DRAFT ENVIRONMENTAL ASSESSMENT

9 Acre Site

SAN PASQUAL BAND OF DIEGUEÑO MISSION INDIANS
Appendices

April 2010

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Appendix A
Stormwater/Drainage Assessment

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STORMWATER RUNOFF/DRAINAGE ASSESSMENT
9-ACRE SITE, VALLEY CENTER, CA
FEE-TO-TRUST
[DRAFT]

San Pasqual Indian Reservation,
San Diego County, California

September 5, 2009

Applicant:
San Pasqual Band of Indians
27458 North Lake Wohlford Road
Valley Center, CA 92082

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1.0 INTRODUCTION

1.1 Assessment Purpose & References

This Stormwater Runoff/Drainage Assessment was conducted in support of an Environmental Assessment (EA) which addresses the current environmental conditions and future consequences associated with a proposed action by the San Pasqual Band of Mission Indians. The proposed action consists of the transfer of a 9 acre site into federal trust status for the San Pasqual Band of Mission Indians and the subsequent site development. Please refer to the EA document for specific details on the site setting and discussion/analysis of project alternatives, impact avoidance, and mitigation measures.

This report is one of several additional technical studies and analysis requested by the U.S. Department of Interior, Bureau of Indian Affairs (BIA). The purpose of this report is to provide a description of existing site conditions as well as potential impacts of surface water runoff from the proposed action. Subject matter detailed in this document includes current hydrogeologic conditions, applicable regulations, site/nearby surface water bodies, runoff calculations and mitigation measures. This report specifically covers the potential of sedimentation from increased runoff water as result of proposed action on the site; runoff transports of potential chemical pollutants from site operations are not addressed.

The following documents/sources were reviewed in the preparation of this document:

- "Aggregate Resource Investigation for Selected Area of the San Pasqual Band of Mission Indians Reservation, Valley Center, California", M.S. Thesis, Eric Bergstrom 2005
- "Draft Environmental Assessment (EA), 9 Acre Site, San Pasqual Band of Indians, Valley Center California", GreenWave Environmental Consulting Inc. , August 2009
- "Phase I Environmental Site Assessment Report (ESA), 9 Acre Site", GreenWave Environmental Consulting Inc. , April 2009
- "Preliminary Drainage Analysis for Valley View Casino Expansion Project", Hamada Engineering, February 2003
- Site Visit Photographs, Mr. Doug DeBerry, Ecologist/Biologist, Vanasse Hangen Brustlin, Inc. (VHB), site visit on 17 December 2008 after a major rainfall event.
- "Water Quality Control Plan for the San Diego Basin", California Regional Water Quality Control Board, San Diego Region, 1994-2008 (living document)

1.2 Applicable Regulations

The EA document addresses the overall regulatory context for the site activities. This stormwater/runoff drainage assessment has been prepared for BIA. The BIA is the federal agency charged with reviewing and approving tribal applications pursuant to Section 151 of Title 25 of the Code of Federal Regulations to take land into federal trust status. For the purposes of this stormwater runoff/drainage assessment, the following regulations from federal, state and county levels may affect the proposed actions at the site:

Environmental Protection Agency (EPA)

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells.

The Clean Water Act (CWA) is the primary federal law in the United States governing water pollution. The CWA requires a National Pollutant Discharge Elimination System (NPDES) permit for all point source discharges into the waters of the United States, as described in Section 402 of the CWA. Since the site does not have drainage into any water bodies; an NPDES permit or SWPPP or stormwater management program is not required.

State of California

The State of California has authority to administer the NPDES program if required. According to the EPA, even when a state receives NPDES authorization, EPA continues to issue NPDES permits on tribal lands. Regardless, the site does not require an NPDES permit.

County of San Diego

The San Diego County Flood Control District (FCD) was first formed in 1966 by an Act of the State Legislature to focus primarily on flood control issues in the Unincorporated County of San Diego. In 1985, the FCD Act was modified to include the protection of watercourses, watershed management, and water quality. For the tribal lands affected by the proposed action, the FCD is authorized under its charter to: *"Operate outside of its jurisdiction to assist with watershed issues within the County of San Diego and in counties and nations with watersheds that drain into the District's jurisdiction."*

2.0 EXISTING HYDROGEOLOGIC CONDITIONS

2.1 Location

The 9 acre site is located in the unincorporated area of San Diego County known as Valley Center, about 11 miles northeast of Escondido. It located less than two miles from the boundaries of the Tribe's reservation. The location in relation to the boundaries of the Tribe's reservation can be found at **Figure 1**. An aerial view of the site can be found at **Figure 2**. The 9 acre site parcel is roughly rectangular in dimension, the short axis of which lies parallel to Lake Wohlford Road along the eastern property boundary. The long axis of the property lies parallel to Valley Center Road along the northern property boundary. South of the site parcel is the Valley Center Middle School and a vacant lot lies to the west.

Figure 1 – Map of Site Location

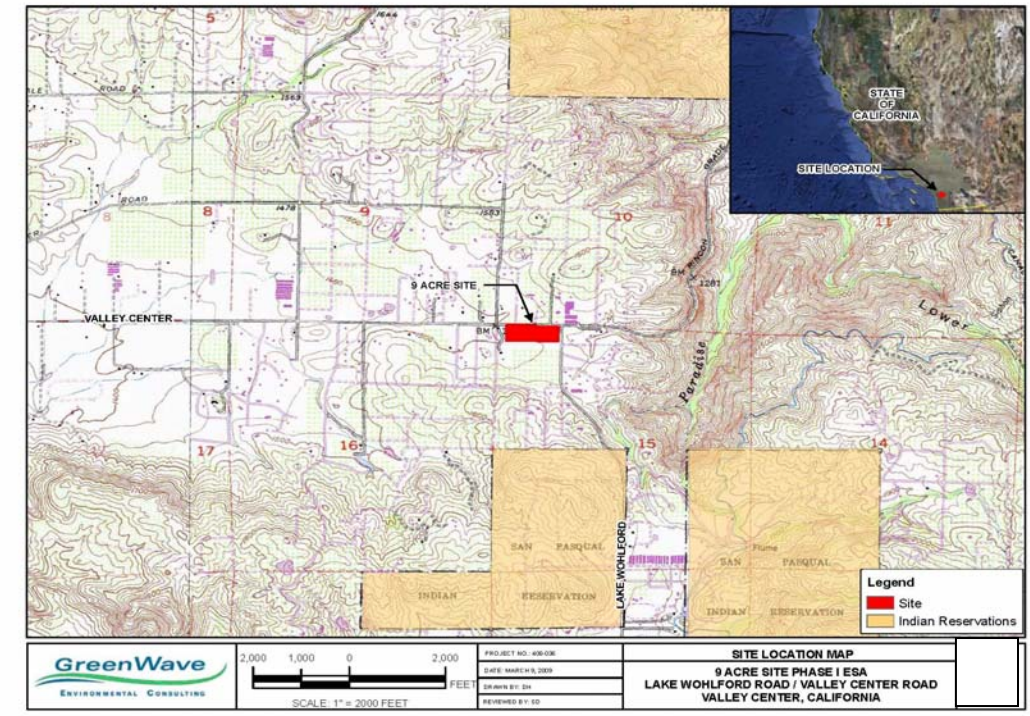
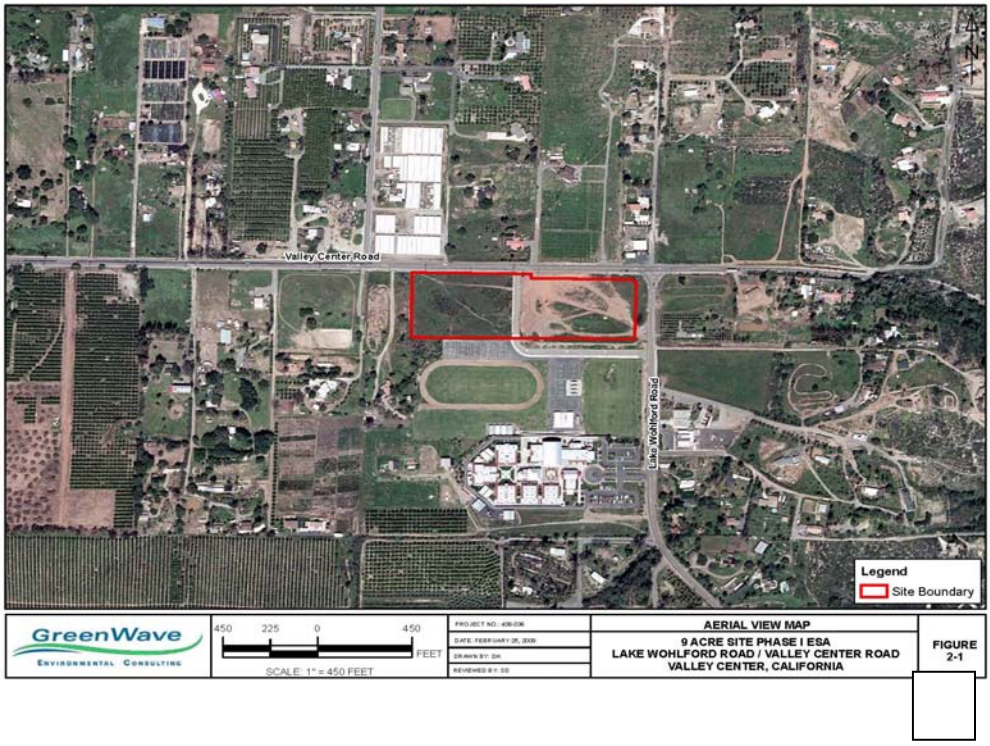


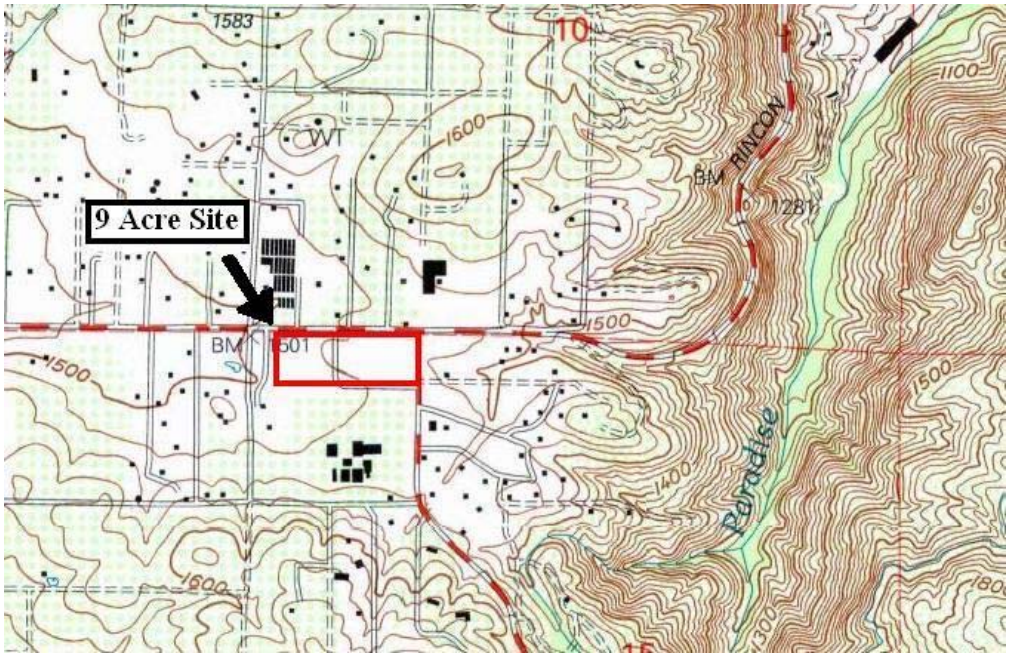
Figure 2 – Aerial View of Site Location



2.2 Topography

Overall the site is flat plateau as displayed by the 1997 United States Geological Survey (USGS) Topographic Map of the area which is included in **Appendix A**. The site has a very slight slope with a down gradient from east to west as shown in **Figure 3** below. The east boundary has an elevation of approximately 1,527 feet above mean sea level (MSL) while the west boundary is approximately 1,500 feet MSL. The east boundary is at the cusp of a saddle which descends to the east into the Paradise Creek drainage. Overall the site is part of a large plateau in the Valley Center area.

Figure 3 - Site Topographical Map



2.3 Geologic Setting

The 9 acre site is located in the Peninsula Range of San Diego, California. The geologic history of the area generally consists of Pre-Cretaceous metasedimentary rocks intruded by Mesozoic granitic plutons. The granitic rocks are identified as the Peninsular Ranges Batholith, a composite mass of Cretaceous age rocks emplaced through plutonic intrusion between 122 and 98 million years ago. Following emplacement, a period of uplift, tilting, and erosion ensued, leading to the present day topography. Exposure of various rock types has led to erratic weathering and occasionally steep cliffs. Along with the surrounding nearby area, the proposed site consists of alluvium from erosion of the hills near the plateau. A 2005 geological map of the entire San Pasqual Reservation was developed for a previous study of the area by Eric Bergstrom and has been included in **Appendix B.** The north side of geological map begins in the hills approximately two miles south of the site. Although the map does not cover the actual site, due to close proximity of the map, the geology of the site area is very similar.

2.3 Soil Types

The soils within the site are composed of two main associations as designated by the United States Department of Agriculture (USDA): the Fallbrook sandy loam and Visalia sandy loam. The 9 acre site has approximately equal amounts of these two soil types. The Visalia series consists of moderately well drained, very deep sandy loams derived from granitic alluvium. The Fallbrook sandy loam is very similar but includes more fine grain size materials. Both of these soils are on alluvial fans and flood plains that have slopes of 0 to 15 percent. The soils are used to grow avocados, citrus, walnut orchards, truck crops, irrigated pasture, field crops, tomatoes, flowers, and nursery stock.

Figure 4 displays the site soil map**. Table 1** has the corresponding soil type descriptions and levels of soil occurrence at the site. **Appendix C** contains a USDA custom soil resource report for the site area created using their website**.**

Figure 4 - Site Soil Map

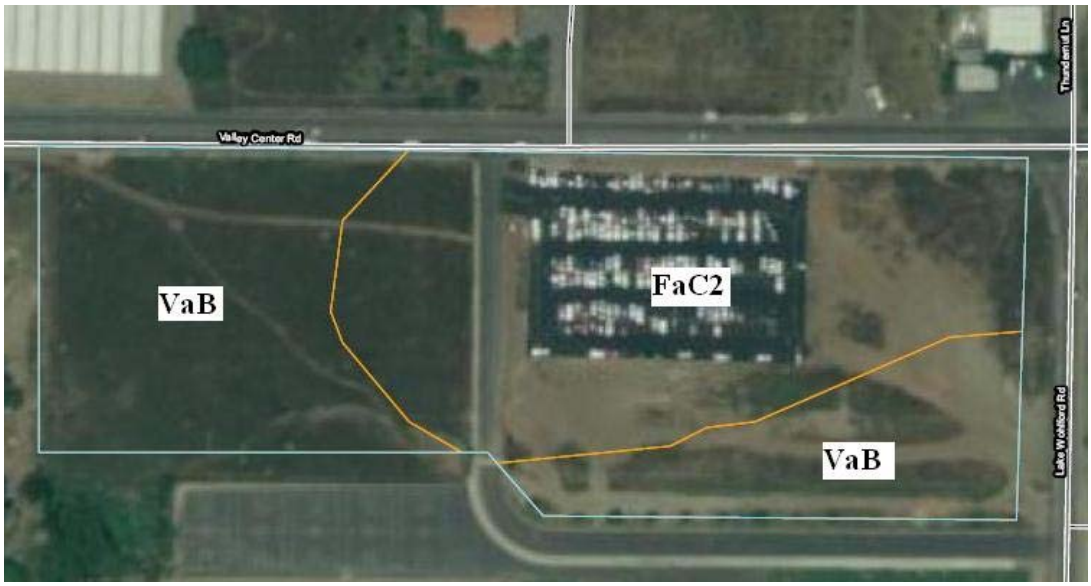


Table 1 – Soil Map Units

9 Acre Site			
Map Unit Symbol	**Map Unit Name**	**Acres**	**Percent**
FaC2	Fallbrook sandy loam	4.7	52%
VaB	Visalia sandy loam	4.3	48%

2.4 Soil Hydrological Classification

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms. The lowest to highest runoff potential runs from group A to D respectively. Both of the site soils are classified in the soil hydrologic group B as described below according to the USDA classification.

Soil drainage class refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized: excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. Both of the site soils are classified as "well drained" as defined below according to the USDA classification.

- **Hydrologic Group B:** Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

- **Well drained:** Water is removed from the soil readily but not rapidly. Internal free water occurrence commonly is deep or very deep; annual duration is not specified. Water is available to plants throughout most of the growing season in humid regions. Wetness does not inhibit growth of roots for significant periods during most growing seasons. The soils are mainly free of the deep to redoximorphic features that are related to wetness.

Based on the existing hydrologic soil group B and "well drained" drainage class, exposed soil on the site has a moderate potential for runoff and erosion in extreme precipitation events.

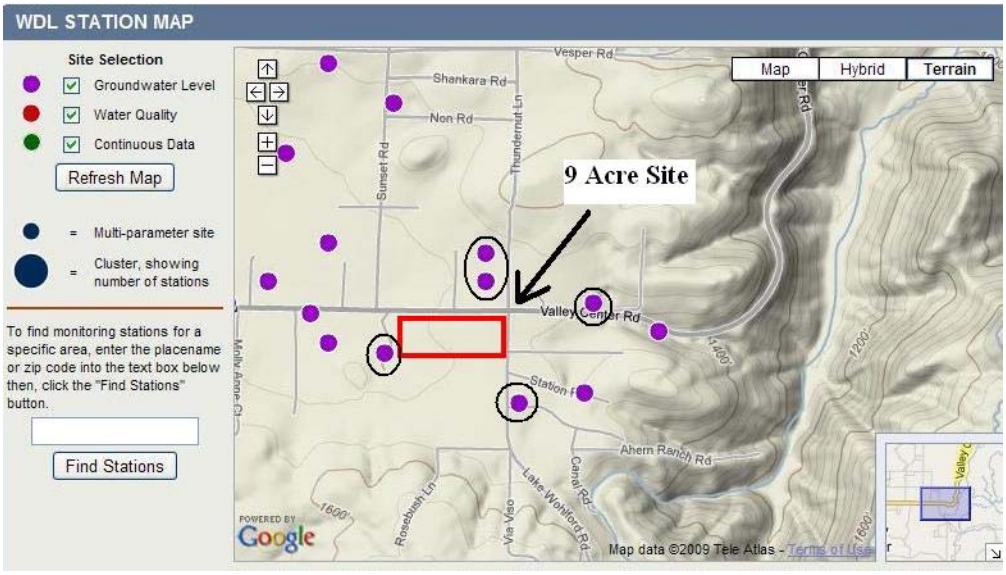
2.6 Groundwater

Numerous wells have been drilled in the site area of Valley Central. Five wells have been drilled at locations on or very near the 9 acre site as shown below in **Figure 5**. The ground water level data for these wells was reported and archived to the Water Data Library, California Department of Water Resources. **Table 2** displays the ground water level depths which have been consistently reported at less than 100 feet below the ground surface. The shallow ground water level is consistent with the flat basin topography of the area. The well ground water level data below may be slightly different now as all of the data was recorded in 1966-1967. For the Phase I Environmental Assessment of the site, Greenwave Consulting found no information available regarding the status of the wells. Contact with the respective state and federal agencies did not yield any information.

Table 2 – Ground Water Level, Well Data

State Well Number	Water Surface Elevation MSL
11S01W15D001S	1481
11S01W10N002S	1481
11S01W10N001S	1490
11S01W15C003S	1482
11S01W10P001S	1462

Figure 5 – Well Data Map



2.7 Surface Water Bodies

The site area does not have any permanent surface water bodies. Based on a review of aerial photographs, there is an intermittent drainage channel and possibly a settling basin in the vacant lot to the west of the site. From the photos, vegetation, and regional climate pattern, the channel appears to flow solely during and after heavy rainfall events. The potential settling basin is an oval feature in the adjoining vacant lot sized approximately 30 feet by 60 feet.

2.8 Climate & Precipitation

The proposed site area has a semiarid climate with warm dry summers and mild winters. The average annual precipitation is approximately 15 inches resulting in a borderline arid climate. Rainfall is strongly concentrated in the cooler half of the year, particularly December through

March. The summer months are virtually rainless. Rainfall amounts are highly variable from year to year and from month to month.

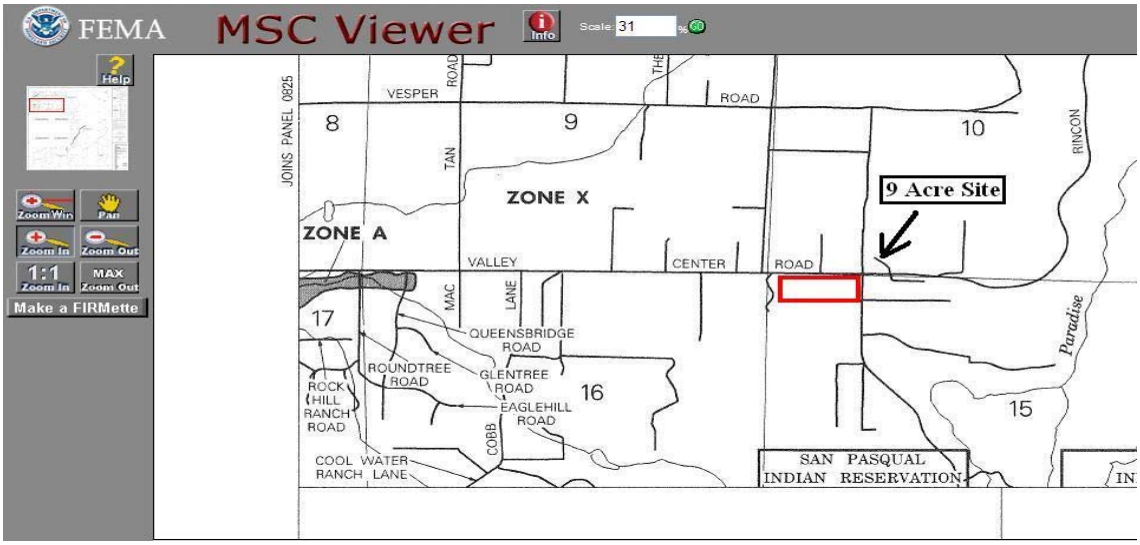
A nearby rain gauge for the site is located at Lake Wohlford. The station was in operation from 1948 to 1992. As part of a study by the National Climatic Data Center, Hourly Precipitation Data (HPD) rainfall event statistics for this station were computed based on recordings made of rainfall and time. The HPD statistics were generated through a process of computer statistical analysis of the station precipitation data in 2003. A data documentation paper on the process and the HPD statistical results for Lake Wohlford are located in **Appendix D**. A cursory review of the data shows that the station recorded precipitation values of 4-7 inches within a 24 hour period several times in the station operating period. The data displays these levels of precipitation occurring at least once if not multiple times every decade from 1940s-1980s. The large rainfall values are almost exclusively during the winter months. The highest value noted in the data is 12.1 inches over 23.5 hours in the early months of 1969. This peak value is collaborated by a nearby Escondido rain gauge station recording 7.7 inches over 16 hours during the same time frame.

2.9 Flood Zone Designations

A Flood Insurance Rate Map (FIRM) displays the floodplains in a town or area. Such maps are used for town planning, the insurance industry, and by individuals. It is the official map showing Federal Emergency Management Agency (FEMA) delineations of both special hazard areas and the risk premium zones.

The entire site is designated as Zone X as shown in **Figure 6.** FEMA describes Zone X as an area determined to be outside the 500-year floodplain. According to FEMA, for Zone X areas, flood insurance is available to all property owners and renters as long as the community participates in the National Flood Insurance Program.

Figure 6 - FEMA Flood Zone Map & Approximate Site Boundary



3.0 STORMWATER & RUNOFF CONSEQUENCES

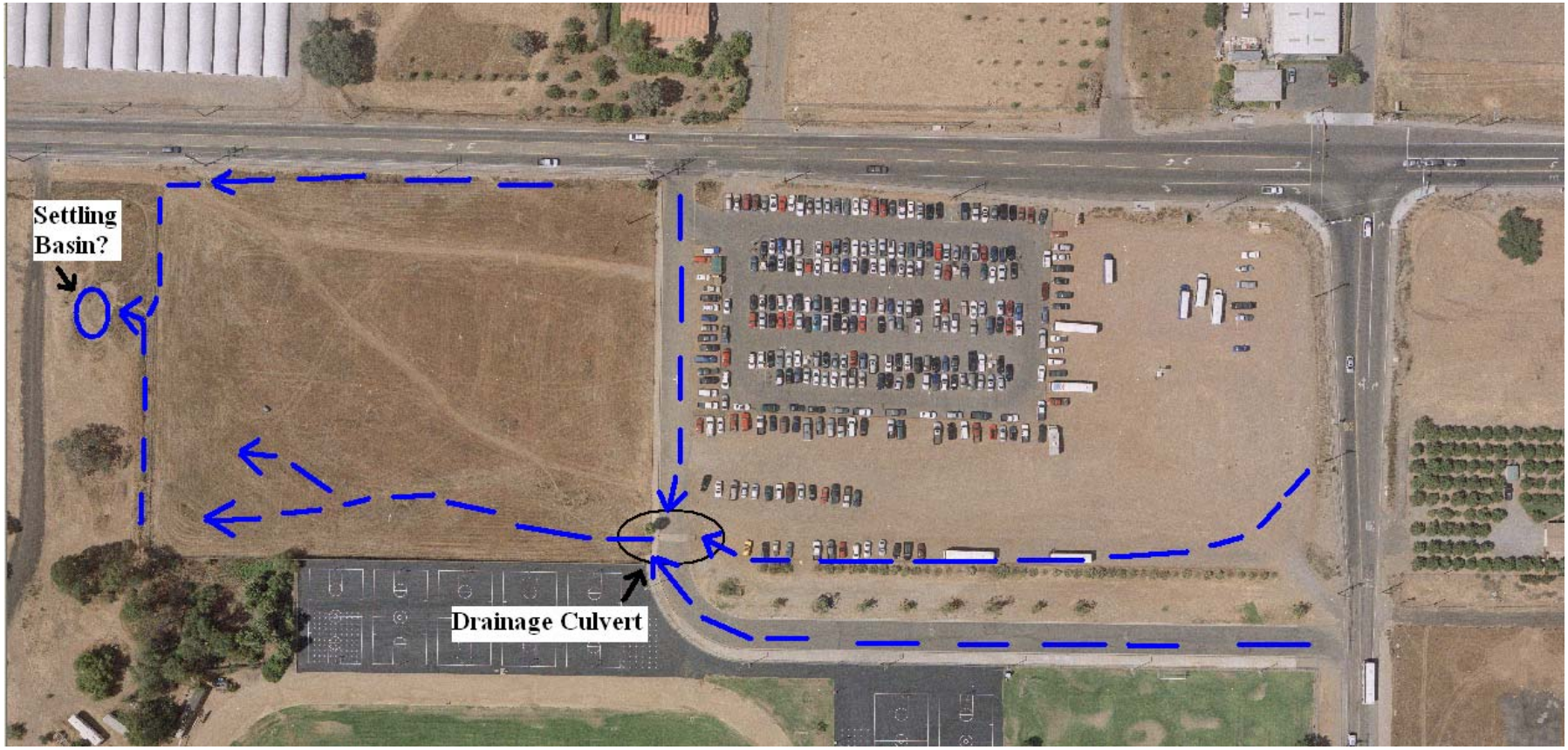
3.1 Drainage Areas

There are no municipal storm drains on or in the vicinity of the site. The only stormwater infrastructure on the property at this time besides the roads, curbs and gutters is the culvert at the south boundary of the site. This culvert runs under the "school bus" road easement acting as a conduit for water from the eastern portion of the property to the western portion. A review of the high definition aerial and ground photos of the site shows stormwater draining to a low area in the southwest corner of the property. Much of the water appears to settle on the site; any remaining runoff appears to exit the property into a small wooded area. Some runoff flow may also drain towards the western site boundary into a channel which possibly flows into a small settling basin in the adjoining parcel. Please refer to **Figure 8** below for drainage patterns inferred from the photos.

Appendix E contains photos of the site drainage areas after a significant winter rainfall. The photos were taken by Mr. Doug DeBerry, an Ecologist/Biologist from Vanasse Hangen Brustlin Inc. on 17 December 2008. As shown in one of the photos in **Figure 7** below, the site drainage flow affects the southwest corner of the site with occasional minor flooding of the area. Also of note in the **Appendix E** photos, the Valley Center and North Lake Wohlford roads on the north and east boundaries, do not have curbs or gutter features. These raised roadbeds do have some stabilization structures and vegetation growth to protect from runoff erosion. The "school bus" road easement does have sidewalk, curb and gutter features draining runoff into the aforementioned culvert into the southwestern corner of the site.

Figure 7 – Runoff into Southwest Site Corner

Figure 8 – Site Drainage Areas



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3.2 Rational Method Runoff Calculations

The rational equation is the simplest method to determine peak discharge from drainage basin runoff. The basic equation and units for the rational method are below:

Rational Method Equation: Q=CIA

Q = Peak discharge (cubic feet per second or CFS)
C = Rational method runoff coefficient
I = Rainfall intensity (inches/hour)
A = Drainage area (acres)

The rational method runoff coefficient (C) is a function of the soil or exposed material type and slope. The coefficient is the least precise unit in the equation and is subject to some individual judgment based on the site attributes. **Appendix F** contains a chart from the book *Hydrologic Analysis and Design* with runoff coefficients (C) versus hydrological soil group and slope range.

For the calculations below, the following runoff coefficients were used. For the current and future site open space use (lawns, fields, future development areas) the chart has a C=.14 value using the parameters of: hydrological unit B, open space land use, slope at 0-2%, and a storm-recurrence interval 25 years or greater. For the current and future site developments, two different values were used. For paved parking lots and streets, the chart has a C=.95 value using the parameters of: parking land use, slope at 0-2%, and a storm-recurrence interval 25 years or greater. For the various buildings, the chart has a C=.89 value using the parameters of: commercial use, slope at 0-2%, and a storm-recurrence interval 25 years or greater.

The rainfall intensity for this area was determined using isopluvial maps in the NOAA Atlas 2, Volume XI-California in Region 3. For average rainfall intensity (I) frequency, the following site values were provided by a previous runoff calculation by Summit Engineering for a proposed casino: 2 year frequency = .46 inches/hour, 10 year frequency = 2.16 inches/hour and 100 year frequency = 2.88 inches/hour

The drainage area values are used for the example runoff calculations below total (9) acres for the site parcel size. The area amount has been split into estimates of acreage under different site uses with resultant runoff coefficient values.

The rational method calculations in **Table 3 & 4** below are simple examples for the current site conditions and fully completed future development as shown on the site plan. The acreage values for each use (C Value) in the tables below are very rough estimates based on approximate measurements of aerial photos and the development site plan. Additional calculations with the rational method will be required to compute exact peak runoff for specific site configurations such as construction, partial development or changes to the final development plan. Regardless of the approximate nature, the runoff value calculations show a result of flows more than doubling in the change from current site conditions to completed development plans.

Table 3 – Example Peak Discharge Calculation, Current Site Conditions

	2 Year Frequency (cfs)	10 Year Frequency (cfs)	100 Year Frequency (cfs)
~6 Acres @ C=.14 (Open Space)	.4	1.8	2.4
~3 Acres @ C=.89 (Parking Lot & Road)	1.2	5.8	7.7
TOTAL SITE RUNOFF	**1.6**	**7.6**	**10.1**

Table 4 – Example Peak Discharge Calculation, Fully Completed Site Development

	2 Year Frequency (cfs)	10 Year Frequency (cfs)	100 Year Frequency (cfs)
~1 Acre @ C=.14 (Lawn/Landscaping)	.1	.3	.4
~3 Acres @ C=.89 (Commercial Buildings)	1.2	5.8	7.7
~5 Acres @ C=.95 (Parking Lot & Road)	2.2	10.2	13.7
TOTAL SITE RUNOFF	**3.5**	**16.3**	**21.8**

3.3 Proposed Action & Potential Consequences

The proposed action consists of the transfer of the site into federal trust status for the San Pasqual Band of Mission Indians and the subsequent development of a portion of the site into a small shopping plaza. The site is currently partially used as a parking lot. Approximately 50 percent of the site is either paved or covered with gravel, and the remaining 50 percent exists as a vacant lot. The parking facility will continue to be used as additional employee parking for the Valley View Casino and as storage and maintenance for buses. The Tribe intends to build a small shopping plaza on the site in the future. The shopping plaza is expected to contain at least one retail tenant, a restaurant and a gas station. A site plan by Howard Parcell Company for the fully completed future development is located in **Appendix G.**

The proposed site activities will result in changes to the hydrogeologic environment. There are different periods to consider for the proposed action: construction of the planned developments, subsequent development operation and planned future development.

The removal of vegetation will be necessary during construction of the development or any future development. Vegetation acts as a binder to hold in soil and rock materials during precipitation events. Additionally, rock and soil materials may be transported or temporarily

stockpiled on the site. The change in the landscape will have an effect on the rate and volume of runoff and sediment load in a direct relationship to the exposed rock materials. Based on the existing hydrologic soil group B and "well drained" drainage class, the site has a moderate potential for runoff in extreme precipitation events. Additionally, the very flat site topography should limit sediment transport. Never the less, the fine grain size materials of the site soils do have the potential for erosion and sediment transport. Without appropriate erosion control practices, the excavation and construction activities in the proposed development could contribute to increased sedimentation and runoff flow to the intermittent streams on and bordering the site. The increase in sediment load may lead to channel aggradation in the site drainages. Changes could affect the channel hydraulic attributes and subsequent watercourse direction or flood behavior.

The change in the site from partially to fully developed will have a large effect on the runoff levels from the site. The building roofs, entry roads and parking lot materials have a very low water absorption capability. While past precipitation events may have been absorbed by site soils, development will result in increased runoff flows. As shown in the rational method calculations in the earlier section, the runoff could be expected to approximately double in the change from partial to complete site development. The runoff will flow down to the low sections of the site which include the current culvert/drainage channel, the southwestern corner of the site and a general east-west and north-south down gradients. The site development will increase the chance of flooding on the site and in neighboring parcels.

Although, not covered in detail for the scope of this report, changes in the runoff and sediment levels may lead to an increased transport of chemical constituents due to leakage or spills from the development including the buildings, roadways and parking lots. Although industrial use is not planned, the development will likely have maintenance areas with potential containments especially the shopping center and gas station.

4.0 MITIGATION MEASURES/BEST MANAGEMENT PRACTICES

4.1 Site Control Measures

The most important element of mitigation for stormwater runoff and drainage is a detailed plan along with the resources and personnel to implement, monitor and adjust site prevention measures. As mentioned earlier, there are different phases of the project for consideration including development design/construction, operation and future development. The following best management practices (BMPs) are recommended taking in account general principals as well as site specific attributes. Some practices may only be applicable to one phase of the project such as construction.

1.) On-site Control

An on-site manager should be assigned oversight of the stormwater runoff/drainage program. The manager should be based near the development and have a direct line of control with the personnel working onsite. The manager will be responsible for overseeing the implementation of mitigation measures, monitoring of runoff quality/volumes, and adjusting the program as necessary. In depth familiarity with the regulations and plans including BMPs will be required. Through standard operating procedures, signage and training, all appropriate site workers (construction or maintenance) should have basic knowledge of the stormwater runoff mitigation practices and contact information for the manager. During the construction phase, the stormwater runoff/drainage program management role may be assigned to a site supervisor or general compliance/quality control officer. After completion of the development, the role might be assigned to the lead property manager or head of site maintenance. As well as onsite conditions, the manager should also be active in monitoring the drainages downhill from the parcel. Offsite monitoring should be completed as possible with the permission of respective land owners. The amount of effort required in implementing the stormwater runoff/drainage program will vary depending on the time of year. The very pronounced winter precipitation pattern should be accounted for in mitigation materials preparation, monitoring and site operations planning.

2.) Construction & Future Development Mitigation Measures

The construction on the site should be planned to proceed in an order of operations to minimize the amount of exposed bare ground. Vegetation should be preserved as possible and landscaping activities conducted as soon as possible after excavation is complete for an area. For all the intrusive site activities that expose sediment to runoff, the following list of mitigation measures should be called upon in combination together depending on the situation and conditions. In addition to construction activities, these mitigation measures could be useful preventative measures for flood control measures during large storms. Note that all water control devices below should be regularly maintained or checked to ensure their continued effectiveness and to protect from unexpected catastrophic failure.

- **Silt fence:** A silt fence is a temporary linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff.

- **Gravel bag barrier:** A gravel bag barrier is a temporary linear sediment barrier consisting of stacked gravel bags, designed to intercept and slow the flow of sediment-laden sheet flow runoff.

- **Straw bale barrier:** A straw bale barrier is a temporary linear sediment barrier consisting of straw bales, designed to intercept and slow sediment-laden sheet flow runoff.

- **Fiber rolls:** Fiber rolls (sediment logs or wattles), composed of bio-degradable fibers stuffed in a photo-degradable open weave netting, are designed to reduce sediment runoff from disturbed sediment into the storm drain system or watercourses. Fiber rolls are porous and allow water to filter through fibers and trap sediment, increase filtration rates, slow runoff, and reduce sheet and rill erosion.

- **Drop inlet sediment barrier:** A drop inlet sediment barrier is a temporary barrier placed at an inlet of drainage areas. The sediment barrier may be constructed of stone, concrete block, straw bales, or silt fence material, and gravel. These barriers will prevent sediment from entering the storm drainages during operations. Sediment-laden runoff is ponded before entering the inlet to the drainage, thus allowing some sediment to fall out of suspension.

- **Settling Basin** A settling basin is a land depression created for sediment-laden runoff to settle before entering drainages outside the site. Very fine particles from the runoff are removed by means of gravity. The turbid water enters the basin at one end and the cleaner water is taken out at the other end.

3.) Construction Stockpiles

Stockpiles of rock materials created during excavation or building foundation preparation are of special concern for sediment transport during runoff events. A stockpile should be covered when it is not being worked. A system will need to be devised to protect the stockpiles during precipitation events. Stockpiles of fine gravel and concrete sand are especially of concern. Protection of stockpiles is a year-round requirement. The following practices are recommended:

- Secure all stockpiles with waterproof covers before all predicted large precipitation events.
- Locate stockpiles away from concentrated flows of stormwater, drainage courses, and inlets.
- Protect all stockpiles from stormwater runoff using temporary perimeter sediment barriers during precipitation events.

4.) Development Design

Careful consideration of stormwater drainage will need to be a part of the site development design. The current intermittent culvert flow through the site and increased runoff from the site development will need to be routed and mitigated. Taking in consideration the east-west & north-south site slope and current runoff path, the south boundary area may present a logical location for a main site drainage channel. The channel could be directed behind the planned shopping center and along the planned re-oriented route of the "school bus" road easement. Building roof and parking lot drainages could be designed to feed into this central drainage.

During partial site development phases, open space areas could be used as settling basins where intermittent runoff is routed from the drainage channel. These locations would need to be built below the rest of the site grade and designed for water settling with an appropriate underlay of porous materials. The southwest corner of the site is currently a settling area for intermittent runoff. Due to almost complete development of the site footprint, the final site design does not allow for significant runoff settling basins. One possible solution could be the construction of a subsurface settling tank. Overall, the site drainage design should account for all of the facilities and potential future development. A discussion may need to take place with owners of the down gradient vacant parcel regarding current and future runoff levels.

5.) Site Development Maintenance

The site developments will need to be maintained properly to reduce the chance of uncontrolled runoff. The building drainage systems, roadways, channels and settling areas will need to be kept clear of debris and checked for structural integrity on a regular basis. Blockages or leaks may result in runoff being directed into unplanned routes resulting in site erosion or flooding of buildings.

6.) Monitoring

Constant site monitoring will reduce the chance of sediment discharge or excess runoff from the site. Monitoring should include regular inspections of the site for compliance with stormwater runoff mitigation practices and preparation. During the winter months, when high precipitation events occur, weather predictions should be monitored to predict runoff events. Site activities may need to be changed or rescheduled for large storms. For example, construction excavation or use southern western parking area might be stopped for incoming weather systems. The weather monitoring should allow early enough warning of runoff events to prepare for site mitigation measures. A portable turbidity monitor could also be used during any site excavation for baseline and stormwater runoff measurements from the intermittent drainage from the site. Combined with 24 hour precipitation from local weather stations, the turbidity amounts can be gauged to establish a baseline for the area. Any spikes in turbidity should be investigated for the point source on the site.

Appendix B Biological Assessment

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Vanasse Hangen Brustlin, Inc.

Biological Assessment

San Pasqual 9-Acre Parcel
San Diego County, California

FEBRUARY 2009

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Introduction

Vanasse Hangen Brustlin, Inc. (VHB) completed a Biological Assessment (BA) of a 9-acre parcel near Valley Center, San Diego County, California. The parcel is located at the intersection of Lake Wohlford Road (east boundary) and Valley Center Road (north boundary) (see attached Location Map). The Valley Center Middle School campus lies immediately to the south. At current, the 9-acre parcel is used, in part, as a parking lot – the remaining acreage is in a periodically-mowed 'vacant lot' condition with an amalgam of ruderal grasses and forbs.

VHB has undertaken this study at the request of GreenWave Solutions, Inc. (GreenWave) on behalf of the San Pasqual Band of Mission Indian Tribe (Tribe). The Tribe currently owns the subject property in fee simple and desires to take the land into trust. GreenWave is preparing an environmental assessment for use by the Bureau of Indian Affairs in deciding whether to take the property into trust. The proposed use for the site is a mixed-use retail development.

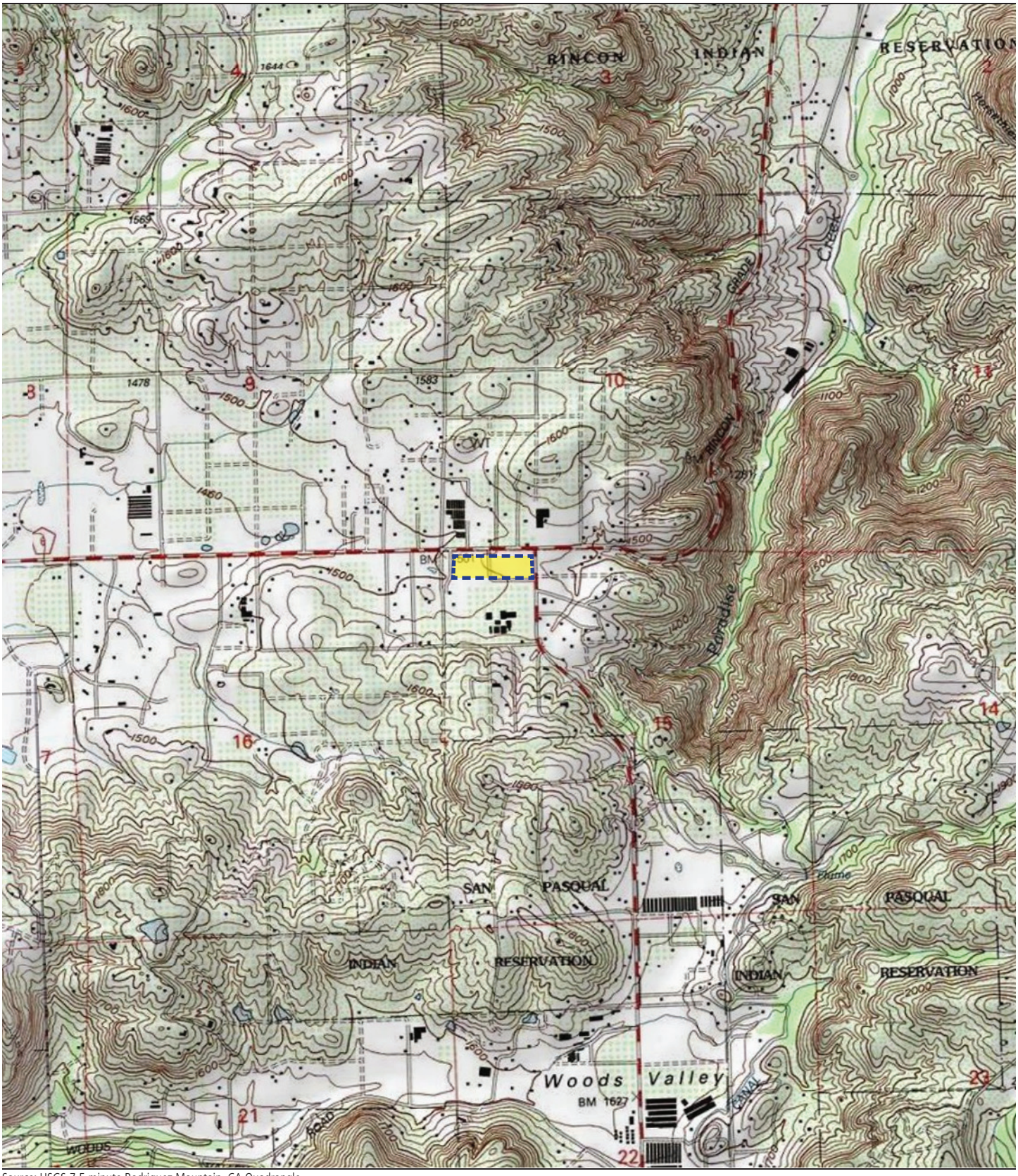
The purpose for VHB's study is twofold: 1) to document extant biological conditions within the parcel boundary in satisfaction of National Environmental Policy Act reporting conventions; and, 2) to evaluate the potential effects of a proposed land use change on federally listed threatened or endangered species that could be present on the property. The format of this report follows general BA guidelines published by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service under Section 7 of the Endangered Species Act (16 U.S.C. 1530-1544), as well as the 1998 'Endangered Species Act Consultation Handbook' jointly published by both agencies (USFWS and NMFS 1998). The conclusions derived herein are based on the professional opinion of VHB's senior scientist Douglas A. DeBerry, Ph.D., PWS, PWD, who is a specialist in rare species inventory and habitat assessment.

Proposed Action

The Tribe proposes to use this 9-acre parcel for development of a retail strip-mall, fast-food restaurant, and gas station. It is our understanding that a plan-of-development (POD), including engineering drawings and specifications, has not been prepared for the proposed land use. However, such a site development will presumably include soil disturbance and cut/fill grading or import of non-native substrate materials for site pad preparation. For the purposes of this BA, it is assumed that all 9 acres of the site area will be disturbed in this manner.

Study Methods

VHB conducted a site visit on December 18, 2008 to review and document current site conditions. An extensive literature review had been completed prior to the site visit to give proper context for community and habitat observations. Information on threatened and endangered species known to



Source: USGS 7.5 minute Rodriguez Mountain, CA Quadrangle

Vanasse Hangen Brustlin, Inc.

Study Limits

0 2,000 4,000 ft.

Location Map
San Pasqual Indian Reservation
9-Acre Parcel
San Diego County, California

occur in San Diego County was extracted from the U.S. Fish and Wildlife Service Carlsbad Regional Office (http://www.fws.gov/carlsbad/TEspecies.html) as well as database information available from the California Department of Fish and Game (http://www.dfg.ca.gov/). Vegetation communities were described in accordance with the classification summaries provided in Barbour and Major (1977), Lightner (2006), and the California Department of Fish and Game (2008). Structure and physiognomic characteristics of the vegetation assemblages onsite were compared with regionally-relevant descriptions in Hanes (1977), Mooney (1977), Griffin (1977), Gray (1982), and Keeley (1989). Plant species identification was based on Munz (1974), Hickman (1993), Stuart and Sawyer (2001), and Lightner (2006). Wildlife information was extracted from various resources, including Small (1974), Mayer and Laudenslayer (1988), Jameson and Peeters (1988), and Lemm (2006).

Listed Species

Table 1 lists all species with a federal status under the Endangered Species Act that have been known to occur in San Diego County. This information is based on a database query from the U.S. Fish and Wildlife Service Carlsbad Regional Office (http://www.fws.gov/carlsbad/). Also included is a reference to the typical habitat type for each species based on a review of the various technical resources noted above, as well as database information available from Calflora (http://www.calflora.org/), the California Department of Fish and Game (http://www.dfg.ca.gov/), the US Fish and Wildlife Service (http://www.fws.gov/), and NatureServe Explorer (http://www.natureserve.org/explorer/).

Site Description

Vegetation: The ca. 9-acre parcel is roughly rectangular in dimension, the long axis of which lies parallel to Valley Center Road. Approximately the eastern half is an existing parking lot, a portion of which is paved; the western half is in a periodically-maintained condition marked by colonization of ruderal (weedy) plants. Common species include Bermuda grass (*Cynodon dactylon*), black mustard (*Brassica nigra*), eastern Mohave buckwheat (*Eriogonum fasciculatum*), telegraph weed (*Heterotheca grandiflora*), and Clearwater cryptantha (*Cryptantha intermedia*). A narrow zone of vegetation on disturbed soils occurs along the parking lot perimeter. This narrow zone is dominated by a variety of colonizing ruderals, including prickly Russian thistle (*Salsola oleraceus*), eastern Mohave buckwheat, Clearwater cryptantha, telegraph weed, narrowleaf plantain (*Plantago lanceolata*), smooth cat's ear (*Hypochaeris glabra*), common dandelion (*Taraxacum officinale*), black mustard, coastal sagebrush (*Artemesia californica*), and common deerweed (*Lotus scoparius*). Occasional landscape ornamentals were observed along the southern perimeter of the lot, including oleander (*Nerium oleander* cultivar), California sycamore (*Platanus racemosa* cultivar), and an unidentified fan palm.

Wildlife: No wildlife species were observed utilizing the property during this site review.

Table 1. US Fish and Wildlife Service: List of Federally Threatened or Endangered Species for San Diego County, California

[Source: Carlsbad Fish and Wildlife Office; http://www.fws.gov/carlsbad/TEspecies.html]
[Accessed February 2009]

Scientific Name	Common Name	Status	Habitat
PLANTS			
Acanthomintha ilicifolia	San Diego thornmint	T	coastal sage scrub, chaparral, native grassland
Ambrosia pumila	San Diego ambrosia	E	openings in sage scrub, river terraces, open grasslands, vernal pool fringes
Arctostaphylos glandulosa subsp. *crassifolia*	Del Mar manzanita	E	southern maritime chaparral
Astragalus magdalenae var. *peirsonii*	Peirson's milk-vetch	T	Algodones dunes
Astragalus tener var. *titi*	coastal dunes milk-vetch	E	coastal dunes near surf zone
Baccharis vanessae	Encinitas baccharis	T	southern maritime chaparral
Berberis nevinii	Nevin's barberry	E	chaparral
Brodiaea filifolia	thread-leaved brodiaea	T	alkali grasslands on hillsides, floodplains (NW SD County)
Chorizanthe orcuttiana	Orcutt's spineflower	E	coastal chaparral openings
Cordylanthus maritimus subsp. *maritimus*	salt marsh bird's beak	E	salt marshes, intertidal brackish zones
Deinandra (=Hemizonia) conjugens	Otay tarplant	T	grasslands, open coastal sage scrub, maritime succulent scrub
Eryngium aristulatum var. *parishii*	San Diego button celery	E	vernal pools
Fremontodendron mexicanum	Mexican flannelbush	E	southern mixed chaparral
Hazardia orcuttii	Orcutt's hazardia	C	coastal sage scrub, mixed chaparral, southern maritime chaparral
Monardella linoides subsp. *viminea*	willowy monardella	E	drainages/floodplains in coastal sage scrub or riparian scrub
Navarretia fossalis	spreading navarretia	T	vernal pools, clay flats, various hydric alkali habitats
Orcuttia californica	California Orcutt grass	E	vernal pools
Phacelia stellaris	Brand's phacelia	C	coastal dunes and sandy washes in Diegan sage scrub
Poa atropurpurea	San Bernardino bluegrass	E	edges of moist meadows at 5000-7500 feet
Pogogyne abramsii	San Diego mesa mint	E	vernals pools, chemise chaparral, coastal sage scrub
Pogogyne nudiuscula	Otay mesa mint	E	vernals pools on Otay Mesa (SW SD County)
Rorippa gambellii	Gambel's watercress	E	lake margins and slow-flowing streams, brackish or freshwater
FISH			
Cyprinodon macularius	desert pupfish	E	seeps and slow moving streams in Salton Sink basin
Eucyclogobius newberryi	tidewater goby	E	small coastal lagoons, lower reaches of streams and upper portions of bays
Gasterosteus aculeatus williamsoni	unarmored threespine stickleback	E	San Felipe Creek (introduced population)
Oncorhynchus mykiss	southern steelhead	E	streams, rivers, lakes, reservoirs (partially anadromous)
AMPHIBIANS			
Bufo californicus (=B. microscaphus c.)	arroyo toad (a. southwestern t.)	E	washes, streams, arroyos, and adjacent uplands
Rana aurora draytoni	California red-legged frog	T	vicinity of pools or other bodies of water

Table 1. US Fish and Wildlife Service: List of Federally Threatened or Endangered Species for San Diego County, California

[Source: Carlsbad Fish and Wildlife Office; http://www.fws.gov/carlsbad/TEspecies.html]
[Accessed February 2009]

Scientific Name	Common Name	Status	Habitat
BIRDS			
Brachyramphus marmoratus	marbled murrelet	T	near shore areas, estuaries, sounds
Charadrius alexandrinus nivosus	western snowy plover	T	beaches, dry mud flats, sandy shores of rivers, lakes, ponds
Charadrius montanus	mountain plover	W*	high plains/shortgrass prairie, tablelands, rangelands
Coccyzus americanus	yellow-billed cuckoo	C	dense riparian woodlands
Empidonax traillii extimus	southwestern willow flycatcher	E	willow thickets
Gymnogyps californianus	California condor	E	mountain and foothill rangeland and forest
Haliaeetus leucocephalus	bald eagle	PDM	various habitats near large bodies of water
Pelecanus occidentalis	brown pelican	E	offshore islands, emergent rocks, sand spits, sand bars
Phoebastria albatrus	short-tailed albatross	E	pelagic; ground nesting sites various
Polioptila californica californica	coastal California gnatcatcher	T*	coastal sage scrub
Rallus longirostris levipes	light-footed clapper rail	E	coastal wetlands
Sternula (=Sterna) antillarum browni	California least tern	E	bare or sparsely vegetated flat substrates near the coast
Vireo bellii pusillus	least Bell's vireo	E	dense, willow-dominated riparian areas with well-developed understory
MAMMALS			
Dipodomys stephensi	Stephens' kangaroo rat	E	annual grassland with sparse perennial vegetation
Enhydra lutris nereis	southern sea otter	T/X*	coastal waters near shore
Ovis canadensis	peninsular bighorn sheep	E	eastern slopes of Sierra Nevada
Perognathus longimembris pacificus	Pacific pocket mouse	E	shrubland, chaparral
INVERTEBRATES			
Branchinecta sandiegonensis	San Diego fairy shrimp	E	Southern California coastal vernal pools
Euphydryas editha quino	Quino checkerspot butterfly	E	chaparral, coastal sage scrub
Pyrgus ruralis lagunae	Laguna Mountains skipper	E	Mt. Palomar and Laguna Mountains
Streptocephalus woottoni	Riverside fairy shrimp	E	vernal pools

Status: E = Federally endangered; T = Federally threatened; C = Federal candidate for listing; P = proposed; PDM = subject to post delisting monitoring
X: experimental population; W = withdrawn

Table 2. Partial Checklist of Vascular Plant Species

San Pasqual Indian Reservation: 9-Acre Parcel
December 18, 2008

Scientific Name	Common Name	Family
Achnatherum P. Beauv.	needlegrass	Poaceae
Ambrosia psilostachya DC.	Cuman ragweed	Asteraceae
Artemisia californica Less.	coastal sagebrush	Asteraceae
Brassica nigra (L.) W.D.J. Koch	black mustard	Brassicaceae
Cryptantha intermedia (A. Gray) Greene	Clearwater cryptantha	Boraginaceae
Cynodon dactylon (L.) Pers.	Bermudagrass	Poaceae
Eriogonum fasciculatum Benth.	Eastern Mojave buckwheat	Polygonaceae
Gutierrezia microcephala (DC.) A. Gray	threadleaf snakeweed	Asteraceae
Heterotheca grandiflora Nutt.	telegraphweed	Asteraceae
Hypochaeris glabra L.	smooth cat's ear	Asteraceae
Lactuca serriola L.	prickly lettuce	Asteraceae
Lolium perenne L. ssp. multiflorum (Lam.) Husnot	Italian ryegrass	Poaceae
Lotus scoparius (Nutt.) Ottley	common deerweed	Fabaceae
Nerium oleander L. (cultivar)	oleander	Apocynaceae
Phleum pratense L.	timothy	Poaceae
Plantago lanceolata L.	narrowleaf plantain	Plantaginaceae
Platanus racemosa Nutt. (cultivar)	California sycamore	Platanaceae
Poa L.	bluegrass	Poaceae
Salsola tragus L.	prickly Russian thistle	Chenopodiaceae
Sonchus oleraceus L.	common sowthistle	Asteraceae
Taraxacum officinale F.H. Wigg.	common dandelion	Asteraceae

Effects of Proposed Action on Listed Species and/or Critical Habitat

Though there are some 49 federally-listed plant and animal species occurring in San Diego County (see Table 1), our review indicates that potential habitat for any such species is completely lacking on this property. The lack of habitat for federally-listed species is attributed to the various anthropogenic activities that have occurred, or are currently undertaken, to maintain this property for previous or current land uses. Such activities appear to have included: soil disturbance, compaction, and grading; importing non-native materials such as gravel and asphalt for the current land use (parking lot); and, periodic maintenance of vegetation in vacant areas by mowing or other mechanical means. Other habitat-limiting factors include adjacent development (school site, major road intersection, adjacent community structures, residential buildings, etc.), colonization by aggressive ruderals and/or non-native species, and the ongoing pattern of automotive traffic on and adjacent to the site. Finally, there is no previously-recorded evidence of federally-listed species or critical habitat on the parcel. Therefore, taking all above-referenced factors into consideration, the proposed land use change is not anticipated to present a threat to the continued existence of any federally-listed threatened or endangered species or critical habitat thereto.

Conclusions

In light of the existing conditions documented during site reconnaissance of December 2008, detailed review of the extant literature including database information on federally-listed resources within San Diego County, and information provided by GreenWave, it is VHB's professional opinion that no effect or incidental take is anticipated through the development of this 9-acre parcel as proposed.

Recommendations for Further Action

Given the overall lack of potential for this site to support federally-listed threatened or endangered species, no further studies are recommended at this time.

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Photograph 1: Typical view of gravel parking area near the center of the parcel.

Photograph 2: Maintained 'vacant lot' portion of the parcel (western half).

Photograph 3: Landscaping along southern parcel boundary.

Photograph 4: Ruderal vegetation colonizing on a fallow strip along Lake Wohlford Road.

Photograph 5: Asphalt portion of parking lot near northern parcel boundary.

Photograph 6: Narrow zone of ruderals along Valley Center Road.

Photograph 7: Field portion of parcel along Valley Center Road.

Photograph 8: View of field portion of parcel from southwestern corner.

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Appendix C Cultural Resources Inventory

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CULTURAL RESOURCE INVENTORY OF A 9-ACRE PARCEL (APN# 189-05-102) FOR THE SAN PASQUAL FEE-TO-TRUST AND TRIBAL IMPROVEMENT PROJECT, SAN PASQUAL, COUNTY OF SAN DIEGO, CALIFORNIA

Prepared for:

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Andrew R. Pigniolo, MA
Elizabeth Davidson, MA

December 2009

Laguna Mountain Environmental, Inc.

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Andrew R. Pigniolo, MA
Elizabeth Davidson, MA

December 2009

National Archaeological Data Base Information
Type of Study: Cultural Resource Survey
Sites: SPP-I-1, SPP-I-2
USGS Quadrangle: Rodriguez Mountain 7.5'
Area: 9 Acres
Key Words: San Pasqual, San Pasqual Indian Reservation, County of San Diego, Positive Survey, APN# 189-05-102, Santiago Peak Volcanic, SPP-I-1, SPP-I-2.

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ABSTRACT

Laguna Mountain Environmental, Inc. (Laguna Mountain) conducted an archaeological/historical survey of a 9-Acre parcel for the San Pasqual Band of Mission Indians. The project area of potential effects (APE) includes the entire parcel. Archaeological and historical research included a records search, literature review, examination of historic maps and records, and an archaeological/historical field inventory of the project APE.

Cultural resource work was conducted in accordance with the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). The Bureau of Indian Affairs (BIA) will serve as Federal lead agency for NHPA and NEPA compliance.

The records and literature search for the project was conducted at the South Coastal Information Center at San Diego State University and the San Diego Museum of Man. The records search included a one-mile radius of the project area to provide background on the types of sites that would be expected in the region. Copies of historic maps were provided by the South Coastal Information Center.

A total of 25 documented archaeological investigations have taken place in the vicinity of the project. These studies include those for sewer and water projects, significance assessments, telecommunication projects, private land development projects, and other projects on San Pasqual Reservation lands. The current project area has not been previously surveyed. A total of 51 cultural resources have been identified through previous research within a one-mile radius of the project. No resources have been identified within the project area. Other resources in the area include prehistoric temporary camps, ceramic and lithic scatters, bedrock milling features, historic structures, a historic water conveyance system (CA-SDI-16945), and other isolated artifacts.

The survey of the project area was conducted on October 21, 2009 by Mr. Andrew R. Pigniolo, RPA and Ms. Elizabeth Davidson, RPA. The project area was surveyed on foot at approximately 5 to 10 m intervals. The project site includes a paved parking area and an open field. The survey focused on the identification of potential historic features and prehistoric resource evidence. Surface visibility was good in the unpaved portion, although some areas of non-native grass were dense. Overall surface visibility averaged approximately 40 percent. The cultural resources inventory of the project APE served to identify cultural resources within the constraints of surface visibility and existing paved areas.

The surface survey of the project APE resulted in the identification of two isolated artifacts, SPP-I-1 and SPP-I-2. Photographs and project records for this inventory will be temporarily curated at Laguna Mountain until final curation arrangements can be made at the San Diego Archaeological Center or another appropriate regional repository.

Isolates SPP-I-1 and SPP-I-2 have not been previously evaluated for NRHP eligibility. Isolates are not considered significant and therefore not eligible for the NRHP. As such, no historic properties were identified within the project area.

The potential for unanticipated buried prehistoric archaeological resources is present within the project area based on the identification of an isolated artifact within rodent backdirt. Because the project contains potential for buried prehistoric archaeological sites that may be eligible for nomination to the NRHP, construction monitoring of the property is recommended. This construction monitoring will include significance evaluation of any unanticipated discoveries. Because only isolated finds were identified during the field survey, a determination of No Historic Properties Affected is recommended for this project.

I. INTRODUCTION

A. Project Description and Location

The proposed project includes fee-to-trust transfer of the 9-acre parcel as well as construction of tribal administration and service facilities. As part of the project, potential impacts to cultural resources include the removal of portions of existing buildings, grading, and utility placement.

The 9-acre project area is located in the northwestern portion of San Diego County north of Woods Valley and west of Paradise Creek in the northwestern portion of San Diego County (Figure 1). The project APE includes a 9-acre parcel (APN# 189-05-102) located south of Rincon Grade and west of Lake Wohlford Road. The project is located within Section 15 in Township 11 South, Range 1 West. The project area is shown on the Rodriguez Mountain USGS 7.5' Quadrangle (Figure 2).

Cultural resource work was conducted in accordance with the National Historic Preservation Act (NHPA) and the National Environmental Policy Act (NEPA). The Bureau of Indian Affairs (BIA) will serve as Federal lead agency for NHPA and NEPA compliance.

B. Project Personnel

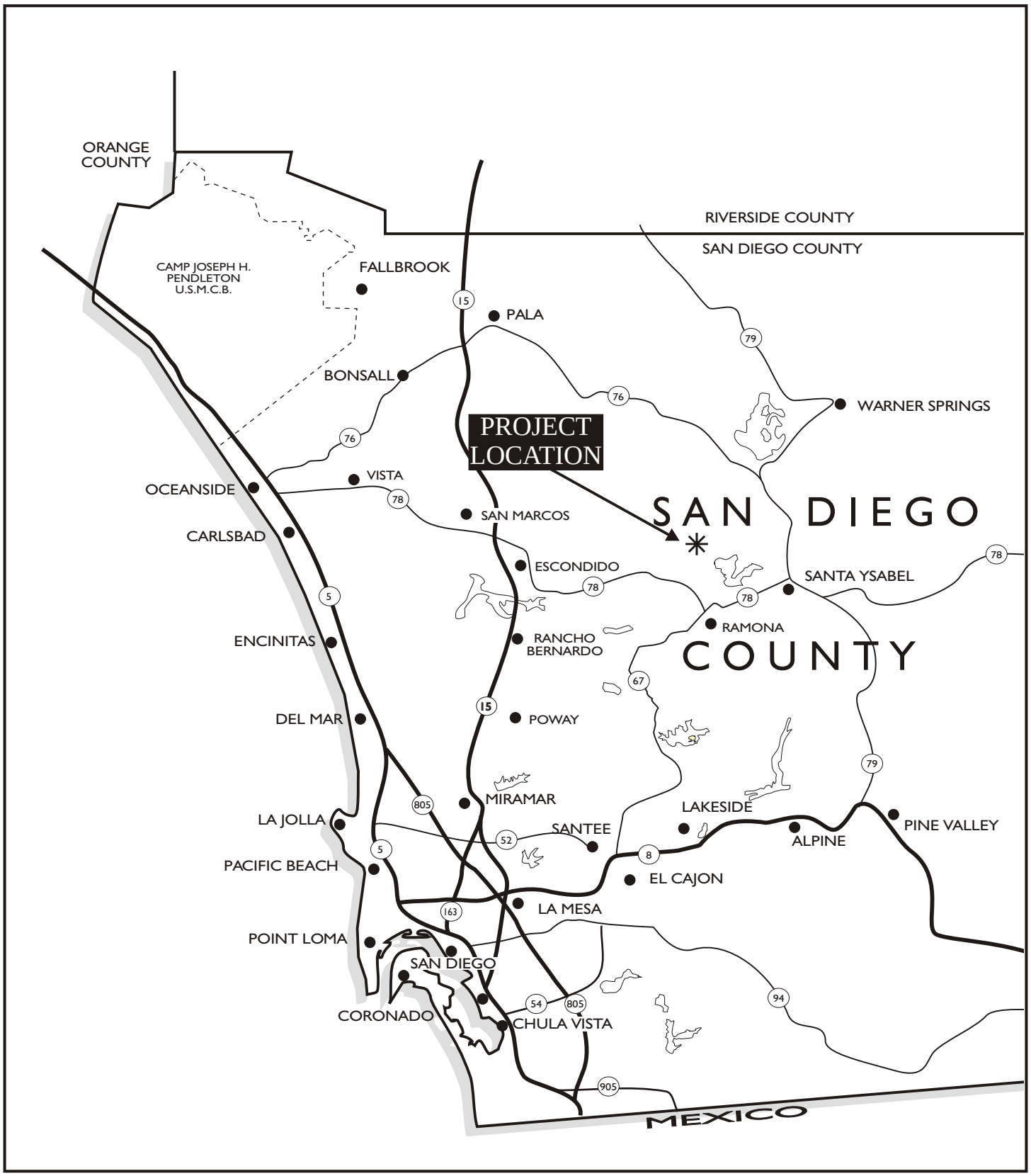
The cultural resource inventory has been conducted by Laguna Mountain Environmental, Inc. (Laguna Mountain), whose cultural resources staff meet federal, state, and local requirements. Mr. Andrew R. Pigniolo served as Principal Investigator for the project. Mr. Pigniolo is a member of the Register of Professional Archaeologists (RPA; previously called SOPA) and meets the Secretary of the Interior's standards for qualified archaeologists. He is also on the County of San Diego's list of qualified archaeologists. Mr. Pigniolo has an MA in Anthropology from San Diego State University and has extensive experience in the San Diego region. The resume of the Principal Investigator is included in Appendix A.

Ms. Elizabeth Davidson assisted in the field survey and Ms. Davidson and Ms. Patricia MacInnes assisted in the preparation of the technical report. Ms. Davidson has an MA in Archaeology from the University of Leicester, United Kingdom and has more than 12 years of experience as a professional archaeologist in Southern California.

Ms. Patricia MacInnes has a BA in English with a Minor in Anthropology from San Diego State University, and an MFA in writing from the University of Montana, Missoula. She has extensive technical writing experience.

Ms. Natalie Brodie prepared graphics for and assisted in the preparation of the technical report. Ms. Brodie has a BA in Anthropology from the University of California, San Diego, and more than eight years of experience as a professional archaeologist in Southern California.

Mr. Johnny Contreras served as Native American monitor working for the San Pasqual Indian Reservation.



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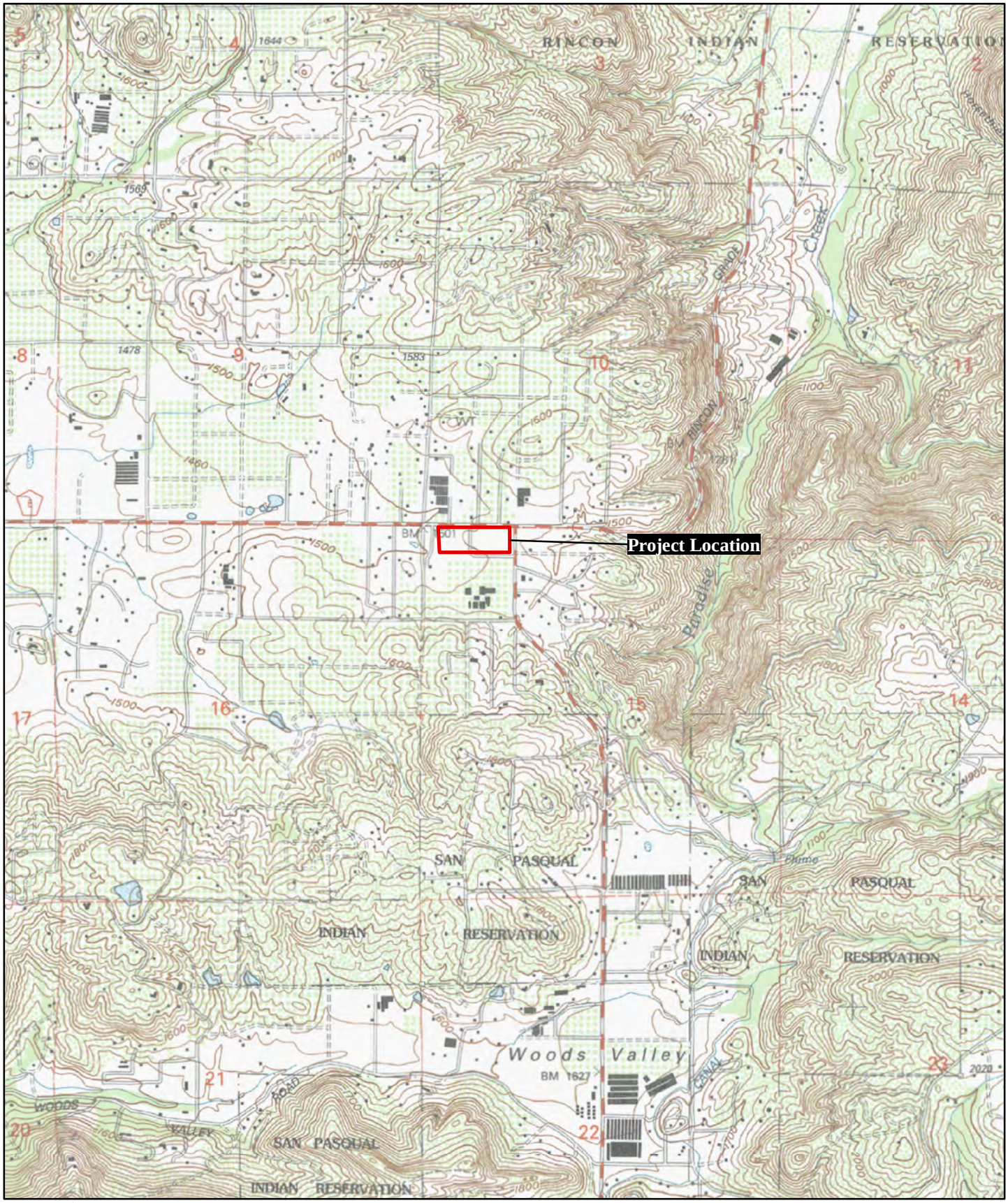
M I L E S

Figure 1
Regional Location Map

Laguna Mountain Environmental, Inc.



Source: USGS 7.5' Rodriguez Mountain Quadrangle

Figure 2
Project Location

C. Structure of the Report

This report follows the State Historic Preservation Office's guidelines for Archaeological Resource Management Reports (ARMR). The report introduction provides a description of the project and associated personnel. Section II provides background on the project area and previous research. Section III describes the survey methods, while Section IV describes the results of the archaeological survey. Section V provides evaluation criteria and recommendations and Section VI includes the references cited.

II. NATURAL AND CULTURAL SETTING

The following environmental and cultural background provides a context for the cultural resource inventory.

A. Natural Setting

The project area is located in the northern portion of San Diego County within the foothills and interior valleys of the region. The project APE includes the lower hills west of Paradise Creek and south of the Rincon Indian Reservation. The geomorphology of the project area is largely a product of the region's geologic history. During the Jurassic and late Cretaceous (>100 million years ago) a series of volcanic islands paralleled the current coastline in the San Diego region. The remnants of these islands stand as the Double Peak area near San Marcos, Black Mountain, and the Jamul Mountains among others. This island arc of volcanoes spewed out vast layers of tuff (volcanic ash) and breccia that have since been metamorphosed into the hard rock of the Santiago Peak Volcanic formation. These fine-grained rocks provided a regionally important resource for Native American flaked stone tools.

The climate of the region can generally be described as Mediterranean, with cool, wet winters and hot, dry summers. Rainfall limits vegetation growth. Two vegetation communities adapted to the dry conditions of the area occur in the project area and prior to agricultural development probably occurred within the project area. These include southern mixed chaparral and coast live oak woodland vegetation. Components of these communities provided important resources to Native Americans in the region. Sage seed, yucca, buckwheat, acorns, and native grasses formed important food resources to Late Prehistoric Native Americans. The project area is currently dominated by native and non-native grasses and partially paved as a parking area.

The APE includes areas of recent development and past disturbance in the open area west of the parking area. Paradise Creek likely provided a water source in the past.

Animal resources in the region originally included deer, fox, raccoon, skunk, bobcats, coyotes, rabbits, and various rodent, reptile, and bird species. Small game, dominated by rabbits, was relatively abundant in the area.

B. Cultural Setting

Paleoindian Period

The earliest well-documented prehistoric sites in southern California are identified as belonging to the Paleoindian period, which has locally been termed the San Dieguito complex/tradition. The Paleoindian period is thought to have occurred between 9,000 years ago, or earlier, and 8,000 years ago in this region. Although varying from the well-defined fluted point complexes such as clovis, the San Dieguito complex is seen as a hunting- focused economy with limited use of seed grinding technology. The economy generally focuses on highly ranked resources such as large mammals and relatively high mobility, which may be related to following large game. Archaeological evidence associated with this period has been found around inland dry lakes, on old terrace deposits of the California desert, and also near the coast where it was first documented at the Harris Site.

Early Archaic Period

Native Americans during the Archaic period had a generalized economy that focused on hunting and gathering. In many parts of North America, Native Americans chose to replace this economy with types based on horticulture and agriculture. Coastal southern California economies remained largely based on wild resource use until European contact (Willey and Phillips 1958). Changes in hunting technology and other important elements of material culture have created two distinct subdivisions within the Archaic period in southern California.

The Early Archaic period is differentiated from the earlier Paleoindian period by a shift to a more generalized economy and an increased focus on the use of grinding and seed processing technology. At sites dated between approximately 8,000 and 1,500 years before present, the increased use of groundstone artifacts and atlatl dart points, along with a mixed core-based tool assemblage, identify a range of adaptations to a more diversified set of plant and animal resources. Variations of the Pinto and Elko series projectile points, large bifaces, manos and portable metates, core tools, and heavy use of marine invertebrates in coastal areas are characteristic of this period, but many coastal sites show limited use of diagnostic atlatl points. Major changes in technology within this relatively long chronological unit appear limited. Several scientists have considered changes in projectile point styles and artifact frequencies within the Early Archaic period to be indicative of population movements or units of cultural change (Moratto 1984), but these units are poorly defined locally due to poor site preservation.

Late Archaic or Late Prehistoric Period

Around 2,000 B.P., Yuman-speaking people from the eastern Colorado River region began migrating into southern California, representing what is called the Late Prehistoric Period. The Late Prehistoric Period in San Diego County is recognized archaeologically by smaller projectile points, the replacement of flexed inhumations with cremation, the introduction of ceramics, and an emphasis on inland plant food collection and processing, especially acorns (True 1966). Inland semi-sedentary villages were established along major water courses, and montane areas were seasonally occupied to exploit acorns and piñon nuts, resulting in permanent milling features on bedrock outcrops. Mortars for acorn processing increased in frequency relative to seed grinding basins. This period is known archaeologically in southern San Diego County as the Yuman (Rogers 1945) or the Cuyamaca Complex (True 1970).

The Kumeyaay (formerly referred to as Diegueño) who inhabited the southern region of San Diego County, western and central Imperial County, and northern Baja California (Almstedt 1982; Gifford 1931; Hedges 1975; Luomala 1976; Shipek 1982; Spier 1923) are the direct descendants of the early Yuman hunter-gatherers. Kumeyaay territory encompassed a large and diverse environment, which included marine, foothill, mountain, and desert resource zones. Their language is a dialect of the Yuman language which is related to the large Hokan super family.

There seems to have been considerable variability in the level of social organization and settlement variance. The Kumeyaay were organized by patrilineal, patrilocal lineages that claimed prescribed territories, but did not own the resources except for some minor plants and eagle aeries (Luomala 1976; Spier 1923). Some lineages occupied procurement ranges that required considerable residential mobility, such as those in the deserts (Hicks 1963). In the mountains, some of the larger groups occupied a few large residential bases that would be occupied biannually, such as those occupied in Cuyamaca in the summer and fall, and in Guatay or Descanso during the rest of the year (Almstedt 1982; Rensch 1975). According to Spier (1923), many Eastern Kumeyaay spent the period of time from spring through autumn in larger residential bases in the upland procurement ranges, and wintered in mixed groups in residential bases along the eastern foothills on the edge of the desert (i.e., Jacumba and Mountain Springs). This variability in settlement mobility and organization reflects the great range of environments in the territory.

Acorns were the single most important food source used by the Kumeyaay. Their villages were usually located near water, which was necessary for leaching acorn meal. Other storable resources such as mesquite or agave were equally valuable to groups inhabiting desert areas, at least during certain seasons (Hicks 1963; Shackley 1984). Seeds from grasses, manzanita, sage, sunflowers, lemonadeberry, chia and other plants were also used along with various wild greens and fruits. Deer, small game and birds were hunted and fish and marine foods were eaten. Houses were arranged in the village without apparent pattern. The houses in primary villages were conical structures covered with tule bundles, having excavated floors and central hearths. Houses constructed at the mountain camps generally lacked any excavation, probably due to the summer occupation. Other structures included sweathouses, ceremonial enclosures, ramadas, and acorn granaries. The material culture included ceramic cooking and storage vessels, baskets, flaked lithic and ground stone tools, arrow shaft straighteners, stone, bone, and shell ornaments.

Hunting implements included the bow and arrow, curved throwing sticks, nets and snares. Shell and bone fishhooks, as well as nets, were used for fishing. Lithic materials including quartz and metavolcanics were commonly available throughout much of the Kumeyaay territory. Other lithic resources, such as obsidian, chert, chalcedony and steatite, occur in more localized areas and were acquired through direct procurement or exchange. Projectile points including the Cottonwood Series points and Desert Side-notched points were commonly produced.

Kumeyaay culture and society remained stable until the advent of missionization and displacement by Hispanic populations during the eighteenth century. The effects of missionization, along with the introduction of European diseases, greatly reduced the native population of southern California. By the early 1820s, California was under Mexico's rule. The establishment of ranchos under the Mexican land grant program further disrupted the way of life of the native inhabitants.

Ethnohistoric Period

The Ethnohistoric period refers to a brief period when Native American culture was initially being affected by Euroamerican culture and historical records on Native American activities were limited. When the Spanish colonists began to settle California, the project area was within the territory of a loosely integrated cultural group historically known as the Kumeyaay or Northern and Southern Diegueño because of their association with the San Diego Mission. The Kumeyaay as a whole speak a Yuman language, which differentiates them from the Luiseño to the north, who speak a Takic language (Kroeber 1925). Both of these groups were hunter-gatherers with highly developed social

systems. European contact introduced diseases that dramatically reduced the Native American population and helped to break down cultural institutions. The transition to a largely Euroamerican lifestyle occurred relatively rapidly in the nineteenth century.

Historic Period

Cultural activities within San Diego County between the late 1700s and the present provide a record of Native American, Spanish, Mexican, and American control, occupation, and land use. An abbreviated history of San Diego County is presented for the purpose of providing a background on the presence, chronological significance, and historical relationship of cultural resources within the county.

Native American control of the southern California region ended in the political views of western nations with Spanish colonization of the area beginning in 1769. De facto Native American control of the majority of the population of California did not end until several decades later. In southern California, Euroamerican control was firmly established by the end of the Garra uprising in the early 1850s (Phillips 1975).

The Spanish Period (1769-1821) represents a period of Euroamerican exploration and settlement. Dual military and religious contingents established the San Diego Presidio and the San Diego and San Luis Rey Missions. The Mission system used Native Americans to build a footing for greater European settlement. The Mission system also introduced horses, cattle, other agricultural goods and implements; and provided construction methods and new architectural styles. The cultural and institutional systems established by the Spanish continued beyond the year 1821, when California came under Mexican rule.

The Mexican Period (1821-1848) includes the retention of many Spanish institutions and laws. The mission system was secularized in 1834, which dispossessed many Native Americans and increased Mexican settlement. After secularization, large tracts of land were granted to individuals and families and the rancho system was established. Cattle ranching dominated other agricultural activities and the development of the hide and tallow trade with the United States increased during the early part of this period. The Pueblo of San Diego was established during this period and Native American influence and control greatly declined. The Mexican Period ended when Mexico ceded California to the United States after the Mexican-American War of 1846-48.

Soon after American control was established (1848-present), gold was discovered in California. The tremendous influx of American and Europeans that resulted quickly drowned out much of the Spanish and Mexican cultural influences and eliminated the last vestiges of de facto Native American control. Few Mexican ranchos remained intact because of land claim disputes and the homestead system increased American settlement beyond the coastal plain.

The San Pasqual Band originally lived along the San Dieguito River in the San Pasqual Valley. During the 1850s and 1860s, Americans began to settle portions of the San Pasqual Valley and encroach on the Native American lands associated with the Pueblo they had built there. In 1856, Panto, the well-known Capitan of the San Pasqual Indians, asked the U.S. Army for protection from encroachment on their lands (Rustvold 1983). During this period, encroachment on Native American lands occurred throughout southern California and eventually a reservation was established in San Pasqual on January 31, 1870, by President Ulysses S. Grant (Peet 1949). This

reservation was retracted only five months later due to protests from the American community and political pressure. Eventually, although the Indians continued to press claims to this land, a Deputy Sheriff evicted them from the Pueblo in 1878 and destroyed the structures he found there (Ferris 1984). The Native Americans scattered until the current San Pasqual Reservation was established for them in 1910 in the Valley Center area. This reservation is located north of their original territory, however, due to a past mapping error (Shipek 1987).

C. **Prior Research**

The archaeological inventory includes archival and other background studies in addition to Laguna Mountain's field inventory of the project area. The archival research consisted of literature and record searches at local archaeological repositories, in addition to an examination of historic maps, and historic site inventories. This information was used to identify previously recorded resources and determine the types of resources that might occur in the survey area. The methods and results of the archival research are described below.

The records and literature search for the project was conducted at the South Coastal Information Center at San Diego State University and the San Diego Museum of Man (Appendix B). The records search included a one-mile radius of the project area to provide background on the types of sites that would be expected in the region. Copies of historic maps were provided by the South Coastal Information Center.

A total of 25 documented archaeological investigations have taken place in the vicinity of the project. These studies include those for sewer and water projects, significance assessments, telecommunication projects, private land development projects, and other projects on San Pasqual Reservation lands. The current project area has not been previously surveyed. Table 1 summarizes the investigations in a 1-mile radius.

The cultural resources within a one-mile radius are summarized on Table 2. The previously recorded sites in the region provide an idea of the types of cultural resources that might be expected within the project area. A total of 51 cultural resources have been identified through previous research within a one-mile radius of the project. No resources have been identified within the project area. Other resources in the area include prehistoric temporary camps, ceramic and lithic scatters, bedrock milling features, historic structures, a historic water conveyance system (CA-SDI-16945), and other isolated artifacts. Many of the prehistoric milling and habitation sites are located near creeks and streams to utilize the water resources there.

Historic research included an examination of a variety of resources. The current listings of the National Register of Historic Places were checked through the National Register of Historic Places website. The California Inventory of Historic Resources (State of California 1976) and the California Historical Landmarks (State of California 1992) were also checked for historic resources. Historic USGS Topographic maps were examined, and the 1903 and 1942 editions of the Ramona Quadrangle did not indicate the presence of any structures within the project area.

Table 1. Archaeological Investigations Within a One-Mile Radius of the Project Area

Author	Title	Date
Bull and Ezell	An Archaeological Survey for the Escondido Mutual Water Company Relocated Water Line	1974
Chance	A Cultural Resources Survey for the Central Valley Center Sewer SWCB Project No. C-06-1567	1984
County of San Diego	Cultural Resource Assessment of Bureau of Land Management Valley Center Site 1.	1983
Gallegos, et al	A Cultural Resource Overview for Escondido, California	1987
Gallegos and Kyle	Historical/Archaeological Survey Report for the Proposed Valley Center Sewage and Water Reclamation Facilities, Valley Center	1992
Gross and Robbins-Wade	Cultural Resources Survey and Significance Assessment: Live Oak Ranch, Valley Center, California	1989
Hector and Akyuz	Management Plan for Archaeological Resources Within the Hellhole Canyon Preserve, San Diego County	2008
Jensen and Jensen	Archaeological Inventory Survey: Replacement of Two Wooden Flumes Along the Escondido Canal, Woods Valley at San Pasqual Indian Reservation, San Diego County, California	1996
Jensen	Requesting Review and Concurrence with Findings, Archaeology Inventory Survey, Escondido Canal	1995
Jensen	Archaeological Inventory Survey: Replacement of 2 Wooden Flumes Along the Escondido Canal, Woods Valley at San Pasqual Indian Reservation	1996
Kyle	Cultural Resource Assessment for Cingular Wireless Facility SD-733-04 27434 South Canal Road	2004
McGinnis	Cultural Resources Survey Report for the San Pasqual 3.5-Acre Fee-To-Trust Project, San Diego County, California	2004
McGinnis	Cultural Resources Survey Report for the San Pasqual 3.31 Acre Fee-To-Trust Project San Diego County, California	2004
McGinnis	Cultural Resources Report for the San Pasqual Reservaton Water System Extension	2008
Mooney	Jon Wilkie Property	1989
Patterson and Brand	Biology/Archaeology Technical Reports for Indian Hills, Ltd. MSA.	1979
Napton and Greathouse	Cultural Resource Investigations, San Pasqual Indian Reservation, California	1984
Napton	Cultural Resource Investigations for San Pasqual Indian Reservation, California	1984
Leeper	Live Oak Ranch Historical Background.	1989
Pigniolo and Baksh	Cultural Resource Survey Report for the San Pasqual Firebreaks Project, San Pasqual Indian Reservation, California	2000
Pigniolo	Cultural Resources Survey Report for the Districts A&B Water System Rehabilitation Project, San Pasqual Indian Reservation, San Diego, California	2000
Roybal	Reconnaissance Survey for the San Pasqual Indian Reservation Proposed Road Surfacing and Construction	1995

Table 1. Archaeological Investigations Within a One-Mile Radius of the Project Area, Continued

Author	Title	Date
Tierra Environ-mental Services	Phase I – Environmental Site Assessment for a 3.75-Acre Parcel Lake Wohlford Road, Valley Center, California	2005
Wright	Cultural Resources Survey Report for TPM 20803, Log No. 04-09-003, Brown APN 188-226-27-00, Negative Findings, County of San Diego	2004
Wright	Cultural Resources Survey Report for TPM 20917, Log 05-09-005 Brown's Rancho Minor Subdivision APN 189-030-38. County of San Diego, Dep. of Planning and Land Use	2005

Table 2. Recorded Cultural Resources Within a One-Mile Radius of the Project Area

Site Number	Site Type	Recorder
CA-SDI (I236) (SDM-W-4537)	Isolated metavolcanic flake	Gross/Robbins-Wade/ Knight/Schultze
CA-SDI-258	Pottery and groundstone	True
CA-SDI-261	Quartz chips	True
CA-SDI-275	Prehistoric campsite	True
CA-SDI-276	Prehistoric temporary campsite	True
CA-SDI-277	Prehistoric campsite	True
CA-SDI-666	Village or campsite	True
CA-SDI-669	Bedrock slicks and single mano	True
CA-SDI-670 (P-37-000670)	Lithic scatter and bedrock milling features	Pigniolo
CA-SDI-5511 (SDM-W-1662)	Lithic scatter	Horn/Aasved
CA-SDI-6702	Milling Station	Harris
CA-SDI-6703	Lithic scatter and bedrock millgin features	Dietler/Bark/Pigniolo
CA-SDI-6704	Bedrock milling features and lithic scatter	Harris
CA-SDI-6942H (SDM-W-1861)	Possible historic erosion control methods	Hatley
CA-SDI-6944 (SDM-W-2114)	Bedrock milling feature	Carrillo
CA-SDI-9480	Bedrock milling station and single scraper	Cook
CA-SDI-10463	Bedrock milling station	Collins/Chace
CA-SDI-10562	Bedrock milling station	Collins/Chace
CA-SDI-10563	Bedrock milling features	Chace/Collins
CA-SDI-11513	Two bedrock milling slicks	Serr/Shackley
CA-SDI-11514	Lithic scatter	Serr/Shackley
CA-SDI-11551H	Concrete dam	Phillips
CA-SDI-11567 (SDM-W-4533)	Bedrock milling features	Gross et al.
CA-SDI-11568H (SDM-W-4534)	Ranch structure	Gross et al.
CA-SDI-13433H (SDM-W-5990)	Historic structures and prehistoric milling features	Briggs/Bark
CA-SDI-13434 (SDM-W-5991)	Bedrock milling station	Schultze/James/Glenn
CA-SDI-13435 (SDM-W-5992)	Bedrock milling station	James/Glenn
CA-SDI-13436	Bedrock milling station	James/Glenn
CA-SDI-15331 (P-37-018319)	Bedrock milling features and habitaion debris	Pigniolo
CA-SDI-15342 (P-37-018321)	Small temporary camp	Pigniolo/Dietler
CA-SDI-16944 (P-37-025522)	Lithic scatter	McGinnis
CA-SDI-16945 (P-37-025523)	Historic water conveyance system	McGinnis
P-37-014932 (SDM-W-4535)	Isolated metavolcanic flake	Gross/Robbins-Wade/ Knight/Schultze

Table 2. Recorded Cultural Resources Within a One-Mile Radius of the Project Area, Continued

Site Number	Site Type	Recorder
P-37-014935 (SDM-W-4538)	Isolated quartz core	Gross/Robbins-Wade/ Knight/Schultze/Leeper
P-37-014936 (SDM-W-4539)	Isolated cobble with battered end, used as hammerstone	Gross/Robbins-Wade/ Knight/Schultze/Leeper/ Tift
P-37-014937 (SDM-W-4540)	Isolated metavolcanic flake	Gross/Robbins-Wade/ Knight/Schultze/Leeper/ Tift
P-37-014938 (SDM-W-4541)	Isolated metavolcanic flake	Gross/ Robbins-Wade/Knight/Schultze/ Leeper/Tift
SDM-W-4507	Historic structure	Gross/Robbins-Wade/Knight/Schultze/Smith/ Tift
SDM-W-4511	Quartz quarry	Gross/Robbins-Wade/Knight/ Leeper/Shultze/Smith/Tift
SDM-W-5806	Isolated quartz flakes	Schultze, James, Bark, Pearl, Norris, Glenn
SDM-W-5807	Isolated quartz flake	James, Schultze, Bark, Pearl, Norris, Glenn
SDM-W-5988	Bedrock milling station	Schultze, James, Glenn
SDM-W-7464	Bedrock milling station	Dietler, Bark, Pigniolo
SDM-W-7465	Temporary camp	Dietler, Bark, Pigniolo
SDM-W-7466	Bedrock milling station	Dietler, Bark, Pigniolo
SDM-W-7467	Bedrock milling features	Dietler, Banks, Pigniolo
SDM-W-7468	Lithic scatter	Pigniolo and Dietler
SDM-W-7469	Temporary camp, milling features	Pigniolo and Dietler
SDM-W-7470	Temporary camp, milling features	Pigniolo and Dietler
SDM-W-7471	Temporary camp, milling feature	Pigniolo and Dietler
SDM-W-7472	Isolated groundstone (mano)	Pigniolo and Dietler

III. RESEARCH DESIGN AND METHODS

A. Survey Methods

Survey Research Design

The goal of this study is to identify any cultural resources located within the project area so the effects of the project on these resources can be assessed. To accomplish this goal, background information was examined and assessed, and a field survey was conducted to identify any cultural resources. Based on the records search and historic map check, most of the cultural resources within the project are likely to be prehistoric resources. Historic structures appear within one mile of the project area on early maps of the area, but are unlikely to occur within the project area based on early maps. Prehistoric cultural resources could include temporary camps, lithic and ceramic scatters, and bedrock milling features associated with nearby creeks and streams. Special attention was given to naturally exposed soil deposits.

Survey Methods

The records and literature search for the project was conducted at the South Coastal Information Center of the California Archaeological Inventory at San Diego State University and the San Diego Museum of Man. This records search included site records and reports for the project area and a one- mile radius of the project along with information on potential historic resources.

The survey of the project area was conducted on October 21, 2009 by Mr. Andrew R. Pigniolo, RPA and Ms. Elizabeth Davidson, RPA. The project area was surveyed on foot at approximately 5 to 10 m intervals. The project site includes a paved parking area and an open field (Figure 3). The survey focused on the identification of potential historic features and prehistoric resource evidence. Surface visibility was good in the unpaved portion, although some areas of non-native grass were dense. Overall surface visibility averaged approximately 40 percent. The cultural resources inventory of the project APE served to identify cultural resources within the constraints of surface visibility and paved areas.

Cultural resources identified during the survey were recorded on appropriate Department of Parks and Recreation forms (Appendix E) and will be submitted to the South Coastal Information Center for trinomials. Photographs and project records for this inventory will be temporarily curated at Laguna Mountain until final curation arrangements can be made at the San Diego Archaeological Center or another appropriate regional repository.

A sacred lands file search was conducted by the California Native American Heritage Commission (Appendix C). The California Native American Heritage Commission also provided a list of appropriate local Native American contacts, each of whom were contacted about the project. No responses have been received to date.

Project Location Overview, View to Northeast (PR-02671-023)

Project Location Overview, View to Northwest (PR-02671-024)

Figure 3
Project Overview Photos

IV. SURVEY RESULTS

The cultural resource survey identified two prehistoric isolates (SPP-I-1 and SPP-I-2) within the project area (Figure 4). The cultural resources identified during the survey are described in greater detail below.

A. SPP-I-1

SPP-I-1 is an isolated Santiago Peak Volcanic flake. The isolate is located in the northwest corner of the parking area in a narrow, open and disturbed area, next to an existing power pole (#P207651). The artifact is an interior flake with crushing on the dorsal side of the platform. It measures 2 cm by 1.5 cm and is grayish-brown in color. The surrounding area has been highly disturbed due to parking area construction and the installation of the transmission line along the road.

B. SPP-I-2

Isolate SPP-I-2 is a Santiago Peak Volcanic flake. The isolate is located on the edge of a rodent burrow approximately 10 m north of the existing dirt road and power pole (#P88103). The artifact is an aphanitic patinated late stage bifacial thinning flake. Because the artifact came from a rodent burrow, a potential subsurface archaeological deposit may be present. The surrounding area includes low-lying native and non-native vegetation.

Figure 4

Project Location and Associated Cultural Resources

(Confidential figure located in Appendix F)

V. EVALUATION CRITERIA, SIGNIFICANCE, AND RECOMMENDATIONS

A. Evaluation Criteria

The Federal criteria used to evaluate cultural resources are specified by the National Register criteria within NHPA. The National Register criteria are presented in 36 CFR 60 as follows:

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and
>
> (a) That are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> (b) That are associated with the lives of persons significant in our past; or
>
> (c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
>
> (d) That have yielded, or may be likely to yield, information important in prehistory or history.

B. Impacts and Significance

The surface survey of the project APE resulted in the identification of two isolated artifacts, SPP-I-1 and SPP-I-2. Isolates SPP-I-1 and SPP-I-2 have not been previously evaluated for NRHP eligibility. Isolates are not considered significant and therefore not eligible for the NRHP. No historic properties were identified within the project area.

C. Recommendations

The potential for unanticipated buried prehistoric archaeological resources is present within the project area based on the identification of an isolated artifact within rodent backdirt. Because the project contains potential for buried prehistoric archaeological sites that may be eligible for nomination to the NRHP, construction monitoring of the property is recommended. This construction monitoring will include significance evaluation of any unanticipated discoveries. Because only isolated finds were identified within the APE as a result of this study, a determination of No Historic Properties Affected is recommended for this project.

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APPENDICES

A. Resumes of Principal Personnel
B. Records Search Results
C. Native American Correspondence
D. Photograph Log and Photographs
E. Isolate Forms (Confidential)(With Confidential Appendix)
F. Confidential Figure (Confidential)(With Confidential Appendix)

APPENDIX A

RESUME OF PRINCIPAL INVESTIGATOR

ANDREW R. PIGNIOLO, M.A., RPA
Principal Archaeologist
Laguna Mountain Environmental, Inc.

Education

San Diego State University, Master of Arts, Anthropology, 1992
San Diego State University, Bachelor of Arts, Anthropology, 1985

Professional Experience

2002-Present	Principal Archaeologist/President, Laguna Mountain Environmental, Inc., San Diego, California
1997-2002	Senior Archaeologist, Tierra Environmental Services, San Diego, California
1994-1997	Senior Archaeologist, KEA Environmental, Inc., San Diego, California
1985-1994	Project Archaeologist, Ogden Environmental and Energy Services, San Diego, California
1982-1985	Reports Archivist, Cultural Resource Management Center (now South Coastal Information Center), San Diego State University
1980-1985	Archaeological Consultant, San Diego, California

Professional Affiliations

Register of Professional Archaeologists (RPA; formerly called SOPA), 1992-present
Society for American Archaeology
Society for California Archaeology
Pacific Coast Archaeology Society
Certified Archaeology Consultant, San Diego County
Certified Archaeology Consultant, Riverside County
Certified Archaeology Consultant, City of San Diego
Permitted for Bureau of Land Management lands in California

Qualifications

Mr. Andrew Pigniolo is RPA/SOPA certified (1992-present) and is a certified archaeology consultant for San Diego and Riverside Counties. Mr. Pigniolo has more than 29 years of experience as an archaeologist, and has conducted more than 650 projects throughout southern California and western Arizona. His archaeological investigations have been conducted for a wide variety of development and resource management projects including military installations, geothermal power projects, water resource facilities, transportation projects, commercial and residential developments, and projects involving Indian Reservation lands. He has conducted the complete range of technical studies including archaeological overviews, archaeological surveys, test excavations, historical research, evaluations of significance for National Register eligibility, data recovery programs, and monitoring projects.

Relevant Projects

Rancho San Vicente Project ***(****Turrini & Brink Planning Consultants)* Mr. Pigniolo served as Project Archaeologist, Principal Author, and Field Manager of a testing program at 24 archaeological sites located within an 850-acre planned development near Ramona, San Diego County, California. The project was conducted for compliance with County of San Diego guidelines and CEQA.

Los Coyotes Landfill Cultural Resources ***(****Bureau of Indian Affairs)* Project Archaeologist and Field Manager of a cultural resources survey for a landfill and related facilities on Los Coyotes Indian Reservation in San Diego County, California. The project involved a literature search and field survey to identify the presence and location of archaeological sites within the project boundary in compliance with NEPA.

Salt Creek Ranch Testing Program (*City of Chula Vista)* Mr. Pigniolo served as Project Archaeologist, Principal Author, and Field Manager of a large testing program which included 27 archaeological sites that were evaluated under CEQA and City of Chula Vista guidelines.

State Route 56 Transportation Alternatives Project ***(****City of San Diego)* Mr. Pigniolo was Senior Archaeologist, Principal Author, and Field Manager for a large testing and evaluation program at 13 sites in northern San Diego. Six of these were significant pursuant to CEQA and NHPA criteria providing a variety of important data on the Archaic period.

Imperial Project 2,500-Acre Survey and Evaluation *(Bureau of Land Management)* Mr. Pigniolo served as the Senior Archaeologist, Author, and Field Manager for an intensive archaeological inventory of more than 2,500 acres in eastern Imperial County, California for a proposed gold mine project. The project included the involvement of Native American representatives. More than 90 sites, including eight very large multicomponent sites, were identified and evaluated for National Register eligibility. A Traditional Cultural Property was identified and evaluated in the main portion of the project area.

Daley Rock Quarry Cultural Resources Survey and Test ***(****The Daley Corporation)* Project Archaeologist, Author, and Field Manager for the testing program and a series of associated surveys for a large prehistoric quarry (CA-SDi-10,027) located in southern San Diego County in compliance with County of San Diego guidelines and CEQA.

MCAS Tustin Relocation, MCAGCC Twentynine Palms 5,000-Acre Survey Project *(Commandant of the Marine Corps, COMCABWEST Base Realignment and Closure)* Mr. Pigniolo was Principal Investigator, Author, and Field Manager of a proposed base relocation project in San Bernardino County, California. The project included intensive inventory of an approximately 5,000 acre area and the recording of 137 archaeological sites and 207 isolated artifacts. The project was conducted under Section 106 of the national Historic Preservation Act (NHPA).

Reconnaissance of Sky Oaks Ranch ***(****Systems Ecology/Biology, San Diego State University)* Mr. Pigniolo participated in archaeological survey of more than 1,500 acres in the eastern portion of San Diego County.

Olympic Training Center Boathouse Project ***(****City of Chula Vista)* Project Archaeologist for an archaeological survey and testing program at two prehistoric archaeological sites adjacent to Lower Otay Lake.

Otay Ranch 5,000-Acre Survey Project *(City of Chula Vista)* Mr. Pigniolo served as Project Archaeologist for a survey of approximately 5,000 acres in southern San Diego County in compliance with County of San Diego guidelines, CEQA, and guidelines of the City of Chula Vista.

Scripps Poway Parkway Alternatives Project ***(****City of Poway)* Mr. Pigniolo was Principal Investigator, Author, and Field Manager of a survey of approximately 1,400 acres in the City of Poway. The survey resulted in the identification of 69 archaeological and historical resources within the area of potential effect. The survey was conducted under guidelines for the California Environmental Quality Act (CEQA) and the National Historic Preservation Act (NHPA).

160-Acre Eastlake Parcel of Otay Ranch *(City of Chula Vista/County of San Diego)* Project Archaeologist for an archaeological survey identifying three sites and ten isolates.

Monofill Land Exchange Project *(Magma Operating Company)* Mr. Pigniolo was Principal Investigator and Project Manager of an archaeological field survey of 1,280 acres to create a buffer zone around an existing landfill operation. The survey identified 92 prehistoric and historic sites and 42 isolated artifacts. The project was conducted in compliance with NEPA.

Otay Mesa OHV Park Survey ***(****County of San Diego)*Associate Archaeologist and Field Manager of a survey of the eastern portion of Otay Mesa in southern San Diego County pursuant to CEQA and County of San Diego guidelines.

Viejas Indian Reservation 1,200-Acre Survey ***(****Gold River Country)* Project Archaeologist for an archaeological survey of the entire Viejas Indian Reservation identifying more than 60 archaeological sites.

Campo Indian Reservation Cultural Resource Inventory (*U.S. Department of the Interior National Park Service)* Mr. Pigniolo participated in an archaeological survey of approximately 12,000 acres. The survey included working closely with local Native Americans in the identification and recordation of a variety of prehistoric and historic cultural resources.

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APPENDIX B

RECORDS SEARCH RESULTS

SAN DIEGO
MUSEUM of MAN
It's about people

1350 El Prado, Balboa Park • San Diego, CA 92101
T: 619-239-2001 • F: 619-239-2749 • www.museumofman.org

REPORT ON ARCHAEOLOGICAL SITE FILES RECORD SEARCH

Source of Request:	**Laguna Mountain Environmental, Inc.**
Name of Project:	**San Pasqual Reservation Survey Project**
Date of Request:	**October 5, 2009**
Date Request Received:	**October 22, 2009**

The Record Search for the above referenced project has been completed. Archaeological site file information is enclosed for the following site located within a one-mile radius of the project area:

W – 1662
W – 1861
W – 2114
W – 4507
W – 4511
W – 4533 thru 4535
W – 4537 thru 4541
W – 5806
W – 5807
W – 5988
W – 5990 thru 5992
W – 7464 thru 7472

Bibliographic information is enclosed for the following archaeological environmental impact studies conducted within a one-mile radius of the project area:

EIS – 1129
EIS – 1193

This Record Search is based only on information contained in the files of the San Diego Museum of Man. Archaeological site records and/or environmental impact studies pertaining to the project area may exist in other repositories.

Record Search completed by: Wayne Saunders
Wayne Saunders & Philip Hoog

Date of Record Search: November 3, 2009

South Coastal Information Center
4283 El Cajon Blvd., Suite 250
San Diego, CA 92105
Office: (619) 594-5682
Fax: (619) 594-4483
scic@mail.sdsu.edu
scic_gis@mail.sdsu.edu

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
CLIENT IN-HOUSE RECORDS SEARCH

Company: Laguna Mountain Environmental, Inc.

Company Representative: Natalie Brodie

Date: 10/6/2009

Project Identification: San Pasqual Reservation Survey Project

Search Radius: 1 mile

Historical Resources: SELF

Trinomial and Primary site maps have been reviewed. All sites within the project boundaries and the specified radius of the project area have been plotted. Copies of the site record forms have been included for all recorded sites.

Previous Survey Report Boundaries: SELF

Project boundary maps have been reviewed. National Archaeological Database (NADB) citations for reports within the project boundaries and within the specified radius of the project area have been included.

Historic Addresses: SELF

A map and database of historic properties (formerly Geofinder) has been included.

Historic Maps: SELF

The historic maps on file at the South Coastal Information Center have been reviewed, and copies have been included.

Copies: 169

Hours: 1.5

This is not an invoice. Please pay from the monthly billing statement

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APPENDIX C

NATIVE AMERICAN CORRESPONDENCE

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-6251
Fax (916) 657-5390
Web Site www.nahc.ca.gov
ds_nahc@pacbell.net

December 17, 2009

Mr. Andrew Pigniolo, RPA
LAGUNA MOUNTAIN ENVIRONMENTAL, INC.
7969 Engineer Road, Suite 208
San Diego, CA 92111

Sent by FAX to: 858-505-9658
Number of pages: 4

Re: Request for a Sacred Lands File Search and Native American Contacts List for a Proposed "San Pasqual Band of Indians Survey Project"; located near Lake Wolford, approx six miles northeast of the City of Escondido; San Diego County, California

Dear Mr. Pigniolo:

The Native American Heritage Commission (NAHC), the State of California 'Trustee Agency' for the protection and preservation of Native American cultural resources (c.f. CA Public Resources Code §21070; also c.f. *Environmental Protection Information Center v. Johnson (1985) 170 Cal App. 3rd 604*), was able to perform a record search of its Sacred Lands File (SLF) for the affected project area (APE) requested. The California Environmental Quality Act (CEQA; CA Public Resources Code Section 21000 – 21177)) requires that any project that causes a substantial adverse change in the significance of an historical resource, that includes archaeological resources, is a 'significant effect' requiring the preparation of an Environmental Impact Report (EIR) per the California Code of Regulations §15064.5(b)(c)(f) CEQA guidelines). Section 15382 of the 2007 CEQA Guidelines defines a significant impact on the environment as "a substantial, or potentially substantial, adverse change in any of physical conditions within an area affected by the proposed project, including ...objects of historic or aesthetic significance." The NAHC SLF search **did not indicate** the presence of Native American cultural resources within one-half - mile radius of the proposed project (APE). There are. however, Native American cultural resources in close proximity to the APE.

This letter includes state and federal statutes relating to Native American historic properties of religious and cultural significance to American Indian tribes and individuals as 'consulting parties' under both state and federal law.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed are the names of the nearest tribes and interested Native American individuals that the NAHC recommends as 'consulting parties,' for this purpose, that may have knowledge of the religious and cultural significance of the historic properties in the project area (e.g. APE). We recommend that you contact persons on the attached list of Native American contacts. Furthermore we suggest that you contact the California Historic Resources Information System (CHRIS) at the Office of Historic Preservation Coordinator's office (at (916) 653-7278, for referral to the nearest Information Center of which there are 10.

Consultation with 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 and 4(f) of federal NHPA (16 U.S.C. 470 [f])*et seq)*, 36 CFR Part 800.3, 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. .

Lead agencies should consider avoidance, as defined in Section 15370 of the California Environmental Quality Act (CEQA) when significant cultural resources could be affected by a project. Also, Public Resources Code Section 5097.98 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. Discussion of these should be included in your environmental documents, as appropriate.

The response to this search for Native American cultural resources is conducted in the NAHC Sacred Lands Inventory, established by the California Legislature (CA Public Resources Code §5097.94(a) and is exempt from the CA Public Records Act (c.f. California Government Code §6254.10) although Native Americans on the attached contact list may wish to reveal the nature of identified cultural resources/historic properties. Confidentiality of "historic properties of religious and cultural significance' may also be protected the 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 possibly 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
Program Analyst

Attachment: Native American Contacts List (NOTE: we further recommend that other forms of 'proof of mailing or proof of contact be utilized instead of 'Return Receipt Requested' Certified or Registered Mail.) Further, we suggest a follow-up telephone call to the contacts if the replies are not received or need clarification.

Native American Contact
San Diego County
December 17, 2009

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
PO Box 365 Diegueno
Valley Center, CA 92082
(760) 749-3200
(760) 749-3876 Fax

Rincon Band of Mission Indians
Angela Veltrano, Rincon Culture Committee
P.O. Box 68 Luiseno
Valley Center, CA 92082
council@rincontribe.org
(760) 749-1051
(760) 749-8901 Fax

Santa Ysabel Band of Diegueno Indians
Johnny Hernandez, Spokesman
PO Box 130 Diegueno
Santa Ysabel, CA 92070
brandietaylor@yahoo.com
(760) 765-0845
(760) 765-0320 Fax

Kwaaymii Laguna Band of Mission Indians
Carmen Lucas
P.O. Box 775 Diegueno -
Pine Valley , CA 91962
(619) 709-4207

Mesa Grande Band of Mission Indians
Mark Romero, Chairperson
P.O Box 270 Diegueno
Santa Ysabel, CA 92070
mesagrandeband@msn.com
(760) 782-3818
(760) 782-9092 Fax

Inaja Band of Mission Indians
Rebecca Osuna, Spokesperson
309 S. Maple Street Diegueno
Escondido , CA 92025
(760) 737-7628
(760) 747-8568 Fax

Pauma & Yuima
Christobal C. Devers, Chairperson
P.O. Box 369 Luiseno
Pauma Valley CA 92061
paumareservation@aol.com
(760) 742-1289
(760) 742-3422 Fax

San Luis Rey Band of Mission Indians
Henry Contreras, Most Likely Descendant
1763 Chapulin Lane Luiseno
Fallbrook , CA 92028
(760) 728-6722 - Home
(760) 908-7625 - Cell

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of 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 only applicable for contacting local Native Americans with regard to cultural resources for the proposed San Pasqual Band of Indians Project of approx. 38-acres, near Lake Wohlford about six miles northeast of Excondido in North Metro San Diego County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Native American Contact
San Diego County
December 17, 2009

San Luis Rey Band of Mission Indians
Russell Romo
12064 Old Pomerado Road Luiseno
Poway , CA 92064
(858) 748-1586

Kupa Cultural Center (Pala Band)
Shasta Gaughen, Assistant Director
35008 Pala-Temecula Rd.PMB Box Luiseno
Pala , CA 92059
cupa@palatribe.com
(760) 891-3590
(760) 742-4543 - FAX

Pauma Valley Band of Luiseño Indians
Bennae Calac, Tribal Council Member
P.O. Box 369 Luiseno
Pauma Valley CA 92061
bennaecalac@aol.com
(760) 617-2872
(760) 742-3422 - FAX

La Jolla Band of Mission Indians
ATTN: Rob Roy,Environmental Director
22000 Highway 76 Luiseno
Pauma Valley CA 92061
lajolla-sherry@aol.com and
(760) 742-3790
(760) 742-1704 Fax

Rincon Band of Mission Indians
Bo Mazzetti, Chairperson
P.O. Box 68 Luiseno
Valley Center CA 92082
council@rincontribe.org
(760) 749-1051
(760) 749-8901 Fax

Clint Linton
P.O. Box 507 Diegueno/Kumeyaay
Santa Ysabel CA 92070
(760) 803-5694
cjlinton73@aol.com

San Luis Rey Band of Mission Indians
Carmen Mojado, Co-Chair
1889 Sunset Drive Luiseno
Vista , CA 92081
cjmojado@slrmissionindians.org
(760) 724-8505
(760) 724-2172 - FAX

Mel Vernon, Chairperson
San Luis Rey Band of Mission Indians
1044 North Ivy Street Luiseno
Escondido , CA 92026
melvern@aol.com
(760) 746-8692
(760) 703-1514 - cell

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of 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 only applicable for contacting local Native Americans with regard to cultural resources for the proposed San Pasqual Band of Indians Project of approx. 38-acres, near Lake Wohlford about six miles northeast of Escondido in North Metro San Diego County, California for which a Sacred Lands File search and Native American Contacts list were requested.

Laguna Mountain Environmental, Inc.

December 18, 2009

San Pasqual Band of Mission Indians
Allen E. Lawson, Chairperson
PO Box 365
Valley Center CA 92082

Dear Allen E. Lawson:

RE: Cultural Resource Survey for San Pasqual Tribal Land Improvements Project

Laguna Mountain Environmental, Inc. (Laguna Mountain) conducted an archaeological/historical survey of two parcels, totaling 38-acres for the proposed San Pasqual Tribal Land Improvements Project. Cultural resource work was conducted in accordance with Section 106 of the National Historic Preservation Act (NHPA) for the Bureau of Indian Affairs. The BIA served as the lead agency for NHPA compliance.

The 38-acre project area, including a 9-acre parcel and a 29-acre parcel, is located in northeastern San Diego County near Lake Wohlford (Figure 1). The project is located within the northwest quarter of Section 22 in Township 11 South, Range 1 West. The project area is shown on the Rodriguez Mountain USGS 7.5' Quadrangle (Figure 2).

We respectfully request any information and input that you may have regarding Native American concerns either directly or indirectly associated with this project area. If you or your files have any information about cultural resources or traditional cultural properties located on or near the project site, please contact us. If we can provide any additional information, please contact me. Thank you for your assistance.

Sincerely,

Andrew R. Pigniolo
Principal Investigator

7969 Engineer Road, Suite 208 ✦ San Diego, CA 92111
Phone: (858) 505-8164 ✦ Fax: (858) 505-9658
E-Mail: Laguna@LagunaEnv.com

IPAI

SAN PASQUAL ECONOMIC DEVELOPMENT AGENCY
SAN PASQUAL BAND OF MISSION INDIANS OF CALIFORNIA
SAN PASQUAL RESERVATION

SPEDA

September 24, 2009

Dr. Seth Mallios, Coordinator
South Coastal Information Center
College of Arts and Letters
4283 El Cajon Blvd., Suite 250
San Diego, CA 92105

Re: San Pasqual Reservation Parcel Survey Project

Dear Dr. Mallios:

As President of the San Pasqual Economic Development Agency, I hereby authorize the release of any cultural resources information regarding the San Pasqual Indian Reservation to Laguna Mountain Environmental, Inc. This information will be used in preparation of a cultural resources assessment in connection with the above-referenced Tribal project. The assessment includes a pedestrian survey of approximately 38 acres on two parcels on the Reservation, and associated background research for any previously recorded resources. Please feel free to contact me if you have any questions.

Sincerely,

Michael Contreras
President
San Pasqual Economic Development Agency
27458 N. Lake Wohlford Rd
Valley Center, CA 92082

PALA BAND OF MISSION INDIANS
Tribal Historic Preservation Office
35008 Pala Temecula Rd. PMB 445
Pala, CA 92059

Ph: (760) 891-3591
Fax: (760) 742-4543

December 23, 2009

Andrew R. Pigniolo, Principal Investigator
Laguna Mountain Environmental, Inc.
7969 Engineer Road, Suite 208
San Diego, CA 92111

Re: Cultural Resource Survey for San Pasqual Tribal Land Improvements Project

Dear Mr. Pigniolo:

The Pala Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Robert Smith, Tribal Chairman.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized Pala Indian Reservation. The project is also beyond the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we have no objection to the continuation of project activities as currently planned and we defer to the wishes of Tribes in closer proximity to the project area.

We appreciate involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone at 760-891-3591 or by e-mail at sgaughen@palatribe.com.

Sincerely,

Shasta C. Gaughen, MA
Tribal Historic Preservation Officer
Pala Band of Mission Indians

ATTENTION: THE PALA TRIBAL HISTORIC PRESERVATION OFFICE IS RESPONSIBLE FOR ALL REQUESTS FOR CONSULTATION. PLEASE ADDRESS CORRESPONDENCE TO **SHASTA C. GAUGHEN** AT THE ABOVE ADDRESS. IT IS NOT NECESSARY TO ALSO SEND NOTICES TO PALA TRIBAL CHAIRMAN ROBERT SMITH. PLEASE ALSO NOTE THAT JOE NIXON NO LONGER WORKS FOR THE PALA THPO.

APPENDIX D

PHOTOGRAPH LOG AND PHOTOGRAPHS

State of California — The Resources Agency **Primary #**
DEPARTMENT OF PARKS AND RECREATION **HRI#**

PHOTOGRAPH RECORD

Trinomial

Page 1 **of** 1 **Resource Name or #:** San Pasqual 9-Acre Parcel Survey **Year:** 2009

Camera Format: Digital Lens Size:
Film Type and Speed: Digital Media Kept at: Laguna Mountain Environmental, Inc.

Mo.	Day	Time	Exp./Frame	Subject/Description	View Toward	Accession #
10	21	0900	1	SPP-I-1closeup of flake	-	PR-02671-001
10	21	0900	2	SPP-I-1 closeup of flake	-	PR-02671-002
10	21	0900	3	SPP-I-1 closeup of flake	-	PR-02671-003
10	21	0900	4	SPP-I-1 closeup of flake	-	PR-02671-004
10	21	0900	5	SPP-I-1 location overview	W	PR-02671-005
10	21	0900	6	Project Overview	WSW	PR-02671-006
10	21	0900	7	Project overview	SW	PR-02671-007
10	21	0900	8	Project overview	S	PR-02671-008
10	21	0900	9	Project overview	SSW	PR-02671-009
10	21	0900	10	SPP-I-1 overview	E	PR-02671-010
10	21	0900	11	Project overview	SE	PR-02671-011
10	21	0900	12	SPP-I-1 overview	E	PR-02671-012
10	21	0900	13	SPP-H-1 concrete slab	N	PR-02671-013
10	21	0900	14	SPP-H-1 concrete slab closeup	E	PR-02671-014
10	21	1000	15	SPP-H-1 concrete slab	E	PR-02671-015
10	21	1000	16	SPP-I-2 closeup	-	PR-02671-016
10	21	1000	17	SPP-I-2 closeup	-	PR-02671-017
10	21	1000	18	SPP-I-2 closeup	-	PR-02671-018
10	21	1000	19	SPP-I-2 closeup	-	PR-02671-019
10	21	1000	20	SPP-I-2 closeup	-	PR-02671-020
10	21	1000	21	SPP-I-2 overview	E	PR-02671-021
10	21	1000	22	SPP-I-2 overview	N	PR-02671-022


PR-02671-001


PR-02671-002


PR-02671-003


PR-02671-004


PR-02671-005


PR-02671-006


PR-02671-007


PR-02671-008


PR-02671-009


PR-02671-010


PR-02671-011


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PR-02671-021


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PR-02671-023

APPENDIX E

ISOLATE FORMS

(With Confidential Appendix)

APPENDIX F

CONFIDENTIAL FIGURE

(With Confidential Appendix)

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Appendix D Traffic Analysis

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LINSCOTT LAW & GREENSPAN engineers

FOCUSED TRAFFIC IMPACT ANALYSIS

9-ACRE SAN PASQUAL PROJECT

County of San Diego, California
September 1, 2009

LLG Ref. 3-09-1913

Prepared by:

Raul Armenta
Transportation Engineer III
&
Cara Leone
Transportation Planner I

Under the Supervision of:

John Boarman, P.E.
Principal

Linscott, Law & Greenspan, Engineers
4542 Ruffner Street
Suite 100
San Diego, CA 92111
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www.llgengineers.com

TABLE OF CONTENTS

APPENDICES

APPENDIX

LIST OF FIGURES

LIST OF TABLES

FOCUSED TRAFFIC IMPACT ANALYSIS

9-ACRE SAN PASQUAL PROJECT

County of San Diego, California
September 1, 2009

1.0 INTRODUCTION

Linscott, Law, & Greenspan, Engineers (LLG) has been retained to prepare a traffic study for the 9-Acre San Pasqual project located on the San Pasqual Band of Mission Indians Reservation. The Reservation is located approximately 11 miles northeast of Escondido in San Diego County, California. The purpose of this study is to assess the potential impacts to the local circulation system as a result of the proposed project.

The project proposes to develop a 9-acre site to provide a gas station, drive-through restaurant, and a strip commercial/retail development. It also includes the relocation and expansion of an existing surface parking lot currently occupying the project site to the westerly adjacent parcel. A more detailed project description is presented in Section 2.0 of this report.

The traffic analysis presented in this report includes the following:

- Project Description
- Existing Conditions Description
- Analysis Approach and Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Trip Generation/Distribution/Assignment
- Analysis of Potential Project Impacts
- Congestion Management Compliance
- Project Access Review
- Summary and Conclusions

2.0 PROJECT DESCRIPTION

The following is a brief description of the project location, as well as operational characteristics that affect project traffic generation and regional distribution.

2.1 Project Location

The project is located in the northern portion of the San Pasqual Indian Reservation in the Community of Valley Center in the County of San Diego. The site is located on the southwest corner of the Valley Center Road/ Lake Wohlford Road intersection.

Figure 2–1 shows the project vicinity, and ***Figure 2–2*** is a more detailed project area map.

2.2 Project Description

The San Pasqual Band of Mission Indians proposes to develop a 9-acre site to provide a gas station, a restaurant, and a strip commercial/retail development. Additionally, the project proposes the relocation of an existing surface parking lot currently occupying the project site to the westerly adjacent parcel.

Figure 2–3 shows the preliminary conceptual site plan.

2.3 Project Access

Access to the commercial portion of the project is proposed via an existing driveway on Valley Center Road at School Bus Road and at a proposed driveway along Lake Wohlford Road. The Valley Center Road driveway will be full access and the driveway located on Lake Wohlford Road will be restricted to right-in/right-out only movements. A more detailed discussion of the project access is located in Section 10.0 of the report.

Currently, school buses, shuttle buses and casino employee private vehicles utilize the Valley Center Road/ School Bus Road intersection. With the relocation of the existing surface parking lot, the Valley Center Road/ School Bus Road intersection is proposed to be relocated to the west of its current location. The existing Valley Center Road/ School Bus Road intersection will be modified into the commercial access portion of the proposed project. The following is a detailed discussion of the existing and proposed access for these existing trips.

Existing

School buses currently use School Bus Road to drop-off students in the morning and pick them up in the afternoon on weekdays during the school year. The buses enter School Bus Road from Valley Center Road, pick-up and drop-off students at the sidewalk along the south side of the road within the west-to-east section of the School Bus Road, and exit onto Lake Wohlford Road.

Shuttle buses are currently used to transport casino employees. The shuttle buses make a right-turn onto School Bus Road (two-way portion) from Valley Center Road, make a left-turn into the existing parking lot, load or unload the employees at the shelters within the existing parking lot, return to

School Bus Road where they make a right-turn to exit the lot, and lastly turn right at Valley Center Road and head east toward Lake Wohlford Road where they make a right-turn to travel south toward the casino. It should be noted that the shuttle buses only utilize a short segment of School Bus Road (two-way portion) to ingress the parking lot. No left turns exiting the parking lot onto School Bus Road are allowed.

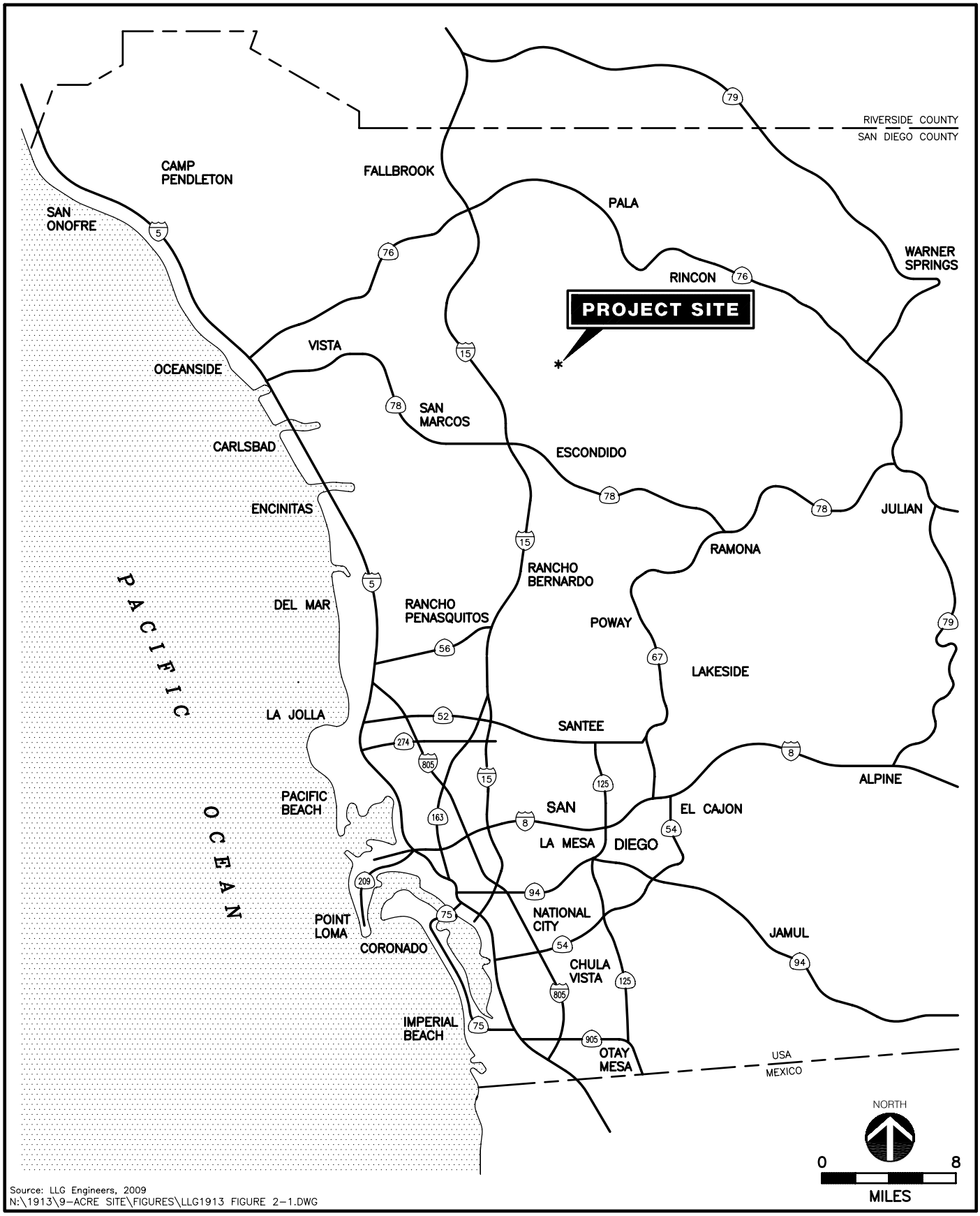
Private vehicles driven by casino employees enter the parking lot from Valley Center Road by turning onto School Bus Road (two-way portion), and then make a left-turn into the existing parking lot. Vehicles exiting the parking lot make a right-turn onto School Bus Road and continue onto Valley Center Road to reach their destination. No left turns exiting the parking lot onto School Bus Road are allowed.

With School Bus Road Realignment and Parking Relocation

School buses will use the relocated School Bus Road. The buses will continue to enter School Bus Road from Valley Center Road and exit onto Lake Wohlford Road. However, there will no longer be a portion of School Bus Road that operates as a two-lane roadway.

Shuttle buses will continue to transport casino employees from Valley Center Road, however, they will no longer access School Bus Road and will instead utilize the project access (Street "A") located along Valley Center Road. From the project access, they will now turn right into the relocated parking lot where they will load or unload the employees at the shuttle stops and then return to the project access where they make a left-turn to exit the lot, and lastly turn right at Valley Center Road and head east toward Lake Wohlford Road where they make right-turn to travel south toward the casino.

Private vehicles driven by casino employees will enter the relocated parking lot from Valley Center Road, however they will no longer access School Bus Road and will instead utilize the project access (Street "A") located along Valley Center Road. From the project access, they will now turn right into the relocated parking lot. Vehicles will now make a left-turn to exit the relocated parking lot and continue onto Valley Center Road to reach their destination.



Source: LLG Engineers, 2009
N:\1913\9-ACRE SITE\FIGURES\LLG1913 FIGURE 2-1.DWG

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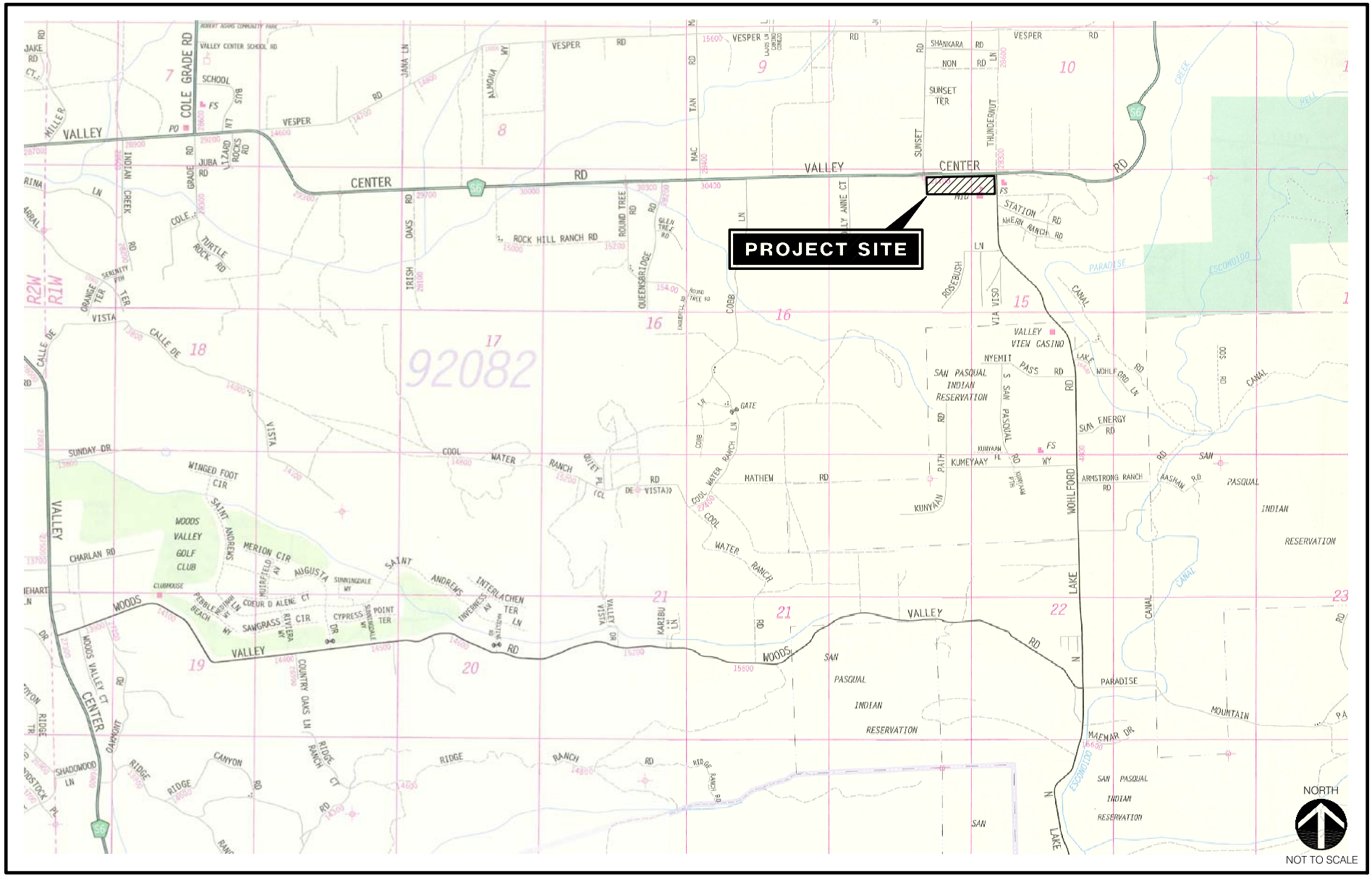
Figure 2-1

Vicinity Map



Source: Thomas Guide, 2009
N:\1913\9-ACRE SITE\FIGURES\LLG1913 FIGURE 2-2.DWG

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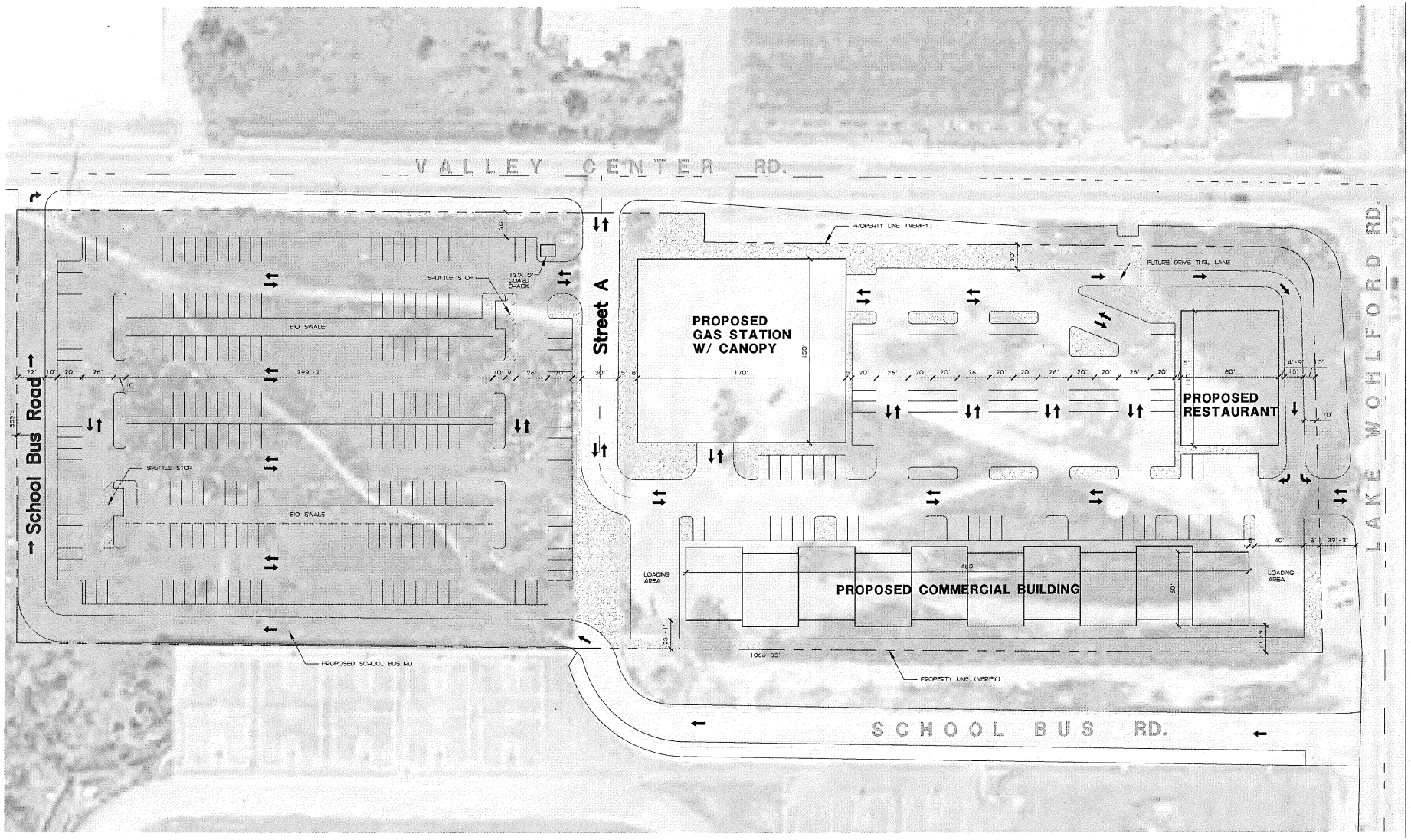
Figure 2-2

Project Area Map

9-ACRE SAN PASQUAL PROJECT



Source: Howard Parsell Company, 2009
N:\1913\9-ACRE SITE\FIGURES\LLG1913 FIGURE 2-3.DWG

LINSCOTT LAW & GREENSPAN engineers

NORTH

NOT TO SCALE

Figure 2-3

Site Plan

9-ACRE SAN PASQUAL PROJECT

3.0 EXISTING CONDITIONS

The following is a discussion of the key roadways analyzed in the study area. The existing traffic data collection is also described in detail.

Figure 3–1 depicts the existing conditions and geometry of the driveways and study area intersections.

3.1 Existing Street Network

Valley Center Road is classified on the existing County of San Diego Circulation Element as a Prime Arterial west/south of Cole Grade Road and as a Rural Collector east/north of Cole Grade Road. Valley Center Road transitions from East Valley Parkway as a two-lane undivided with a portion of Valley Center Road north of Lake Wohlford Road constructed with two northbound lanes (climbing grade) and one southbound lane. Continuing north of Lake Wohlford Road to Cole Grade Road, Valley Center Road has recently been widened to major road standards (four-lane divided roadway with bike lanes). East of Cole Grade Road, Valley Center Road becomes a two-lane undivided roadway. Beginning at Sunset Road, Valley Center Road provides a two-way left-turn lane continuing to Lake Wohlford Road (N.). The posted speed limit ranges from 45 to 60 mph with bus stops provided. Bike lanes are provided and curbside parking is prohibited for the entirety of the roadway.

Lake Wohlford Road is classified on the existing County of San Diego Circulation Element as a Rural Collector. Lake Wohlford Road is currently constructed as a two-lane undivided roadway. The posted speed limit within the project area varies between 45 to 50 mph. Curbside parking is generally prohibited, and no bike lanes or bus stops are provided.

Woods Valley Road is classified on the existing County of San Diego Circulation Element as a Rural Collector. Woods Valley Road is currently constructed as a two-lane undivided roadway. Curb, gutter and sidewalks are not provided. The posted speed limit ranges from 40 to 45 mph in the project vicinity.

Cole Grade Road is classified as a Collector on the San Diego County Circulation Element. It is currently constructed as a two-lane undivided road and is operating as a Rural Collector. Curb, gutter and sidewalks are not provided. The posted speed limit ranges from 45 to 50 mph.

School Bus Road is an unclassified private roadway. It currently operates primarily as a one-way roadway with vehicles entering from Valley Center Road and exiting at Lake Wohlford Road. Currently, school buses, casino shuttle buses and private vehicles driven by casino employees utilize School Bus Road. A small portion of School Bus Road between Valley Parkway and the parking lot driveway operates as a two-way roadway used for private casino employee vehicles and shuttle service. The remainder of the roadway operates one-way and serves as a student pick-up zone for the middle school.

3.2 Existing Traffic Volumes

Peak hour intersection turning movement traffic counts and segment counts within the project area were conducted by LLG in July 2009. Traffic counts were conducted between 7:00 AM and 9:00 AM and the highest hour of traffic within this period was utilized. Similarly, the highest hour of traffic between 4:00 PM and 6:00 PM was used in the analysis

Table 3–1 is a summary of the most recent available average daily traffic volumes (ADTs). ***Figure 3–2*** shows the existing traffic volumes. ***Appendix A*** contains the manual count sheets.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]
Valley Center Road	
West of Lake Wohlford Road	14,900
Lake Wohlford Road	
Valley Center Road to Woods Valley Road	8,970
South of Woods Valley Road	5,690
Woods Valley Road	
West of Lake Wohlford Road	2,330

Footnotes:

a. Average Daily Traffic Volumes.

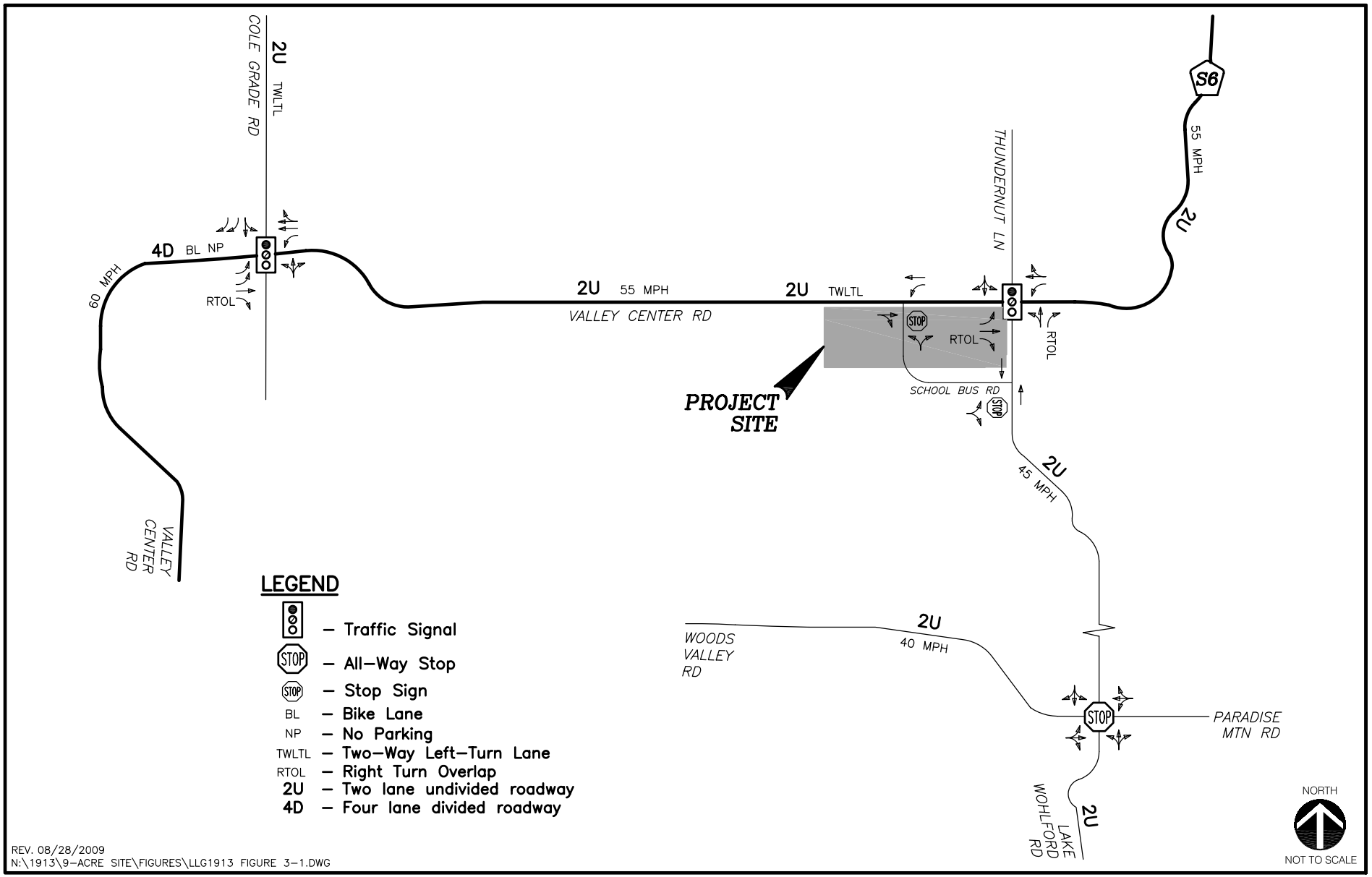


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Figure 3-1

Existing Conditions Diagram

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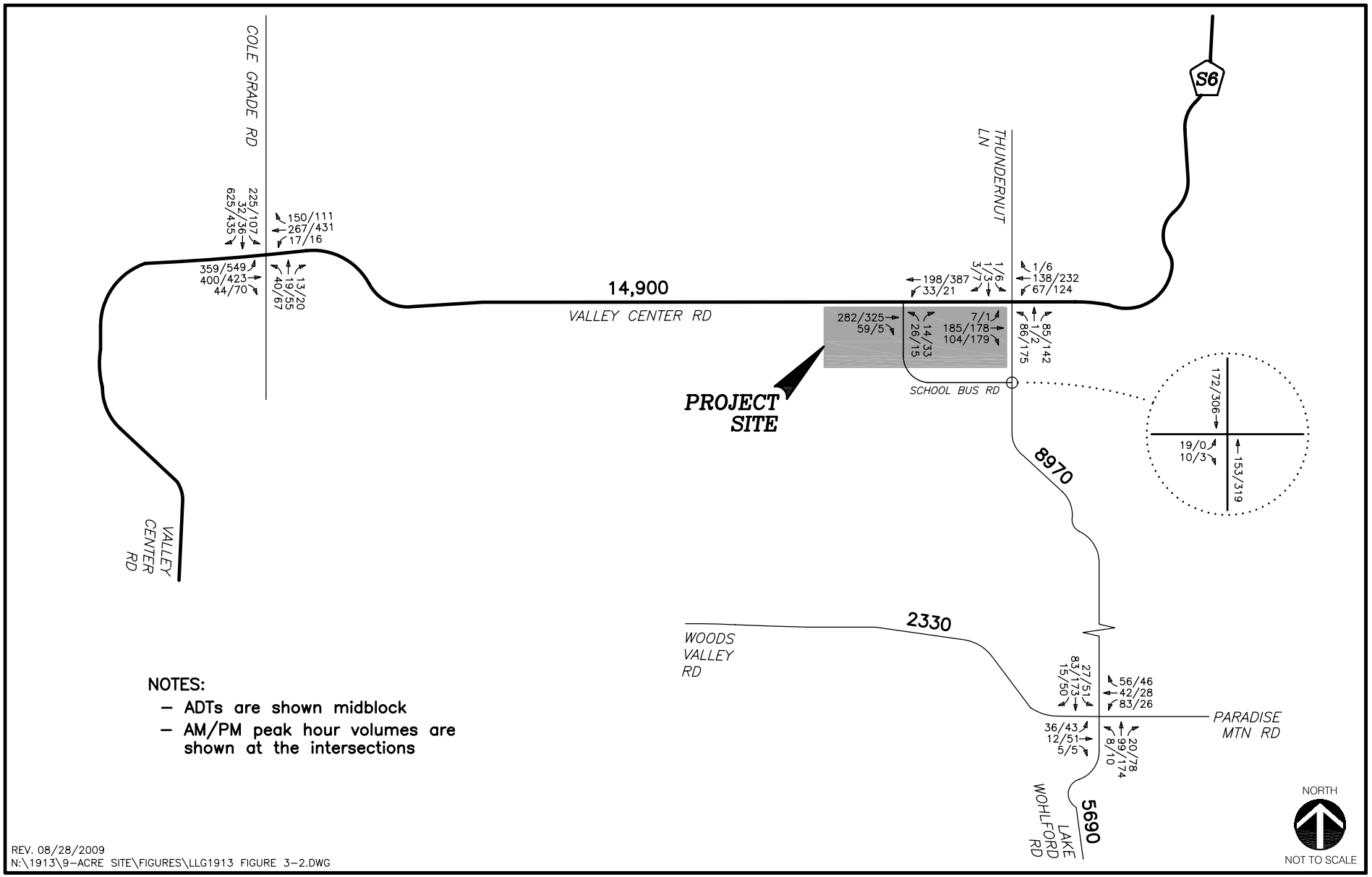

NOTES:

- ADTs are shown midblock
- AM/PM peak hour volumes are shown at the intersections

REV. 08/28/2009
N:\1913\9-ACRE SITE\FIGURES\LLG1913 FIGURE 3-2.DWG

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Figure 3-2

Existing Traffic Volumes AM/PM Peak Hours & ADT

9-ACRE SAN PASQUAL PROJECT

4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.1 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Traffix* (version 7.5) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS).

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the *Traffix* (version 7.5) computer software

4.2 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The County of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in ***Appendix B.***

5.0 SIGNIFICANCE CRITERIA

The following criterion was utilized to evaluate potential significant impacts, based on the County's documents "Guidelines for Determining Significance", effective June 30, 2009.

5.1 Road Segments

Pursuant to the County's General Plan Public Facilities Element (PFE), new development must provide improvements or other measures to mitigate traffic impacts to avoid:

a. Reduction in Level of Service (LOS) below "C" for on-site Circulation Element roads;

b. Reduction in LOS below "D" for off-site and on-site abutting Circulation Element roads; and

c. "Significantly impacting congestion" on roads that operate at LOS "E" or "F". If impacts cannot be mitigated, the project will be denied unless a statement of overriding findings is made pursuant to the State CEQA Guidelines. The PFE, however, does not include specific guidelines/thresholds for determining the amount of additional traffic that would "significantly impact congestion" on such roads, as that phrase is used in item (c) above.

The County has created the following guidelines to evaluate likely traffic impacts of a proposed project for road segments and intersections serving that project site, for purposes of determining whether the development would "significantly impact congestion" on the referenced LOS E and F roads. The guidelines are summarized in ***Table 5–1***. The thresholds in *Table 5–1* are based upon average operating conditions on County roadways. It should be noted that these thresholds only establish general guidelines, and that the specific project location must be taken into account in conducting an analysis of traffic impact from new development.

TABLE 5–1
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON ROAD SEGMENTS
ALLOWABLE INCREASES ON CONGESTED ROAD SEGMENTS

Level of Service	Two-Lane Road	Four-Lane Road	Six-Lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

General Notes:

1. By adding proposed project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts.
2. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

On-site Circulation Element Roads—PFE, Transportation, Policy 1.1 states that "new development shall provide needed roadway expansion and improvements on-site to meet demand created by the development, and to maintain a Level of Service C on Circulation Element Roads during peak traffic hours". Pursuant to this policy, a significant traffic impact would result if:

- The additional or redistributed ADT generated by the proposed land development project will cause on-site Circulation Element Roads to operate below LOS C during peak traffic hours.

Off-Site Circulation Element Roads—PFE, Transportation, Policy 1.1 also states that "new development shall provide needed roadway expansion and improvements off-site to meet demand created by the development, and to maintain a Level of Service D on Circulation Element Roads." "New development that would significantly impact congestion on roads operating at LOS E or F, either currently or as a result of the project, will be denied unless improvements are scheduled to improve the LOS to D or better or appropriate mitigation is provided." The PFE, however, does not specify what would significantly impact congestion or establish criteria for evaluating when increased traffic volumes would significantly impact congestion. The following significance guidelines provided are the County's preferred method for evaluating whether or not increased traffic volumes generated or redistributed from a proposed project will "significantly impact congestion" on County roads, operating at LOS E or F, either currently or as a result of the project.

Traffic volume increases from projects that result in one or more of the following criteria will have a significant traffic impact on a road segment, unless specific facts show that there are other circumstances that mitigate or avoid such impacts:

- The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a Circulation Element Road or State Highway currently operating at LOS E or LOS F, or will cause a Circulation Element Road or State Highway to operate at a LOS E or LOS F as a result of the proposed project as identified in *Table 1*, or
- The additional or redistributed ADT generated by the proposed project will cause a residential street to exceed its design capacity.

5.2 Intersections

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on a signalized intersection:

- The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at a LOS E or LOS F as identified in ***Table 5–2***.
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operation of the intersection.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or level of service traffic impact on an unsignalized intersection:

- The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
- The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, it is found that the generation rate is less than those specified above, and would significantly impact the operations of the intersection.

TABLE 5–2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Delay of 1 second, or 5 or less peak hour trips on a critical movement	5 or less peak hour trips on a critical movement

General Notes:

1. A critical movement is an intersection movement (right-turn, left-turn, through-movement) that experiences excessive queues, which typically operate at LOS F.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes any trips must mitigate a share of the cumulative impacts.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay and the number of trips on a critical movement, exceedance of either criteria result in a significant impact.

6.0 ANALYSIS OF EXISTING CONDITIONS

The analysis of existing conditions includes the assessment of the study area intersection and street segments.

6.1 Peak Hour Intersection Levels of Service

Table 6–1 summarizes the existing intersection levels of service. As seen in *Table 6–1*, all intersections are calculated to operate at LOS C or better during both the AM and PM peak hours.

Appendix C contains the existing intersection analysis worksheets.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. Valley Center Road/ Cole Grade Road	Signal	AM PM	32.8 32.4	C C
2. Valley Center Road/ School Bus Road	TWSC [c]	AM PM	12.8 12.7	B B
3. Valley Center Road/ Lake Wohlford Road (N.)	Signal	AM PM	23.8 25.8	C C
4. Lake Wohlford Road/ School Bus Road	TWSC	AM PM	10.4 10.1	B B
5. Lake Wohlford Road/ Woods Valley Road	AWSC [d]	AM PM	8.7 10.3	A C

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection.
d. AWSC – All-Way Stop Controlled intersection.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

6.2 Daily Street Segment Levels of Service

Table 6–2 summarizes the existing roadway segment level of service. As seen in *Table 6–2*, the segments are calculated to currently operate at LOS D or better except for the Valley Center Road segment west of Lake Wohlford Road which currently operates at LOS E.

TABLE 6–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]
Valley Center Road				
West of Lake Wohlford Road	Rural Collector	16,200	14,900	E
Lake Wohlford Road				
Valley Center Road to Woods Valley Road	Rural Collector	16,200	8,970	D
South of Woods Valley Road	Rural Collector	16,200	5,690	C
Woods Valley Road				
West of Lake Wohlford Road	Rural Collector	16,200	2,330	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

Based on the preliminary conceptual site plan, the proposed project consists of specialty retail/strip commercial, restaurant, and gas station land uses. It also includes the relocation of an existing surface parking lot currently occupying the project site to the westerly adjacent parcel. It is expected that many of the trips will be trips not new to the street system, but instead captured from trips already on the system. These trips are termed "pass-by" trips.

7.1 Trip Generation

The project trip generation was determined using the following steps:

1. San Diego Association of Governments (SANDAG) trip generation rates taken from the *(Not so) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*, were used for the project land uses.
2. Total project trips were calculated using the SANDAG rates to obtain the total trips generated by the project site.
3. As previously mentioned, a portion of project trips will not be new to the street system, but will be captured from trips already on the street system. These trips are termed "pass-by" trips and are assumed to be already on the roadways for another purpose.
4. Primary trips are trips assumed to be new to the street system. The primary trips are calculated by subtracting the pass-by trips from the total project trips.

Commercial Development Trips

Based on the total commercial trip generation calculations, the proposed project is calculated to generate 5,072 ADT with 325 total trips during the AM peak hour (166 inbound / 159 outbound) and 417 total trips during the PM peak hour (220 inbound / 197 outbound).

Total Primary Commercial Trips

Based on SANDAG rates and pass-by percentages, the proposed project is calculated to generate approximately 4,168 primary daily trips with 293 primary trips during the AM peak hour (150 inbound / 143 outbound) and 257 primary trips during the PM peak hour (140 inbound / 117 outbound). These trips are new to the street system.

The total project trip generation is summarized in ***Table 7–1***.

7.2 Trip Distribution/Assignment

The project traffic was distributed and assigned to the street system based on the project's proximity to state highways and arterials, and the locations of existing and proposed residential communities.

Figure 7–1 shows the project traffic distribution. ***Figure 7–2*** shows the primary project traffic assignment. ***Figure 7–3*** shows the existing + project traffic volumes.

TABLE 7–1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate[a]	Volume	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total	% of ADT	In:Out Split	Volume In	Volume Out	Volume Total
Commercial Development													
Specialty Retail/Strip Commercial	27.6 KSF	40/KSF	1,104	3%	6:4	20	13	33	9%	5:5	50	50	100
Pass-by		*10%*	*(110)*	*10%*	*5:5*	*(2)*	*(2)*	*(4)*	*10%*	*5:5*	*(5)*	*(5)*	*(10)*
Specialty Retail/Strip Commercial Primary Trips			994	—		18	11	29	—		45	45	90
Restaurant Sit-Down, High Turnover	8.8 KSF	160/KSF	1,408	8%	5:5	56	56	112	8%	6:4	68	45	113
Pass-by		*20%*	*(282)*	*10%*	*5:5*	*(5)*	*(5)*	*(10)*	*40%*	*5:5*	*(23)*	*(23)*	*(46)*
Restaurant Sit-Down, High Turnover Primary Trips			1,126	—		51	51	102	—		45	22	67
Gasoline w/ Food Mart	12 VFS	160/VFS	2,560	7%	5:5	90	90	180	8%	5:5	102	102	204
Pass-by		*20%*	*(512)*	*10%*	*5:5*	*(9)*	*(9)*	*(18)*	*50%*	*5:5*	*(52)*	*(52)*	*(104)*
Gasoline w/ Food Mart Primary Trips			2,048	—		81	81	162	—		50	50	100
Total Commercial Trips			**5,072**	**—**		**166**	**159**	**325**	**—**		**220**	**197**	**417**
Total Project Pass-by			*(904)*	—		*(16)*	*(16)*	*(32)*	—		*(80)*	*(80)*	*(160)*
Total Primary Commercial Trips			**4,168**	**—**		**150**	**143**	**293**	**—**		**140**	**117**	**257**

Footnotes:

a. Rates are based on SANDAG's (*Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002.

General Notes:
KSF = Thousand square feet
VFS = Vehicle fueling stations

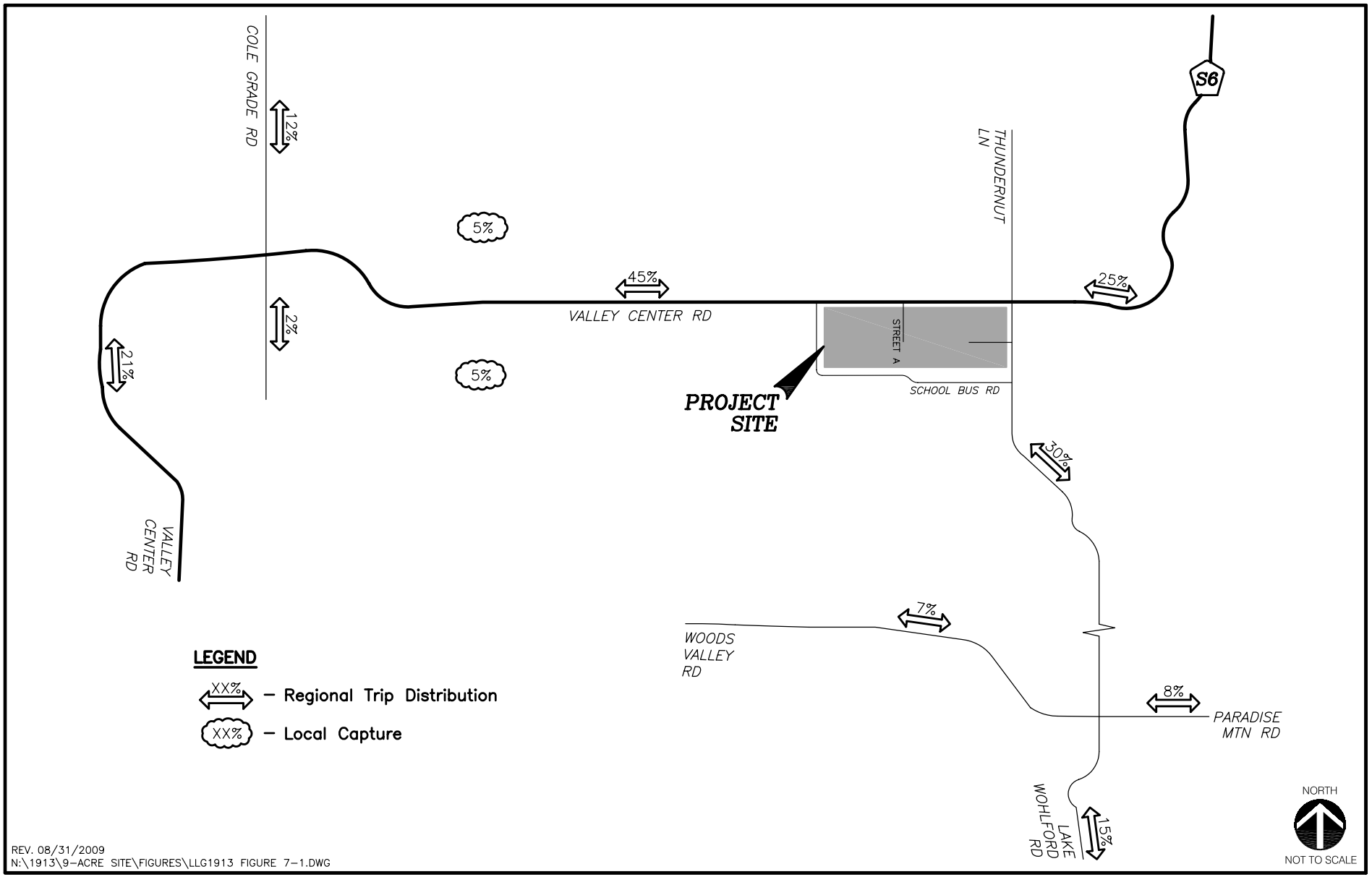

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Figure 7-1

Project Traffic Distribution

9-ACRE SAN PASQUAL PROJECT

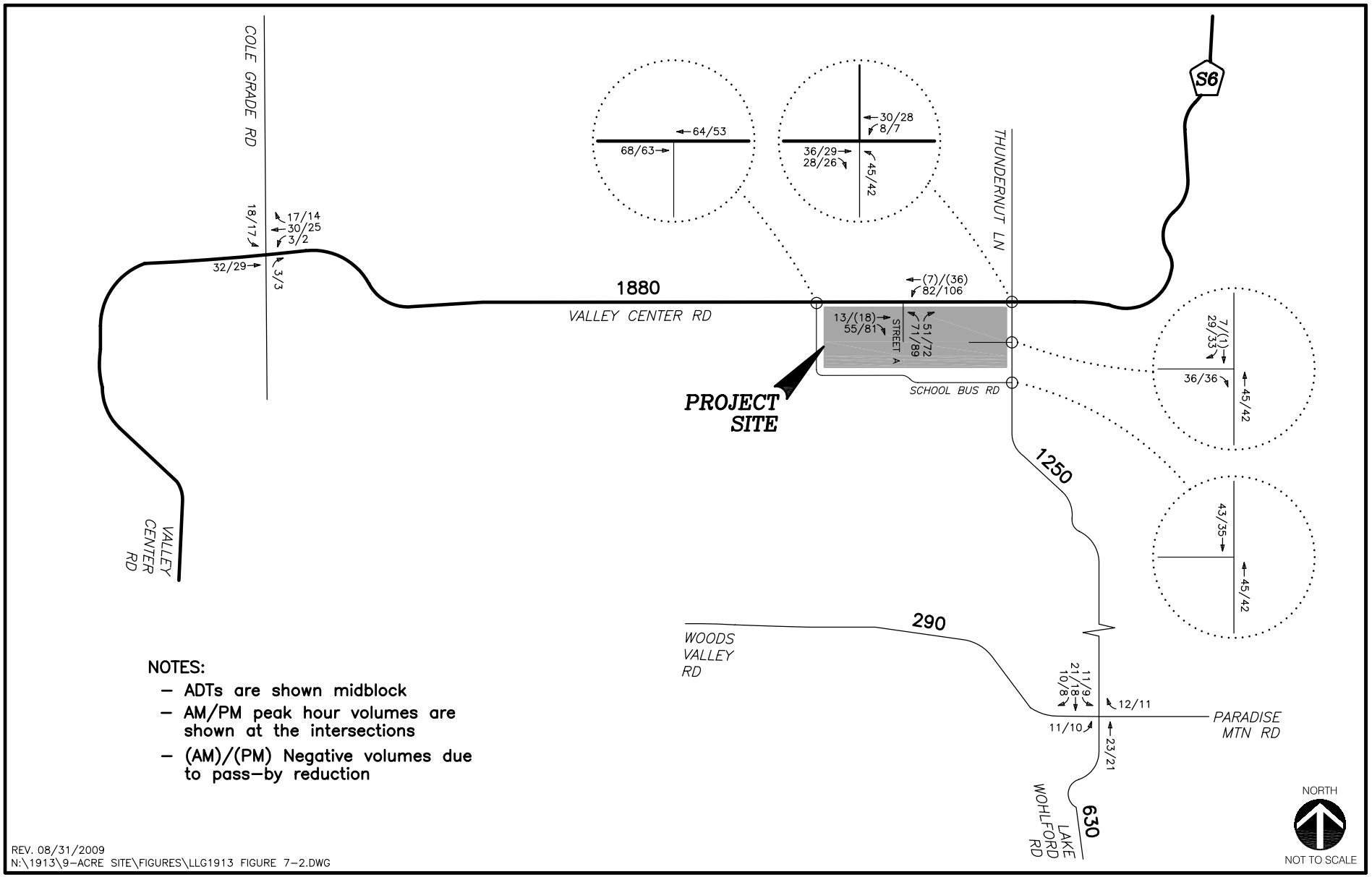

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Figure 7-2

Project Traffic Volumes AM/PM Peak Hours & ADT

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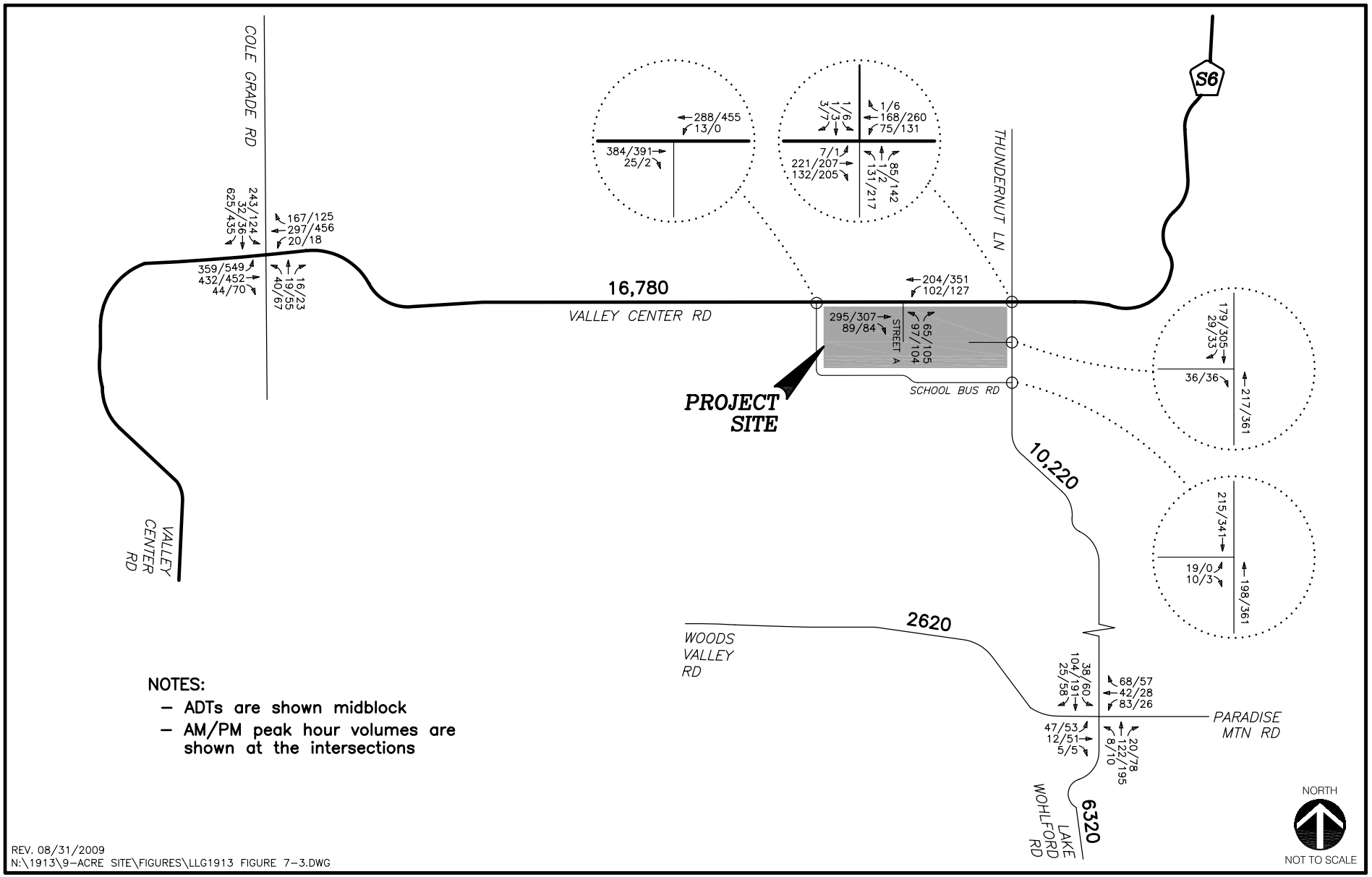

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Figure 7-3

Existing + Project Traffic Volumes AM/PM Peak Hours & ADT

9-ACRE SAN PASQUAL PROJECT

8.0 ANALYSIS OF PROJECT IMPACTS

The following is a summary of the intersection and daily street segment operations for the Near-Term scenarios. The impacts of the proposed project traffic volumes are compared to the existing volumes to determine potential near-term significant direct impacts, based on the published significance criteria. Also presented are the Year 2030 forecasted operations, which is utilized to address cumulative project traffic impacts. Findings of significance are made at the conclusion of the report in *Section 11.0.*

8.1 Existing + Project Operations

8.1.1 *Intersection Analysis*

Table 8–1 shows that with the addition of project traffic, the study area intersections are calculated to continue to operate at a LOS D or better during the AM and PM peak hours.

8.1.2 *Segment Operations*

Table 8–2 shows that with the addition of project traffic, the street segments are calculated to continue to operate at a LOS D or better except for the two-lane portion of Valley Center Road segment west of Lake Wohlford Road which degrades to LOS F.

Appendix D contains the existing + project intersection level of service analysis worksheets.

8.2 Year 2030 Operations

Year 2030 traffic volumes are derived from the County of San Diego's GP Update traffic model with project traffic added, which includes land use and network changes consistent with the proposed GP Update This includes the recent widening of Valley Center Road to four lanes. The GP Update traffic model ADTs were compared to existing ADTs in the study area. Where existing ADTs were lower, the GP Update traffic model ADT's were adjusted upward to represent the magnitude of regional growth observed elsewhere in the study area. Future peak hour intersection turn volumes were calculated based on forecasted growth in ADT on the adjacent links. ***Figure 8–1*** shows the Year 2030 (With Project) traffic volumes.

8.2.1 *Intersection Analysis*

Table 8–1 shows that with the forecasted Year 2030 traffic volumes the study area intersections are calculated to continue to operate at a LOS D or better except for the Valley Center Road/ Street "A" intersection which is forecasted to operate at LOS F during the AM and PM peak hours.

8.2.2 *Segment Operations*

Table 8–2 shows that with the forecasted Year 2030 traffic volumes the street segments are calculated to continue to operate at a LOS D or better except for the two-lane portion of Valley Center Road segment west of Lake Wohlford Road which continues to operate at LOS F.

Appendix E contains the Year 2030 intersection level of service analysis worksheets.

TABLE 8–1
INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project			Year 2030	
			Delay[a]	LOS[b]	Delay	LOS	Δ[c]	Delay	LOS
1. Valley Center Road/ Cole Grade Road	Signal	AM	32.8	C	33.4	C	—	48.5	D
		PM	32.4	C	33.0	C	—	50.6	D
2. Valley Center Road/ Street "A"	TWSC[d]	AM	12.8	B	20.4	C	—	**>100**	**F**
		PM	12.7	B	33.4	D	**195**	**>100**	**F**
3. Valley Center Road/ Relocated School Bus Road	Inbound Only	AM	DNE	DNE	8.3	A	—	10.1	B
		PM	DNE	DNE	0.0[f]	—	—	0.0[f]	—
4. Valley Center Road/ Lake Wohlford Road (N.)	Signal	AM	23.8	C	24.5	C	—	35.8	D
		PM	25.8	C	26.5	C	—	35.5	D
5. Lake Wohlford Road (N.)/ School Bus Road	TWSC	AM	10.4	B	11.0	B	—	34.0	D
		PM	10.1	B	10.4	B	—	13.4	B
6. Lake Wohlford Road (N.)/ Woods Valley Road	AWSC[e]	AM	8.7	A	9.2	A	—	14.2	B
		PM	10.3	C	11.1	B	—	23.8	C
7. Lake Wohlford Road/ Project Access	TWSC	AM	—	—	9.6	A	—	15.4	C
		PM	—	—	10.5	B	—	13.7	B

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. "Δ" denotes the project-induced increase in trips at the critical movement for potentially impacted intersections.
d. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
e. AWSC –All-Way Stop Controlled intersection.
f. No critical movements are reported during the PM peak hour on the Valley Center Road/ School Bus Road (Realigned) intersection, therefore no delay is shown.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

General Notes:

Bold typeface and shading indicates a potential significant impact.
DNE = Does Not Exist

TABLE 8–2
STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	Existing		Existing + Project			Year 2030 (With Project)	
		ADT[b]	LOS[c]	ADT	LOS	Project-induced increase	ADT	LOS
Valley Center Road								
West of Lake Wohlford Road (N.)	16,200	14,900	E	**16,780**	**F**	**1,880**	**17,360**	**F**
Lake Wohlford Road (N.)								
Valley Center Road to Woods Valley Road	16,200	8,970	D	10,220	D	1,250	10,700	D
South of Woods Valley Road	16,200	5,690	C	6,320	C	—	7,830	D
Woods Valley Road								
West of Lake Wohlford Road	16,200	2,330	B	2,620	B	—	10,690	D

Footnotes:

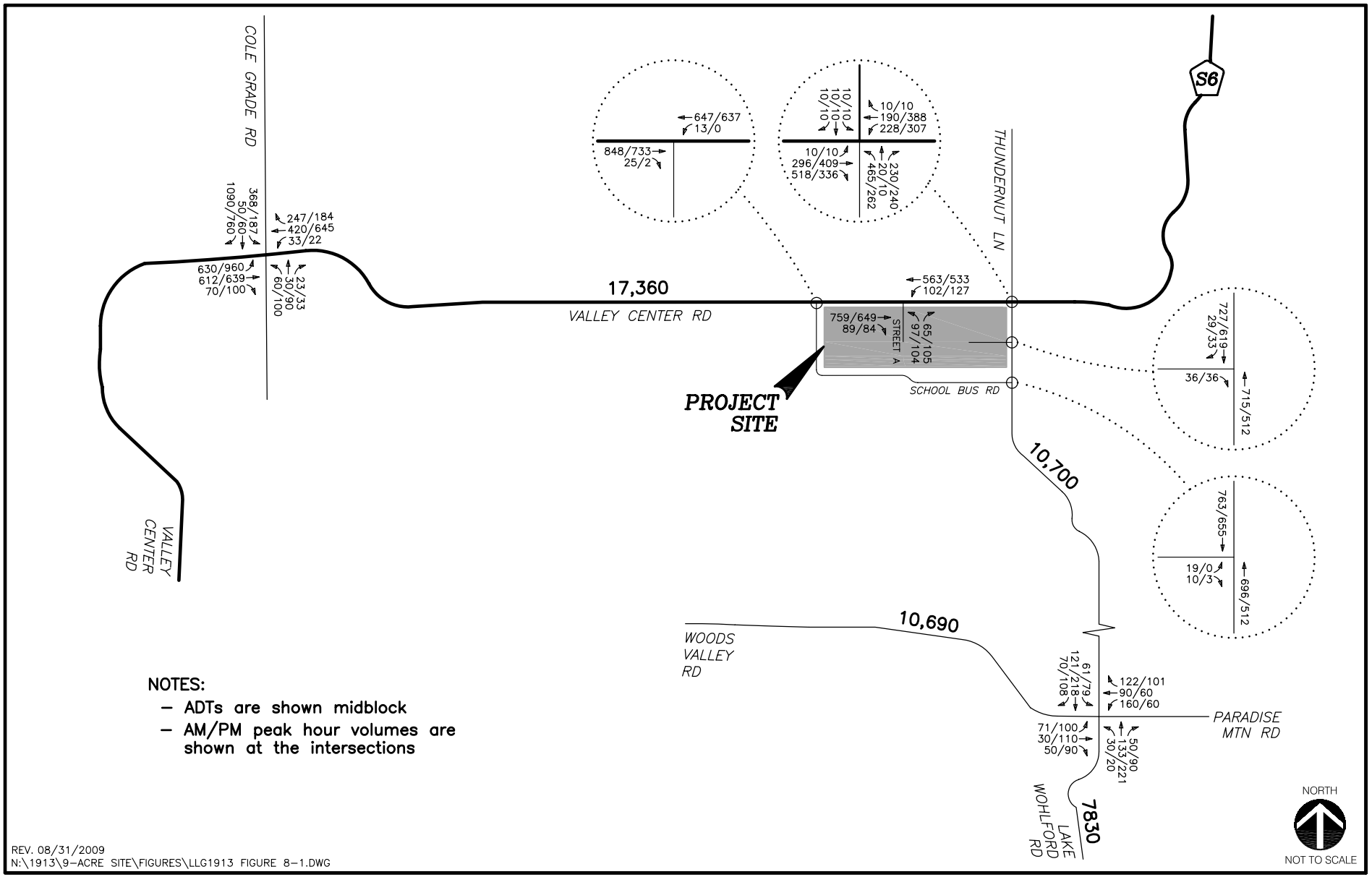
a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

General Notes:

Bold typeface and shading indicates a significant impact.



LINSCOTT LAW & GREENSPAN engineers

Figure 8-1

Year 2030 Traffic Volumes AM/PM Peak Hours & ADT

9-ACRE SAN PASQUAL PROJECT

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9.0 CONGESTION MANAGEMENT PROGRAM COMPLIANCE

The Congestion Management Program (CMP), adopted on November 22, 1991, is intended to link land use, transportation and air quality through level of service performance. The CMP requires an Enhanced CEQA Review for projects that are expected to generate more than 2,400 ADT or more than 200 peak hour trips.

The *SANDAG Congestion Management Program, Updated July 16, 2008* report contains a list of "CMP Arterials" that are to be analyzed if the project exceeds the above mentioned trip generation thresholds. Although the project generates more than the 2,400 ADT and 200 peak hour trips, none of the study area locations analyzed in this report are listed as CMP arterials, highways, or freeways. ***Therefore, a CMP analysis is not required of this project.***

10.0 ACCESS AND OTHER ISSUES

10.1 Project Access

Access to the commercial portion of the project is proposed via one full access driveway on Valley Center Road and one right-turn in/out only driveway on Lake Wohlford Road. Based on a review of forecasted traffic volumes at the access points, the following geometry and traffic controls are recommended to facilitate adequate operations at each driveway.

1. **Valley Center Road/ Street "A"**

   Restripe Valley Center Road to provide a westbound left-turn lane with 150-feet of storage and a 90-foot bay taper. Provide two outbound (northbound) lanes on Street "A", one left-turn lane and one right-turn lane with an overlap phase. Conduct an annual traffic count at the Valley Center Road/ Street "A" intersection as part of a monitoring program of the intersection to determine when signal warrants are met. Install the traffic signal once warrants are met.

2. **Lake Wohlford Road/ Project Access**

   Place the project driveway under stop-control. Signage shall be placed to restrict access to a right-turn in/ right-turn out only driveway. An exception to the 300-foot separation standard between road intersections is justified because access will be limited to right-in/right-out only at Lake Wohlford Road. In addition, there will be less conflict points at the driveway and the future signal at Valley Center Road will provide gaps for vehicles exiting the site. Ensure proper sight distance is met based on County standards.

At the relocated Valley Center Road/ School Bus Road intersection, the following is recommended to provide adequate operations:

Restripe Valley Center Road to provide a westbound left-turn lane with 130-feet of storage and a 90-foot bay taper. School Bus Road should be a 22-foot wide one-way roadway with school buses entering along Valley Center Road and exiting along Lake Wohlford Road. Ensure proper sight distance is met based on County standards.

It should be noted that signalization of the Valley Center Road/ Street "A" intersection will likely not be needed until full buildout of the site and is dependent on tenant mix and trip generation. It is recommended that a monitoring system be implemented to identify the point at which a traffic signal is warranted.

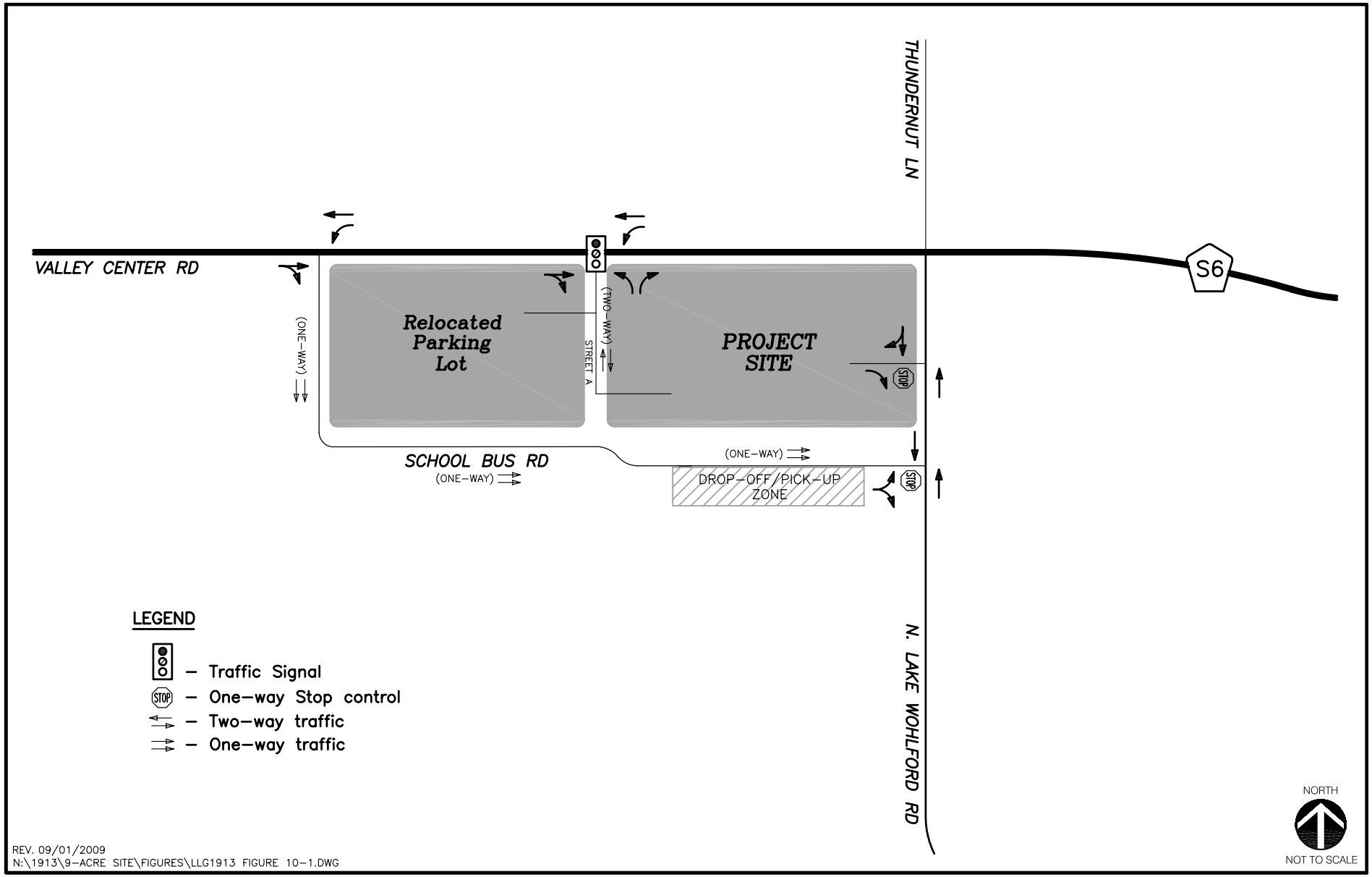
10.2 Site Plan Assessment

The site plan dated March 24, 2009 (***Figure 2–3***) was evaluated for access and circulation issues. Based on this evaluation, LLG has the following recommendations.

1. The one-way School Bus Road shall continue its current operations in which buses and vehicles enter from Valley Center Road and exit to Lake Wohlford Road.

2. Place the relocated parking lot driveway to Street "A" further south to be opposite the commercial portion parking lot access and provide for a four-legged intersection. The current location is only 50 feet from Valley Center Road, which could result in queuing issues and conflicting movements.

Figure 10–1 illustrates the project access recommendations.



LINSCOTT LAW & GREENSPAN engineers

Figure 10-1

Project Access Recommendations

9-ACRE SAN PASQUAL PROJECT

11.0 IMPACT SUMMARY

The project is calculated to generate a total of 5,122 ADT with 336 total AM and 309 total PM peak hour trips. The effects of the proposed project traffic were measured at 6 intersections and 4 street segments in the project area for near-term and long-term conditions.

11.1 Significance of Impacts

The following is a description of the calculated significant impacts for the proposed project based on the County's established significance criteria along with recommendations for mitigation measures at the impacted locations.

Direct

1. Valley Center Road segment west of Lake Wohlford Road

Cumulative

2. Valley Center Road/ Street "A"intersection

3. Valley Center Road segment west of Lake Wohlford Road

11.2 Mitigation Measures

The following mitigation measures are recommended.

1 & 3.

Valley Center Road west of Lake Wohlford Road (Lake Wohlford Road to Cole Grade Road): Provide an eastbound left-turn only lane at the Valley Center Road/ Molly Anne Court intersection (entering into Citrus Point Subdivision). This capacity improvement to this intersection along Valley Center Road would directly improve traffic flow and is a proportional improvement to the amount of traffic the project adds to the segment. The provision of this left turn lane will enable left turn vehicles to not need to stop in Valley Center Road through traffic to make their turn. This is advantageous due to high speeds on Valley Center Road. This improvement would mitigate the significant impact.

2.

Valley Center Road/ Project Access intersection: Restripe Valley Center Road to provide a westbound left-turn lane with 150-feet of storage and a 90-foot bay taper. Provide two outbound (northbound) lanes on Street "A", one left-turn lane and one right-turn lane with an overlap phase. Conduct an annual traffic count at the Valley Center Road/ Street "A" intersection as part of a monitoring program of the intersection to determine when signal warrants are met. Install the traffic signal once warrants are met.

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Appendix E Resumes of the Preparers

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Andrew E. Boenau

Transportation Engineer

Mr. Boenau has 11 years of diversified transportation experience that includes safety studies, Road Safety Audits (RSA), crash analysis, intersection planning and design, access management, and traffic signal design in both the public and private sector. He is also active in the public involvement component of transportation projects.

VDOT 2035 State Highway Plan: Strategically Targeted Affordable Roadway Solutions (STARS)

Central and Eastern Operations Region manager providing professional engineering/planning services in the development of the Commonwealth's 2035 State Highway Plan by conducting a thorough examination of Virginia's interstate and primary highway systems to identify short/mid-term operational and safety improvements. Mr. Boenau is currently working with VDOT to identify/prioritize corridors and intersections for safety review and congestion mitigation, and will lead road safety assessments of selected corridors/intersections and address over 100 locations documenting deficiencies and providing potential corrective measures.

Statewide Safety Action Plan

Project Engineer. Assisted VDOT in the development of a Safety Action Plan (SAP) to guide the Department's activities for implementing the strategies contained in the Commonwealth's Strategic Highway Safety Plan (SHSP). Some of the strategies in the SHSP may face constraints to being implemented. These constraints may include such items as funding, manpower, policy, or legislative requirements. The purpose of the SAP was to identify the primary stakeholder responsible for implementing a strategy or action within VDOT and to track progress on implementation for each strategy.

VDOT Intelligent Transportation Systems/Operations On-Call Services

Project Manager for tasks involving VHB as part of VDOT's 3-year, $6 million Statewide ITS on-call team. Responsible for staffing plans, scoping, schedules, and financial management for task orders. Traffic engineering tasks included traffic signal systems, project prioritization for critical crash rate intersections, and crash countermeasure development applying nationwide best practices in Virginia.

Route 29 Access Management Plan, Danville, VA

Project Manager. Working with Pittsylvania County, Danville Urbanized Area MPO, and VDOT to develop an access management plan for a critical segment of Route 29 between Blairs and Dry Fork, VA. In addition to being a significant regional facility, in Virginia U.S. Route 29 links urban, suburban, and rural localities within Pittsylvania County. The Access Management Plan will help maintain an efficient flow of traffic, improve safety, and accommodate multimodal uses where appropriate.

Franklin County Access Management Guidebook, Franklin County, VA

Project Manager. Planning guide to help develop and implement cost-effective solutions to traffic and safety problems by applying access management principles. Guidebook contains action items for immediate integration into the County's comprehensive plan and land use ordinances. Other jurisdictions can apply the recommendations developed in this joint effort between the County, West Piedmont Planning District Commission, and VDOT. Franklin County adopted the Guidebook in 2007.

Education	B.S., Civil Engineering, Virginia Polytechnic Institute and State University
Professional Registrations/ Certifications	Virginia Section of the Institute of Transportation Engineers Urban Land Institute

Ray Clark

GreenWave Environmental Consulting, Inc.

Role: Cumulative Impacts Assessment Expert; Tribal, Local State and Federal Agency Consultations and Coordination Expert

Mr. Clark, is a NEPA expert with more than three decades of environmental experience. He has extensive experience preparing, reviewing and approving NEPA regulations, writing environmental impact analyses, reviewing and approving environmental analyses, and making decisions based on environmental analyses.

As Associate Director of the Council on Environmental Quality, he implemented the Council's mandate for oversight of NEPA, reviewed and approved federal agency NEPA regulations, and mediated interagency disputes regarding compliance. During his tenure at CEQ, he led the development of the handbook, "Considering Cumulative Effects Under the National Environmental Policy Act."

As acting Assistant Secretary of the Army for Installations, Logistics, and Environment and Principal Deputy Assistant Secretary of the Army, he was responsible for over 14 million acres of land, 2,000 army installations, a $10.5 billion construction and base operations budget, and $1.4 billion in environmental program management. He reviewed numerous NEPA analyses in his role as the decision-maker on the most complex and controversial Army projects.

Mr. Clark has published numerous papers on environmental issues and policies, has co-authored two seminal books on these subjects and is frequently invited to present and lecture at conferences and universities. As an adjunct faculty member at Duke University, Mr. Clark develops courses and seminars on environmental policy and lectures at the Nicholas School of the Environment. He is currently leading the development of a suite of courses for the NRC.

Education

1974 B.A., Jacksonsville State University
1984 M.A., Environmental Management – Duke University

GreenWave
ENVIRONMENTAL CONSULTING

Professional Experience

2008-present	President, GreenWave Environmental Consulting, Inc.
2008-present	Vice-President, Washington Operations, Environet, Inc.
2001-present	Of Counsel, The Clark Group, LLC
1999-2001	Acting Assistant Secretary of the Army for Installations and Environment, United States Department of the Army Principal Deputy Assistant Secretary of the Army
1992-1999	Associate Director; Senior Policy Analyst, Council on Environmental Quality, White House Office of Environmental Quality
1988-1992	Assistant for Environment, Office of the Secretary of the Army
1988-present	Adjunct Faculty, Duke University
1986-1988	Environmental Protection Specialist, U.S. Army Corps of Engineers
1979-1986	Chief, Environmental & Natural Resources Office, U.S. Army Chemical and Police Schools, Ft. McClellan

Affiliations

Director, Native Hawaiian Community Development Corporation
Board of Directors, Federal Development, LLC
Past Board Member – International Association for Impact Assessment
Past Commissioner – Alexandria Environmental Policy Commission
International Advisory Board Member – Environmental Assessment Review
Editorial Board – Forum for Applied Research and Public Policy, University of Chicago
Review Committee – National Association of Environmental Professionals

Awards

National Resources Council of America, National Environmental Quality Award
Secretary of the Army, Environmental Quality Award
Secretary of the Army, Superior Civilian Service
Alabama Environmental Quality Association, Milestone Achievement Award
Alabama House of Representatives, Distinguished Service Award

Relevant Experience

Mr. Clark has worked in the environmental profession for more than 30 years at the local, state and national level. He has managed interdisciplinary teams working on hazardous waste remediation, natural resource management, energy planning and strategic planning. During his tenure at the white house council on environmental quality, he led the development of the handbook that is considered the standard in practical approached to assessing cumulative effects. He teaches cumulative effects analysis at Duke University and is leading a team assessing cumulative effects of the proposed airport near Las Vegas, Nevada.

Mr. Clark has worked with American Indian tribes near Seattle assisting with salmon recovery efforts where he spearheaded a tribal-private partnership construction of a biogas facility to capture animal wastes and convert it to energy. He has been retained by a tribe in Kansas to help them achieve energy independence. He also developed the US Visit program's "American Indian Consultation Policy."

Stephanie Davis
Project Manager
Environmental Scientist

Date of Hire – 1/1/06

Designations
n/a

Education
1996 B.S. Environmental Science, The Evergreen State College

Professional Experience

2005 to present	Project Manager/Environmental Scientist, Environet, Inc.
2002-2005	Environmental Scientist, BEI Environmental Services
2000-2001	Fisheries Scientist, National Oceanic & Atmospheric Administration
2000	Laboratory Technician, Brooks Rand Laboratory

Professional Certifications & Training
29 CFR 1910.120 - 40 Hour HAZWOPER
Hazardous Communications and Chemical Hygiene Training
Adult CPR/Standard First Aid Certified
Maritime Port Security (MARSEC) Training
State of Hawaii Asbestos Inspector Certification
State of Hawaii Lead Based Paint Risk Assessor Certification

Areas of Expertise
Environmental Investigations
Soil and groundwater sample collection
Underground storage tank closures
Monitoring programs
Waste removal actions
State of Hawaii Voluntary Response Program

Career Summary
With over a decade of industry experience, including participation in natural resources studies and environmental education programs in West Africa, Washington, and Hawaii, Ms. Davis has served on projects in a multitude of capacities including environmental scientist, fisheries technician, environmental laboratory technician, and field biologist. She is well-versed in the collection of soil and groundwater samples and in the use of

field instruments such as photoionization detectors, interface probes, and pH- and conductivity-meters.

Ms. Davis has managed and conducted numerous environmental investigations throughout the State of Hawaii, including environmental site assessments for commercial, residential, and industrial sites; soil and groundwater monitoring; underground storage tank closures; remedial investigations; hazardous waste removal actions; soil and groundwater remediation; and environmental impact statements.

These investigations have been performed in the context of waste disposal facilities, retail service stations, automotive repair and maintenance facilities, dry cleaning facilities, hotel sites, base yards, and former sugar mills. In addition, she has performed quarterly groundwater monitoring at commercial properties, managed remediation activities of petroleum and lead-contaminated soil, bioremediation of petroleum-contaminated soil, soil investigation of a waste disposal business, and closure of underground storage tanks as large as 20,000-gallons.

Ms. Davis frequently collaborates with regulatory agencies to coordinate project efforts, address permitting procedures, and expedite project completion. She is familiar with the State of Hawaii Voluntary Response Program and has completed the process for several clients. In the past, she has also facilitated the permitting process for Underground Injection Control (UIC) wells and National Pollutant Discharge Elimination System (NPDES) permits.

Selected Project Experience

Long-Term Monitoring/Remedial Action Operations at Guam and Barbers Point, PACNAVFACENGCOM IDIQ Contract. Operations and Quality Control Manager responsible for directing work associated with remedial action operations. Specific tasks include managing and administering material logistics; executing project tracking system; coordinating on-site work, including subcontractors; monitoring on-site crew performance and quality of work; ensuring that RAO equipment is properly monitored and maintained to provide effective operations and prevent system shutdown and maintaining, and enforcing the QC program.
Year Completed: Ongoing Contract Amount: **$3 million Performed with EI**

Environmental Technical Services for Environmental Sites at Navy Installations and Facilities Located on Guam and Former Naval Air Station Barbers Point, NAVFAC Pacific IDIQ Contract. Operations and QA/QC Manager responsible for Operations and Quality Control Manager responsible for directing work associated with remedial action operations. Specific tasks include managing and administering material logistics; executing project tracking system; coordinating on-site work, including subcontractors; monitoring on-site crew performance and quality of work; ensuring that RAO equipment is properly monitored and maintained to provide effective operations and prevent system shutdown and maintaining, and enforcing the QA/QC program.
Year Completed: Ongoing Contract Amount: **$3 million Performed with EI**

Groundwater Monitoring and Product Recovery System Maintenance, Costco Wholesale. Honolulu, Hawaii.
Environmental Scientist responsible for monthly gauging and maintenance of site-wide groundwater monitoring wells and sumps; coordination and supervision of subcontractors; semi-annual groundwater sampling; semi-annual product pumping; preparation of written quarterly reports documenting field activities; and preparation of an annual report summarizing all site activities and data.
Year Completed: Ongoing Contract Amount: **approx. $1 million**

Former Meadow Gold Site Soil Remediation, Honolulu, Hawaii. Project Manager and Environmental Scientist for remediation and removal of 2,050 cubic yards of petroleum impacted soil. Site activities included coordination and supervision of subcontractors, excavation and disposal of petroleum impacted soil, vacuum pumping of free product, bioremediation of dissolved phase petroleum constituents, soil and groundwater sampling to assess any residual contamination, and preparation of Removal Action Report documenting field activities and analytical results for submittal to State of Hawaii Department of Health to receive a No Further Action (NFA).
Year Completed: 2008 Contract Amount: $600,000 Performed with EI

Site Remediation for Confidential Client. Kapolei, Hawaii. Project Manager, Environmental Scientist, and Site Safety and Health Officer managing remediation activities of lead-contaminated soil. Tasks included delineation of extent of impacted soil; classification and mapping of lead-contaminated soil areas; coordination and supervision of subcontractors; remediation of hazardous lead-contaminated soil; confirmation soil sampling; and preparation of a written report documenting field activities.
Year Completed: 2005 Contract Amount: $94,500

Bioremediation of Petroleum-Contaminated Soil for Confidential Client. Honolulu, Hawaii. Project Manager, Environmental Scientist, and Site Safety and Health Officer managing the bioremediation of petroleum-contaminated soil at the site. Bioremediation activities included biological enhancement and tilling of petroleum-contaminated soil; confirmation soil sampling; preparation of a written report documenting field activities; coordination for site access; coordination with on-site personnel; and coordination and supervision of subcontractors.
Year Completed: 2002 Contact Amount: $14,000

Groundwater Remediation System, Castle & Cooke Commercial, Inc., Honolulu, Hawaii. Environmental Scientist overseeing construction and maintenance of remediation system to treat petroleum-contaminated groundwater; coordination for site access; coordination and supervision of subcontractors; weekly and monthly effluent sampling; and preparation of monthly discharge compliance reports.
Year Completed: Ongoing Contract Amount: $125,500 Performed with EI

UST Closure, Verizon Western Division, Honolulu, Hawaii. Project Manager, Environmental Scientist responsible for completing notification to state agencies, coordination and supervision of subcontractors, overseeing and documenting UST closure activities, confirmation sampling, and report preparation.
Year Completed: 2003 Contract Amount: $17,000

UST Closure & Soil Investigation at Lihue Airport Dollar Rent-a-Car, Lihue, Hawaii. Project Manager, Environmental Scientist responsible for completing notification to state agencies, coordination and supervision of subcontractors, overseeing and documenting UST closure activities, confirmation sampling, and report preparation.
Year Completed: 2004 Contract Amount: $50,000

UST Release and Soil & Groundwater Investigation for Mercantile Trucking, Honolulu, Hawaii. Project Manager, Environmental Scientist responsible for preparation of work plan, coordination and supervision of subcontractors, collection of soil and groundwater samples, and report preparation.
Year Completed: 2004 Contract Amount: $8,000

20,000-gallon UST Closure-in-Place, Castle & Cooke Commercial, Inc., Honolulu, Hawaii. Project Manager, Environmental Scientist, and Site Safety and Health Officer managing the closure of a 20,000-gallon UST at the former Dole Cannery site. Activities involved coordination for site access; sampling and identification of the UST contents; coordination and supervision of subcontractors; removal and disposal of the tank contents off-site; filling the UST with cement; confirmation soil and groundwater sampling; and preparation of a written report documenting field activities. Soil borings were advanced using Geoprobe direct push technology. Installed two-temporary groundwater monitoring wells, and performed groundwater monitoring.
Year Completed: 2003 Contract Amount: $60,000

Rolloffs Hawaii Phase II Site Investigation, Honolulu, Hawaii. Project Manager and Environmental Scientist for soil investigation to address areas of possible petroleum-contamination identified during a Phase I Site Assessment. Soil borings were advanced using Geoprobe direct push technology and soil samples were collected and analyzed to assess the extent of contamination. Site activities included coordination of site access, removal, classification, and disposal of petroleum-contaminated soil off-site, coordination and supervision of subcontractors, confirmation soil sampling, and preparation of report documenting field activities.
Year Completed: 2003 Contract Amount: $11,900

Phase II Site Investigation for Confidential Client, Wailua, Kauai, Hawaii. Project Manager and Environmental Scientist for soil investigation. Site activities included coordination of site access, soil sampling to assess the vertical and horizontal extent of mercury-impacted soil, coordination and supervision of subcontractors, and preparation of report documenting field activities.
Year Completed: 2005 Contract Amount: $18,000

Site Investigation, Clean Living - Hakuyosha International Inc., Honolulu, Hawaii. Project Manager and Environmental Scientist for soil and groundwater investigation. Site activities included coordination of site access, soil, soil vapor, and groundwater sampling to assess the potential subsurface presence of volatile petroleum compounds, coordination and supervision of subcontractors, and preparation of report documenting field activities.
Year Completed: 2007 Contract Amount: $76,000 Performed with EI

Sprint Lot Voluntary Response Program, Honolulu, Hawaii. Project Manager and Environmental Scientist for preparation of technical documents to complete the 10 task State of Hawaii Voluntary Response Program. Reporting included summarizing historical environmental data, assessing the environmental risks, outlining the remedial options for the site, selecting an appropriate remedial option, and implementation of a public participation plan.
Year Completed: 2007 Contract Amount: $56,800 Performed with EI

Sprint Lot Remediation Enhancement Program, Castle & Cooke Commercial, Inc., Honolulu, Hawaii. Project Manager and Environmental Scientist for petroleum remediation program, in an effort to remediate the site to satisfy regulatory requirements. Site activities included coordination of site access, coordination and supervision of subcontractors, periodic well gauging and product pumping, free product monitoring, groundwater sampling, and preparation of status reports documenting remedial progress.
Year Completed: Ongoing Contract Amount: $106,500 Performed with EI

Hana Landfill Monitoring, County of Maui. As Environmental Scientist conducted semi-annual groundwater monitoring at the Hana Landfill. Conducted field sampling activities, reviewed analytical data, completed statistical analysis, and prepared annual reports to State of Hawaii Department of Health.
Year Completed: 2004 Contract Amount: $20,800

Environmental Impact Statement, Artificial Reef Installation, Lahaina, Maui, Hawaii. Environmental Scientist for preparation of an environmental impact statement. Field activities included an ocean activities survey and coordination with subcontractors and personnel to complete a boat traffic survey, water quality assessment, and marine community structure assessment. Community interviews were conducted and archaeological and cultural research was performed. Following publication of the draft EIS, response to comment letters were prepared and meetings were held with DLNR. A public meeting was held and after agency and community approval, a final written EIS was prepared. In addition, permit applications were prepared for several regulatory agencies.
Year Completed: 2005 Contract Amount: $112,000

Shellfish Surveys, Various Beaches, Puget Sound, Washington. Fisheries Technician for shellfish surveys at various beaches throughout Western Washington. Laboratory data was gathered on different shellfish species. Field data was entered into a database and various technical reports were prepared.

Year Completed: 1996 **Contract Amount: Not applicable**

Stream Surveys, Willamette National Forest, Oregon. Fisheries Technician for stream surveys in the Willamette National Forest. Surveys included collection of stream attribute data, riparian zone description, and snorkeling for fish identification. Daily field logs were prepared and field data was entered into a database.

Year Completed: 1998 **Contract Amount: Not applicable**

Douglas A. DeBerry, Ph.D., PWS, PWD
Senior Environmental Scientist

Fort Pickett, Blackstone, VA
Project and Task Manager: habitat assessment for fire-dependent stress-disturbance obligates (e.g., the federally endangered Michaux's sumac, *Rhus michauxii*), wetland mapping, GIS integration, floristic survey, rare species and habitat inventory, and herbarium documentation over a 45,000-acre military installation in central Virginia.

Fountainhead Regional Park, Fairfax County, VA
Project Manager: natural resource inventory, vegetation community mapping, and wildlife habitat analysis on a large NVRPA regional park in Fairfax County, Virginia.

Bull Run Shooting Center, Fairfax County, VA
Project Manager: wetland delineation and COE approval, natural resource inventory and assessment, floodplain hydrogeomorphology assessment, amphibian habitat assessment, toxic metals remediation alternatives analysis on a NVRPA public park in Fairfax County.

Liberson Property, Fauquier County, VA
Project Manager: natural resource inventory, wildlife habitat assessment and habitat management plan, vegetation community mapping, stream geomorphic, habitat, and water quality assessment, pond and stream restoration plan, wetland delineation, and permit support on a ca. 200-acre privately-owned tract of land in Fauquier County, VA.

Bristers to Gainesville Powerline Project, Prince William and Fauquier Counties, VA
Task Leader for rare species surveys and habitat evaluation, including stiff goldenrod (*Oligoneuron rigidum* var. *rigidum*) and Torrey's mountain-mint (*Pycnanthemum torrei*), as well as a Natural Heritage conservation area known as the Vulcan Gainesville Tract characterized by diabase glade, a rare scrub-meadow community type established over edaphic conditions corresponding to unique geologic substrates.

Fort Lee Forest Inventory, Petersburg, VA
Project Manager: forest inventory including detailed statistical analysis of understory vegetation, mapping, project narrative on an active military installation in east-central Virginia.

Pond Bay, Island of St. John, U.S. Caribbean
Project and Task Manager: mangrove and seagrass monitoring, coral mapping, wetland delineation, general resource inventory, wildlife inventory, public advocacy, Coastal Zone Management Act coordination, and environmental permitting on a tract of land in the sub-tropical West Indies.

Snowshoe Mountain Resort, Snowshoe, WV
Task Manager: permitting support, wetland delineation, stream gauging, fish inventory, and flying squirrel survey over a 10,000-acre ski resort and recreational facility in eastern West Virginia.

Deer Management Plan, Valley Forge National Historical Park, PA
Technical advisor in developing a comprehensive deer management plan for this important National Park Service park in Pennsylvania. Included a review of all potential management options available to the park service, particularly in

Doug DeBerry has over 15 years of professional experience as an environmental specialist during which time he has managed multi-disciplinary teams for a variety of projects. His areas of specialization include natural resource management , inventory and assessment, endangered species surveys, environmental permitting, wetland delineation, wetland mitigation planning and monitoring, and stream assessment. He is a certified wetland delineator and professional wetland scientist and is a recognized expert as an accredited survey contact for threatened and endangered species. He has extensive experience working in habitat management and creation/restoration, and completed his doctoral dissertation (2006) on assessment of created and restored ecosystems, with emphasis on plant community ecology in successional habitats.

Continued, p. 2

consideration of aspects such as public opinion and the ultimate goal of managing native vegetation communities affected by deer predation.

Uwharrie Point, Badin, NC
Project and Task Manager: permitting support, detailed lake bathymetry, bald eagle surveys, wetland delineation, and shoreline management plan development for a high-end residential and golf development on a TVA reservoir in central North Carolina.

Dundalk Mitigation Area, Dundalk, MD
Project Manager: mitigation monitoring, agency coordination, and invasive species remediation on a wetland creation site near Baltimore, Maryland.

Education	Ph.D., Marine Science, College of William and Mary, 2006 M.A., Biology, College of William and Mary, 1999 B.A., Environmental Sciences, University of Virginia, 1993
Professional Registrations/ Certifications	Professional Wetland Scientist 1999 Professional Wetland Delineator: Virginia 2005 USFWS-Approved Survey Contact for all Plant Species in Virginia
Affiliations/ Memberships	Natural Areas Association *Flora of Virginia* Advisory Board Society of Wetland Scientists Virginia Association of Wetland Professionals (Vice-President: 2008-2009) Association of State Wetland Managers Southern Appalachian Botanical Society Virginia Natural History Society Mid-Atlantic Wetland Workgroup

Select Publications

DeBerry, D.A. and J.E. Perry. 2007 Noteworthy collections: Virginia. *Castanea* 72:119-120.

Nichols, J.D., J.E. Perry, and D.A. DeBerry. 2006. Using a Floristic Quality Assessment technique to evaluate plant community integrity of forested wetlands in southeastern Virginia, USA. *Natural Areas Journal* 26: 360-369.

Bailey, D.E., J.E. Perry, and D.A. DeBerry. 2006. *Aeschynomene virginica* (L.) B.S.P. habitat in a tidal freshwater marsh, James City County, Virginia. *Banisteria* 27: 3-9.

DeBerry, D.A. and J.E. Perry. 2005. A drawdown flora in Virginia. *Castanea* 70:276-286.

DeBerry, D.A., W.D. Beisch, and T.W. Crayosky. 2004. Integrated wetland design: sustainability within the landscape. (Invited Paper). *Geo-Strata* Spring 2004:23-25.

DeBerry, D.A. and J.E. Perry. 2004. Primary succession in a created freshwater wetland. *Castanea* 69: 185-193.

Colette Sakoda
Senior Environmental Planning Manager

Date of Hire – 11/1/2000

Designations
M.C.P.

Education
1981 M.C.P. City and Regional Planning, University of California at Berkeley
1979 M.P.A. Public Administration, California State University at Fullerton
1975 B.A. Journalism, University of Hawaii at Manoa

Professional Experience

2000 to present	Senior Environmental Planner, Environet, Inc.
1998-2000	Project Manager, Parsons, Brinkerhoff, Quaid, & Douglas
1986-1998	Planning Project Manager, R.M. Towill Corporation
1983-1986	Chief Planner, State of Hawaii - Hawaii Housing Authority
1982-1983	Planner, EDAW - Planning and Landscape Architecture
1981-1982	Planner, Executive Office on Aging

Professional Certifications & Training
Initial 40-Hour HAZWOPER Training
HDOH Certified Lead Risk Assessor
CPR & First Aid Certified

Professional Affiliations
Member - American Planning Association

Career Summary
Ms. Sakoda has over two decades of environmental and community planning experience in both the public and private sectors. She has managed and staffed multi-disciplinary environmental planning projects which have included community consultation, field reconnaissance, documentation, preparation of NEPA environmental impact statements, NEPA Categorical Exclusions evaluations and assessments and Chapter 343, HRS environmental evaluation.

She served as a Senior Planner/Planning Project Manager on the Honolulu Bus Rapid Transit Project and later as a Technical Presenter for the Honolulu High-Capacity Transit Corridor's public outreach Speakers Bureau.

She has prepared waterfront redevelopment and new community master plans and processed land use and environmental permits for new developments. She has extensive experience in acquiring State Historic Preservation Officer approvals, has coordinated Section 106 consultation tasks and has managed Section 7 Endangered Species Biological Assessment preparation and consultation with USFWS and NMFS.

She is well-versed in contract management, project scheduling, QA/QC implementation and assurance, technical analysis, and government agency coordination. She is adept at communicating technical engineering, legal, and environmental concepts to the general public and has participated in the community involvement and neighborhood participation phases of project planning with the focus on obtaining consensus and project acceptance.

Additionally, she has managed environmental/hazardous waste studies and has supervised lead based paint surveys field work for military bases and statewide public housing developments.

Selected Project Experience

Honolulu High-Capacity Transit Corridor Alternative Analysis Study, subconsultant to Parson Brinckerhoff Quaid and Douglas, Honolulu. Technical Presenter for the Honolulu High-Capacity Transit Corridor Speakers Bureau. Assisted public involvement team by making presentations to citizen groups during the preparation of the Alternative Analysis for the project. Attended regular briefings on the progress of the Alternative Analysis and training sessions in preparation for public presentations.

Alternatives Analysis/Environmental Impact Statement – Honolulu Bus Rapid Transit, City and County of Honolulu Department of Transportation Services. Parson Brinckerhoff Quaid and Douglas. Served as Senior Planner/Planning Project Manager conducting land use planning programs and policies research for the Bus Rapid Transit Alternatives Analysis/NEPA EIS. Duties included active participation as an EIS writer and managing subconsultants' work product including that of Mason Architects, Helbert Hastert Fee and Plan Pacific. Coordinated and communicated project status in relation to their expected work products.

Environmental Impact Statement for Kalaeloa Barbers Point Harbor Deepening Project, USACE, Honolulu District. As Senior Planner managed the preparation of a NEPA Supplemental Environmental Impact Study for the deepening of the Kalaeloa Harbor channel to improve navigation. Evaluation included Section 7 Endangered Species Act consultation with the USFWS and NMFS. Responsible for oversight of

subconsultants, review and incorporation of studies into the SEIS, interaction with government agency personnel, participation in public hearings and other briefings, including stakeholder consultations.

Honolulu Harbor Environmental Impact Statement for Channel Deepening Navigational Improvements. Senior Planner involved in preparation of NEPA EIS for the deepening of the Kalihi Channel to improve navigation in Honolulu Harbor.

Environmental Assessment for Wailele Stream Flood Damage Reduction Study USACE, Honolulu District. Senior Planner responsible for prepared and processing NEPA Environmental Assessment evaluating environmental and socio-cultural impacts of an array of alternative solutions to flooding in the Wailele Stream Watershed. Prepared cultural resource impact assessment, final Environmental Assessment, and a Findings of No Significant Impact.

Ocean Pointe Off-site Sewer Line Environmental Assessment, Ewa, Oahu, Hawaii. Senior Planner for preparation and processing of environmental assessment for replacement of a deteriorating 24" sewer line with a new 36" line and to increase the size and capacity of the Ewa Beach Wastewater Pump Station. EA incorporated data gathered from document research, site reconnaissance, regulatory consultation, and design plans for project area. Data included environmental, cultural, socio-economic, and infrastructure system conditions.

Kekaha Agricultural Park Environmental Assessment, State Department of Agricultural Park, Kauai. Senior Planner working with a committee consisting of State Department of Agriculture, County of Kauai Economic Development officials, University of Hawaii researchers, and Kekaha Sugar Company representatives to facilitate development and design as well as the environmental assessment. Responsible for preparation of Chapter 343, HRS Environmental Assessment and oversight and evaluation of all subconsultant studies including agro-economic market study, archaeological resource impact analysis, botanical resource assessment, and wildlife biological resource assessment.

Environmental Assessment for Iao Stream Flood Control Project, USACE, Honolulu District. Senior Planner responsible for preparation and processing of a NEPA Environmental Assessment that evaluated environmental and socio-cultural effects of stream improvements to halt levee and stream bed erosion, protect adjoining property during major storm events, and maintain habitats. Coordinated community consultation efforts and Section 7 consultation tasks to ensure that project objectives were achieved during the preparation and review process.

Environmental Assessment for Saipan Ecosystem Restoration USACE, Honolulu District. Senior Planner responsible for preparation and processing of a NEPA environmental assessment evaluating improved watershed management alternatives for 1.5-miles of shoreline in Western Saipan, including Garapan resort area. Scoping

marketplace planning effort. Performed land use inventory analyses, research and feasibility studies as part of the long range plan preparation for this urban redevelopment undertaking.

Waikoloa Affordable Housing Master Plan, County of Hawaii, Office of Housing and Community Development, Waikoloa, Hawaii. Served as Senior Planner on consulting team tasked with master planning a 150-acre site within Waikoloa Village. Responsible for preparing land use alternatives for site that presented design and development challenges, including rolling lots on rough lava fields. Appeared before the County's Planning Commission and Housing Committee to present findings.

Kailua-Kona Town Master Plan Revision, County of Hawaii. Served as Senior Planner on consultant team responsible for revising the Kailua-Kona Town Master Plan. Responsibilities included providing the framework, policies, and land use inventory information needed for the planning document.

Kawaihae Long Range Master Plan, State Department of Hawaiian Home Lands. Senior Planner on consulting team commissioned to prepare a long-range master plan for 200+ acre site on the Island of Hawaii. Provided research, land use inventory and opportunities and constraints analyses. Participated in the preparation of the Master Plan Report and Environmental Impact Statement.

Kamanele Park Master Plan, City & County of Honolulu, Oahu. Planner responsible for data gathering, research, capital improvement project research and analysis, and community consultation to prepare foundation of design guidelines for entry monument for Manoa Valley.

Concrete Plants, Terminals and Quarries Statewide, Hawaiian Cement, Hawaii. Project manager responsible for coordination, preparation and processing of Department of Health NPDES industrial storm water permit in compliance with EPA regulations for industrial operations.

Kaneohe Marine Base Hawaii Lead Based Paint Survey, USACE, Honolulu District. Project Manager responsible for lead based paint survey of 91 industrial warehouse and storage buildings slated for demolition and/or renovation. Survey was conducted in accordance with HUD Federal interim rules and procedures regarding lead paint survey protocol. Supervised two field survey teams and served as field team investigator/surveyor, as needed, to complete the comprehensive survey. Protocol included utilizing state-of-the art XRF technology and paint chip sampling procedures, documenting results, and providing recommendations on abatement and alternatives.

Nicole Scheman
Senior Scientist

Date of Hire – 6/13/05

Designations

Ph.D. (pending)

Education

Present	Ph.D. Candidate, Natural Resource and Environmental Management, University of Hawaii at Manoa
2002	M.S. Environmental Science, University of Guam
1999	B.S. Geology, College of Charleston, S.C.

Professional Experience

2005 to Present	Senior Environmental Scientist, Environet, Inc.
2004-2006	Research Assistant, University of Hawaii at Manoa
2003-2004	Hydrologic Technician, U.S. Geological Survey
2000-2002	Hydrologic Technician Intern, U.S. Geological Survey
1996-1999	Laboratory Assistant, College of Charleston, S.C.

Professional Certifications and Training

Occupational Safety and Health Administration (OSHA) – 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER)
Department of Transportation (DOT) – Hazardous Material Training Title 49, CFR 172.704(a),(1),(3),(4)
U.S. Environmental Protection Agency (USEPA) – Lead-Based Paint Inspector
U.S. Navy – Anti-Terrorist, Level 1 Awareness Certification
U.S. Army Corps of Engineers (USACE), Honolulu District – Small Business Safety Training
Sampling for Defensible Environmental Decisions Course sponsored by Hawaii Department of Health (HDOH)
American Red Cross – CPR and First Aid
Unexploded Ordnance Safety (UXO) Safety Awareness Training Course sponsored by Donaldson Enterprises, Inc. (DEI)

Professional Association of Diving Instructors (PADI) Certified Advanced Diver

Professional Affiliations
Member – Environmental and Engineering Geophysical Society
Member – Geological Society of America
Member – Project Management Institute

Publications

Schenck, S. and Scheman, N. 2008. Microorganisms for Bioremediation. Agriculture Hawaii (fall issue).

Scheman, N. 2007. Microbial Influenced Corrosion in a Hawaii Soil. College of Tropical Agriculture and Human Resources Annual Symposium (CTAHR) 19th Annual Student Research Symposium poster.

Scheman, N. 2006. Microbial Influenced Corrosion in a Hawaii Soil. College of Tropical Agriculture and Human Resources Annual Symposium (CTAHR) 18th Annual Student Research Symposium poster; Department of Natural Resources and Environmental Management (NREM) Ph.D. poster session winner.

Hazell, W.F. and Scheman, N.D. 2004. Procedures for Data Collection and Quality Assurance for the Charlotte/Mecklenburg Rainfall Network. U.S. Geological Survey Water Resources Division internal publication.

Scheman, N.D. 2004. Procedures for Data Collection and Quality Assurance for the Use of Optical Backscatter Sensors in Mecklenburg County, North Carolina. U.S. Geological Survey Water Resources Division internal publication.

Scheman, N.D. and Hazell, W.F. 2004. An Update to the Charlotte/Mecklenburg County Rainfall Network. U.S. Geological Survey Fact Sheet.

Scheman, N., Golabi, M., Heitz, L., Hill, B. and Khosrowpanah, S. 2003. Quantitative Identification of Erosion Processes and Sources of Exposed Patches in the La Sa Fua Watershed of Southern Guam. Water and Environmental Research Institute (WERI), University of Guam Technical Report No. 99

Areas of Expertise

- Technical report writing
- Compiling and drafting environmental proposals, phase reports, baseline surveys, investigations and remediation reports
- Site reconnaissance to observe environmental geologic and hydrogeologic conditions and current activities of subject properties
- Presenting assemblages of data collection
- Management and coordination of subcontractors and subcontracted laboratories

- Coordinate geographic information system (GIS) and design-software output production
- Specializations include multi-incremental sampling, risk avoidance and work plans for unexploded ordnance (UXO) removal and remediation

Career Summary

Ms. Scheman's professional background includes multi-incremental (MI) sampling, risk avoidance and work plans associated with UXO removal projects, coastal zone surveys, storm water data collection, interpretive studies on the quantity and quality of surface and ground water, and reconnaissance to observe environmental conditions and current activities of subject properties. Here academic background in geology and environmental hydrogeology lends itself to her specialized assessment capabilities for geologic and hydrogeologic resources. For the past four years she has worked to accumulate data for research and analysis of UXO chemical constituents in Hawaii soils. Her dissertation work is further associated with the corrosion of UXO.

Selected Project Experience

Removal and Disposal of Munitions and Explosives of Concern (MEC) for Formerly Used Defense Sites (FUDS)

Project Senior Scientist responsible for costing and drafting risk assessment and work plans associated with MEC response and removal, including analog and digital geophysical mapping, geographic information system (GIS) management and recording, anomaly discrimination, time-critical and non-time critical removal actions, emergency removal responses, clean-up of range residue, disposal and management of MEC and other constituents related to MEC.
Year completed: Ongoing Contract Amount: $13,900,000
Performed with Dawson- Environet Joint Venture

Hawaii Undersea Military Munitions Assessment

Project Senior Scientist responsible for conducting a review of existing databases and technical documents, developing a sampling and analysis plan, deep-sea munitions' chemical and constituent sampling, data analysis, determination of human health and environmental risk, implementing a community outreach program, and preparing a final summary assessment.
Year completed: Ongoing Contract Amount: >$900,000
Performed with Environet and the University of Hawaii

Mapping and Detection of Unexploded Ordnance within the Former Waikoloa Maneuver Area, Hawaii.

Project Manager responsible for environmental baseline survey, work plans, health and safety plan, and geophysical and soil chemistry reports. Specific tasks included historical research, site surveys, drafting of figures, soil sampling, managing sub-consultants, and tracking project schedules and budgets.
Year completed: 2007 Contract Amount: $325,000
Performed with Environet

Mapping of the Lalamilo Subject Property within the Former Waikoloa Maneuver Area, Hawaii.

Project Manager responsible for creating a GIS-based utility for viewing survey and map layers with in the project boundary. Specific tasks included site surveys, drafting of figures, managing technical staff, and tracking project schedules and budgets.
Year completed: 2007 Contract Amount: $270,000
Performed with Environet sister company, CP&E

Enhanced Degradation of Energetics in Firing Ranges Located in Tropical Environments, SERDP/ESTCP Award, U.S. Army.
Makua Military Reservation, Oahu, Hawaii

Environmental Scientist responsible for evaluating *in-situ* degradation of energetic compounds in tropical soils as a result of natural plant-mediated degradation (phytoremediation), as well as enhanced aerobic and anaerobic bioremediation. Reviewed previous bioremediation and phytoremediation studies specific to Makua Military Reservation, drafted technical reports and coordinated with project managers from Water Resources Research Center, U.S. Army and Hawaii Agricultural Resource Center.
Year Completed: Ongoing Contract Amount: $240,000
Performed with Environet

Various Phase I Environmental Site Assessments and Soil and Groundwater Investigations in Hawaii.

Environmental Scientist assists with records review and site reconnaissance for various industrial, commercial, and residential properties located throughout the island of Oahu. Experience includes preparation of work plans, coordination and supervision of subcontractors, collection of soil and groundwater samples, and report preparation.

Groundwater Well Abandonment, Former Ewa Sugar Mill, Hawaii

Environmental Scientist responsible for the preparation of construction documents to abandon and close monitoring wells for completion of total remediation within the City and County of Honolulu's property (formerly the Ewa Sugar Mill).

Year Completed: Ongoing Contract Amount: $25,500
Performed with Environet

Environmental Baseline Survey to Support the Housing Public-Private Venture Phase II. Pearl Harbor, Oahu, Hawaii.

Environmental Scientist responsible for drafting portions of the Environmental Baseline Survey and Finding of Suitability for 17 neighborhoods in the Pearl Harbor area and on Kauai. Reviewed previous environmental reports, historical and current data, aerial photographs and other supplementary data sources to determine whether additional actions or notifications were required in accordance with CERCLA and/or Navy policy.
Year Completed: 2006 Contract Amount: >$800,000
Performed with Environet