, Hubbard Avenue on the east, and open space/residential uses on the west and north, the project site is transitional between primarily rural uses in nearby areas to the north and northeast, and denser urban development in other directions. The project site is located within an unincorporated area of the County, while the off-site pipeline corridor along Hubbard Avenue includes areas within the jurisdiction of both the City and County. Adjacent areas include County jurisdiction to the north, east and southeast, and City jurisdiction to the west, south and east. More distant surrounding areas are predominantly within the incorporated City of Escondido (please refer to Figures 1 through 4 of the project IS/MND).

## Metrics

### NOISE

All noise-level and sound-level values presented herein are expressed in terms of decibels (dB), with A-weighting, abbreviated “dBA,” to approximate the hearing sensitivity of humans. Time-averaged noise levels of one hour are expressed by the symbol “ $L_{EQ}$ ” unless a different time period is specified. Specifically,  $L_{EQ}$  (8-hour) is used in the San Diego County construction noise ordinances (below). Construction equipment noise may be analyzed based on its Maximum Sound Level ( $L_{MAX}$ );  $L_{MAX}$  is defined as the maximum sound level measured during a specified time period with “slow/1-second” time-averaging. The Community Noise Equivalent Level (CNEL) is a 24-hour average, where noise levels during the evening hours of 7:00 p.m. to 10:00 p.m. have an added 5 dB weighting, and sound levels during the nighttime hours of 10:00 p.m. to 7:00 a.m. have an added 10 dB weighting. This is similar to the Day-Night sound level,  $L_{DN}$ , which is a 24-hour average with an added 10 dB weighting on the same nighttime hours but no added weighting on the evening hours. Sound levels expressed in CNEL

# Memorandum (cont.)

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are always based on the A-weighted decibel. These metrics are used to express noise levels for both measurement and municipal regulations, as well as for land use guidelines and enforcement of noise ordinances.

## VIBRATION

Vibration is an oscillatory motion which can be described in terms of the displacement, velocity, or acceleration. The criteria used for analysis is Velocity in Inches per Second (in/sec) for the analysis of impacts to both humans and structures. The criteria for structural damage are based on the Peak Particle Velocity (PPV), however, which is defined as the maximum instantaneous positive or negative peak of the vibration signal. Analysis of annoyance levels to humans is based on a 1-second time averaged Root Mean Square (RMS) vibration signal (to accurately reflect normal human response to vibration), which like noise is expressed in decibels specified as VdB (with a standard reference velocity of one micro-inch per second).

## Regulatory Framework

As previously noted, the project site is located on unincorporated County land and is surrounded by areas with properties under both County and City jurisdiction. Based on these considerations and the fact that the City is the CEQA Lead Agency for the proposed project, the assessment of potential construction-related noise impacts includes assessment under both City and County noise standards, as outlined below.

### San Diego County Code Sections 36.409 thru 36.410

## CONSTRUCTION NOISE

Except for emergency work, it shall be unlawful for any person to operate construction equipment or cause construction equipment to be operated, that exceeds an average sound level of 75 decibels for an eight-hour period, between 7:00 a.m. and 7:00 p.m., when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is being received.

In addition to the general limitations on sound levels in section 36.404 and the limitations on construction equipment in section 36.409, the following additional sound level limitations shall apply:

- (e) Except for emergency work or work on a public road Project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3-2, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive)

# Memorandum (cont.)

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Measured at Occupied Property, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 1 (Table 3-2 County) are as described in the County Zoning Ordinance.

<b>TABLE 1 (TABLE 3-2 COUNTY) SAN DIEGO COUNTY CODE SECTION 36.410 MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY</b>	
<b>Occupied Property Use</b>	<b>Decibels (dBA)</b>
Residential, village zoning or civic use	82
Agricultural, commercial or industrial use	85

- (f) Except for emergency work, no person working on a public road Project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3-3, San Diego County Code Section 36.410 Maximum Sound Level (Impulsive) Measured at Occupied Property for Public Road Projects, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in subsection (c) below. The maximum sound level depends on the use being made of the occupied property. The uses in Table 2 (Table 3-3 County) are as described in the County Zoning Ordinance.

<b>TABLE 2 (TABLE 3-3 COUNTY) SAN DIEGO COUNTY CODE SECTION 36.410 MAXIMUM SOUND LEVEL (IMPULSIVE) MEASURED AT OCCUPIED PROPERTY FOR PUBLIC ROAD PROJECTS</b>	
<b>Occupied Property Use</b>	<b>Decibels (dBA)</b>
Residential, village zoning or civic use	85
Agricultural, commercial or industrial use	90

# Memorandum (cont.)

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- (g) The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period.

If the sound level caused by construction equipment or the producer of the impulsive noise, exceeds the maximum sound level for any portion of any minute it will be deemed that the maximum sound level was exceeded during that minute.

## TRAFFIC NOISE

Noise sensitive land uses (NSLUs) are defined as any residence, hospital, school, hotel, resort, library, or similar facility where quiet is an important attribute of the environment.

Noise Impacts would be considered significant if Project implementation would result in the exposure of any on- or off-site, existing or reasonably foreseeable future NSLUs to exterior or interior noise (including noise generated from the Project, together with noise from roads [existing and planned Mobility Element roadways], railroads, airports, heliports, and all other noise sources) in excess of any of the following:

### a. Exterior Locations:

- i. 60 (CNEL) Single Family; or 65 CNEL Multi-Family or Mixed Use;<sup>1</sup> or
- ii. A significant cumulative impact would occur if the project would contribute to a cumulative scenario that would result in the exposure of any on- or off-site, existing or reasonably foreseeable NSLU, to: (1) an increase of 10 CNEL over pre-existing noise levels of less than 50 CNEL resulting in a combined exterior noise level of 60 CNEL or greater, (2) an increase of 3 CNEL in existing plus project plus cumulative conditions if that total is above 60 CNEL, or (3) interior noise in excess of 45 CNEL. A “cumulatively considerable” project contribution to an identified significant cumulative noise impact would occur if the project would contribute more than a one dB increase.<sup>2</sup>

In the case of single-family residential detached NSLUs, exterior noise shall be measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

---

<sup>1</sup> County General Plan 2011

<sup>2</sup> Report Format and Content Requirements 2009

# Memorandum (cont.)

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- (1) Net lot area up to 4,000 square feet (s.f.): 400 s.f.
- (2) Net lot area 4,000 s.f. to 10 acres: 10 percent of net lot area
- (3) Net lot area over 10 acres: 1 acre

For all other Projects, exterior noise shall be measured at all exterior areas provided for group or private usable open space.

## VIBRATION

The County standards for ground-borne noise and vibration impacts are derived from Federal Transit Administration (FTA) regulations, and summarized below in Table 3 (County Table 4-1).

<b>Table 3 (County Table 4-1) GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUND-BORNE VIBRATION AND NOISE IMPACTS</b>				
<b>Land Use Category</b>	<b>Ground-Borne Vibration Impact Levels (inches/sec rms)</b>		<b>Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)</b>	
	<b>Frequent Events<sup>1</sup></b>	<b>Infrequent Events<sup>2</sup></b>	<b>Frequent Events<sup>1</sup></b>	<b>Infrequent Events<sup>2</sup></b>
Category 1: Buildings where low ambient vibration is essential for interior operations. (research and manufacturing facilities with special vibration constraints)	0.0018 <sup>3</sup>	0.0018 <sup>3</sup>	Not applicable <sup>5</sup>	Not applicable <sup>5</sup>
Category 2: Residences and buildings where people normally sleep. (hotels, hospitals, residences, and other sleeping facilities) <sup>6</sup>	0.0040	0.010	35 dBA	43 dBA

# Memorandum (cont.)

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<b>Table 3 (County Table 4-1) (cont.) GUIDELINES FOR DETERMINING THE SIGNIFICANCE OF GROUND-BORNE VIBRATION AND NOISE IMPACTS</b>				
<b>Land Use Category</b>	<b>Ground-Borne Vibration Impact Levels (inches/sec rms)</b>		<b>Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)</b>	
	<b>Frequent Events<sup>1</sup></b>	<b>Infrequent Events<sup>2</sup></b>	<b>Frequent Events<sup>1</sup></b>	<b>Infrequent Events<sup>2</sup></b>
Category 3: Institutional land uses with primarily daytime use. (schools, churches, libraries, other institutions, and quiet offices) <sup>6</sup>	0.0056	0.014	40 dBA	48 dBA

Source: U.S. Department of Transportation, FTA, "Transit Noise and Vibration Impact Assessment," May 2006.

<sup>1</sup> "Frequent Events" is defined as more than 70 vibration events per day. Most rapid transit Projects fall into this category.

<sup>2</sup> "Infrequent Events" is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

<sup>3</sup> This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

<sup>4</sup> Vibration-sensitive equipment is not sensitive to ground-borne noise.

<sup>5</sup> There are some buildings, such as concert halls, TV and recording studios, and theaters that can be very sensitive to vibration and noise but do not fit into any of the three categories. Table 4 gives criteria for acceptable levels of ground-borne vibration and noise for these various types of special uses.

<sup>6</sup> For Categories 2 and 3 with occupied facilities, isolated events are significant when the peak particle velocity (PPV) exceeds one inch per second. Continuous or frequent intermittent vibration sources such as impact pile drivers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County.

<b>Table 4 (FTA Table 12-3) CONSTRUCTION VIBRATION DAMAGE CRITERIA</b>			
<b>Building Category</b>		<b>PPV (in/sec)</b>	<b>Approximate VdB</b>
1	Reinforced-concrete, steel or timber (no plaster)	0.5	102
2	Engineered concrete and masonry (no plaster)	0.3	98
3	Non-engineered timber and masonry buildings	0.2	94
4	Buildings extremely susceptible to vibration damage	0.12	90

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## City of Escondido Municipal Code Section 17-234

### CONSTRUCTION NOISE

Except for emergency work, it shall be unlawful for any person, including the City of Escondido, to operate construction equipment as follows:

- (a) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site, except on Monday through Friday during a week between the hours of seven (7) a.m. and six (6) p.m. and on Saturdays between the hours of nine (9) a.m. and five (5) p.m., and provided that the operation of such construction equipment complies with the requirements of subsection (d) of this section.
- (b) It shall be unlawful for any person, including the City of Escondido, to operate construction equipment at any construction site on Sundays and on days designated by the president, governor or city council as public holidays.
- (c) A person may operate construction equipment at his/her residence or for the purpose of constructing or modifying a residence for himself/herself on Monday through Friday of a week between the hours of seven (7) a.m. and six (6) p.m., and on Saturdays, Sundays, and holidays between the hours of nine (9) a.m. and five (5) p.m.; provided, that such operation of construction equipment is not carried on for profit or livelihood and complies with the requirements of subsection (d) of this section.
- (d) No construction equipment or combination of equipment, regardless of age or date of acquisition, shall be operated so as to cause noise in excess of a one-hour average sound level limit of seventy-five (75) dB at any time, unless a variance has been obtained in advance from the city manager.
- (e) Persons engaged in construction for profit or as a business shall post signs at conspicuous places on a construction site, indicating hours of work as prescribed by this article or authorized by permit and the applicable noise level limits. (Ord. No. 90-8, § 2, 3-28-90)

### TRAFFIC NOISE

**Policy E1.1:** New projects shall be required to meet acceptable exterior noise level standards as established in the noise and land use compatibility guidelines contained in Table 14.12-4 of the City guidelines. These guidelines, along with the future noise levels shown in the future noise

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contours map (Figure IV-3<sup>3</sup>) shall be used by the City as a guide for evaluating the compatibility of “noise sensitive” projects in potentially noisy areas.

**Policy E1.2:** In accordance with Table 14.12-4, the goal for outdoor noise levels in residential areas is a CNEL of 60 dB or less. However, a CNEL of 60 dB or less is a goal which may not necessarily be achievable in all residential areas within the realm of economic or aesthetic feasibility. This goal should be applied where outdoor use is a major consideration (e.g., back yards and single family housing developments, and recreation areas in multifamily housing developments). The goal should generally be applied at ten feet from the backyard property line. However, in certain cases such as on estate lots where backyards are typically very large, the goal could be applied approximately one half the distance between the back of the main residential structure and the rear property line. The outdoor standard should not normally be applied to balconies or patios associated with residential uses.

**Policy E1.4:** The City shall enforce its noise ordinance to protect the noise environment in existing residential areas. The City shall analyze potential noise impacts associated with any projects which could significantly alter noise levels in the community. The noise impact for the proposed project on existing land use should be evaluated in terms of potential for adverse community response, based on a significant increase in existing noise levels. The “noise/land use compatibility guidelines” are not intended to assess the impacts associated with a project with the potential to generate noise. If an area currently is below the maximum normally acceptable level, an increase in noise up to the maximum should not necessarily be allowed. Projects that increase noise levels by 5 dB or greater should be considered as generating a significant impact and should require mitigation.

## CONSTRUCTION VIBRATION

The County Vibration Standards utilize the Federal Transit Administration criteria for operational vibration (and long term construction annoyance). The City does not have vibration specifications. The Federal Transit Administration (FTA) provides the following standards for construction vibration damage to structures. Transit Noise and Vibration Impact Assessment, FTA-VA-90-1003-06 May 2006.

## Study Methods

The analysis was based on Community Noise Equivalent Levels (CNELs) pursuant to the unit of measure used in the Noise Element. The model-calculated noise output is the one-hour  $L_{EQ}$ .

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<sup>3</sup>Figure IV-3 and Table 14.12-4 from the noted guidelines are available on City website at: <http://www.escondido.org/Data/Sites/1/media/PDFs/Planning/GPUupdate/Vol1Noise.pdf>

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This is equivalent to CNEL, with the use of 8 to 10 percent of the average daily traffic (considered to represent peak hour traffic; Caltrans Technical Noise Supplement).

The Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) Version 1.0 (February 2, 2006) is utilized to analyze construction equipment noise. Traffic noise levels were calculated using Version 5 of The Traffic Noise Model (TNM). TNM calculates traffic noise levels based on the following factors: road alignment, elevation, lane configuration, projected traffic volumes, estimated truck composition percentages, and vehicle speeds. Hard surface noise attenuation was assumed in the model

## **Construction Noise Planning**

Total estimated grading for the project would involve approximately 69,200 cubic yards (cy), including 42,600 cy of cut and 26,600 cy of fill. Based on the shallow nature of onsite bedrock, it is assumed that all excavated material would be hauled off-site for disposal and/or reuse, and all backfill material would be imported into the site. A total of approximately 5,260 cy yards of concrete would also be required for the proposed facilities, including access road construction/resurfacing, reservoir slabs, parking areas, and other miscellaneous structures.

Project grading would be conducted with standard earth-moving and related equipment, as well as specialized equipment for rock excavation/breaking. Specifically, because blasting is precluded at the project site (due to the proximity of surrounding residences), rock excavation/breaking would entail mechanical methods such as rippers and pneumatic hammers. A preliminary list of project-related construction equipment/vehicles includes the specialized equipment noted above, as well as bulldozers, excavators, loaders, scrapers, dump trucks, transport trucks (for excavated materials/demolition debris and material/equipment deliveries), cranes, concrete trucks, vibratory compactors, work trucks (e.g., mechanic's trucks), paving machines, water trucks, and pickup trucks. Due to the relatively small size of the project site, it is anticipated that larger equipment types would be limited to one or two pieces on site at any given time, with final equipment types and numbers to be determined by the project contractor(s).

The current site grading map indicates a fill slope along the southern portion of the site which would likely be created by having a dozer cut in a "toe" area at the base of the fill slope to key in the fill, and then start working up the slope with compacted fill and removal of the softer surface material to continue the compacted slope up to the final grade. The excavation for the water tank area would likely require removal of significant amounts of hard granitic material.

The primary "worst case" impacts would come from several sources including the use of an excavator-mounted hydraulic breaker (breaker), a track-mounted pneumatic rock drill (drill), and a large tracked crawler with blade and rippers (dozer). Others sources would have significantly

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less (though not inconsiderable) potential for noise, including a loader used to place excavated material into trucks and other smaller equipment. This analysis will focus on the first three equipment types which represent the primary noise impact sources as noted.

The Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM) Version 1.0 (February 2, 2006) lists the maximum noise level of an excavator as 85 dBA at 50 feet. None of these types of equipment are used continuously and the normal FHWA analysis utilizes an assumed 40 percent hourly operating time for the dozer, 10 percent for a breaker, and 10 percent for a drill which reduces the noise average noise impacts substantially.

The FHWA model lists the dozer as 85 dBA  $L_{MAX}$  at 50 feet, the breaker as 90 dBA  $L_{MAX}$  at 50 feet, and the drill as 85 dBA  $L_{MAX}$  at 50 feet.

The closest distance for the dozer would be to the southern property line, which has a developed residence at approximately 70 feet from the closest location on the fill slope. The closest location to the areas where they would do significant excavation for the tanks is about 225 feet from the residences to the south.

Table 5 gives the potential construction noise impacts at the southern residential areas, and Table 6 provides similar data for the western residential areas. If the equipment was in simultaneous use, the normally allowable 75 dBA limits would be exceeded at the southern residences, and would be below the allowable limits at the western residences.

<b>Table 5 NOISE IMPACTS (dBA) AT SOUTHERN RESIDENCES</b>		
<b>Equipment</b>	<b><math>L_{MAX}</math></b>	<b><math>L_{EQ}</math></b>
Breaker	76.9	66.9
Rock Drill	71.9	64.9
Dozer	78.7	74.8
Total	78.7	75.8

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<b>Equipment</b>	<b>L<sub>MAX</sub></b>	<b>L<sub>EQ</sub></b>
Breaker	64.8	60.8
Rock Drill	73.1	63.1
Dozer	64.1	57.1
Total	73.1	65.7

## Construction Vibration Planning

The most likely vibration sources and distances are the same as the noise sources, excluding the rock drill which creates significantly less vibration than the other two sources.

Analysis is based on the source data presented in Table 7 (FTA Table 12-2) below, using the Caltrans screening methodology (Transportation and Construction-Induced Vibration Guidance Manual California Department of Transportation, June 2004).

At 70 feet, a dozer would create approximately a 0.019 (in/sec) PPV or 0.01343 (in/sec) RMS below the level of building damage and barely above the level of annoyance for infrequent<sup>4</sup> events (refer to Tables 3 and 4). Based on the short-term nature of dozer operations in the noted area (one or two days), associated impacts are considered less than significant.

At 225 feet a reaker would create approximately a 0.0033 (in/sec) PPV or 0.00233 (in/sec) RMS below the significance levels for building damage and frequent<sup>4</sup> events as noted in Tables 3 and 4.

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<sup>4</sup> These operations are not within the classifications normally analyzed for frequent or infrequent events. However, given the duration of construction a brief review is indicated. The dozer use would be relatively short-term with only a limited number of passes, and would only be reasonable to consider as an infrequent source. The Breaker will be longer term and might be considered frequent.

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<b>Table 7 (FTA Table 12-2)</b>		
<b>VIBRATION SOURCE LEVELS FOR CONSTRUCTION EQUIPMENT</b>		
<b>(FROM MEASURED DATA)</b>		
<b>Equipment</b>	<b>PPV at 25 ft (in/sec)</b>	<b>Approximate VdB at 25 ft</b>
Pile Driver (impact)	Upper Range	1.518
	Typical	0.644
Pile Driver (sonic)	Upper Range	0.734
	Typical	0.170
Vibratory Roller	0.21	94
Breaker	0.089	87
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

## Traffic Noise Planning

Based on the previous discussions, a total of approximately 74,460 cy of excavated material/fill (69,200 cy) and concrete (5,260 cy) hauling would be required for project construction. Assuming an average load capacity of 9 cy, this would entail a total of approximately 8,273 truck round trips ( $74,460 \div 9$ ). From the previously noted schedule of 406 workdays, this would translate to a total of approximately 20 truck round trips per day ( $8,273 \div 406$ ). An additional 10 round trips per day is assumed for construction crew/equipment and material deliveries, for a total average of approximately 30 round trips per day during project construction.

Typically, many of the daily trips for both material import/export and site access trips are clustered at the beginning of the day. Therefore, planning is based on a “worst case” hourly (7 a.m. to 8 a.m.) traffic volume of 10 autos (including pickups), 5 Medium Trucks (MT) (two-axles), and 5 Heavy Trucks (HT) (three or more axles), and an hourly average for other hours of 1 auto, 1 MT, and 3 HT. Analysis is based on a residential 25 Miles Per Hour (mph) speed limit. The 7 a.m. to 8 a.m. hourly noise at 50-feet is 56.9 dBA and the remaining hours would have a noise level of 53.7 dBA at 50-feet. The calculated CNEL for the daily roadway trips is 50.3 CNEL at 50-feet from the centerline of the roadway. The associated impact would not be significant by either City or County standards.

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## Mitigation

Construction of a noise barrier is required to reduce the impacts of the site construction on the southern residential locations. While not specifically required based on regulatory standards, it is also recommended that this same mitigation be extended to address construction-related noise impacts along the western property line boundary. Due to the slope conditions, the location for the barriers will need to be close to the equipment to provide a break in the line of sight. Specific mitigation requirements include:

- Construct a temporary 12-foot high noise control barrier along the boundaries of the work so that this 12-foot fence continues past the location of the horizontal construction line of sight by a similar 12 feet. The fence should be constructed of a double layer of ½ inch thick plywood arranged in a ships lap, or a single layer of ¾ inch plywood with no cracks or gaps. Noise blanket or other temporary noise control fencing is acceptable replacement if it provides a Sound Transmission Control (STC) 18 or greater noise control rating.

By breaking the line sight, a noise barrier as described would provide a minimum 5 dBA of noise reduction and reduce all impacts to less than significant.

## Conclusion

With mitigation, the proposed Lindley Water Tank construction would comply with the City and County construction noise limits.

Based on the above screening analysis and the nature and duration of project construction operations, potential project-related vibration impacts would be less than significant.

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