APPENDIX B

Traffic Impact Analysis

OTAY RANCH
VILLAGE 8 WEST
TRAFFIC IMPACT ANALYSIS REPORT

Prepared for

City of Chula Vista

Prepared by

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INTRODUCTION

This traffic impact analysis (TIA) has been prepared for the proposed Village 8 West Sectional Planning Area (SPA) Plan within the Otay Ranch community in the City of Chula Vista. The project is planned to be located around the future intersection of La Media Road and Main Street, continuing southeasterly along Otay Valley Road to State Route 125 (SR-125). The project location is shown in **Exhibit 1**.

Otay Ranch is a master-planned community of approximately 23,000 acres in size and includes a mix of land uses within 20 villages and planning areas. From the newly adopted 2012 General Plan, a General Development Plan (GDP) and Environmental Impact Report (EIR) for Otay Ranch was adopted in October 1993. The GDP outlines the uses anticipated for each village. A General Plan Amendment (GPA) and General Development Plan Amendment (GDPA) were prepared for Village 8 West to account for changes in circulation network and land use from the 2005 Adopted General Plan. The GPA and GDPA were approved as part of PCM-09-11 and GPA 09-01.

Sectional Planning Area (SPA) Plans are required for each village prior to consideration of final development permits and entitlements. The Village 8 West SPA Plan includes 320.1 gross acres, consisting of a mix of residential, commercial, parks and open space, and community uses, including two schools. The future La Media Road and Main Street within the Village 8 West Town Center are designated as Town Center arterials and will be designed as a pair of one-way couplets. Both Main Street and La Media Road will serve as the primary access routes in and out of Village 8 West. A town center will be located within the couplet and surrounded by mixed use and park space. Single family housing is planned to be developed in the southern portion of Village 8 West.

The vision for Village 8 West is to develop a cohesive community with inter-connected uses and densities. The mix of proposed residential, commercial and community uses are intended to provide a mixed-use environment that serves the needs of residents and employees. The densities and design patterns envisioned for the village focus on promoting a walkable and bikeable community with less emphasis on automobile trips. To account for trips internal to the village and for trips replaced by walking, biking, or transit, internal capture and trip reductions were applied to the traffic analysis.

The project will be built in several phases. At maximum buildout, the proposed project is forecast to generate approximately 43,084 (total gross) trips per day which includes 3,467 a.m. peak hour trips and 4,283 p.m. peak hour trips, based on SANDAG's *(Not So) Brief Guide of Vehicular Traffic Generation Rates* (April 2002), internal capture calculations, and transit trip reductions. In addition to traffic operating conditions, this report discusses the phasing of future roadways, access to transit, pedestrian and bicycle linkages, and activity within and surrounding the project site.

Traffic impact analysis was conducted for existing, 2015, 2020, 2025, and 2030 conditions. As required by the City of Chula Vista, this traffic impact study has been prepared in accordance with the City's Adopted General Plan. The City's goal for acceptable levels of service is generally LOS D or better at signalized and unsignalized intersections and LOS C along roadway segments.

PROJECT DESCRIPTION

The proposed development of Village 8 West will be located in the southwest portion of Otay Ranch and is one of 20 planned community villages. Village 8 West will be developed around the future intersection of La Media Road and Main Street, which is designed to be constructed as a pair of couplets, with a town square located in the center and surrounded by mixed use and park space. Single family housing is planned to be developed in the southern portion of Village 8 West.

Land Use Description

Altogether, the Village 8 West SPA plan includes 320.1 gross acres and a range of allowable uses and quantities. The following land uses and quantities represent the maximum allowed per the Village 8 West SPA plan, thereby representing the most intensive scenario for the purposes of this traffic study:

- 2,050 residential dwelling units;
- 250,000 square feet of commercial retail;
- 50,000 square feet of office;
- 28.0 acres of park;
- 26.0 acres of open space;
- 11.4 acres for one elementary school;
- 21.0 acres for one middle school; and
- 5.8 acres of community purpose facilities.

The proposed elements and site utilization of the Village 8 West SPA are shown in **Exhibit 2**, which includes a range of residential units and densities, mixed use, parks and open space, and community facilities. The proposed land uses are consistent with the land use designations outlined in the Otay Ranch GDPA. Transportation facilities will be provided to meet the existing and future demand for motorists, transit, pedestrians and bicyclists.

Project Access

The project will construct a couplet at Main Street / La Media Road to provide access to and from Village 8 West. The couplet will be two lanes in each direction through the town center. All intersections through the couplet will be signalized. Street "A" will be constructed as a two-lane street. Street "A" will intersect with Main Street and connect with internal roadways. Traffic signals are also planned for all access points along Otay Valley Road. The internal roadway network for Village 8 West is depicted in **Exhibit 2**.

Pedestrian and bicycle access to the site will be provided via bicycle lanes and sidewalks along all circulation element roadways. To help maintain lower traffic speeds, traffic calming devices are recommended on internal streets including intersection bulb-outs, one-way street bulb-outs and narrow streets.

Transit service will be provided by MTS along Main Street. Both Rapid Bus service and local circulator service will be accessible from this village.

STUDY AREA

The project study area was defined based on the distribution of project-generated trips on the roadway network and the requirements of the Congestion Management Plan (CMP). The list of study intersections was determined based on the trip threshold, which includes all intersections where 50 or more peak hour project-generated trips forecast to be added, including several future intersections and roadway segments. Study intersections and roadway segments are illustrated in **Exhibit 3**. The study area consists of the following intersections and roadway segments:

Study Intersections

1. Olympic Parkway / I-805 Southbound Ramps
2. Olympic Parkway / I-805 Northbound Ramps
3. Olympic Parkway / Brandywine Avenue
4. Olympic Parkway / Santa Victoria
5. Olympic Parkway / Heritage Road
6. Olympic Parkway / La Media Road
7. Olympic Parkway / SR-125 Southbound Ramps
8. Olympic Parkway / SR-125 Northbound Ramps
9. Olympic Parkway / Eastlake Parkway
10. Olympic Parkway / Hunte Parkway
11. Santa Victoria/ Heritage Road
12. Birch Road / La Media Road
13. Birch Road / SR-125 Southbound Ramps
14. Birch Road / SR-125 Northbound Ramps
15. Birch Road / Eastlake Parkway
16. Main Street / I-805 Southbound Ramps
17. Main Street / I-805 Northbound Ramps
18. Main Street / Heritage Road
19. Main Street / La Media Road (Couplet)
20. Main Street / Magdalena Avenue
21. Main Street / SR-125 Southbound Ramps
22. Main Street / SR-125 Northbound Ramps
23. Main Street / Eastlake Parkway
24. Otay Valley Road / SR-125 Southbound Ramps
25. Otay Valley Road / SR-125 Northbound Ramps

Study Roadway Segments

<u>Olympic Pkwy:</u>

I-805 to Brandywine Ave
Brandywine Ave to Heritage Rd
Heritage Rd to La Media Rd
La Media Rd to SR-125
SR-125 to Eastlake Pkwy
Eastlake Pkwy to Hunte Pkwy
East of Hunte Pkwy

<u>Birch Rd:</u>

La Media Rd to SR-125
SR-125 to Eastlake Pkwy

<u>Main St:</u>

I-805 to Brandywine Ave
Brandywine Ave to Heritage Rd
Heritage Rd to Couplet
Couplet to Magdalena Ave
Magdalena Ave to SR-125
SR-125 to Village 9 Access Road
Village 9 Access Road to Eastlake Pkwy

<u>Hunte Parkway:</u>

Eastlake Pkwy to Olympic Pkwy
Olympic Pkwy to Otay Lakes Rd

<u>Heritage Rd:</u>

Telegraph Cyn Rd to Olympic Pkwy
Olympic Pkwy to Main St
Main St to Entertainment Cir
*Entertainment Cir to Ave de las Vistas
(*City of SD)

<u>La Media Rd:</u>

Telegraph Cyn Rd to Olympic Pkwy
Olympic Pkwy to Birch Rd
Birch Rd to Couplet

<u>Magdalena Ave:</u>

Birch Rd to Main St

<u>Eastlake Pkwy:</u>

Otay Lakes Rd to Olympic Pkwy
Olympic Pkwy to Birch Rd
Birch Rd to Main St
Main St to Otay Valley Rd

<u>Otay Valley Rd:</u>

Couplet to Village 8 West Street “C”
Village 8 West Street “C” to SR-125
SR-125 to Village 9 Street “A”
Village 9 Street “A” to Eastlake Parkway

ANALYSIS METHODOLOGY

The 2000 Highway Capacity Manual (HCM) methodology for *Signalized Intersections* was used to determine the operating Levels of Service (LOS) of the study intersections. The HCM methodology describes the operation of an intersection using a range of levels of service (LOS) from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on corresponding average stopped delay per vehicle shown in **Table 1**.

Table 1
Intersection LOS & Delay Ranges

LOS	Delay (seconds/vehicle)	
	Signalized Intersections	**Unsignalized Intersections**
A	≤ 10.0	≤ 10.0
B	> 10.0 to ≤ 20.0	> 10.0 to ≤ 15.0
C	> 20.0 to ≤ 35.0	> 15.0 to ≤ 25.0
D	> 35.0 to ≤ 55.0	> 25.0 to ≤ 35.0
E	> 55.0 to ≤ 80.0	> 35.0 to ≤ 50.0
F	> 80.0	> 50.0

Source: 2000 Highway Capacity Manual.

The roadway segment analysis of the study area roadways is based upon roadway classifications and capacity thresholds defined in the City of Chula Vista Transportation Element. The roadway segment level of service criteria is included in **Table 2**.

Table 2
Level of Service Thresholds for Roadway Segments

Classification (# Lanes)	Level of Service (percent of capacity)				
	A (60%)	**B (70%)**	**C (80%)**	**D (90%)**	**E (100%)**
Expressway (8)	52,500	61,300	70,000	78,800	87,500
Prime Arterial (6) (1)	37,500	43,800	50,000	56,300	62,500
Major Street (6)	30,000	35,000	40,000	45,000	50,000
Major Street (4)	22,500	26,300	30,000	33,800	37,500
Class I Collector (4)	16,500	19,300	22,000	24,800	27,500
Class II Collector (2)	9,000	10,500	12,000	13,500	15,000
Class III Collector (2)	5,600	6,600	7,500	8,400	9,400
Town Center Arterial (6) (2)	37,500	43,800	50,000	56,300	62,500
Gateway Arterial (6) (2)	40,500	47,500	54,500	61,200	68,700

Source: City of Chula Vista General Plan, Land Use and Transportation Element

Notes: (1) The technical analysis includes the evaluation of augmented arterials near the freeway on and off ramps. The augmented arterials include auxiliary lanes in advance of the freeway ramps to serve the higher traffic volumes that typically occur. When auxiliary lanes are provided, the capacity of the segment is increased by the equivalent single lane capacity (10,500 vpd per lane for LOS E) to account for the benefit in overall operations that is achieved with the construction of auxiliary lanes near the ramps.

(2) Town Center and Gateway arterials are "urban core" classifications. Urban Core facilities are evaluated against a LOS D or better standard.

Analysis of Caltrans Facilities

In accordance with City of Chula Vista and Caltrans requirements, the following analysis was conducted for 2030 conditions using the City of Chula Vista Traffic Impact Study Guidelines, the 2000 Highway Capacity Manual, and the Caltrans Highway Design Manual:

- Freeway Mainline
  - City of Chula Vista TIS Guidelines

- Intersections
  - Caltrans Intersection Lane Volume (ILV) Methodology

Basic Freeway Segment Analysis

Segments of northbound and southbound I-805 between Telegraph Canyon Road and Main Street were analyzed under 2030 Without and With Project peak hour conditions using the 2000 HCS Basic Freeway Segment analysis methodology. A 4% heavy truck factor was applied in addition to a measured free-flow speed of 65 mph was used in the HCS calculations for multi-lane segments.

Intersection Lane Volume (ILV) Analysis

The ILV methodology evaluates the traffic demand at an intersection to the available capacity at the intersection. Combining traffic signal phasing and intersection geometry with peak hour traffic volumes, the ILV methodology determines if a ramp is either "stable", "unstable" or at "capacity". The thresholds for operating conditions using the ILV methodology are summarized in **Table 3**.

Table 3
Intersection Lane Volume (ILV) Operational Thresholds

ILV/hr	Description
<1,200 "Stable"	Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free midblock operations.
1,200 to 1,500 "Unstable"	Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs on some approaches.
>1,500 "Capacity"	Stop-and-go operation with severe delay and heavy congestion. Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Notes: Caltrans Highway Design Manual, Table 406.

THRESHOLDS OF SIGNIFICANCE

Project impacts are defined as either project specific or cumulative. Project specific impacts are those impacts for which the addition of project trips results in an identifiable degradation in LOS, triggering the need for specific project-related improvements. Cumulative impacts are those in which project trips contribute to an unacceptable LOS. The City of Chula Vista goal for acceptable operating conditions is LOS D or better for signalized and unsignalized intersections and LOS C or better for roadway segments. For urban core arterials (Town Center and Gateway classifications), the threshold for acceptable level of service is LOS D along roadway segments. For intersections, roadway segments and freeway sections, impacts are defined when the acceptable level of service is breached either by the project or as a cumulative affect of multiple projects. The criteria for determining whether the project results in either a project specific or cumulative impact are defined both for short term and long term conditions. The criteria for each condition is defined below.

Short Term Impacts (0-4 years)

Per the City's thresholds of significance for short-term analyses, (0 to 4 years), roadway sections may be defined as either links or segments. A link is typically that section of roadway between two adjacent Circulation Element intersections and a segment is defined as that combination of contiguous links used in Growth Management Plan Traffic Monitoring Program.

Analysis of roadway links under short-term conditions may require a more detailed analysis using the Growth Management Oversight Committee (GMOC) methodology if the typical planning analysis using volume to capacity ratios on an individual link indicates a potential impact to that link. The GMOC analysis uses the Highway Capacity Manual (HCM) methodology of average travel speed based on actual measurements on the segments as listed in the Growth Management Plan Traffic Monitoring Program.

Intersections:

a. ***Direct*** P*roject Impact* if both the following criteria are met:
   i. LOS E or LOS F.
   ii. Project trips comprise 5% or more of entering volume.
b. **C*umulative*** *impact* if only (i) above is met.

Street Links/Segments

If the planning short-term analysis of street links or segments using the volume to capacity ratio indicates *LOS C or better, there is no impact*. IF the planning analysis indicates LOS D, E or F, the GMOC method should be utilized. The following criteria would then be utilized:

a. ***Direct*** *Project Impact* if all the following criteria are met:
   i) LOS D for more than 2 hours or LOS E/F for 1 hour
   ii) Project trips comprise 5% or more of segment volume.
   iii) Project adds greater than 800 ADT to the segment.
b. ***Cumulative*** *impact* if only (i) above is met.

Long Term Impacts (5 or more years)

Per the City's thresholds of significance for long-term analyses, (5 or more years), the City of Chula Vista adopted General Plan identifies a project to result in a significant impact if one of the following criteria is met:

Intersections

a. ***Direct*** *project impact* if both the following criteria are met:
   i. Level of service is LOS E or F
   ii. Project trips consist of five percent or more of entering volume
b. ***Cumulative*** *impact* if only (i) is met.

Street Links/Segments

a. ***Direct*** *project impact* if all the following criteria are met:
   i. Level of service is LOS D, E, or F
   ii. Project trips consist of five percent or more of segment volume
   iii. Project adds greater than 800 ADT to the segment
b. ***Cumulative*** *impact* if only (i) is met. However, if the intersections along a LOS D or E segment all operate at LOS D or better, the segment impact is considered not significant since intersection analysis is more indicative of actual roadway system operations than street segment analysis. If a segment is LOS F, an impact is significant regardless of intersection LOS.

Direct impacts must be mitigated by the project. This includes the construction of improvements that reduce the project impacts to less than significant.

Cumulative impacts will be mitigated to a less than significant level, which may include payment of TDIF fees for projects included in the TDIF program.

Roadways and intersections along the project frontage are required to be constructed concurrently with the project to mitigate impacts and provide access. These improvements are assumed to be constructed in the technical analysis.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) GUIDELINES

The environmental impacts of a project are evaluated based on criteria established in the CEQA guidelines. The six guidelines pertaining to Transportation/Traffic were updated in 2010 and focus on providing a balanced transportation system. As stated in the 2010 CEQA Guidelines, a project may result in a significant impact if any of the following criteria are met:

a. Would the project conflict with an applicable plan, ordinance, or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways, and freeways, pedestrian and bicycle paths, and mass transit?

b. Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?

c. Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?

d. Would the project substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses (e.g. farm equipment)?

e. Would the project result in inadequate emergency access?

f. Would the project conflict with adopted policies, plans or programs regarding public transit, bicycle or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

ROADWAY CIRCULATION SYSTEM

A field investigation of the existing roadway and intersection conditions was conducted specifically for this project at the time the traffic data was collected. Traffic signal operations, lanes, parking and other factors that may affect the capacity of the roadway were identified and included in this analysis. A description of existing and future roadways in the project study area is provided below. Roadway classifications as identified in the City GPA Transportation Element are illustrated in **Exhibit 4**. Existing and future intersection geometry is shown in **Exhibit 5**.

Interstate 805 (I-805) provides regional access through the South San Diego County area as a major freeway facility and is oriented in a north-south direction. Regional project access is provided at Olympic Parkway and Main Street. I-805 is generally an eight-lane freeway between I-5 and SR-54. By Horizon Year 2030, I-805 is planned to include eight lanes plus four managed lanes north of East Palomar Street.

State Route 125 (SR-125) is a combination freeway/tollway that provides north-south access through eastern Chula Vista, east of I-805. SR-125 is a four-lane freeway facility that extends from State Route 52 (SR-52) in Santee to State Route 54. The southern portion of SR-125 from SR-54 to SR-905 is a toll road, also known as the South Bay Expressway.

Olympic Parkway is classified as a six-lane Prime Arterial from I-805 to Hunte Parkway and as a four-lane Major Road east of Hunte Parkway. To serve high traffic volumes in the vicinity of SR-125, Olympic Parkway is classified as an 8-lane Expressway from SR-125 to Eastlake Parkway. Olympic Parkway provides local access to and from I-805 and east-west connections through the surrounding areas to Otay Ranch. Bike lanes are provided and on-street parking is prohibited. The posted speed limit is 45 mph.

Main Street is classified as a six-lane Prime Arterial from I-805 to its existing terminus at Heritage Road. The extension of Main Street is identified in the City of Chula Vista Transportation Element to extend from the existing terminus to connect with Hunte Parkway. The extension of Main Street will provide an additional east-west route between I-805 and SR-125, parallel to Olympic Parkway. Through Village 8 West, Main Street will be constructed as a four-lane couplet with two lanes eastbound and two lanes westbound. The speed through the couplet will be set at 25 to 35 mph to complement the pedestrian oriented development and to support on-street parking within the town center. Sidewalks and bicycle lanes will be provided along Main Street.

Brandywine Avenue is currently a four-lane Class I Collector road and narrows to two lanes with a two-way left-turn lane north of Main Street. Brandywine Avenue is oriented in a north-south direction and provides connections to Telegraph Canyon Road, East Palomar Street, Olympic Parkway, and Main Street. Bike lanes are provided along Brandywine Avenue. The posted speed limit is 25 mph. On-street parking is prohibited except along the two-lane section of Brandywine Avenue.

Heritage Road is constructed as a six-lane Prime Arterial north of Olympic Parkway and is generally oriented in a north-south direction, providing access from Olympic Parkway north to Telegraph Canyon Road where the road turns into Paseo Ranchero. There is currently a gap in Heritage Road between Olympic Parkway and Main Street. South of Main Street, Heritage Road is located within the City of Chula Vista up to Entertainment Circle. South of Entertainment Circle Heritage Road is located within the City of San Diego. Currently, Heritage Road south of Main Street is striped as a two- to four-lane Collector with a posted speed limit of 40 mph. Bike lanes and sidewalks are provided; on-street parking is prohibited. The future extension of Heritage Road will be constructed as a six-lane Prime Arterial from Olympic Parkway to Main Street and will be the only circulation roadway connection from Chula Vista to the Otay Mesa in the City of San Diego between I-805 and SR-125.

La Media Road is constructed as a six-lane Prime Arterial road oriented in a north-south direction, providing access between Telegraph Canyon Road, the northerly property line of Village 8 West, and south of Birch Road. The City Transportation Element includes the extension of La Media south into Village 8 West as a six-lane Prime Arterial. The posted speed limit is 40 mph. On-street parking is prohibited to accommodate bike lanes. Through Village 8 West, La Media Road will be constructed as a four-lane couplet with two lanes southbound and two lanes northbound. Through the couplet speeds will be set between 25 and 35 mph to complement the pedestrian oriented development and to support the proposed on-street parking. Sidewalks are also provided both within the couplet and along the six-lane sections of La Media Road.

Eastlake Parkway is constructed as a six-lane roadway between Olympic Parkway and Hunte Parkway and is oriented in a north-south direction immediately east of SR-125. Eastlake Parkway is a four-lane roadway north of Olympic Parkway, a six-lane roadway between Olympic Parkway and Hunte Parkway/Main Street, and is proposed to be a four-lane roadway from Hunte Parkway/Main Street to Otay Valley Road. Eastlake Parkway provides access from its southern terminus at Hunte Parkway to north of Otay Lakes Road. The City Transportation Element includes the extension of Eastlake Parkway south of Hunte Parkway into the future university site. Bike lanes are provided. On-street parking is prohibited.

Hunte Parkway is constructed as a six-lane Prime Arterial from Olympic Parkway to Eastlake Parkway. Bike lanes and sidewalks are provided. The greenbelt trail is located along the south side of Hunte Parkway. The posted speed limit is 45 mph.

Birch Road is constructed as a six-lane road from La Media Road to Eastlake Parkway and is oriented in an east-west direction, providing access to La Media Road, SR-125, and Eastlake Parkway. Birch Road is classified as a six-lane Major Arterial from La Media Road to SR-125. From SR-125 to Eastlake Parkway, Birch Road is classified as a six-lane Prime Arterial.

Magdalena Avenue is currently a two to four lane local road that connects Main Street to Birch Road through Village 7. It provides access to the local high school and residential areas on the west side of SR-125. Although local roads are typically not subject to the LOS requirements established for Circulation Element roads, the segment of Magdalena Avenue from Birch Road to Main Street is included in the analysis because of its close proximity to the project site and because the intersection of Main Street/Magdalena Avenue is a direct access point to the project.

Santa Victoria (Future) Santa Victoria is currently partially constructed. At buildout, the roadway will be a two-lane road that will extend west from the Birch Road/La Media Road intersection and head northwesterly to connect with Olympic Parkway. The road is planned as part of the Village 2 roadway network.

Otay Valley Road (Future) Otay Valley Road is a future four-lane major road that will be connected to the southern terminus of the Main Street/La Media Road Couplet and will continue southeasterly to the future extension of Eastlake Parkway. MTS plans to use the Otay Valley Road bridge as part of the Bus Rapid Transit route.

Main Street / La Media Road Couplet

The intersection of La Media Road and Main Street will be constructed as a pair of one-way streets that form a couplet. A total of four new signalized intersections will be constructed within the couplet to allow higher volumes traffic to move efficiently between Main Street and La Media Road.

By separating the intersection of Main Street/La Media Road into four smaller intersections, left turn phases can be eliminated thereby improving the efficiency of the signal cycle. Shorter cycle lengths and fewer phases result in lower delay and improved traffic flows.

The width of the intersection is also significantly decreased, improving access for pedestrians and reducing pedestrian green time at the traffic signal. Total conflicting traffic volume through the series of four smaller intersections is lower than the total intersection volume of a single point intersection, thereby allowing shorter cycle lengths and improved safety for pedestrians.

Combined, these operational benefits of the couplet allow the series of intersections to carry a higher volume of traffic more efficiently and with acceptable levels of service. The four signalized intersection are connected by 200 to 500 feet long roadway segments. The operations of the segments are dictated by the operating conditions of the adjacent signalized intersection. Therefore, there are no typical roadway segments through the couplet. The performance of the roadways between the intersections is a reflection of the signal coordination and signal timing. The peak hour analysis conducted for intersections is a better determinant for levels of service than a V/C daily roadway analysis.

Thus, the individual intersections within the couplet were analyzed and included in the traffic study to determine the levels of service at each location. Acceptable levels of service through the intersections are a clear indication that traffic will flow through the couplet at acceptable levels of service.

EXISTING CONDITIONS

To determine the existing conditions at the study intersections, turning movement counts were taken on a typical weekday during the a.m. (7:00 to 9:00 a.m.) and p.m. (4:00 to 6:00 p.m.) peak periods. Average daily traffic (ADT) volumes were also collected along most roadway segments over a 24-hour period. **Exhibits 6 and 7** show existing peak hour and daily traffic volumes, respectively. Detailed count data is contained in **Appendix A**.

Table 4 summarizes the existing a.m. and p.m. peak hour levels of service (LOS) of the study intersections based on the existing peak hour intersection volumes and existing intersection geometry. Detailed HCM calculation sheets are contained in **Appendix B**. As shown in Table 4, most intersections are currently operating at an acceptable LOS (LOS D or better) during the a.m. and p.m. peak hours, with the exception of Olympic Parkway / I-805 Northbound Ramps, which operates at LOS F during the a.m. peak hour.

Roadway segment levels of service were calculated based on established capacity thresholds defined by roadway classification and ADT volumes. **Table 5** presents the results of the existing conditions roadway segment level of service analysis. As shown in Table 5, all roadway segments currently operate at acceptable levels of service, except for Olympic Parkway from Heritage Road to La Media Road.

Table 4
Existing Study Intersection LOS

Study Intersection	Control	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS	
1. Olympic Parkway / 805 Southbound Ramps	Signalized	41.7	D	41.6	D
2. Olympic Parkway / 805 Northbound Ramps	Signalized	**118.4**	**F**	37.8	D
3. Olympic Parkway / Brandywine Ave	Signalized	30.2	C	31.6	C
4. Olympic Parkway / Santa Victoria Rd	*Does Not Exist*				
5. Olympic Parkway / Heritage Road	Signalized	18.5	B	15.6	B
6. Olympic Parkway / La Media Road	Signalized	37.6	D	25.4	C
7. Olympic Parkway / 125 Southbound Ramps	Signalized	2.8	A	4.7	A
8. Olympic Parkway / 125 Northbound Ramps	Signalized	1.3	A	2.4	A
9. Olympic Parkway / Eastlake Parkway	Signalized	29.2	C	31.5	C
10. Olympic Parkway / Hunte Parkway	Signalized	33.4	C	34.2	C
11. Santa Victoria Rd / Heritage Road	*Does Not Exist*				
12. Birch Road / La Media Road	Signalized	27.0	C	22.6	C
13. Birch Road / SR125 Southbound Ramps	Signalized	~~7.4~~11.8	~~A~~B	~~7.6~~11.2	~~A~~B
14. Birch Road / SR125 Northbound Ramps	Signalized	1.6	A	5.7	A
15. Birch Road / Eastlake Parkway	Signalized	35.2	D	32.7	C
16. Main Street / 805 Southbound Ramps	Signalized	27.8	C	29.7	C
17. Main Street / 805 Northbound Ramps	Signalized	27.7	C	28.9	C
18. Main Street / Heritage Street	Signalized	2.8	A	0.9	A
19. Main Street / La Media Road (Couplet)	*Does Not Exist*				
20. Main Street (*Rock Mtn Rd*) / Magdalena Avenue	Uncontrolled	2.8	A	0.9	A
21. Main Street / SR125 Southbound Ramps	*Does Not Exist*				
22. Main Street / SR125 Northbound Ramps	*Does Not Exist*				
23. Main Street / Eastlake Parkway	Signalized	13.6	B	12.9	B
24. Otay Valley Road / SR125 Southbound Ramps	*Does Not Exist*				
25. Otay Valley Road / SR125 Northbound Ramps	*Does Not Exist*				

Note: Deficient intersection operation shown in **bold**

Table 5
Existing Study Roadway Segment LOS

Roadway	*Segment*	*Existing Conditions* Classification (# Lanes)	LOS C Capacity	ADT	V/C	LOS	Count Year	Count Source
Olympic Parkway	805 to Brandywine	Prime Arterial (6)	50,000	47,000	0.75	C	2008	City of Chula Vista
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	48,721	0.78	C	2009	LLG
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	**50,538**	**0.81**	**D**	2009	LLG
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	43,563	0.70	C	2008	City of Chula Vista
	SR-125 Ramps to Eastlake Pkwy	Prime Arterial (8)	70,000	40,478	0.46	A	2008	City of Chula Vista
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	13,926	0.22	A	2009	LLG
	East of Hunte Pkwy	Major Street (4)	30,000	7,846	0.21	A	2010	RBF Consulting
Birch Road	La Media to SR-125	Major Street (6)	40,000	11,084	0.22	A	2011	City of Chula Vista
	SR-125 to Eastlake Parkway	Prime Arterial (6)	50,000	10,250	0.16	A	2008	Estimated Volume
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,500	26,896	0.37	A	2011	City of Chula Vista
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	18,729	0.30	A	2008	City of Chula Vista
	Heritage Rd to Couplet	*Does Not Exist*						
	Couplet to Magdalena Ave	*Does Not Exist*						
	Magdalena Ave to SR-125 Ramps	*Does Not Exist*						
	SR-125 Ramps to Village 9 Access Road	*Does Not Exist*						
	Village 9 Access Road to Eastlake Pkwy	*Does Not Exist*						
Hunte Pkwy	Eastlake Pkwy to Olympic Pkwy	Prime Arterial (6)	50,000	1,406	0.02	A	2010	RBF Consulting
	Olympic Pkwy to Otay Lakes Rd	Major Street (4)	30,000	9,580	0.26	A	2010	RBF Consulting
Heritage Rd	Telegraph Cyn Rd to Olympic Pkwy	Prime Arterial (6)	50,000	12,383	0.20	A	2006	City of Chula Vista
	Olympic Pkwy to Main St	*Does Not Exist*						
	Main Street to Entertainment Circle	Class II Collector (2A)	12,000	10,035	0.67	B	2009	LLG
	Entertainment Circle to Ave. de Las Vistas *(City of SD)*	Class II Collector (2A)	12,000	9,846	0.66	B	2009	LLG
La Media Rd	Telegraph Cyn Rd to Olympic Pkwy	Prime Arterial (6)	50,000	12,658	0.20	A	2006	City of Chula Vista
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	11,037	0.18	A	2009	LLG
	Birch Rd to Couplet	*Does Not Exist*						
Magdalena Ave	Birch Road to Main	Class II Collector (2)	12,000	9,122	0.61	B	2011	City of Chula Vista
Eastlake Pkwy	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	18,945	0.30	A	2006	City of Chula Vista
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	9,199	0.15	A	2008	City of Chula Vista
	Birch Rd to Hunte Parkway-Main St	Major Street (6)	40,000	1,310	0.03	A	2008	City of Chula Vista
	Main St to Otay Valley Rd	*Does Not Exist*						
Otay Valley Rd	Couplet to Village 9 Access Road	*Does Not Exist*						
	Village 9 Access Road to SR-125 Ramps	*Does Not Exist*						
	SR-125 Ramps to University	*Does Not Exist*						

Note: Deficient roadway segment operation shown in **bold**.
6A = 6 lane augments arterial. Augmented arterials include additional turn lanes that provide the necessary capacity in advance of key intersections such as freeway ramps. The additional lanes improve the overall performance of the link nearest the intersection where the greatest delay typically occurs. The performance of the segment benefits from this additional capacity; therefore, the overall capacity of the link is increased by the equivalent single lane volume for this classification (10,500 vpd per lane).

STUDY SCENARIOS AND LAND USE ASSUMPTIONS

The traffic impact analysis was conducted for several scenarios. Initially, the project's traffic impacts to the existing physical environment as of the date of this study are analyzed. Recognizing that this large project likely will be constructed over time in several phases, this study analyzes the impacts of the project in years 2015, 2020, 2025, and 2030. For existing conditions, the project was overlaid on the existing conditions traffic volumes and evaluated against the existing circulation network. Each future year scenario included land use assumptions for all undeveloped or partially developed villages through the Otay Ranch community as well as a phased project development approach by scenario year.

Roadway Network Assumptions

The baseline roadway network for this study is the existing roadway network based on the conditions observed in the field at the time this report was initiated. Throughout the study, impacts are identified and mitigation measures are recommended. As a result, improvements to the roadway network are assumed to occur as part of this planning document. The roadway network improvements are either a result of improvements constructed by the project through project frontage or direct impact mitigation or improvements constructed through payment of TDIF fees by the project and by others.

If the project equivalent dwelling unit (EDU) limit for each study year (2015, 2020, 2025, & 2030) is reached prior to any of the assumed roadway or intersection improvements being constructed and open to traffic, then one of the following steps shall be taken as determined by the City Engineer:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or

2. City and OLC shall meet to determine the need for the incomplete roadway segments. A number of factors, including changes to the tolling structure at SR-125, may affect the traffic patterns in the Otay Ranch. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or

3. Developer shall construct the missing roadway links and receive TDIF credit for those improvements as applicable; or

4. An alternative measure is selected by the city in accordance with the city of Chula Vista Growth Management Ordinance.

5. All to the satisfaction of the City Engineer.

Background Land Use Assumptions

Future year land use information for the City of Chula Vista, City of San Diego, and County of San Diego were based upon the current General Plan or Community Plan information available. For the County of San Diego, General Plan 2020 land use data was used and in the City of San Diego the

Otay Mesa Community Plan land uses were applied. For City of Chula Vista, the General Plan land use data was updated to reflect approved or pending projects in the Otay Ranch. All updated land use data was integrated into the SANDAG database prior to running the traffic model.

For background land use data, the interim year development assumptions were estimated using a straight line methodology from 2015 to 2030, with full buildout assumed by year 2030. Once the land uses and street networks were coded appropriately, the model was run for each of the study scenarios. The model volumes were further refined to produce forecasted average daily traffic (ADT) volumes for all street segments.

Model Methodology

Future year traffic volumes were forecast using the Series 11 South Bay Sub Area traffic model developed by SANDAG. In collaboration with City of Chula Vista and SANDAG, RBF Consulting provided the land use and network designations for each scenario year. Interim year land use data and model plots are provided in **Appendix C**. Interim forecast data was determined for each study year beginning in year 2015. The model provides average daily traffic (ADT) for roadway segments.

When the model runs were conducted for the study area, they included future roads in order to understand how future traffic patterns may change when new capacity is added to the roadway network. The traffic analysis in this report assumes that the existing roadway network exists until mitigation measures are determined to be necessary, which may include the addition of links modeled with the SANDAG traffic model. In each study scenario, manual adjustments were made to the model volumes to remove the future links. The future link volumes were reassigned to existing roadways in order to forecast traffic volumes on the existing roadway network. Manual adjustments and forecast traffic patterns for the future year conditions were compared to existing traffic patterns and volumes to ensure reasonable growth and traffic flow.

Peak hour intersection turning volumes were post-processed for each study year based on the model ADT and the relationship between existing peak hour volumes to existing ADT as well as anticipated growth in the surrounding area.

For new intersections, peak hour volumes were post processed based on the distribution of ADT volumes on the network. Relationships between links, understanding of proposed land and traffic trends on existing, similar roadways were used to refine the peak hour volumes. Post-processing worksheets prepared for this report are provided for each horizon year (2015, 2020, 2025 and 2030) are provided in **Appendix D**.

The SANDAG model assigned limited volumes to the ramps along SR-125. This is primarily due to the model methodology used to assess the impact of tolls on the facility. At the time this analysis was conducted, SANDAG reduced the speeds along SR-125 to 35 mph or less to simulate the affect the toll has on driver's decision making process. This resulted in lower than anticipated ADT volumes along the SR-125 corridor and at ramps. There was a large disparity between ramp volumes within a single interchange. In many cases one or two of the ramp volumes were less than

100 vpd and other ramp volumes at the interchange exceeded 10,000 vpd. Because of the disparity in ramp volumes, the post-processing of ramp volumes were refined to equalize the use of ramps through each of the interchanges to reflect existing traffic patterns at existing ramps along the SR-125 corridor. The post-processing assumes that drivers enter and exit the SR-125 at the same interchange. Further refinements to the distribution of traffic during the peak hour were made around the ramps to reflect peak period demand and turning movement volumes.

Village 8 West Land Use Assumptions

The development of Village 8 West will occur over several phases and will not be fully constructed for many years. In addition to an analysis of the project's impacts to the existing physical environment as of the date of this study, referred to as the "Existing Plus Project" scenario, this traffic analysis includes an evaluation of years 2015, 2020, 2025, and 2030 with incremental developments of the proposed project in order to more accurately reflect how actual development is expected to occur. The following sections summarize the findings of the analysis for each study scenario. **Table 6** provides a summary of land uses assumed for each phase.

- **Existing Plus Project** includes project-generated trips associated with buildout of Village 8 West. The project-generated trips were added to the existing roadway network. Frontage improvements to be completed by the project applicant include construction of La Media Road north of Main Street and Main Street east of La Media Road.

- **2015** includes project-generated trips associated with the construction of 105 single family and 246 multi-family residential dwelling units in Village 8 West. In addition to the existing street network, this scenario assumes partial construction of the couplet at La Media Road and Main Street. Frontage improvements to be completed by the project applicant include construction of two lanes of the four lane couplet along La Media Road north of Main Street and Main Street east of La Media Road.

- **2020** includes development assumed in 2015, plus project-generated trips associated with the construction of 354 single family and 824 multi-family residential dwelling units, 50,000 square feet of office use, 40,000 square feet of commercial retail, and 5.5 acres of park within Village 8 West.

- **2025** includes development assumed in 2020 plus project-generated trips associated with the construction of 162 single family dwelling units, 359 multi family dwelling units, an elementary school, 150,000 square feet of commercial retail, and 13.1 acres of park space. Half of the couplet is built by 2025, and the remainder of the couplet is constructed by 2030.

- **2030** includes development assumed in 2025 plus a middle school, 60,000 square feet of commercial retail, and 9.4 acres of park space.

Table 6
Summary of Land Uses by Study Year(1)

Land Use	Total Units	2015	2020	2025	2030
Park (Active Recreation)	17.4 acres			8.0 acres	9.4 Acres
Urban & Neighborhood Park	10.6 acres		5.5 acres	5.1 acres	
Single Family Residential	621 DU	105 DU	354 DU	162 DU	
Multi-Family Residential	1,429 DU	246 DU	824 DU	359 DU	
Elementary School	11.4 acres			11.4 acres	
Jr. High/Middle School	21 acres				21.0 Acres
Office (< 100 KSF)	50 KSF		50 KSF		
Commercial Retail	250 KSF		40 KSF	150 KSF	60.0 KSF
Community Purpose Facility	5.8 acres				5.8 Acres
TOTAL EDU		302	1,388	2,234	2,610

Notes: KSF = thousand square feet DU = dwelling units
(1) Land use phasing assumptions in this table were provided by the applicant for the purposes of this TIA.

PROJECT TRIP GENERATION AND TRIP DISTRIBUTION

SANDAG trip generation rates were utilized to determine the daily and peak hour trips to be generated by the proposed project. **Table 7** summarizes the Village 8 West trip generation rates applied to the proposed uses.

Table 7
Trip Generation Rates

Land Use	Units	Daily Rate	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Park (Active Recreation)	Acres	50	4%	50%	50%	8%	50%	50%
Urban/Neighborhood Park	Acres	5	4%	50%	50%	8%	50%	50%
Single Family Residential	DU	10	8%	30%	70%	10%	70%	30%
Multi-Family Residential	DU	8	8%	20%	80%	10%	70%	30%
Elementary School	Acres	100	32%	60%	40%	9%	40%	60%
Middle School	Acres	105	32%	60%	40%	9%	40%	60%
Office (<100 KSF)	KSF	20	14%	90%	10%	13%	20%	80%
Commercial Retail	KSF	80	4%	60%	40%	10%	50%	50%
Community Purpose Facility	Acres	30	5%	60%	40%	8%	50%	50%

Source: SANDAG *(Not So) Brief Guide to Trip Generation* Rates (2002) DU = Dwelling Units KSF = Thousand Square Feet

The proposed project is planned to be mixed use with a range of residential densities and variety of land uses. Because of the mix of uses and comprehensive network of bicycle and pedestrian facilities, it is reasonable to assume that a portion of the trips made will be either non-motorized or transit-oriented. Therefore, trip reduction factors were applied to the forecasted trip generation for Village 8 West to reflect internally captured trips (trips that do not leave the village), non-motorized trips (pedestrian and bike trips), and transit trips. The concept of Otay Ranch Villages is comprehensive and designed to keep a portion of traffic internal to the project as residential, commercial, and community land uses will be within close proximity to one another. Internal trips will result in traffic circulating within the village, but will not add traffic on the surrounding roadway network outside of the Village 8 West boundaries.

Internal capture rates were calculated for retail, residential, office, and recreational uses as outlined in the *ITE Trip Generation Handbook*. This methodology applies attractiveness factors between uses to determine the propensity for short vehicle trips and/or non-motorized trips. Internal capture rates range from 2% to 60% depending on the combination of land uses. Internal trip capture reductions are lower in 2015 and 2020 when Village 8 West is primarily residential. As commercial office and retail develop in 2025 and 2030, internal capture within the village increases. At buildout, internal capture accounts for an approximate 32% reduction in daily trips.

In addition, a 5% reduction was applied for transit uses for all study years 2020 through 2030 based on SANDAG transit reduction rates. MTS is planning both Rapid Bus service and local circulator service that will be accessible from Village 8 West. Rapid Bus Service provides efficient, limited stop service along Main Street. A stop is planned within the town center and will be within walking distance of much of Village 8 West. Local circulator service will travel along La Media Road and circulate through the ranch. This service will have frequent stops. Although Bus Rapid Transit (BRT) is also planned for the Otay Ranch, there are not stops that are within the Village 8 West boundary. Nearest access to the proposed BRT line is east of Village 8 West in Village 9. Therefore, no credit for access to BRT is included in the internal capture assessment for Village 8 West. Internal capture rate and transit reduction calculations are provided in **Appendix E**.

Table 8 shows the forecast project-generated daily and peak hour trips, including internal capture and transit reductions, for the proposed project. As shown, at buildout the proposed project is forecast to generate a total of approximately 43,084 daily trips, which includes 3,467 a.m. peak hour trips and 4,286 p.m. peak hour trips before internal capture and transit reductions With internal capture and transit reductions, the project is forecast to generate approximately 26,104 trips per day, including 2,662 a.m. and 2,769 p.m. peak hour trips.

Distribution of project-generated traffic was determined using the SANDAG Series 11 South Bay Sub Area Select Zone analysis for each study year: 2015, 2020, 2025, and 2030. **Exhibits 8 through 12** illustrate the project trip distribution for each study scenario. SANDAG Select Zone model runs for each year are provided in **Appendix F**.

Exhibits 13 through 17 illustrate the peak hour project trip assignment based on the trip distribution percentages for each respective study scenario. **Exhibits 18 through 22** illustrate the daily project trip assignment for each study scenario.

Table 8
Forecast Project-Generated Trips

Land Use	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Park (Active Recreation)	17.4 AC	870	35	17	17	70	35	35
Urban/Neighborhood Park	10.6 AC	53	2	1	1	4	2	2
Single Family Residential	621 DU	6,210	497	149	348	621	435	186
Multi-Family Residential	1,429 DU	11,432	915	183	732	1,143	800	343
Elementary School	11.4 AC	1,140	365	219	146	103	41	62
Middle School	21 AC	2,205	706	423	282	198	79	119
Office (<100KSF)	50 KSF	1,000	140	126	14	130	26	104
Commercial Retail	250 KSF	20,000	800	480	320	2,000	1,000	1,000
Community Purpose Facility	5.8 AC	174	9	5	3	14	7	7
SUBTOTAL		**43,084**	**3,467**	**1,604**	**1,864**	**4,283**	**2,425**	**1,858**
Internal Capture[1]		*-14,826*	*-632*	*-316*	*-316*	*-1,300*	*-650*	*-650*
Transit Reduction[2]		*-2,154*	*-173*	*-80*	*-93*	*-214*	*-121*	*-93*
TOTAL		**26,104**	**2,662**	**1,208**	**1,455**	**2,769**	**1,654**	**1,115**

Note: based on *SANDAG, Not So Brief Guide, April 2002*
[1] Internal Capture Rates provided from *ITE Trip Generation Handbook.* Internal capture rates vary by each combination of land uses.
[2] Transit Reduction Rates provided from SANDAG; a transit reduction of 5% is assumed by project buildout.

EXISTING PLUS PROJECT CONDITIONS

The California Environmental Quality Act (CEQA) mandates the assessment of existing (ground) conditions with project buildout conditions. The Existing Plus Project study scenario assumes the existing street network with existing traffic count data as the baseline in order to analyze impacts from the project at buildout. Table 8 showed that the project is forecast to generate 43,084 trips per day at buildout. Because of the lack of existing transit service and the isolated nature of the project in this study scenario, neither internal capture nor transit reductions were applied in this analysis.

Access to Village 8 West will be provided along the future Otay Valley Road, future La Media Road, future Main Street and Magdalena Avenue.

Exhibit 23 illustrates the Existing Plus Project conditions peak hour volumes. **Table 9** summarizes the peak hour level of service for Existing Plus Project conditions. Detailed HCM Worksheets are provided in **Appendix G** of this report. As shown, the intersections of Olympic Parkway / I-805 Northbound Ramps and Main Street / Magdalena are forecast to operate at deficient levels of service and are forecast to be significantly impacted by the project.

Exhibit 24 illustrates the Existing Plus Project conditions average daily volumes. **Table 10** presents the results of the Existing Plus Project conditions roadway segment level of service analysis. As shown, the segments of Olympic Parkway from I-805 to Brandywine Avenue (LOS E), Brandywine Avenue to Heritage Road (LOS E), and Heritage Road to La Media Road (LOS F) are forecast to operate at deficient levels of service.

Table 9
Existing Plus Project Study Intersection LOS

Study Intersection	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		LOS E or F	% Project Trips	Impact
1. Olympic Pkwy / 805 Southbound Ramps	40.4	D	47.9	D			
2. Olympic Pkwy / 805 Northbound Ramps	**120.6**	**F**	49.7	D	X	13.5%	Direct
3. Olympic Pkwy / Brandywine Ave	31.6	C	41.5	D			
4. Olympic Pkwy / Santa Victoria	*Does Not Exist*						
5. Olympic Pkwy / Heritage Rd	21.9	C	20.2	D			
6. Olympic Pkwy / La Media Rd	51.5	D	38.8	D			
7. Olympic Pkwy / 125 Southbound Ramps	15.8	B	17.0	B			
8. Olympic Pkwy / 125 Northbound Ramps	1.3	A	2.4	A			
9. Olympic Pkwy / Eastlake Parkway	29.8	C	32.1	C			
10. Olympic Pkwy / Hunte Pkwy	33.6	C	34.7	C			
11. Santa Victoria / Heritage Rd	*Does Not Exist*						
12. Birch Rd / La Media Rd	30.6	C	25.1	C			
13. Birch Rd / SR125 Southbound Ramps	~~9.8~~15.8	~~A~~B	~~11.0~~17.0	B			
14. Birch Rd / SR125 Northbound Ramps	5.2	A	12.4	B			
15. Birch Rd / Eastlake Pkwy	35.8	D	33.8	C			
16. Main St / 805 Southbound Ramps	27.8	C	31.9	C			
17. Main St / 805 Northbound Ramps	27.0	C	28.9	C			
18. Main St / Heritage Rd	2.7	A	0.9	A			
19. Main St / La Media Rd (Couplet)							
Westbound Main St / Southbound La Media Rd	0.0	A	0.1	A			
Westbound Main St / Northbound La Media Rd	8.5	A	8.4	A			
Eastbound Main St / Southbound La Media Rd	0.0	A	0.1	A			
Eastbound Main St / Northbound La Media Rd	4.5	A	6.3	A			
20. Main St / Magdalena Ave	**78.8**	**E**	**164.1**	**F**	X	100%	Direct
21. Main St / SR125 Southbound Ramps	*Does Not Exist*						
22. Main St / SR125 Northbound Ramps	*Does Not Exist*						
23. Main Street / Eastlake Pkwy	13.6	B	12.9	B			
24. Otay Valley Rd / SR125 Southbound Ramps	*Does Not Exist*						
25. Otay Valley Rd / SR125 Northbound Ramps	*Does Not Exist*						

Note: Deficient intersection operation shown in **bold**

Table 10
Existing Plus Project Study Roadway Segment LOS

Roadway	Segment	Existing Plus Project Conditions					Project/Cumulative Impacts		
		Classification (# Lanes)	LOS C Capacity	ADT	V/C	LOS	≥800 Project Trips	≥5% Project Trips?	Impact
Olympic Parkway	805 to Brandywine	Prime Arterial (6)	50,000	**56,478**	**0.90**	**E**	9,478	16.8%	**Direct**
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	**59,061**	**0.94**	**E**	10,340	17.5%	**Direct**
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	**65,617**	**1.05**	**F**	15,079	23.0%	**Direct**
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	48,302	0.77	C			
	SR-125 Ramps to Eastlake Pkwy	Expressway (8)	70,000	44,786	0.48	A			
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	18,324	0.26	A			
	East of Hunte Pkwy	Major Street (4)	30,000	10,000	0.25	A			
Birch Road	La Media to SR-125	Major Street (6)	40,000	22,717	0.45	A			
	SR-125 to Eastlake Parkway	Prime Arterial (6)	50,000	18,005	0.29	A			
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,500	27,327	0.37	A			
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	18,729	0.30	A			
	Heritage Rd to Couplet	*Does Not Exist*							
	Couplet to Magdalena Ave	Prime Arterial (6)	50,000	11,633	0.19	A			
	Magdalena Ave to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9 Access Road	*Does Not Exist*							
	Village 9 Access Road to Eastlake Pkwy	*Does Not Exist*							
Hunte Pkwy	Eastlake Pkwy to Olympic Pkwy	Prime Arterial (6)	50,000	2,699	0.04	A			
	Olympic Pkwy to Otay Lakes Rd	Major Street (4)	30,000	10,734	0.28	A			
Heritage Rd	Telegraph Cyn Rd to Olympic Pkwy	Prime Arterial (6)	50,000	17,553	0.28	A			
	Olympic Pkwy to Main St	*Does Not Exist*							
	Main Street to Entertainment Circle	Class II Collector (2A)	12,000	10,035	0.67	B			
	Entertainment Circle to Ave. de Las Vistas *(City of SD)*	Class II Collector (2A)	12,000	9,846	0.66	B			
La Media Rd	Telegraph Cyn Rd to Olympic Pkwy	Prime Arterial (6)	50,000	19,982	0.32	A			
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	38,180	0.68	A			
	Birch Rd to Couplet	Prime Arterial (6)	50,000	31,458	0.62	A			
Magdalena Ave	Birch Road to Main	Class II Collector (2)	12,000	**20,755**	**1.38**	**F**	11,633	56.0%	**Direct**
Eastlake Pkwy	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	24,115	0.36	A			
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	14,369	0.22	A			
	Birch Rd to Hunte Parkway-Main St	Major Street (6)	40,000	3,895	0.08	A			
	Main St to Otay Valley Rd	*Does Not Exist*							
Otay Valley Rd	Couplet to Street “A”	*Does Not Exist*							
	Street “A” to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9 Access	*Does Not Exist*							

Note: Deficient LOS operation shown in **bold**

Significant Impacts & Mitigation

The results of the Existing Plus Project analysis show that two intersections are forecast to operate at deficient LOS under Existing plus Project conditions. For each of the two impacted intersections, listed below, the project trips added to the intersections exceed the City of Chula Vista's five percent threshold of significance. Therefore, both intersections are forecast to result in direct project impacts:

- Olympic Parkway / 805 Northbound Ramps (13.5%)
- Main Street /Magdalena Avenue (100%)

Four roadway segments are forecast to operate at deficient LOS under Existing plus Project conditions. The project trips added to the deficient segments listed below exceed the City of Chula Vista's five percent threshold of significance. Therefore, all four segments are forecast to be directly impacted by the project:

- Olympic Parkway: from I-805 to Brandywine Avenue (16.8%)
from Brandywine Avenue to Heritage Road (17.5%)
from Heritage Road to La Media Road (23%)
- Magdalena Ave from Birch Road to Main Street

As shown, the project is forecast to result in direct impacts under the Existing Plus Project scenario. The improvements identified for the 2015, 2020, 2025 and 2030 development scenarios, as listed in Tables 29, 30 and 31 would mitigate these direct impacts. The project, however, is planned to be constructed in a series of phases over a period of nearly 20 years. This phasing would not require construction of all the improvements at once, but rather such improvements will be constructed as is needed to mitigate impacts of the phased development. **Exhibit 25** illustrates the proposed phasing plan for Village 8 West.

The Otay Ranch is largely undeveloped around Village 8 West. Existing infrastructure within the Otay Ranch services currently vacant properties. Therefore, substantial capacity is currently available to serve the Village 8 West project. As other projects within the Ranch develop over time and consume portions of the available capacity, the overall impacts of the project will be greater than those identified in the Existing plus Project study scenario.

A phased analysis of this project was therefore conducted that includes both the proposed project and the cumulative projects throughout the City. The project traffic and the cumulative traffic was phased in five year increments beginning in 2015. Although the cumulative projects may provide improvements to the circulation system as either mitigation or project frontage improvements, the analysis conducted in this study assumes the existing roadway network until mitigation measures are required to offset project impacts. Once a mitigation measure is identified in a future year scenario, including the payment of TDIF fees for cumulative impacts, the subject improvements are integrated into future year analysis This methodology more accurately evaluates the overall project impact on the circulation system as this project and other projects develop over time.

2015 CONDITIONS

By 2015, Village 8 West is planned to include up to 105 single family and 246 multi-family residential dwelling units. **Table 11** summarizes the Village 8 West 2015 project trip generation.

Table 11
2015 Project Trip Generation

Land Use	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Single Family Residential	105 DU	1,050	84	25	59	105	74	32
Multi-Family Residential	246 DU	1,968	157	31	126	197	138	59
SUBTOTAL		**3,018**	**241**	**57**	**185**	**302**	**211**	**91**
Internal Capture[1]		-	-	-	-	-	-	-
Transit Reduction[2]		-	-	-	-	-	-	-
TOTAL		**3,018**	**241**	**57**	**185**	**302**	**211**	**91**
TOTAL EDU'S		**302 EDU**						

[1] No internal capture is applied to the 2015 Project scenario
[2] No transit reduction is applied to the 2015 Project scenario

The design and topography of the project requires a logical progression of on-site infrastructure improvements. The on-site access improvements will be constructed from the north end of the property to the south end of the property. This is necessary to connect Village 8 West to the existing roadway network in Otay Ranch. To provide access to Village 8 West in the year 2015, the project will construct the following on-site roadway improvements:

- Two lanes of La Media Road from existing terminus to Main Street
- Two lanes of Main Street from La Media Road to Magdalena Avenue.

Exhibit 26 illustrates the 2015 circulation system evaluated for year 2015. Access to Village 8 West will be provided along Main Street, La Media Road and Magdalena Avenue in this study scenario.

Year 2015 traffic volumes were calculated using the SANDAG Series 11 South Bay traffic model. The SANDAG traffic model provides average daily traffic (ADT) for roadway segments, from which peak hour intersection turning volumes were post-processed. The relationship between existing peak hour volumes to existing ADT as well as anticipated growth in the surrounding area was used as a basis for post processing. **Exhibit 27** shows 2015 peak hour intersection volumes. **Exhibit 28** illustrates 2015 ADT volumes.

2015 Operational Analysis

Table 12 summarizes the results of the 2015 a.m. and p.m. peak hour intersection level of service analysis. Detailed HCM calculation sheets are contained in **Appendix H**.

As shown in Table 12, the intersection of Olympic Parkway and I-805 Northbound Ramps is forecast to operate at a deficient level of service under 2015 conditions.

Table 12
2015 Study Intersection LOS

Study Intersection	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		LOS E or F	% Project Trips	Impact
1. Olympic Pkwy / 805 Southbound Ramps	48.4	D	49.0	D			
2. Olympic Pkwy / 805 Northbound Ramps	**116.2**	**F**	42.7	D	X	0.6%	Cumulative
3. Olympic Pkwy / Brandywine Ave	23.1	C	29.6	C			
4. Olympic Pkwy / Santa Victoria	*Does Not Exist*						
5. Olympic Pkwy / Heritage Rd	33.1	C	41.9	D			
6. Olympic Pkwy / La Media Rd	42.3	D	32.8	C			
7. Olympic Pkwy / 125 Southbound Ramps	5.2	A	4.8	A			
8. Olympic Pkwy / 125 Northbound Ramps	2.2	A	4.0	A			
9. Olympic Pkwy / Eastlake Parkway	31.5	C	32.6	C			
10. Olympic Pkwy / Hunte Pkwy	34.6	C	34.7	C			
11. Santa Victoria / Heritage Rd	*Does Not Exist*						
12. Birch Rd / La Media Rd	33.0	C	31.8	C			
13. Birch Rd / SR125 Southbound Ramps	7.2	A	8.2	A			
14. Birch Rd / SR125 Northbound Ramps	16.0	B	15.8	B			
15. Birch Rd / Eastlake Pkwy	35.3	D	34.9	C			
16. Main St / 805 Southbound Ramps	30.2	C	40.5	D			
17. Main St / 805 Northbound Ramps	29.6	C	30.7	C			
18. Main St / Heritage Street	4.1	A	4.8	A			
19. Main St / La Media Rd:	10.4	B	9.0	A			
20. Main St / Magdalena Ave	13.5	B	17.5	B			
21. Main St / SR125 Southbound Ramps	*Does Not Exist*						
22. Main St / SR125 Northbound Ramps	*Does Not Exist*						
23. Main Street / Eastlake Pkwy	14.0	B	13.6	B			
24. Otay Valley Rd / SR125 Southbound Ramps	*Does Not Exist*						
25. Otay Valley Rd / SR125 Northbound Ramps	*Does Not Exist*						

Note: Deficient intersection operation shown in **bold**

Table 13 presents the results of the 2015 conditions roadway segment level of service analysis. As shown in Table 13, the following segments are forecast to operate at deficient levels of service (LOS D, E, or F):

- Olympic Parkway: from I-805 to Brandywine Avenue (LOS D)
  from Brandywine Avenue to Heritage Road (LOS D)
  from Heritage Road to La Media Road (LOS D)
  from La Media Road to SR-125 Ramps (LOS E)
- Heritage Road: from Main St to Entertainment Circle (LOS E)
  from Entertainment Circle to Avenida de Las Vistas (LOS E)

Table 13
2015 Roadway Segment LOS

Roadway	Segment	Classification	LOS C Capacity	ADT	LOS	Significance Criteria[1]			Impact
						LOS D/E/F?	≥5% Project Trips?	Project ADT ≥800?	
Olympic Parkway	805 to Brandywine	Prime Arterial (6A)	50,000	**52,150**	**D**	X	1.3%	664	No Impact
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	**54,000**	**D**	X	1.3%	724	No Impact
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	**55,350**	**D**	X	1.9%	1,056	No Impact
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	**57,300**	**E**	X	0.1%	60	No Impact
	SR-125 Ramps to Eastlake Pkwy	Expressway (8)	70,000	45,000	A				
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	31,400	A				
	East of Hunte Pkwy	Major Street (4)	30,000	11,700	A				
Birch Road	La Media to SR-125	Major Street (6)	40,000	17,700	A				
	SR-125 to Eastlake Pkwy	Prime Arterial (6)	50,000	17,400	A				
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,500	37,800	B				
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	24,500	A				
	Heritage Rd to La Media Rd	*Does Not Exist*							
	La Media Rd to Magdalena Ave	Class II Collector (2)	12,000	1,000	A				
	Magdalena Ave to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9 St “A”	*Does Not Exist*							
	Village 9 St “A” to Eastlake Pkwy	*Does Not Exist*							
Hunte Parkway	Eastlake Pkwy to Olympic Pkwy	Prime Arterial (6)	50,000	7,300	A				
	Olympic Pkwy to Otay Lakes Rd	Major Arterial (4)	30,000	11,000	A				
Heritage Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	32,300	A				
	Olympic Pkwy to Main St	*Does Not Exist*							
	Main St to Entertainment Circle	Class II Collector (2A)	12,000	**14,700**	**E**	X	0%	0	No Impact – No project volume
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	Class II Collector (2A)	12,000	**14,900**	**E**	X	0%	0	No Impact – No project volume
La Media Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	13,000	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	15,700	A				
	Birch Rd to Main St	Prime Arterial (6)	50,000	2,500	A				
Magdalena Ave	Birch Rd to Main St	Class II Collector (2)	12,000	10,400	B				
Eastlake Parkway	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	17,200	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	18,200	A				
	Birch Rd to Main St	Major Street (6)	40,000	15,100	A				
	Main St to Otay Valley Rd	*Does Not Exist*							
Otay Valley Road	Couplet to Street “A”	*Does Not Exist*							
	Street “A” to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9	*Does Not Exist*							
	Village 9 Access to University	*Does Not Exist*							

Note: Deficient LOS operation shown in **bold** [1] A “Direct” project impact occurs if a project meets all three significance criteria; otherwise impacts are identified as “Cumulative”.

2015 Significant Impacts and Recommended Mitigation Measures

As discussed above, one intersection and six roadway segments are forecast to operate at deficient levels of service by 2015. Each of the deficient locations were evaluated to determine the project impact at those locations using the City's thresholds of significance as outlined previously in the "Thresholds of Significance" section of this report. The intersections and roadway segments forecast to operate at deficient LOS are listed below along with the percentage of project trips at each location:

- Olympic Parkway / I-805 Northbound Ramps (0.6%)

- Olympic Parkway: from I-805 to Brandywine Avenue (1.3%)
  from Brandywine Avenue to Heritage Road (1.3%)
  from Heritage Road to La Media Road (1.9%)
  from La Media Road to SR-125 (0.1%)

- Heritage Road: from Main St to Entertainment Circle (0.0%)
  from Entertainment Circle to Avenida de Las Vistas (0.0%)

Mitigation measures are required at intersections or along roadway segments forecast to be significantly impacted by the project based on the City's Thresholds of Significance:

Intersections

a. ***Direct*** *project impact* if both the following criteria are met:
   i. Level of service is LOS E or F
   ii. Project trips consist of five percent or more of entering volume
b. ***Cumulative*** *impact* if only (i) is met.

Street Links/Segments

a. ***Direct*** *project impact* if all the following criteria are met:
   i. Level of service is LOS D, E, or F
   ii. Project trips consist of five percent or more of segment volume
   iii. Project adds greater than 800 ADT to the segment
b. ***Cumulative*** *impact* if only (i) is met. However, if the intersections along a LOS D or E segment all operate at LOS D or better, the segment impact is considered not significant since intersection analysis is more indicative of actual roadway system operations than street segment analysis. If a segment is LOS F, an impact is significant regardless of intersection LOS.

For cumulative impacts, the project would mitigate impacts through payment toward the City-established TDIF program. Direct impacts need to be fully mitigated by the project.

Access is a requirement of development and a public safety issue (Municipal Code 12.24). Access related impacts would occur if appropriate access and frontage improvements are not provided as required.

Table 14 summarizes the project impacts and recommended mitigation measures for each deficient location as well as the forecast levels of service without and with the proposed mitigation for year 2015. **Appendix I** includes the mitigated HCM worksheets. A detailed description is provided below for each of the recommended mitigation measures.

Table 14
Year 2015 Summary of Recommended Mitigation Measures

PROJECT ACCESS AND FRONTAGE IMPROVEMENT (BY 1ST EDU) (1)	
Location	**Recommended Mitigation**
Main Street:	Construct Main Street from La Media Road to Magdalena Avenue as a two-lane, two-way street to provide access to Village 8 West
La Media Road:	Construct La Media Road From Existing Terminus South of Santa Luna Street to Planning Areas N, I & J South of Main Street as a two-lane, two-way street to provide access to Village 8 West
Main Street/La Media Road Intersection	Install Traffic Signal at Intersection
Main Street / Magdalena Avenue Intersection	Construct West Leg of Intersection and Modify Existing Striping Install Stop Sign on Southbound Approach

MITIGATION (BY 302nd EDU) (1)						
Study Intersection	**Peak Hour**	**2015 with Project without Mitigation**		**Impact & Recommended Mitigation**	**2015 with Project with Mitigation**	
		Delay	**LOS**		**Delay**	**LOS**
Olympic Pkwy / 805 Northbound Ramps	AM	**116.2**	**F**	**Cumulative Impact** Payment of TDIF Fees	**116.2**	**F**
Study Roadway Segment	**ADT**	**LOS C Capacity**	**LOS**		**ADT**	**LOS**
Olympic Parkway: I-805 to Brandywine	**52,150**	**50,000**	**D**	No Impact: GMO thresholds not exceeded.	**52,150**	**D**
Olympic Parkway: Brandywine Ave to Heritage Rd	**54,000**	**50,000**	**D**	No Impact: GMO thresholds not exceeded	**54,000**	**D**
Olympic Parkway: Heritage Rd to La Media Rd	**55,350**	**50,000**	**D**	No Impact: GMO threshold not exceeded	**55,350**	**D**
Olympic Parkway: La Media Road to SR-125	**57,300**	**50,000**	**E**	No Impact: GMO threshold not exceeded	**57,300**	**E**
Heritage Road: Main Street to Entertainment Circle	**14,700**	**12,000**	**E**	No Impact: GMO threshold not exceeded	**14,700**	**E**
Heritage Road: Entertainment Circle to Avenida de las Vistas	**14,900**	**12,000**	**E**	No Impact: GMO threshold not exceeded	**14,900**	**E**

(1) EDU calculations are based on assumptions regarding phasing as defined by the applicant and summarized in this TIA. Mitigation may also be required as shown in the PFFP section of this report and summarized in Table 32.

Olympic Parkway / I-805 NB Ramps:

At the intersection of Olympic Parkway / I-805 Northbound Ramps, the percentage of project trips added in year 2015 is 0.6%. This does not exceed City of Chula Vista thresholds of significance for determining a "direct impact". Therefore, the impact at this location is considered a cumulative impact.

Recommended Mitigation Measure: *Payment of TDIF fees.*

This facility is within Caltrans ROW and is not within the City's TDIF program. Physical widening through the intersection was evaluated and determined to be infeasible due to limited available right-of-way and potential impacts to the surrounding land uses. However, there are a number of planned improvements within the TDIF program as well as planned improvements by Caltrans for the I-805 corridor which will reduce the traffic volume through the Olympic Parkway/I-805 interchange. These improvements include the construction of the Palomar Street Direct Access Ramps (anticipated completion 2014) and the construction of Heritage Road (included in TDIF program). The construction of these projects will reduce the traffic demand on the interchange at I-805/Olympic Parkway and will result in improved LOS.

Olympic Parkway: From I-805 to SR-125

Four segments along Olympic Parkway from I-805 to SR-125 are forecast to operate at LOS D or LOS E. As stated previously in the "Thresholds of Significance" section of this report, three of the criteria for short term impacts must be met in order for the impact to be identified as "direct":

i) LOS D for more than 2 hours or LOS E/F for 1 hour
ii) Project trips comprise 5% or more of segment volume.
iii) Project adds greater than 800 ADT to the segment.

For all four segments, the project adds less than 800 trips and/or the total trips added is less than 5% of the total volume of the segment. Since at least one of the three criteria are not met, there are no direct project impacts to Olympic Parkway.

If the planning analysis indicates an impact of LOS D, E or F, the Growth Management Ordinance (GMO) method shall be utilized. Under the City's GMO, the threshold for a cumulative impact is considered LOS D for more than 2 hours. The GMO states that if the LOS D threshold is exceeded for more than 2 hours, then all development may be suspended until acceptable operating conditions can be achieved.

As a part of the City's Growth Management Program (GMP), the City monitors the operating conditions along Olympic Parkway on an annual basis. As part of the GMP, an expanded traffic analysis was prepared and documented as the Olympic Parkway Capacity Enhancement Analysis (LLG, 2011) to monitor new development in the Eastern Territories with respect to the existing available capacity on Olympic Parkway east of I-805. The study determined if GMO thresholds are projected to be reached or exceeded, and whether mitigation measures are necessary to remain compliant with the requirements of the GMP. In conformance with the requirements of the GMP, a peak-hour arterial analysis was conducted on the segment of westbound Olympic Parkway between Heritage Road and Oleander Avenue under near-term conditions (Years 0-4) based on the City of Chula Vista's Traffic Monitoring Program (TMP) methodology. The Chula Vista TMP is used to assess the operating performance of the City's arterial street system in order to determine compliance with the Threshold Standards of the GMP.

Based on the LLG study, the segment of westbound Olympic Parkway between Heritage Road and Oleander Avenue during a.m. peak hours would be the first to fall below GMO traffic threshold standards as traffic volumes increase over time with this project and other projects east of I-805. The analysis demonstrated that GMO thresholds would not be reached along Olympic Parkway until building permits for 2,463 dwelling units have been issued for projects east of I-805.

The projected 2,463 dwelling unit threshold is used by the City to determine when cumulative impacts may occur along the corridor. The following mitigation measure has been identified in the event the GMO threshold is reached:

> ***Recommended Mitigation Measures:*** *Prior to the issuance of the building permit for the 2,463rd dwelling unit for development east of I-805 (commencing from April 4, 2011), the applicant may:*
>
> *i.* *Prepare a traffic study that demonstrates, to the satisfaction of the City Engineer, that the circulation system has additional capacity without exceeding the GMO traffic threshold standards, or*
>
> *ii.* *Demonstrate that other improvements are constructed which provide the additional necessary capacity to comply with the GMO traffic threshold to the satisfaction of the City Engineer, or*
>
> *iii.* *Agree to the City Engineer's selection of an alternative method of maintaining GMO traffic threshold compliance, or*
>
> *iv.* *Enter into agreement, approved by the City, with other Otay Ranch developers that alleviates congestion and achieves GMO traffic threshold compliance for Olympic Parkway. The Agreement will identify the deficiencies in transportation infrastructure that will need to be constructed, the parties that will construct said needed infrastructure, a timeline for such construction, and provide assurances for construction, in accordance with the City's customary requirements, for said infrastructure.*
>
> *If GMO compliance cannot be achieved through i, ii, iii or iv above, then the City may, in its sole discretion, stop issuing new building permits within the Project Area after building permits for 2,463 dwelling units have been issued for any development east of I-805 after April 4, 2011, until such time that GMO traffic threshold standard compliance can be assured to the satisfaction of the City Manager.*
>
> *These measures shall constitute full compliance with growth management objectives and policies in accordance with the requirements of the General Plan, Chapter 10 with regard to traffic thresholds set forth in the GMO.*

<u>Heritage Road: From Main Street to Avenida de las Vistas</u>

The project does not add any trips to the two deficient segments along Heritage Road. Therefore, the project does not result in an impact, either direct or cumulative to this segment. No mitigation measures are required.

2020 CONDITIONS

In addition to the development assumed in 2015, an additional 354 single family and 824 multi-family residential dwelling units, 50,000 square feet of office use, 40,000 square feet of commercial retail, and 5.5 acres of park are planned by 2020 within Village 8 West. **Table 15** summarizes the forecasted Village 8 West 2020 project trip generation.

Table 15
2020 Project Trip Generation

Land Use	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Urban & Neighborhood Park	5.5 acres	28	1	1	1	2	1	1
Single Family Residential	459 DU	4,590	367	110	257	459	321	138
Multi-Family Residential	1,070 DU	8,560	685	137	548	856	599	257
Office (<100 KSF)	50 KSF	1,000	140	126	14	130	26	104
Commercial Retail	40 KSF	3,200	128	77	51	320	160	160
SUBTOTAL		**17,378**	**1,321**	**450**	**871**	**1,767**	**1,108**	**660**
Internal Capture[1]		*-2,634*	*-104*	*-52*	*-52*	*-256*	*-128*	*-128*
Transit Reduction[2]		*-869*	*-67*	*-23*	*-44*	*-88*	*-55*	*-33*
TOTAL		**13,875**	**1,150**	**375**	**775**	**1,422**	**924**	**498**
Total EDU's		**1,388**						

Note: based on *SANDAG, Not So Brief Guide, April 2002*
[1] Internal Capture Rates provided from *ITE Trip Generation Handbook.* Internal capture rates vary by each combination of land uses.
[2] Transit Reduction Rates provided from SANDAG; a transit reduction of 5% is assumed by project buildout.

The traffic analysis assumes the 2015 roadway network plus roadway improvements necessary to provide access to Village 8 West including the following:

- Construction of Otay Valley Road from south of Main Street to Village 8 West Street "A" as a four lane Major Street.

Road network assumptions for year 2020 are provided in **Exhibit 29**. Access to Village 8 West will be provided along Main Street, La Media Road, Otay Valley Road and Magdalena Avenue in 2020.

The forecast 2020 volumes include the project traffic and traffic associated with existing and planned development in Chula Vista, City of San Diego, and County of San Diego. Cumulative project volumes were forecast using the SANDAG Series 11 South Bay model, which included straight lined development assumptions for all other undeveloped or partially developed properties. **Exhibit 30** illustrates the forecasted 2020 peak hour intersection volumes. Forecast 2020 daily traffic volumes are illustrated in **Exhibit 31.**

2020 Operational Analysis

Table 16 summarizes the 2020 peak hour intersection LOS. HCM Worksheets are provided in **Appendix J.** As shown, the following intersections are forecast to operate at deficient levels of service under 2020 conditions:

- Olympic Parkway / I-805 Northbound Ramps (a.m. – LOS F)
- Olympic Parkway / Brandywine Avenue (p.m. – LOS F)

Table 17 presents the results of the 2020 conditions roadway segment level of service analysis. As shown, the following segments are forecast to operate at deficient levels of service (LOS D, E, or F):

- Olympic Parkway: from I-805 to Brandywine Avenue (LOS D)
  from Brandywine Avenue to Heritage Road (LOS E)
  from Heritage Road to La Media Road (LOS E)
  from La Media Road to SR-125 Ramps (LOS D)

- Heritage Road: from Main Street to Entertainment Circle (LOS F)
  from Entertainment Circle to Avenida de Las Vistas (LOS F)

- Magdalena Avenue: from Birch Road to Main Street (LOS D)

2020 Significant Impacts & Recommended Mitigation Measures

As discussed above, two intersections and seven roadway segments are forecast to operate at deficient levels of service by 2020. Each of the deficient locations were evaluated to determine the project impact at those locations using the City's thresholds of significance as outlined previously in the "Thresholds of Significance" section of this report. The intersections and roadway segments forecast to operate at deficient LOS are listed below along with the percentage of project trips at each location:

- Olympic Parkway / I-805 Northbound Ramps (4.3%)
- Olympic Parkway / Brandywine Avenue (6.2%)

- Olympic Parkway: from I-805 to Brandywine Avenue (3.6%)
  from Brandywine Avenue to Heritage Road (4.3%)
  from Heritage Road to La Media Road (8.2%)
  from La Media Road to SR-125 Ramps (0.7%)

- Heritage Road: from Main Street to Entertainment Circle (0%)
  from Entertainment Circle to Avenida de Las Vistas (0%)

- Magdalena Avenue: from Birch Road to Main Street (0%)

Table 16
2020 Peak Hour Intersection Levels of Service

Study Intersection	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		LOS E or F	% Project Trips	Impact
1. Olympic Pkwy / 805 Southbound Ramps	51.9	D	54.0	D			
2. Olympic Pkwy / 805 Northbound Ramps	**117.7**	**F**	50.5	D	X	4.3%	Cumulative
3. Olympic Pkwy / Brandywine Ave	42.9	D	**80.4**	**F**	X	**6.2%**	**Direct**
4. Olympic Pkwy / Santa Victoria	*Does Not Exist*						
5. Olympic Pkwy / Heritage Rd	46.7	D	54.6	D			
6. Olympic Pkwy / La Media Rd	40.0	D	35.1	D			
7. Olympic Pkwy / 125 Southbound Ramps	5.3	A	5.6	A			
8. Olympic Pkwy / 125 Northbound Ramps	4.3	A	5.0	A			
9. Olympic Pkwy / Eastlake Parkway	33.5	C	32.6	C			
10. Olympic Pkwy / Hunte Pkwy	35.4	D	35.9	D			
11. Santa Victoria / Heritage Rd	*Does Not Exist*						
12. Birch Rd / La Media Rd	45.9	D	51.1	D			
13. Birch Rd / SR125 Southbound Ramps	5.1	A	5.2	A			
14. Birch Rd / SR125 Northbound Ramps	13.4	B	14.3	B			
15. Birch Rd / Eastlake Pkwy	40.4	D	47.3	D			
16. Main St / 805 Southbound Ramps	30.6	C	43.6	D			
17. Main St / 805 Northbound Ramps	29.8	C	35.7	D			
18. Main St / Heritage Street	4.0	A	5.8	A			
19. Main St / La Media Rd	11.2	B	10.2	B			
20. Main St / Magdalena Ave	22.5	C	24.3	C			
21. Main St / SR125 Southbound Ramps	*Does Not Exist*						
22. Main St / SR125 Northbound Ramps	*Does Not Exist*						
23. Main Street / Eastlake Pkwy	22.5	C	24.1	C			
24. Otay Valley Rd / SR125 Southbound Ramps	*Does Not Exist*						
25. Otay Valley Rd / SR125 Northbound Ramps	*Does Not Exist*						

Note: Deficient intersection operation shown in **bold**

Table 17
2020 Conditions Roadway Segment LOS

Roadway	Segment	Classification	LOS C Capacity	ADT	LOS	Significance Criteria[1]			Impact
						LOS D/E/F?	≥5% Project Trips?	Project ADT ≥800?	
Olympic Parkway	805 to Brandywine	Prime Arterial (6)	50,000	**54,600**	**D**	X	3.6%	1,943	Cumulative
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	**58,200**	**E**	X	4.3%	2,498	Cumulative
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	**60,800**	**E**	X	8.2%	4,995	Direct
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	**58,700**	**E**	X	0.7%	416	No impact[2]
	SR-125 Ramps to Eastlake Pkwy	Expressway (8)	70,000	46,700	A				
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	33,600	A				
	East of Hunte Pkwy	Major Street (4)	30,000	14,700	A				
Birch Road	La Media to SR-125	Major Street (6)	40,000	37,000	C				
	SR-125 to Eastlake Pkwy	Prime Arterial (6)	50,000	37,200	B				
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,500	39,400	A				
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	27,700	A				
	Heritage Rd to Couplet	*Does Not Exist*							
	Couplet to Magdalena Ave	Prime Arterial (6)	50,000	12,000	A				
	Magdalena Ave to SR-125	*Does Not Exist*							
	SR-125 Ramps to Village 9 St A	*Does Not Exist*							
	Village 9 St "A" to Eastlake Pkwy	Gateway (6)	61,200	17,900	A				
Hunte Parkway	Eastlake Pkwy to Olympic Pkwy	Prime Arterial (6)	50,000	11,700	A				
	Olympic Pkwy to Otay Lakes Rd	Major Street (4)	30,000	12,800	A				
Heritage Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	40,500	B				
	Olympic Pkwy to Main St	*Does Not Exist*							
	Main St to Entertainment Circle	Class II Collector (2A)	12,000	**17,300**	**F**	X	0%	0	Cumulative
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	Class II Collector (2A)	12,000	**16,300**	**F**	X	0%	0	Cumulative
La Media Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	19,500	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	34,600	A				
	Birch Rd to Couplet	Prime Arterial (6)	50,000	33,700	A				
Magdalena Ave	Birch Rd to Main St	Class II Collector (2)	12,000	**12,500**	**D**	X	25.5%	3,191	No Impact[(3)]
Eastlake Parkway	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	20,700	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	23,200	A				
	Birch Rd to Main	Major Street (6)	40,000	31,400	B				
	Main St to Otay Valley Rd	*Does Not Exist*							
Otay Valley Road	Couplet to Street "A"	Major Street (4)	30,000	4,300	A				
	La Media to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9 St A	*Does Not Exist*							
	Village 9 St "A" to University	Major Street (4)	30,000	1,600	A				

Deficient conditions shown in **bold.** [1]A "Direct" project impact occurs if a project meets all three significance criteria; otherwise impacts are identified as "Cumulative." [2]According to the City of Chula Vista significance thresholds, an impact along a deficient roadway segment operating at LOS D or E is considered NOT significant if: the intersections along a roadway segment operate at LOS D or better, the project contributes less than 800 ADT, or if the project contributes less than 5% total volume. [3]Magdalena is a local street, not on the city's circulation network and not subject to General Plan LOS standards. The intersection of Main/Magdalena is forecast to operate at acceptable LOS with the project. Therefore, the project is not forecast to have a significant impact on Magdalena Avenue.

For cumulative impacts, the project would mitigate impacts through payment toward the City-established TDIF program. Direct impacts need to be fully mitigated by the project.

Access is a requirement of development and a public safety issue (Municipal Code 12.24). Access related impacts would occur if appropriate access and frontage improvements are not provided as required.

Table 18 summarizes the project impacts and recommended mitigation measures for each significantly impacted location, as well as the forecast levels of service without and with the proposed mitigation for year 2020. All improvements identified as mitigation measures will be bonded or constructed prior to approval of the Final Map associated with the number of EDU's listed in Table 18.

Appendix K includes the mitigated HCM worksheets. A detailed description of recommended project mitigation measures is provided below.

Table 18
Year 2020 Levels of Service
Without and With Recommended Mitigation

PROJECT ACCESS AND FRONTAGE IMPROVEMENT (BY 302nd EDU) (1)	
Location	**Recommended Mitigation**
Otay Valley Road:	Construct from south of Main Street to Village 8 West Street "A" as 4-lane Major

MITIGATION (BY 1,388TH EDU) (1)						
Study Intersection	**Peak Hour**	**2020 With Project Without Mitigation**		**Recommended Mitigation**	**2020 With Project With Mitigation**	
Olympic Pkwy / I-805 NB Ramps	AM	**117.7**	**F**	***Cumulative Impact*** Payment of TDIF fees	**117.7**	**F**
Olympic Pkwy / Brandywine Ave	PM	**80.4**	**F**	***Direct Impact*** Install NB right turn overlap phase. Extend westbound left turn pocket (CIP Project), if not completed by 2015.	46.4	D
Study Roadway Segment	**LOS C Capacity**	**ADT**	**LOS**	**Recommended Mitigation**	**ADT**	**LOS**
Olympic Parkway: I-805 to Brandywine	50,000	**54,600**	**D**	***Cumulative Impact*** Payment of TDIF	**54,600**	**D**
Olympic Parkway: Brandywine to Heritage Rd	50,000	**58,200**	**E**	***Cumulative Impact*** Payment of TDIF	**58,200**	**E**
Olympic Parkway: Heritage Rd to La Media Rd	50,000	**60,800**	**E**	***Direct Impact*** *Construct Santa Victoria Road from Heritage Road to La Media Road & Heritage Road from Olympic Parkway to Santa Victoria*	**55,600**	**D**
Olympic Parkway La Media Road to SR-125	50,000	**58,700**	**D**	***No Impact*** *Intersections along the corridor operate at LOS D or better,*	**58,700**	**D**
Heritage Road Main Street to Avenida de las Vistas	12,000	**17,300**	**F**	***Cumulative Impact*** Payment of TDIF	**17,300**	**F**
Magdalena Avenue Main Street to Birch Road	12,000	**12,500**	**D**	***No Impact*** (2)	**12,500**	**D**

(1) EDU calculations are based on assumptions regarding phasing as defined by the applicant and summarized in this TIA. Mitigation may also be required as shown in the PFFP section of this report and summarized in Table 32.
(2) Magdalena is not a circulation element road and is not subject to GDP LOS standards.

Olympic Parkway/I-805 Northbound Ramps:

At Olympic Parkway / I-805 Northbound Ramps, the percentage of project trips added to the intersection is less than five percent. Therefore, the impacts fall below the thresholds of significance and the impacts are considered cumulative.

> ***Recommended Mitigation Measures:*** *Payment of TDIF fees.*
> This facility is within Caltrans ROW and is not within the City's TDIF program. Physical widening through the intersection was evaluated and determined to be infeasible due to limited available right-of-way and potential impacts to the surrounding land uses. However, there are a number of planned improvements that have been assumed for this traffic analysis and are within the TDIF program and as well as planned improvements by Caltrans for the I-805 corridor that will reduce the traffic volume through the Olympic Parkway/I-805 interchange should these improvements be constructed within the timeframe analyzed in this traffic report. These improvements include the construction of the Palomar Street Direct Access Ramps (anticipated completion 2014) and the construction of Heritage Road (included in TDIF program). The construction of these projects will reduce the traffic demand on the interchange at I-805/Olympic Parkway and will result in improved LOS.

Olympic Parkway / Brandywine Avenue:

At Olympic Parkway / Brandywine Avenue, the percentage of project trips added to the intersections is more than five percent, resulting in direct project impacts. The obvious mitigation measure for this intersection is the construction of westbound dual left turn lanes to address the high left turn volumes that occur during the a.m. peak period. However, existing right of way constraints make this improvement infeasible, expensive and not reasonable. Based on future forecast of volumes in the study area, and at this location in particular, modifications to the roadway system would in fact reduce the demand at Olympic Parkway at Brandywine Avenue and make this improvement unnecessary in the future.

Currently, Brandywine is the main north-south connection between Main Street & Olympic Parkway. During the a.m. peak period, there is a heavy westbound left turn volume. As a result the left turning volume queues in the through lane, blocking access to westbound through vehicles, or the through vehicles block access for the left turning vehicles. When Heritage Road is constructed to provide parallel and redundant access between Olympic Parkway and Main Street, the north-south demand on Brandywine is greatly reduced. As a result the future left turn volumes for this intersection are also greatly reduced.

> ***Recommended Mitigation Measures:*** *There are two mitigations identified that when combined fully mitigate the identified project impacts for the Olympic Parkway and Brandywine Avenue intersection:*
>
> 1. ***Install northbound right turn overlap phase***. This will reduce delay to the northbound right turning volume and provide an overall capacity improvement to the intersection. This improvement will offset the projects' direct impact.

2. ***Extend westbound left turn pocket (CIP Project), if not completed by 2015.*** To reduce the short term lane blockage issue, the City has developed a CIP project, that is fully funded through TransNet funds to lengthen the existing westbound left turn pocket. Although traditional methods of measuring levels of service do not accurately measure the benefits of this improvement, the ability for vehicles to decelerate in the left turn lane and the ability for the queue to be maintained within the provided left turn pocket will provide operational benefits to the intersection and corridor. This is a short-term solution toward mitigating existing queuing issues at the intersection.

Olympic Parkway: From I-805 to Brandywine

This segment of Olympic Parkway is forecast to operate at LOS D. The project contributes 1,943 daily trips (3.6% to the total volume of the segment), which falls below the threshold of significance for a direct impact. Therefore, the impact is cumulative.

Recommended Mitigation Measures: *Payment of TDIF fees.*

Olympic Parkway: From Brandywine to Heritage Road

Based on this analysis, the project will add 2,498 trips (4.3% percent of the total daily traffic) to Olympic Parkway from Brandywine Avenue to Heritage Road. As this falls below the thresholds of significance for a direct impact, the impact is determined to be cumulative

Recommended Mitigation Measures: *Payment of TDIF fees.*

Olympic Parkway: From Heritage Road to La Media Road

The project is forecast to add 4,995 trips (8.2% of the total daily traffic) to the segment of Olympic Parkway from Heritage Road to La Media Road. As this exceeds the City's thresholds of significance, the impacts to this segment are a direct project impact. Therefore, improvements are required to offset the project impacts.

Recommended Mitigation Measures: *Construct Santa Victoria from Heritage Road to La Media Road and Heritage Road from Olympic Parkway to Santa Victoria.*

Santa Victoria is a future road that runs parallel to Olympic Parkway between Heritage Road and La Media Road. The construction of Santa Victoria will reduce the demand on Olympic Parkway by providing an alternative route through Village 2. The trip distribution analysis conducted using the SANDAG model demonstrated that project traffic from Village 8 West will use Santa Victoria as an alternative route to Olympic Parkway. As this road is not included in the TDIF program, TDIF credits would not be allocated for the construction of this road.

Olympic Parkway: From La Media Road to SR-125

Olympic Parkway from La Media Road to SR-125 is forecast to operate at LOS E, but all intersections along the segment operate at LOS D or better. According to the City's thresholds of significance, when this occurs, there is no impact to this segment. No mitigation measures are required.

Heritage Road: Main Street to Avenida de las Vistas

Heritage Road is forecast to operate at LOS F by the year 2020. The distribution of project trips using the SANDAG model showed that the project is not forecast to add any project trips to the segment of Heritage Road from Main Street to Entertainment Circle to Avenida de las Vistas.

> ***Recommended Mitigation Measures:*** *Payment of TDIF Fees*
>
> Future plans to widen Heritage Road to six lanes will increase the roadway capacity and the segment is forecast to operate acceptably once the road is widened. The payment of TDIF fees will mitigate any cumulative impacts this project would have on Heritage Road.

Magdalena Avenue: Birch Road to Main Street

Magdalena Avenue is not a Circulation Element road and is not subject to General Plan LOS thresholds according to the Otay Ranch General Development Plan. Analysis of Magdalena Avenue shows that this road operates at LOS D in the year 2020. A level of service D operating condition indicates that the forecast ADT volume in the year 2020 is approximately 70 to 80% of the overall capacity of the road and acceptable traffic flow will occur. As the forecast year 2020 volumes are well below the capacity of the road, the project not forecast to impact Magdalena Avenue in the 2020. Therefore, the project impacts to this road are determined to be not significant and mitigation measures are not required.

2025 CONDITIONS

In addition to the development assumed in 2015 and 2020, an additional 162 single family dwelling units, 359 multi family dwelling units, an elementary school, 150,000 square feet of commercial retail, and 13 acres of park space are planned in Village 8 West by 2025. **Table 19** summarizes the forecasted Village 8 West 2025 project trip generation.

Table 19
2025 Project Trip Generation

Land Use	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Park (Active Recreation)	8.0 acres	400	16	8	8	32	16	16
Urban & Neighborhood Park	10.6 acres	53	2	1	1	4	2	2
Single Family Residential	621 DU	6,210	497	149	348	621	435	186
Multi-Family Residential	1,429 DU	11,432	915	183	732	1,143	800	343
Elementary School	11.4 acres	1,140	365	219	146	103	41	62
Office (<100 KSF)	50 KSF	1,000	140	129	14	130	26	104
Commercial Retail	190 KSF	15,200	608	365	243	1,520	760	760
SUBTOTAL		**35,435**	**2,542**	**1,051**	**1,492**	**3,553**	**2,080**	**1,473**
Internal Capture[1]		*-11,326*	*-484*	*-242*	*-242*	*-1,043*	*-522*	*-522*
Transit Reduction[2]		*-1,772*	*-127*	*-53*	*-75*	*-178*	*-104*	*-74*
TOTAL		**22,338**	**1,932**	**756**	**1,175**	**2,332**	**1,454**	**878**
Total EDU's		**2,234**						

Note: based on *SANDAG, Not So Brief Guide, April 2002*
[1] Internal Capture Rates provided from *ITE Trip Generation Handbook.* Internal capture rates vary by each combination of land uses.
[2] Transit Reduction Rates provided from SANDAG; a transit reduction of 5% is assumed by project buildout.

The 2025 traffic analysis assumes the 2020 mitigated roadway network plus the following roadway improvements:

- Construction of additional two lanes of Main Street through couplet (project frontage improvement)
- Construction of additional two lanes of La Media Road through couplet (project frontage improvement)
- Construction of Otay Valley Road from Street "A" to the southeastern project boundary as a four lane Major arterial (project frontage improvement)
- Construction of Santa Victoria Road from Heritage Road to La Media Road (2020 project mitigation)
- Construction of Heritage Road (from Olympic Parkway to Main Street); re-stripe southbound Heritage Road to include dual left turn lanes, three through lanes and one right turn lane (constructed by others)
- Widening of Heritage Road from Main Street to Avenida de las Vistas from a Class II Collector to a six lane Prime (constructed by others)

The 2020 mitigated roadway network is required to be constructed prior to the construction of the first EDU following the 2020 development phase (1,388 EDUs). Any additional development cannot occur until the 2020 mitigated roadway network is in place. If the project equivalent dwelling unit limit exceeds the 2020 development phase (1,388 EDUs) prior to the completion of all of the above-listed assumed and planned off-site and on-site improvements being constructed and open to traffic, then one of the following steps shall be taken as determined by the City Engineer:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or

2. City and OLC shall meet to determine the need for the incomplete roadway segments. A number of factors, including changes to the tolling structure at SR-125, may affect the traffic patterns in the Otay Ranch. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or

3. Developer shall construct the missing roadway links and receive TDIF credit for those improvements as applicable; or

4. An alternative measure is selected by the city in accordance with the city of Chula Vista Growth Management Ordinance.

5. All to the satisfaction of the City Engineer.

The roadway network used in this analysis is illustrated in **Exhibit 32**. Village 8 West will gain access from Main Street, La Media Road, Otay Valley Road and Magdalena Avenue.

The forecast 2025 volumes include the project traffic and traffic associated with existing and planned development in Chula Vista, City of San Diego, and County of San Diego. Cumulative project volumes were forecast using the SANDAG Series 11 South Bay model, which included straight-lined development assumptions for all other undeveloped or partially developed properties. **Exhibit 33** illustrates the forecasted 2025 peak hour intersection volumes. Forecast 2025 daily traffic volumes are illustrated in **Exhibit 34.**

2025 Operational Analysis

Table 20 summarizes the 2025 peak hour intersection level of service analysis. HCM analysis worksheets for the year 2025 conditions are provided in **Appendix L.** As shown, the following intersections are forecast to operate at deficient levels of service under 2025 conditions:

- Birch Road / La Media Road (a.m. – LOS F, p.m. – LOS F)
- Birch Road / Eastlake Parkway (a.m. – LOS F, p.m. – LOS F)
- Main Street / Eastlake Parkway (a.m. – LOS F, p.m. – LOS F)

Table 21 presents the results of the 2025 conditions roadway segment level of service analysis. As shown, the following segments are forecast to operate at deficient levels of service (LOS D, E, or F):

- Olympic Parkway: from Heritage Road to La Media Road (LOS F)
  from La Media Road to SR-125 Ramps (LOS D)
- Birch Road: from La Media to SR-125 (LOS F)
- Magdalena Avenue: from Birch Road to Main Street (LOS F)
- Eastlake Parkway: from Birch Road to Main Street (LOS F)

Table 20
2025 Conditions
Peak Hour Study Intersection Level of Service

Study Intersection	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		LOS E or F	% Project Trips	Impact
1. Olympic Pkwy / 805 Southbound Ramps	43.3	D	46.2	D			
2. Olympic Pkwy / 805 Northbound Ramps	43.5	D	34.3	C			
3. Olympic Pkwy / Brandywine Ave	30.0	C	36.8	D			
4. Olympic Pkwy / Santa Victoria	26.6	C	37.8	D			
5. Olympic Pkwy / Heritage Rd	37.8	D	50.5	D			
6. Olympic Pkwy / La Media Rd	45.7	D	47.9	D			
7. Olympic Pkwy / 125 Southbound Ramps	5.4	A	5.8	A			
8. Olympic Pkwy / 125 Northbound Ramps	4.1	A	4.9	A			
9. Olympic Pkwy / Eastlake Parkway	34.9	C	36.8	D			
10. Olympic Pkwy / Hunte Pkwy	36.9	D	36.6	D			
11. Santa Victoria / Heritage Rd	37.5	D	39.5	D			
12. Birch Rd / La Media Rd	**234.8**	**F**	**190.5**	**F**	X	13.2%	Direct
13. Birch Rd / SR125 Southbound Ramps	10.6	B	11.4	B			
14. Birch Rd / SR125 Northbound Ramps	46.7	D	46.1	D			
15. Birch Rd / Eastlake Pkwy	**443.0**	**F**	**454.5**	**F**	X	9.6%	Direct
16. Main St / 805 Southbound Ramps	32.6	C	53.0	D			
17. Main St / 805 Northbound Ramps	39.0	D	48.3	D			
18. Main St / Heritage Street	21.2	C	16.5	B			
19. Main St / La Media Rd (Couplet):							
Westbound Main St / Southbound La Media Rd	10.4	B	12.3	B			
Westbound Main St / Northbound La Media Rd	18.7	B	17.3	B			
Eastbound Main St / Southbound La Media Rd	0.1	A	0.1	A			
Eastbound Main St / Northbound La Media Rd	9.5	A	14.2	B			
20. Main St / Magdalena Ave	26.2	C	41.4	D			
21. Main St / SR125 Southbound Ramps	*Does Not Exist*						
22. Main St / SR125 Northbound Ramps	*Does Not Exist*						
23. Main Street / Eastlake Pkwy	**274.4**	**F**	**242.8**	**F**	X	10.2%	Direct
24. Otay Valley Rd / SR125 Southbound Ramps	*Does Not Exist*						
25. Otay Valley Rd / SR125 Northbound Ramps	*Does Not Exist*						

Note: Deficient intersection operation shown in **bold**

Table 21
2025 Roadway Segment Level of Service

Roadway	Segment	Classification	LOS C Capacity	ADT	LOS	Significance Criteria[1]			Impact
						LOS D/E/F?	≥5% Project Trips?	Project ADT ≥800?	
Olympic Parkway	805 to Brandywine	Prime Arterial (6)	50,000	43,300	B				
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	42,600	B				
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	**62,900**	**F**	X	4.8%	3,051	Cumulative
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	**56,200**	**D**	X	1.2%	670	No impact[2]
	SR-125 Ramps to Eastlake Pkwy	Expressway (8)	70,000	49,700	A				
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	35,300	A				
	East of Hunte Pkwy	Major Street (4)	30,000	18,400	A				
Birch Road	La Media to SR-125	Major Street (6)	40,000	**51,100**	**F**	X	20.1%	10,275	Direct
	SR-125 to Eastlake Pkwy	Prime Arterial (6)	50,000	47,000	C				
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,500	41,600	C				
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	31,200	B				
	Heritage Rd to Couplet	*Does Not Exist*							
	Couplet to Magdalena Ave	Prime Arterial (6)	50,000	5,200	A				
	Magdalena Ave to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9 St "A"	*Does Not Exist*							
	Village 9 St "A" to Eastlake Pkwy	Gateway (6)	61,200	22,600	A				
Hunte Parkway	Eastlake Pkwy to Olympic Pkwy	Prime Arterial (6)	50,000	24,800	A				
	Olympic Pkwy to Otay Lakes Rd	Major Street (4)	30,000	16,000	A				
Heritage Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	43,100	B				
	Olympic Pkwy to Main St	Prime Arterial (6)	50,000	32,500	A				
	Main St to Entertainment Circle	Prime Arterial (6)	50,000	19,500	A				
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	Prime Arterial (6)	50,000	19,500	A				
La Media Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	19,600	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	35,900	A				
	Birch Rd to Couplet	Prime Arterial (6)	50,000	35,000	A				
Magdalena Ave	Birch Rd to Main St	Class II Collector (2)	12,000	**20,100**	**F**	X	26.6%	5,337	Direct
Eastlake Parkway	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	21,200	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	24,700	A				
	Birch Rd to Main	Major Street (6)	40,000	**54,600**	**F**	X	10.2%	5,584	Direct
	Main St to Otay Valley Rd	*Does Not Exist*							
Otay Valley Road	Couplet to Street "A"	Major Street (4)	30,000	7,600	A				
	Street "A" to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9	*Does Not Exist*							
	Village 9 Access Rd to University	Major Street (4)	30,000	9,700	A				

Note: Deficient LOS operation shown in **bold** [1] A "Direct" project impact occurs if a project meets all three significance criteria; otherwise impacts are identified as "Cumulative. [2]According to the City of Chula Vista significance thresholds, an impact along a deficient roadway segment operating at LOS D or E is considered NOT significant if: the intersections along a roadway segment operate at LOS D or better, the project contributes less than 800 ADT, or if the project contributes less than 5% total volume.

2025 Significant Impacts & Recommended Mitigation Measures

As discussed above, three intersections and five roadway segments are forecast to operate at deficient levels of service by 2025. Each of the deficient locations were evaluated to determine the project impact at those locations using the City's thresholds of significance as outlined previously in the "Thresholds of Significance" section of this report. The intersections and roadway segments forecast to operate at deficient LOS are listed below along with the percentage of project trips at each location:

- Birch Road / La Media Road (13.2%)
- Birch Road / Eastlake Parkway (9.6%)
- Main Street / Eastlake Parkway (10.2%)

• Olympic Parkway:	from Heritage Road to La Media Road (4.8%)
	from La Media Road to SR-125 (1.2%)
• Birch Road:	from La Media Road to SR-125 (20.1%)
• Magdalena Avenue:	from Birch Road to Main Street (26.6%)
• Eastlake Parkway:	from Birch Road to Main Street (10.2%)

For cumulative impacts, the project would mitigate impacts through payment toward the City-established TDIF program. Direct impacts need to be fully mitigated by the project.

Access is a requirement of development and a public safety issue (Municipal Code 12.24). Access related impacts would occur if appropriate access and frontage improvements are not provided as required.

Table 22 summarizes the project impacts and recommended mitigation measures for each of the deficient locations, as well as the forecast levels of service without and with the proposed mitigation for year 2025. All improvements identified as mitigation measures will be bonded or constructed prior to approval of the Final Map for the associated number of EDU's identified in Table 22.

Appendix M includes the volume analysis worksheets for Olympic Parkway and Birch Road as well as the mitigated HCM worksheets. A detailed description of each of the recommended mitigation measures is provided in the following paragraphs.

<u>Olympic Parkway: From Heritage Road to La Media Road</u>

Olympic Parkway is forecast to operate at LOS F by year 2025 from Heritage Road to La Media Road. The project traffic is approximately 4.8% of the total traffic on this segment. Therefore, the project is forecast to have a cumulative impact on Olympic Parkway.

Recommended Mitigation Measure: *Payment of TDIF Fees.*

<u>Olympic Parkway: La Media Road to SR-125</u>

Olympic Parkway is forecast to operate at LOS D by year 2025 from La Media Road to SR-125. Intersections along this segment are forecast to operate at acceptable LOS. Therefore, the project is not forecast to impact this segment and mitigation measures are not required.

Birch Road: From La Media Road to SR-125, and the intersections of Birch Road / La Media and Birch Road / Eastlake Parkway

Birch Road operates at LOS F under 2025 conditions from La Media Road to SR-125, including the intersection of Birch Road / La Media Road. The intersection of Birch Road / Eastlake Parkway is also forecast to operate at LOS F under 2025 conditions. Birch Road is currently constructed to its Circulation Element classification. Therefore, no capacity enhancements can be made to Birch Road to offset the impacts.

The construction of Main Street as a six lane Prime arterial between the Village 8 West eastern boundary and Eastlake Parkway would reduce the demand on Birch Road between La Media Road and Eastlake Parkway by as much as 40%. This shift in traffic would reduce the volume on Birch Road to an acceptable level of service, thereby mitigating the impact on the deficient segment and identified intersections.

> ***Recommended Mitigation Measure:*** *Construct Main Street from existing terminus east of Village 8 West to Eastlake Parkway, including the overcrossing at SR-125.* The impacted segment of Birch Road from La Media Road to SR-125, and the intersections of Birch Road / La Media Road and Birch Road / Eastlake Parkway are directly impacted by the project. Therefore, the project should construct Main Street between the eastern project boundary and Eastlake Parkway, including the overcrossing at SR-125. The construction of Main Street between the Village 8 West boundary and Eastlake Parkway would offset the project impacts at the following locations:
>
> - Birch Road / La Media Road
> - Birch Road / Eastlake Parkway
> - Birch Road: from La Media Road to SR-125

Table 22
Year 2025 Levels of Service
Without and With Proposed Mitigation

PROJECT ACCESS AND FRONTAGE IMPROVEMENT (BY 1,388th EDU) (1)	
Location	**Recommended Mitigation**
Main Street:	Construct remaining two lanes of Main Street through the couplet and install traffic signals at new couplet intersections. Restripe Main Street as one-way for each leg of couplet.
La Media Road:	Construct remaining two lanes of La Media Road through the couplet and install traffic signals at new couplet intersections. Restripe La Media Road as one-way for each leg of couplet.
Main Street/Magdalena Avenue	Re-stripe Main Street/Magdalena Avenue intersection to include dual eastbound left turn lanes and one eastbound through lane. Install traffic signal.
Otay Valley Road:	Construct as a 4-lane Major from Village 8 West Street "A" to Village 8 West eastern project boundary. Install stop control on side streets until traffic signal is warranted

MITIGATION (BY 2,234th EDU) (1)						
Study Intersection	**Peak Hour**	**2025 With Project Without Mitigation**		**Recommended Mitigation**	**2025 With Project With Mitigation**	
Birch Rd / La Media Rd	AM	**234.8**	**F**	***Direct Impact*** Construct Main Street from Village 8 West eastern boundary to Eastlake Parkway including bridge over SR-125.	37.9	D
	PM	**190.5**	**F**		37.1	D
Birch Rd / Eastlake Pkwy	AM	**443.0**	**F**		39.0	D
	PM	**454.5**	**F**		40.3	D
Main St / Eastlake Pkwy	AM	**274.4**	**F**		24.6	C
	PM	**242.8**	**F**		24.1	C
Study Roadway Segment	**LOS C Capacity**	**ADT**	**LOS**	**Recommended Mitigation**	**ADT**	**LOS**
Olympic Parkway: Heritage Rd to La Media Rd	50,000	**62,900**	**F**	***Cumulative Impact*** Pay TDIF Fees	**62,900**	**F**
Olympic Parkway: La Media Rd to SR-125	50,000	**56,200**	**D**	***No Impact*** Intersections operate at acceptable LOS.	**56,200**	**D**
Birch Road La Media to SR-125	40,000	**51,100**	**F**	***Direct Impact*** Construct Main Street from Village 8 West eastern boundary to Eastlake Parkway including bridge over SR-125	23,200	A
Magdalena Avenue Birch Rd to Main St	12,000	**20,100**	**F**		11,500	C
Eastlake Parkway Birch Rd to Main St	40,000	**54,600**	**F**		35,400	C

(1) EDU calculations are based on assumptions regarding phasing as defined by the applicant and summarized in this TIA. Mitigation may also be required as shown in the PFFP section of this report and summarized in Table 32.

Magdalena Avenue: From Birch Road to Main Street

Magdalena Avenue operates at LOS F under 2025 conditions from Birch Road to Main Street.

> ***Recommended Mitigation Measure:*** *Construct Main Street from existing terminus east of Village 8 West to Eastlake Parkway, including the overcrossing at SR-125.* The construction of Main Street will reduce traffic demand on Magdalena thereby mitigating the direct project impact of this segment.

Eastlake Parkway: From Birch Road to Main Street including the intersection of Main Street and Eastlake Parkway

Eastlake Parkway operates at LOS F under 2025 conditions from Birch Road to Main Street. Eastlake Parkway provides the primary access to future villages on the east side of SR-125.

> ***Recommended Mitigation Measure:*** *Construct Main Street from existing terminus east of Village 8 West to Eastlake Parkway, including the overcrossing at SR-125.* The construction of Main Street from its existing terminus east of Village 8 West to Eastlake Parkway including the overcrossing at SR-125 would reduce the traffic demand on Eastlake Parkway thereby mitigating the identified direct project impact at the following locations:
>
> - Main Street / Eastlake Parkway
> - Eastlake Parkway: from Birch Road to Main Street

2030 CONDITIONS

In addition to the developments assumed through 2025, this scenario assumes buildout of Village 8 West to include the construction of a middle school, an additional 60,000 square feet of commercial retail, and 9.4 acres of park space. This scenario assumes the 2025 mitigated street network. **Table 23** summarizes the forecasted Village 8 West 2030 project trip generation.

Table 23
2030 Project Trip Generation

Land Use	Size	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	Inbound	Outbound	Total	Inbound	Outbound
Park (Active Recreation)	17.4 acres	870	35	17	17	70	35	35
Urban & Neighborhood Park	10.6 acres	53	2	1	1	4	2	2
Single Family Residential	621 DU	6,210	497	149	348	621	435	186
Multi-Family Residential	1,429 DU	11,432	915	183	732	1,143	800	343
Elementary School	11.4 acres	1,140	365	219	146	103	41	62
Jr. High/Middle School	21.0 acres	2,205	706	423	282	198	79	119
Office (<100 KSF)	50 KSF	1,000	140	129	14	130	26	104
Commercial Retail	250 KSF	20,000	800	480	320	2,000	1,000	1,000
SUBTOTAL		**43,084**	**3,467**	**1,604**	**1,864**	**4,283**	**2,425**	**1,858**
Internal Capture[1]		*-14,826*	*-632*	*-316*	*-316*	*-1,300*	*-650*	*-650*
Transit Reduction[2]		*-2,154*	*-173*	*-80*	*-93*	*-214*	*-121*	*-93*
TOTAL		**26,104**	**2,662**	**1,208**	**1,455**	**2,769**	**1,654**	**1,115**
Total EDU's		**2,610**						

Note: based on *SANDAG, Not So Brief Guide, April 2002*
[1] Internal Capture Rates provided from *ITE Trip Generation Handbook.* Internal capture rates vary by each combination of land uses.
[2] Transit Reduction Rates provided from SANDAG; a transit reduction of 5% is assumed by project buildout.

The 2030 scenario includes analysis of the forecasted traffic volumes from the SANDAG model run for year 2030, including anticipated land uses and traffic associated with projects expected to be constructed by 2030.

The traffic analysis assumes the 2025 mitigated network plus the following:

- Street "A" will be constructed from Main Street to Otay Valley Road as a two-lane Collector
- Construction of Main Street from Heritage Road to La Media Road (constructed by others)

The 2025 mitigated roadway network is required to be constructed prior to the construction of the first EDU following the 2025 development phase (2,234 EDUs). Any additional development cannot occur until the 2025 mitigated roadway network is in place. If the project equivalent dwelling unit exceeds the 2025 development phase (2,234 EDUs) prior to the completion of all of the above-listed assumed and planned off-site and on-site improvements being constructed and open to traffic, then one of the following steps shall be taken as determined by the City Engineer:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or

2. City and OLC shall meet to determine the need for the incomplete roadway segments. A number of factors, including changes to the tolling structure at SR-125, may affect the traffic patterns in the Otay Ranch. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or

3. Developer shall construct the missing roadway links and receive TDIF credit for those improvements as applicable; or

4. An alternative measure is selected by the city in accordance with the city of Chula Vista Growth Management Ordinance.

5. All to the satisfaction of the City Engineer.

The roadway network used in evaluating the 2030 conditions is illustrated in **Exhibit 35**. The 2030 roadway network does not represent the City's ultimate Circulation Element network. The 2030 roadway network lacks a few components of the ultimate infrastructure that is planned in the study area, and it has been determined that these remaining components of the ultimate roadway network are not necessary to mitigate the project's impacts.

Access to Village 8 West will be provided along Main Street, La Media Road, Otay Valley Road, Street "A" and Magdalena Avenue. Street "A" is not included in the roadway segment analysis as it is a local street not subject to LOS requirements. Operating conditions of Street "A" and the associated internal intersections are discussed in the On-Site Street Improvements Phase and Operational Analysis section provided later in this report.

2030 Operational Analysis

The forecast traffic volumes for year 2030 were utilized to evaluate year 2030 operating conditions at the study intersections and along roadway segments. **Exhibit 36** shows 2030 peak hour intersection volumes. **Exhibit 37** illustrates 2030 ADT volumes. Detailed HCM calculation sheets are contained in **Appendix N**.

Table 24 summarizes the 2030 a.m. and p.m. peak hour intersection LOS. As shown in Table 24, the following intersections are forecast to operate at deficient levels of service (LOS E or F) under 2030 conditions:

- Birch Road / La Media Road (a.m. – LOS F, p.m. – LOS F)
- Birch Road / SR-125 Northbound Ramps (a.m. – LOS F)
- Birch Road / Eastlake Parkway (a.m. – LOS F, p.m. – LOS E)
- Main St / 805 Southbound Ramps (p.m. – LOS E)
- Main St / 805 Northbound Ramps (p.m. – LOS E)
- Main Street / La Media Road Couplet
    - Westbound Main Street / Northbound La Media (a.m. – LOS E)
    - Eastbound Main Street / Southbound La Media (a.m. – LOS E, p.m. – LOS F)
    - Eastbound Main Street / Northbound La Media (a.m. – LOS E)
- Main Street / Magdalena (a.m. – LOS F, p.m. – LOS F)
- Main Street / Eastlake Parkway (a.m. – LOS F, p.m. – LOS E)

Table 25 presents the results of the 2030 conditions roadway segment level of service analysis. As shown in Table 25, the following segments are forecast to operate at deficient levels of service (LOS D, E, or F):

- Olympic Parkway: from east of Hunte Parkway (LOS D)
- Birch Road: from La Media to SR-125 (LOS F)
  from SR-125 to Eastlake Parkway (LOS F)
- Main Street: from I-805 to Brandywine Ave (LOS D)
  from Brandywine to Heritage Road (LOS D)
- Heritage Road: from Telegraph Canyon to Olympic Parkway (LOS D)
  from Main Street to Entertainment Circle (LOS E)
  from Entertainment Circle to Avenida de Las Vistas (LOS D)

- Magdalena Avenue: from Birch Road to Main Street (LOS D)
- Eastlake Parkway: from Birch Road to Main Street (LOS D)

Table 24
2030 Study Intersection LOS

Study Intersection	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		LOS E or F	% Project Trips	Impact
1. Olympic Pkwy / 805 Southbound Ramps	29.1	C	34.8	C			
2. Olympic Pkwy / 805 Northbound Ramps	23.7	C	23.2	C			
3. Olympic Pkwy / Brandywine Ave	27.9	C	39.2	C			
4. Olympic Pkwy / Santa Victoria	12.7	B	13.3	B			
5. Olympic Pkwy / Heritage Rd	37.4	D	54.4	D			
6. Olympic Pkwy / La Media Rd	37.6	D	39.2	D			
7. Olympic Pkwy / 125 Southbound Ramps	6.6	A	7.8	A			
8. Olympic Pkwy / 125 Northbound Ramps	2.6	A	3.0	A			
9. Olympic Pkwy / Eastlake Parkway	33.8	C	36.5	D			
10. Olympic Pkwy / Hunte Pkwy	38.9	D	39.2	D			
11. Santa Victoria / Heritage Rd	37.0	D	42.3	D			
12. Birch Rd / La Media Rd	**91.0**	**F**	**116.2**	**F**	X	8.3%	Direct
13. Birch Rd / SR125 Southbound Ramps	7.8	A	6.1	A			
14. Birch Rd / SR125 Northbound Ramps	**112.4**	**F**	31.8	C	X	6.4%	Direct
15. Birch Rd / Eastlake Pkwy	**117.2**	**F**	**65.8**	**E**	X	10.7%	Direct
16. Main St / 805 Southbound Ramps	46.2	D	**55.9**	**E**	X	4.2%	Cumulative
17. Main St / 805 Northbound Ramps	39.6	D	**57.8**	**E**	X	7.0%	Direct
18. Main St / Heritage Street	32.2	C	42.0	D			
19. Main St / La Media Rd (Couplet):							
Westbound Main St / Southbound La Media Rd	26.9	C	23.3	C			
Westbound Main St / Northbound La Media Rd	**103.2**	**F**	48.0	D	X		
Eastbound Main St / Southbound La Media Rd	**140.3**	**F**	**95.2**	**F**	X	13.0%	Direct
Eastbound Main St / Northbound La Media Rd	**80.9**	**F**	42.5	D	X		
20. Main St / Magdalena Ave	**131.3**	**F**	**143.8**	**F**	X	20.2%	Direct
21. Main St / SR125 Southbound Ramps	*Does Not Exist*						
22. Main St / SR125 Northbound Ramps	*Does Not Exist*						
23. Main Street / Eastlake Pkwy	**141.9**	**F**	52.1	D	X	10.8%	Direct
24. Otay Valley Rd / SR125 Southbound Ramps	*Does Not Exist*						
25. Otay Valley Rd / SR125 Northbound Ramps	*Does Not Exist*						

Note: Deficient intersection operation shown in **bold**

Table 25
2030 Roadway Segment LOS

Roadway	Segment	Classification	LOS C Capacity	ADT	LOS	Significance Criteria[1]			Impact
						LOS D/E/F?	≥5% Project Trips?	Project ADT ≥800?	
Olympic Parkway	I-805 to Brandywine Ave	Prime Arterial (6)	50,000	48,300	C				
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	34,800	A				
	Heritage Rd to La Media Rd	Prime Arterial (6)	50,000	33,300	A				
	La Media Rd to SR-125 Ramps	Prime Arterial (6)	50,000	43,900	C				
	SR-125 Ramps to Eastlake Pkwy	Expressway (8)	70,000	49,400	A				
	Eastlake Pkwy to Hunte Pkwy	Prime Arterial (6)	50,000	34,200	A				
	East of Hunte Pkwy	Major Street (4)	30,000	**30,100**	**D**	X	0.9%	261	*No impact; acceptable intersection LOS along segment[2]*
Birch Road	La Media to SR-125	Major Street (6)	40,000	**54,200**	**F**	X	1.9%	1,044	Cumulative
	SR-125 to Eastlake Pkwy	Prime Arterial (6)	50,000	**65,200**	**F**	X	1.6%	1,044	Cumulative
Main Street	I-805 to Brandywine Ave	Prime Arterial (6A)	58,000	**61,300**	**D**	X	6.4%	3,916	Direct
	Brandywine Ave to Heritage Rd	Prime Arterial (6)	50,000	**52,200**	**D**	X	8.5%	4,438	
	Heritage Rd to Couplet	Prime Arterial (6)	50,000	44,900	C				
	Couplet to Magdalena Ave	Prime Arterial (6)	50,000	25,100	A				
	Magdalena Ave to SR-125 Ramps	Prime Arterial (6)	50,000	33,100	A				
	SR-125 to Village 9 St "A"	Gateway (6)	68,700	35,400	A				
	Village 9 St "A" to Eastlake Pkwy	Gateway (6)	68,700	24,500	A				
Hunte Pkwy	Eastlake Pkwy to Olympic Pkwy	Prime (6)	50,000	40,000	B				
	Olympic Pkwy to Otay Lakes Rd	Major Street (4)	30,000	20,700	A				
Heritage Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	**50,700**	**D**	X	0.5%	261	*No impact; acceptable intersection LOS along segment[2]*
	Olympic Pkwy to Main St	Prime Arterial (6)	50,000	42,300	B				
	Main St to Entertainment Circle	Prime Arterial (6)	50,000	**61,400**	**E**	X	2.6%	1,566	*Cumulative*
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	Prime Arterial (6)	50,000	**52,600**	**D**	X	3.0%	1,566	
La Media Road	Telegraph Cyn to Olympic Pkwy	Prime Arterial (6)	50,000	29,900	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	28,300	A				
	Birch Rd to Couplet	Prime Arterial (6)	50,000	38,000	B				
Magdalena Ave	Birch Rd to Main St	Class II Collector (2)	12,000	**12,700**	**D**	X	12.3%	1,566	*No impact[3]*
Eastlake Parkway	Otay Lakes Rd to Olympic Pkwy	Prime Arterial (6)	50,000	24,000	A				
	Olympic Pkwy to Birch Rd	Prime Arterial (6)	50,000	27,600	A				
	Birch Rd to Main	Major Street (6)	40,000	**41,300**	**D**	X	0.6%	261	Cumulative
	Main St to Otay Valley Rd	*Does Not Exist*							
Otay Valley Road	Couplet to Street "A"	Major Street (4)	30,000	7,300	A				
	Street "A" to SR-125 Ramps	*Does Not Exist*							
	SR-125 Ramps to Village 9	*Does Not Exist*							
	Village 9 Access Rd to University	Major Street (4)	30,000	9,500	A				

Note: Deficient LOS operation shown in **bold**. [1] A "Direct" project impact occurs if a project meets all three significance criteria; otherwise impacts are identified as "Cumulative. [2] According to the City of Chula Vista significance thresholds, an impact along a deficient roadway segment operating at LOS D or E is considered NOT significant if the intersections along a roadway segment operate at LOS D or better. [3] [3] Magdalena is a local street, not on the city's circulation network and not subject to General Plan LOS standards. The intersection of Main/Magdalena is forecast to operate at acceptable LOS with the project. Therefore, the project is not forecast to have a significant impact on Magdalena Avenue.

2030 Significant Impacts & Recommended Mitigation

As discussed above, eight intersections and nine roadway segments are forecast to operate at deficient levels of service by 2030. Each of the deficient locations were evaluated to determine the project impact at those locations using the City's thresholds of significance as outlined previously in the "Thresholds of Significance" section of this report. The intersections and roadway segments forecast to operate at deficient LOS are listed below along with the percentage of project trips at each location:

- Birch Road / La Media Road (8.3%)
- Birch Road / SR-125 Northbound Ramps (6.4%)
- Birch Road / Eastlake Parkway (10.7%)
- Main Street / 805 Southbound Ramps (4.2%)
- Main Street / 805 Northbound Ramps (7.0%)
- Main Street / La Media Couplet (13.0%)
- Main Street / Magdalena Avenue (20.2%)
- Main Street / Eastlake Parkway (10.8%)

• Olympic Parkway:	East of Hunte Parkway (0.9%)
• Birch Road:	from La Media Road to SR-125 (1.9%)
	from SR-125 to Eastlake Parkway (1.6%)
• Main Street:	from I-805 to Brandywine Ave (6.4%)
	from Brandywine to Heritage Road (8.5%)
• Heritage Road:	from Telegraph Canyon to Olympic Parkway (0.5%)
	from Main Street to Entertainment Circle (2.6%)
	from Entertainment Circle to Avenida de Las Vistas (3.0%)
• Magdalena Avenue:	from Birch Road to Main Street (12.3%)
• Eastlake Parkway:	from Birch Road to Main Street (0.6%)

For cumulative impacts, the project would mitigate impacts through payment toward the City-established TDIF program. Direct impacts need to be fully mitigated by the project.

Access is a requirement of development and a public safety issue (Municipal Code 12.24). Access related impacts would occur if appropriate access and frontage improvements are not provided as required.

Table 26 summarizes the recommended mitigation measures for each of the identified impacts, as well as the forecast levels of service without and with the proposed mitigation for year 2030. All improvements identified as project mitigation shall be bonded or constructed prior to approval of the Final Map for the associated number of EDU's identified in Table 26.

Table 27 provides a comprehensive summary of all study area intersection operating conditions for the year 2030 with the mitigation measures summarized in Table 26. Roadway segment operating conditions for all study segments in year 2030 with mitigation are summarized in **Table 28**.

Appendix O includes the mitigated HCM worksheets. The following paragraphs summarize the recommended mitigation measures for the year 2030 conditions. The mitigated roadway network and daily traffic volumes are provided in **Exhibit 38**. Peak hour volumes for the mitigated conditions are illustrated in **Exhibit 39**.

Olympic Parkway: East of Hunte Parkway

Olympic Parkway east of Hunte Parkway is forecast to operate at LOS D by year 2030. Intersection operational analysis along this segment shows that the signalized intersections operate at LOS D or better. Therefore, the project has no impact on this segment and no mitigation measures are recommended.

Birch Road: From La Media Road to SR-125 and from SR-125 to Eastlake Parkway including the intersections of Birch Road / La Media Road, Birch Road / SR-125 NB Ramps and Birch Road / Eastlake Parkway

Birch Road operates at LOS F under 2030 conditions from La Media Road to Eastlake Parkway. Birch Road is currently constructed to its Circulation Element classification. Therefore, no capacity enhancements can be made to Birch Road to offset the impacts.

Recommended Mitigation Measure: *Construct Main Street / SR-125 Ramps*

Traffic volumes along Birch Road exceed the available capacity primarily due to the demand for access to SR-125 ramps. Therefore, the construction of northbound and southbound ramps to SR-125 at Main Street will reduce the demand on Birch Road between La Media Road and Eastlake Parkway. This shift in traffic would reduce the volume on Birch Road to an acceptable level of service, thereby mitigating the impact on the deficient segments. Providing ramps at Main Street would relieve traffic along Birch Road and mitigates the impacts at the following locations:

- Birch Road / La Media Road
- Birch Road / SR-125 Northbound Ramps
- Birch Road / Eastlake Parkway
- Birch Road: from La Media Road to SR-125
from SR-125 to Eastlake Parkway

Main Street: Intersections of Main Street / La Media Road (Couplet), Main Street / Magdalena Avenue and Main Street Eastlake Parkway

Main Street is forecast to operate at an acceptable LOS by year 2030. However, intersections along Main Street through this segment operate at LOS E or F. The high demand of traffic and deficient operating conditions are due to a high demand of east-west traffic across SR-125 and heavy turning movements at these intersections. The high demand stems from limited access to development south of Main Street. Village 8 West, Village 8 East and Village 9 must cross SR-125 at Main Street or points north of Main Street to travel between villages. Although improvements to the intersections could be made to offset the impacts, the circulation between villages would be improved if a secondary connection was made between villages.

Recommended Mitigation Measure: *Construct Otay Valley Road from Village 8 West eastern boundary to Village 9 Street "A" including the overcrossing at SR-125* Constructing Otay Valley Road as a four-lane Major from Village 8 West eastern boundary to Village 9 including the bridge over SR-125 would relieve traffic along Main Street, reduce turning movements at key intersections. This improvement would mitigate the impacts at the following locations:

- Main Street / La Media Road Couplet
- Main Street / Magdalena
- Main Street / Eastlake Parkway

Main Street: From I-805 to Brandywine Avenue, including Main Street / I-805 NB Ramp and Main Street / I-805 SB Ramp Intersections

Main Street is forecast to operate at LOS D by year 2030 from I-805 to Brandywine Road. Based on the project volume at this location, the segment is forecast to be directly impacted by the project as well as the intersections at the Main Street/ I-805 interchange. Construction of the Main Street Ramps at SR-125 will reduce the demand on the I-805 ramps, thereby mitigating the impact at this location.

Recommended Mitigation Measure: *Construct Main Street / SR-125 Ramps* Construct northbound and southbound ramps to provide access to SR-125 from Main Street. Providing ramps at Main Street would mitigate the impacts at the following locations:

- Main Street / I-805 Northbound Ramps
- Main Street / I-805 Southbound Ramps
- Main Street: from I-805 to Brandywine Avenue

Main Street: From Brandywine Avenue to Heritage Road

Main Street is forecast to operate at LOS D by year 2030 from I-805 to Brandywine Road. Based on the project volume at this location, the segment is forecast to be directly impacted by the project. Construction of the Main Street Ramps at SR-125 is forecast to reduce the demand on Main Street from Brandywine Avenue to Heritage Road.

> ***Recommended Mitigation Measure:*** *Construct Main Street / SR-125 Ramps*
> Construct northbound and southbound ramps to provide access to SR-125 from Main Street. Providing ramps at Main Street would relieve traffic demand along Main Street from Brandywine Avenue to Heritage Road.

Heritage Road: From Telegraph Canyon Road to Olympic Parkway

Heritage Road is forecast to operate at LOS D by year 2030 from Telegraph Canyon Road to Olympic Parkway. Intersection operational analysis shows that the signalized intersections along this segment operate at LOS D or better. Therefore, the project has no impact on this segment and no mitigation measures are recommended.

Heritage Road: Main Street to Avenida de las Vistas

Heritage Road is forecast to operate at LOS E from Main Street to Entertainment Circle and LOS D from Entertainment Circle to Avenida de las Vistas by year 2030. The project adds less than 5% of the total traffic to this segment resulting in a cumulative impact.

> ***Recommended Mitigation Measure:*** *Payment of TDIF Fees*

Magdalena Avenue: Birch Road to Main Street

Magdalena Avenue is not a circulation element road and is not subject to General Plan LOS thresholds. The analysis shows that in 2030, Magdalena Avenue is forecast to operate at LOS D. According to the city's thresholds of significance, segments operating at LOS D or E are not impacted by a project if the intersections along the segment operate at LOS D or better. As shown in the analysis, mitigated construction of Otay Valley Road from Village 8 West eastern boundary to Village 9 Street "A" including the overcrossing at SR-125 reduces through traffic volumes on Main Street. This improves the operation of the intersection at Main/Magdalena to LOS D or better. Therefore this segment is not impacted by the project under mitigated 2030 conditions.

Eastlake Parkway: Birch Road to Main Street

Eastlake Parkway is forecast to operate at LOS D from Birch Road to Main Street by year 2030. The project adds less than 5% of the total traffic to this segment resulting in a cumulative impact.

> ***Recommended Mitigation Measure:*** *Payment of TDIF Fees*

Table 26
Year 2030 Levels of Service
Without and With Proposed Mitigation

PROJECT ACCESS AND FRONTAGE IMPROVEMENT (BY 2,234th EDU) (1)	
Location	**Recommended Mitigation**
Village 8 West Street "A"	Construct as a local street from Main Street to Otay Valley Road. Provide signalized access at Otay Valley Road and at Main Street when signal warrants are met.

MITIGATION (BY 2,610th EDU) (1)						
Study Intersection	**Peak Hour**	**2030 With Project**		**Recommended Mitigation**	**2030 With Project With Mitigation**	
Birch Rd / La Media Rd	AM	**91.0**	**F**	***Direct Impact*** Construct SR-125 northbound and southbound ramps at Main Street	37.6	D
	PM	**116.2**	**F**		41.9	D
Birch Rd / SR-125 Northbound Ramps	AM	**112.4**	**F**	***Direct Impact*** Construct SR-125 northbound and southbound ramps at Main Street	13.0	B
	PM	31.8	C		6.2	A
Birch Rd / Eastlake Pkwy	AM	**117.2**	**F**	***Direct Impact*** Construct SR-125 northbound and southbound ramps at Main Street	37.2	D
	PM	**65.8**	**E**		38.7	D
Main Street / 805 Southbound Ramps	AM	46.2	D	***Cumulative Impact*** Construct SR-125 northbound and southbound ramps at Main Street	34.5	C
	PM	**55.9**	**E**		55.0	D
Main Street / 805 Northbound Ramps	AM	39.6	D	***Direct Impact*** Construct SR-125 northbound and southbound ramps at Main Street	39.2	C
	PM	**57.8**	**E**		54.7	D
Main Street / La Media Couplet	*WB Main Street / NB La Media*			***Direct Impact*** Construct Otay Valley Road from Village 8 West eastern boundary to Village 9 "Street A" including the SR-125 Overcrossing		
	AM	**103.2**	**F**		43.0	D
	PM	48.0	D		41.1	D
	EB Main Street / SB La Media					
	AM	**140.3**	**F**		44.0	D
	PM	**95.2**	**F**		47.5	D
	EB Main Street / NB La Media					
	AM	**80.9**	**F**		26.7	C
	PM	42.5	D		36.1	D
Main Street / Magdalena Avenue	AM	**131.3**	**F**	***Direct Impact*** Construct Otay Valley Road from Village 8 West eastern boundary to Village 9 "Street A" including the SR-125 Overcrossing	32.1	C
	PM	**143.8**	**F**		35.7	D
Main Street / Eastlake Parkway	AM	**141.9**	**F**	***Direct Impact*** Construct Otay Valley Road from Village 8 West eastern boundary to Village 9 "Street A" including the SR-125 Overcrossing	52.5	D
	PM	52.1	D		27.2	C

Table 26
Year 2030 Levels of Service
Without and With Proposed Mitigation

Study Roadway Segment	LOS C Capacity	ADT	LOS	Recommended Mitigation	ADT	LOS
Olympic Parkway: East of Hunte Parkway	30,000	**30,100**	**D**	**No Impact** Intersections forecast to operate at acceptable levels of service	**30,100**	**D**
Birch Road: La Media Road to SR-125	40,000	**54,200**	**F**	***Cumulative Impact*** Construct SR-125 northbound & southbound ramps at Main Street	26,200	A
Birch Road SR-125 to Eastlake Pkwy	40,000	**65,200**	**F**	***Cumulative Impact*** Construct SR-125 northbound & southbound ramps at Main Street	37,200	C
Main Street I-805 to Brandywine Ave	58,000	**61,300**	**D**	***Direct Impact*** Construct SR-125 northbound & southbound ramps at Main Street	**59,300**	**D**
Main Street Brandywine to Heritage Rd	50,000	**52,200**	**D**	***Direct Impact*** Construct SR-125 northbound & southbound ramps at Main Street	**50,200**	**D**
Heritage Road Telegraph Canyon Road to Olympic Parkway	50,000	**50,700**	**D**	***No Impact*** Intersections forecast to operate at acceptable levels of service	**50,700**	**D**
Heritage Road Main to Entertainment Cir	50,000	**61,400**	**E**	***Cumulative Impact*** Payment of TDIF Fees	**61,400**	**E**
Heritage Road Entertainment Cir to Avenida de las Vistas	50,000	**52,600**	**D**	***Cumulative Impact*** Payment of TDIF Fees	**52,600**	**D**
Magdalena Avenue Birch Road to Main Street	12,000	**12,700**	**D**	***No Impact***[(2)]	**12,300**	**D**
Eastlake Parkway Birch Road to Main Street	40,000	**41,300**	**D**	***Cumulative Impact*** Payment of TDIF Fees	**41,300**	**D**

(1) EDU calculations are based on assumptions regarding phasing as defined by the applicant and summarized in this TIA. Mitigation may also be required as shown in the PFFP section of this report and summarized in Table 32.

(2) Magdalena is not a circulation element road and is not subject to GDP LOS standards.

Table 27
2030 Study Intersection LOS With Mitigation

Study Intersection	2030 Without Mitigation				2030 With Mitigation			
	AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS		AM Peak Hour Delay-LOS		PM Peak Hour Delay-LOS	
1. Olympic Pkwy / 805 Southbound Ramps	29.1	C	34.8	C	29.1	C	34.8	C
2. Olympic Pkwy / 805 Northbound Ramps	23.7	C	23.2	C	23.7	C	23.2	C
3. Olympic Pkwy / Brandywine Ave	27.9	C	39.2	C	27.9	C	39.2	C
4. Olympic Pkwy / Santa Victoria	12.7	B	13.3	B	12.7	B	13.3	B
5. Olympic Pkwy / Heritage Rd	37.4	D	54.4	D	37.4	D	54.4	D
6. Olympic Pkwy / La Media Rd	37.6	D	39.2	D	37.6	D	39.2	D
7. Olympic Pkwy / 125 Southbound Ramps	6.6	A	7.8	A	6.6	A	7.8	A
8. Olympic Pkwy / 125 Northbound Ramps	2.6	A	3.0	A	2.6	A	3.0	A
9. Olympic Pkwy / Eastlake Parkway	33.8	C	36.5	D	33.8	C	36.5	D
10. Olympic Pkwy / Hunte Pkwy	38.9	D	39.2	D	38.9	D	39.2	D
11. Santa Victoria / Heritage Rd	37.0	D	42.3	D	37.0	D	42.3	D
12. Birch Rd / La Media Rd	**91.0**	**F**	**116.2**	**F**	37.6	D	41.9	D
13. Birch Rd / SR125 Southbound Ramps	7.8	A	6.1	A	4.3	A	6.7	A
14. Birch Rd / SR125 Northbound Ramps	**112.4**	**F**	31.8	C	13.0	B	6.2	A
15. Birch Rd / Eastlake Pkwy	**117.2**	**F**	**65.8**	**E**	37.2	D	38.7	D
16. Main St / 805 Southbound Ramps	46.2	D	**55.9**	**E**	34.5	C	55.0	D
17. Main St / 805 Northbound Ramps	39.6	D	**57.8**	**E**	39.2	C	54.7	D
18. Main St / Heritage Street	32.2	C	42.0	D	32.2	C	42.0	D
19. Main St / La Media Rd (Couplet):								
Westbound Main St / Southbound La Media Rd	26.9	C	23.3	C	31.4	C	54.1	D
Westbound Main St / Northbound La Media Rd	**103.2**	**F**	48.0	D	47.8	D	37.1	D
Eastbound Main St / Southbound La Media Rd	**140.3**	**F**	**95.2**	**F**	49.0	D	34.5	C
Eastbound Main St / Northbound La Media Rd	**80.9**	**F**	42.5	D	28.1	C	25.3	C
20. Main St / Magdalena Ave	**131.3**	**F**	**143.8**	**F**	32.1	C	35.7	D
21. Main St / SR125 Southbound Ramps	*Does not exist*				19.8	B	19.7	B
22. Main St / SR125 Northbound Ramps	*Does not exist*				41.8	D	20.7	C
23. Main Street / Eastlake Pkwy	**141.9**	**F**	52.1	D	52.5	D	27.2	C
24. Otay Valley Rd / SR125 Southbound Ramps	*Does not exist*							
25. Otay Valley Rd / SR125 Northbound Ramps	*Does not exist*							

Note: Deficient intersection operation shown in **bold**

Table 28
2030 Roadway Segment LOS With Mitigation

Roadway	Segment	2030 ADT / LOS Without Mitigation		Adjusted Volume For Mitigation	2030 Mitigated ADT / LOS	
		ADT	LOS		ADT	LOS
Olympic Parkway	I-805 to Brandywine Ave	48,300	C		48,300	C
	Brandywine Ave to Heritage Rd	34,800	A		34,800	A
	Heritage Rd to La Media Rd	33,300	A		33,300	A
	La Media Rd to SR-125 Ramps	43,900	C		43,900	C
	SR-125 Ramps to Eastlake Pkwy	49,400	A		49,400	A
	Eastlake Pkwy to Hunte Pkwy	34,200	A		34,200	A
	East of Hunte Pkwy	**30,100**	**D**		**30,100**	**D**
Birch Road	La Media Rd to SR-125	**54,200**	**F**	-28,000	26,200	A
	SR-125 to Eastlake Parkway	**65,200**	**F**	-28,000	37,200	B
Main Street	I-805 to Brandywine Ave	**61,300**	**D**	-2,000	**59,300**	**D**
	Brandywine Ave to Heritage Rd	**52,200**	**D**	-2,000	**50,200**	**D**
	Heritage Rd to La Media Rd	44,900	C		44,900	C
	La Media Rd to Magdalena Ave	25,100	A	15,000	40,100	B
	Magdalena Ave to SR-125	33,100	A	15,000	48,100	C
	SR-125 to Village 9 "Street A"	35,400	A	18,000	53,400	D
	Village 9 "Street A" to Eastlake Pkwy	24,500	A	18,000	42,500	B
Hunte Pkwy	Eastlake Pkwy to Olympic Pkwy	40,000	B		40,000	B
	Olympic Pkwy to Otay Lakes Rd	20,700	A		20,700	A
Heritage Rd	Palomar St to Olympic Pkwy	**50,700**	**D**		**50,700**	**D**
	Olympic Pkwy to Main St/Hunte	42,300	B		42,300	B
	Main St to Entertainment Circle	**61,400**	**E**		**61,400**	**E**
	Entertainment Circle to Avenida de Las Vistas (City of SD)	**52,600**	**D**		**52,600**	**D**
La Media Rd	E. Palomar St to Olympic Pkwy	29,900	A		29,900	A
	Olympic Pkwy to Birch Rd	28,300	A		28,300	A
	Birch Rd to Main St	38,000	B		38,000	B
Magdalena Ave	Birch Rd to Main St	**12,700**	**D**	-400	**12,300**	**D**
Eastlake Pkwy	Otay Lakes Rd to Olympic Pkwy	24,000	A		24,000	A
	Olympic Pkwy to Birch Rd	27,600	A		27,600	A
	Birch Rd to Main St	**41,300**	**D**	-18,500	22,800	A
Otay Valley Rd	Couplet to Street “A”	7,300	A		7,300	A
	Street “A” to SR-125 Ramps	*Does Not Exist*			11,400	A
	SR-125 Ramps to Village 9	*Does Not Exist*			11,400	A
	Village 9 Access Rd to University	9,500	A		9,500	A

Note: Deficient LOS operation shown in **bold**.

ANALYSIS OF CALTRANS FACILITIES

Freeway Mainline Segment Analysis

Segments of northbound and southbound I-805 between Telegraph Canyon Road and Main Street were analyzed under 2030 Without and With Project conditions using the 2000 HCS Basic Freeway Segment analysis methodology, which is the methodology supported by the City of Chula Vista. Mainline segment volumes are based on SANDAG forecast 2030 ADT. A 4% heavy truck factor was applied in addition to a measured free-flow speed of 65 mph was used in the HCS calculations for multi-lane segments.

The results of the freeway segment level of service are shown in **Table 29**. HCS worksheets used to calculate the freeway segments are included in **Appendix P** to this report.

The acceptable LOS for freeways is generally LOS D. As shown in Table 29, the freeway mainline segments operate at acceptable levels of service (LOS D or better) under 2030 Without and With Project conditions except for I-805 Northbound between Main Street and Telegraph Canyon Road, which is forecast to operate at LOS E during the PM Peak Hour. According to the *City of Chula Vista Traffic Study Guidelines*, a significant project impact is identified if a project adds 1 mph speed delay or greater to a segment operating at LOS D, E, or F. The results of the 2030 With Project mainline segment analysis demonstrate a change in delay (Average Passenger Car Speed) less than 1 mph for each study segment. Therefore, no direct impacts are identified.

Table 29
2030 Conditions
Freeway Mainline Segment Level of Service Analysis (I-805)

From	To	2030 Without Project Conditions							
		Volume	LOS	APCS	D	Volume	LOS	APCS	D
2030 Conditions (Northbound)		**AM Peak Hour**				**PM Peak Hour**			
Main St	Olympic Pkwy	7,810	C	64.6	25.9	10,113	**E**	57.8	37.6
Olympic Pkwy	Telegraph Canyon Rd	7,738	C	64.7	25.7	10,020	**E**	58.3	36.9
2030 Conditions (Southbound)		**AM Peak Hour**				**PM Peak Hour**			
Telegraph Canyon Rd	Olympic Pkwy	9,544	D	60.6	33.8	9,261	D	61.6	32.3
Olympic Pkwy	Main Street	9,633	D	60.2	34.4	9,347	D	61.3	32.7

From	To	2030 With Project Conditions							
		Volume	LOS	APCS	D	Volume	LOS	APCS	D
2030 Conditions (Northbound)		**AM Peak Hour**				**PM Peak Hour**			
Main St	Olympic Pkwy	7,886	D	64.6	26.2	10,172	**E**	57.5	38.0
Olympic Pkwy	Telegraph Canyon Rd	7,839	D	64.6	26.0	10,099	**E**	57.9	37.5
2030 Conditions (Southbound)		**AM Peak Hour**				**PM Peak Hour**			
Telegraph Canyon Rd	Olympic Pkwy	9,628	D	60.2	34.3	9,377	D	61.2	32.9
Olympic Pkwy	Main Street	9,696	D	59.9	34.8	9,434	D	61.0	33.2

Note: Deficient freeway segment operation indicated in **bold** where applicable.
APCS Average Passenger Car Speed (mph)
D Density, Passenger Cars per Mile per Lane

Intersection Lane Volume (ILV) Analysis

Caltrans requires that an Intersection Lane Volume (ILV) analysis be conducted for all state-owned facilities that may be impacted by a proposed project. As this project is located near the ramp to I-805, the ILV method was conducted for the interchanges within the project study area.

Table 30 summarizes the results of the ILV analysis. ILV Calculation worksheets are provided in **Appendix Q**. The results of the analysis for 2030 Without and With Project conditions show that the peak hour volumes during the a.m. and p.m. peak hours exceed the threshold for the "unstable" flow classification at Main Street/I-805 Northbound Ramps. Under With Project conditions, Main Street/I-805 Southbound Ramps is also forecast to exceed the threshold for "unstable" conditions. Traffic conditions that experience "unstable" flow usually experience considerable delays during the morning and evening peak hours. I-805 Northbound and Southbound Ramps at Main Street are forecast to operate at "Capacity" conditions, according to the Caltrans ILV thresholds. The "Capacity" condition consists of stop-and-go operations with severe delay and heavy congestion.

Table 30
2030 Intersection Lane Volume (ILV) Analysis

Intersection		2030 Without Project	2030 With Project
Olympic Parkway / I-805 Southbound Ramps	AM	Stable	Stable
	PM	Unstable	Unstable
Olympic Parkway / I-805 Northbound Ramps	AM	Unstable	Unstable
	PM	Unstable	Unstable
Main Street / I-805 Southbound Ramps	AM	Stable	Unstable
	PM	**Capacity**	**Capacity**
Main Street / I-805 Northbound Ramps	AM	**Capacity**	**Capacity**
	PM	**Capacity**	**Capacity**

SIGNIFICANT IMPACTS & MITIGATION MEASURES

Significant impacts for each study scenario were determined based on the peak hour intersection and daily roadway segment analysis, as identified by City of Chula Vista significance thresholds. **Tables 31** through **33** summarize the intersections and roadway segments with project impacts for each study scenario year and the recommended mitigation measures.

Table 31
Recommended Mitigation Measures – Access and Frontage

Location	Impact	Recommended Mitigation
2015		
Main Street	Direct	Construct from La Media Road to Magdalena Avenue as a two-lane, two-way street.
La Media Road	Direct	Construct from south of Santa Luna Street to Planning Areas N, I & J south of Main Street as a two-lane, two-way street.
Main Street / La Media Road	Direct	Install Traffic Signal
Main Street / Magdalena Avenue Intersection	Direct	Construct west leg of intersection and stripe to include a dedicated left turn lane and one through lane and install stop sign on the southbound approach.
2020		
Otay Valley Road	Direct	Construct from south of Main Street to Village 8 West Street "A" as 4-lane Major to provide access to Village 8 West.
2025		
Main Street	Direct	Construct remaining two lanes of Main Street through the couplet and install traffic signals at new couplet intersections. Restripe Main Street as one-way for each leg of the couplet.
La Media Road	Direct	Construct remaining two lanes of La Media Road through the couplet and install traffic signals at new couplet intersections. Restripe La Media Road as one-way for each leg of the couplet.
Main Street/Magdalena Avenue	Direct	Re-stripe Main Street/Magdalena Avenue intersection to include dual eastbound left turn lanes and one eastbound through lane. Install traffic signal.
Otay Valley Road	Direct	Construct as a 4-lane Major from Village 8 West Street "A" to Village 8 West eastern project boundary. Install stop control on side streets until traffic signal is warranted.
2030		
Village 8 West Street "A"	Direct	Construct as a 2-lane Collector from Main Street to Otay Valley Road. Provide signalized access at Otay Valley Road and at Main Street when signal warrants are met.

Table 32
Recommended Mitigation Measures - Intersections

Location	Study Year LOS		Impact	Recommended Mitigation	LOS with Mitigation	
	AM Delay - LOS	**PM Delay – LOS**			**AM Delay - LOS**	**PM Delay – LOS**
2015 (302 EDU's)						
Olympic Pkwy / 805 Northbound Ramps	**116.2 – F**	41.9 – D	Cumulative	Payment of TDIF fees	**116.2-F**	41.9 – D
2020 (1,388 EDU's)						
Olympic Pkwy / 805 Northbound Ramps	**117.7 – F**	50.5 - D	Cumulative	Payment of TDIF fees	**117.7 – F**	50.5 - D
Olympic Pkwy / Brandywine Ave	42.9 – D	**80.4 – F**	Direct	Install northbound right turn overlap. Extend westbound left turn pocket (CIP Project), if not completed by 2015.	42.9 - D	46.4 - D
2025 (2,234 EDU's)						
Birch Road / La Media Road	**234.8 – F**	**190.5 – F**	Direct	Construct Main Street from Village 8 West eastern boundary to Eastlake Parkway including bridge over SR-125	37.9 – D	37.1 – D
Birch Road / Eastlake Pkwy	**443.0 – F**	**454.5 - F**	Direct		39.0 – D	40.3 – D
Main Street / Eastlake Pkwy	**274.4 – F**	**242.8 - F**	Direct		24.6 – C	24.1 – C
2030 (2,610 EDU's)						
Birch Road / La Media Road	**91.0 – F**	**116.2 – F**	Direct	Construct SR-125 northbound and southbound ramps at Main Street	37.6 – D	41.9 – D
Birch Road / SR-125 NB Ramps	**112.4 – F**	31.8 - C	Direct		13.0 – B	6.2 – A
Birch Road / Eastlake Parkway	**117.2 – F**	**65.8 – E**	Direct		37.2 – D	38.7 – D
Main St / 805 SB Ramps	46.2 – D	**55.9 – E**	Cumulative		34.5 – C	55.0 – D
Main St / 805 NB Ramps	39.6 – D	**57.8 – E**	Direct		39.2 – D	54.7 – D
Main Street / La Media Road Couplet						
WB Main St / NB La Media	**103.2 – F**	48.0 – D	Direct	Construct Otay Valley Road from Village 8 West eastern boundary to Village 9 Street "A" including SR-125 overcrossing	43.0 – D	41.1 – D
EB Main St / SB La Media	**140.3 – F**	**95.2 – F**			44.0 – D	47.5 – D
EB Main St / NB La Media	**80.9 – F**	42.5 - D			26.7 – C	36.1 – D
Main Street / Magdalena Avenue	**131.3 – F**	**143.8 – F**	Direct		32.1 – C	35.7 – D
Main Street / Eastlake Pkwy	**141.9 – F**	52.1 - D	Direct		52.5 – D	27.2 - C

Table 33
Recommended Mitigation Measures
Roadway Segments

Study Roadway Segment	LOS C Capacity	ADT	LOS	Impact	Recommended Mitigation	ADT	LOS
2015 (302 EDU's)							
No forecasted impacts	-	-	-	-	-	-	-
2020 (1,388 EDU's)							
Olympic Parkway: I-805 to Brandywine	50,000	**54,600**	**D**	Cumulative	Payment of TDIF fees	**54,600**	**D**
Olympic Parkway: Brandywine to Heritage Rd	50,000	**58,200**	**E**	Cumulative	Payment of TDIF fees	**58,200**	**E**
Olympic Parkway: Heritage Rd to La Media Rd	50,000	**60,800**	**E**	Direct	Construct Santa Victoria from Heritage Road to La Media and Heritage Road from Olympic Parkway to Santa Victoria	**55,600**	**D**
Heritage Road Main Street to Avenda de la Vistas	12,000	**17,300**	**F**	Cumulative	Payment of TDIF fees	**17,300**	**F**
2025 (2,234 EDU's)							
Olympic Parkway: Heritage Rd to La Media Rd	50,000	**62,900**	**F**	Cumulative	Payment of TDIF fees	**62,900**	**D**
Birch Road La Media to SR-125	40,000	**51,100**	**F**	Direct	Construct Main Street from Village 8 West eastern boundary to Eastlake Parkway including bridge over SR-125	23,200	A
Magdalena Avenue Birch Rd to Main St	12,000	**20,100**	**F**	Direct		11,500	C
Eastlake Parkway Birch Rd to Main St	40,000	**54,600**	**F**	Direct		35,400	C
2030 (2,610 EDU's)							
Birch Road: La Media Road to SR-125	40,000	**54,200**	**F**	Cumulative	Construct SR-125 northbound and southbound ramps at Main Street	26,200	A
Birch Road SR-125 to Eastlake Pkwy	40,000	**65,200**	**F**	Cumulative		37,200	C
Main Street 805 to Brandywine Ave	58,000	**61,300**	**D**	Direct Impact		**59,300**	**D**
Main Street Brandywine to Heritage Rd	50,000	**52,200**	**D**	Direct Impact		**50,200**	**D**
Heritage Road Main Street to Avenida de la Vistas	50,000	**61,400**	**E**	Cumulative Impact	Payment of TDIF fees	**61,400**	**E**
Eastlake Parkway Birch Rd to Main St	40,000	**41,300**	**D**	Cumulative Impact	Payment of TDIF fees	**41,300**	**D**

PUBLIC FACILITIES FINANCING PROGRAM (PFFP)

A Public Facilities Financing Program (PFFP) report is required for developments in the Otay Ranch according to the City's Growth Management Program. A separate document will be prepared to assess all elements of the PFFP, however the information provided in this section outlines the specific traffic related thresholds for each phase of development that will trigger the need for future roadway and/or intersection improvements in the City. This analysis is based on the planning assumptions used in this traffic report to evaluate the impacts of development in five year increments. These improvements are based on both the Growth Management Program thresholds and the CEQA thresholds for determining project impacts.

Growth Management Ordinance

Olympic Parkway is forecast to operate at a deficient LOS by year 2015 based on the standard volume to capacity ratio methodology. As a part of the City's Growth Management Program, an expanded traffic analysis was prepared to determine if GMOC thresholds for Olympic Parkway are projected to be reached or exceeded, and whether mitigation measures are necessary to remain compliant with the requirements of the Growth Management Program.

Recent GMOC traffic studies have indicated that the segment of westbound Olympic Parkway between Heritage Road and Oleander Avenue during the a.m. peak hours would be the first to fall below City Growth Management Traffic threshold standards as traffic volumes increase over time with this project and other projects east of I-805. In conformance with the requirements of the Growth Management Program, a peak-hour arterial analysis was conducted on the segment of westbound Olympic Parkway between Heritage Road and Oleander Avenue under near-term conditions (Years 0-4) based on the City of Chula Vista's TMP methodology. The Chula Vista TMP is used to assess the operating performance of the City's arterial street system in order to determine compliance with the Threshold Standards of the Growth Management Program.

At the time this study was completed, the GMOC thresholds of 2,463 EDU's was not forecast to be exceeded by the year 2015. Therefore, the project is not forecast to have a significant impact on Olympic Parkway based on the forecast findings of this study. However, the City will continue to monitor to actual performance of Olympic Parkway on an annual or bi-annual basis. In the event the GMOC threshold of LOS D for a period of 2 hours, the city shall stop issuing new building permits for Village 8 West.

Therefore, development of Village 8 West may be suspended if either of two conditions occur:

1. Building permits for a total of 2,463 dwelling units (DU) have been issued for projects east of I-805 or,

2. An alternative measure is selected by the city in accordance with the city of Chula Vista Growth Management Ordinance.

The start date for counting the 2,463 dwelling units is April 4, 2011. Notwithstanding the foregoing, the City may issue building permits to Village 8 West if the City determines in its sole discretion that either traffic studies demonstrate to the satisfaction of the City Engineer, that the circulation system has additional capacity without exceeding the GMOC traffic threshold standards; other improvements are constructed which provide additional necessary capacity; or the City selects an alternative method of implementing the GMOC standards.

CEQA Thresholds of Significance and Mitigation

Cumulative impacts and direct impacts identified in the traffic report will be fully mitigated by the project. Direct impacts will be mitigated through the construction of specifically identified projects. Cumulative impacts are mitigated through the payment of TDIF fees. TDIF fees paid by the project are not directly tied to any one road or intersection improvement project. However, it is reasonable to assume that as TDIF fees are collected by this project and others, new roads and intersections will be constructed over time. Therefore, year 2025 and 2030 include road improvements that are assumed to be constructed through the TDIF program.

If the project EDU limit for each study year (2015, 2020, 2025, & 2030) is reached prior to one of the assumed roadway or intersection improvements is constructed and open to traffic, then one of the following steps must need to be taken:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or

2. City and OLC shall meet to determine the need for the incomplete roadway segments. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or

3. Developer shall construct the missing roadway links and receive TDIF credit for those improvements; or

4. An alternative measure is selected by the city in accordance with the city of Chula Vista Growth Management Ordinance.
5. All to the satisfaction of the City Engineer.

Project Access and Frontage Phasing

Village 8 West will be constructed in a series of phases. With each phase of development, internal roadways will be constructed to support not only the traffic associated with that phase, but also the public works infrastructure such as water and sewer service. Although the project has been evaluated in five year increments based on phasing illustrated previously in **Exhibit 25**, the development of Village 8 West will occur based on market demands and other external factors. As this project is not currently connected to the circulation system or public works infrastructure, a logical progression of on-site improvements has been designed from the north end of the property to the south end of the property. **Table 34** summarizes the phasing of on-site street improvements within Village 8 West.

Table 34
Village 8 West PFFP Analysis(1)

PHASE/PLANNING AREAS	INFRASTRUCTURE DESCRIPTION	UNIT TRIGGERS WITHIN EACH PHASE
ORANGE NORTH **B, G, H-A, H-2**	La Media (Bi-directional)– north Project boundary to "C" St.	1ST EDU
	Main Street (Bi-directional)– La Media to Easterly Project Boundary	1st EDU
	Appropriate Internal Streets Street "A" north of Main Street	Access/Frontage

ORANGE SOUTH **I, J, N**	La Media Road (Bi-directional) from northerly Project boundary to Street "C".	1st EDU
	Appropriate internal streets C, F, & G Street "D" from St. "C" to St. "H"	Access/Frontage

BLUE **P, Q**	La Media (Bi-directional)– north Project boundary to Street "A".	1st EDU
	Provide secondary access by constructing either; - Street "D" - Otay Valley Road to Easterly project access point - Street "A" connecting to Magdalena Ave.	@ 120th EDU
	Appropriate internal streets	Access/Frontage

YELLOW WEST **A, E, F**	La Media (Bi-directional)– north Project boundary to eastbound Main Street	1ST EDU
	Main Street couplet (as a pair of one way streets) west of La Media.	1st EDU
	Appropriate internal streets	Access/Frontage

YELLOW NORTH EAST **C, D**	La Media (Bi-directional)– north Project boundary to eastbound Main Street	1st EDU
	Main Street (Bi-directional)– La Media to Easterly Project Boundary	1st EDU

YELLOW SOUTH **L**	La Media (Bi-directional)– north Project boundary to eastbound Main Street	1st EDU
	Main Street (Bi-directional)– La Media to Easterly Project Boundary	1st EDU
	Street "A" –Main St. to Planning Area L southern boundary	1st EDU
	Appropriate Internal Streets	Access/Frontage

GREEN **M, O, R, S**	La Media (Bi-directional)– north Project boundary to eastbound Main Street	1st EDU
	Main Street (Bi-directional)– La Media to Easterly Project Boundary	1st EDU
	Street A - Main Street to Otay Valley Road, south of school	1st EDU
	Otay Valley Road - St. "A" to easterly project boundary	Access/Frontage
	Street "B" – St. "A" to easterly project boundary	1st EDU
	Appropriate Internal Streets	Access/Frontage

PURPLE	- La Media (Bi-directional) /Otay Valley Road - north Project boundary to easterly project boundary -Otay Valley Road - eastbound Main Street to easterly Project boundary -Street "A" south of Otay Valley Road	1st EDU
	Appropriate Internal Streets	Access/Frontage

Triggers for Circulation Element Road Improvements (TDIF or Project Improvements)			
INFRASTRUCTURE DESCRIPTION	**LIMITS**	**EDU TRIGGER**	Type of Mitigation
Heritage Road	Olympic Parkway to Main Street	1,388th EDU	Cumulative / TDIF Improvement
Heritage Road	Main Street to Avenida de la Vistas		Cumulative / TDIF Improvement
Santa Victoria	La Media Road to Olympic Parkway		Direct / Project Improvement
Complete the couplet	From northern boundary to eastbound Main Street and from westerly project boundary to Magdalena Avenue		Direct / Project Improvement
Main Street	Magdalena Avenue to SR-125 as six lane Major	2,234th EDU	Direct / Project Improvement
	SR 125 to Eastlake Parkway including overcrossing as a six lane Town Center Arterial		Direct / Project Improvement
	Heritage Road to La Media Road		Cumulative / TDIF Improvement
Main Street/SR125 Ramps	Northbound and Southbound Ramps	2,610th	Direct / Project Improvement
Otay Valley Road	Village 8 West boundary to Village 9 Street A including SR-125 overcrossing		Direct / Project Improvement

[1] Agree to construct or secure the facility prior to the final map that triggers the EDU or cumulative EDU as shown in table.

[2] City and Otay Land Company shall meet to determine their need for the incomplete roadway segments. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of the improvements.

ON-SITE OPERATIONAL ANALYSIS

Traffic control devices for internal and external road connections were determined based on traffic demand and project phasing. **Exhibit 40** illustrates the proposed intersection geometry and proposed traffic control devices for each of the internal intersections and traffic control devices for roads connecting the project to the external circulation network.

Operational analysis of all intersections where the project connects to the roadway network was conducted for the year 2030. Forecast year 2030 traffic volumes for the project intersections are illustrated in **Exhibit 41**. **Table 35** summarizes the results of the operational analysis of the key project intersections. As shown in Table 35, all intersections are forecast to operate at acceptable levels of service.

Table 35
2030 Internal Intersection Operational Analysis

Internal Intersection	AM		PM	
	Delay	LOS	Delay	LOS
Westbound Main Street / Street “A”	6.1	A	5.1	A
Eastbound Main Street / Street “A”	30.0	C	29.9	C
Otay Valley Road / Street “C”	5.5	A	5.4	A
Otay Valley Road / Street “A”	34.5	C	45.0	D
Street “A” / Street “B”	20.4	C	24.4	C

For each of the proposed signalized intersections, a preliminary traffic signal warrant analysis was conducted to demonstrate that, by year 2030, traffic signals would be appropriately placed at these intersections. The traffic signal warrant analysis was conducted based on the California Manual on Uniform Traffic Control Devices (MUTCD) planning level warrant which uses daily traffic volume as a threshold for analysis. **Table 36** provides the forecast daily traffic volume for the intersections where traffic signals are warranted along with the thresholds established in the MUTCD. As shown, all proposed traffic signal locations meet the minimum traffic signal warrants by year 2030. The volumes used in this analysis are the forecast year 2030 mitigated conditions which include the Otay Valley Road connection over SR-125 and the Main Street interchange at SR-125.

It should be noted that during interim years, the traffic signals may not be warranted. As an interim traffic control measure stop signs may be a more appropriate traffic control device until the traffic on the side street or along the major street approaches the thresholds identified in Table 36. The appropriate traffic control device should be determined during each phase of construction based on traffic volume, connections to the overall circulation system and other factors.

Table 36
2030 Traffic Signal Warrants and Daily Traffic Volumes

Intersection	Street (Major or Minor)	Year 2030 ADT	ADT Thresholds[1]		Signal Warranted?
			Condition A: Minimum Volume	Condition B: Interruption of Continuous Traffic	
WB Main St / Street "A"	*MAJOR:* Main St	12,550	9,600	14,400	Yes (Condition A)
	MINOR: Street "A"	2,730	2,400	1,200	
EB Main St / Street "A"	*MAJOR*: Main St	12,550	9,600	14,000	Yes (Condition A)
	MINOR: Street "A"	5,460	2,400	1,200	
Otay Valley Rd / Street "C"	*MAJOR:* Otay Valley	12,400	9,600	14,000	Yes (Combination)
	MINOR: Street "C"	2,000	2,400	1,200	
Otay Valley Rd / Street "A"	*MAJOR:* Otay Valley	11,400	9,600	14,000	Yes (Combination)
	MINOR: Street "A"	1,975	2,400	1,200	
Street "A" / Street "B"	*MAJOR:* Street "A"	9,000	8,000	12,000	Yes (Condition A)
	MINOR: Street "B"	2,500	2,400	1,200	

[1] California MUTCD Minimum Estimated Average Daily Traffic thresholds for Major and Minor Streets. Daily traffic volume on the major street is two-way volume and ADT volume on the Minor Street is the highest one-way approach volume. Volumes are baaed upon the Year 2030 with Mitigation conditions. When either Condition A or Condition B are not met, then the Combination of Warrants should be considered. The Combination of Warrants is met if both Condition A and Condition B are fulfilled 80% or more.

MULTIMODAL ACCESS ANALYSIS

Village 8 West will be accessible by both local circulation bus service and Rapid Bus Service provided by MTS. The Rapid Bus route is proposed to serve Main Street and circulate through eastern Chula Vista.

Class II bicycle facilities are planned along all circulation element roadways through Village 8 West. Roadways internal to the Village are designed to local street standards with speed limits of 25 to 30 mph. Slow traffic speeds are conducive to bicycling and provide the necessary linkage the regional bicycle circulation network.

Sidewalks will be provided throughout Village 8 West and will include bulb-outs at key locations to reduce pedestrian crossing distances. With pedestrian scale development, wide sidewalks and slower traffic speeds, the community and roadways are designed to provide a comfortable walking environment.

CONSTRUCTION ACTIVITY

Construction of the project will occur in several phases. During grading of the site, it is anticipated that cut and fill will be balanced on-site; therefore, there will be limited need to haul material to or from the site. Material will be screened on-site, thereby reducing the need to remove materials from the site during construction activity. Material hauled to the site for backfill material and road construction will be provided from the existing quarry located within Village 4. Therefore, most if not all material hauling will occur within the Otay Ranch reducing the sphere of potential construction impacts.

As evaluated in the TIA, the Village 8 West project is forecast to generate between 3,000 trips per day (2015 analysis) and 26,100 trips per day (2030 analysis) when fully occupied. During the development of Village 8 West, typical construction activity will occur including the grading and construction of new roads, grading of lots and parks, utility installation and construction of new structures. Initially, traffic generated by Village 8 West will be construction traffic. Typical construction traffic will include:

- Grading Operations – Up to 30 Workers
- Underground Utility Construction – Up to 10 Workers
- Builders (2-3 builders constructing at one time) – Up to 100 Workers

Assuming each worker drives to and from the jobsite in their own personal vehicle, and approximately 50% of them leave the site once a day for lunch, materials, meetings, etc, the trip generation rate per construction worker is approximately 3 trips per day with one trip occurring the a.m. peak and one trip occurring in the p.m. peak. Based on the average number of workers on a jobsite, as described above, the average daily trip generation would 420 trips per day with 140 trips occurring in the a.m. peak and 140 occurring during the p.m. peak.

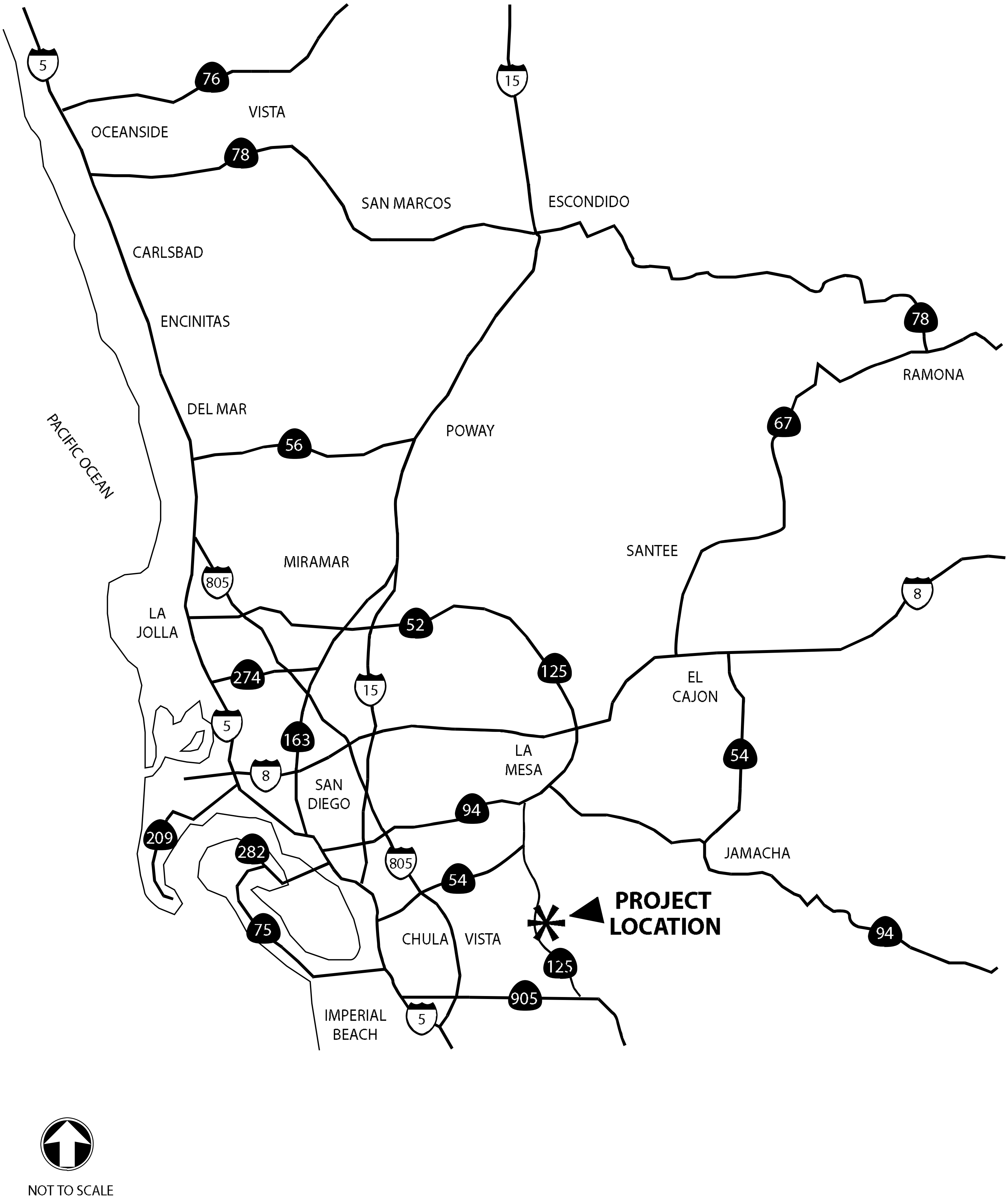
As project traffic increases due to the completion of various phases of the project, the construction traffic will gradually decrease. At any given time during the project, the number of construction staff on site on a given day will vary and will extend over a period of several years. **Table 37** compares the forecast construction related traffic to the forecast traffic generation at each phase of the project.

Table 37
Comparison of Construction and Project Trips by Study Year

	Forecast Construction Traffic	Total Project Trips through Year…			
		2015	2020	2025	2030
ADT	420	3,018	13,875	22,338	26,104
A.M. Peak Inbound	112	57	375	756	1,208
A.M. Peak Outbound	28	185	775	1,175	1,455
P.M. Peak Inbound	28	211	924	1,454	1,654
P.M. Peak Outbound	112	91	498	878	1,115

As shown, the construction traffic is less than the net increase in traffic for each five year increment. The peak volumes are greater inbound in the a.m. peak and outbound in the p.m. peak when the construction traffic is compared to the year 2015 traffic. Throughout this study, the project generated traffic was evaluated against the existing and mitigated roadway networks to determine the impacts associated with the development of this Village. Since the traffic associated with the development of the site exceed the volume of traffic generated during construction, the impacts identified in this study for each study year would more than exceed the potential impacts associated with construction related traffic.

The findings of this study show that all impacts associated with the project will be fully mitigated with the project. Although the construction traffic may occur prior to and/or during the construction of mitigation measures, the construction impacts will be temporary. Therefore, it is reasonable to state that construction traffic to and from the site would not result in any unidentified impacts.



REGIONAL PROJECT VICINITY

RBF

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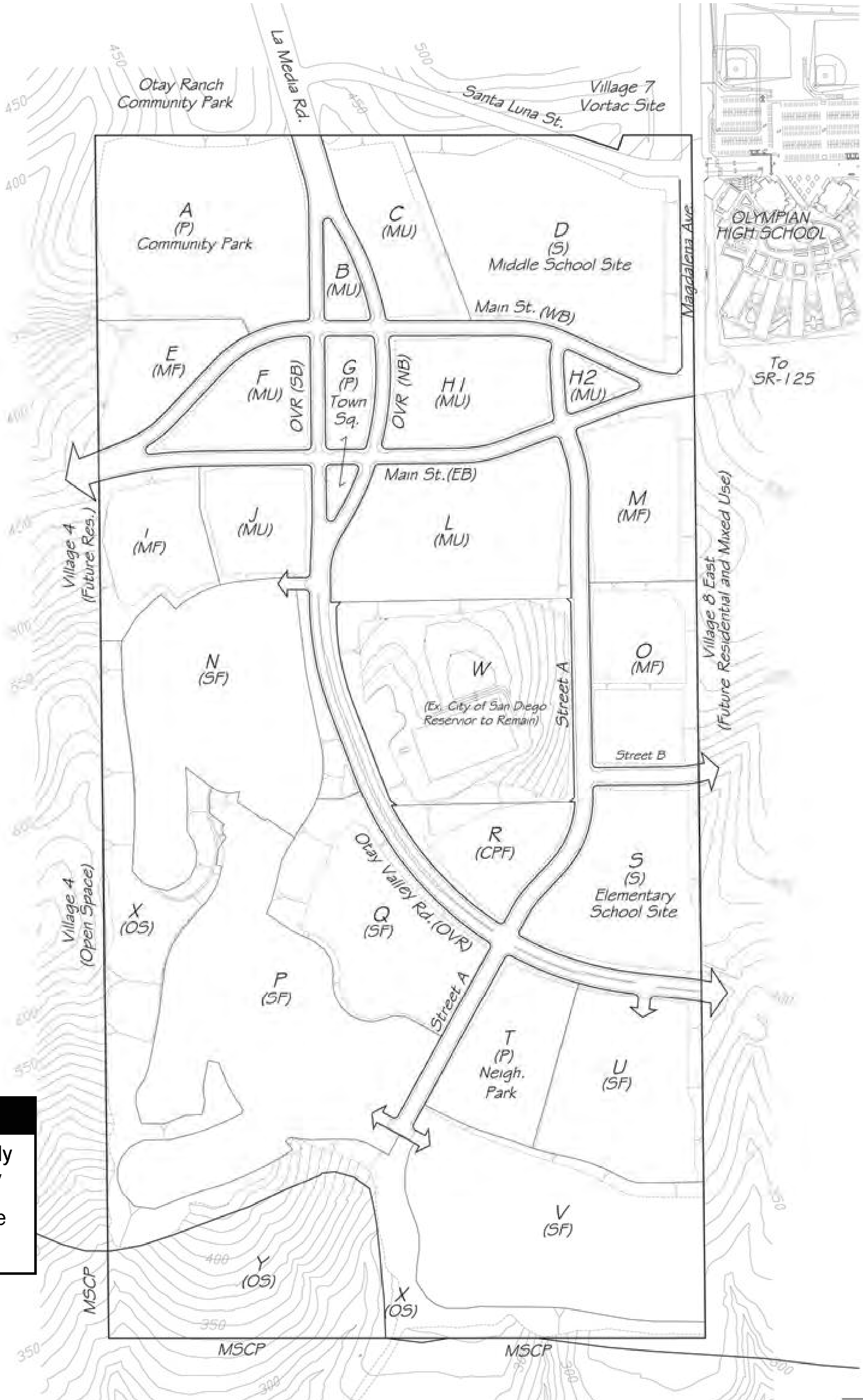
EXHIBIT 1



LEGEND

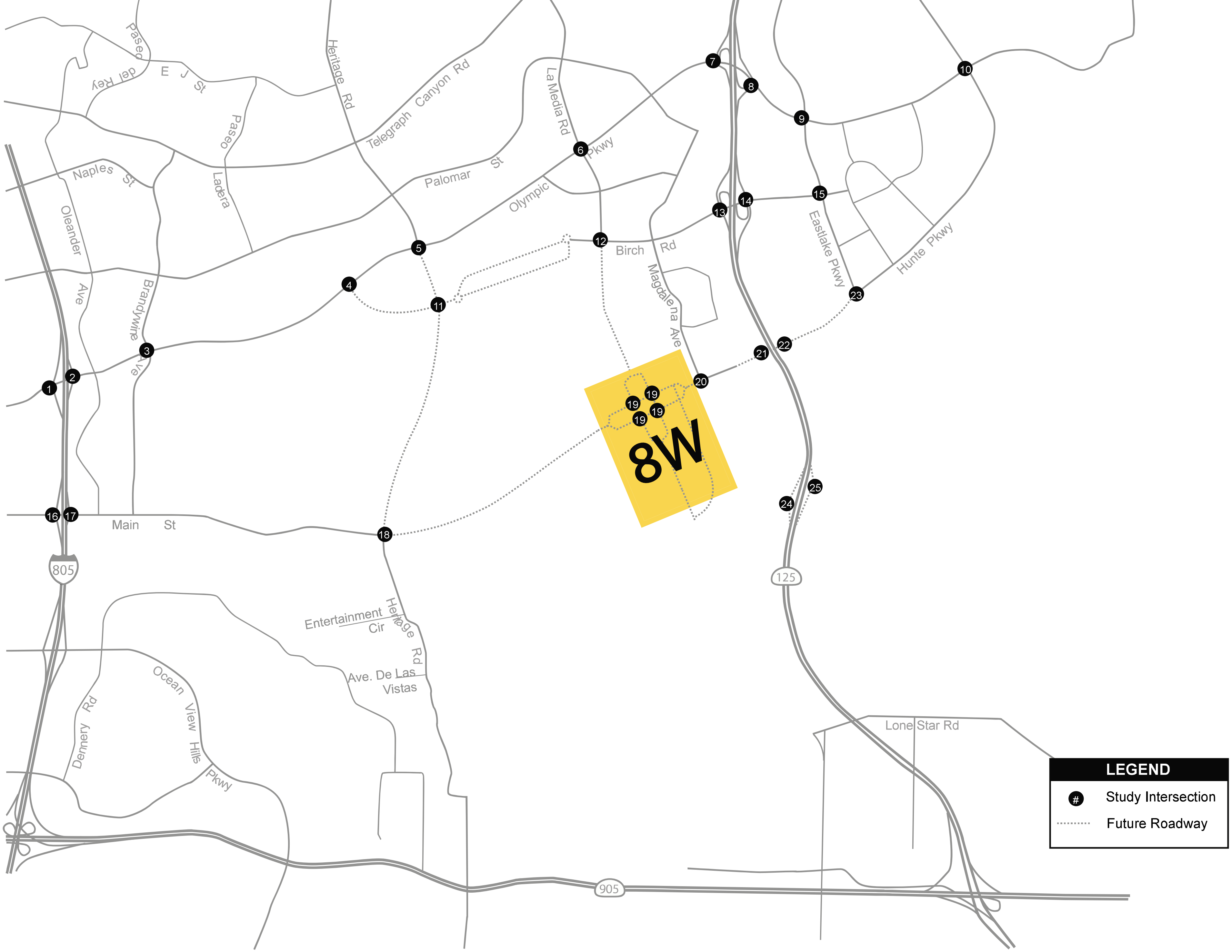
SF = Single Family
MF = Multi Family
MU = Mixed Use
OS = Open Space
P = Park
S = School

NOT TO SCALE

VILLAGE 8 WEST SITE UTILIZATION PLAN

55-100535.001 AUGUST 2011

EXHIBIT 2



STUDY AREA
EXHIBIT 3

55-100535.001 MARCH 2013

Chula Vista Vision 2020

Circulation Plan - East

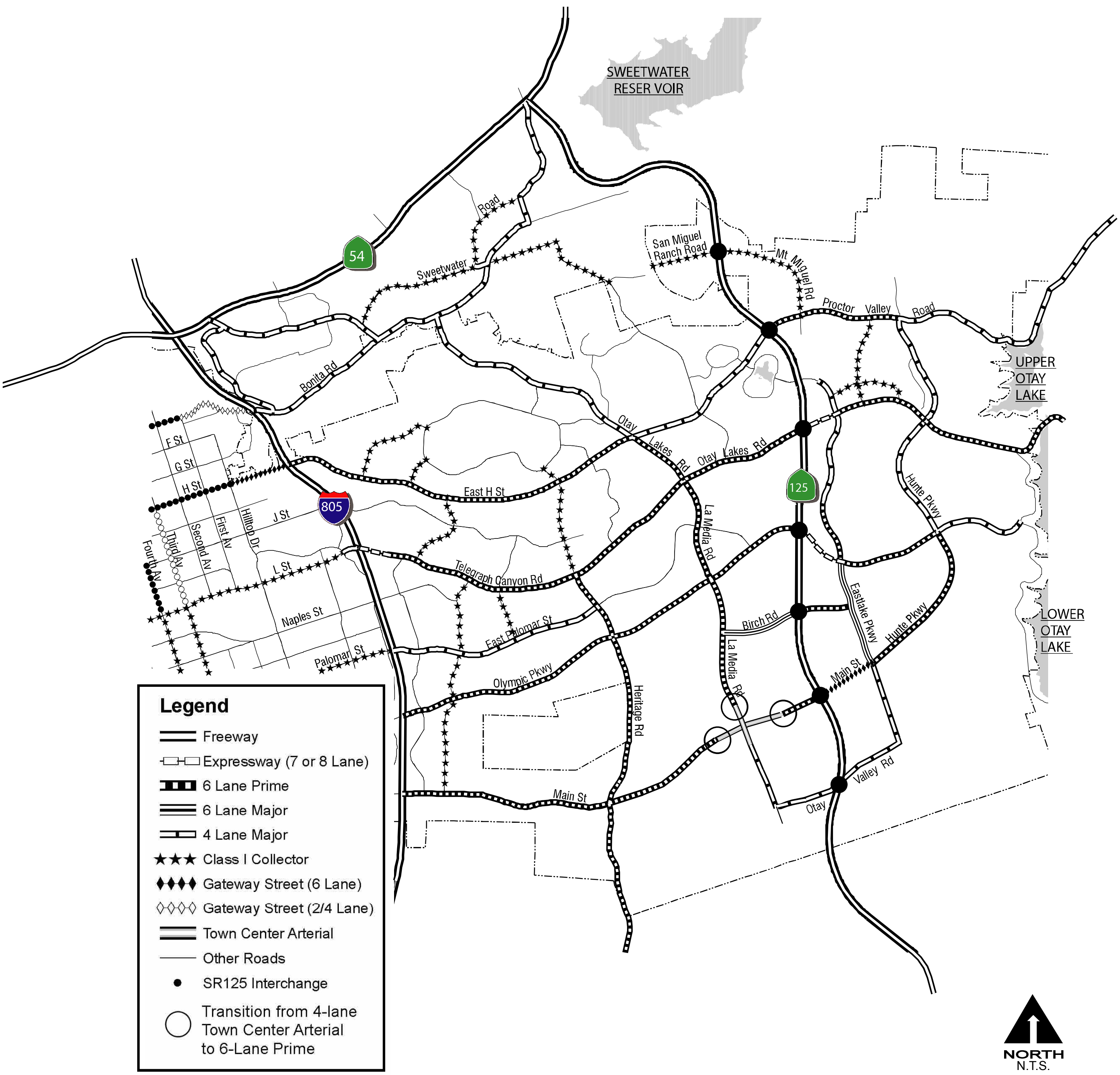


Figure 5-13E

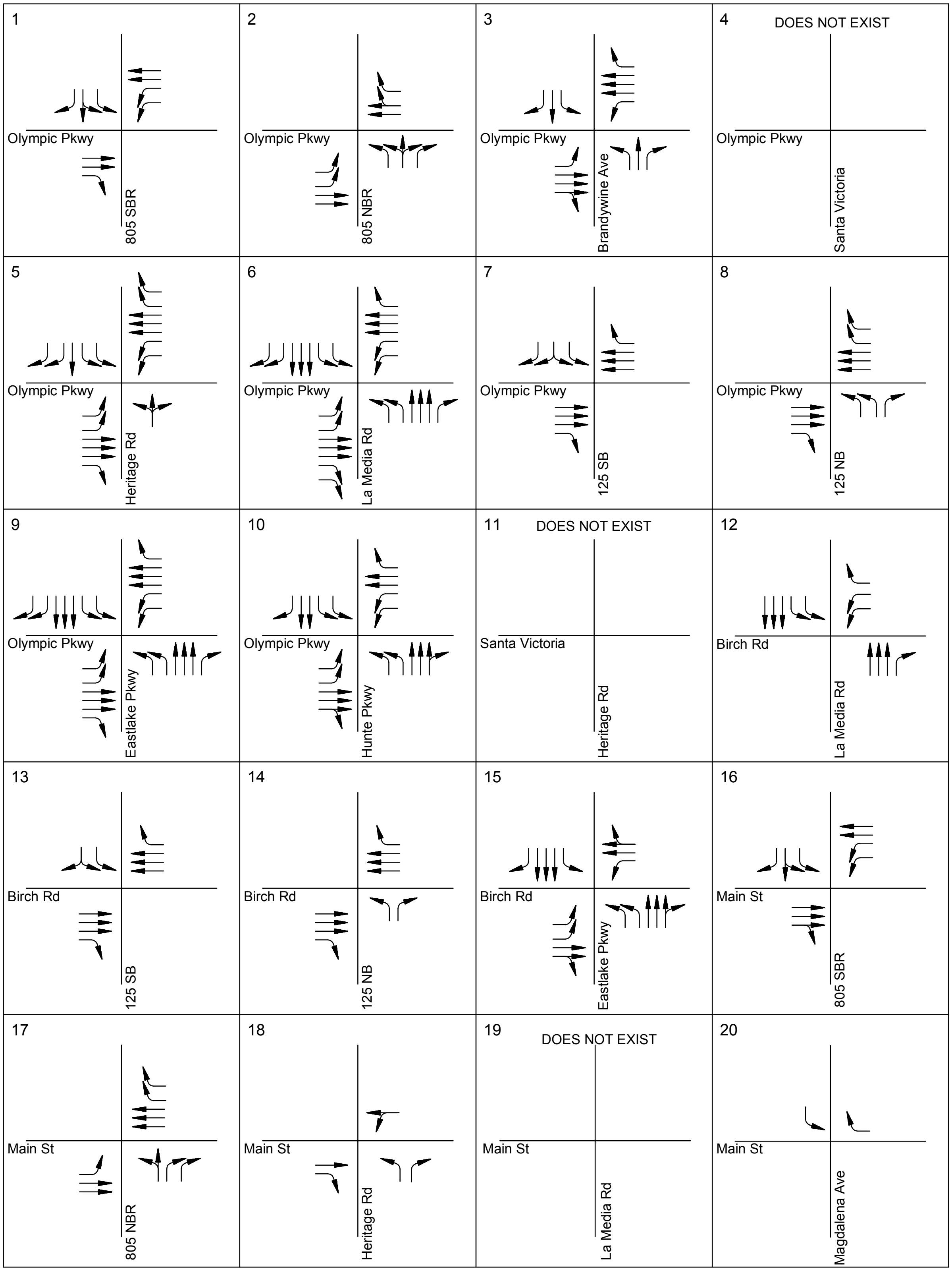
CITY OF CHULA VISTA

NOT TO SCALE

CITY OF CHULA VISTA CIRCULATION PLAN

55-100535.001 MARCH 2013

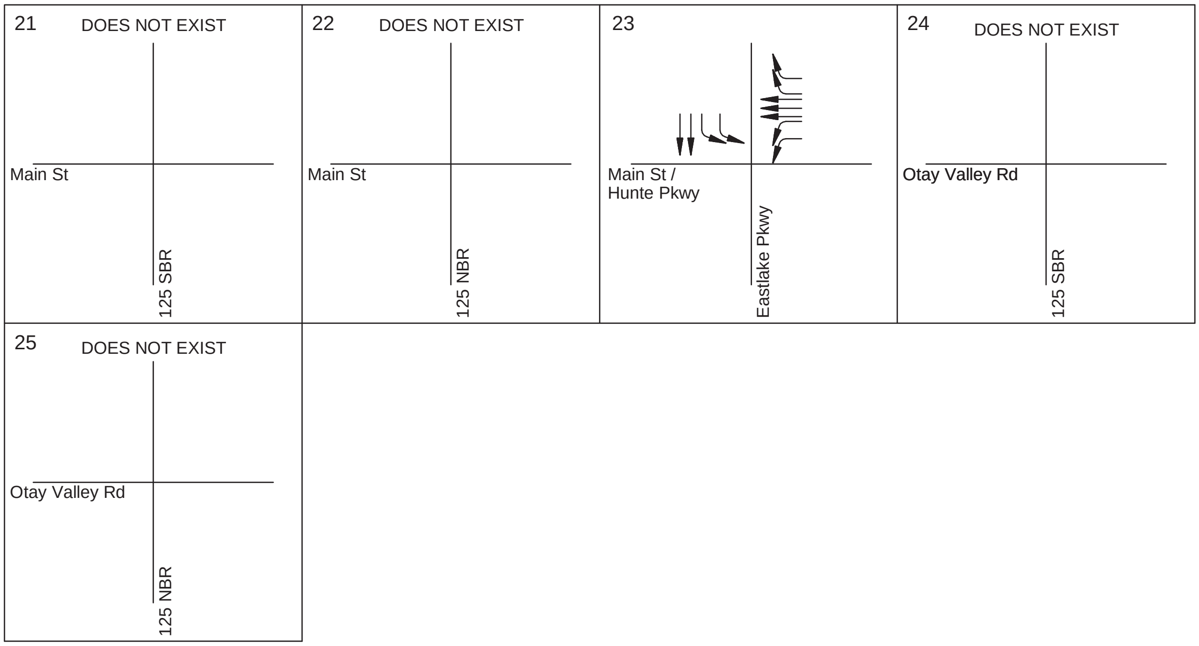
EXHIBIT 4



EXISTING INTERSECTION GEOMETRY

55-100535.001 AUGUST 2011

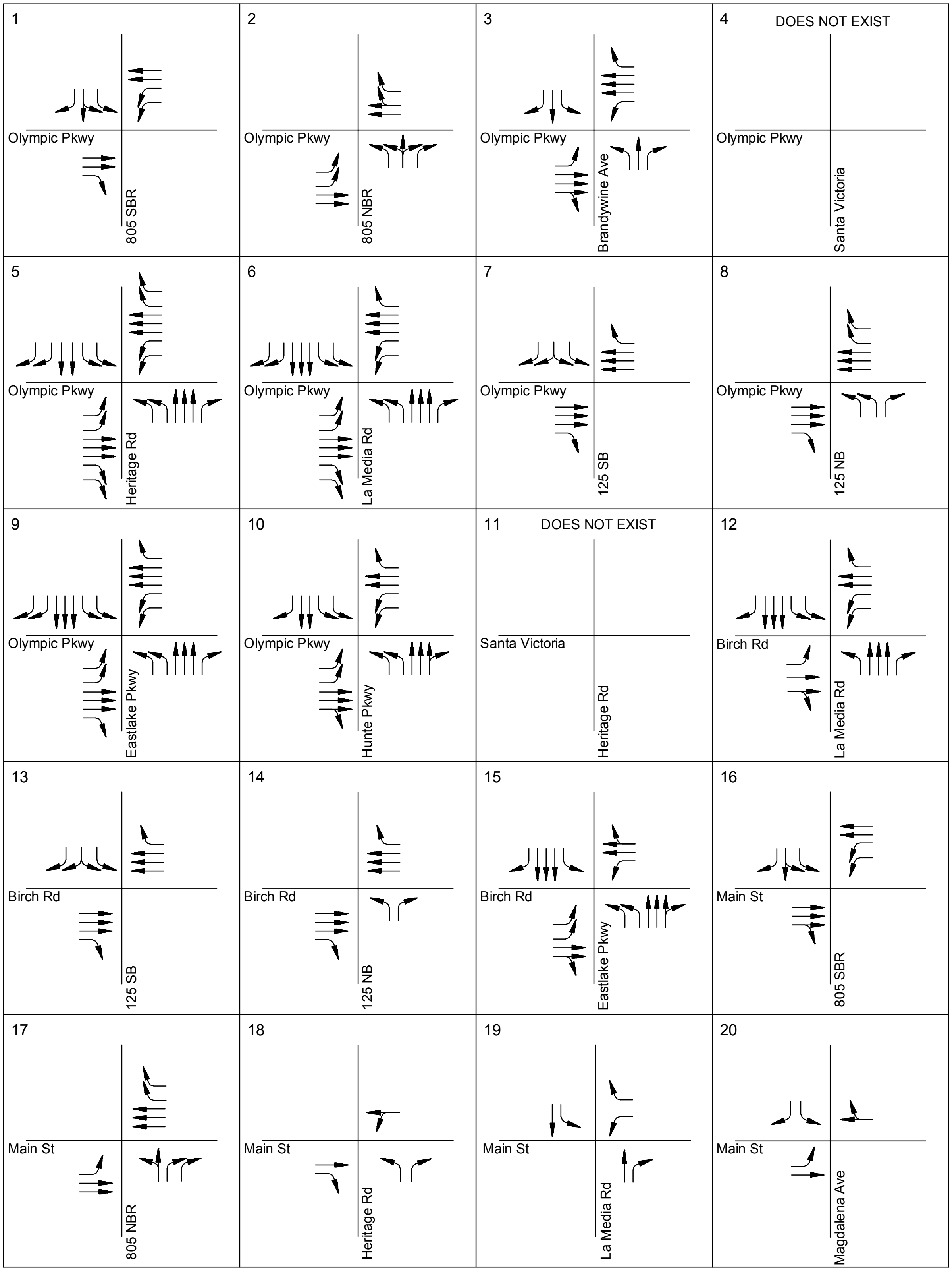
EXHIBIT 5A



EXISTING INTERSECTION GEOMETRY

55-100535.001 MARCH 2013

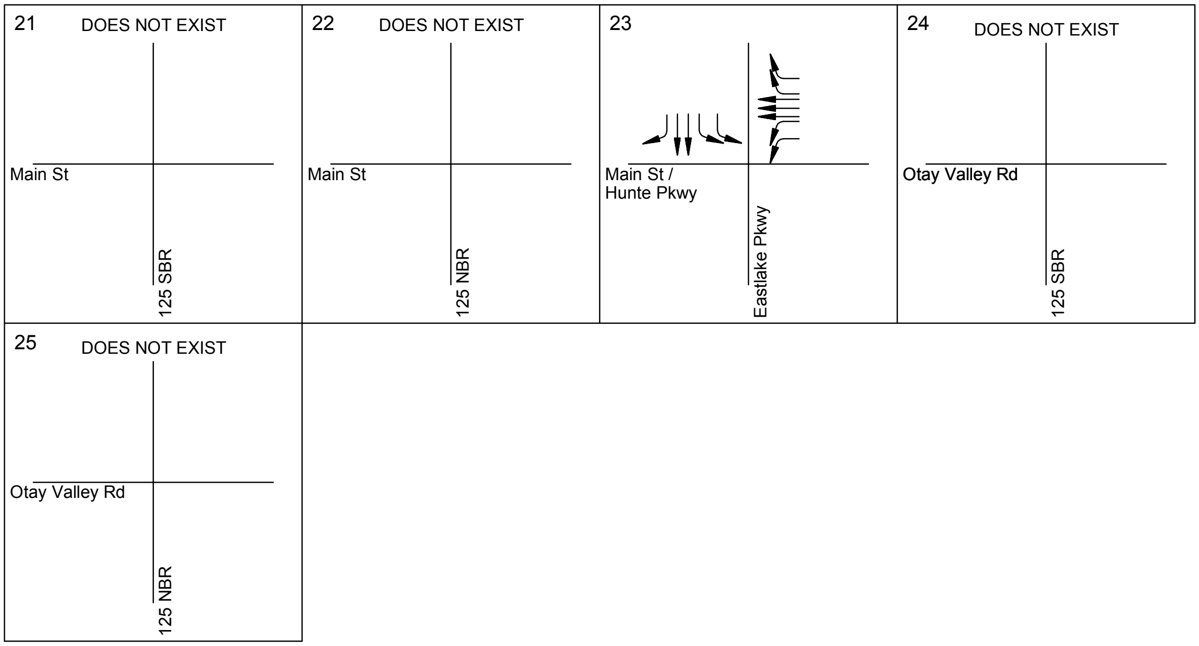
EXHIBIT 5A



2015 INTERSECTION GEOMETRY

55-100535.001 AUGUST 2011

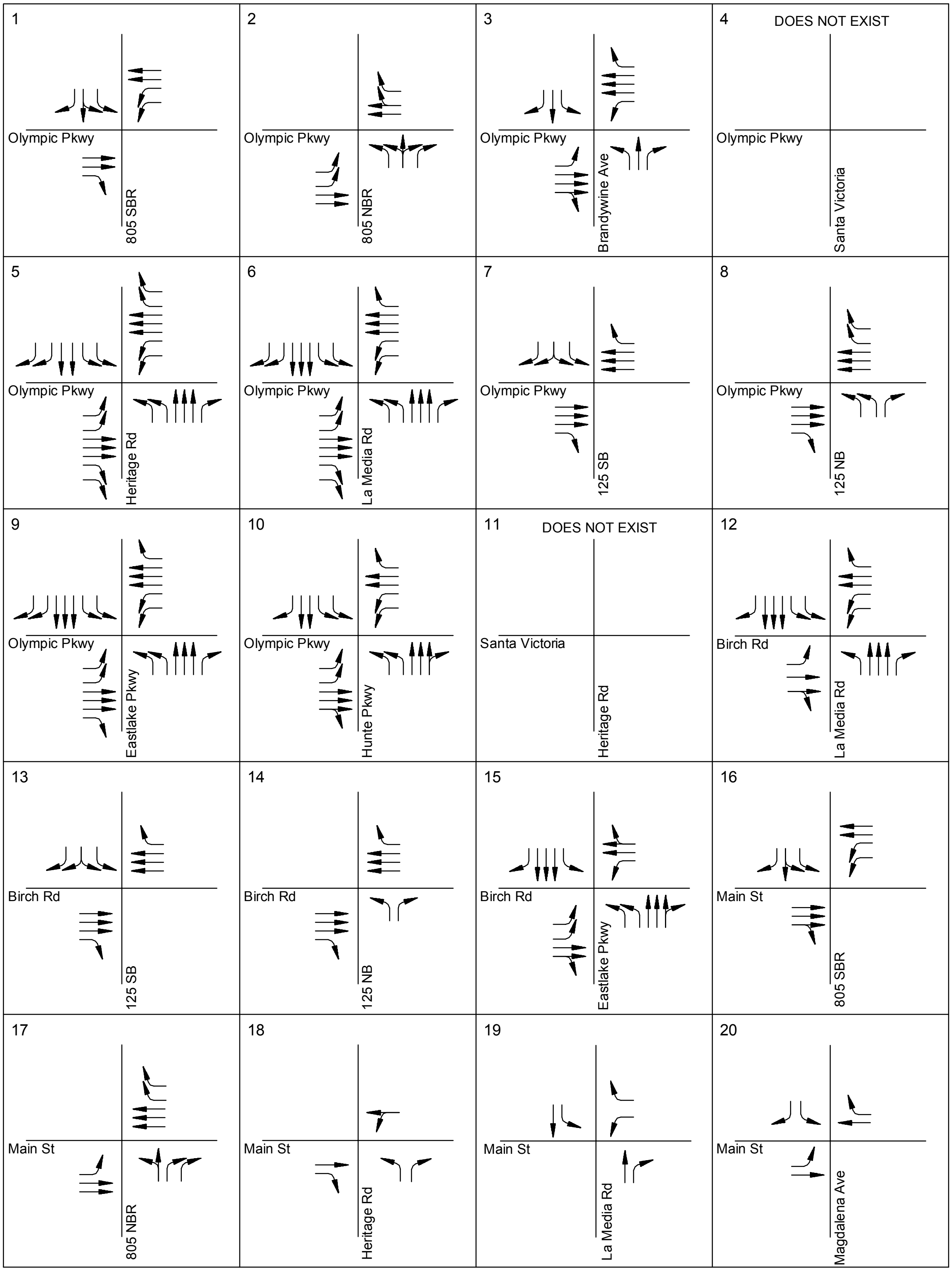
EXHIBIT 5B



2015 INTERSECTION GEOMETRY

55-100535.001 MARCH 2013

EXHIBIT 5B

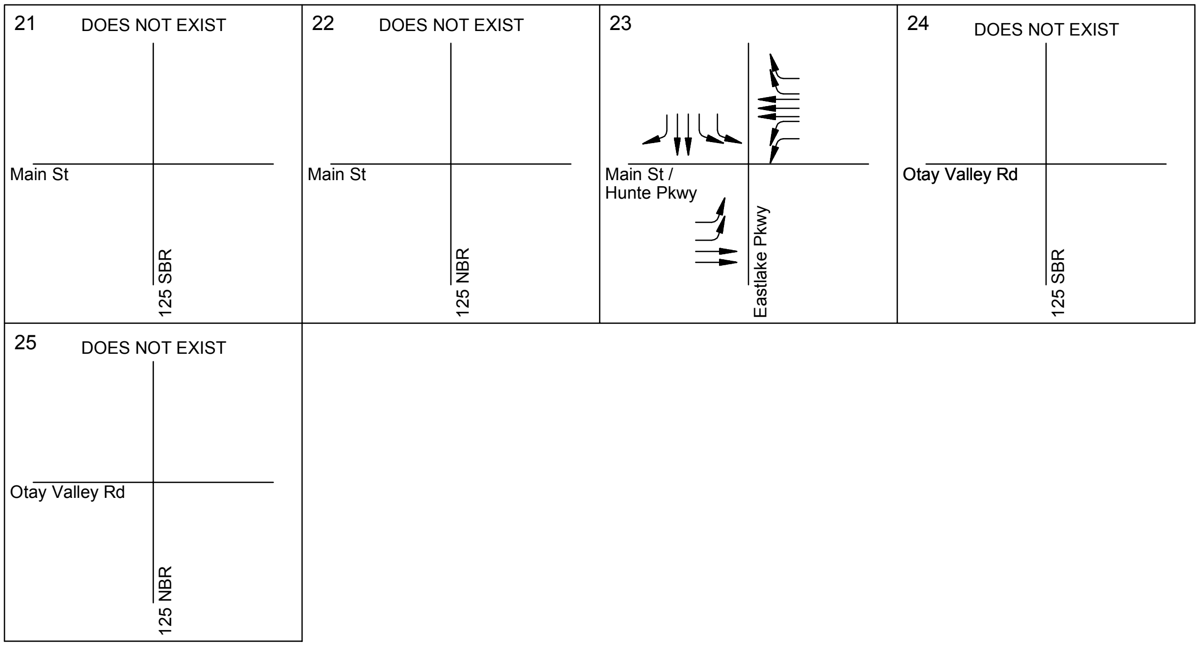


RBF

2020 INTERSECTION GEOMETRY

55-100535.001 AUGUST 2011

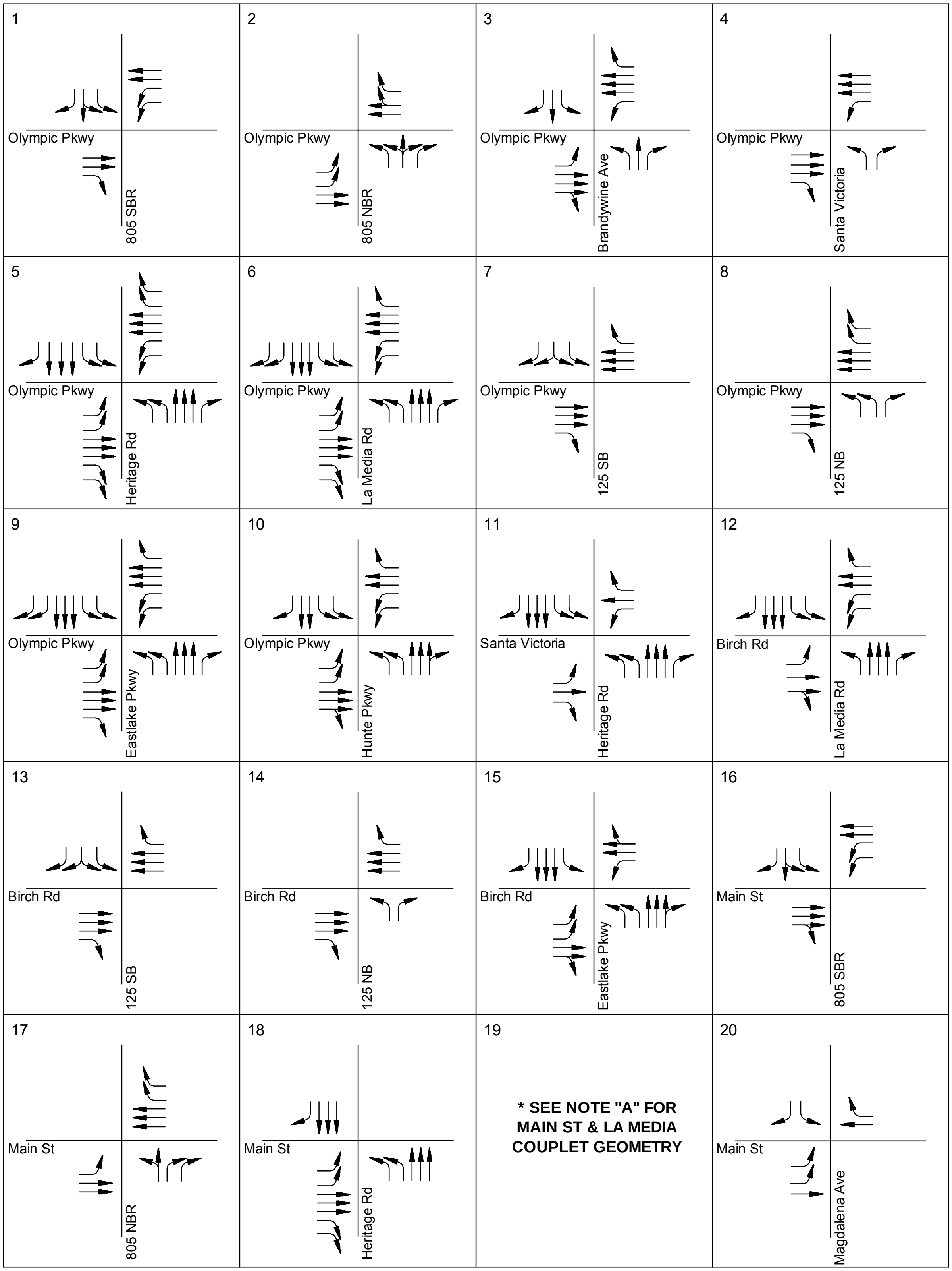
EXHIBIT 5C



2020 INTERSECTION GEOMETRY

55-100535.001 MARCH 2013

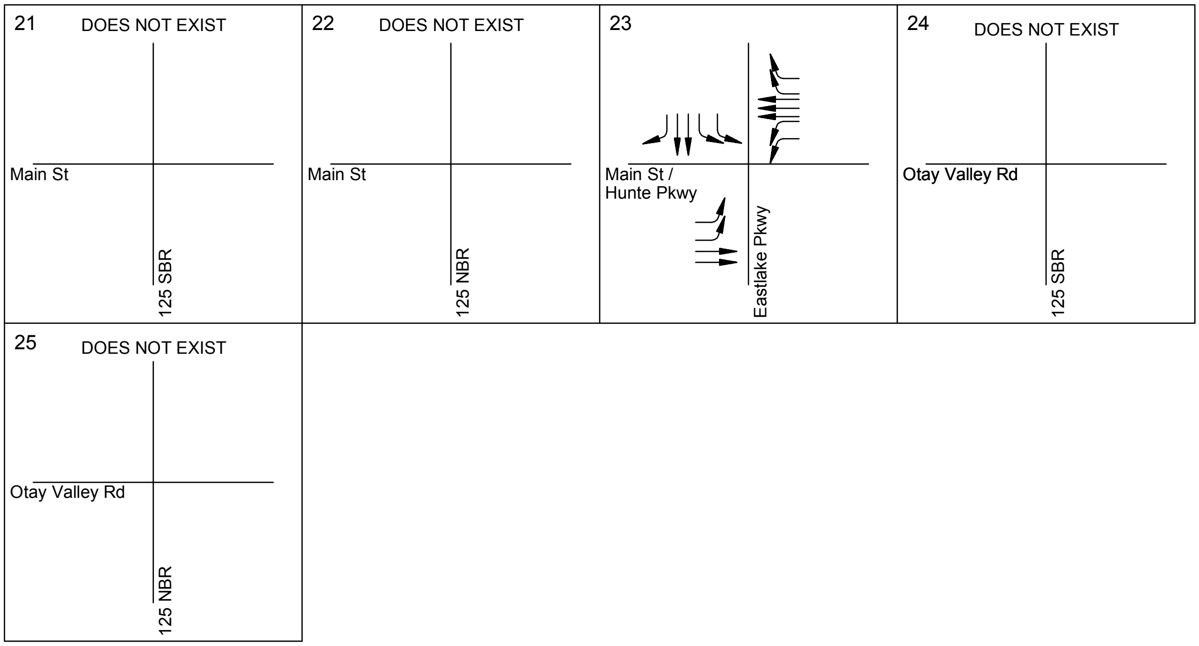
EXHIBIT 5C



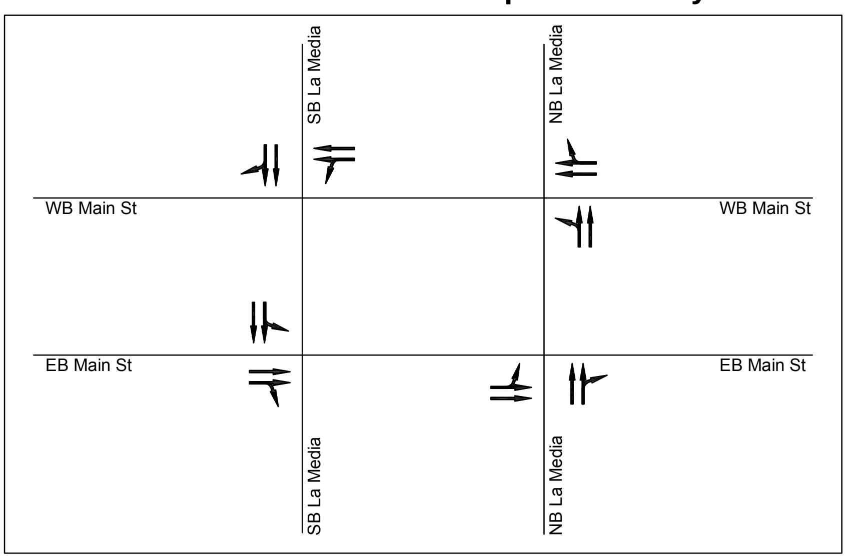
2025 INTERSECTION GEOMETRY

55-100535.001 AUGUST 2011

EXHIBIT 5D



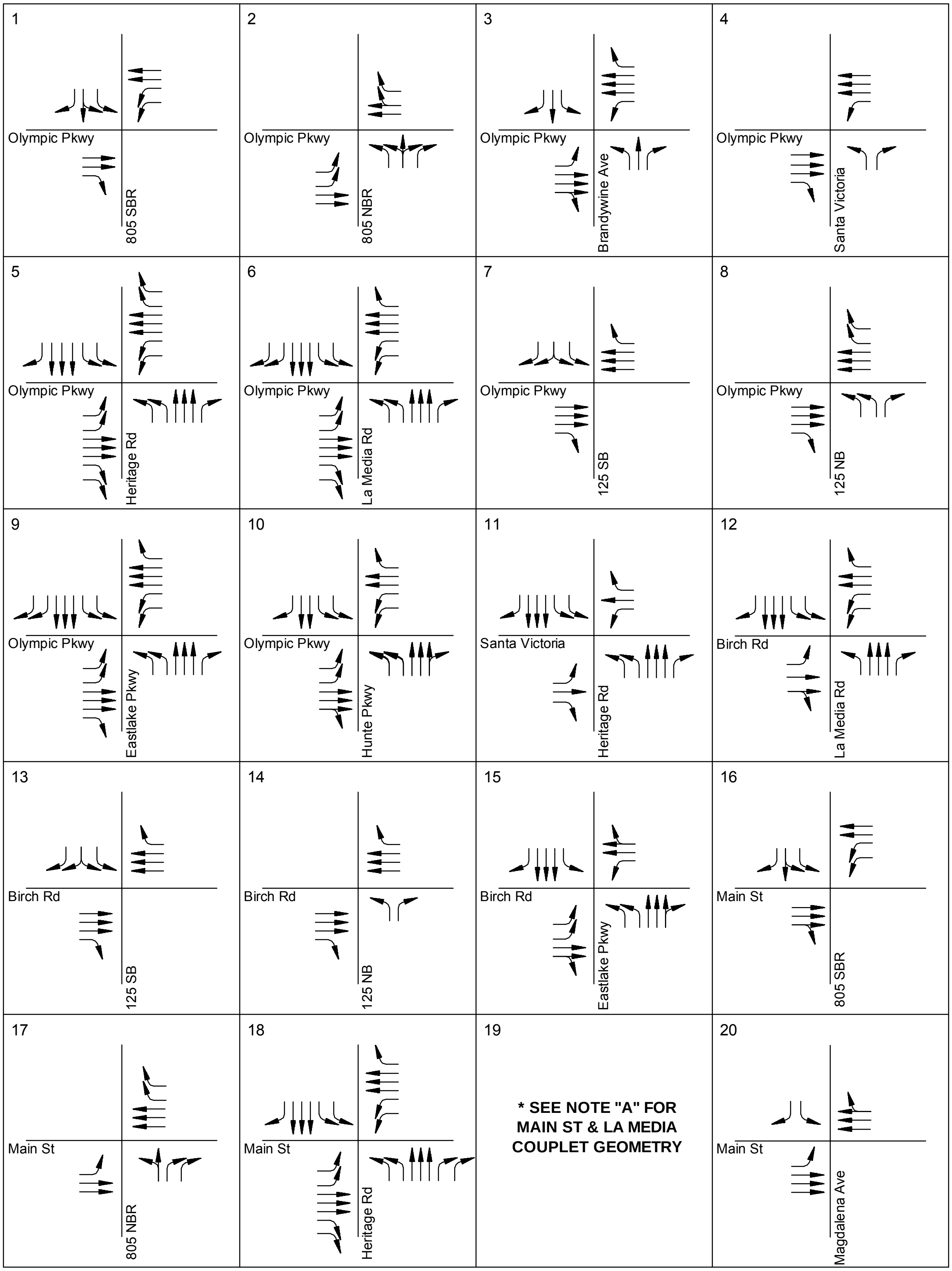
NOTE "A": Main St / La Media Couplet Geometry



2025 INTERSECTION GEOMETRY

55-100535.001 MARCH 2013

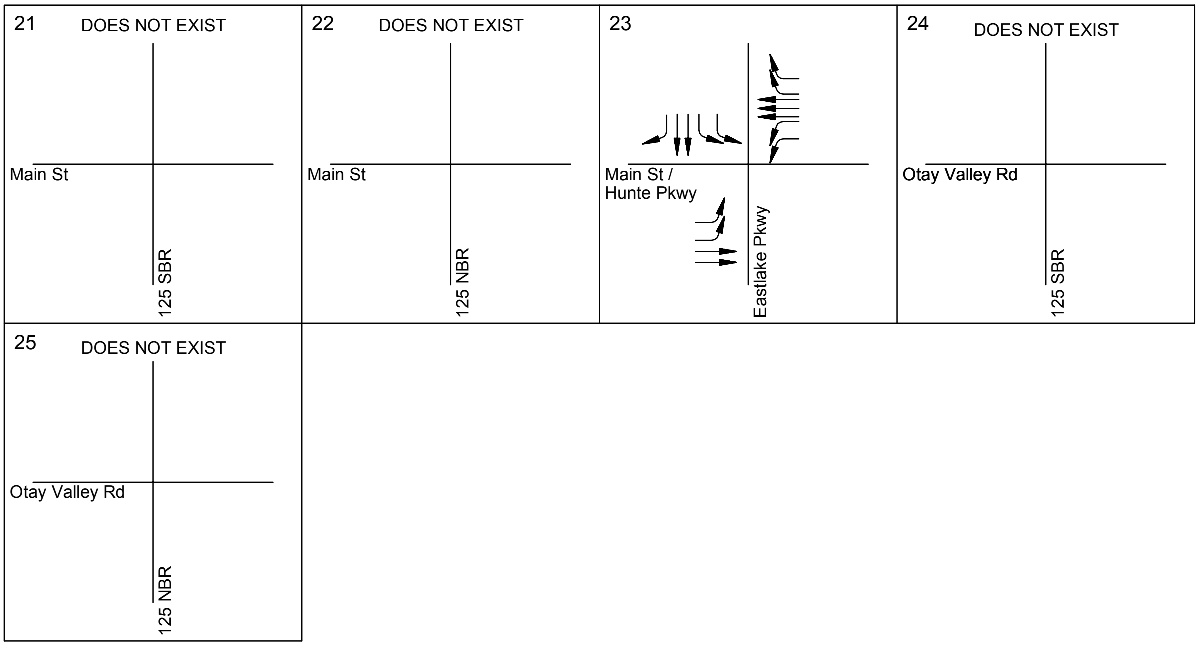
EXHIBIT 5D



2030 INTERSECTION GEOMETRY

55-100535.001 AUGUST 2011

EXHIBIT 5E



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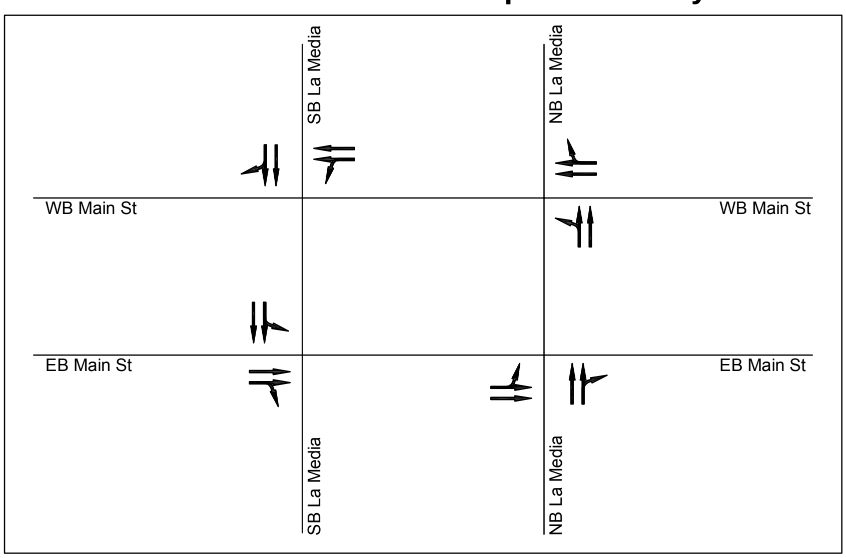
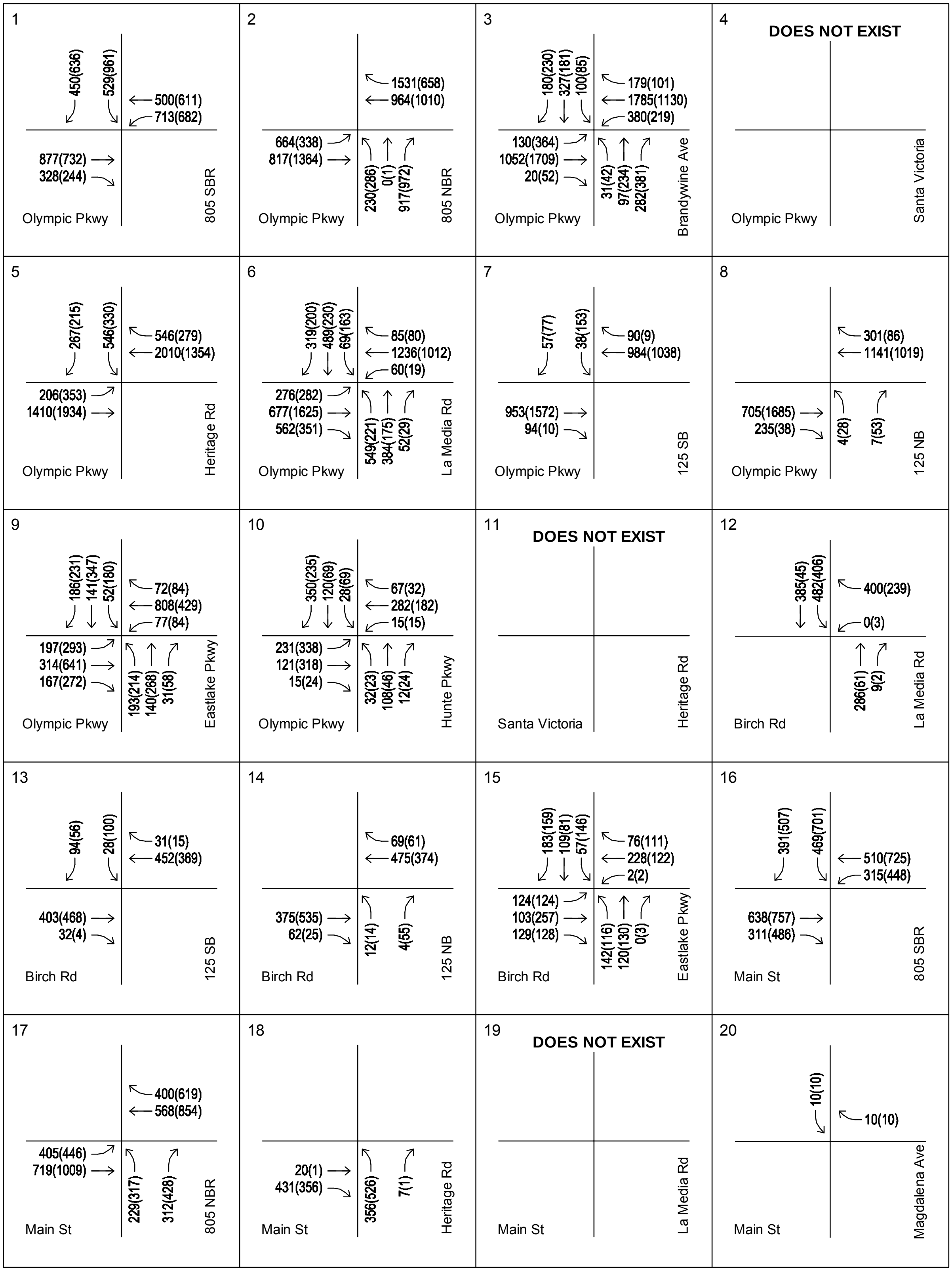


2025 INTERSECTION GEOMETRY

55-100535.001 MARCH 2013

EXHIBIT 5D



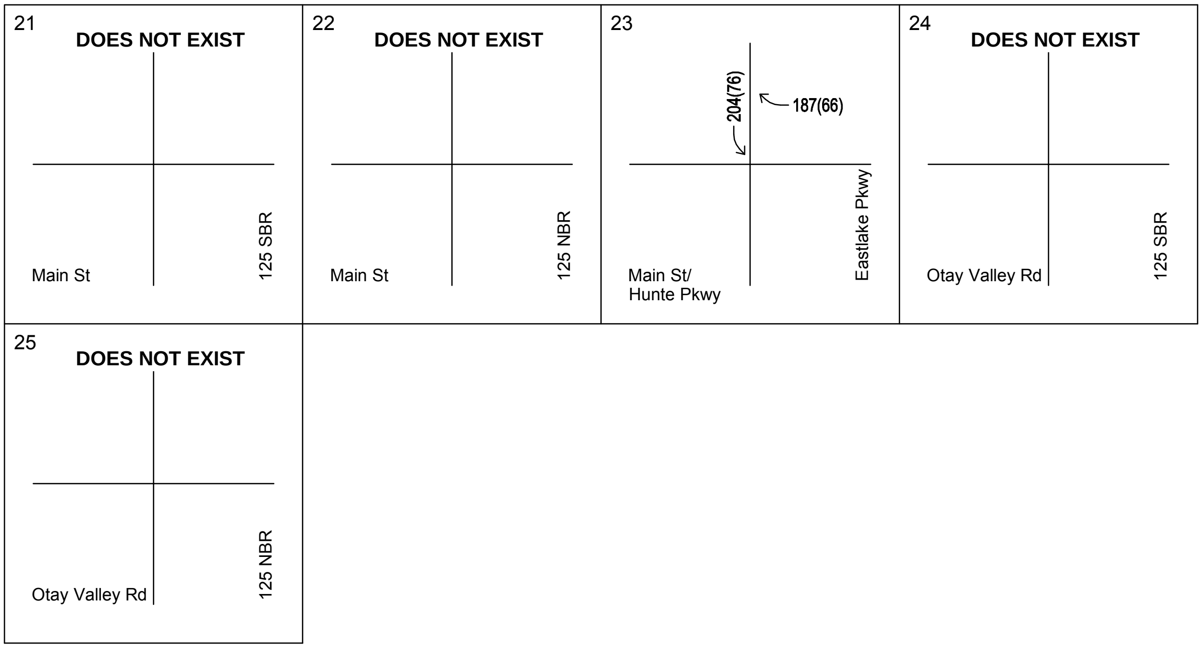
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

EXISTING PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 6

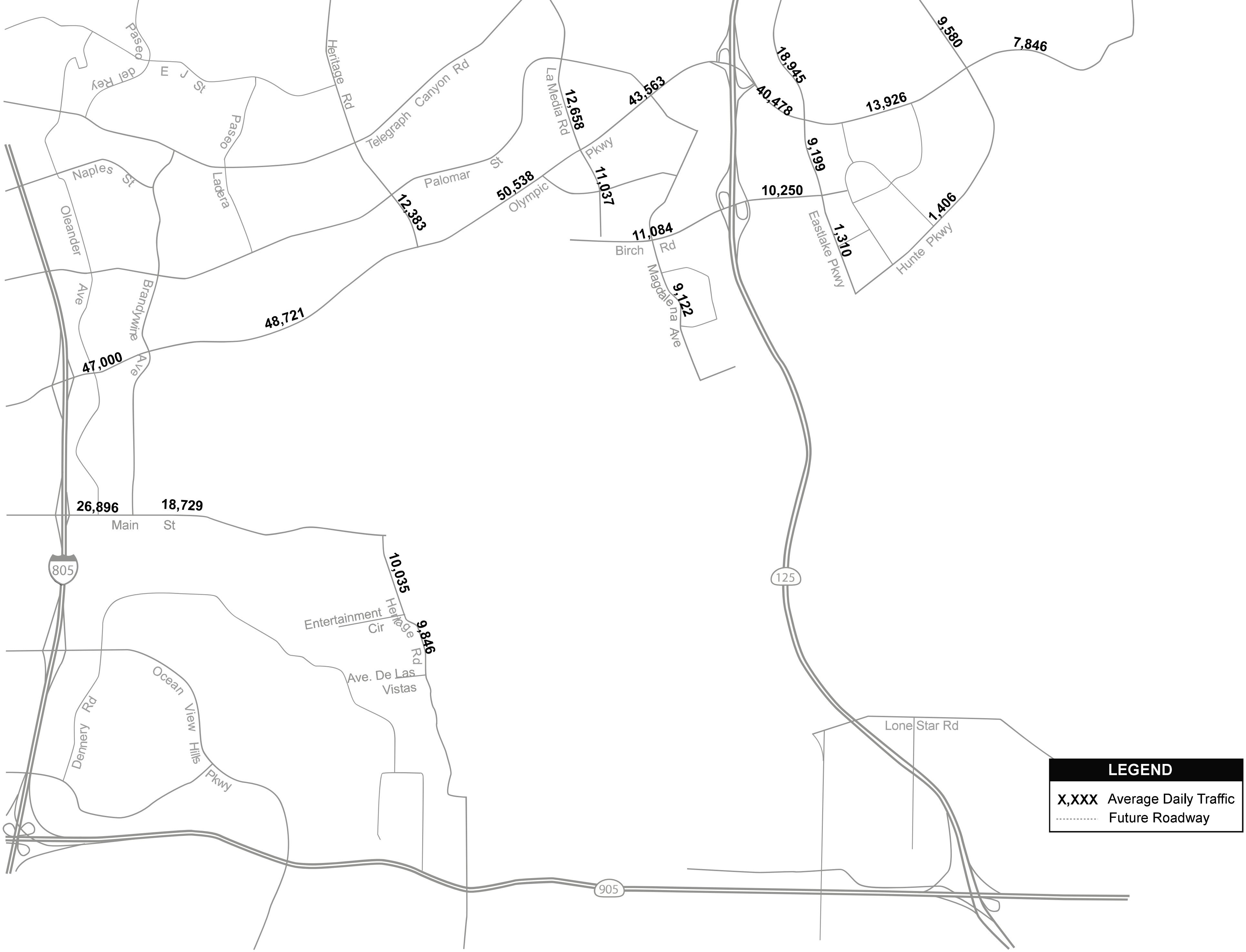


LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

EXISTING PEAK HOUR VOLUMES

EXHIBIT 6



RBF

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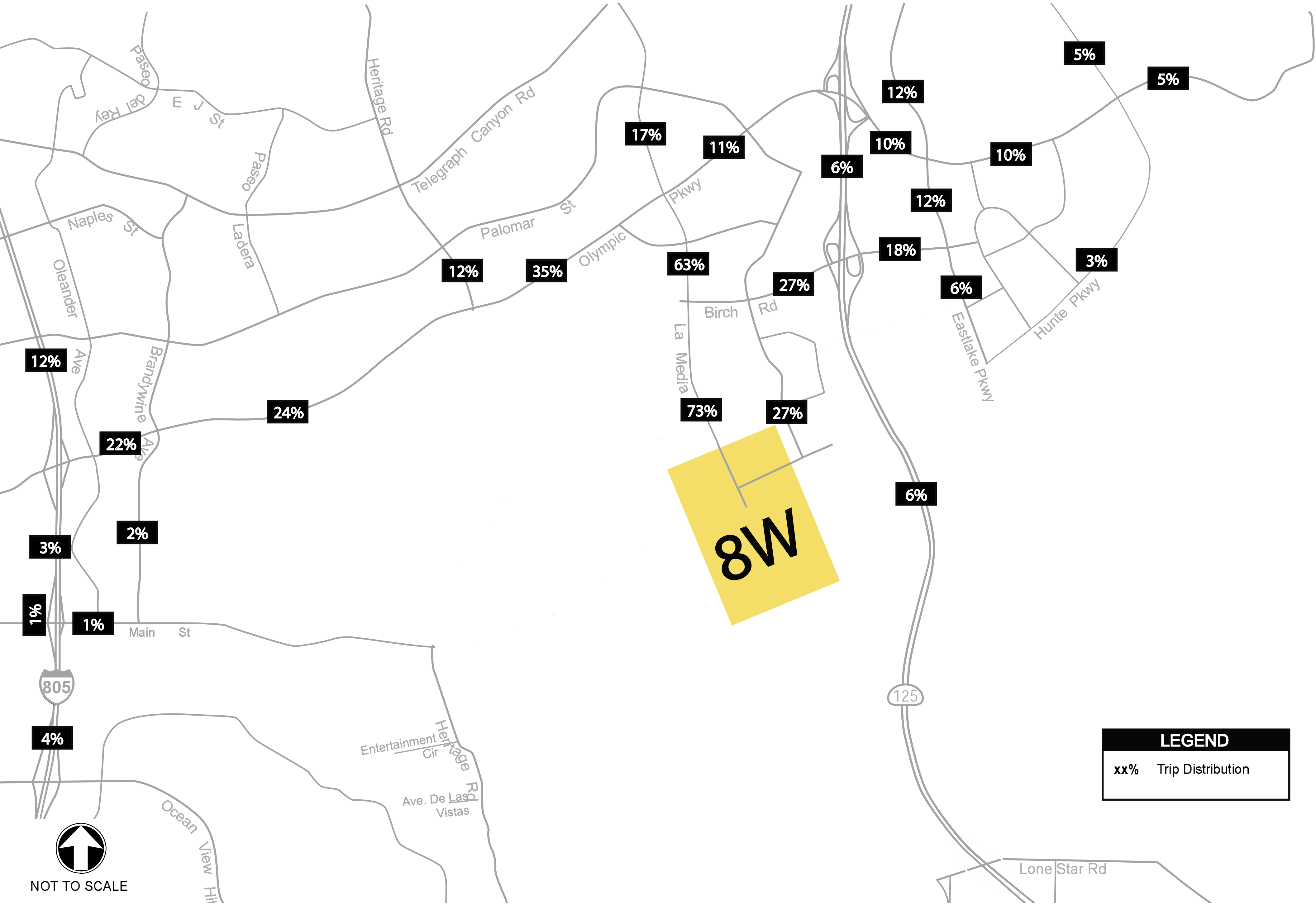
EXISTING CONDITIONS ADT VOLUMES

EXHIBIT 7



RBF

EXISTING PLUS PROJECT CONDITIONS PROJECT TRIP DISTRIBUTION

55-100535.001 AUGUST 2011

EXHIBIT 8

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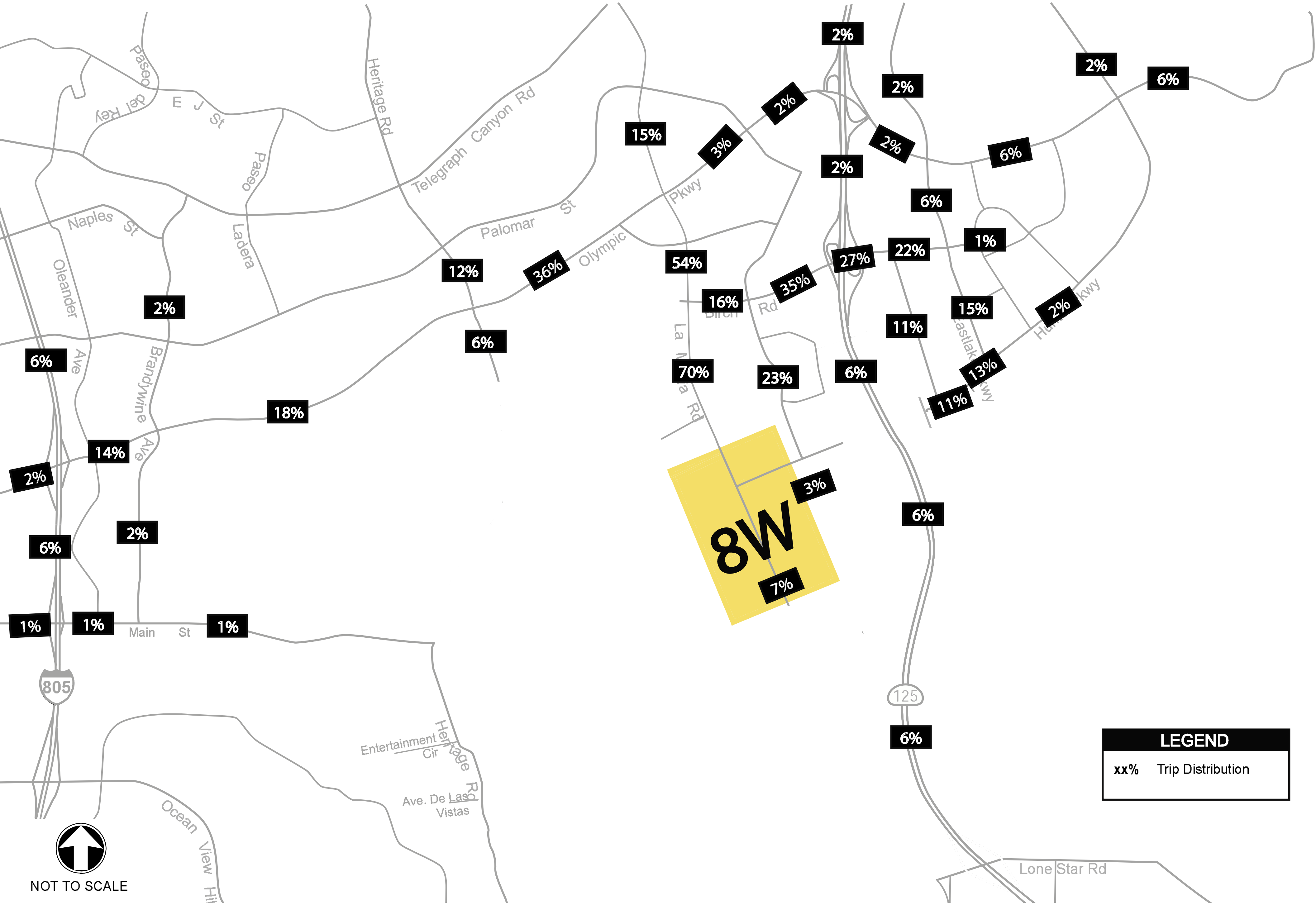
2015 PROJECT TRIP DISTRIBUTION

EXHIBIT 9



RBF

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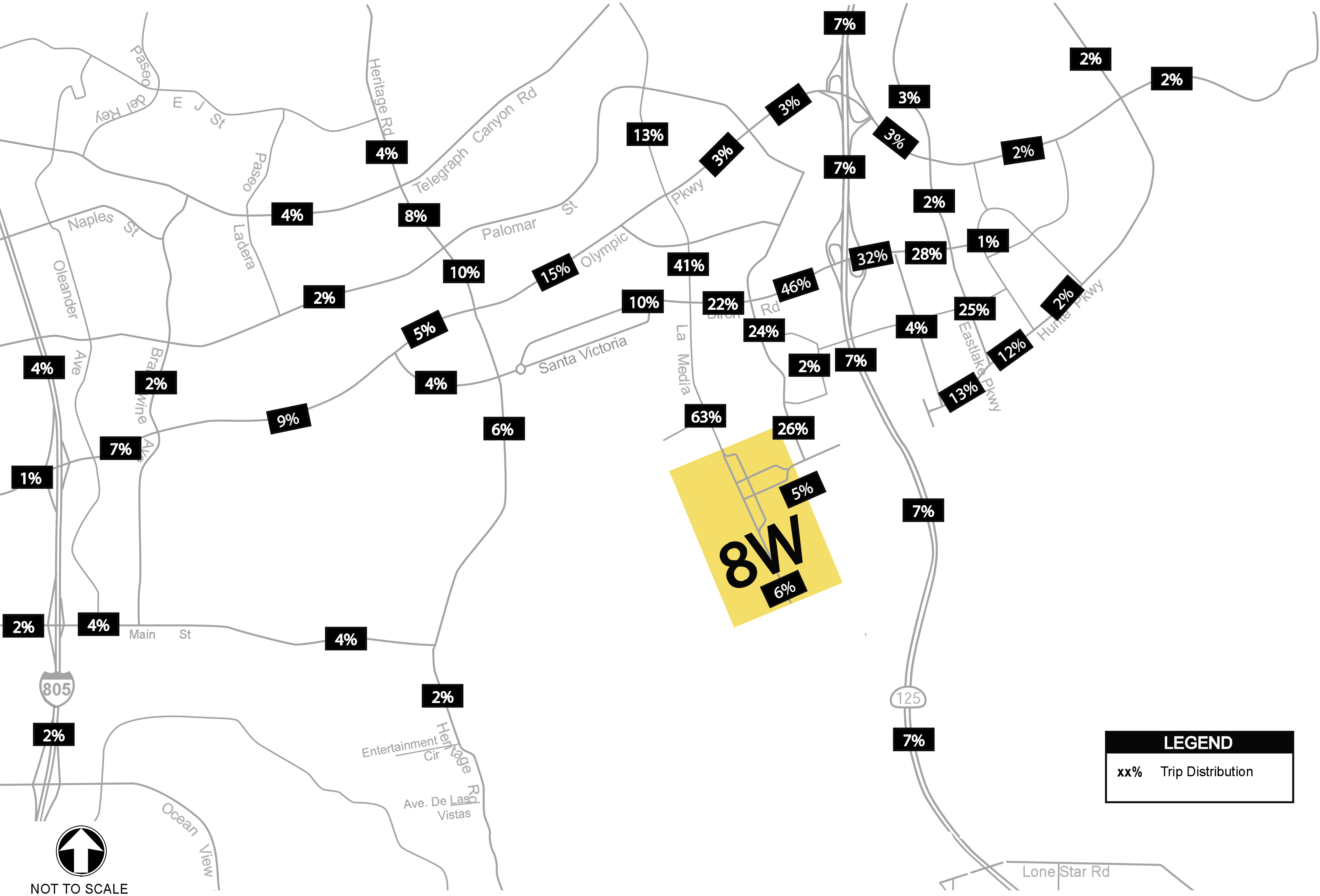
2020 PROJECT TRIP DISTRIBUTION

EXHIBIT 10

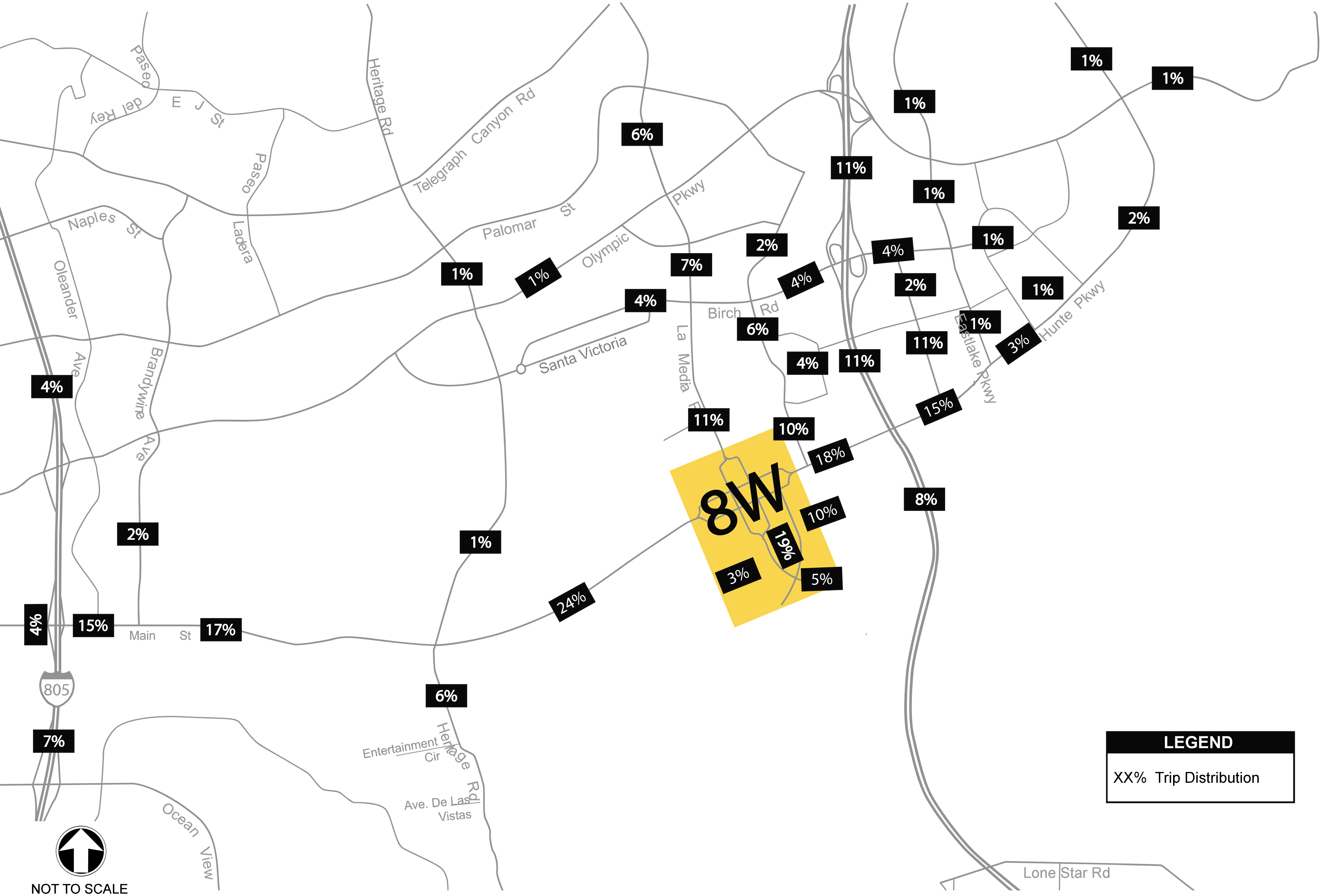


RBF

2025 PROJECT TRIP DISTRIBUTION

55-100535.001 AUGUST 2011

EXHIBIT 11

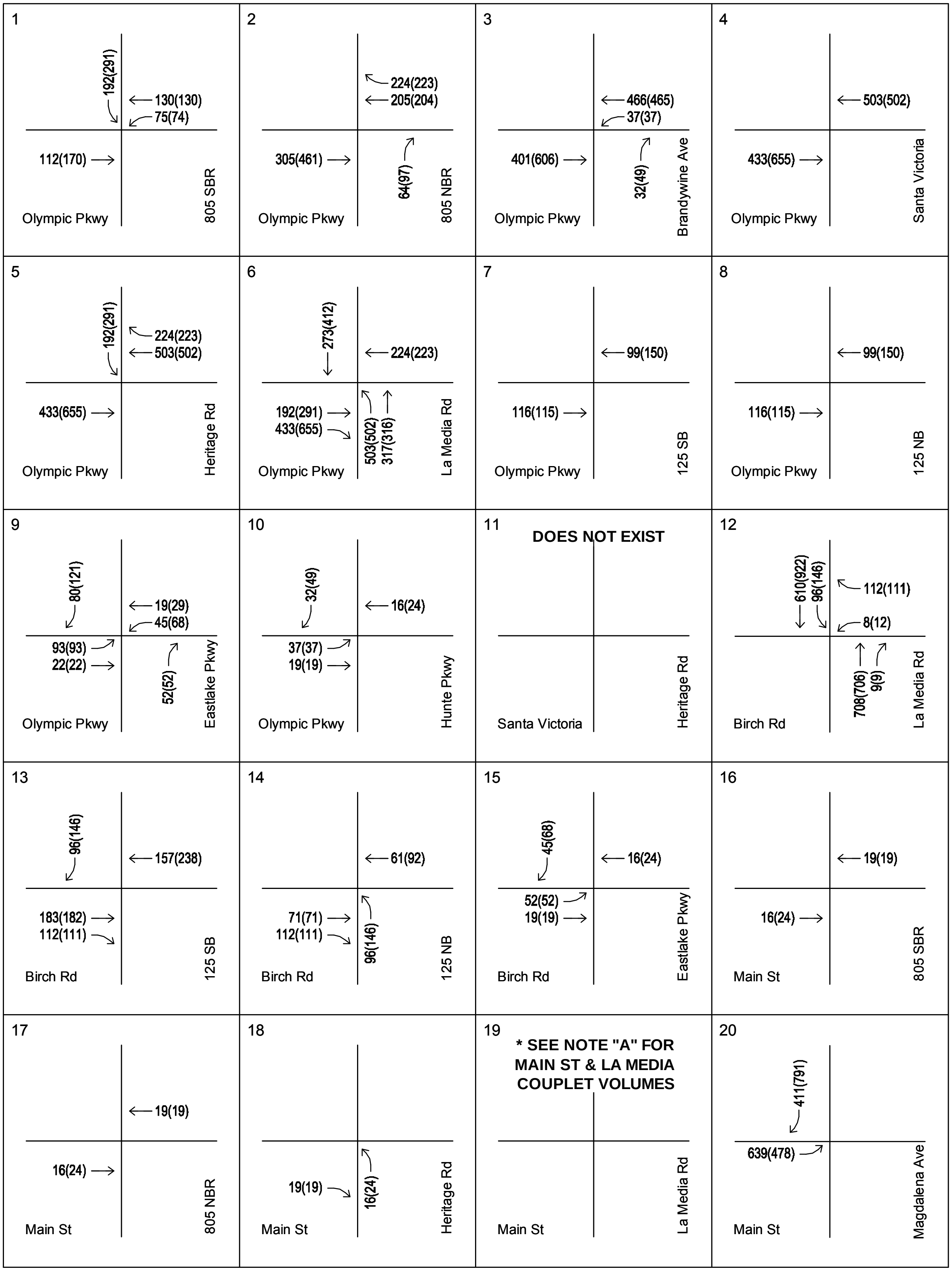


RBF

55-100535.001 MARCH 2013

2030 PROJECT TRIP DISTRIBUTION

EXHIBIT 12



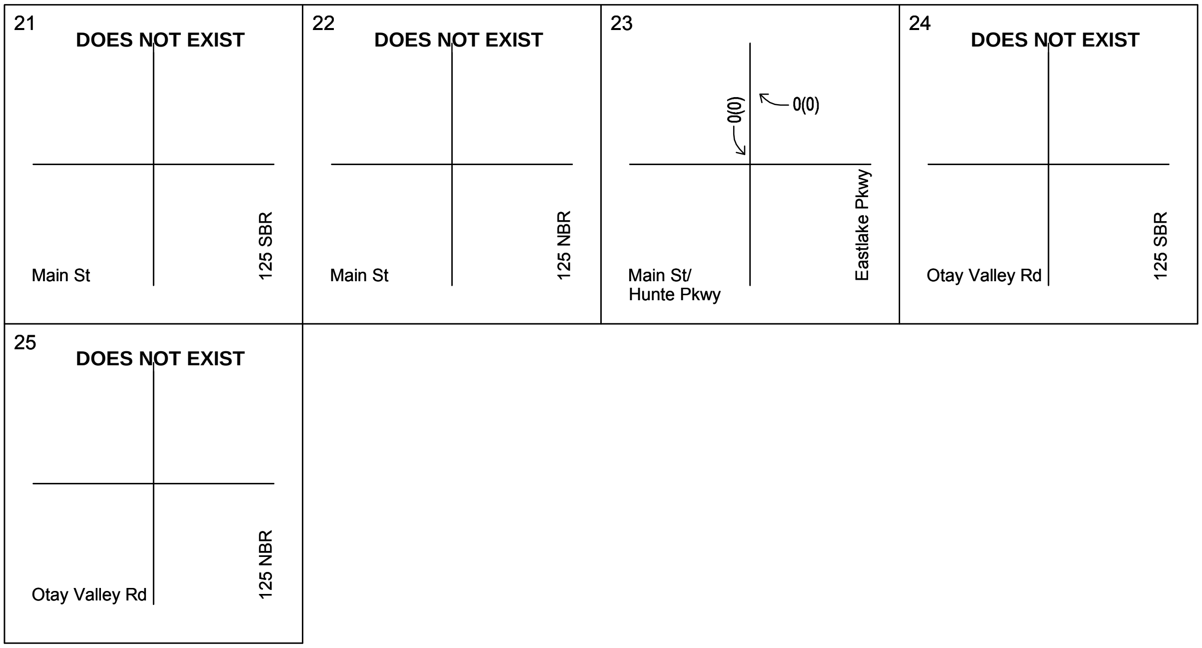
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

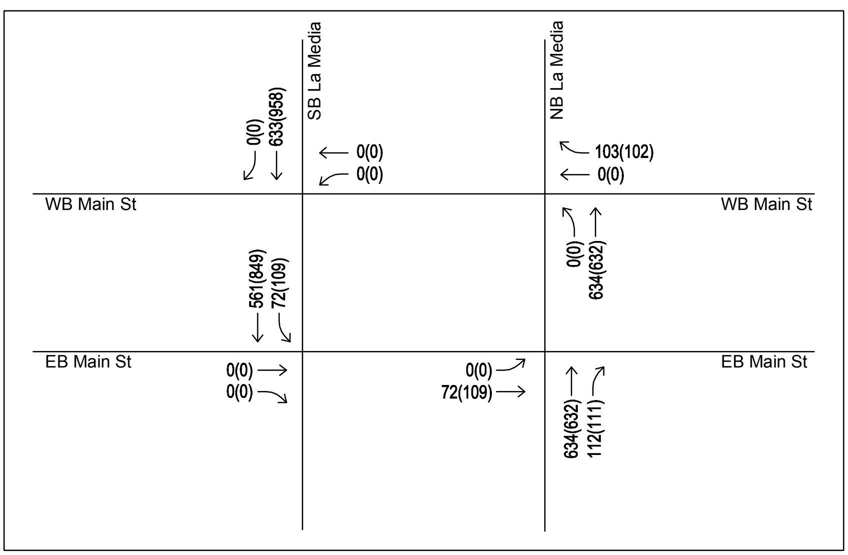
EXISTING PLUS PROJECT BUILD-OUT PEAK HOUR PROJECT TRIPS

55-100535.001 AUGUST 2011

EXHIBIT 13



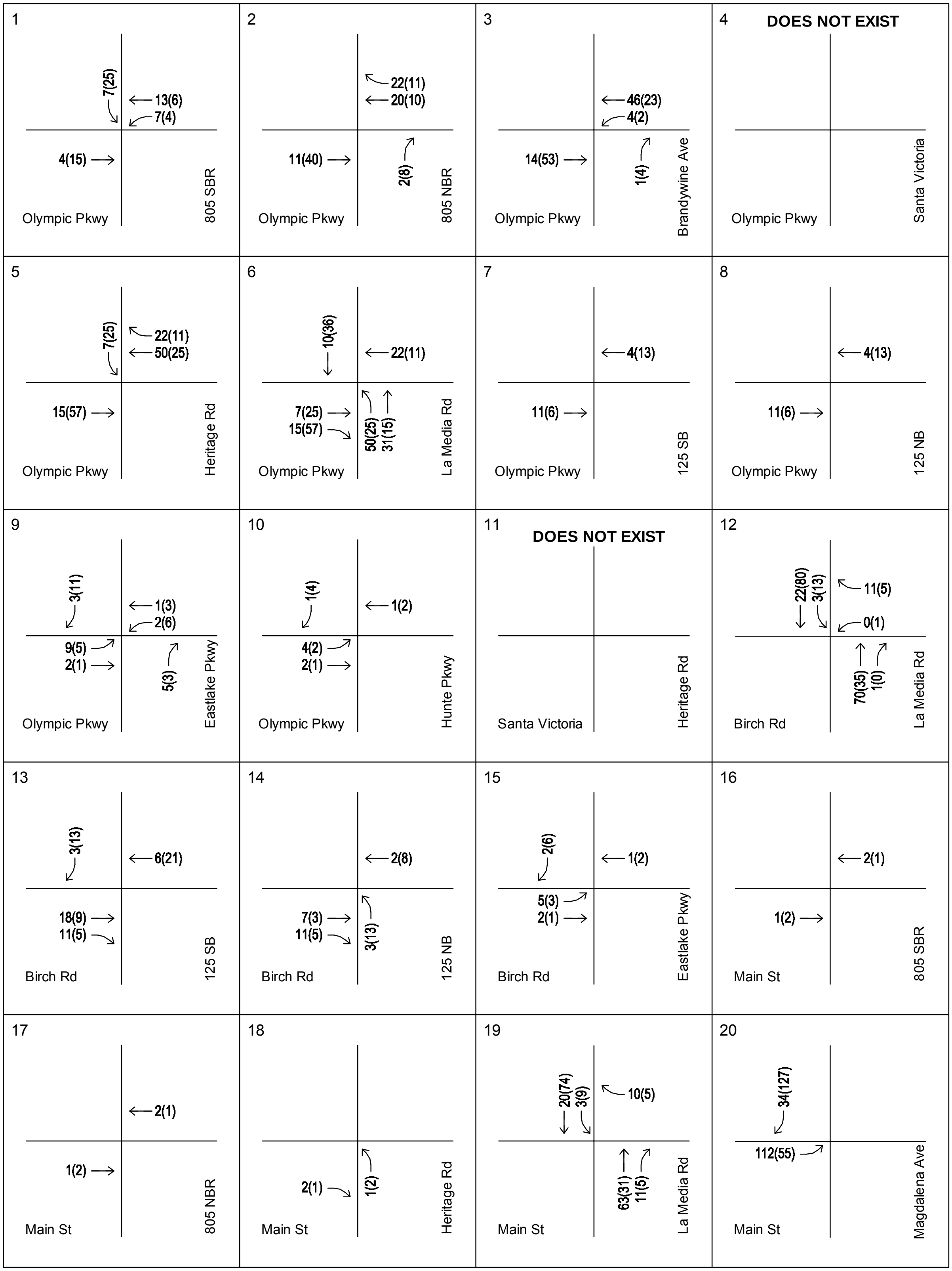
NOTE "A": Main St / La Media Couplet Geometry



LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

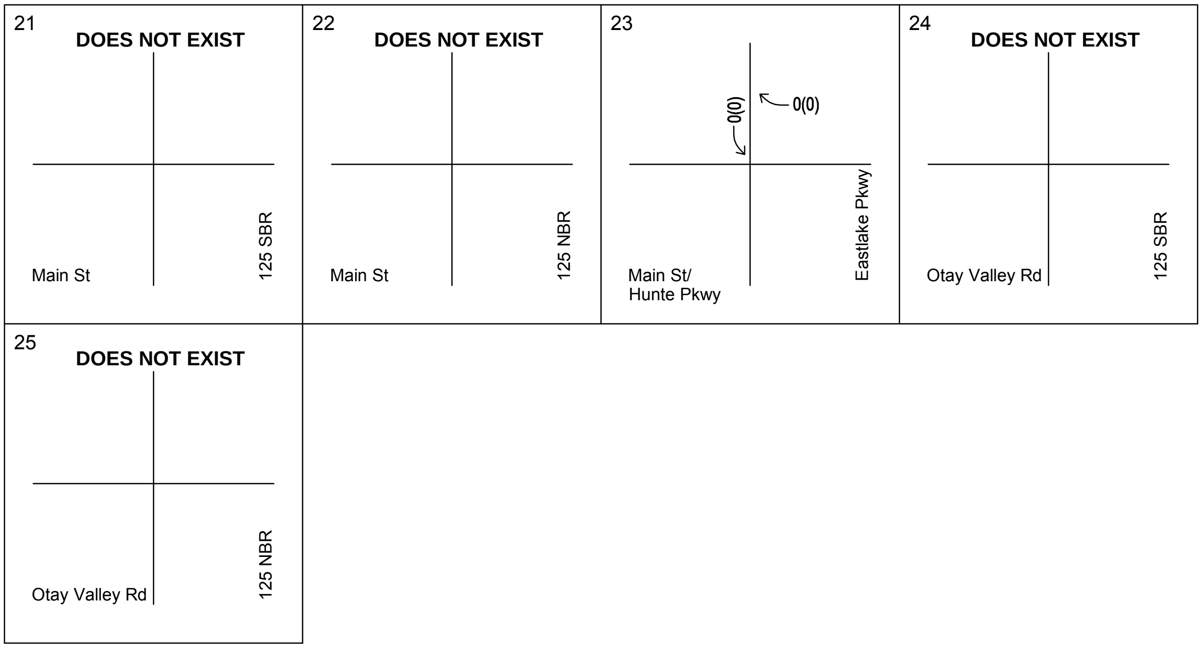
EXISTING PLUS PROJECT BUILD-OUT PEAK HOUR PROJECT TRIPS



LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2015 PROJECT TRIP ASSIGNMENT



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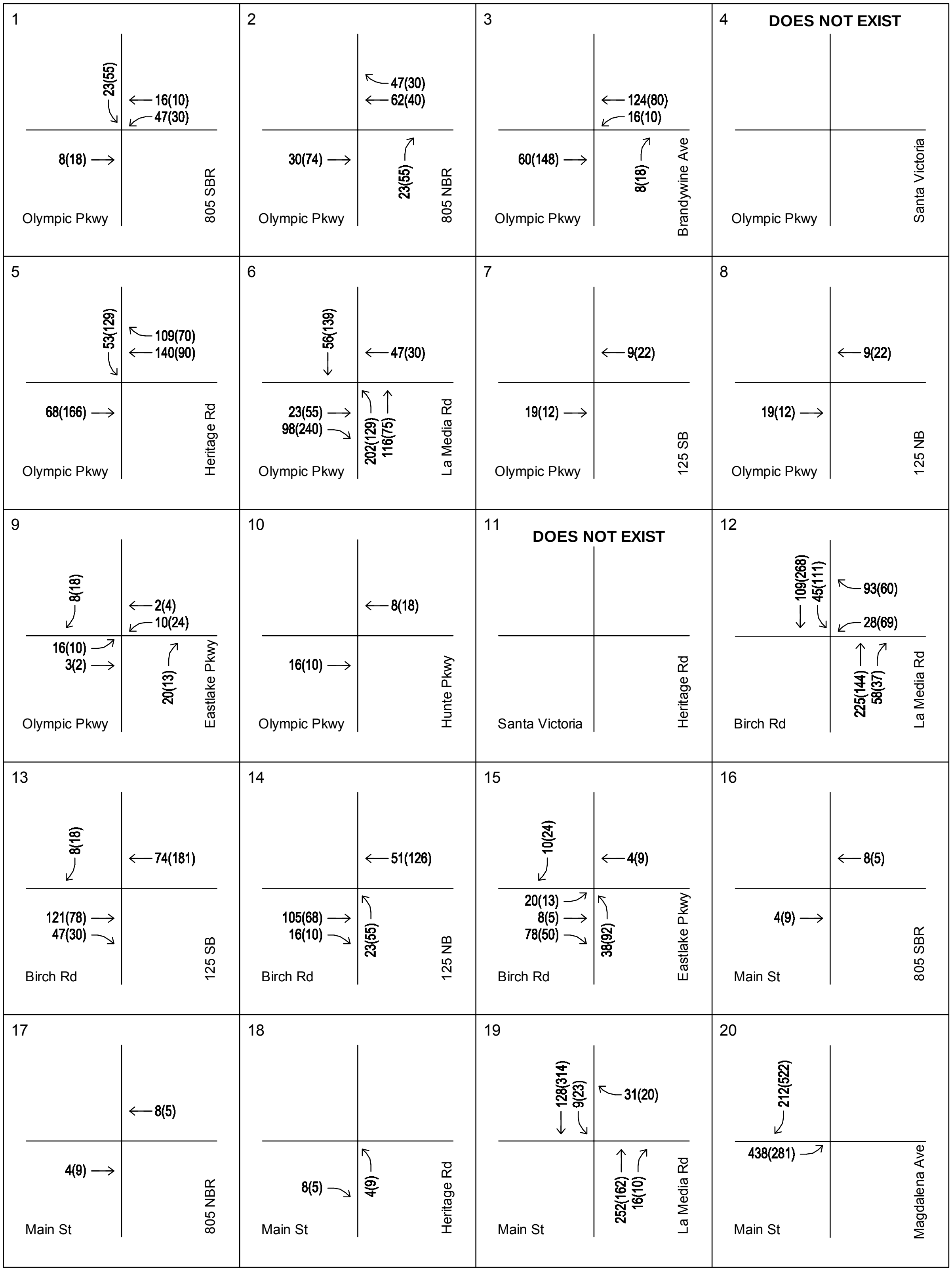
XX(XX) AM/PM PEAK HOUR VOLUME

2015 PROJECT TRIP ASSIGNMENT

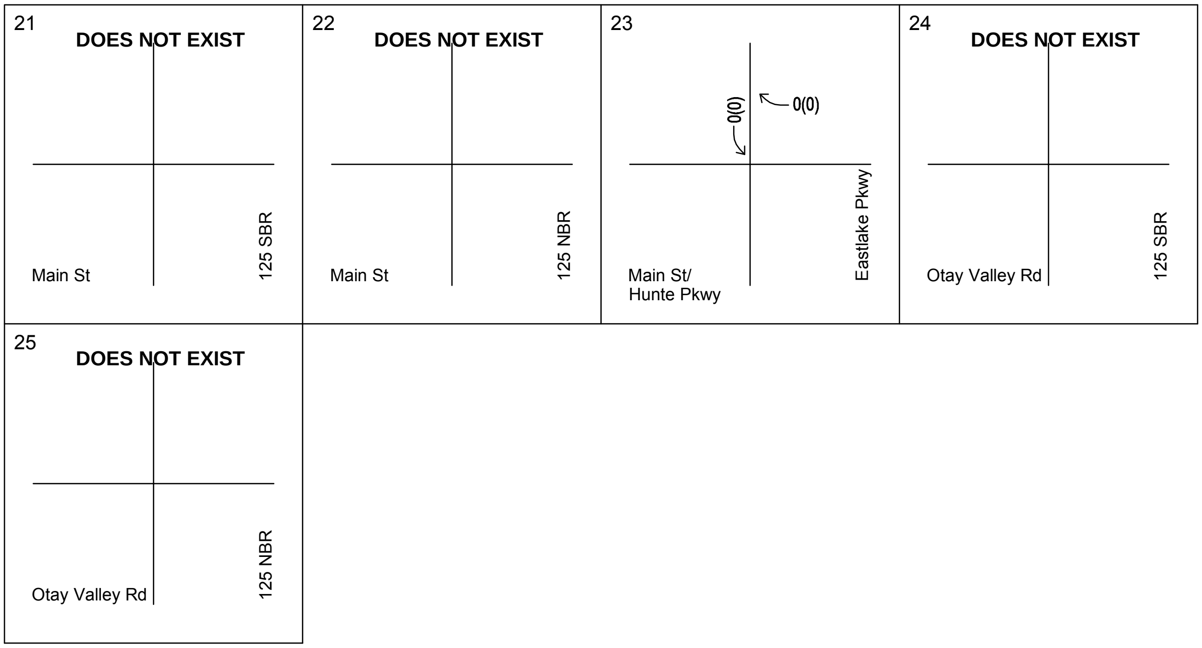


LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2020 PROJECT TRIP ASSIGNMENT

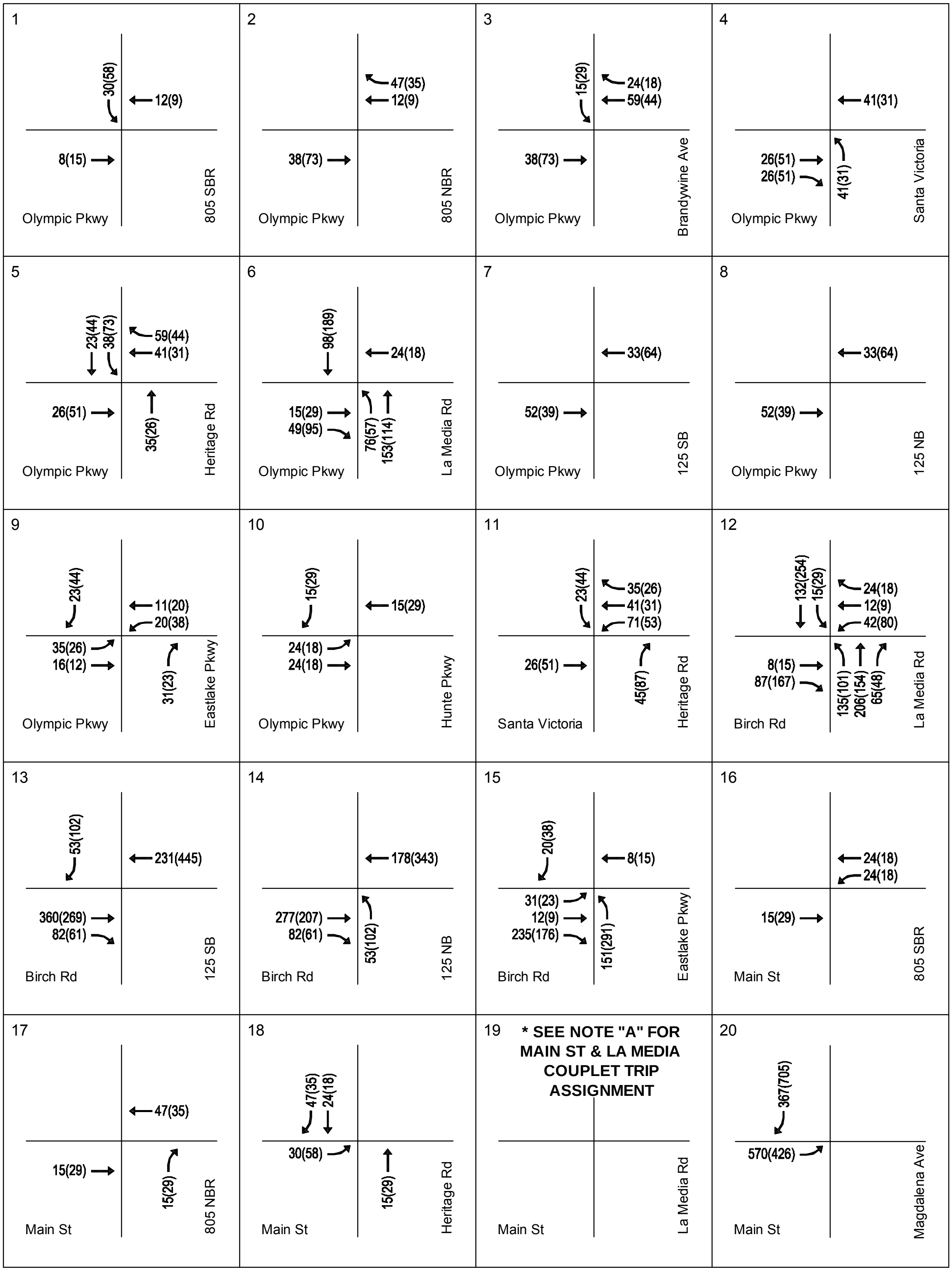
EXHIBIT 15



LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2020 PROJECT TRIP ASSIGNMENT



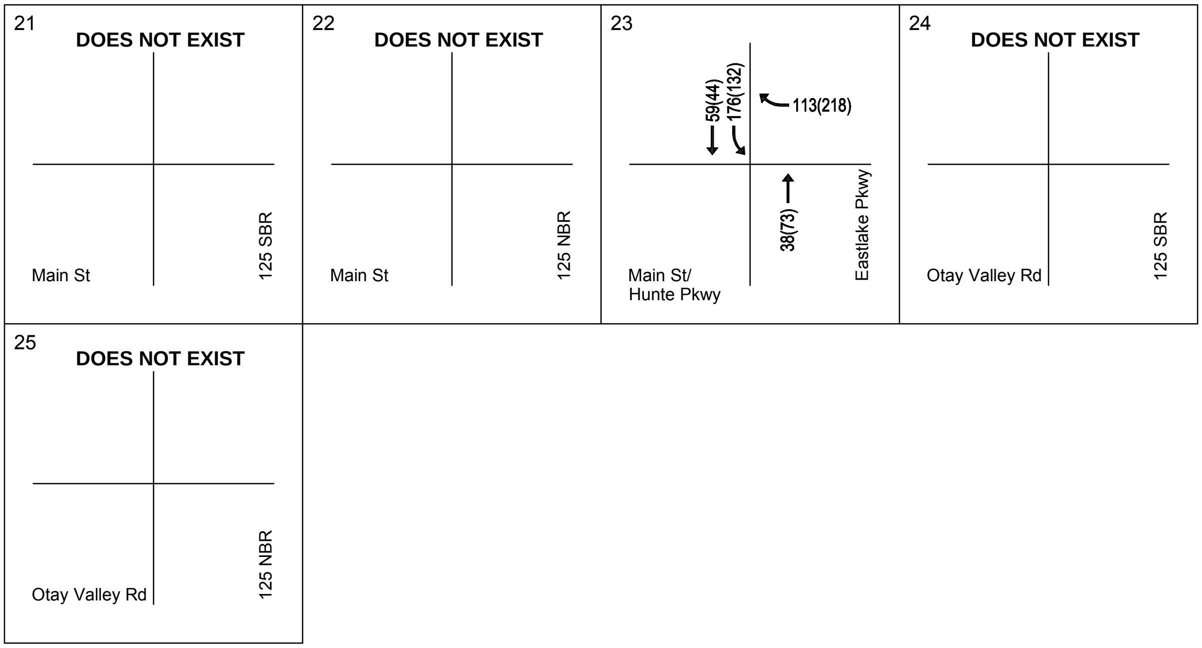
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

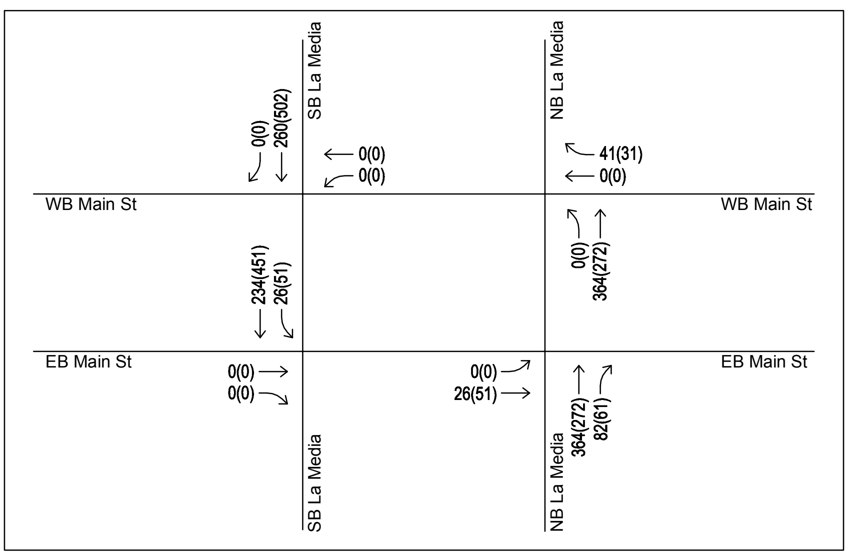
2025 PROJECT TRIP ASSIGNMENT

55-100535.001 AUGUST 2011

EXHIBIT 16



NOTE "A": Main St / La Media Couplet Geometry



LEGEND

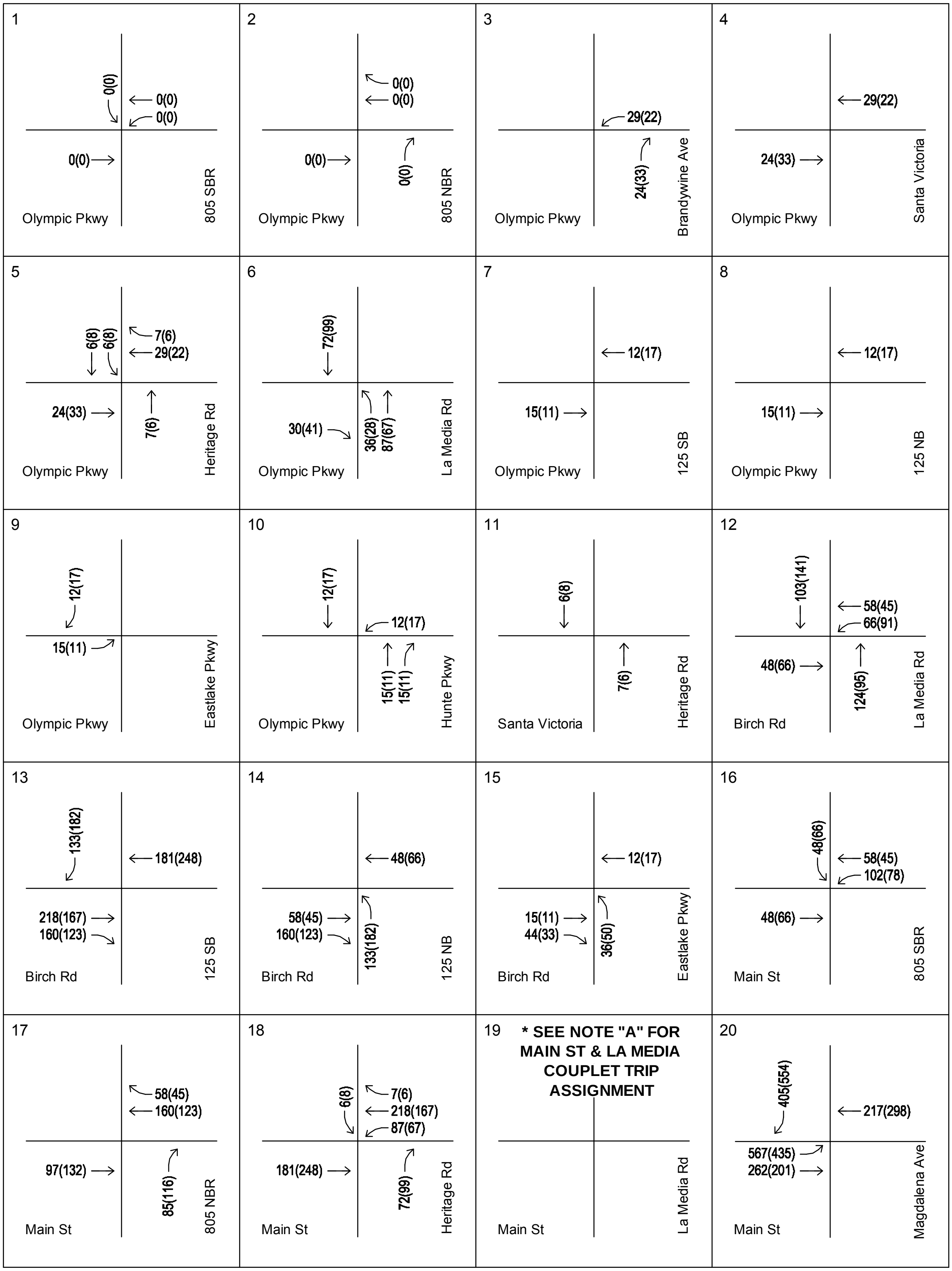
XX(XX) AM/PM PEAK HOUR VOLUME

RBF

2025 PROJECT TRIP ASSIGNMENT

55-100535.001 MARCH 2013

EXHIBIT 16



LEGEND

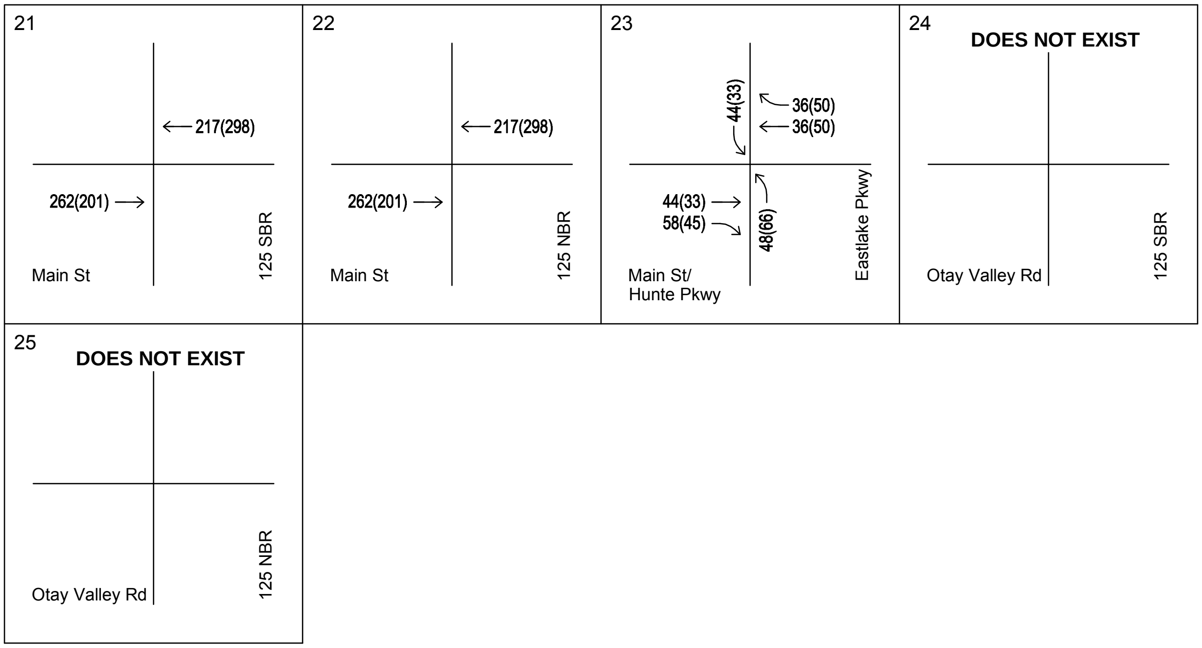
XX(XX) AM/PM PEAK HOUR VOLUME

RBF

2030 PROJECT TRIP ASSIGNMENT

55-100535.001 AUGUST 2011

EXHIBIT 17



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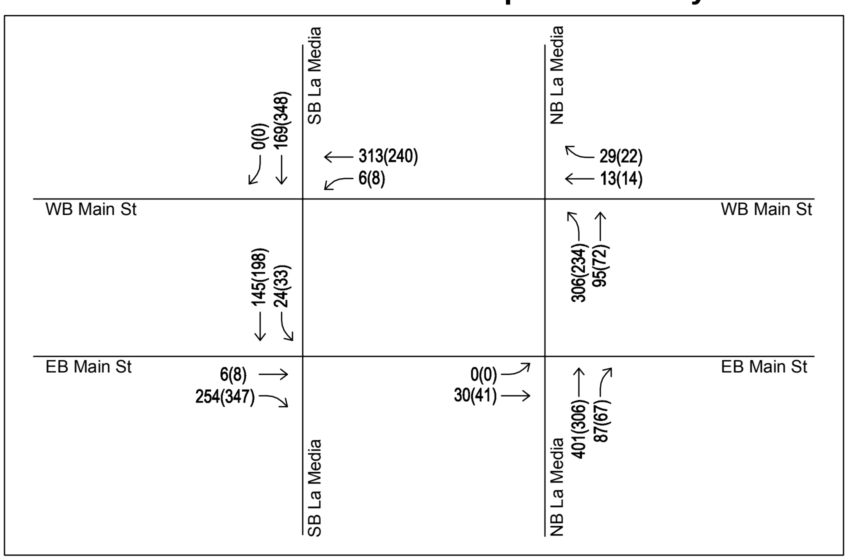


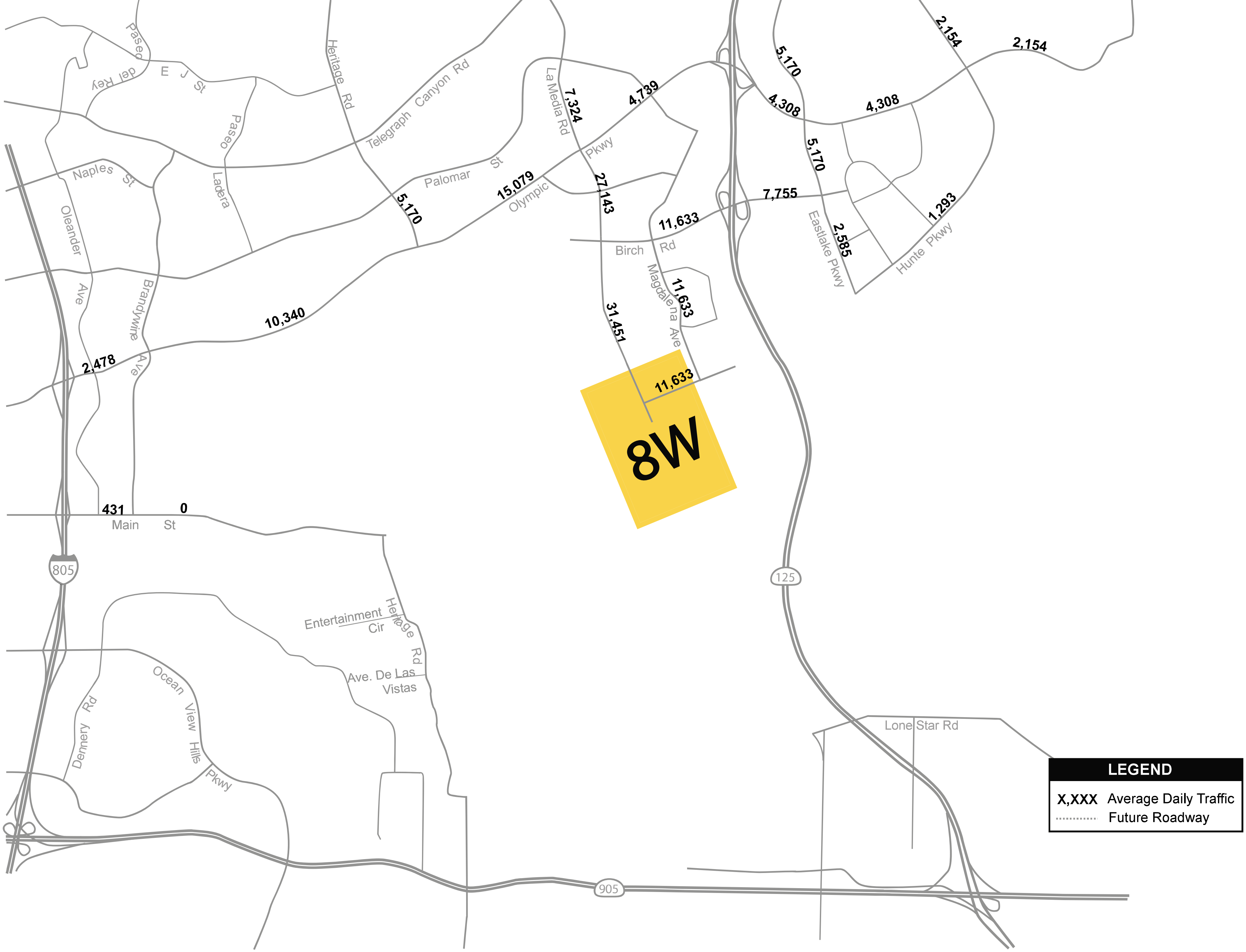
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2030 PROJECT TRIP ASSIGNMENT

55-100535.001 MARCH 2013

EXHIBIT 17

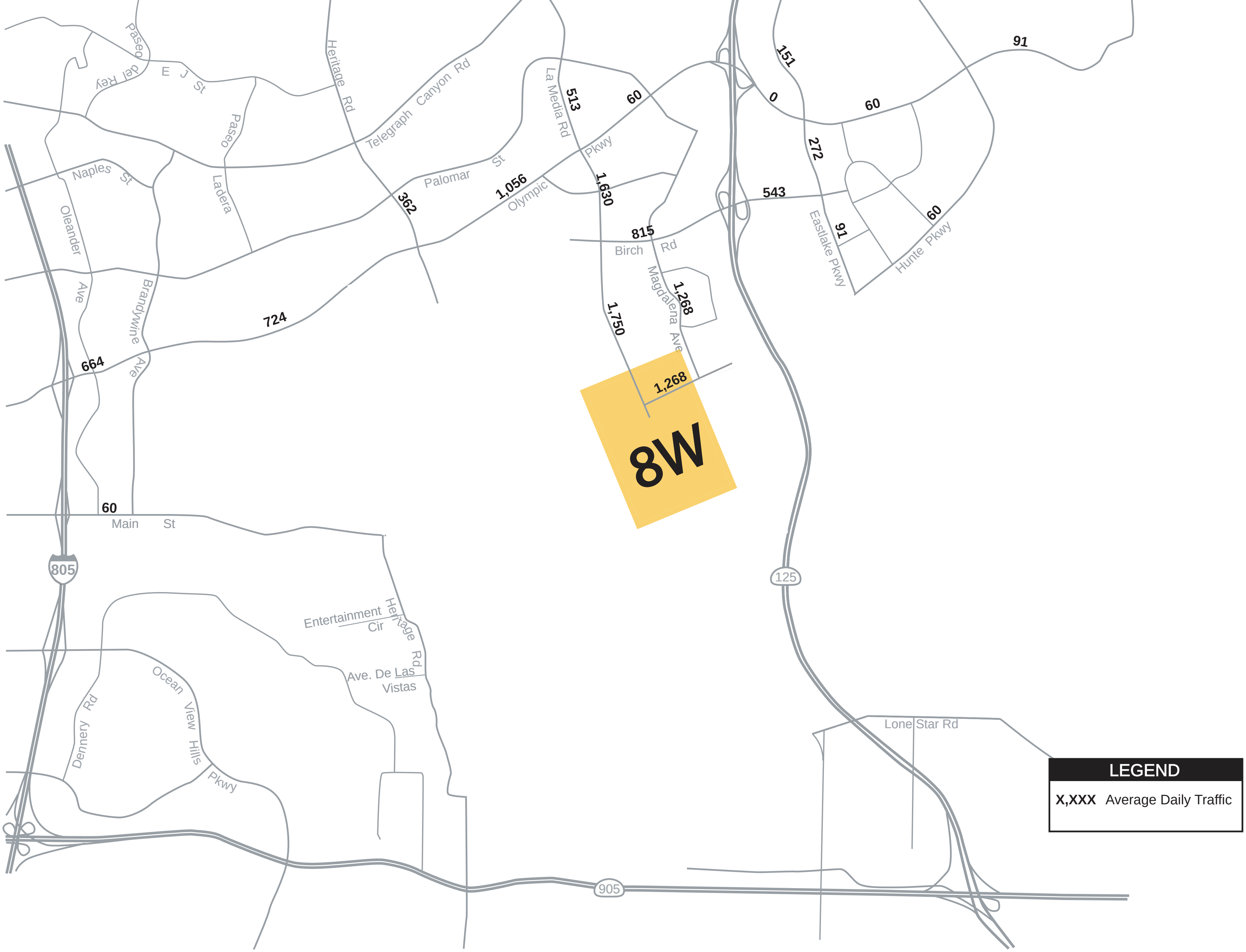


RBF

EXISTING PLUS PROJECT CONDITIONS DAILY PROJECT TRIPS

55-100535.001 MARCH 2013

EXHIBIT 18

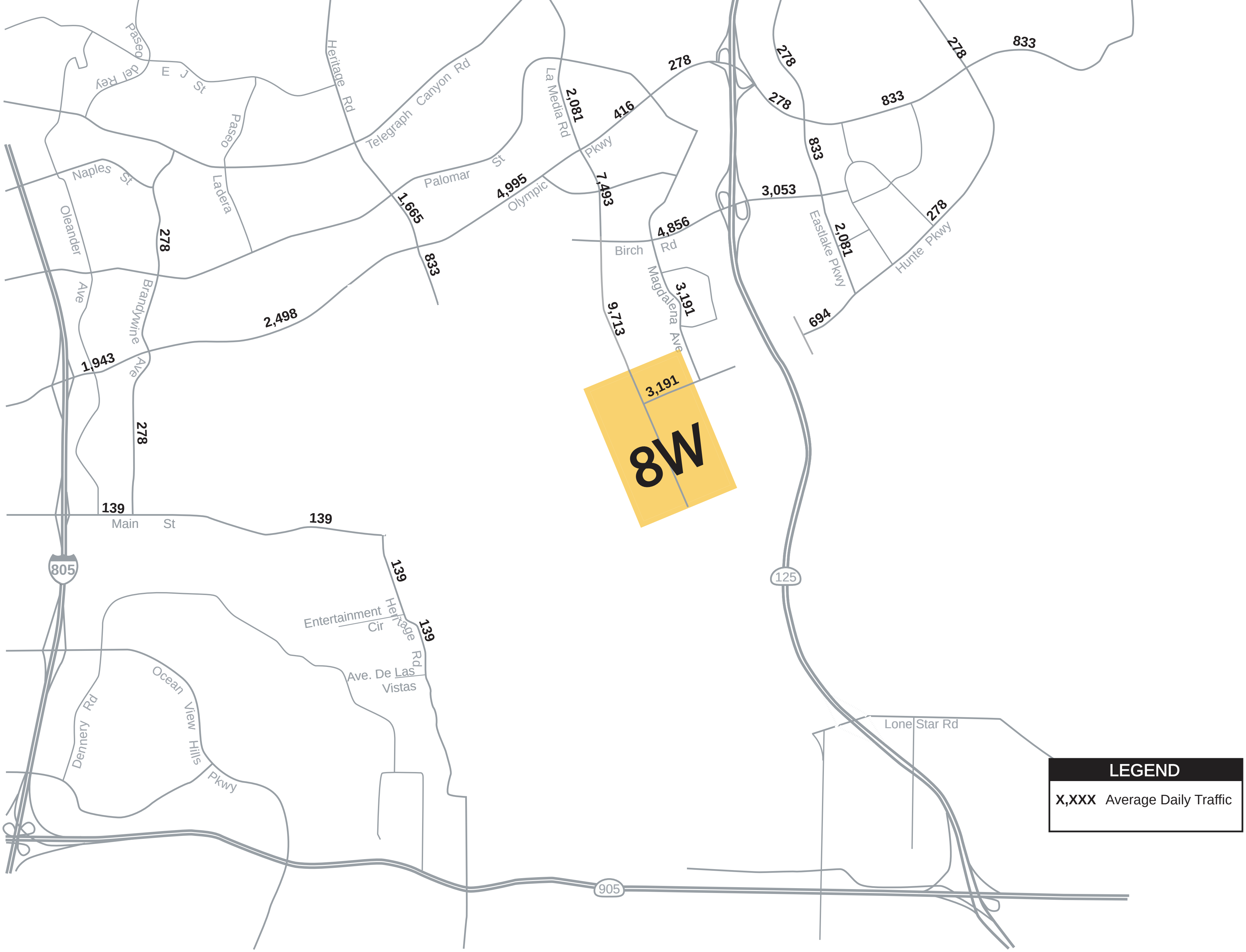


RBF

2015 CONDITIONS DAILY PROJECT TRIPS

55-100535.001 JANUARY 2012

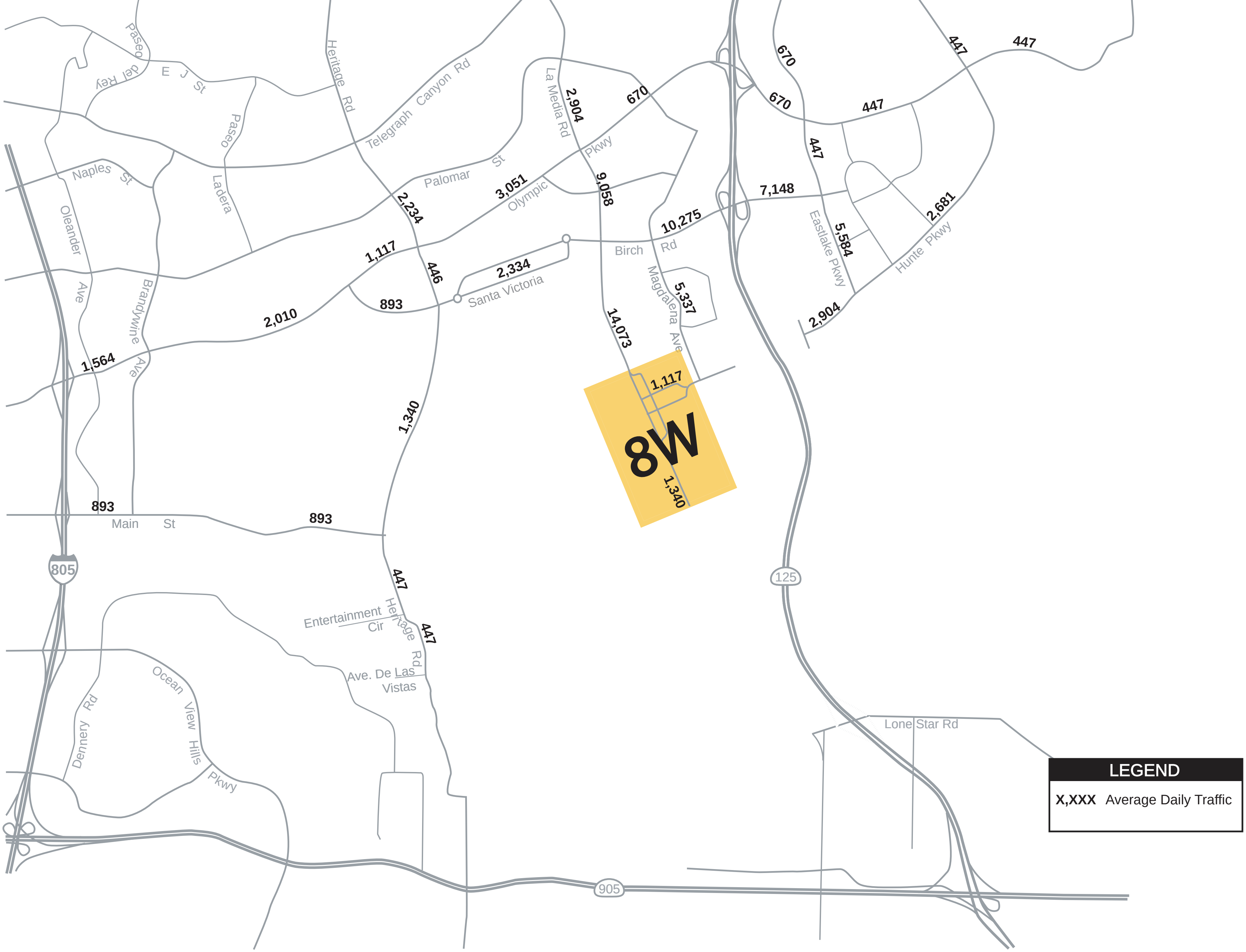
EXHIBIT 19



2020 CONDITIONS DAILY PROJECT TRIPS

EXHIBIT 20

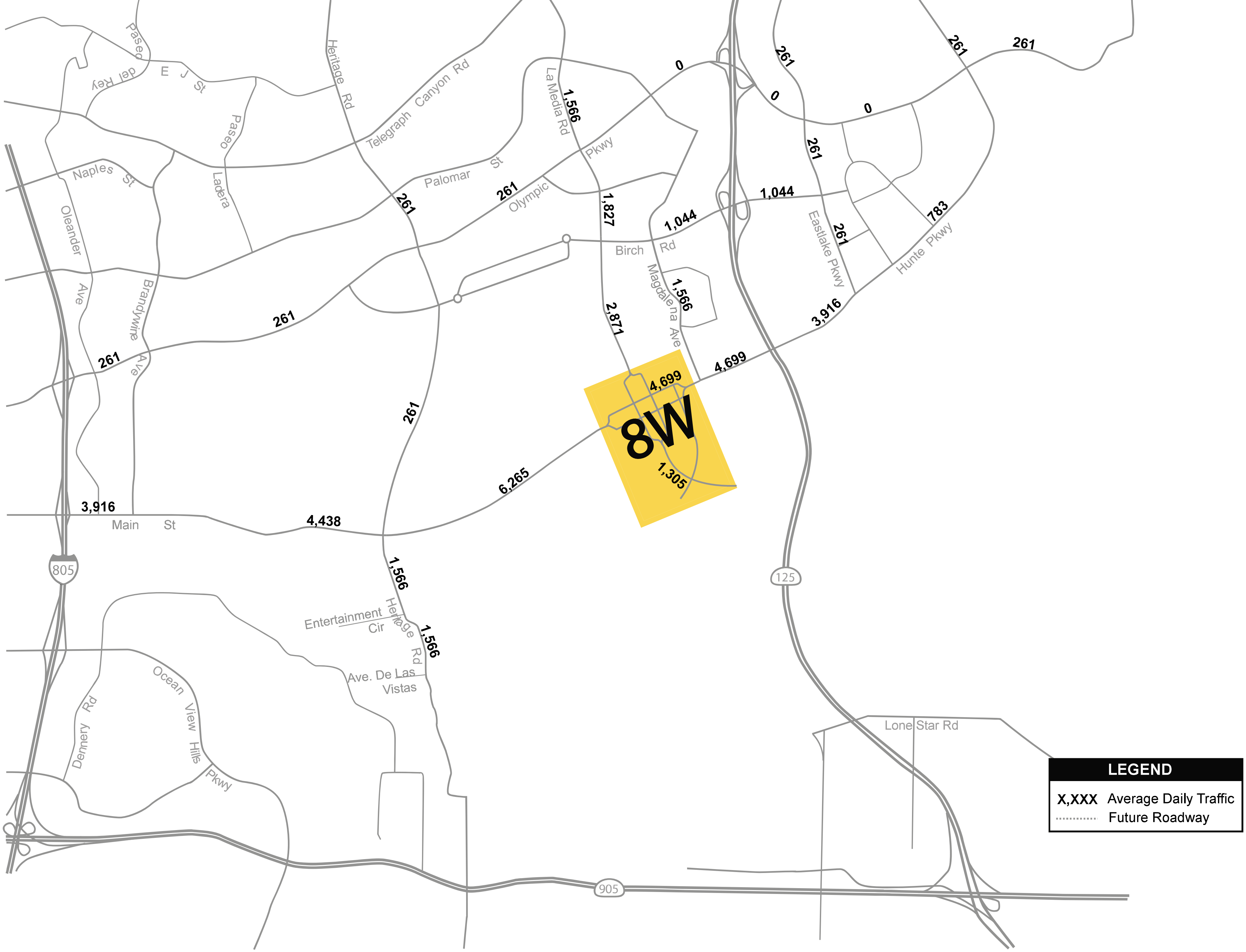
55-100535.001 JANUARY 2012



2025 DAILY PROJECT TRIPS

EXHIBIT 21

55-100535.001 JANUARY 2012

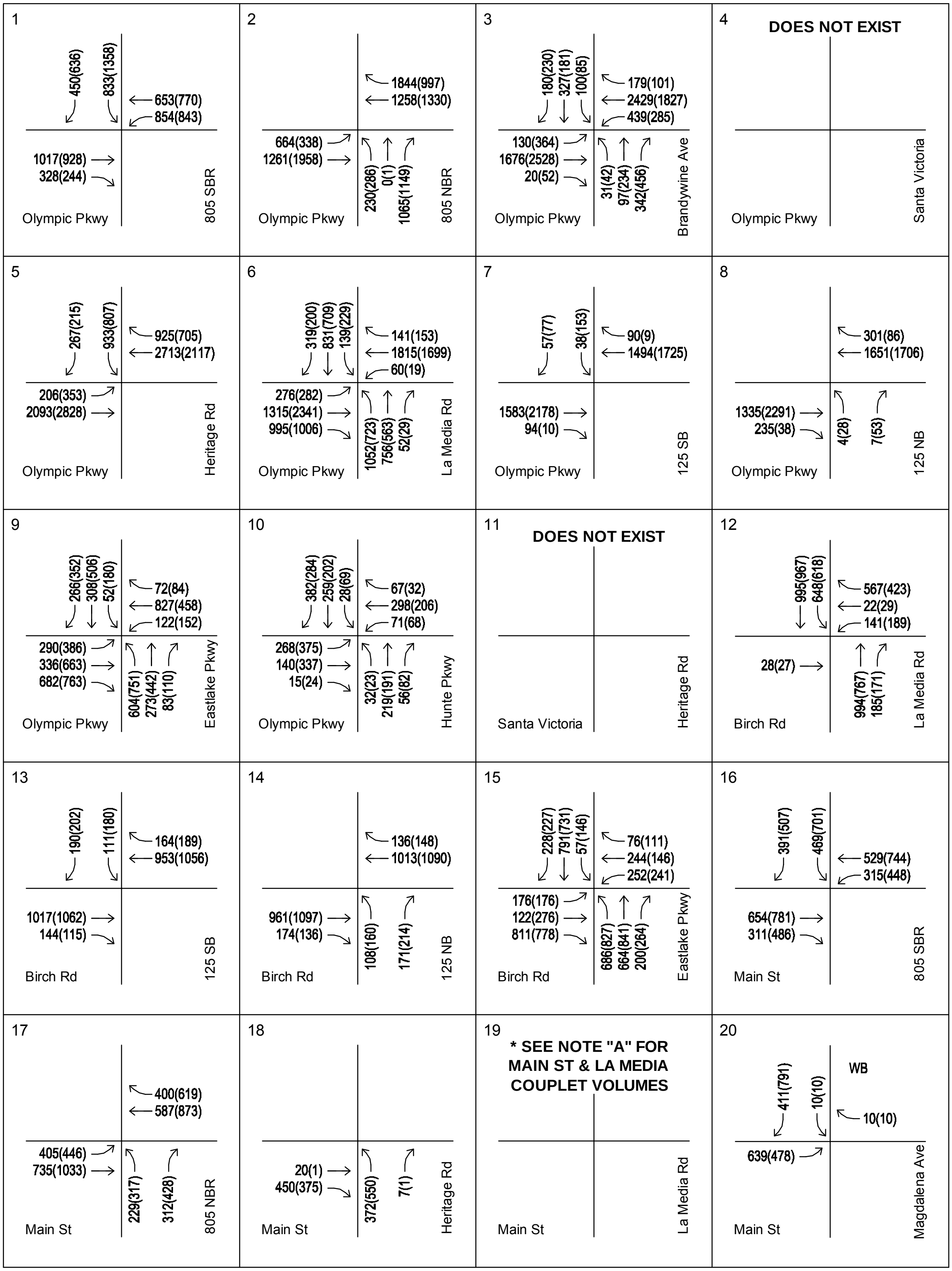


RBF

2030 CONDITIONS DAILY PROJECT TRIPS

55-100535.001 MARCH 2013

EXHIBIT 22



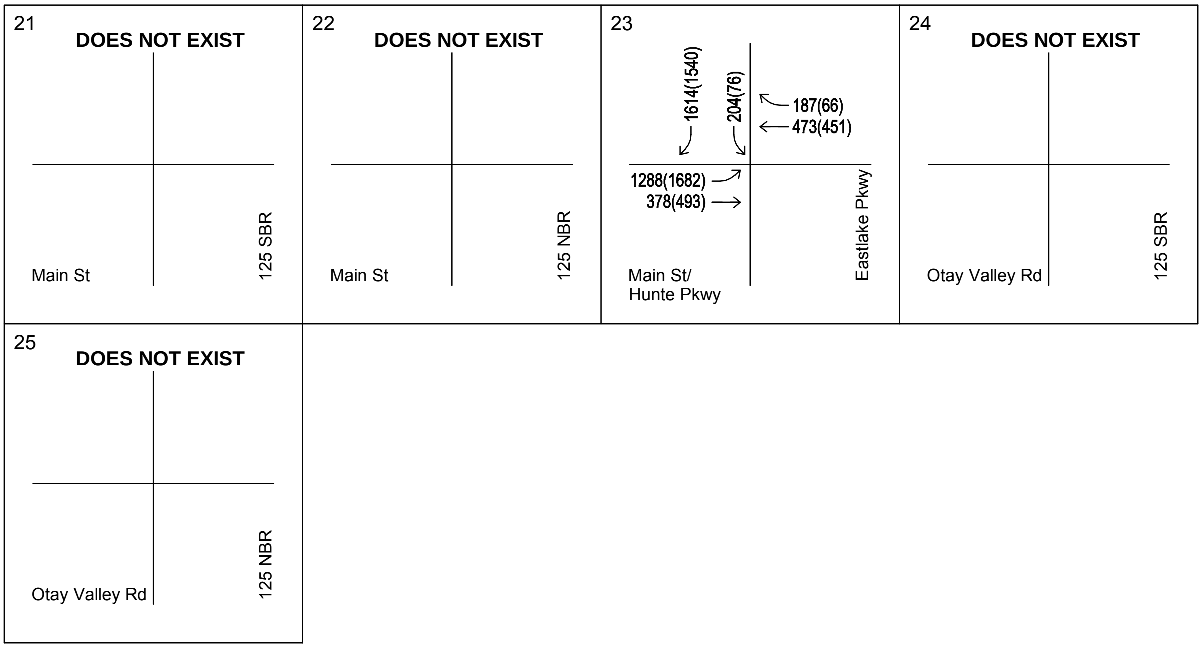
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

EXISTING PLUS PROJECT BUILD-OUT PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 23



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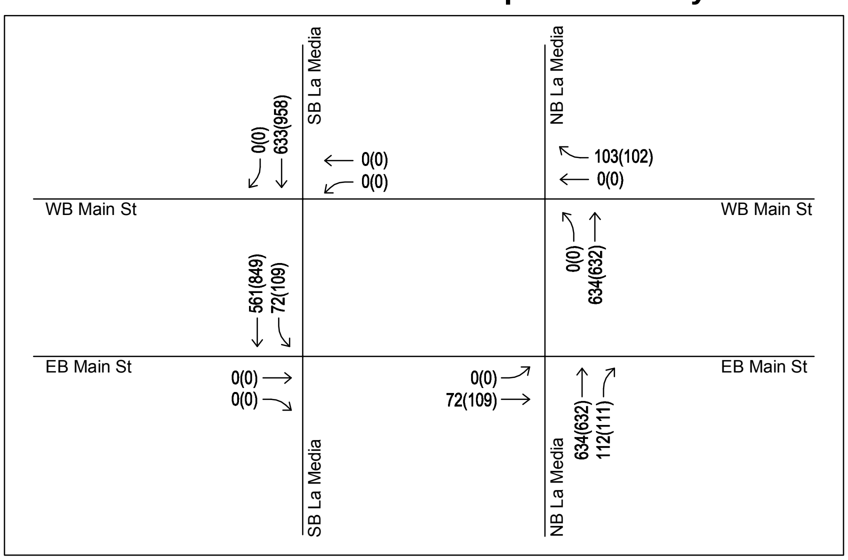


LEGEND

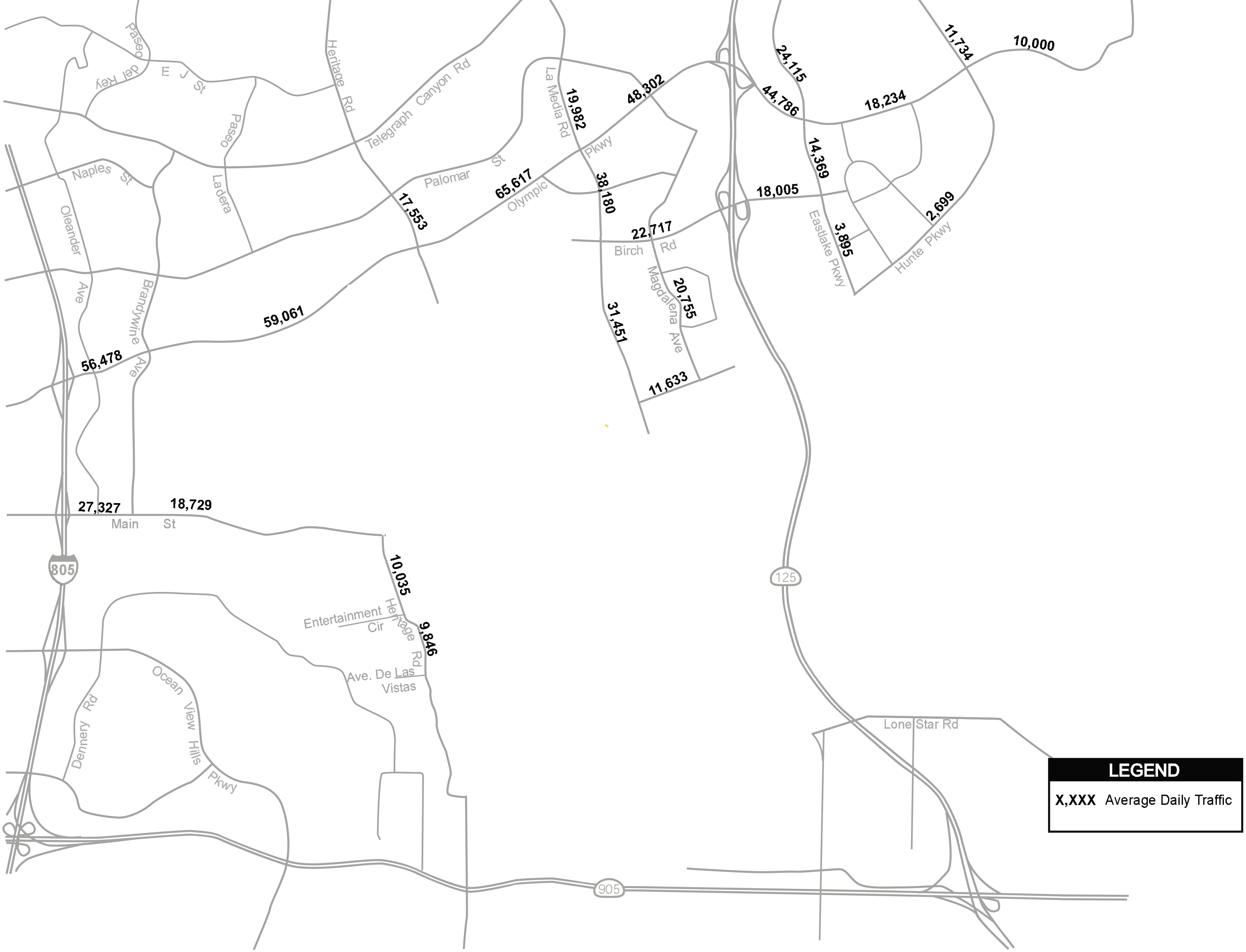
XX(XX) AM/PM PEAK HOUR VOLUME

RBF

EXISTING PLUS PROJECT BUILD-OUT PEAK HOUR VOLUMES

55-100535.001 MARCH 2013

EXHIBIT 23

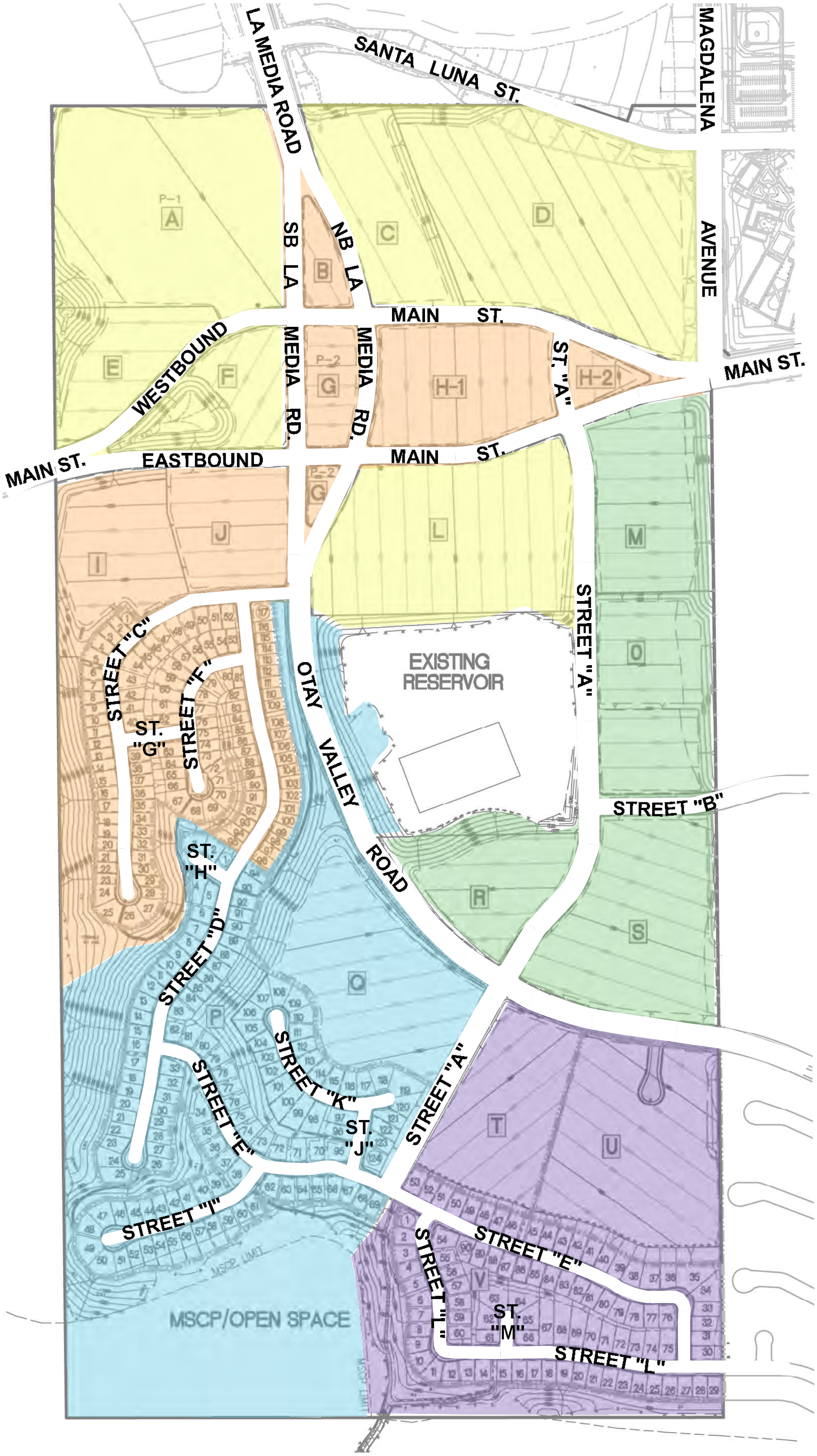


RBF

EXISTING PLUS PROJECT BUILD-OUT CONDITIONS AVERAGE DAILY TRAFFIC

55-100535.001 JANUARY 2012

EXHIBIT 24

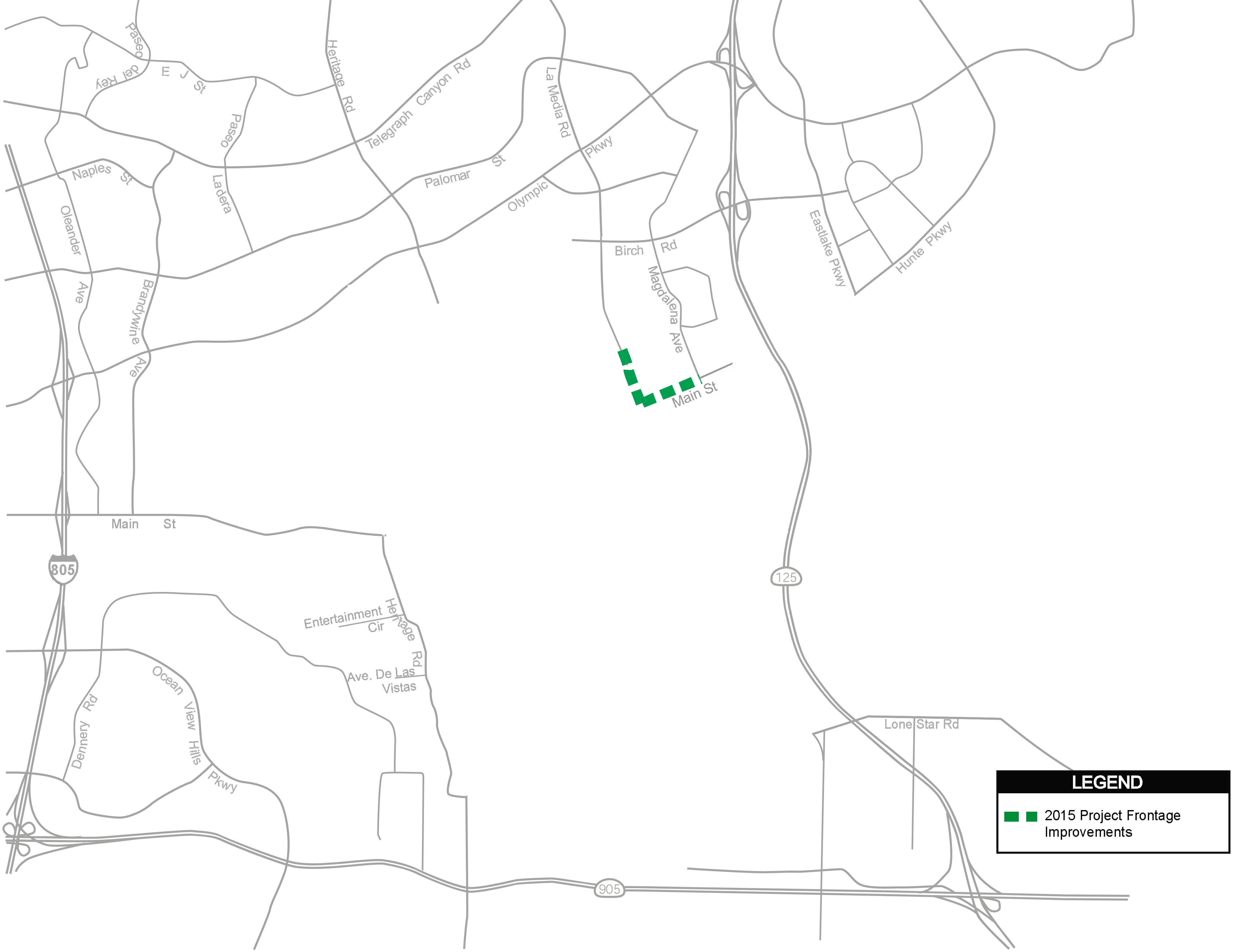


NOT TO SCALE

VILLAGE 8 WEST PHASING PLAN

55-100535.001 SEPTEMBER 2011

EXHIBIT 25

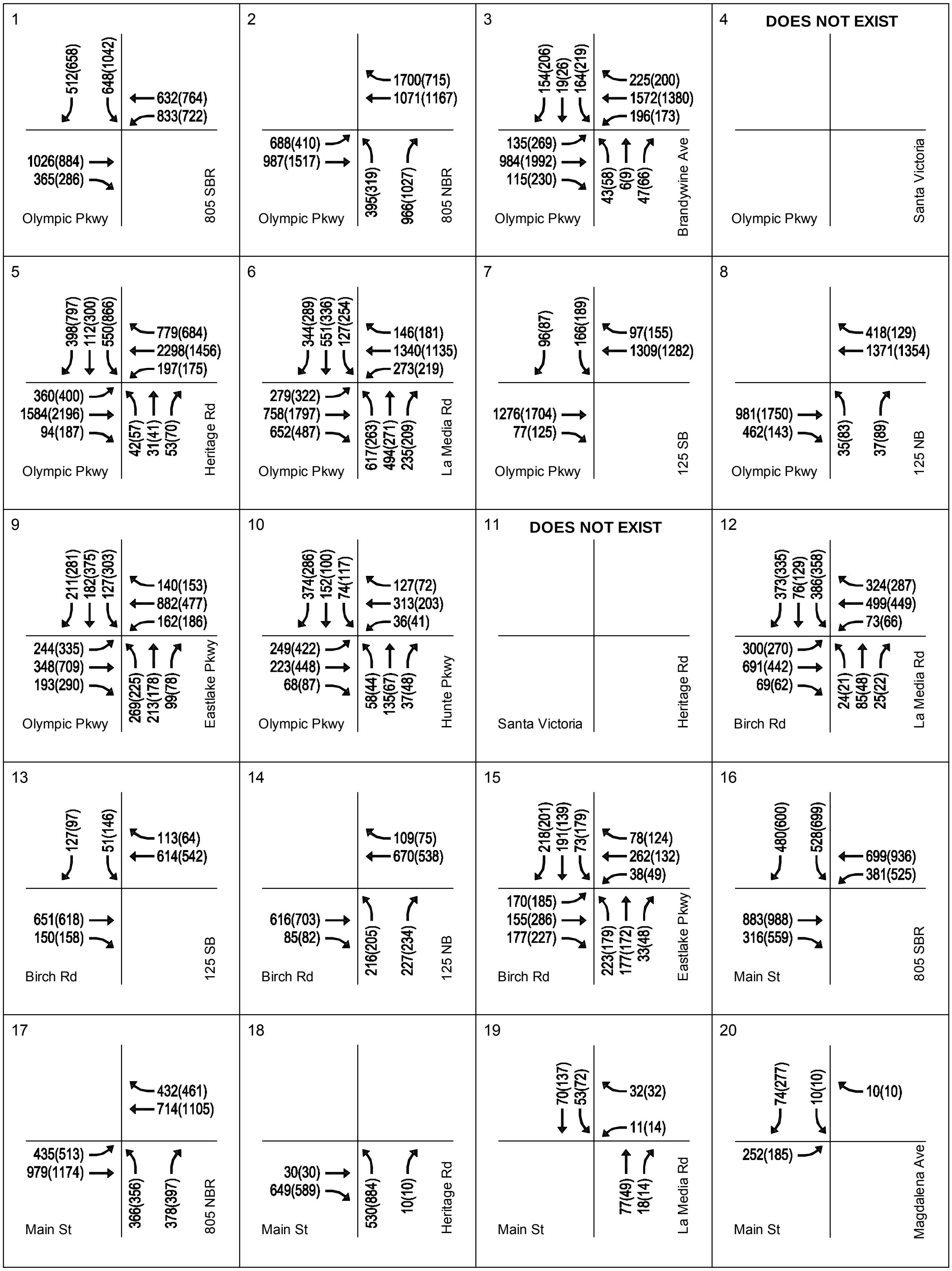


VILLAGE 8 WEST 2015 ROADWAY NETWORK

EXHIBIT 26

RBF

55-100535.001 AUGUST 2011



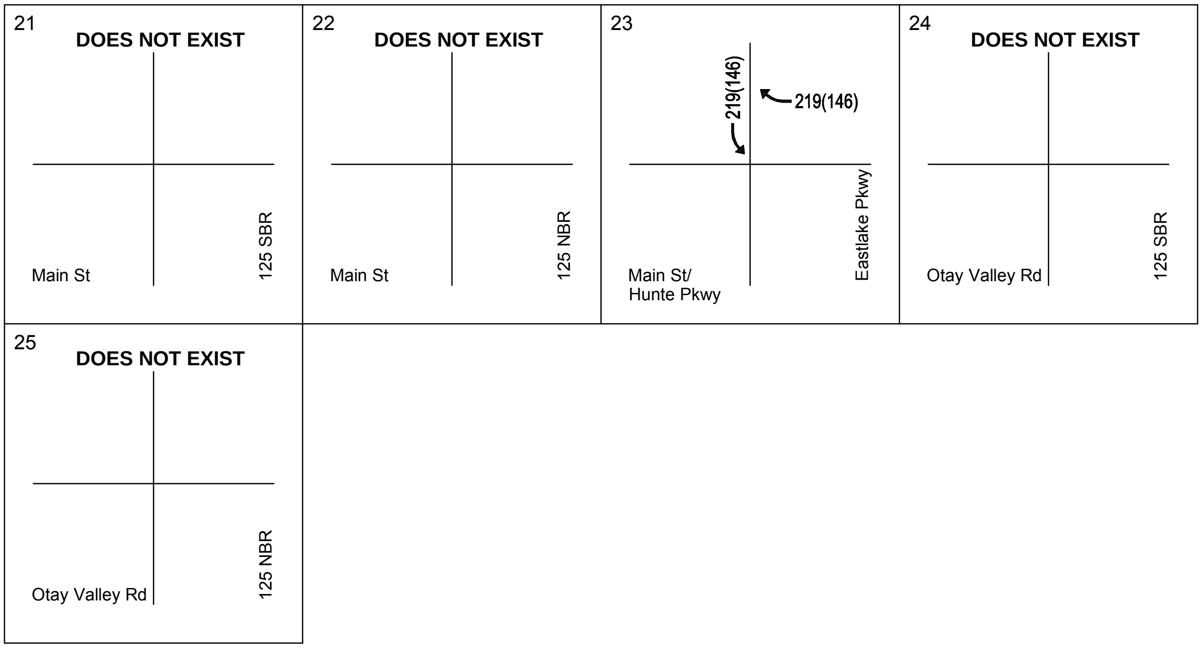
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2015 PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 27



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XX(XX) AM/PM PEAK HOUR VOLUME

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2015 PEAK HOUR VOLUMES

55-100535.001 MARCH 2013

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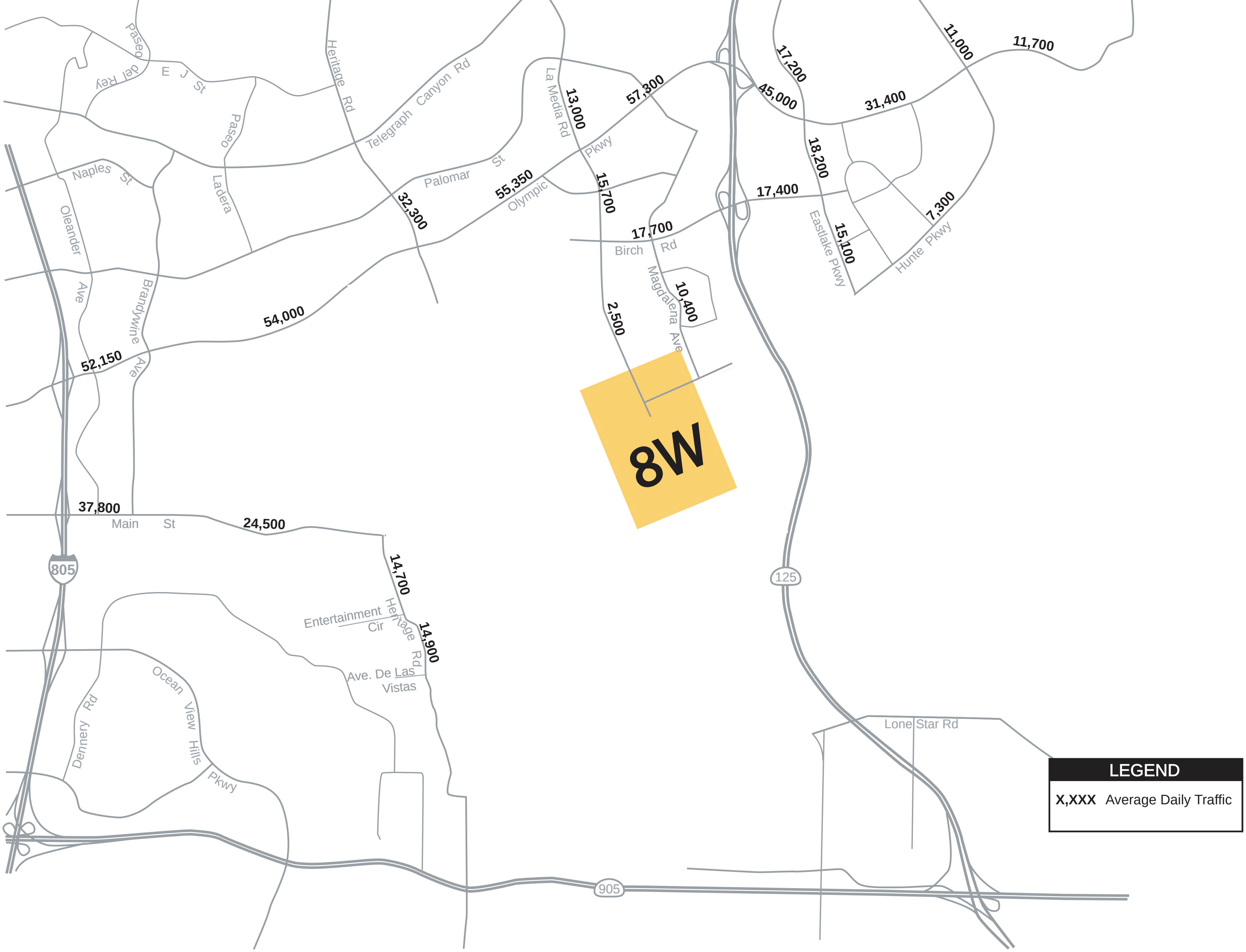

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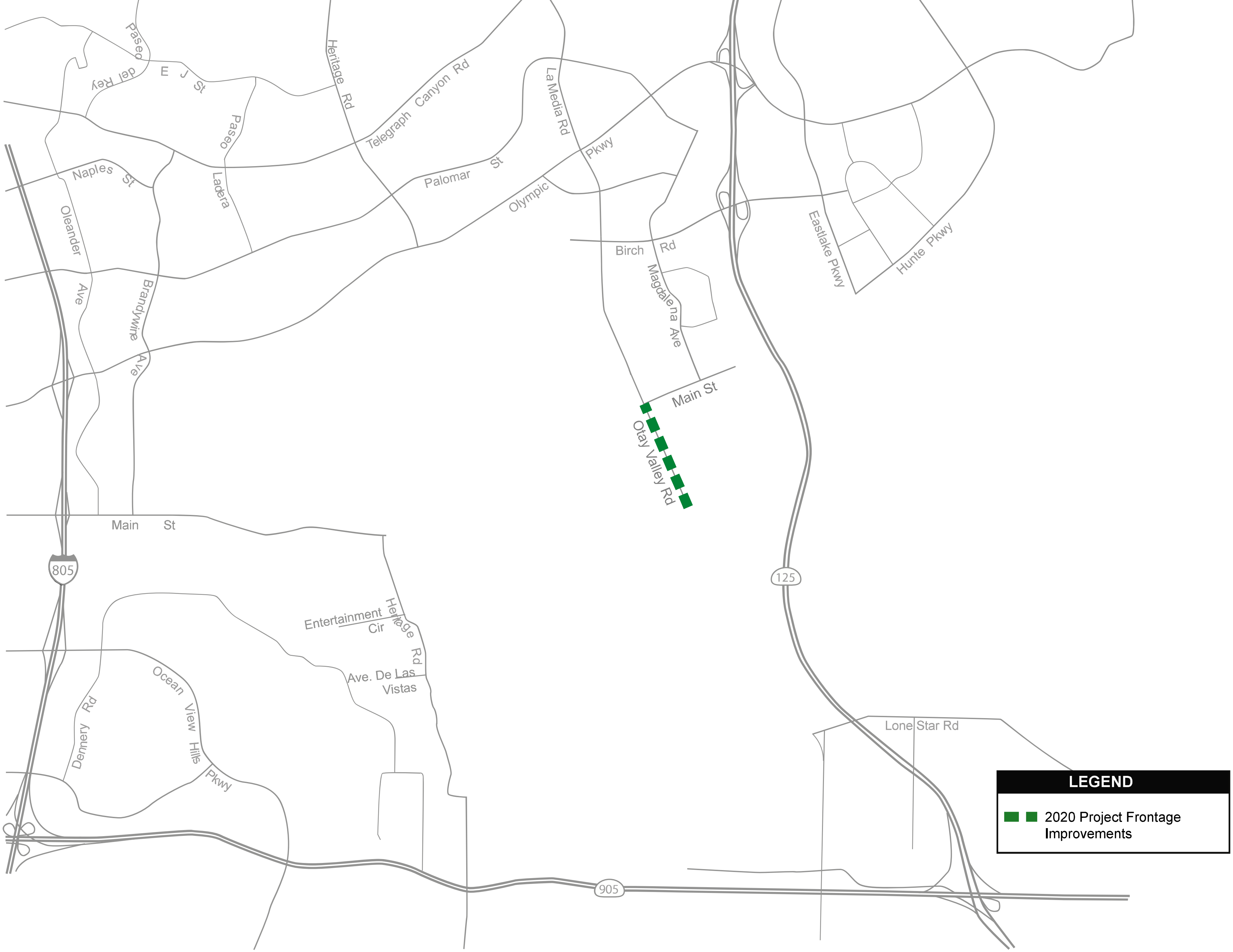
55-100535.001 JANUARY 2012

2015 CONDITIONS AVERAGE DAILY TRAFFIC

EXHIBIT 28



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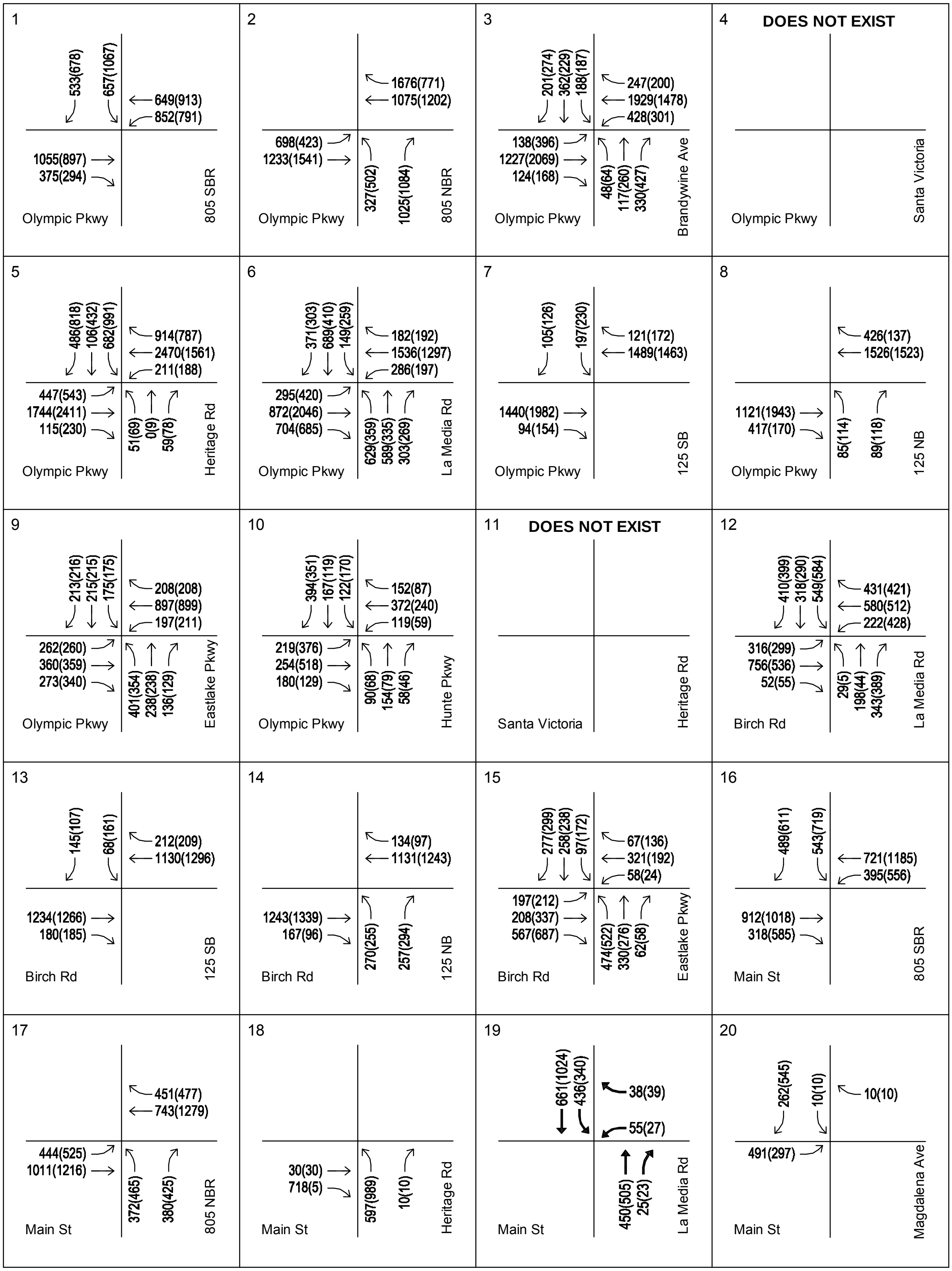
55-100535.001 MARCH 2013

VILLAGE 8 WEST 2020 ROADWAY NETWORK

EXHIBIT 29



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XX(XX) AM/PM PEAK HOUR VOLUME

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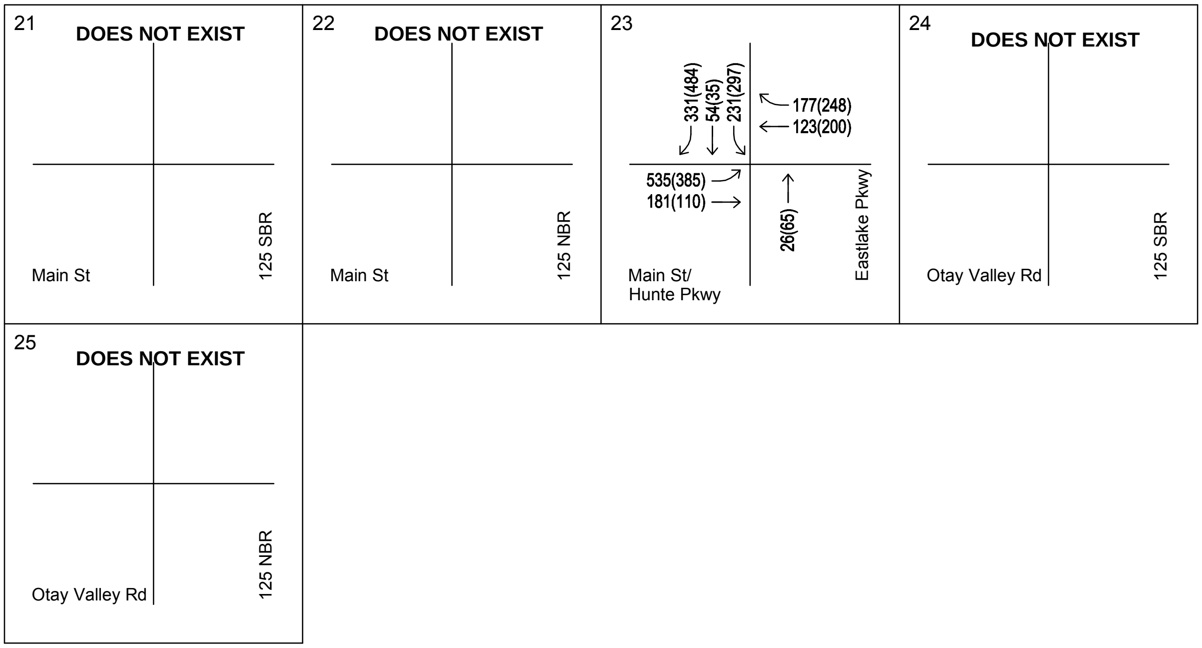
2020 PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 30



LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

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2020 PEAK HOUR VOLUMES

55-100535.001 MARCH 2013

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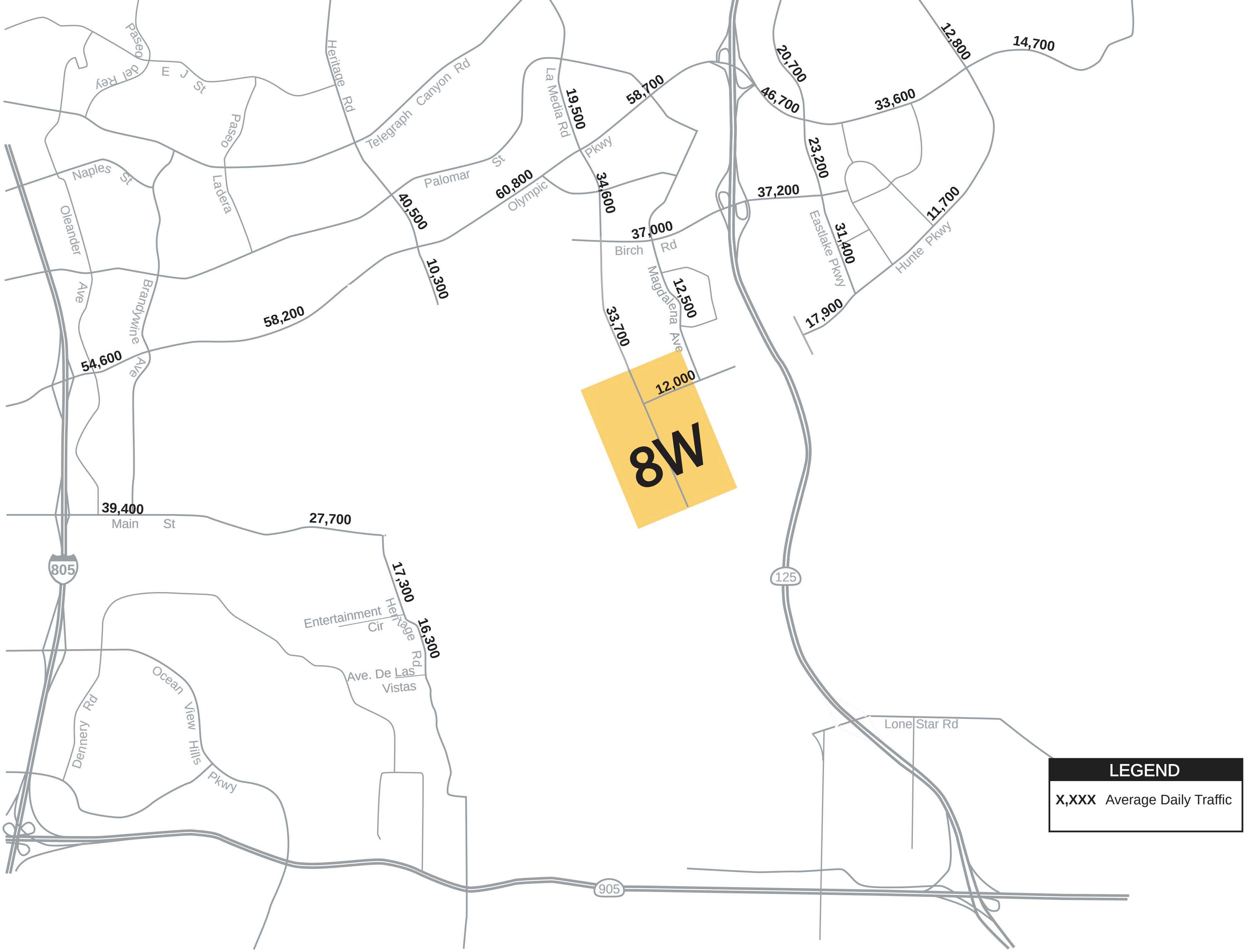

2020 CONDITIONS AVERAGE DAILY TRAFFIC

55-100535.001 JANUARY 2012

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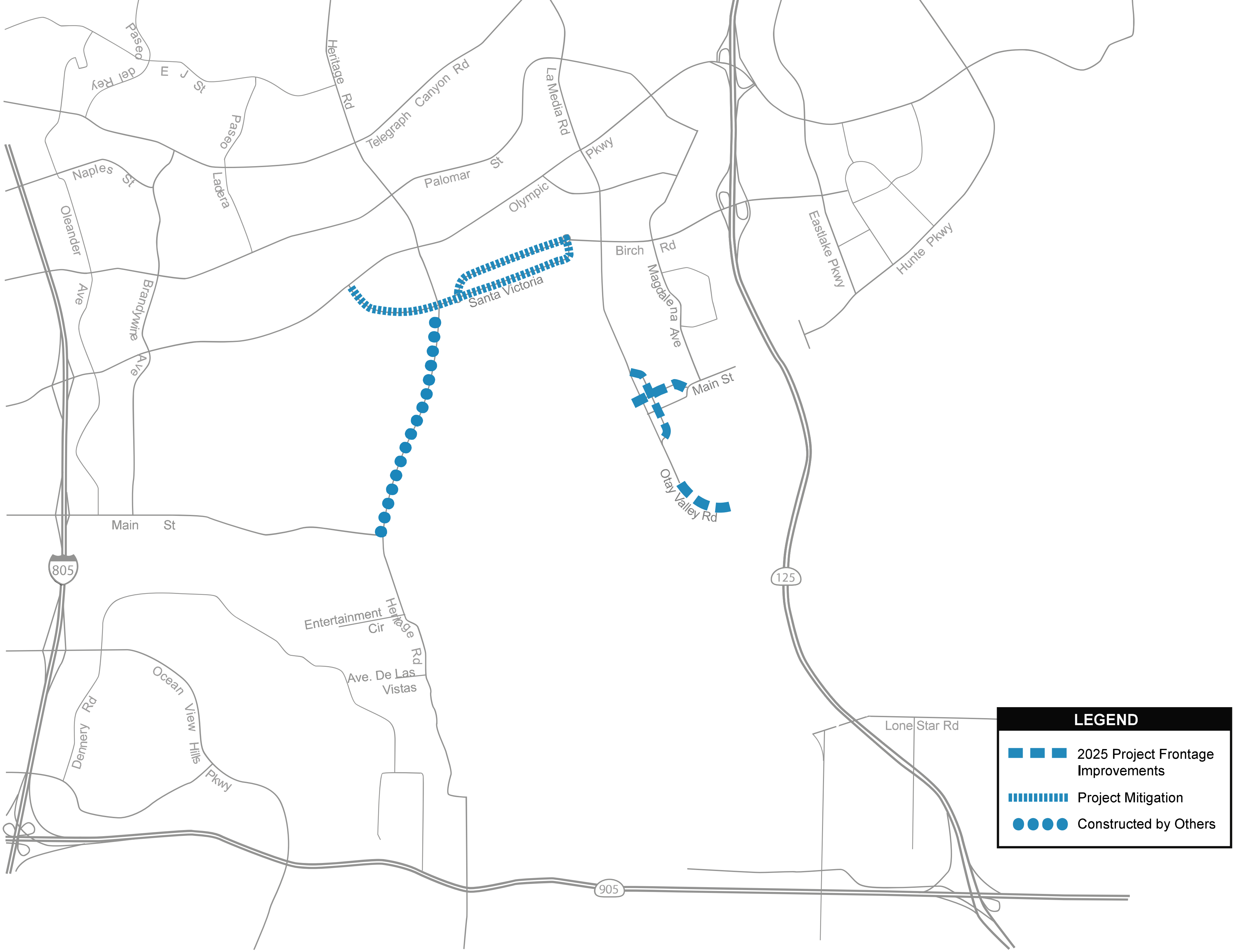

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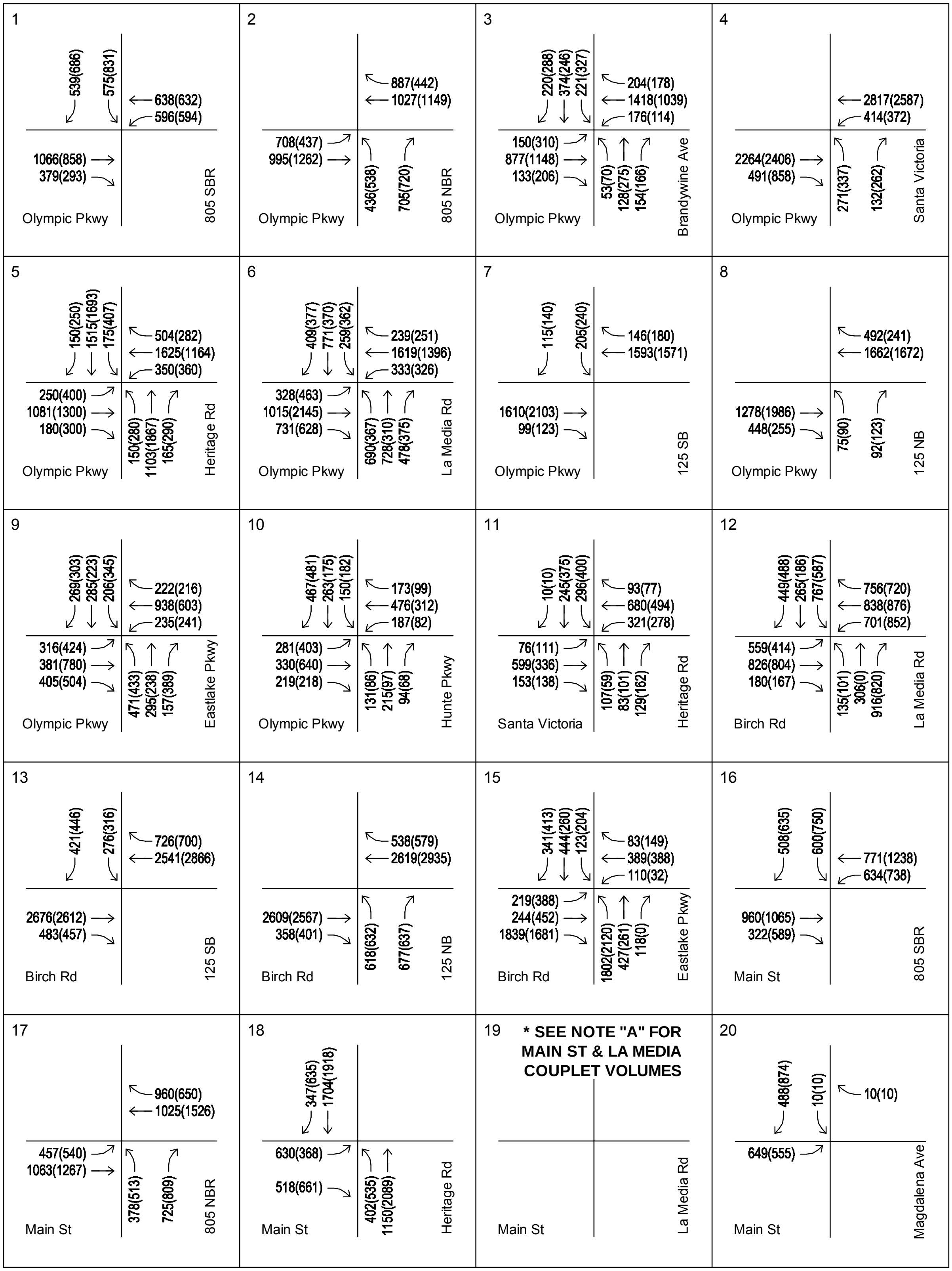
VILLAGE 8 WEST 2025 ROADWAY NETWORK

55-100535.001 MARCH 2013

EXHIBIT 32



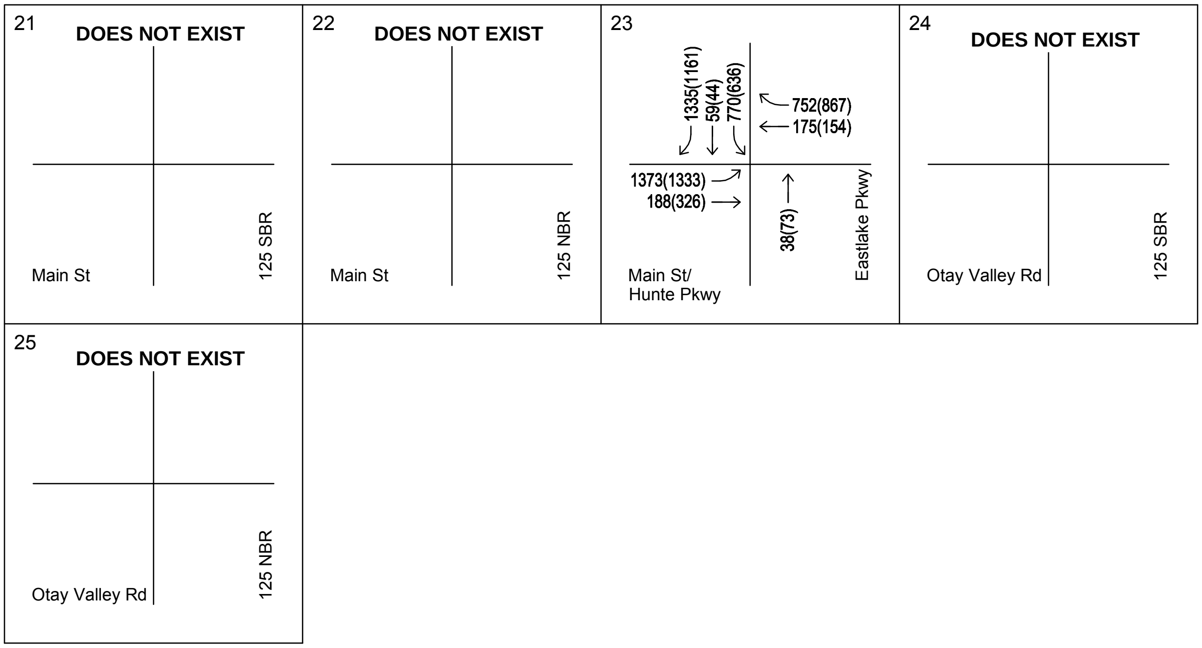
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

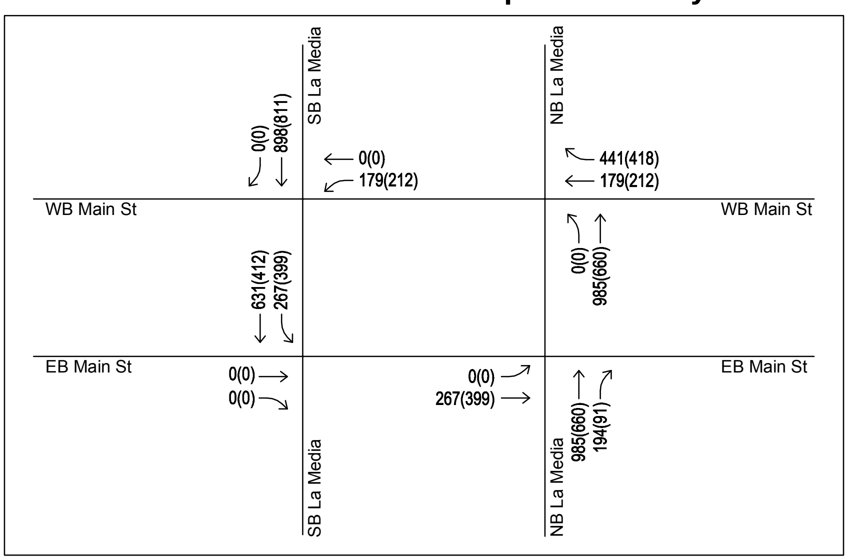
2025 PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 33



NOTE "A": Main St / La Media Couplet Geometry



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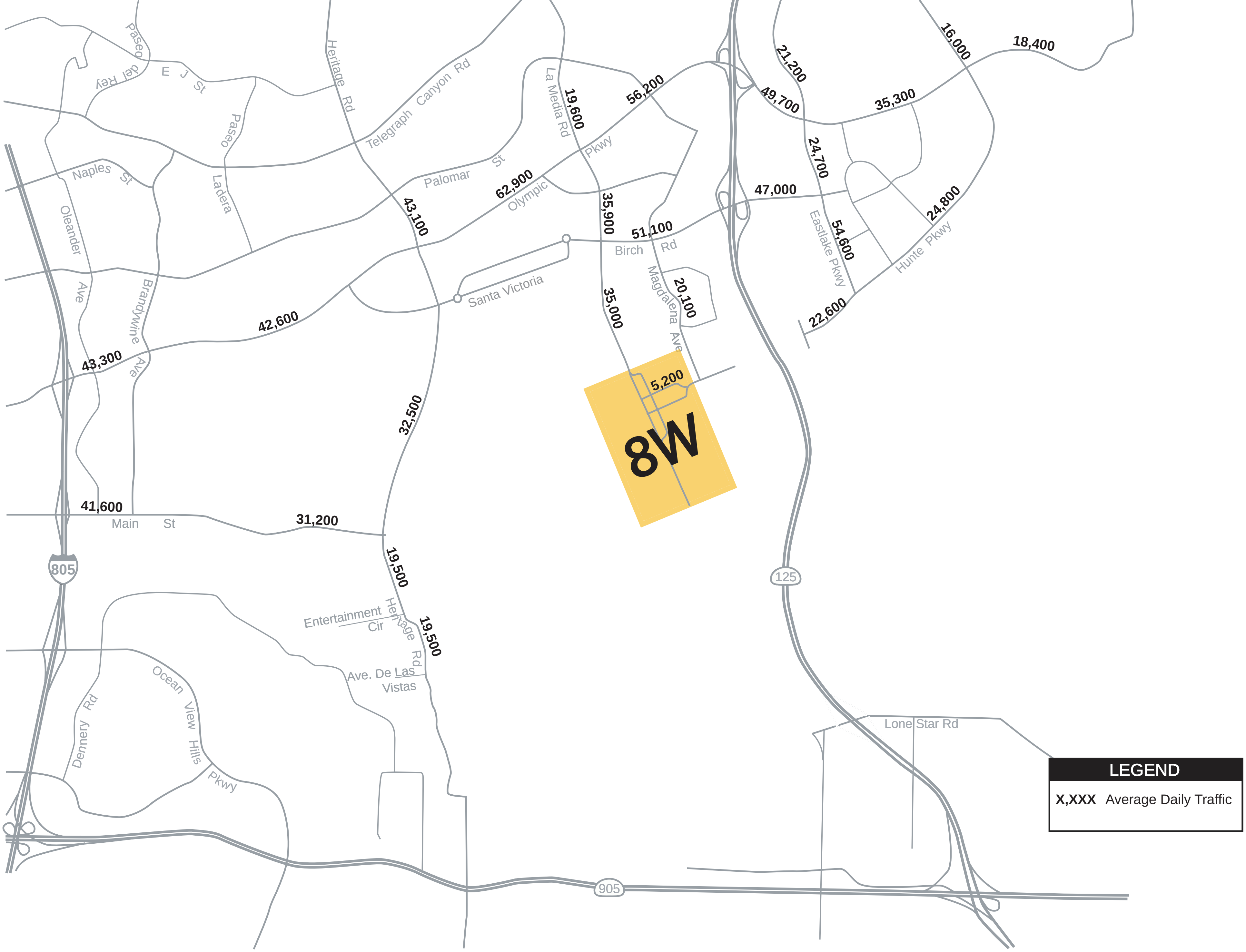
XX(XX) AM/PM PEAK HOUR VOLUME

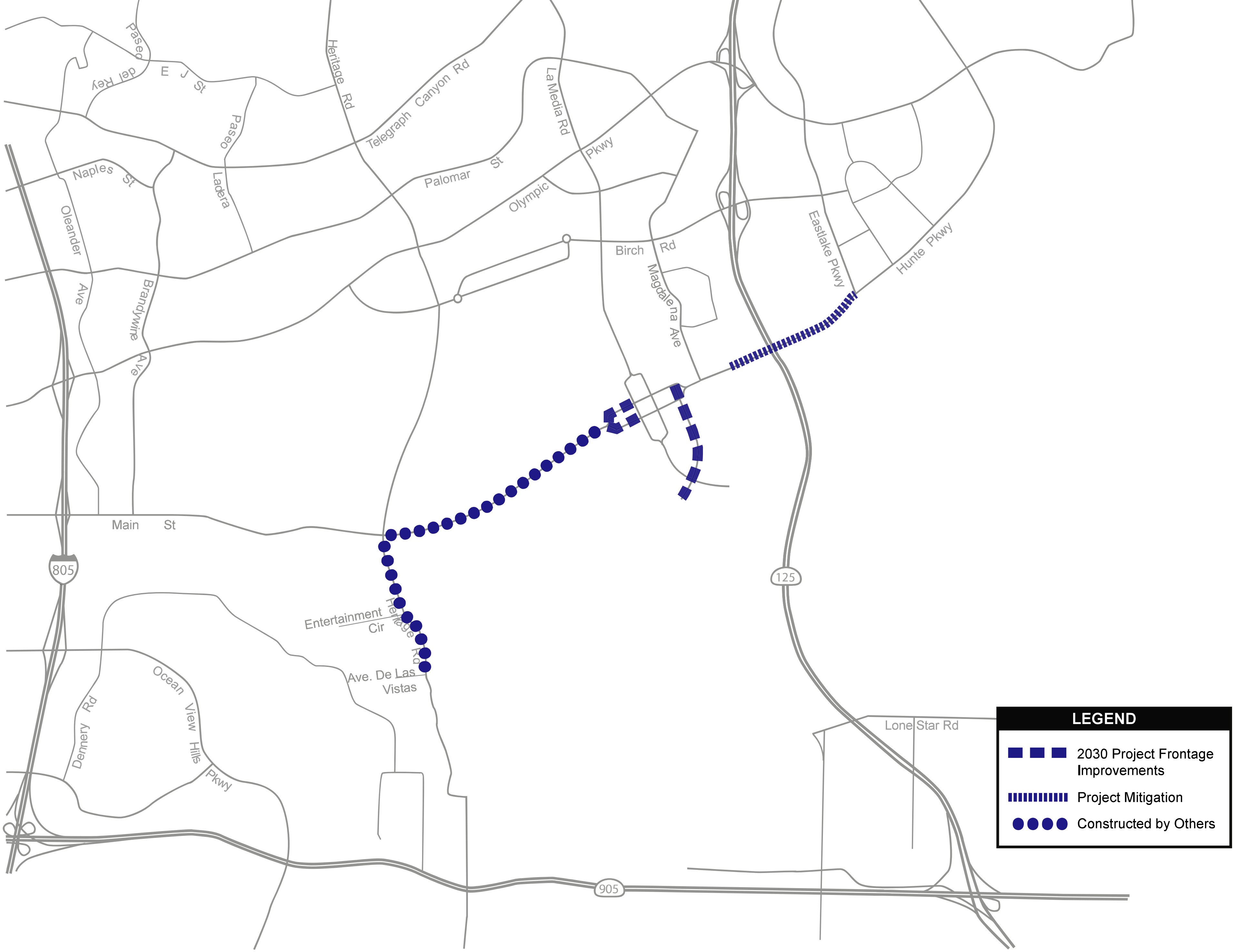
2025 PEAK HOUR VOLUMES



2025 CONDITIONS AVERAGE DAILY TRAFFIC

55-100535.001 JANUARY 2012

EXHIBIT 34



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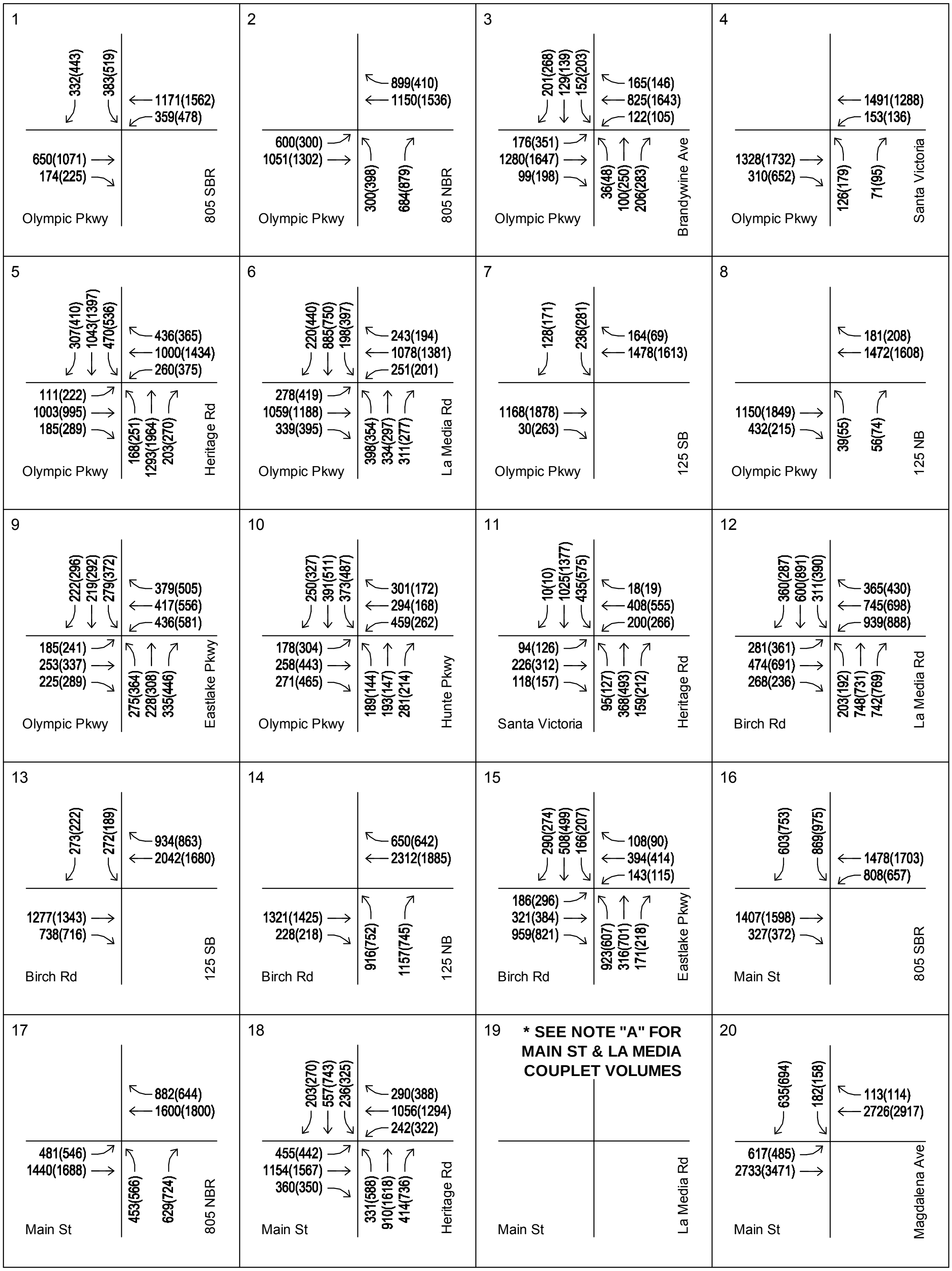
55-100535.001 MARCH 2013

VILLAGE 8 WEST 2030 ROADWAY NETWORK

EXHIBIT 35

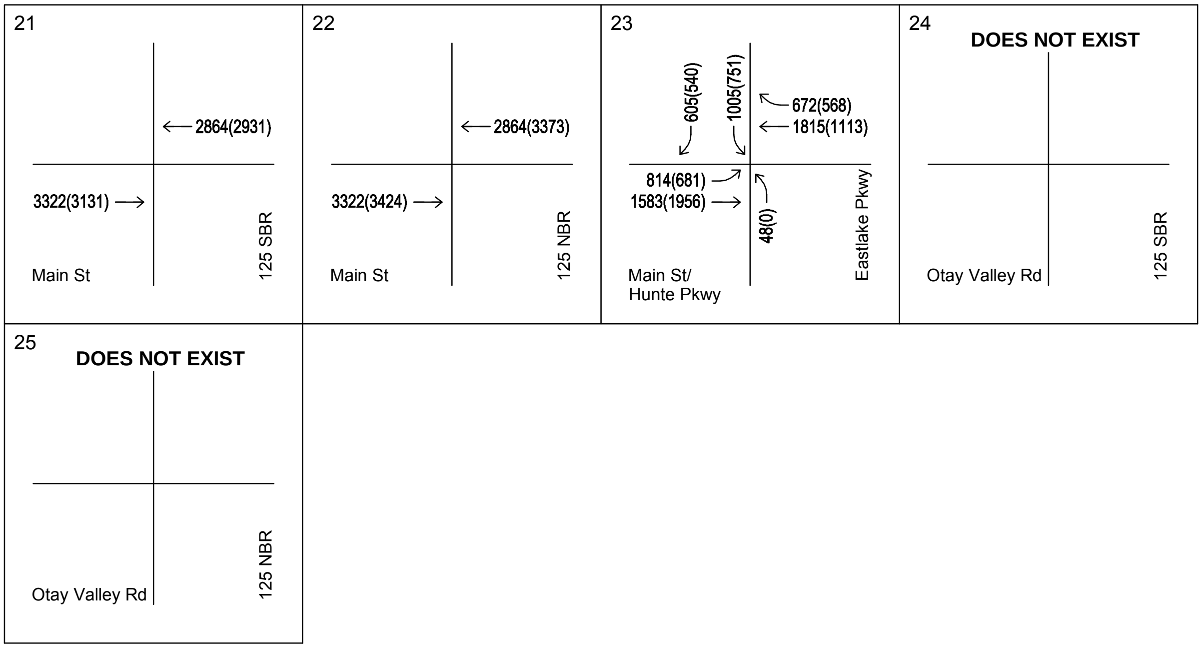


LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2030 PEAK HOUR VOLUMES

EXHIBIT 36



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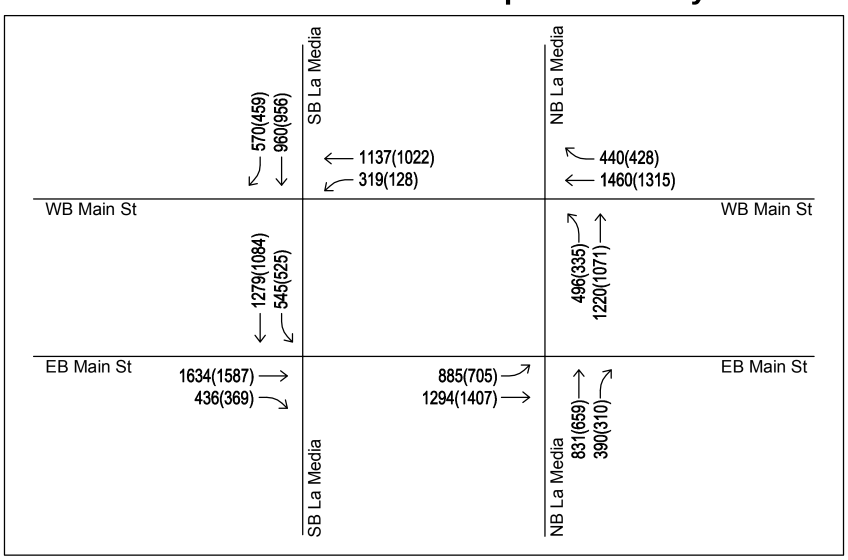

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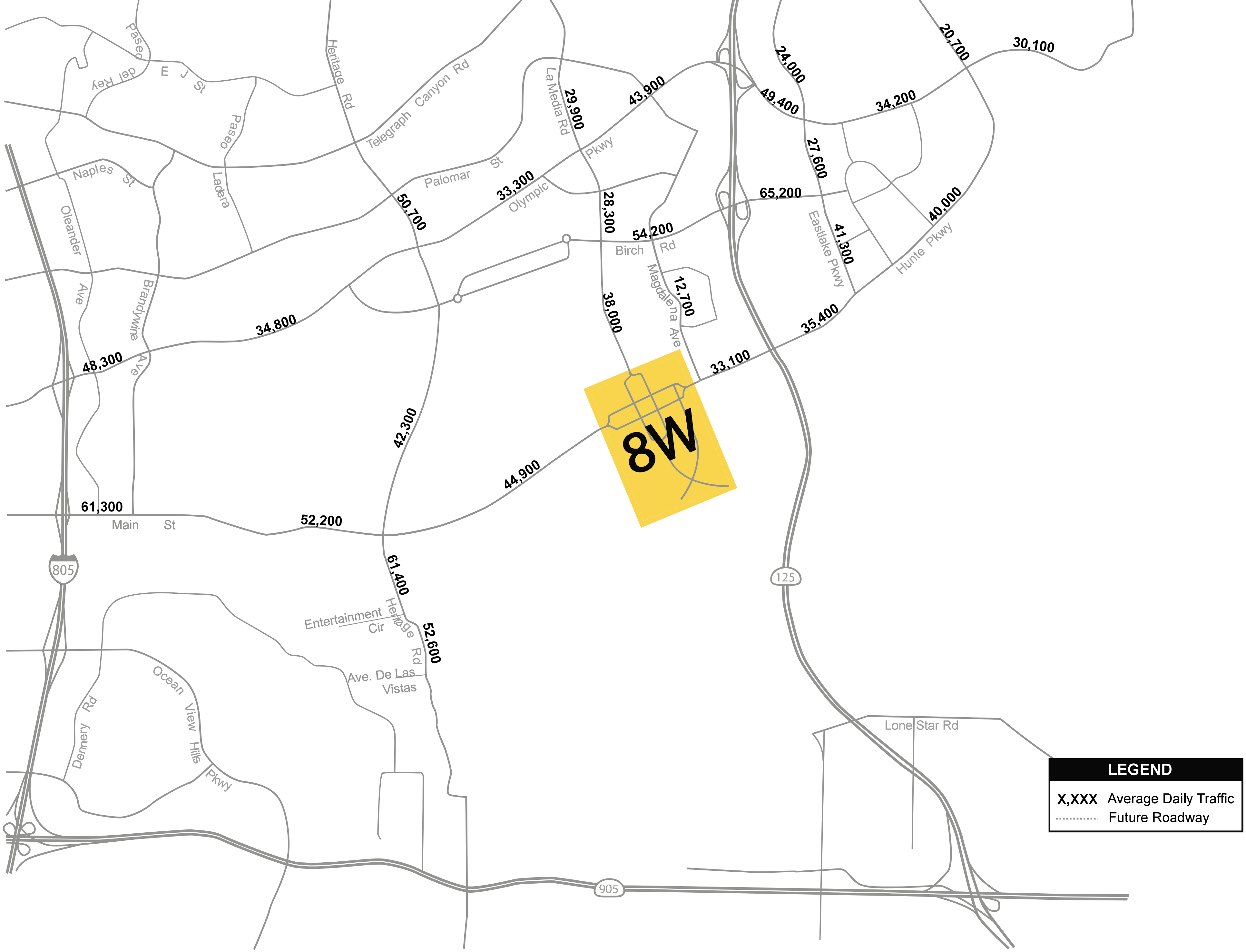
XX(XX) AM/PM PEAK HOUR VOLUME

2030 PEAK HOUR VOLUMES

55-100535.001 MARCH 2013

EXHIBIT 36



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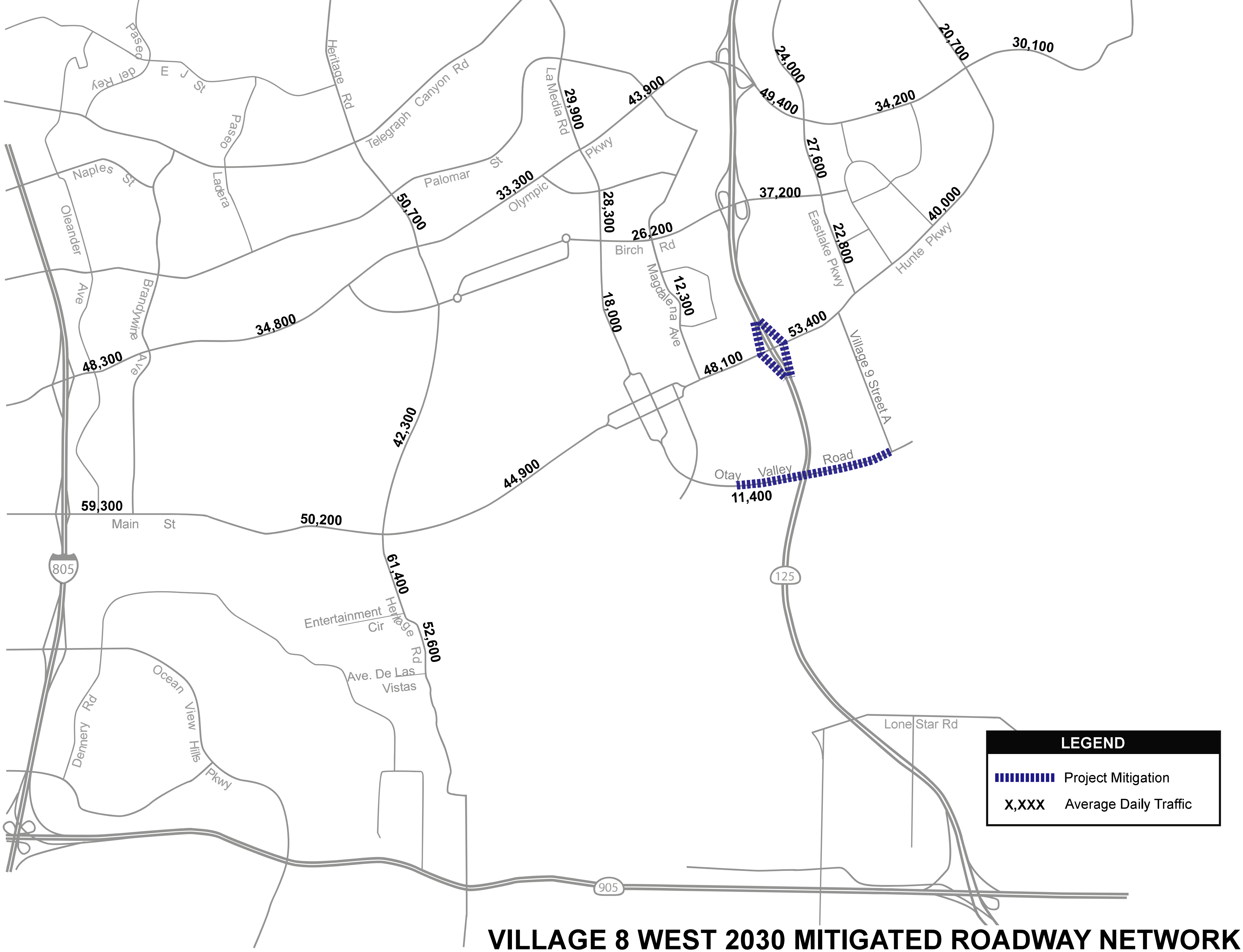
55-100535.001 MARCH 2013

2030 CONDITIONS ADT VOLUMES

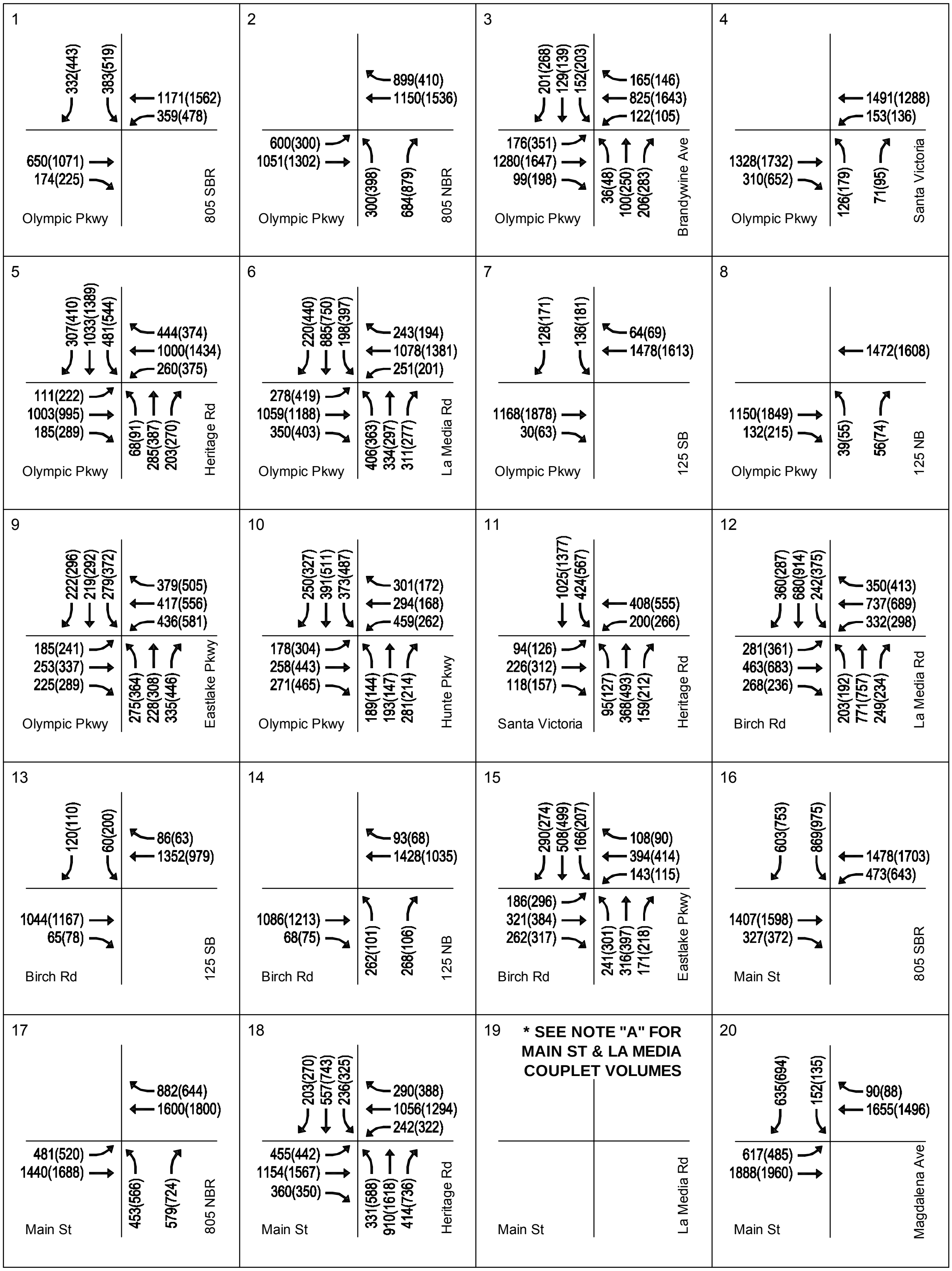
EXHIBIT 37



VILLAGE 8 WEST 2030 MITIGATED ROADWAY NETWORK AND AVERAGE DAILY TRAFFIC

55-100535.001 MARCH 2013

EXHIBIT 38



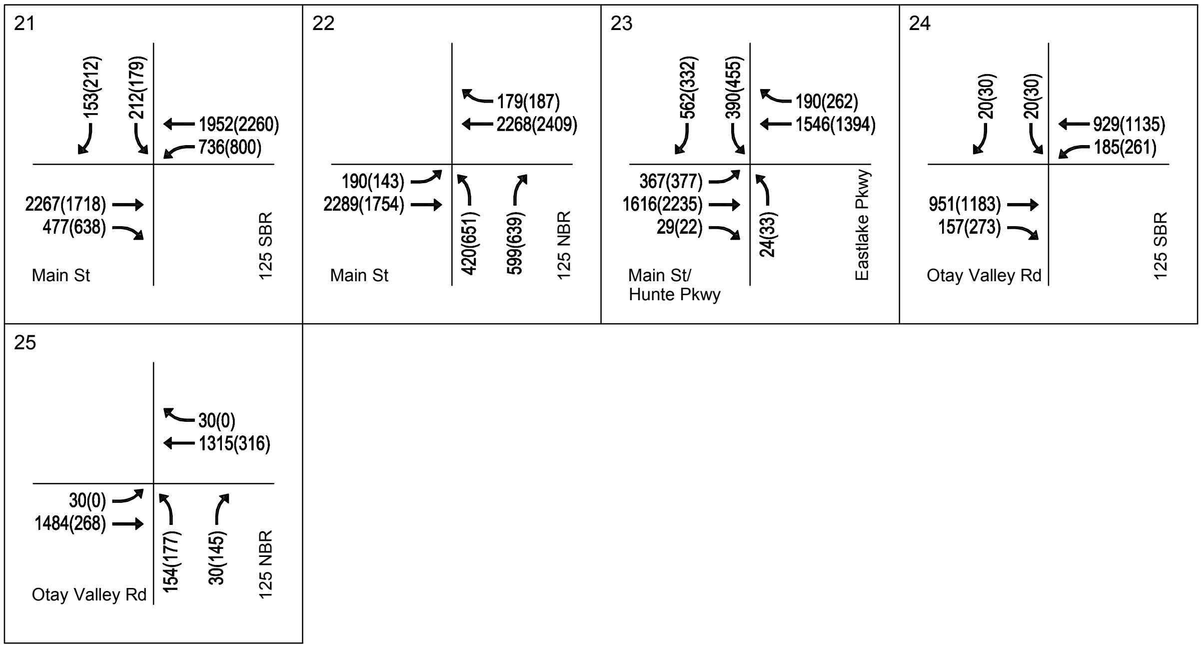
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

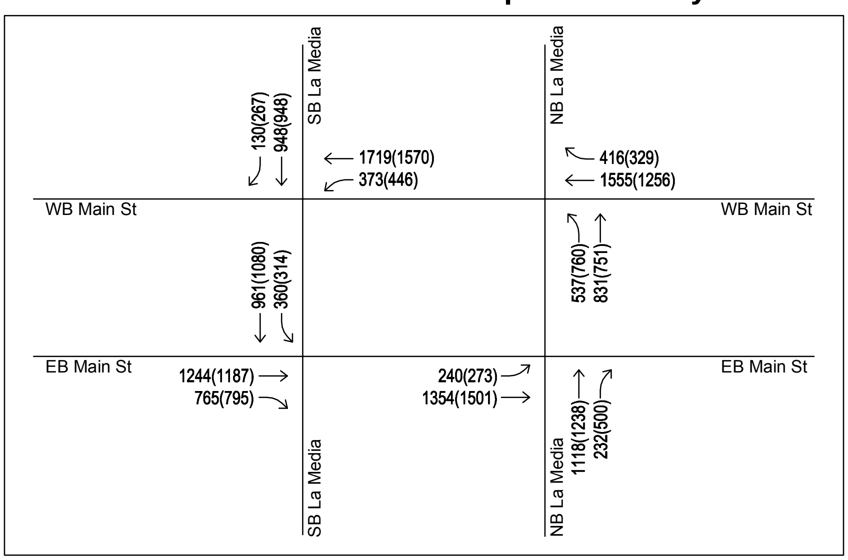
2030 MITIGATED PEAK HOUR VOLUMES

55-100535.001 AUGUST 2011

EXHIBIT 39



NOTE "A": Main St / La Media Couplet Geometry



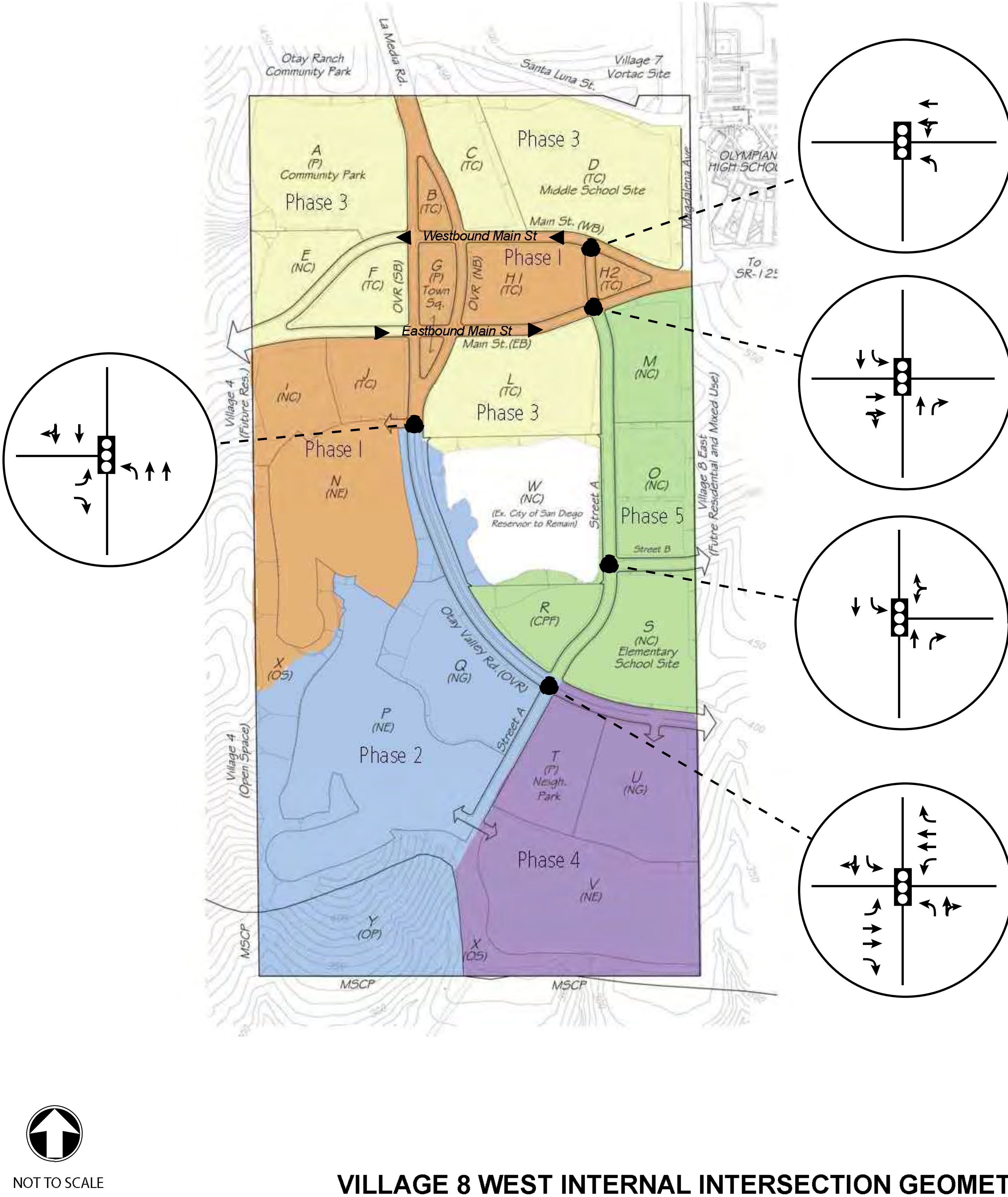
LEGEND

XX(XX) AM/PM PEAK HOUR VOLUME

2030 MITIGATED PEAK HOUR VOLUMES

55-100535.001 MARCH 2013

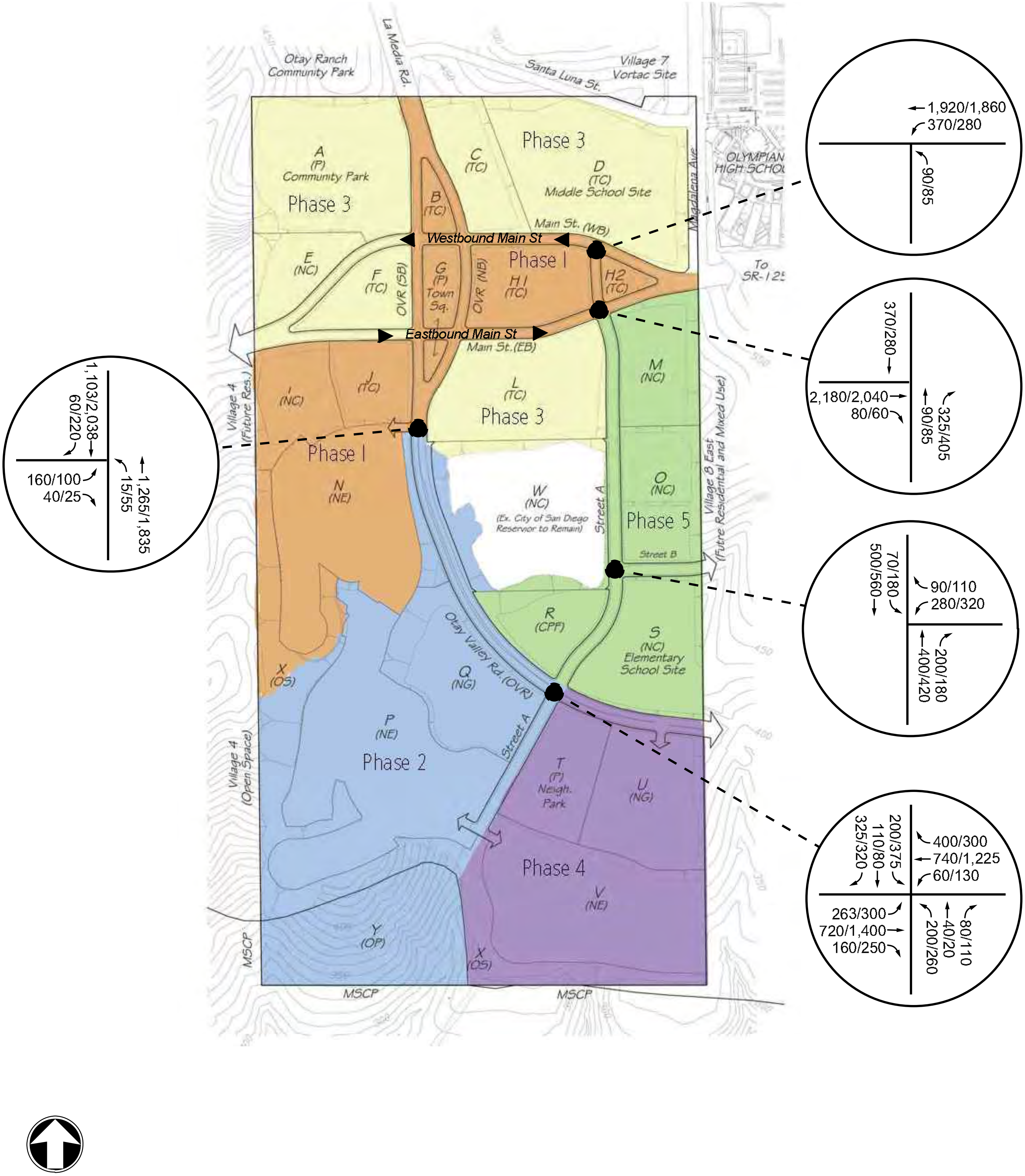
EXHIBIT 39



VILLAGE 8 WEST INTERNAL INTERSECTION GEOMETRY AND TRAFFIC CONTROL

55-100535.001 AUGUST 2011

EXHIBIT 40



VILLAGE 8 WEST YEAR 2030
INTERNAL INTERSECTION TRAFFIC VOLUMES

RBF

55-100535.001 AUGUST 2011

EXHIBIT 41

APPENDIX C

Air Quality Technical Report

Otay Ranch Village 8 West Sectional Planning Area Project

Final Air Quality Technical Report

May 2013

Prepared for:

CITY OF
CHULA VISTA

276 Fourth Avenue
Chula Vista, California 91910

Prepared by:

ATKINS

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San Diego, California 92130

Contents

Figures

Tables

This technical report assesses the potential for air quality impacts to occur in conjunction with the type and scale of development associated with the proposed Otay Ranch Village 8 West Sectional Planning Area (SPA) plan, herein referred to as the “project.” The project consists of approximately 300 acres of land in Otay Ranch known as Village 8 West, located entirely within the City of Chula Vista, California, near the southeasterly edge of the City’s limits. This report is intended to satisfy the City of Chula Vista's requirement for an air quality impact analysis by examining the impacts of the proposed project and identifying mitigation measures where applicable to address significant air quality impacts.

1.0 Summary

The proposed project would result in emissions during construction and operation that would exceed significance thresholds. Mitigation measures that require construction best management practices (BMPs), improve traffic flow, and eliminate wood-burning fireplaces during operation would reduce impacts, but not to a less than significant level. The proposed project would also result in a significant and unavoidable conflict with applicable air quality plans because of the significant air emissions and because the growth proposed in Village 8 West exceeds the growth projections in the applicable air quality plans. Impacts would also be cumulatively considerable and unavoidable.

The proposed project does not propose any major emitters of toxic pollutants or place new sensitive receptors near a major freeway where they would be exposed to substantial toxic pollutant concentrations. New gas stations accommodated under the Village 8 West SPA plan would be required to comply with California Air Resources Board (CARB) siting guidelines to avoid impacts to sensitive receptors. Mitigation that requires new sources of TACs to demonstrate compliance with SDAPCD criteria would ensure that impacts associated with TAC emissions are less than significant. The proposed project would not result in emissions that would result in a carbon monoxide hot spot or a source of substantial odors.

The analysis in this air quality report has been incorporated into the Village 8 West Air Quality Improvement Plan (AQIP) as part of the final SPA plan.

2.0 Project Description

Figure 1, Project Vicinity, and Figure 2, Existing and Planned Land Uses in the Project Vicinity, illustrate the project’s location and surrounding uses. Village 8 West is one of the designated fourteen villages within the Otay Ranch General Development Plan (GDP) area. As prescribed in the Otay Ranch GDP, Village 8 West is proposed to be an Urban Village with a mixed-use Town Center, higher density uses around the Town Center and low-medium density residential uses to the south of the Town Center. Urban Villages are intended to be adjacent to existing urban development and planned for transit-oriented development with higher densities and mixed uses within one quarter mile of a transit stop or station. The Village 8 West circulation system would provide a system of roadway and trail corridors to support both vehicular and non-vehicular modes of transportation. This system includes the extension of existing and planned roads, trails, and transit from adjacent villages as well as internal systems to serve the SPA. Community streets are designed as “complete” streets, considering all modes of transportation by providing vehicular travel lanes, bike lanes or bike routes, sidewalks, and transit lanes where appropriate. Figure 3, Site Utilization Plan, illustrates the land use plan for the SPA. The proposed land uses for Village 8 West are provided in Table 1.

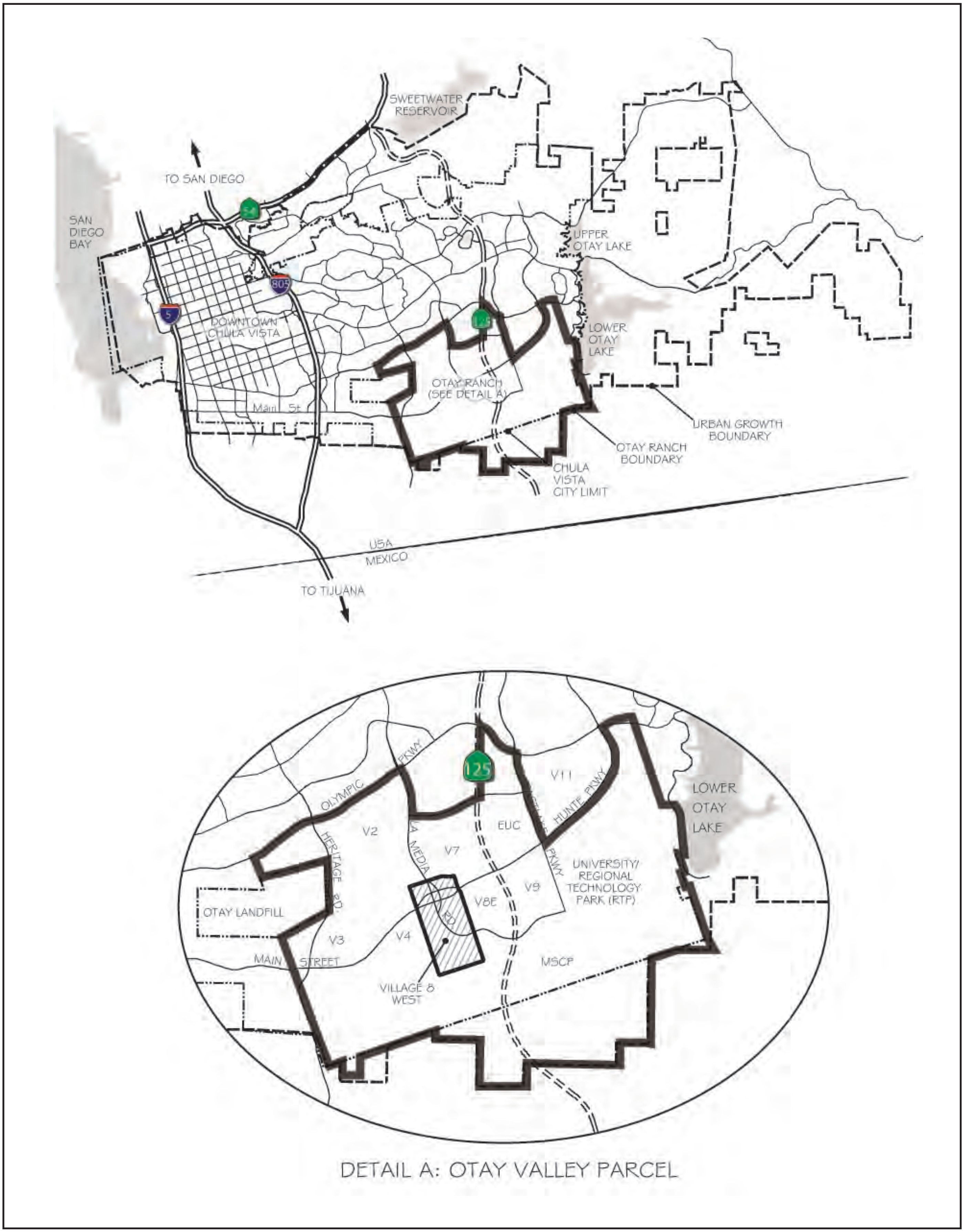
Table 1 Village 8 West SPA Land Uses

Land Use	Area (Acres)	Residential (Dwelling Units)	Office (Square Feet)	Commercial (Square Feet)
Mixed Use	40.7	899	50,000	250,000
Multi-family	29.5	530	--	--
Cluster Single-Family/Town homes	26.2	290	--	--
Single-Family	67.0	331	--	--
Schools	31.6	--	--	--
Community Purpose Facility	5.8	--	--	--
Parks	27.9	--	--	--
Open Space	39.1	--	--	--
Arterial Rights-of-Way and Basin	32.5	--	--	--
Total	**300.3**	**2,050**	**50,000**	**250,000**

Project Features

The Village 8 West SPA Plan incorporates several additional features into the site design that promote alternative transportation use, reduce traffic congestion, encourage energy efficiency, and reduce area source pollutants. These measures are listed in Appendix B of the SPA Plan, Air Quality Improvement Plan, and include the following measures:

1. Provide shower and locker facilities at offices with more than ten occupants to encourage bicycle use.
2. Design parking lots to promote use of mass transit and car pools.
3. Synchronize the traffic lights included as part of an individual development project with previously installed traffic lights in order to reduce traffic congestion.
4. Utilize solar heating technology as practical. Generally, solar panels can be cost-effectively used to heat water for domestic use and for swimming pools. Advances in solar technology in the future may make other applications appropriate.
5. Enhance energy efficiency in building designs and landscaping plans.
6. Identify an environmental coordinator to be responsible for education and disseminating information on ridesharing and/or mass transit opportunities, recycling, energy conservation programs, etc.
7. Install only electric or natural gas fireplaces in new development. No wood burning fireplaces are permitted.

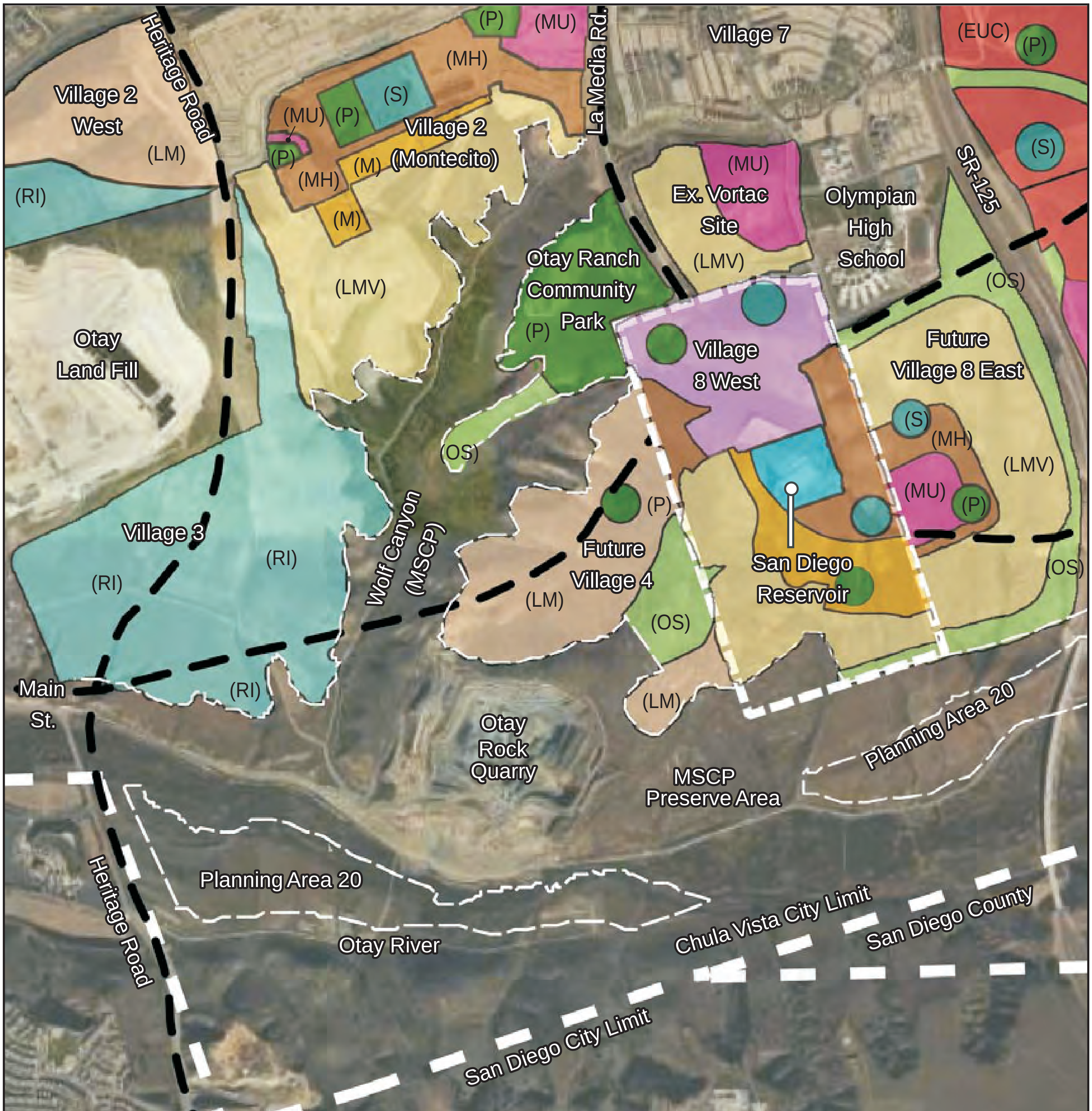


Source: William Hezmalhalch Architects, Inc. 2012

Not to Scale

N

PROJECT VICINITY
FIGURE 1



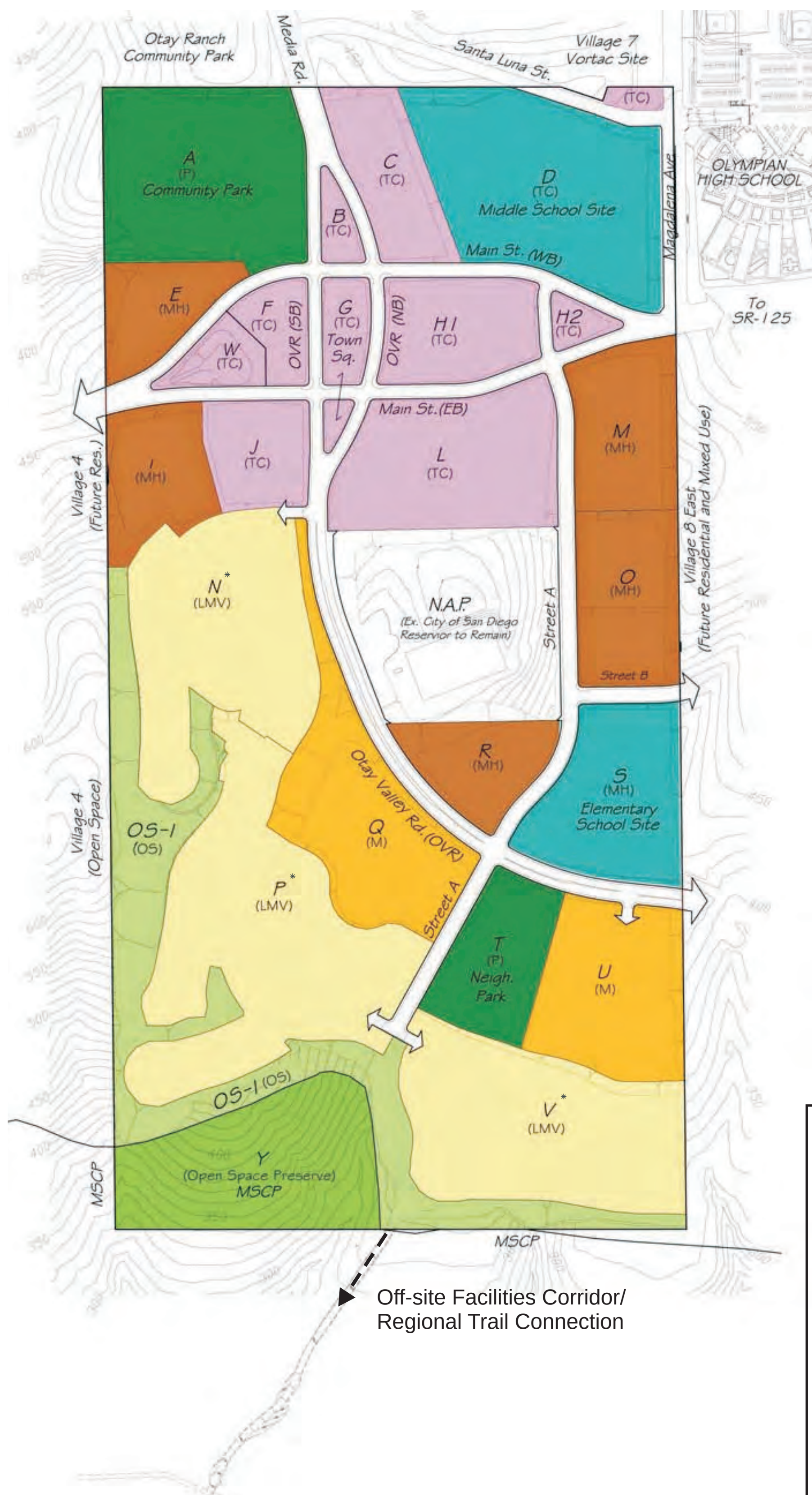
General Development Planned Land Uses

- Planned Roadway
- Open Space (OS)
- Park (P)
- School (S)
- Research and Limited Industrial (RI)
- Eastern Urban Center (EUC)
- Low Medium Density Residential (LM)
- Low Medium Village Density Residential (LMV)
- Medium Density Residential (M)
- Medium High Density Residential (MH)
- Mixed Use (MU)

Source: William Hezmalhalch Architects, Inc. 2012

Not to Scale N

EXISTING AND PLANNED LAND USES IN THE PROJECT VICINITY
FIGURE 2



Land Use

- Town Center (TC)
- Medium High Density Residential (MH)
- Medium Density Residential (M)
- Low Medium Density Residential Village (LMV)
- Open Space (OS)
- Open Space (Preserve)
- Park (P)
- School

* Lotting and grading to be determined at Tentative Map

Commercial and Residential

Planning Area	Gross Acres	Transect[1]	Target Res. Units	Target C'ml Sq.Ft. (K)[2]
Town Center - 18-45 du/ac				
B	1.4	T-4: TC	35	0
C	6.9	T-4: TC	156	36
F	3.0	T-4: TC	54	25
H-1	7.8	T-4: TC	33	144
H-2	1.3	T-4: TC	0	12
J	5.4	T-4: TC	161	18
L	14.2	T-4: TC	460	65
X	0.7	T-4: TC	0	0
Subtotal	**40.7**		**899**	**300**

Planning Area	Gross Acres	Transect	Target Res. Units
Medium High Density Residential - 11-18 du/ac			
E	5.3	T-3:NC	95
I	6.8	T-3:NC	122
M	8.5	T-3:NC	153
O	8.9	T-3:NC	160
Subtotal	**29.5**		**530**
Medium Density Residential Attached/Detached - 6-11 du/ac			
Q	14.7	T-2:NG	160
U	11.5	T-2:NG	130
Subtotal	**26.2**		**290**
Low Medium Density Residential Village - 3-6 du/ac			
N	19.6	T-2:NE	117
P	26.9	T-2:NE	124
V	20.5	T-2:NE	90
Subtotal	**67.0**		**331**
TOTAL	**163.4**		**2,050**

Public, Quasi Public, and Other

Planning Area	GDP Land Use	Gross Acres	Transect	Description
Community Purpose Facility (CPF)				
R	MH	5.8	SD: CPF	As de?ned by CVMC Chapter 19.48
Subtotal		**5.8**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Description
Potential School (S) Sites[3]				
D	TC	20.2	T-4: TC	Middle
S	MH	11.4	T-3: NC	Elementary
Subtotal		**31.6**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Classification
Parks (P)				
A	P	17.4	SD: P	Community
G	TC	3.0	SD: P	Town Square
T	P	7.5	SD: P	Neighborhood
Subtotal		**27.9**		
Open Space (OS)				
Y	CVOSP[4]	15.6	T-1: OP	Preserve (MSCP)
OS-1	OS	23.5	T-1: OS	Open Space
Subtotal		**39.1**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Description
Other				
W	TC	2.4	SD: R	Basin
Right-of-Way	NA	30.1	NA	Arterials
Subtotal		**32.5**		
TOTAL		**136.9**		

SPA Total Area: 300.3 Gross Acres[5]

1 Transects are defined in Chapter 3 of the SPA Plan.
2 50k square feet of office retail; 250k square feet of retail commercial (excludes Live/Work).
3 School sites will revert to the underlying use if sites are not accepted by the school district. Parcel D shall revert to Town Center and Parcel S shall revert to Medium High Density Residential.
4 Chula Vista Open Space Preserve.
5 Acreage does not include 19.6-acre San Diego Reservoir.

Source: William Hezmalhalch Architects, Inc. 2012

0 400 800
Feet
N

SITE UTILIZATION PLAN
FIGURE 3

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Additionally, the Village 8 West SPA Plan requires development proposed under the SPA Plan to use the recommendations set forth in Table 1-1 of the CARB's Land Use and Air Quality Handbook (CARB 2005) as a guideline for siting sensitive land uses. Implementation of these recommendations would ensure that sensitive land uses such as residences, schools, day care centers, playgrounds, and medical facilities are sited appropriately to minimize exposure to emissions of TACs. Specifically, new sensitive uses would not be located within 50 feet of any typical-sized gas station (assumed to have a throughput of less than 3.6 million gallons per year). Due to physical size constraints, large gas stations (greater than a throughput of 3.6 million gallons per year or more) would not be permitted within Village 8 West.

The Village 8 West SPA Plan includes the extension of a utility easement off-site to the south of the SPA to extend sewer facilities to connect to existing facilities, and connect the storm drain to Otay River. A 12-foot paved trail would be included within the 30-foot easement to provide access to the offsite utilities and a trail connection to the Otay Valley Regional Park trail system. Approximately 4.57 acres would be graded offsite on the City of San Diego reservoir property.

The project area ranges in elevation from approximately 600 feet above mean sea level (AMSL) in the east to 400 feet AMSL in the west. The project site is located approximately 0.5 miles west of State Route 125 (SR-125) and is surrounded on three sides by currently undeveloped land. Rock Mountain is located to the west of the site, and bluffs abutting the Otay River Valley are located to the south. The future location for Village 8 East (currently undeveloped) is located to the east of the site; Otay Valley Regional Park and the Otay River Valley are along the southerly boundary; the Otay Valley Quarry and portions of the future Village 4 (currently undeveloped) are located along the westerly boundary; and the partially developed Village 7, including Olympian High School, is located immediately adjacent to the northeast corner of the project area. An existing City of San Diego reservoir facility is located in approximately the center of the site. The facility is not part of the proposed project.

This air quality technical report is being prepared in support of the Environmental Impact Report (EIR) being prepared for the Village 8 West SPA project. The EIR being prepared for Village 8 West is a Second Tier EIR. Pursuant to CEQA Section 21093, the Village 8 West EIR tiers from the Supplemental EIR (SEIR 09-01) to the General Plan Update EIR (EIR 05-01; SCH #2004081066). The SEIR addresses the General Plan/General Development Plan Amendments (GPA/GDPA) that redefine boundaries for Villages 4, 7, and 8 to provide a clear definition of the proposed SPA. A program-level air quality technical report has been prepared for the GPA/GDPA (Recon 2011). This technical report tiers from the analysis in the GPA/GDPA air quality technical report and provides more project-specific analysis. The analysis and conclusions of the GPA/GDPA air quality technical report are incorporated into the impact analysis sections for the proposed project.

The results of this air quality report have been incorporated into the AQIP, which is included in the final SPA for Village 8 West. The AQIP has been prepared in accordance with the City of Chula Vista Growth Management Ordinance, Municipal Code Section 19.09.050B, which requires an AQIP to be submitted with all SPA Plans. The AQIP demonstrates how the final SPA plan for Village 8 West reduces vehicle trips, improves traffic flow, and reduces vehicle miles traveled.

3.0 Regulatory Framework

3.1 Federal

3.1.1 Clean Air Act

The Clean Air Act (CAA) of 1970 and the CAA Amendments of 1971 required the U.S. Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) with states retaining the option to adopt more stringent standards or to include other specific pollutants. On April 2, 2007, the Supreme Court found that greenhouse gases, including carbon dioxide, are air pollutants covered by the CAA; however, no NAAQS have been established for greenhouse gases.

These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those sensitive receptors most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Current NAAQS are listed in Table 2. Areas that meet the ambient air quality standards are classified as “attainment” areas while areas that do not meet these standards are classified as “non-attainment” areas.

The CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SIP is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The EPA has the responsibility to review all SIPs to determine if they conform to the requirements of the CAA.

3.2 State

3.2.1 California Clean Air Act

The federal CAA allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. The California CAA was adopted in 1988 and establishes the state’s air quality goals, planning mechanisms, regulatory strategies, and standards of progress. CARB, a part of the California EPA (CalEPA) is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California ambient air quality standards (CAAQS). CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs.

Table 2 National and California Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1] Concentration[3]	Federal Standards [2] Primary [3, 4]	Secondary [3, 5]
Ozone (O_3)	1-hour	0.09 ppm (180 μg/m^3)	--	Same as Primary Standards
	8-hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	
Respirable Particulate Matter (PM_{10})	24 Hour	50 μg/m^3	150 μg/m^3	Same as Primary Standards
	Annual Arithmetic Mean	20 μg/m	--	
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard	35 μg/m^3	Same as Primary Standards
	Annual Arithmetic Mean	12 μg/m^3	15 μg/m^3	
Carbon Monoxide (CO)	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m^3)	53 ppm (100 μg/m^3)[6]	Same as Primary Standard
	1-hour	0.18 ppm (470 mg/m^3)	100 ppb (188 μg/m^3)[6]	None
Sulfur Dioxide (SO_2)	24 Hour	0.04 ppm (105 μg/m^3)	--	--
	3 Hour	--	--	0.5 ppm (1300 μg/m^3)[7]
	1-hour	0.25 ppm (655 μg/m^3)	75 ppb (196 μg/m^3)[7]	--
Lead[8]	30 Day Average	1.5 μg/m^3	--	--
	Calendar Quarter	--	1.5 μg/m^3	Same as Primary Standard
	Rolling 3-Month Average[9]	--	0.15 μg/m^3	
Visibility Reducing Particles	8-hour	Extinction coefficient of 0.23 per kilometer - visibility of 10 miles or more due to particles.	No Federal Standards	
Sulfates	24 Hour	25 μg/m^3	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 μg/m^3)	No Federal Standards	
Vinyl Chloride[8]	24 Hour	0.01 ppm (26 μg/m^3)	No Federal Standards	

ppm = parts per million; ppb = parts per billion

(1) California standards for ozone, PM_{10}, CO, NO_2, SO_2 (1-hour and 24-hour), and visibility reducing particles are values that are not to be exceeded. The standards for sulfates, lead, hydrogen sulfide, and vinyl chloride standards are not to be equaled or exceeded.

(2) National standards, other than 1-hour ozone, 8-hour ozone, 24-hour PM_{10}, 24-hour $PM_{2.5}$, and those based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the annual fourth-highest daily maximum 8-hour concentrations is below 0.08 ppm. The 24-hour PM_{10} standard is attained when the 3-year average of the 99th percentile 24-hour concentrations is below 150 μg/m^3. The 24-hour $PM_{2.5}$ standard is attained when the 3-year average of the 98th percentile 24-hour concentrations is below 65 μg/m^3.

(3) Concentration expressed first in units in which it was promulgated. Equivalent units given in parenthesis are based on a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar). All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

(4) National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

(5) National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

(6) To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of ppb. California standards are in units of ppm. To directly compare the national standards to the California standards the units can be converted from ppb to ppm. In this case, the national standards of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.

(7) On June 2, 2010, the EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. EPA also proposed a new automated Federal Reference Method using ultraviolet technology, but will retain the older pararosaniline methods until the new methods have adequately permeated state monitoring networks. The EPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO_2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by EPA. Note that the new standard is in units of ppb. California standards are in units of ppm. To directly compare the new primary national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

(8) The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

(9) National lead standard, rolling 3-month average: final rule signed October 15, 2008.

Source: CARB 2010a.

The CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. The CARB also has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts.

In addition to standards set for the criteria pollutants, the state has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles (see Table 2); however, these are not pollutants of concern for Village 8 West because construction and operation of the proposed land uses would not result in emissions of these pollutants. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety. Further, in addition to primary and secondary CAAQS, the state has established a set of episode criteria for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, and particulate matter. These criteria refer to episode levels representing periods of short-term exposure to air pollutants that actually threaten public health.

3.2.2 Toxic Air Contaminants

The public's exposure to toxic air contaminants (TACs) is a significant public health issue in California. In 1983, the California Legislature enacted a program to identify the health effects of TACs and to reduce exposure to these contaminants to protect the public health (AB 1807: Health and Safety Code Sections 39650-39674). The Legislature established a two-step process to address the potential health effects from TACs. The first step is the risk assessment (or identification) phase. The second step is the risk management (or control) phase of the process.

Diesel-exhaust particulate matter emissions have since been established as TACs. Following the identification of diesel particulate matter as an air toxic in 1998, the CARB has worked on developing strategies and regulations aimed at reducing the risk from diesel particulate matter. The overall strategy for achieving these reductions is found in the Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel Fueled Engines and Vehicles (CARB 2000). A stated goal of the plan is to reduce the cancer risk statewide arising from exposure to diesel particulate matter by 85 percent by 2020. A number of programs and strategies to reduce diesel particulate matter that have been or are in the process of being developed include:

The Carl Moyer Program: This program, administered by the CARB, was initially approved in February 1999 and is regularly updated. The most recent program guidelines are the 2011 Carl Moyer Program Guidelines, approved in April 2011 and released in January 2012. It provides grants to private companies, public agencies, or individuals operating heavy-duty diesel engines to cover an incremental portion of the cost of cleaner on-road, off-road, marine, locomotive, and agricultural irrigation pump engines.

California Diesel Fuel Regulations: The California Diesel Fuel Regulations (13 CCR 2281-2285 and 17 CCR 93114) set limits on the aromatic hydrocarbon and sulfur content for diesel fuel marketed in California. Under these rules, starting in June 2006 in accordance with the phase-in schedule, vehicular diesel fuel must not have a sulfur content that exceeds 15 parts per million (ppm) by weight. The regulations also specify that on or after October 1, 1993, the aromatic hydrocarbon content of vehicular diesel fuel must not exceed 10 percent by volume.

On-Road Heavy-Duty Diesel New Engine Program: This program develops strategies and regulations to reduce diesel emissions from new on-road diesel-powered equipment. Emission control regulations have been coordinated with the EPA and require that new engines manufactured in and subsequent to 2004 meet new emissions requirements for particulates and other pollutants.

Heavy-Duty Diesel In-Use Strategies Program: The goal of this program is to develop and implement strategies for reducing diesel emissions from existing on and off-road diesel engines. The Retrofit Assessment section is responsible for the development and implementation of procedures for assessing, recommending, and approving emission control devices. The Retrofit Implementation section is responsible for developing plans for retrofitting on- and off-road engines with emission reducing technologies. To date plans being developed or implemented have targeted solid waste collection vehicles, on-road heavy-duty public fleet vehicles, and fuel delivery trucks. Generally these plans require that a percentage of the fleet, based on age of the vehicles, be retrofitted on a predetermined schedule.

Other programs include:

Off-Road Mobile Sources Emission Reduction Program: The goal of this program is to develop regulations to control emissions from diesel, gasoline, and alternative-fueled off-road mobile engines. These sources include a range of equipment from lawn mowers to construction equipment to locomotives.

Heavy-Duty Vehicle Inspection and Periodic Smoke Inspection Program: This program provides periodic inspections to ensure that truck and bus fleets do not emit excessive amounts of smoke.

Lower-Emission School Bus Program: Under this program, and in coordination with the California Energy Commission, the CARB is developing guidelines to provide criteria for the purchase of new school buses and the retrofit of existing school buses to reduce particulate matter emissions.

As an ongoing process, the CARB will continue to establish new programs and regulations for the control of diesel particulate emissions as appropriate. The continued development and implementation of these programs and policies will ensure that public exposure to diesel particulate matter will continue to decline.

3.2.3 California Health and Safety Code Section 41700

This section of the Health and Safety Code states that a person shall not discharge from any source whatsoever quantities of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or that endanger the comfort, repose, health, or safety of any of those persons or the public, or that cause, or have a natural tendency to cause, injury or damage to business or property. This regulation also applies to sources of objectionable odors.

3.2.4 California Building Standards Code Title 24, Part 6

Title 24, Part 6 of the California Building Standards Code regulates energy uses including space heating and cooling, hot water heating, and ventilation. The energy code allows new buildings to meet a performance standard that allows a builder to choose the most cost effective energy saving measures to meet the standard from a variety of measures including added insulation, improved HVAC systems, and more efficient water heating and lighting systems. New construction and major renovations must demonstrate their compliance with the current Energy Code through submission and approval of a Title 24 Compliance Report to the local building permit review authority and the California Energy Commission. The Code is updated periodically to incorporate and consider new energy efficiency technologies and methodologies as they become available. The most recent amendments to the Code, known as Title 24 2008, or the 2008 Energy Code, became effective January 1, 2010. At a minimum, residential buildings must achieve a 15 percent reduction in their combined space heating, cooling and water heating energy compared to the Title 24 2005 standards.

3.3 Local

3.3.1 San Diego County Regional Air Quality Strategy and State Implementation Plan

The San Diego Air Pollution Control District (SDAPCD) is the local agency responsible for the administration and enforcement of air quality regulations for San Diego County. The SDAPCD regulates most air pollutant sources, except for motor vehicles, marine vessels, aircrafts, and agricultural equipment, which are regulated by the CARB or the EPA. State and local government projects, as well as projects proposed by the private sector, are subject to SDAPCD requirements if the sources are regulated by the SDAPCD. Additionally, the SDAPCD, along with the CARB, maintains and operates ambient air quality monitoring stations at numerous locations throughout San Diego County. These stations are used to measure and monitor criteria and toxic air pollutant levels in the ambient air.

The SDAPCD and the San Diego Association of Governments (SANDAG) are responsible for developing and implementing the clean air plan for attainment and maintenance of the ambient air quality standards in the San Diego Air Basin (SDAB). The San Diego County Regional Air Quality Strategy (RAQS) was initially adopted in 1991, and is updated on a triennial basis. The RAQS was updated in 1995, 1998, 2001, 2004, and most recently in April 2009. The RAQS outlines the SDAPCD's plans and control measures designed to attain the state air quality standards for ozone. The SDAPCD has also developed the SDAB's input to the SIP, which is required under the federal CAA for pollutants that are designated as being in non-attainment of national air quality standards for the basin.

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

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

3.3.2 City of Chula Vista General Plan and Growth Management Ordinance

Included in the Chula Vista General Plan is the Growth Management Ordinance. Air quality is identified as an important part of the quality of life in Chula Vista and one of the stated policies of the element (Policy GM 4.4) adapts city regulations to meet federal and state air quality standards. In addition, the Growth Management Ordinance (Municipal Code Section 19.09.050B) requires an AQIP be prepared for all major development projects (50 dwelling units or greater) as part of the SPA Plan process. The AQIP for the project must comply with the city AQIP guidelines. Copies of AQIP Guidelines are available at the City of Chula Vista Planning and Building Department. As discussed in Section 2.0, Project Description, an AQIP has been prepared for Village 8 West, and is based on the results of this air quality technical report.

3.3.3 City of Chula Vista General Plan

Objective E 6 of the Chula Vista General Plan contains multiple policies focused on the improvement of air quality:

Objective E-6

Improve local air quality by minimizing the production and emission of air pollutants and TACs, and limit the exposure of people to such pollutants.

Policies

E 6.1: Encourage compact development featuring a mix of uses that locate residential areas within reasonable walking distance to jobs, services, and transit.

E 6.2: Promote and facilitate transit system improvements in order to increase transit use and reduce dependency on the automobile.

E 6.3: Ensure that operational procedures of the City promote clean air by maximizing the use of low- and zero-emissions equipment and vehicles.

E 6.4: Avoid siting new or re-powered energy-generation facilities and other major toxic air emitters within 1,000 feet of a sensitive receiver or placing a sensitive receiver within 1,000 feet of a major toxic emitter.

E 6.5: Ensure that plans developed to meet the City's energy demand use the least polluting strategies, wherever practical. Conservation, clean renewables, and clean distributed generation should be considered as part of the City's energy plan, along with larger natural gas-fired plants.

E 6.6: Explore incentives to promote voluntary air pollutant reductions, including incentives for developers who go above and beyond applicable requirements and for facilities and operations that are not otherwise regulated.

E 6.7: Encourage innovative energy conservation practices and air quality improvements in new development and redevelopment projects consistent with the City's AQIP Guidelines or its equivalent, pursuant to the City's Growth Management Program.

E 6.8: Support the use of alternative fuel transit, City fleet, and private vehicles in Chula Vista.

E 6.9: Discourage the use of landscaping equipment powered by two-stroke gasoline engines within the City and promote less polluting alternatives to their use.

E 6.10: The siting of new sensitive receivers within 500 feet of highways resulting from development or redevelopment projects shall require the preparation of a health risk assessment (HRA) as part of the CEQA review of the project. Attendant health risks identified in the HRA shall be feasibly mitigated to the maximum extent practicable, in accordance with CEQA, in order to help ensure that applicable federal and state standards are not exceeded.

E 6.11: Develop strategies to minimize carbon monoxide hot spots that address all modes of transportation.

E 6.12: Promote clean fuel sources that help reduce the exposure of sensitive uses to pollutants.

E 6.13: Encourage programs and infrastructure to increase the availability and usage of energy-efficient vehicles, such as hybrid electric vehicles, electric vehicles, or those that run on alternative fuels.

E 6.14: The City will implement a clean vehicle/alternative fuel program for City vehicles (except safety vehicles and equipment, when not feasible) and promote the development of infrastructure to support their use.

E 6.15: Site industries in a way that minimizes the potential impacts of poor air quality on homes, schools, hospitals, and other land uses where people congregate.

3.3.4 City of Chula Vista Green Building Ordinance

The City of Chula Vista has adopted Green Building Standards (CVMC Chapter 15.12) and Energy Efficiency Standards (CVMC Section 15.26.030) that require increased energy efficiency of 15 percent beyond the 2008 Title 24, Part 6 energy requirements. No building permit shall be issued for any project subject to the city requirements until the Building Official has determined that the plans and specifications submitted for the building permit are in compliance with the Green Building Standard and Energy Efficiency requirements.

3.3.5 Otay Ranch General Development Plan

Part II, Chapter 6, Section C of the GDP establishes goals to minimize the adverse impacts of development on air quality including creating a safe and efficient multi-modal transportation network which minimizes the number and length of single passenger vehicle trips.

Objective:

Minimize the number and length of single passenger vehicle trips to and from employment and commercial centers to achieve an average of 1.5 persons per passenger vehicle during weekday commute hours.

Policies:

- Encourage, as appropriate, alternative transportation incentives offered to employees, alternative work hour programs, alternative transportation promotional materials, information on car pool and van pool matching services, transit pass information, space for car-pool and van-pool-riders-wanted advertisements, information about transit and rail service, as well as information about bicycle facilities, routes, storage, and location of nearby shower and locker facilities.
- Promote telecommuting and teleconferencing programs and policies in employment centers.
- Establish or participate in education-based commute programs, which minimize the number and length of single passenger vehicle trips.
- Provide on-site amenities in commercial and employment centers to include childcare facilities, post offices, banking services, cafeterias/delis/restaurants, etc.

3.3.6 SDAPCD Particulate Matter Reduction Measures

In addition to the RAQS and SIP, the SDAPCD adopted the “Measures to Reduce Particulate Matter in San Diego County” report in December 2005. This report is based on particulate matter reduction measures adopted by CARB. The SDAPCD evaluated CARB's list of measures and found that the majority were already being implemented in San Diego County. As a result of the evaluation, SDAPCD proposed measures for further evaluation to reduce particulate emissions from residential wood combustion and from fugitive dust from construction sites and unpaved roads. The SDAPCD requires that construction activities implement the measures listed in Rule 55 to minimize fugitive dust emissions. Rule 55 requires the following:

1. No person shall engage in construction or demolition activity in a manner that discharges visible dust emissions into the atmosphere beyond the property line for a period or periods aggregating more than 3 minutes in any 60 minute period.

2. Visible roadway dust as a result of active operations, spillage from transport trucks, erosion, or track-out/carry-out shall be minimized by the use of any of the equally effective trackout/carry-out and erosion control measures listed in Rule 55 that apply to the project or operation. These measures include track-out grates or gravel beds at each egress point; wheel-washing at each egress during muddy conditions; soil binders, chemical soil stabilizers, geotextiles, mulching, or seeding; watering for dust control; and using secured tarps or cargo covering, watering, or treating of transported material for outbound transport trucks. Visible roadway dust must be removed at the conclusion of each work day when active operations cease, or every 24 hours for continuous operations.

3.3.7 Other APCD Rules and Regulations

The SDAPCD adopted Rule 67, Architectural Coatings, in December 2001, which establishes volatile organic compounds content limits for architectural coatings. Additionally, APCD Rule 1210 implements the public notification and risk reduction requirements of the State Air Toxics “Hot Spots” Act, and requires facilities to reduce risks to acceptable levels within five years. Rule 1200 establishes acceptable risk levels, and emission control requirements for new and modified facilities that may emit additional TACs. Rule 51 also prohibits nuisances, including objectionable odors.

4.0 Existing Conditions

4.1 Climate

Regional climate and local meteorological conditions influence ambient air quality. Village 8 West is located in the SDAB. The climate of the SDAB is dominated by a semi-permanent high pressure cell located over the Pacific Ocean. This cell influences the direction of prevailing winds (westerly to northwesterly) and maintains clear skies for much of the year. It also drives the dominant onshore circulation and helps create two types of temperature inversions, subsidence and radiation, that contribute to local air quality degradation.

Subsidence inversions occur during warmer months, as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. The boundary between the two layers of air represents a temperature inversion that traps pollutants below it. Radiation inversions typically develop on winter nights with low wind speeds, when air near the ground cools by radiation, and the air aloft remain warm. A shallow inversion layer that can trap pollutants is formed between the two layers.

In the vicinity of the project area, the nearest climatological monitoring station that provides precipitation data is located at the lower Otay Reservoir, approximately three miles east of the project site. The normal precipitation in the lower Otay Reservoir area is 11 inches annually, occurring primarily from December through March (WRCC 2011a). Temperature is recorded at the monitoring station located in the community of Bonita, north of the Otay Ranch area. The normal daily maximum temperature in Bonita is 81 degrees Fahrenheit (°F) in August, and the normal daily minimum temperature is 40 °F in December and January, according to the Western Regional Climate Center (WRCC 2011b).

4.2 Health Effects Related to Air Pollutants

Federal and state laws regulate the air pollutants emitted into the ambient air by stationary and mobile sources. These regulated air pollutants are known as “criteria air pollutants” and are categorized as primary and secondary pollutants. Primary air pollutants are those that are emitted directly from sources. Carbon monoxide, volatile organic compounds (VOCs), nitrogen oxides (NO_x), sulfur dioxide (SO_2), and most fine particulate matter including lead and fugitive dust (PM_{10} and $PM_{2.5}$) are primary air pollutants. Of these, carbon monoxide, sulfur dioxide, PM_{10}, and $PM_{2.5}$ are criteria pollutants. VOCs and nitrogen oxides are criteria pollutant precursors that go on to form secondary criteria pollutants through chemical and photochemical reactions in the atmosphere. Ozone and nitrogen dioxide are the principal secondary pollutants. Diesel particulate matter is a mixture of particles and is a component of diesel exhaust. The EPA lists diesel exhaust as a mobile source air toxic due to the cancer and non-cancer health effects associated with exposure to whole diesel exhaust.

Presented below is a description of each of the primary and secondary criteria air pollutants and their known health effects.

Carbon Monoxide is an odorless, colorless, and toxic gas. Because it is impossible to see, taste, or smell the toxic fumes, carbon monoxide can kill people before they are aware that it is in their homes. At lower levels of exposure, carbon monoxide causes mild effects that are often mistaken for the flu. These symptoms include headaches, dizziness, disorientation, nausea, and fatigue. The effects of carbon monoxide exposure can vary greatly from person to person depending on age, overall health, and the concentration and length of exposure (EPA 2010). The major sources of carbon monoxide in the SDAB are on-road vehicles, aircraft, and off-road vehicles and equipment.

Volatile Organic Compounds (VOCs) are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions. VOCs consist of non-methane hydrocarbons and oxygenated hydrocarbons. Hydrocarbons are organic compounds that contain only hydrogen and carbon atoms. Non-methane hydrocarbons are hydrocarbons that do not contain the un-reactive hydrocarbon, methane. Oxygenated hydrocarbons are hydrocarbons with oxygenated functional groups attached.

It should be noted that there are no CAAQS or NAAQS for VOCs because they are not classified as criteria pollutants. They are regulated, however, because a reduction in VOC emissions reduces certain chemical reactions that contribute to the formulation of ozone. VOCs are also transformed into organic aerosols in the atmosphere, which contribute to higher PM_{10} levels and lower visibility. Although health-based standards have not been established for VOCs, health effects can occur from exposures to high concentrations because of interference with oxygen uptake. In general, higher concentrations of VOCs are suspected to cause eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to the liver, kidneys, and central nervous system (EPA 1999).

The major sources of VOCs in the SDAB are on-road motor vehicles and solvent evaporation. Benzene, a VOC and known carcinogen, is emitted into the air from gasoline service stations (fuel evaporation), motor vehicle exhaust, tobacco smoke, and from burning oil and coal. Benzene is also sometimes used as a solvent for paints, inks, oils, waxes, plastic, and rubber. It is used in the extraction of oils from seeds and nuts. It is also used in the manufacture of detergents, explosives, dyestuffs, and pharmaceuticals. Short-term (acute) exposure of high doses of benzene from inhalation may cause dizziness, drowsiness, headaches, eye irritation, skin irritation, and respiratory tract irritation. At higher levels, unconsciousness can occur. Long-term (chronic) occupational exposure of high doses by inhalation has caused blood disorders, including aplastic anemia and lower levels of red blood cells (EPA 1999).

Nitrogen Oxides (NO_x) are a byproduct of fuel combustion and serve as integral components in the process of photochemical smog production. The two major forms of nitrogen oxides are nitric oxide and nitrogen dioxide (NO_2). Nitric oxide is a colorless, odorless gas formed from atmospheric nitrogen and oxygen when combustion takes place under high temperature and/or high pressure. Nitrogen dioxide is a reddish-brown, irritating gas formed by the combination of nitric oxide and oxygen. Nitrogen oxides act as an acute respiratory irritant and increases susceptibility to respiratory pathogens. Nitrogen oxides are also an ozone precursor. A precursor is a directly emitted air contaminant that, when released into the atmosphere, forms, causes to be formed, or contributes to the formation of a secondary air contaminant for which a NAAQS has been adopted, or whose presence in the atmosphere will contribute to the violation of one or more NAAQS. When nitrogen oxide and VOCs are released in the atmosphere, they chemically react with one another in the presence of sunlight to form ozone. While the EPA's NAAQS covers this entire family, nitrogen dioxide is the component of greatest interest and the indicator for the larger group of nitrogen oxides.

Ozone is one of a number of substances called photochemical oxidants that are formed when VOCs and nitrogen oxides (both byproducts of the internal combustion engine) react with sunlight. Ozone is present in relatively high concentrations in the SDAB, and the damaging effects of photochemical smog are generally related to ozone concentrations. Ozone may pose a health threat to those who already suffer from respiratory diseases as well as healthy people. Additionally, ozone has been tied to crop damage, typically in the form of stunted growth and pre-mature death. Ozone can also act as a corrosive, resulting in property damage such as the embitterment of rubber products.

Lead (Pb) is a solid heavy metal that can exist in air pollution as an aerosol particle component. An aerosol is a collection of solid, liquid, or mixed-phase particles suspended in the air. Lead was first regulated as an air pollutant in 1976. Leaded gasoline was first marketed in 1923 and was used in motor vehicles until around 1970. The exclusion of lead from gasoline helped to decrease emissions of lead in the United States from 219,000 to 4,000 tons per year between 1970 and 1997. Even though leaded gasoline has been phased out in most countries, some, such as Egypt and Iraq, still use at least some leaded gasoline (United Nations Environment Programme 2010). Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and physical weathering of surfaces containing lead. The mechanisms by which lead can be removed from the atmosphere (sinks) include deposition to soils, ice caps, oceans, and inhalation.

Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. The more serious effects of lead poisoning include behavioral disorders, mental retardation, and neurological impairment. Low levels of lead in fetuses and young children can result in nervous system damage, which can cause learning deficiencies and low intelligence quotients. Lead may also contribute to high blood pressure and heart disease. Lead concentrations once exceeded the state and national air quality standards by a wide margin but have not exceeded these standards at any regular monitoring station since 1982. Lead is no longer an additive to normal gasoline, which is the main reason that concentration of lead in the air is now much lower. The project would not emit lead; therefore, lead has been eliminated from further review in this analysis.

Sulfur Dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfuric acid is formed from sulfur dioxide and is an aerosol particle component that may lead to acid deposition. Acid deposition into water, vegetation, soil, or other materials can harm natural resources and materials. Sulfur oxides include sulfur dioxide and sulfur trioxide. Although sulfur dioxide concentrations have been reduced to levels well below state and national standards, further reductions are desirable because sulfur dioxide is a precursor to sulfates. Sulfates are a particulate formed through the photochemical oxidation of sulfur dioxide. Long-term exposure to high levels of sulfur dioxide can cause irritation of existing cardiovascular disease, respiratory illness, and changes in the defenses in the lungs. When people with asthma are exposed to high levels of sulfur dioxide for short periods of time during moderate activity, effects may include wheezing, chest tightness, or shortness of breath.

Particulate Matter consists of finely divided solids or liquids such as soot, dust, aerosols, fumes, and mists. Two forms of fine particulate, also known as fugitive dust, are now recognized. Course particles (PM_{10}) include that portion of the particulate matter with an aerodynamic diameter of 10 microns (i.e., 10 one-millionths of a meter or 0.0004 inch) or less. Fine particles ($PM_{2.5}$) have an aerodynamic diameter of 2.5 microns, that is 2.5 one-millionths of a meter or 0.0001 inch or less. Particulate discharge into the atmosphere results primarily from industrial, agricultural, construction, and transportation activities; however, wind action on the arid landscape also contributes substantially to the local particulate loading. Both PM_{10} and $PM_{2.5}$ may adversely affect the human respiratory system, especially in those people who are naturally sensitive or susceptible to breathing problems.

Fugitive dust poses primarily two public health and safety concerns. The first concern is that of respiratory problems attributable to the suspended particulates in the air. The second concern is that of motor vehicle accidents caused by reduced visibility during severe wind conditions. Fugitive dust may also cause significant property damage during strong windstorms by acting as an abrasive material agent (similar to sandblasting activities). Finally, fugitive dust can result in a nuisance factor due to the soiling of proximate structures and vehicles.

Diesel particulate matter is a mixture of many exhaust particles and gases that is produced when an engine burns diesel fuel. Many compounds found in diesel exhaust are carcinogenic, including 16 that are classified as possibly carcinogenic by the International Agency for Research on Cancer. Diesel particulate matter includes the particle-phase constituents in diesel exhaust. Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation and exposure can cause coughs, headaches, light-headedness, and nausea. Diesel exhaust is a major source of ambient fugitive dust pollution as well, and numerous studies have linked elevated fugitive dust levels in the air to increased hospital admission, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems (OEHHA 2001). Diesel particulate matter in the SDAB poses the greatest cancer risk of all the toxic air pollutants.

4.3 Ambient Air Pollutant Levels

The SDAPCD operates a network of ambient air monitoring stations throughout San Diego County. The purpose of the monitoring stations is to measure ambient concentrations of air pollutants and determine whether the ambient air quality meets the NAAQS and the CAAQS. The closest ambient monitoring station is the Otay Mesa Station, approximately four miles from the project site. However, this station is located in a heavy industrial area that does not accurately reflect the existing conditions in the project area. The next closest station is the Chula Vista station, located approximately five miles from the project site, which better represents the development in surrounding areas. Table 3 presents a summary of the ambient pollutant concentrations monitored at the Chula Vista station during the last three years (2008 through 2010).

Table 3 Air Quality Monitoring Data

Pollutant	Monitoring Station	2008	2009	2010
Carbon Monoxide (CO)				
Maximum 8-hour concentration (ppm)	Chula Vista	1.87	1.43	1.56
Days above state or federal standard (>9.0 ppm)		0	0	0
Nitrogen Dioxide (NO_2)				
Peak 1-hour concentration (ppm)	Chula Vista	0.072	0.065	0.050
Days above state 1-hour standard (0.18 ppm)		0	0	0
Ozone (O_3)				
Maximum 1-hour concentration (ppm)	Chula Vista	0.107	0.098	0.107
Days above 1-hour state standard (>0.09 ppm)		1	1	1
Maximum 8-hour concentration (ppm)		0.084	0.075	0.083
Days above 8-hour state standard (>0.07 ppm)		4	3	3
Days above 8-hour federal standard (>0.075 ppm)		3	0	2
Sulfur Dioxide (SO_2)				
Maximum 24-hour concentration (ppm)	Chula Vista	0.004	0.003	0.002
Days above 24-hour state standard (>0.04 ppm)		0	0	0
Days above 24-hour federal standard (>0.14 ppm)		0	0	0
Respirable Particulate Matter (PM_{10})				
Peak 24-hour concentration ($\mu g/m^3$)	Chula Vista	54	58	45
Days above state standard (>50 $\mu g/m^3$)		1	2	0
Days above federal standard (>150 $\mu g/m^3$)		0	0	0
Fine Particulate Matter ($PM_{2.5}$)				
Peak 24-hour concentration ($\mu g/m^3$)	Chula Vista	32.9	43.7	22.7
Days above federal standard (>35 $\mu g/m^3$)		0	1	0
ppm = parts per million, $\mu g/m^3$ = micrograms per cubic meter Source: CARB 2011				

As shown in Table 3, the 1-hour ozone concentration exceeded the state standard once per year between 2008 and 2010. The 8-hour ozone concentration exceeded the state standard in 2008, 2009, and 2010, and the federal standard in 2008 and 2010. The daily PM_{10} concentration exceeded the state standard in 2008 and 2009, but not in 2010. The federal standard was not exceeded during this period. The federal 24-hour $PM_{2.5}$ standard was violated once in 2009 but not in 2008 or 2010.

Neither the state nor federal standards for carbon monoxide, nitrogen dioxide, or sulfur dioxide were exceeded at any time during the years 2008 through 2010. The federal annual average nitrogen dioxide standard has not been exceeded since 1978 and the California 1-hour standard has not been exceeded since 1988 (SDAPCD 2007a). With one exception during October 2003, the SDAB has not violated the state or federal standards for carbon monoxide since 1990 (SDAPCD 2007a).

4.4 Attainment Status

The classifications for ozone non-attainment range in magnitude from marginal, moderate, serious, severe, and extreme. A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment. The SDAB federal and state attainment status is shown in Table 4. The SDAB is currently designated as a non-attainment area for the state standard for PM_{10}, $PM_{2.5}$, 1-Hour and 8-Hour ozone, and the Federal 8-Hour Standard for ozone.

Table 4 Attainment Status for the San Diego Air Basin

Pollutant	State Status	Federal Status
Carbon Monoxide (CO)	Attainment	Attainment
Nitrogen Dioxide (NO_2)	Attainment	Attainment
Ozone (1-hour)	Serious Non-attainment	--[1]
Ozone (8-hour)	Serious Non-Attainment	Non-attainment
Lead (Pb)	Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Respirable Particulate Matter (PM_{10})	Non-attainment	Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Non-attainment	Attainment\Unclassified

(1) The federal 1-hour ozone standard was revoked in 2005 and is no longer in effect for California.
Source: CARB 2011, EPA 2011

4.5 Sensitive Receptors and Locations

CARB defines sensitive receptors as residences, schools, day care centers, playgrounds, and medical facilities, or other facilities that may house individuals with health conditions that would be adversely affected by changes in air quality. The project site is currently undeveloped and no sensitive receptors are located on the site. The sensitive receptors closest to the project site include the following:

1. Olympian High School, approximately 100 feet east of the northeast corner of the project site;
2. Wolf Canyon Elementary school, approximately 875 feet (0.2 mile) northeast of the project site;
3. Residences located approximately 1,500 feet (0.3 mile) northeast of the project site; and
4. Residences located 1,750 feet (0.3 mile) north of the project site.

5.0 Methodology and Significance Criteria

5.1 Methodology

5.1.1 Construction

Regional impacts for construction are assessed using the Urban Emissions Model (URBEMIS 2007, version 9.2.4) distributed by the CARB. The URBEMIS 2007 model uses EMFAC 2007 emission factors for vehicle traffic and Off-Road 2007 for construction equipment. The construction analysis included modeling of the projected construction equipment that would be used during each construction activity and quantities of earth and debris to be moved. The analysis assessed maximum daily emissions from individual construction activities, including site grading, paving, and building construction, as well as simultaneous construction phases. Construction activities, scheduling, grading quantities, and the construction equipment list (including size of equipment engines and load factor) were provided by the project applicant. Project development would be constructed in sequential phases starting in 2013, and to be conservative, the most intensive development phase was used for the worst-case daily construction emissions. A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

5.1.2 Operation

Operational impacts are also assessed using the URBEMIS 2007 model. The model estimates daily regional emissions from vehicle and stationary sources of pollutants that would result from implementation of the project at full buildout. Mobile source emissions were calculated using an average daily trip (ADT) estimate of 26,104 trips provided by the project's traffic consultant and the estimated vehicle trip length for Village 8 West of 4.62 miles that was determined in conjunction with SANDAG (RBF 2013). Area sources of air emissions include natural gas combustion from water and space heating, landscape equipment, consumer products, and architectural coatings. All air quality modeling output files are provided in Appendix A of this report.

5.1.3 TAC Impacts to Sensitive Receptors

Potential impacts related to the emission of TAC from stationary sources are evaluated using the siting distances in the CARB's Air Quality and Land Use Handbook. The handbook lists common sources of TAC emission and recommends minimum distances for siting sensitive receptors away from each source. Localized carbon monoxide concentrations are evaluated by using the CALINE4 microscale dispersion model, in accordance with the Caltrans Transportation Project-Level Carbon Monoxide Protocol, in combination with EMFAC 2007 emission factors. Carbon monoxide concentrations were estimated for the Existing + Project scenario, as well as three interim scenarios (2015, 2020, 2025) and full project buildout (2030), based on intersection analysis found in the project traffic report (RBF 2013). CALINE4 modeling output files are provided in Appendix A of this report.

5.1.4 Odor Impacts

Potential odor impacts are evaluated by conducting a qualitative screening-level analysis, consisting of reviewing the proposed project's site plan and project description to identify any new or modified odor sources. If the project introduces a new odor source, or modifies an existing odor source, then downwind sensitive receptor locations are identified and odor control measures recommended if necessary to minimize potential impacts.

5.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines, an impact would be considered significant if the proposed project would violate any air quality standard or contribute substantially to an existing or projected air quality violation. The City of Chula Vista has not established specific numeric thresholds related to criteria air pollutants. The City relies on the significance thresholds established by the South Coast Air Quality Management District (SCAQMD). For this analysis, the calculated emissions of the project are compared to the SCAQMD thresholds of significance for criteria pollutants for individual projects, provided in Table 5. If the thresholds are exceeded by a proposed project, then the impact is considered significant.

Based on Appendix G of the CEQA Guidelines, a project would result in a potentially significant impact if it would expose sensitive receptors to substantial pollutant concentrations.

Based on Appendix G of the CEQA Guidelines, a project would result in a potentially significant impact if it would create objectionable odors affecting a substantial number of people.

Based on Appendix G of the CEQA Guidelines, an impact related to consistency with applicable air quality plans would be considered significant if implementation of the proposed project would result in a conflict with, or obstruct implementation of, the RAQS or SIP.

Table 5 SCAQMD Thresholds of Significance

Pollutant	Construction Emissions (pounds/day)	Operation Emissions (pounds/day)
Carbon Monoxide (CO)	550	550
Reactive organic gases (ROG)[(1)]	75	55
Nitrogen Oxides (NO_x)	100	55
Sulfur Oxides (SO_x)	150	150
Respirable Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55

[(1)] Reactive organic gases are also sometimes referred to as volatile organic compounds (VOCs).
Source: SCAQMD 2010

6.0 Impact Analysis and Mitigation Measures

6.1 Issue 1: Conformance to Federal and State Ambient Air Quality Standards

6.1.1 Impact Analysis

This section addresses the potential for the project to generate air pollutant emissions that exceed ambient air quality standards. Construction and operational criteria air pollutant emissions that would be generated by implementation of the project are discussed below.

Construction

The air quality technical report prepared for the 2013 GPA/GDPA SEIR determined that potential impacts related to construction would be less than significant because development would be required to comply with standard dust minimizing practices. However, construction emissions and estimated emission reductions from the BMPs were not quantified because the timing of future development and the specific construction details could not have been known at the programmatic level. For these reasons, the 2013 GPA/GDPA SEIR air quality report does not quantify the potential impacts of construction of the Village 8 West SPA Plan and TM. Additionally, the report does not provide the construction assumptions used to determine the potential impacts of construction of the Village 8 West SPA project. Therefore, this project-specific analysis was conducted to estimate the criteria pollutant emissions that would result from construction of the project.

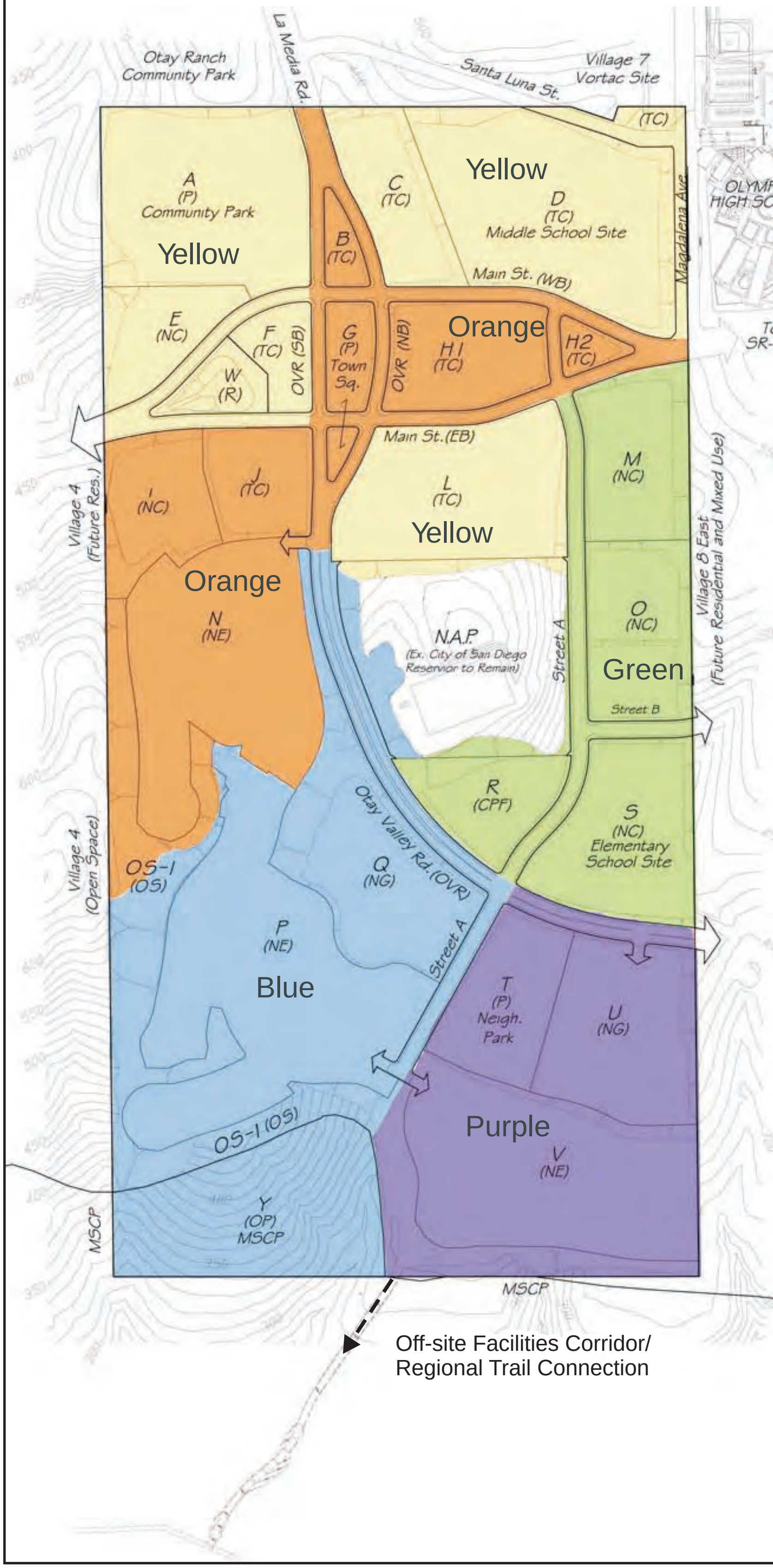
Air pollutant emission sources during project construction would include exhaust and particulate emissions generated from construction equipment; fugitive dust from soil disturbance during site preparation, grading, and excavation activities; and volatile compounds that evaporate during site paving and painting of the structures. The project site is approximately 300 acres; however, only 261 acres of the site would be disturbed by onsite construction. The remaining onsite area consists of areas designated for open space. An additional 1.95 acres would be disturbed for installation of the offsite improvements and 4.57 acres would be graded on the City of San Diego reservoir property, for a total disturbance area of approximately 268 acres.

Development within Village 8 West would include single-family residences, multi-family residences, mixed-use commercial development, a community purpose facility, a middle school, and elementary school, and parks. Construction would occur in sequential development phases, and take a minimum of eight years to complete, although full buildout of the project is not expected until 2030. For the purposes of modeling the worst-case daily construction scenario for one phase, the analysis years used for construction were 2013-2015. This is conservative because increasingly stringent air quality regulations on construction equipment would result in fewer emissions in later years. Village 8 West would be constructed in five development phases, as shown in Figure 4, and would include the following components:

- The **Orange** phase would develop a maximum of 351 multi-family residential units, 117 single-family units, a town square, and 174,000 SF of commercial space in primarily the western portion of the project site.
- The **Blue** phase would develop a maximum of 284 single-family residential units in the southwestern area of the project site.
- The **Yellow** phase would include a maximum of 765 multi-family units, 126,000 SF of commercial land use, a community park, and a middle school in the northern portion of the project site.
- The **Purple** phase would develop a maximum of 220 single-family residential units and a neighborhood park in the southeast portion of the project site.
- The **Green** phase would develop 313 multi-family residences, a community purpose facility, and an elementary school in the eastern portion of the project site.

The sequencing of phases would be determined by market conditions. However, it is assumed that the Orange and Blue phases would be constructed prior to the Yellow, Green, and Purple phases because the Orange and Blue phases require blasting.

Each phase of project development would include the following construction activities: mass grading, trenching for utilities and underground improvements, paving and surface improvement, building construction, and exterior architectural coating, as shown in Table 6. The offsite improvements would also require grading, trenching, and paving. For the purpose of isolating emissions from each type of construction activity, it is assumed that the construction activities within one development phase would occur consecutively, with no overlap. However, approximately nine months prior to completion of one development phase, grading could potentially begin for the next phase. Any of the construction activities in subsequent development phases would have the potential to overlap with the building construction activities of the previous phase.



Plan Area	Target Units	C'ml Sq. Ft (K)
Orange		
B	35	0
G (Town Sq.)	0	0
H1	33	144
H2	0	12
I	122	0
J	161	18
N	117	0
Subtotal	**468**	**174**
Blue		
P	124	0
Q	160	0
Subtotal	**284**	**0**
Yellow		
A (Comm. Park)	0	0
C	156	36
D (Mid. Sch'l)	0	0
E	95	0
F	54	25
L	460	65
Subtotal	**765**	**126**
Purple		
T (Neigh Park)	0	0
U	130	0
V	90	0
Subtotal	**220**	**0**
Green		
M	153	0
O	160	0
R (CPF)	0	0
S (Elem. Sch'l)	0	0
Subtotal	**313**	**0**
Total	**2,050**	**300**

Note: Village 8 West is generally planned to develop from north to south; however, the sequencing of development phases would be determined by market conditions and the PFFP.

Source: William Hezmalhalch Architects, Inc. 2012

0 400 800
Feet

N

DEVELOPMENT PHASES
FIGURE 4

Table 6 Approximate Duration of Project Construction Activities Per Development Phase

Construction Activity	Duration
Mass Grading	3 months
Trenching	2 months
Surface Improvements	2 months
Building Construction and Coating	2 years

Grading in each phase would occur over a three month period. The phases are generally similar in area; therefore, it assumed than the same amount of grading would occur in each phase. This analysis assumes that a limit of 20 acres per day would be disturbed and/or graded. A total of 4.7 million cubic yards would be graded as a result of the project and replaced within the disturbance area, or 940,000 cubic yards in each phase. It is assumed that a maximum of 35,000 cubic yards of material would be graded each day. All cut material would be used on site and no hauling of material off site would be required. The Orange and Blue phases of construction would involve blasting during the grading operations and would require additional construction equipment compared to the Yellow, Green, and Purple phases, including a rock drill, crushing unit, and rock spread. Use of this equipment is included in the daily emission calculation for the grading activity. Typical grading equipment that would be used for grading in all phases would include tractors, excavators, graders, and water trucks.

Approximately two months would be required for installation of the utilities in each phase. The most intensive utility installation activity that would require heavy equipment is trenching. Trenching activities would typically require excavators, dump trucks, dozers, backhoes, and water trucks. Paving and surface improvements would be required for approximately 12 percent of the project area (31 acres). Approximately six acres would be paved during each phase and would be accomplished in approximately two months. Approximately two acres would be required for the offsite improvements during one phase of development. A maximum of approximately 8 acres would be paved during one phase. Typical construction equipment required for paving would include graders, pavers, and rollers. Because building construction within Village 8 West would be completed by multiple developers, multiple areas of the site may be under construction at one time. Building construction activities are estimated to last a minimum of approximately two years and would typically require dump trucks, concrete trucks, excavators, backhoes, and water trucks. It is assumed that architectural coating activities would occur simultaneously with the building construction activities; therefore, the coating activities would also last approximately two years. The Yellow phase is projected to require the most and greatest diversity of development, including the highest number of residential units, almost one half of the proposed commercial development, the largest proposed recreational use, and a middle school. Therefore, the land uses proposed in the Yellow phase were used to determine maximum daily emissions from architectural coating and building construction. Construction of the offsite improvements is also included in the worst-case construction scenario. The URBEMIS 2007 model does not take into account the additional construction standards adopted by the CARB after 2007. For example, beginning in 2008, heavy-duty diesel engines were required to be shut down when idling more than five minutes at any location within California. Therefore, actual project emissions may be less than calculated by the URBEMIS 2007 model.

Table 7 summarizes the maximum daily emissions of grading (assuming a maximum of 20 acres per day), trenching, paving, construction, and coating in comparison with the thresholds of significance (as mentioned earlier, the Yellow phase was chosen as the basis for the worst case daily emissions). As shown in Table 7, when considering the typical scenario of each construction phase occurring consecutively with no overlap, project related emissions would be below the significance thresholds during the underground utility (trenching) and building construction and coating activities. Construction of the project would exceed the significance thresholds for nitrogen oxides, PM_{10}, and $PM_{2.5}$ during grading, and the nitrogen oxide threshold during surface improvements (paving). Impacts to air quality resulting from grading and surface improvement activities during each development phase would be potentially significant.

Additionally, any of the construction activities of a subsequent development phase would have the potential to overlap with building construction activities in the previous development phase. For example, if the Blue phase is constructed after the Orange phase, the earlier construction activities, such as grading, in the Blue phase would potentially overlap with the later construction activities, such as building construction and architectural coating in the Orange phase. Although it is unlikely, it is possible that all four categories of construction activities could occur simultaneously on the site within different development phases. To estimate this worst-case scenario, Table 7 provides the total amount of emissions that would occur if all types of construction activities occur simultaneously on one day. Since other development phases would be less intensive than the Yellow phase, the total emissions shown in Table 7 represent a conservative estimate.

As indicated by the maximum combined daily emissions provided in Table 7, simultaneous construction activities would combine to exceed the significance thresholds for VOCs, nitrogen oxides, PM_{10}, and $PM_{2.5}$ emissions. Therefore, simultaneous construction activities between development phases would potentially worsen significant impacts during construction.

The blasting operations in the Orange and Blue phases would also generate fugitive dust. The URBEMIS 2007 model takes into account emissions from construction equipment required for blasting, but does not include particulate emissions that would result from use of explosives. Therefore, fugitive dust emissions during grading of the Orange and Blue phases would be higher than estimated on the days that blasting occurs. However, blasting activities would only occur on a few days. Additionally, the project would result in significant particulate matter emissions during grading with or without blasting; therefore, mitigation is already required to minimize dust. However, because blasting would contribute to the potentially significant particulate matter impact from grading activities on the days that it would occur, specific dust-minimizing measures to be applied during blasting activities would be required.

Dust from construction activities would also have the potential to impact sensitive biological resources in the Multiple Species Conservation Program (MSCP) Preserve area to the south of the project area. Dust has the potential to disrupt plant vitality in the short-term. Potential impacts to the MSCP Preserve would primarily result from construction of the offsite improvements and the single-family residences near the southern area of the site. Impacts would cease once construction is complete. However, the Biological Resources Report prepared for Village 8 West (URS 2012) determined that potential indirect impacts to biological resources, including dust from construction, would be potentially significant.

Table 7 Maximum Daily Emissions Per Construction Activity

Construction Activity	Pollutant Emissions (pounds/day)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Mass Grading(1)	174	44	**379**	0	**4,345**	**918**
Trenching(2)	22	6	51	0	2	2
Surface Improvements (paving)(3)	52	15	**121**	0	5	4
Building Construction and Coating Phases(4)	161	36	81	0	4	3
Combined Daily Total for all Construction Activities	409	**101**	**632**	0	**4,356**	**927**
Significance Threshold	550	75	100	150	150	55
Significant Impact?	No	**Yes**	**Yes**	No	**Yes**	**Yes**

Bold = exceeds significance threshold
CO = carbon monoxide; VOC = volatile organic compound; NO_x = nitrogen oxides; SO_x = sulfur oxides;
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Modeling assumptions: Emissions are based on assumptions for the Yellow development phase, plus additional equipment added to account for blasting within the Blue and Orange phases, and offsite improvements. Worst-case construction activities for the Yellow development phases were assumed to occur during 2013-2015.
(1) Assumes a three month period and a maximum land disturbance of 20 acres per day. A total of approximately 268 acres would be disturbed over five development phases. A total of 4.7 million cubic yards would be graded and replaced within the disturbance area, or 940,000 cubic yards in each phase. All cut material would be used on site and no hauling of material off site would be required. Equipment list for grading includes an excavator, two graders, four heavy duty trucks, five dozers, 12 scrapers, and two water trucks. A drill rig, crushing unit, and tractor would be required for blasting in the Orange and Blue phases and are included in the modeled equipment list.
(2) Assumes a two month period. Equipment list includes two excavators, two dump trucks, a dozer, two backhoes, and a water truck.
(3) Assumes a two month period. Paving and surface improvements would be required for approximately 12 percent of the SPA area (31 acres), or six acres per phase. Assumes an additional two acres for offsite improvements. Equipment list includes a grader, a paver, a roller, and 27 dump trucks and concrete trucks.
(4) Assumes a two year period and architectural coating activities would occur simultaneously with the building construction activities. Assumes building construction would require a total of 11 dump trucks and concrete trucks, an excavator, a backhoe, and a water truck. Calculations are based on the Yellow phase, which includes development of 765 multi-family units, 126,000 SF of commercial land use, a community park, and a middle school. Assumes model defaults for low VOC coating (250 grams of VOC per liter or less).
Source: URBEMIS 2007. See Appendix A for data sheets.

Operation

To estimate the most conservative estimate for operational air quality emissions, the project assumptions for the full buildout year (2030) were used in the analysis. The full buildout condition represents the greatest amount of vehicle trips and land use development. The major source of long-term operational air quality impacts from the project would be emissions produced from project-generated vehicle trips. Vehicle trip generation is based on the project traffic study, which was prepared by RBF Consulting (2013). The projected ADT rate for the project is 26,104 trips. The vehicle trip emissions account for internal capture from mixed-use development and the reduction in vehicle trips compared to similar developments that do not provide access to transit. Two bus stops are proposed in the Village 8 West Town Center, one along west-bound Main Street and one along east-bound Main Street. The projected ADT also takes into account the Transportation Demand Management (TDM) program included in the SPA Plan. The TDM includes strategies to reduce vehicle trips and miles traveled and to design a multi-modal transportation system, and establishes a Transportation Management Association to provide transportation services in a particular area to reduce vehicle miles and implement other TDM strategies. Pollutant emissions from vehicles were calculated using the EMFAC 2007 emission factors that are used in URBEMIS 2007.

In addition to vehicle trips, the project would emit pollutants from on-site area sources, such as burning natural gas for space and water heating, including fireplaces; landscape maintenance equipment; consumer products; and periodic repainting of interior and exterior surfaces (architectural coatings). The area source assumptions include a 15 percent increased efficiency beyond the URBEMIS default Title 24 standards (2005) to reflect the 2008 Title 24 standards. This assumption is conservative because required compliance with the Chula Vista Green Building Standards (CVMC Chapter 15.12) and Energy Efficiency Standards (CVMC Section 15.26.030) would improve energy efficiency beyond the 2008 Title 24 standards.

The vehicular and area source emissions associated with operation of the project are summarized in Table 8. As shown, the project would exceed the daily regional thresholds for VOCs, nitrogen oxides, and PM_{10} during operation of the development in Village 8 West. Therefore, a significant impact would occur. The air quality technical report for the 2013 GPA/GDPA SEIR estimated emissions that would result from the increase in building potential accommodated by the GPA/GDPA compared to the previous GDP, including the increase in building potential in Village 8 West. The findings in this report are consistent with the 2013 GPA/GDPA SEIR conclusion that significant impacts would occur.

Table 8 Operation Maximum Daily Emissions

Emissions Source	Pollutant Emissions (pounds/ day)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Vehicular Sources (1)	368	40	31	1	**201**	39
Area Sources						
Natural Gas (2)	20	3	34	0	0	0
Hearth (fireplaces)(3)	1	0	4	0	0	0
Landscape	38	6	0	0	0	0
Consumer Products	0	**105**	0	0	0	0
Architectural Coatings(4)	0	15	0	0	0	0
Total Emissions	427	**169**	**69**	1	**201**	39
Significance Thresholds	550	55	55	150	150	55
Significant Impact?	No	**Yes**	**Yes**	No	**Yes**	No

Bold = exceeds significance threshold
CO = carbon monoxide; VOC = volatile organic compounds; NO_x = nitrogen oxides; SO_x = sulfur oxides;
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Modeling assumptions: Calculations assume the full development of project at buildout (2030). Output is for summer emissions, with the exception of hearth emissions, where winter emissions were added to the daily emissions for a worst-case condition. Other assumptions include:

(1) Based on an ADT of 26,104 trips and an estimated vehicle trip length of 4.62 miles, which accounts for internal capture from mixed-use development, the reduction in vehicle trips compared to similar developments that do not provide access to transit, and the TDM program in the SPA Plan. A four percent vehicular emission reduction for VOC, NOx, CO, and PM_{10} emissions was applied for traffic light synchronization based on the SCAQMD CEQA Air Quality Handbook (1993).

(2) Assumes buildings comply with 15% above 2005 Title 24 standards.

(3) Assumes 15 percent of homes would have fireplaces, consistent with assumptions of the GPA/GDPA SEIR. No wood burning fireplaces would be allowed.

(4) Includes the use of low VOC coatings (250 grams of VOC per liter or less).

Source: URBEMIS 2007. See Appendix A for data sheets.

6.1.2 Mitigation Measures

Construction

Mitigation measure Air-1 below is from the Otay Ranch GDP Final Program EIR (EIR 90-01) (Ogden 1992), and mitigation measure Air-2 is from the 2013 GPA/GDPA SEIR (SEIR 09-01). These measures and project-specific measure Air-3 would reduce impacts related to emissions of nitrogen oxides, PM_{10}, and $PM_{2.5}$ during construction. Mitigation measure Air-1 lists the BMPs recommended in the Otay Ranch GDP Final Program EIR to reduce construction emissions. Mitigation measure Air-2 lists the BMPs recommended in the 2005 General Plan Update EIR and the 2013 GPA/GDPA SEIR for reducing fugitive dust emissions during grading. Mitigation measure Air-3 includes additional project-specific measures to reduce nitrogen oxides, PM_{10}, and $PM_{2.5}$ emissions during all construction activities. These measures would also minimize potential indirect impacts to sensitive biological resources from dust. Future construction activities would also be required to comply with SDAPCD Rule 55 requirements for grading and the SDAPCD Rule 67 requirements for low VOC coatings.

Air-1 **Short-term Air Quality Violations Reduction Measures.** The following techniques to reduce construction emissions shall be implemented during all construction activities:

1. Minimize simultaneous operation of multiple construction equipment units (i.e., phase construction to minimize impacts)
2. Use low pollutant-emitting construction equipment
3. Use electrical construction equipment as practical
4. Use catalytic reduction for gasoline-powered equipment
5. Use injection timing retard for diesel-powered equipment
6. Water the construction area twice daily to minimize fugitive dust
7. Stabilize (for example hydroseed) graded areas as quickly as possible to minimize fugitive dust
8. Pave permanent roads as quickly as possible to minimize dust

Air-2 **Dust Control Measures.** Mitigation of PM_{10} impacts requires active dust control during construction. As a matter of standard practice, the City of Chula Vista shall require the following standard construction measures be included on all grading plans to the satisfaction of the City Engineer, and shall be implemented during construction to the extent applicable:

1. All unpaved construction areas shall be sprinkled with water or other acceptable San Diego APCD dust control agents twice daily during dust-generating activities to reduce dust emissions. Additional watering or acceptable APCD dust control agents shall be applied during dry weather or on windy days until dust emissions are not visible.
2. Trucks hauling dirt and debris shall be properly covered to reduce windblown dust and spills.
3. A 20-mile-per-hour speed limit on unpaved surfaces shall be enforced.
4. On dry days, dirt and debris spilled onto paved surfaces shall be swept up immediately to reduce re-suspension of particulate matter caused by vehicle movement. Approach

routes to construction sites shall be cleaned daily of construction-related dirt in dry weather.

5. On-site stockpiles of excavated material shall be covered or watered.
6. Disturbed areas shall be hydroseeded, landscaped, or developed as quickly as possible and as directed by the city and/or APCD to reduce dust generation.
7. To the maximum extent feasible:
   i. Heavy-duty construction equipment with modified combustion/fuel injection systems for emissions control shall be utilized during grading and construction activities.
   ii. Catalytic reduction for gasoline-powered equipment shall be used.
8. Equip construction equipment with pre-chamber diesel engines (or equivalent) together with proper maintenance and operation to reduce emissions of nitrogen oxides, to the extent available and feasible.
9. Electrical construction equipment shall be used to the extent feasible.
10. The simultaneous operations of multiple construction equipment units shall be minimized (i.e., phase construction to minimize impacts).

Air-3 **Construction Best Management Practices**. During all construction activities for the project, the project applicant shall ensure implementation of the following BMPs to reduce the emissions of nitrogen oxides and fugitive dust (PM_{10} and $PM_{2.5}$). Prior to issuance of a grading permit, the following best management practices shall be included on all grading plans to the satisfaction of the City Engineer and shall be implemented during construction to the extent applicable:

1. All construction equipment shall be outfitted with best available control technology devices certified by CARB. A copy of each unit's best available control technology documentation shall be provided at the time of mobilization of each applicable unit of equipment.
2. Approach routes to the site shall be cleaned daily of construction-related dirt.
3. Apply chemical stabilizer or pave the last 100 feet of internal travel path within the construction site prior to public road entry.
4. Install wheel washers or rumble plates adjacent to a paved apron prior to any vehicle entry on public roads.
5. Remove any visible track-out into traveled public streets within 30 minutes of occurrence.
6. Wet wash the construction access point at the end of each workday if any vehicle travel on unpaved surfaces has occurred.
7. Provide sufficient perimeter erosion control to prevent washout of silty material onto public roads.
8. General contractors shall maintain and operate construction equipment so as to minimize exhaust emissions. During construction, trucks and vehicles in loading and unloading queues should turn their engines off when not in use to reduce vehicle

emissions. Construction emissions should be phased and scheduled to avoid emissions peaks and shall be discontinued during second stage smog alerts.

9. During construction, site grading activities within 500 feet of a school in operation shall be discontinued or all exposed surfaces shall be watered to minimize dust transport off-site to the maximum degree feasible, when the wind velocity is greater than 15 miles per hour in the direction of the school.
10. During blasting, utilize control measures to minimize fugitive dust. Control measures may include, but are not limited to, blast enclosures, vacuum blasters, drapes, water curtains, or wet blasting.

Operation

The Otay Ranch GDP Final Program EIR includes land use policies, siting/design policies, and transportation-related management actions to mitigate operational emissions (Ogden 1992). All applicable measures have already been incorporated into the SPA plan, such as provision of bike lanes, providing services near residences, and providing transit support facilities such as bus stops, as listed in the Project Description.

6.1.3 Significance after Mitigation

Construction

The 2013 GPA/GDPA SEIR determined that construction emissions from implementation of the GPA/GDPA would be reduced to a less than significant level with implementation of the measures listed in mitigation measure Air-1 through Air-3. However, construction emissions and emissions reductions were not quantified because no specific construction details were available at the programmatic level of analysis. Additionally, the GPA/GDPA SEIR mitigation measures only addressed fugitive dust emissions (PM_{10} and $PM_{2.5}$). Construction of the proposed project would also result in significant emissions of nitrogen oxides during grading, and additional significant emissions of nitrogen oxides and VOCs would result from simultaneous construction activities.

The Otay Ranch GDP Final Program EIR and GPA/GDPA SEIR do not quantify the emissions reductions associated with the recommended BMPs. However, the URBEMIS 2007 provides emission reductions for some of the BMPs required in the mitigation measures. Table 9 summarizes the construction related emissions for a single phase of Village 8 West with implementation of mitigation measures Air-1 through Air-4. Implementation of these mitigation measures would reduce significant emissions of nitrogen oxides, PM_{10}, and $PM_{2.5}$ during grading and significant nitrogen oxides emissions during surface improvements, but not to a less than significant level.

Additionally, simultaneous construction activities would still have the potential to result in exceedances of the significance thresholds for VOCs, nitrogen oxides, PM_{10}, and $PM_{2.5}$. Additional available mitigation measures to reduce emissions would require the use of electric powered earth movers or aqueous diesel fuel. Use of electric power earth movers is not feasible because a large enough power source that would be needed to supply energy to such large equipment is not available on the site. A commitment to use aqueous diesel fuel is currently not feasible because this fuel is not widely used or available in San Diego County. However, the project would incorporate electrically-powered tools and smaller equipment that would be served by hard wired temporary power sources until more permanent power sources are available. If a reliable source of diesel aqueous fuel becomes available, it would be used during project construction. Use of an alternative fuel type of such as natural gas or propane instead of electricity is not a feasible alternative because these fuels would increase nitrogen oxides and VOC emissions. Therefore, construction emissions would remain significant and unavoidable.

Table 9 Mitigated Construction Maximum Daily Emissions by Activity (pounds/day)

Construction Activity	Pollutant Emissions (pounds/day)					
	CO	VOC	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Unmitigated Emissions						
Mass Grading Total Emissions(1)	174	44	**379**	0	**4,345**	**918**
Trenching(2)	22	6	51	0	2	2
Surface Improvements (paving)(3)	52	15	**121**	0	5	4
Building Construction and Coating Phases(4)	161	36	81	0	4	3
Combined Daily Total for all Construction Activities (unmitigated)	409	**101**	**632**	0	**4,356**	**927**
Mitigated Emissions(5)						
Mass Grading Total Emissions(1)	174	44	**323**	0	**2,460**	**522**
Trenching(2)	22	6	44	0	**1**	**1**
Surface Improvements (paving)(3)	52	15	**103**	0	4	3
Building Construction and Coating Phases(4)	161	36	72	0	4	3
Combined Daily Total for all Construction Activities (mitigated)	409	**101**	**542**	0	**2,469**	**529**
Significance Threshold	550	75	100	150	150	55
Significant Impact?	No	**Yes**	**Yes**	No	**Yes**	**Yes**

Bold = Exceeds significance threshold
CO = carbon monoxide; VOC = reactive organic gases; NO_x = nitrogen oxides; SO_x = sulfur oxides;
PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter
Source: URBEMIS 2007. See Appendix A for data sheets.
Modeling assumptions: Emissions are based on assumptions for the Yellow phase, plus additional equipment added to account for blasting within the Blue and Orange phases, and offsite improvements. Worst-case construction activities for the Yellow phase were assumed to occur during 2013-2015.

(1) Assumes a three-month period and a maximum land disturbance of 20 acres per day. A total of approximately 268 acres would be disturbed over five development phases. A total of 4.7 million cubic yards would be graded and replaced within the disturbance area, or 940,000 cubic yards in each phase. All cut material would be used on site and no hauling of material off site would be required. Equipment list for grading includes an excavator, two graders, four heavy duty trucks, five dozers, 12 scrapers, and two water trucks. A drill rig, crushing unit, and tractor would be required for blasting in the Orange and Blue phases and are included in the modeled equipment list.

(2) Assumes a two-month period. Equipment list includes two excavators, two dump trucks, a dozer, two backhoes, and a water truck.

(3) Assumes a two-month period. Paving and surface improvements would be required for approximately 12 percent of the project area (31 acres), or six acres per phase. Assumes an additional two acres for offsite improvements. Equipment list includes a grader, a paver, a roller, and 27 dump trucks and concrete trucks.

(4) Assumes a two-year period and architectural coating activities would occur simultaneously with the building construction activities. Assumes building construction would require a total of 11 dump trucks and concrete trucks, an excavator, a backhoe, and a water truck. Based on the Yellow phase, which includes development of 765 multi-family units, 126,000 SF of commercial land use, a community park, and a middle school. Assumes model defaults for low VOC coating (250 grams of VOC per liter or less).

(5) Assumes use of diesel particulate filters and diesel oxidation catalysts for all equipment. Due to a calculation error in the URBEMIS 2007 model, the total reduction in PM_{10} and $PM_{2.5}$ emissions that would occur as result of watering exposed surfaces, applying chemical stabilizers, and replacing ground cover cannot be calculated because the URBEMIS 2007 model overestimates the reduction in emissions. SCAQMD recommends application of the single highest control measure. Watering twice daily was applied for the project. Additionally, emission reductions estimates are not available for all of the BMPs. Emissions would likely be reduced compared to these estimates, but not to a less than significant level.

Operation

The applicable measures of the Otay GDP Final Program EIR mitigation measures have already been incorporated into the SPA Plan, such as provision of bike lanes, providing services near residences, and providing transit support facilities such as bus stops. There are no other feasible mitigation measures available at the project level to reduce vehicular emissions other than reducing vehicle trips. The project trip generation rates account for the approximately 40 percent reduction in vehicle trips that would occur as a result of the mixed-use areas, transit use, and availability of pedestrian and bicycle facilities proposed as part of the SPA Plan. In addition, future vehicular emissions may be lower than estimated due to increasingly stringent California fuel efficiency requirements. Some measures cannot be implemented at the SPA level, such as providing video-conference facilities in work places or requiring flexible work schedules. Additionally, there are no feasible mitigation measures currently available to reduce area sources of emissions without regulating the purchases of individual consumers. Operation emissions of VOCs, nitrogen oxides, and PM_{10} would be significant and unavoidable.

6.2 Issue 2: Impacts to Sensitive Receptors

CARB defines sensitive receptors as residences, schools, day care centers, playgrounds, and medical facilities, or other facilities that may house individuals with health conditions that would be adversely affected by changes in air quality. The two primary pollutants of concern regarding health effects for land development are carbon monoxide and diesel particulates. An analysis of the proposed project's potential to expose sensitive receptors is provided below.

6.2.1 Impact Analysis

Carbon Monoxide Hot Spots

Areas with high vehicle density, such as congested intersections and parking garages, have the potential to create high concentrations of carbon monoxide, known as carbon monoxide hot spots. An air quality impact is considered significant if carbon monoxide emissions create a hot spot where either the California 1-hour standard of 20 ppm or the federal and State eight-hour standard of 9.0 ppm is exceeded. This typically occurs at severely congested intersections (level of service [LOS] E or worse).

The air quality technical report for the 2013 GPA/GDPA SEIR determined that carbon monoxide hot spots would not occur as a result of development under the GPA/GDPA because the SDAB is in attainment of both the federal and state carbon monoxide standards, background carbon monoxide concentrations are well below federal and state limits, and all studied intersections in the traffic report prepared for the GPA/GDPA SEIR are projected to operate at LOS D or better.

The traffic study prepared for Village 8 West (RBF 2013) used project-level trip generation analysis and distribution to evaluate the intersections in the project vicinity that would carry the majority of project traffic. The traffic study analyzed the Existing + Project scenario, as well as three interim scenarios (2015, 2020, 2025) and full project buildout (2030). The traffic study concluded that within each analysis scenario, some intersections would operate at an LOS E or F. Intersections that operate at an LOS E or F have the potential to generate carbon monoxide hot spots. In some locations, the interim scenario resulted in a more congested intersection than the full buildout scenario, due to differences in project trip distribution as roadway improvements are implemented. To estimate the most conservative conditions for the hot spot analysis, carbon monoxide concentrations were analyzed at the most congested intersection for each analysis scenario that would experience the longest delays:

- **Existing (2010) + Full Project Buildout**: Main Street/Magdalena Avenue – LOS F (PM Peak Hour), 164 second delay
- **2015 + Phased Project Buildout**: Olympic Boulevard/I-805 northbound on-ramp – LOS F (AM peak hour), 116 second delay
- **2020 + Phased Project Buildout**: Olympic Boulevard/I-805 northbound on-ramp – LOS F (AM peak hour), 117 second delay
- **2025 + Phased Project Buildout**: Birch Road/Eastlake Boulevard – LOS F (PM peak hour), 454 second delay
- **2030 + Full Project Buildout**: Main Street/Magdalena Avenue – LOS F (PM Peak Hour), 144 second delay

The California Line Source (CALINE 4) model was used to estimate the potential carbon monoxide impact at the above intersections during the most congested peak hour. Receptor locations were set 30 feet from the roadway centerline at the intersection, although actual receptor locations are generally at a greater distance. Carbon monoxide emission factors were generated using the EMFAC 2007 model, using the carbon monoxide emission factor associated with the appropriate analysis year for the total vehicle mix during conditions in January at a temperature of 40 degrees Fahrenheit and 50 percent relative humidity. The assumed vehicle speed is 5 miles per hour. An ambient 1-hour carbon monoxide concentration of 2.0 ppm was used to reflect ambient conditions, based on the data reported at the Chula Vista air quality monitoring station. This concentration estimate is conservative for future years, since carbon monoxide ambient concentrations have been showing a generally downward trend based on historical data. Table 10 displays the estimated carbon monoxide concentrations at the nearest receptor from the affected intersections. See Appendix A for model output data sheets.

Table 10 Estimated Carbon Monoxide Concentrations

Analysis Scenario	Intersection	1-Hour CO Concentration (ppm)	8-Hour CO Concentration (ppm)	Impact?
Existing + Full Project Buildout	Main Street/Magdalena Avenue	2.8	2.0	No
2015 + Phased Project Buildout	Olympic Parkway/I-805 northbound on-ramp	3.5	2.4	No
2020 + Phased Project Buildout	Olympic Parkway/I-805 northbound on-ramp	3.1	2.2	No
2025 + Phased Project Buildout	Birch Road/Eastlake Parkway	3.0	2.1	No
2030 + Full Project Buildout	Main Street/Magdalena Avenue	2.9	2.1	No
	Significance Threshold	20.0 (State) / 35.0 (Federal)	9.0 (State and Federal)	

CO = carbon monoxide
See Appendix A for model output sheets.
Modeling assumptions: One-hour carbon monoxide concentrations were calculated using the worst-case wind angle scenario in the CALINE 4 model. Receptor locations were set 30 feet from the roadway centerline. Carbon monoxide emission factors were generated using the EMFAC 2007 model, using the carbon monoxide emission factor associated with the appropriate analysis year for the total vehicle mix during conditions in January at a temperature of 40 degrees Fahrenheit and 50 percent relative humidity. The assumed vehicle speed is 5 miles per hour. An ambient 1-hour carbon monoxide concentration of 2.0 ppm was used to reflect ambient conditions. The 8-Hour carbon monoxide concentration is based on a persistence factor of 0.7 for urban uses (Caltrans 1997).
Source: CALINE 4 using EMFAC 2007 emission factors.

The highest estimated 1-hour carbon monoxide concentration would be 3.5 ppm at the Olympic Parkway/I-805 northbound on-ramp intersection during the 2015 + Phased Project Buildout scenario. This would not exceed the California 1-hour standard of 20 ppm or the federal 1-hour standard of 35 ppm. Based on an urban persistence factor of 0.7 (for an urban area), the maximum cumulative 8-hour carbon monoxide concentration at the intersection would be 2.4 ppm, which is below the 9 ppm California and federal 8-hour standard. The carbon monoxide concentrations at all of the remaining intersections under each scenario are also below the state and federal standards. Therefore, potential carbon monoxide impacts are less than significant.

Toxic Air Contaminants

The Chula Vista General Plan addresses the siting of sensitive receptors to avoid exposure to TACs. Objective E-6 in the General Plan is to improve local air quality by minimizing the production and emission of air pollutants and TACs, and limit the exposure of people to such pollutants. This objective includes the following policies related to TACs:

- **Policy E 6.4:** Avoid siting new or re-powered energy-generation facilities and other major toxic air emitters within 1,000 feet of a sensitive receiver or the placement of a sensitive receiver within 1,000 feet of a major toxic emitter.
- **Policy E 6.10:** The siting of new sensitive receivers within 500 feet of highways resulting from development or redevelopment projects shall require the preparation of a HRA as part of the CEQA review of the project. Attendant health risks identified in the HRA shall be feasibly mitigated to the maximum extent practicable, in accordance with CEQA, in order to help ensure that applicable federal and state standards are not exceeded.

The CARB's *Air Quality and Land Use Handbook: A Community Health Perspective* lists land uses that are considered major air toxic emitters. These land uses are generally industrial and processing land uses that require a permit from the SDAPCD to operate, including chrome plating facilities, refineries, rail yards, and distribution centers. The SPA Plan proposes residential, mixed-use, school, and park land uses. It does not propose any major toxic emitters. However, CARB does consider dry cleaning facilities and gas stations to be stationary sources of TAC emissions that should not be located near sensitive receptors. Based on CARB siting recommendations within the Air Quality and Land Use Handbook, a detailed HRA should be conducted for proposed sensitive receptors within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater), 50 feet of a "typical" gas station (a facility with a throughput of less 3.6 million gallons per year), or within 300 feet of a dry cleaning facility that uses perchloroethlyene (CARB 2005). Although the SPA Plan would include primarily residential and commercial uses, the proposed land uses may allow the development of gas stations and dry cleaning facilities, as these are common uses within mixed-use and resident-serving development. Dry cleaning facilities and gas stations are allowable in the Town Center, subject to a conditional use permit. However, only storefront dry cleaning facilities or facilities that do not use perchloroethlyene are allowable in the Town Center, subject to a conditional use permit. Due to physical size constraints, large gas stations with a throughput of 3.6 million gallons per year or more would not be permitted within the compact Town Center. Development of a typical-sized gas station in Village 8 West would be possible, but would be subject to the CARB siting recommendations and would not be allowed within 50 feet of a sensitive receptor. Additionally, new sources of TAC emissions such as gas stations are required to obtain authority to construct and operate from the SDAPCD, at which time location-specific details are analyzed. Sources must comply with established criteria, as established in SDAPCD Rule 1200, requiring demonstration that risks are below thresholds and that sources are constructed and operated with appropriate controls. Provided that new sources of TAC emissions proposed within Village 8 West comply with SDAPCD standards, the impact associated with risk of toxic exposure to sensitive receptors is considered less than significant.

The 2005 General Plan EIR lists the Otay Landfill as a major toxic emitter, and therefore new sensitive uses such as residences should not be located within 1,000 feet of this facility. The health risk assessment included in the technical appendices for the Final EIR for the Otay Landfill Development and Expansion Plan indicated that the incremental excess cancer risk of 10 in 1 million was limited to an area within 1,000 feet of the landfill (County of San Diego 2000). The proposed residences in Village 8 West would be located more than 2 miles east of the Otay Landfill. Therefore, potential impacts associated with TACs from the Otay Landfill are considered less than significant.

Exposure to diesel particulate matter generated by traffic on roadways is also a concern identified in the Chula Vista General Plan Update and CARB *Air Quality and Land Use Handbook*. City and CARB guidelines indicate that siting new sensitive land uses within 500 feet of a freeway should be avoided. CARB also recommends siting sensitive land uses more than 500 feet from urban roads with 100,000 vehicles per day. The air quality report prepared for the GPA/GDPA SEIR determined that significant impacts from diesel particulate matter would not occur because the GPA/GDPA area, including Village 8 West, lies outside of the land use avoidance guidelines established by the CARB for roadways generating more that 100,000 vehicle trips per day (I-805 and SR-905).

The nearest sensitive receptors to these roadways would be the single-family residences proposed at the southern end of the project site. The nearest roadway, SR-905, is located approximately 1.5 miles south of the project site and is outside of the avoidance guidelines. SR-125 would carry less than 100,000 trips per day. Additionally, this roadway is located approximately 2,000 feet east of the project site. SR-125 would not result in significant diesel particulate matter concentrations at the project site. The traffic impact analysis prepared for the project does not identify any roadway segments that would carry more than 100,000 vehicles per day at build-out of the project (RBF 2013). Consequently, the project lies well outside of the land use avoidance guidelines established by the CARB, thus impacts related to toxic air emissions would be less than significant.

Sensitive receptors may also be exposed to diesel particulate matter emissions from land uses that attract large numbers of diesel trucks or buses, such as distribution centers or regional transit centers. The SPA Plan does not include any distribution centers. Commercial land uses would intermittently attract diesel trucks for the delivery of goods. However, in 2004, the CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel particulate matter and other TACs and their pollutants. The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are registered. The measure does not allow diesel fueled commercial vehicles to idle for more than five minutes at any given time. This measure may be enforced by either the Chula Vista Police Department or the SDAPCD.

Potential localized air toxic impacts from on-site sources of diesel particulate matter would be minimal since only a limited number of heavy-duty trucks would access the project site. The trucks that would frequent the area would not idle for extended periods of time. Village 8 West does not include a transit center; MTS buses would intermittently briefly idle at the proposed bus stops in the Town Center to load and unload passengers. The MTS buses are subject to the CARB's Public Transit Bus Fleet Rule and Emission Standards for New Urban Buses (California Code of Regulations Title 13, Section 1956). This rule includes requirements for transit agencies to include alternative-fuel buses in their fleet, meet fleet-wide nitrogen oxides and diesel particulate matter emissions reduction requirements, and zero-emissions bus purchase requirements. As older buses are phased out under the CARB program, new buses would either be alternatively fueled or powered by diesel engines with limited diesel particulate matter emissions. In the meantime, fleet-wide emissions standards would reduce exposure to emissions from older buses by reducing their use or installation of retrofits to reduce emissions. Therefore, required compliance with existing CARB regulations would reduce potential impacts related to commercial deliveries and bus service to a less than significant level.

Diesel particulate matter would result from operation of construction equipment. As shown in Table 7, construction of Village 8 West would result in significant particulate matter emissions during grading activities, including fugitive dust and diesel emissions from construction equipment. However, diesel particulate matter is considered to have a long-term health effect (eight years or more) (CalEPA). Grading would be a short-term event (a total of 15 months over five phases) and would be spaced throughout the project site. Diesel particulate emissions from construction would be substantially reduced following completion of grading. Additionally, the majority (98 percent) of particulate matter emissions during grading are from fugitive dust. Emissions of particulate matter from diesel sources during grading would be well below the significance thresholds. Therefore, emissions would not result in a significant long-term health risk to surrounding receptors.

6.2.2 Mitigation Measures

Implementation of the project would result in a less than significant impact with respect to the exposure of sensitive receptors to carbon monoxide hot spots and TACs. However, to assure compliance with established criteria, the following mitigation measure is required.

Air-4 **SDAPCD TAC Emission Criteria Compliance**. Prior to approval of the building permit for any uses that are regulated for TAC emissions by the SDAPCD, the project applicant shall demonstrate to the satisfaction of the Development Services Director (or their designee) that the use complies with established criteria (such as those established by SDAPCD Rule 1200 and CARB). Specifically, gas stations would not be allowed to be constructed within 50 feet of a sensitive receptor, in compliance with CARB siting recommendations.

6.2.3 Significance after Mitigation

Mitigation measure Air-4 ensures that any use within Village 8 West that emits TACs would comply with SDAPCD criteria, and therefore impacts would be less than significant after mitigation.

6.3 Issue 3: Objectionable Odors

6.3.1 Impact Analysis

Offensive odors can present a nuisance to the general public, but seldom result in permanent physical damage. Offensive odors may cause agitation, anger, and concern to the public, especially in residential neighborhoods located near major sources of odor.

Construction associated with implementation of the project could result in minor amounts of odor compounds associated with diesel heavy equipment exhaust. However, construction equipment would be operating at various locations throughout the project site and construction would not take place all at once. The use of architectural coatings and solvents may also emit odors from the evaporation of volatile organic compounds. SDAPCD Rule 67 limits the amount of volatile organic compounds from coatings and solvents, and the project would incorporate the use of low-VOC coatings. In addition, construction near existing sensitive receptors would be temporary. Therefore, consistent with the findings of the air quality technical report for the 2013 GPA/GDPA SEIR, impacts associated with nuisance odors during project construction would not be significant.

The CARB's *Air Quality and Land Use Handbook* identifies a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations. The project proposes the development of residential, commercial, school, and park land uses. Residential development does not typically result in a source of nuisance odors associated with operation. The project does not propose any specific new sources of odor that could affect sensitive receptors. The mixed-use Town Center would potentially result in residences located near commercial land uses with the potential to generate some odors, such as refuse containers or kitchen exhaust vents for restaurants. However, these odor sources would be required to comply with SDAPCD Rule 51, which prohibits nuisance odors.

The Otay Landfill, located approximately two miles west of the project site, is considered to be a major odor-generating facility in Chula Vista. This facility has the potential to produce odors that can be detected outside of the landfill boundary. Odor control practices are in place at all landfills, and odor control is under the purview of the SDAPCD. Landfill odor control practices include application of odor absorbing materials or collecting and treating gases from the landfill before they are released into the surrounding community.

The 2005 General Plan EIR included a summary of the health risk assessment that was conducted to support the Final EIR prepared for the Otay Landfill Development and Expansion Plan (County of San Diego 2000). As part of the expansion, the landfill was also upgraded to include control odor facilities, such as installing flares to dispose of excess landfill gases. This assessment also included an evaluation of nuisance odor issues. The analysis indicated that a buffer of 1,000 feet should be used as a screening threshold for health risk and nuisance odor impacts. The EIR included mitigation measure 5.11-2 that requires that no residential use be permitted within 1,000 feet of the Otay Landfill while the landfill was open and operating, unless a project-specific analysis is completed demonstrating that odor effects are below the odor thresholds for common compounds emitted by the landfill. One such compound is hydrogen sulfide, which has an odor threshold of 0.0045 ppm.

The distance between the landfill and the proposed residences within the Village 8 West SPA plan (two miles) is beyond the screening distance (1,000 feet) established by the General Plan EIR as resulting in a significant impact. However, even at a distance of two miles, it is possible that odors from the Otay Landfill may be detected occasionally (depending on wind direction or other meteorological factors) by the proposed residents of Village 8 West. Facilities that cause nuisance odors are subject to enforcement action by the SDAPCD. Regarding odor impacts, the California Health and Safety Code Section 41700 and SDAPCD Rule 51 prohibit emissions from any source whatsoever in such quantities of air contaminants or other material, which cause injury, detriment, nuisance, or annoyance to the public health or damage to property. The SDAPCD responds to odor complaints by investigating the complaint determining whether the odor violates SDAPCD Rule 51. The inspector takes enforcement action if the source is not in compliance with the SDAPCD rules and regulations (SDAPCD 2010). In the event of enforcement action, odor-causing impacts must be mitigated by appropriate means to reduce the impacts to sensitive receptors to less than significant. Such means include shutdown of odor sources or requirements to control odors using add-on equipment.

Therefore, consistent with the air quality technical report for the 2013 GPA/GDPA SEIR, the project would not create or result in objectionable odors that may affect a substantial number of people, and odor impacts are less than significant.

6.3.2 Mitigation Measures

No mitigation is required.

6.4 Issue 4: Consistency with Regional Plans

6.4.1 Impact Analysis

The air quality plans relevant to this discussion are the SIP and RAQS. The SIP includes strategies and tactics to be used to attain and maintain acceptable air quality in the SDAB based on the NAAQS; while the RAQS includes strategies for the Basin to meet the CAAQS. Consistency with the RAQS is typically determined by two standards. The first standard is whether the proposed project would exceed growth assumptions contained in the RAQS. If the proposed project would exceed the RAQS growth assumptions, the second standard is whether the proposed project would increase the frequency or severity of existing air quality violations, contribute to new violations, or delay the timely attainment of air quality standards or interim reductions as specified in the RAQS.

The RAQS rely on information from the CARB and SANDAG, including mobile and area source emissions, as well as information regarding projected growth in the County of San Diego, to forecast future emissions and then determine the strategies necessary for the reduction of emissions through regulatory controls. The CARB mobile source emissions projections and the SANDAG growth projections are based on population and vehicle use trends and land use plans developed by the cities and the County as part of the development of their respective general plans. As such, projects that propose development consistent with, or less than, the growth projections anticipated by a general plan would be consistent with the RAQS. The growth projections in the RAQS, most recently updated in 2009, are based on the 2030 Regional Transportation Plan prepared by SANDAG (2003). For Village 8 West, the

City of Chula Vista General Plan is the document governing future land use that was considered as part of SANDAG's projections. The growth projections for the City of Chula Vista in the City's General Plan and the General Plan EIR, adopted in December 2005, are consistent with the projections in the 2030 Regional Transportation Plan. However, the General Plan was amended in 2013. The amendment increased the number of units in Village 8 West by 494 units. This project is consistent with the General Plan as amended but since the RAQS have not yet been updated to be consistent with the General Plan, this project is inconsistent with the RAQS.

Because the proposed project would conflict with the growth assumptions of the RAQS, it is subject to the second criterion for determining consistency with the RAQS: whether the proposed project would increase the frequency or severity of existing air quality violations, contribute to new violations, or delay the timely attainment of air quality standards or interim reductions as specified in the RAQS.

The City has experienced violations of the state and federal ozone, state PM_{10}, and state and federal $PM_{2.5}$ ambient air quality standards between 2008 and 2010. The SDAB is currently designated as a nonattainment area for the state standard for PM_{10}, $PM_{2.5}$, 1-Hour and 8-Hour ozone, and the Federal 8-Hour standard for ozone. The proposed project would allow residential, mixed use, school, and park uses. It is not anticipated that development constructed as a result of the proposed project would result in significant stationary sources that would result in any air quality violations. As shown in Table 8, PM_{10}, and $PM_{2.5}$ unmitigated emissions from area sources are less than significant; however emissions of VOCs, an ozone precursor, would be significant.

Additionally, the proposed project would also have the potential to result in air pollutant emissions from increased traffic on area roadways that may lead to air quality violations, consistent with the conclusion in the 2013 GPA/GDPA SEIR air quality technical report. As shown in Table 8, pollutant emissions from vehicular emissions alone would exceed the thresholds for PM_{10}. Additionally, construction of the proposed project would result in temporary significant emissions of VOCs, nitrogen oxides, PM_{10}, and $PM_{2.5}$. Operational and construction emissions would be significant and unavoidable, even with implementation of BMPs and other mitigation in measures GDP EIR-1, GPA/GDPA SEIR 5.5.5-1, and V8W Air-1. Therefore, consistent with the conclusion of the 2013 GPA/GDPA SEIR air quality technical report, emissions from the project may lead to air quality violations.

The project would be consistent with all applicable transportation and area source control measures proposed in the RAQS to reduce emissions in the region, as shown in Table 11. However, implementation of the project would exceed the growth projections in the RAQS and would exceed the significant thresholds for ozone precursors and particulate matter during construction and operation. Therefore, impacts related to consistency with applicable air quality plans would be potentially significant.

6.4.2 Mitigation Measures

As discussed under Issue 1, mitigation measures Air-1 through Air-3 would reduce construction emissions of VOC, nitrogen oxides, PM_{10}, and $PM_{2.5}$. However, even with implementation of all feasible mitigation measures, construction and operational impacts would exceed the significance thresholds and contribute to potential air quality violations. Therefore, impacts related to consistency with applicable air quality plans would also be significant and unavoidable, consistent with the conclusion of the GPA/GDPA SEIR air quality analysis.

Table 11 Project Consistency with RAQS Control Measures

RAQS Control Measure	Proposed Project Consistency
Transit Improvements	Village 8 West would be transit ready for future extension of transit service into the area. Transit service would consist of bus service, including Rapid Bus Service. The bus system would provide local connections between residential, employment, and major activity centers within Village 8 West and Otay Ranch, as well as regional connections. Additionally, Rapid Bus Service has a higher level of service with more frequent headways and is designed to be faster and easier for riders to use than traditional bus service. Two potential transit stops are proposed on the project site.
Park-and-Ride Facilities	The SPA Plan and TM does not specifically propose park and ride facilities; however, the SPA plan is designed to provide transit stops in easily accessible areas and provide bicycle and pedestrian connections to transit stops so the transit riders would not need to drive to transit stops.
Bicycle Facilities	Within the Town Center, on-street bike lanes would be provided. Main vehicular thoroughfares would include dedicated, striped, on-street Class II bike lanes. Local streets would not provide dedicated lanes for bicycles; however, the traffic volumes on parkway residential streets would be low enough to accommodate bicycles as well as vehicles. A village pathway that currently terminates at the south end of Magdalena Avenue would be extended through the project site and would provide a multi-use trail. A greenbelt trail would ultimately connect to the Salt Creek Trail as part of the Otay Valley Regional Park system.
Smart Growth Development	SANDAG'S Smart Growth Concept Map identifies Village 8 West as a Community Center to provide low to mid-rise residential and commercial buildings within one quarter mile of a transit center. The Village 8 West SPA Plan is consistent with this concept. The proposed project promotes smart growth principles such as mixed-use development, a range of housing choices, walkability, proximity to employment centers, environmentally sensitive design, providing adequate infrastructure, and by providing a variety of transportation choices.
Pedestrian Facilities	The pedestrian circulation network includes an interconnected system of village pathways, sidewalks, and rural trails. All streets in Village 8 West would include a sidewalk or trail. Multiple pathways would be provided through parks, the Town Center, and multi-family neighborhoods to provide direct pedestrian connections between the various transects in Village 8 West and to adjacent villages.
Traffic Calming Practices	The SPA Plan and TM would implement several traffic calming measures including urban couplets; intersection bulb-outs; narrow, multi-modal streets; and a circulation pattern design with multiple connections to more evenly distribute traffic.
Support Bus Rapid Transit	Bus Rapid Transit is the highest level of transit service being considered for the Otay Ranch area. Village 8 West supports extension of the transit system by providing accessible transit stops and accommodating reserved transit lanes on project roadways.

6.5 Cumulative Impacts

6.5.1 Consistency with Air Quality Standards and Cumulatively Considerable Net Increase in Emissions

The geographic context for the analysis of cumulative impacts relative to criteria air pollutants is the SDAB. San Diego County is presently designated as being a non-attainment area for the NAAQS ozone standard. The County is also a non-attainment area for the CAAQS standards for ozone, PM_{10} and $PM_{2.5}$. Therefore, a significant cumulative impact to air quality for ozone precursors (VOCs and NO_x), PM_{10}, and $PM_{2.5}$ currently exists. Consequently, the greatest concern involving criteria pollutants is whether a project would result in a cumulatively considerable net increase of PM_{10}, $PM_{2.5}$, or exceed screening-level criteria thresholds of ozone precursors (VOCs and NO_X).

A localized pollutant concentration analysis is applicable to the analysis of the cumulative impacts of construction emissions because construction emissions would be temporary. Pollutant emissions would disperse or settle out following construction and would not contribute to long-term concentrations of emissions in the SDAB. Long-term regional impacts associated with operation of Village 8 West are discussed below. Short-term emissions from construction would present a localized health concern if multiple construction projects would take place at the same time and would exceed the significance thresholds. Therefore, construction projects that do not take place at the same time do not contribute to the same short-term cumulative impact.

The City has not adopted specific emission thresholds by which to evaluate the significance of air quality impacts of projects within its jurisdiction. Additionally, the SDAPCD has not established screening thresholds for localized impacts. In lieu of any set quantitative air quality significance thresholds for localized impacts, the Localized Significance Thresholds established by the SCAQMD (SCAQMD 2009) are used to determine potential cumulative impacts. Based on the thresholds, NO_x emissions decrease approximately 95 percent beyond approximately 1,300 meters (4,270 feet). Therefore, cumulative projects 4,270 feet from project site are excluded from the cumulative NO_x analysis. According to the Localized Significance Thresholds, PM_{10} decreases approximately 95 percent by 400 meters (1,300 feet), and $PM_{2.5}$ by 440 meters (1,430 feet). SCAQMD has not established a threshold for VOCs. However, VOCs disperse quickly (California Indoor Air Quality 2011); therefore, it is assumed that VOC pollutant concentrations would disperse by 95 percent beyond 4,270 feet, similar to NO_x. Therefore, cumulative projects 1,300 feet from the project site are excluded from the cumulative PM_{10} analysis, projects 1,430 feet from the site are excluded from the $PM_{2.5}$, and projects 4,270 feet from the site are excluded from the cumulative VOC analysis.

The closest cumulative projects to the project site with the potential to generate cumulative construction emissions are Village 4, adjacent to the western edge of the project site, and Village 8 East, adjacent to the eastern edge of the project site. Similar to the proposed project, these villages would be completed in several development phases. Construction would not occur across the entire project site at once. It is unlikely that development of Village 8 West and an adjacent village would occur concurrently along the edge of the project site. The Village 4 and Village 8 East projects propose similar mixed-use development as Village 8 West and are assumed to require a similar construction schedule and equipment list. Due to the length of construction period for the proposed project and adjacent projects, it is possible that concurrent construction would take place within the cumulative impact screening distances. The GPA/GDPA air quality analysis determined that implementation of BMPs for construction would reduce impacts to a less than significant level; however, construction emissions and emissions reductions from BMPs were not quantified. Therefore, additional analysis was required for the proposed project construction emissions due to the programmatic level of analysis. The proposed project would result in potentially significant NO_x, PM_{10}, and $PM_{2.5}$ emissions during construction, as shown in Table 7, and potentially significant VOC emissions if construction phases would occur simultaneously. Therefore, the proposed project would result in a cumulatively considerable contribution to a significant impact. Mitigation measures Air-1 through Air-3 would reduce impacts, but not to below the significance thresholds. Impacts would be cumulatively considerable and unavoidable.

Operation of the project would emit carbon monoxide, VOCs, NO_X, PM_{10}, and $PM_{2.5}$. Neither the City of Chula Vista nor the SCAQMD has established thresholds for determining cumulative air quality impacts. The SCAQMD cumulative methodology is based on performance standards and emission reduction targets to comply the air quality plans for the South Coast Air Basin. These plans are not applicable to the SDAB; therefore, this methodology does not apply to the proposed project. According to the County of San Diego significance threshold, which does apply to projects in the SDAB, a project would result in a significant cumulatively considerable contribution to an air quality impact if the project does not conform to the RAQS or if the project has a significant direct impact to air quality. Most of the cumulative projects that would occur in the project area are planned growth consistent with the Otay Ranch GDP and City General Plan, consistent with the 2005 General Plan growth projections that are accounted for in the RAQS. However, the proposed project would exceed the growth projections of the RAQS and would potentially conflict with the RAQS, as discussed in Issue 4. Additionally, as shown in Table 8, the proposed project would result in significant emissions of VOCs, NO_x, and PM_{10} during operation. Impacts would be significant and unavoidable. Therefore, the proposed project would result in a cumulatively considerable and unavoidable contribution to a significant cumulative impact, consistent with the conclusion of the GPA/GDPA air quality analysis.

6.5.2 Sensitive Receptors

The geographic context for the analysis of cumulative impacts relative to sensitive receptors is the SDAB. Cumulative impacts related to carbon monoxide and TACs are discussed below.

Carbon Monoxide

The traffic study prepared for the project evaluated the intersections in the project vicinity that would carry the majority of project traffic. The traffic study analyzed the Existing + Project scenario, as well as three interim scenarios (2015, 2020, 2025) and full project buildout (2030). The traffic impact analysis for the project analyzed potential traffic impacts from buildout of the proposed project and cumulative growth in the region under each phase of development. Table 10 shows the maximum carbon monoxide concentration that would result from the most congested intersections in the study area during interim development phases and full project buildout in 2030. As shown in this table, a carbon monoxide hot spot would not occur at the most congested intersections that would operate at LOS F with implementation of the proposed project in combination with cumulative growth. The cumulative impact related to carbon monoxide hot spots would be less than significant.

Toxic Air Contaminants

Impacts related to siting new sensitive receptors near sources of TACs would generally be site specific because the placement of one sensitive receptor near a source of TACs would not affect the placement of other sensitive receptors. However, a cumulative impact could occur if cumulative projects propose new sources of the TACs that would result in the exposure of people in surrounding projects to significant TAC emissions. Future development in the villages surrounding Village 8 West, including Village 4, Village 8 East, Village 2, and Village 7 propose similar development compared to the proposed project, including residential, commercial and park uses. As described in Issue 2, these land uses are not considered major toxic emitters. However, these developments would potentially include gas stations. Based on CARB siting recommendations, a detailed HRA should be conducted for proposed sensitive receptors within 300 feet of a large gas station or 50 feet of a typical gas station (CARB 2005). These uses would be sited to serve the village in which they are placed. In addition, new emitters of TACs would need to comply with SDAPCD criteria, such as Rule 1200, and mitigation measure Air-4 requires that these uses demonstrate SDAPCD compliance to the City. Due to the limited range for potential impacts from these sources, development of gas stations in one village would not result in the exposure of sensitive receptors in another village to substantial TAC emissions. Similar to the proposed project, potential diesel particulate matter emissions from commercial land uses and bus routes proposed in the adjacent villages would be subject to existing CARB regulations that would reduce potential impacts related to commercial deliveries and bus service to a less than significant level. Therefore, cumulative impacts related to TACs would be less than significant.

6.5.3 Objectionable Odors

Impacts relative to objectionable odors are generally limited to the area in close vicinity to the odor source and are not cumulative in nature because the air emissions that cause odors disperse beyond the sources of the odor. As the emissions disperse, the odor becomes less and less detectable. Further, nuisance odor issues are regulated by the SDAPCD through Rule 51. Similar to the proposed project, none of the adjacent villages propose development that is a typical source of odor complaints. Therefore, a cumulatively significant impact associated with objectionable odors would not occur.

6.5.4 Consistency with Applicable Air Quality Plans

The geographic context for the analysis of cumulative impacts relative to consistency with air quality plans is the SDAB. The RAQS and SIP are intended to address cumulative impacts in the SDAB based on future growth predicted by in the 2030 Regional Growth Forecast Update. As discussed above, the SDAB is currently a nonattainment area for state and federal standards for ozone, and state standards for PM_{10}, and $PM_{2.5}$. Development consistent with the applicable general plan would be generally consistent with the growth projections in the air quality plans. However, a project that conflicts with these growth projections would conflict with the RAQS and SIP and result in cumulative impact. Cumulative development generally would not be expected to result in a significant impact in terms of conflicting with RAQS because the cumulative projects would be required to demonstrate that the proposed development is consistent with local planning documents, such as the Otay Ranch GDP and City General Plan. However, as discussed in Issue 4, the proposed project would exceed the growth projections accounted for in the RAQS and SIP, and would potentially contribute to a regional exceedance of air quality violations. Operational emissions of VOCs, NO_x, and PM_{10} would be significant and unavoidable. Therefore, the proposed project would result in a cumulatively considerable and unavoidable contribution to a potentially significant cumulative impact.

6.6 Conclusion

Construction of the proposed project would have the potential to exceed the significance thresholds for NO_x, PM_{10}, and $PM_{2.5}$, and VOCs if construction phases would occur simultaneously. Mitigation measures Air-1 through Air-3 would reduce NO_x, PM_{10}, and $PM_{2.5}$ emissions from construction, but not to a less than significant level. Operation of the proposed project would have the potential result in significant emissions of VOC, NO_x, and PM_{10}. Impacts would remain significant and unavoidable. Criteria pollutant emissions during construction and operations would result in significant and unavoidable direct and cumulative impacts. No carbon monoxide hot spots would occur as a result of the project and the project would not result in the exposure of sensitive receptors to substantial diesel particulate matter emissions. Additionally, the proposed project would not result in new sources of TACs in close proximity to sensitive receptors. Mitigation measure Air-4 ensures that proposed emitters of TACs demonstrate compliance with SDAPCD criteria and impacts related to TAC emissions are less than significant. Cumulative impacts related to sensitive receptors would be less than significant. No direct or cumulative impacts related to objectionable odors would occur; therefore, no mitigation measures are required. The proposed project would exceed the growth projections in the RAQS and contribute to potential air quality violations. Mitigation measures Air-1 through Air-3 would reduce impacts, but not to a less than significant level. Direct and cumulative impacts would be significant and unavoidable. The results of this air quality report have been incorporated into the project's AQIP, which is included in the SPA for Village 8 West.

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Air Quality Data

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\Environmental\Projects - Current\100019662 Otay Villages 8W & 9 Technical Studies\Village 8 West Air Quality Report\Technical Data\V8W Construction 02 20 12.urb924

Project Name: V8W Construction

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5	PM2.5	CO2
2013 TOTALS (lbs/day unmitigated)	43.87	379.48	173.99	0.01	4,330.04	14.96	4,345.01	904.29	13.76	918.06	45,319.56
2013 TOTALS (lbs/day mitigated)	43.87	322.61	173.99	0.01	2,448.66	11.23	2,459.89	511.38	10.33	521.71	45,319.56
2014 TOTALS (lbs/day unmitigated)	64.49	80.77	161.07	0.26	1.11	3.37	4.48	0.40	3.06	3.45	34,197.32
2014 TOTALS (lbs/day mitigated)	35.86	72.54	161.07	0.26	1.11	2.87	3.98	0.40	2.59	2.99	34,197.32
2015 TOTALS (lbs/day unmitigated)	63.45	71.70	150.78	0.26	1.11	3.01	4.12	0.40	2.72	3.12	34,195.92
2015 TOTALS (lbs/day mitigated)	34.92	64.39	150.78	0.26	1.11	2.57	3.68	0.40	2.32	2.71	34,195.92

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/3/2013-8/30/2013 Active Days: 65	43.87	**379.48**	**173.99**	0.01	**4,330.04**	**14.96**	**4,345.01**	**904.29**	**13.76**	**918.06**	**45,319.56**
Mass Grading 06/03/2013-08/30/2013	43.87	379.48	173.99	0.01	4,330.04	14.96	4,345.01	904.29	13.76	918.06	45,319.56
Mass Grading Dust	0.00	0.00	0.00	0.00	4,330.00	0.00	4,330.00	904.28	0.00	904.28	0.00
Mass Grading Off Road Diesel	43.69	379.14	167.88	0.00	0.00	14.94	14.94	0.00	13.74	13.74	44,418.15
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Mass Grading Worker Trips	0.18	0.34	6.12	0.01	0.04	0.02	0.07	0.02	0.02	0.04	901.40
Time Slice 9/2/2013-10/31/2013 Active Days: 44	6.16	51.48	21.81	0.00	0.01	1.90	1.92	0.00	1.75	1.76	7,407.67
Trenching 09/02/2013-10/31/2013	6.16	51.48	21.81	0.00	0.01	1.90	1.92	0.00	1.75	1.76	7,407.67
Trenching Off Road Diesel	6.11	51.39	20.12	0.00	0.00	1.90	1.90	0.00	1.75	1.75	7,159.01
Trenching Worker Trips	0.05	0.09	1.69	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.66
Time Slice 11/1/2013-12/31/2013 Active Days: 43	15.38	120.60	52.06	0.01	0.05	4.74	4.79	0.02	4.36	4.38	18,796.65
Asphalt 11/01/2013-12/31/2013	15.38	120.60	52.06	0.01	0.05	4.74	4.79	0.02	4.36	4.38	18,796.65
Paving Off-Gas	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	14.57	118.74	45.15	0.00	0.00	4.65	4.65	0.00	4.28	4.28	17,574.03
Paving On Road Diesel	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.05	0.06	290.14
Paving Worker Trips	0.19	0.35	6.33	0.01	0.04	0.03	0.07	0.02	0.02	0.04	932.48
Time Slice 1/2/2014-12/31/2014 Active Days: 260	**64.49**	80.77	161.07	**0.26**	1.11	3.37	4.48	0.40	3.06	3.45	34,197.32
Building 01/02/2014-12/31/2015	12.50	80.73	160.34	0.26	1.10	3.37	4.47	0.39	3.05	3.45	34,082.85
Building Off Road Diesel	7.15	54.89	22.07	0.00	0.00	2.03	2.03	0.00	1.86	1.86	9,265.11
Building Vendor Trips	1.86	19.16	17.63	0.05	0.20	0.78	0.98	0.07	0.71	0.78	5,730.09
Building Worker Trips	3.49	6.68	120.64	0.20	0.90	0.57	1.47	0.33	0.48	0.80	19,087.65
Coating 01/02/2014-12/31/2015	51.99	0.04	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.47
Architectural Coating	51.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.04	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.47
Time Slice 1/1/2015-12/31/2015 Active Days: 261	63.45	71.70	150.78	**0.26**	1.11	3.01	4.12	0.40	2.72	3.12	34,195.92
Building 01/02/2014-12/31/2015	11.46	71.66	150.10	0.26	1.10	3.01	4.11	0.39	2.72	3.11	34,081.47
Building Off Road Diesel	6.60	48.77	21.54	0.00	0.00	1.76	1.76	0.00	1.62	1.62	9,265.11
Building Vendor Trips	1.68	16.77	16.24	0.05	0.20	0.68	0.88	0.07	0.62	0.69	5,730.33
Building Worker Trips	3.19	6.12	112.33	0.20	0.90	0.57	1.47	0.33	0.48	0.80	19,086.02
Coating 01/02/2014-12/31/2015	51.99	0.04	0.67	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.46

Architectural Coating	51.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.04	0.67	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.46

Phase Assumptions

Phase: Mass Grading 6/3/2013 - 8/30/2013 - Default Mass Site Grading/Excavation Description

Total Acres Disturbed: 52.2

Maximum Daily Acreage Disturbed: 20

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 35000 cubic yards/day; Offsite Cut/Fill: 0 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Bore/Drill Rigs (291 hp) operating at a 0.75 load factor for 8 hours per day

1 Crawler Tractors (150 hp) operating at a 0.64 load factor for 8 hours per day

1 Crushing/Processing Equip (310 hp) operating at a 0.8 load factor for 8 hours per day

1 Excavators (400 hp) operating at a 0.5 load factor for 8 hours per day

2 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

4 Off Highway Trucks (300 hp) operating at a 0.2 load factor for 8 hours per day

5 Rubber Tired Dozers (370 hp) operating at a 0.5 load factor for 8 hours per day

12 Scrapers (450 hp) operating at a 0.75 load factor for 8 hours per day

2 Water Trucks (300 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Trenching 9/2/2013 - 10/31/2013 - Default Trenching Description

Off-Road Equipment:

2 Excavators (400 hp) operating at a 0.5 load factor for 8 hours per day

2 Off Highway Trucks (479 hp) operating at a 0.57 load factor for 8 hours per day

1 Rubber Tired Dozers (400 hp) operating at a 0.5 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (150 hp) operating at a 0.5 load factor for 0 hours per day

1 Water Trucks (200 hp) operating at a 0.5 load factor for 8 hours per day

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Phase: Paving 11/1/2013 - 12/31/2013 - Default Paving Description

Acres to be Paved: 8.2

Off-Road Equipment:

1 Graders (150 hp) operating at a 0.61 load factor for 8 hours per day

27 Off Highway Trucks (281 hp) operating at a 0.38 load factor for 8 hours per day

1 Pavers (150 hp) operating at a 0.35 load factor for 7 hours per day

1 Rollers (150 hp) operating at a 0.35 load factor for 7 hours per day

Phase: Building Construction 1/2/2014 - 12/31/2015 - Default Building Construction Description

Off-Road Equipment:

1 Excavators (400 hp) operating at a 0.5 load factor for 8 hours per day

11 Off Highway Trucks (286 hp) operating at a 0.4 load factor for 8 hours per day

1 Tractors/Loaders/Backhoes (150 hp) operating at a 0.5 load factor for 7 hours per day

1 Water Trucks (200 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Architectural Coating 1/2/2014 - 12/31/2015 - Default Architectural Coating Description

Rule: Residential Interior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 100

Rule: Residential Interior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 50

Rule: Residential Exterior Coatings begins 1/1/2005 ends 6/30/2008 specifies a VOC of 250

Rule: Residential Exterior Coatings begins 7/1/2008 ends 12/31/2040 specifies a VOC of 100

Rule: Nonresidential Interior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

Rule: Nonresidential Exterior Coatings begins 1/1/2005 ends 12/31/2040 specifies a VOC of 250

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Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/3/2013-8/30/2013 Active Days: 65	43.87	322.61	**173.99**	0.01	2,448.66	11.23	2,459.89	511.38	10.33	521.71	**45,319.56**
Mass Grading 06/03/2013-08/30/2013	43.87	322.61	173.99	0.01	2,448.66	11.23	2,459.89	511.38	10.33	521.71	45,319.56
Mass Grading Dust	0.00	0.00	0.00	0.00	2,448.62	0.00	2,448.62	511.37	0.00	511.37	0.00
Mass Grading Off Road Diesel	43.69	322.27	167.88	0.00	0.00	11.20	11.20	0.00	10.31	10.31	44,418.15
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.18	0.34	6.12	0.01	0.04	0.02	0.07	0.02	0.02	0.04	901.40
Time Slice 9/2/2013-10/31/2013 Active Days: 44	6.16	43.77	21.81	0.00	0.01	1.43	1.44	0.00	1.32	1.32	7,407.67
Trenching 09/02/2013-10/31/2013	6.16	43.77	21.81	0.00	0.01	1.43	1.44	0.00	1.32	1.32	7,407.67
Trenching Off Road Diesel	6.11	43.68	20.12	0.00	0.00	1.42	1.42	0.00	1.31	1.31	7,159.01
Trenching Worker Trips	0.05	0.09	1.69	0.00	0.01	0.01	0.02	0.00	0.01	0.01	248.66
Time Slice 11/1/2013-12/31/2013 Active Days: 43	15.38	102.79	52.06	0.01	0.05	3.57	3.63	0.02	3.29	3.31	18,796.65
Asphalt 11/01/2013-12/31/2013	15.38	102.79	52.06	0.01	0.05	3.57	3.63	0.02	3.29	3.31	18,796.65
Paving Off-Gas	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	14.57	100.93	45.15	0.00	0.00	3.49	3.49	0.00	3.21	3.21	17,574.03
Paving On Road Diesel	0.12	1.51	0.58	0.00	0.01	0.06	0.07	0.00	0.05	0.06	290.14
Paving Worker Trips	0.19	0.35	6.33	0.01	0.04	0.03	0.07	0.02	0.02	0.04	932.48
Time Slice 1/2/2014-12/31/2014 Active Days: 260	35.86	72.54	161.07	**0.26**	1.11	2.87	3.98	0.40	2.59	2.99	34,197.32
Building 01/02/2014-12/31/2015	12.50	72.50	160.34	0.26	1.10	2.86	3.97	0.39	2.59	2.98	34,082.85
Building Off Road Diesel	7.15	46.66	22.07	0.00	0.00	1.52	1.52	0.00	1.40	1.40	9,265.11
Building Vendor Trips	1.86	19.16	17.63	0.05	0.20	0.78	0.98	0.07	0.71	0.78	5,730.09
Building Worker Trips	3.49	6.68	120.64	0.20	0.90	0.57	1.47	0.33	0.48	0.80	19,087.65

Coating 01/02/2014-12/31/2015	23.36	0.04	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.47
Architectural Coating	23.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.04	0.72	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.47
Time Slice 1/1/2015-12/31/2015 Active Days: 261	34.92	64.39	150.78	**0.26**	1.11	2.57	3.68	0.40	2.32	2.71	34,195.92
Building 01/02/2014-12/31/2015	11.46	64.35	150.10	0.26	1.10	2.57	3.67	0.39	2.31	2.71	34,081.47
Building Off Road Diesel	6.60	41.45	21.54	0.00	0.00	1.32	1.32	0.00	1.22	1.22	9,265.11
Building Vendor Trips	1.68	16.77	16.24	0.05	0.20	0.68	0.88	0.07	0.62	0.69	5,730.33
Building Worker Trips	3.19	6.12	112.33	0.20	0.90	0.57	1.47	0.33	0.48	0.80	19,086.02
Coating 01/02/2014-12/31/2015	23.45	0.04	0.67	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.46
Architectural Coating	23.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Coating Worker Trips	0.02	0.04	0.67	0.00	0.01	0.00	0.01	0.00	0.00	0.00	114.46

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Mass Grading 6/3/2013 - 8/30/2013 - Default Mass Site Grading/Excavation Description

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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For Excavators, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Excavators, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Scrapers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Scrapers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Off Highway Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Off Highway Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Bore/Drill Rigs, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Bore/Drill Rigs, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Crawler Tractors, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Crawler Tractors, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Crushing/Processing Equip, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Crushing/Processing Equip, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Trenching 9/2/2013 - 10/31/2013 - Default Trenching Description

For Excavators, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Excavators, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

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For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Off Highway Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Off Highway Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rubber Tired Dozers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rubber Tired Dozers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Paving 11/1/2013 - 12/31/2013 - Default Paving Description

For Pavers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Pavers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Rollers, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Rollers, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Off Highway Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Off Highway Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Graders, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Graders, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

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The following mitigation measures apply to Phase: Building Construction 1/2/2014 - 12/31/2015 - Default Building Construction Description

For Tractors/Loaders/Backhoes, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Tractors/Loaders/Backhoes, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Off Highway Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Off Highway Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Excavators, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Excavators, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

For Water Trucks, the Diesel Particulate Filter (DPF) 3rd Tier mitigation reduces emissions by:

PM10: 25% PM25: 25%

For Water Trucks, the Diesel Oxidation Catalyst 15% mitigation reduces emissions by:

NOX: 15%

The following mitigation measures apply to Phase: Architectural Coating 1/2/2014 - 12/31/2015 - Default Architectural Coating Description

For Residential Architectural Coating Measures, the Residential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Residential Architectural Coating Measures, the Residential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Exterior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

For Nonresidential Architectural Coating Measures, the Nonresidential Interior: Use Low VOC Coatings mitigation reduces emissions by:

ROG: 10%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: H:\Environmental\Projects - Current\100019662 Otay Villages 8W & 9 Technical Studies\Village 8 West Air Quality Report\Technical Data\V8W

Project Name: V8W Operation

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	128.84	41.02	62.61	0.00	0.19	0.18	50,588.53
TOTALS (lbs/day, mitigated)	128.38	34.94	59.00	0.00	0.17	0.17	43,009.88
Percent Reduction	0.36	14.82	5.77	0.00	10.53	5.56	14.98

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	41.66	31.89	383.82	1.16	208.65	39.20	111,796.26

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	170.50	72.91	446.43	1.16	208.84	39.38	162,384.79

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	3.06	40.56	24.07	0.00	0.08	0.07	50,524.36
Hearth - No Summer Emissions							
Landscape	5.87	0.46	38.54	0.00	0.11	0.11	64.17
Consumer Products	105.17						
Architectural Coatings	14.74						
TOTALS (lbs/day, unmitigated)	128.84	41.02	62.61	0.00	0.19	0.18	50,588.53

Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	2.60	34.48	20.46	0.00	0.06	0.06	42,945.71
Hearth - No Summer Emissions							
Landscape	5.87	0.46	38.54	0.00	0.11	0.11	64.17
Consumer Products	105.17						
Architectural Coatings	14.74						
TOTALS (lbs/day, mitigated)	128.38	34.94	59.00	0.00	0.17	0.17	43,009.88

Area Source Mitigation Measures Selected

Mitigation Description	Percent
Residential Increase Energy Efficiency Beyond Title	15.00
Commercial Increase Energy Efficiency Beyond Title	15.00
Industrial Increase Energy Efficiency Beyond Title 24	15.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 10%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	7.56	5.81	72.59	0.21	37.82	7.12	20,471.49
Apartments low rise	11.63	7.87	98.26	0.29	51.20	9.64	27,710.30
Elementary school	4.55	3.33	39.39	0.12	21.85	4.10	11,649.63
Junior high school	8.38	6.13	72.52	0.22	40.22	7.55	21,447.51
City park	0.24	0.17	1.98	0.01	1.12	0.21	596.00
Strip mall	8.57	7.99	92.05	0.29	52.63	9.87	27,877.98
General office building	0.68	0.55	6.62	0.02	3.58	0.67	1,919.92
Community Purpose Facility	0.05	0.04	0.41	0.00	0.23	0.04	123.43
TOTALS (lbs/day, unmitigated)	41.66	31.89	383.82	1.16	208.65	39.20	111,796.26

Operational Settings:

2/20/2012 11:35:23 AM
Does not include correction for passby trips
Does not include double counting adjustment for internal trips
Analysis Year: 2030 Temperature (F): 80 Season: Summer
Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	114.00	7.65	dwelling units	621.00	4,750.65	22,086.25
Apartments low rise	71.70	4.50	dwelling units	1,429.00	6,430.50	29,896.04
Elementary school		5.50	1000 sq ft	497.00	2,733.50	12,765.44
Junior high school		5.50	1000 sq ft	915.00	5,032.50	23,501.77
City park		5.00	acres	28.00	140.00	656.95
Strip mall		26.20	1000 sq ft	250.00	6,550.00	30,765.35
General office building		9.00	1000 sq ft	50.00	450.00	2,091.37
Community Purpose Facility		5.00	1000 sq ft	5.80	29.00	136.21
					26,116.15	121,899.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	90.9	0.0	100.0	0.0
Light Truck < 3750 lbs	1.0	0.0	100.0	0.0
Light Truck 3751-5750 lbs	1.0	0.0	100.0	0.0
Med Truck 5751-8500 lbs	1.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	83.3	16.7
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.5	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.7	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer

Urban Trip Length (miles)	4.6	4.6	4.7	4.6	4.6	4.7
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Community Purpose Facility				2.0	1.0	97.0

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: H:\Environmental\Projects - Current\100019662 Otay Villages 8W & 9 Technical Studies\Village 8 West Air Quality Report\Technical Data\V8W

Project Name: V8W Operation

Project Location: South Coast AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	123.08	42.52	24.90	0.01	0.24	0.23	53,023.71
TOTALS (lbs/day, mitigated)	122.62	36.44	21.29	0.01	0.22	0.22	45,445.06
Percent Reduction	0.37	14.30	14.50	0.00	8.33	4.35	14.29

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	40.39	38.23	374.74	0.91	208.65	39.20	100,848.04

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	163.47	80.75	399.64	0.92	208.89	39.43	153,871.75

Both Area and Operational Mitigation must be turned on to get a combined mitigated total.

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	3.06	40.56	24.07	0.00	0.08	0.07	50,524.36
Hearth	0.11	1.96	0.83	0.01	0.16	0.16	2,499.35
Landscaping - No Winter							
Consumer Products	105.17						
Architectural Coatings	14.74						
TOTALS (lbs/day, unmitigated)	123.08	42.52	24.90	0.01	0.24	0.23	53,023.71

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Area Source Mitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Mitigated

Source	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
Natural Gas	2.60	34.48	20.46	0.00	0.06	0.06	42,945.71
Hearth	0.11	1.96	0.83	0.01	0.16	0.16	2,499.35
Landscaping - No Winter							
Consumer Products	105.17						
Architectural Coatings	14.74						
TOTALS (lbs/day, mitigated)	122.62	36.44	21.29	0.01	0.22	0.22	45,445.06

Area Source Mitigation Measures Selected

Mitigation Description	Percent
Residential Increase Energy Efficiency Beyond Title	15.00
Commercial Increase Energy Efficiency Beyond Title	15.00
Industrial Increase Energy Efficiency Beyond Title 24	15.00

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 10% to 0%

Percentage of residences with wood fireplaces changed from 5% to 0%

Percentage of residences with natural gas fireplaces changed from 85% to 15%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Single family housing	7.40	6.97	70.79	0.17	37.82	7.12	18,487.85
Apartments low rise	10.75	9.44	95.82	0.23	51.20	9.64	25,025.23
Elementary school	4.31	3.99	38.45	0.09	21.85	4.10	10,503.12
Junior high school	7.93	7.35	70.79	0.17	40.22	7.55	19,336.73
City park	0.22	0.20	1.93	0.00	1.12	0.21	536.99
Strip mall	9.06	9.58	90.12	0.23	52.63	9.87	25,114.84
General office building	0.67	0.66	6.44	0.02	3.58	0.67	1,732.08
Community Purpose Facility	0.05	0.04	0.40	0.00	0.23	0.04	111.20
TOTALS (lbs/day, unmitigated)	40.39	38.23	374.74	0.91	208.65	39.20	100,848.04

2/20/2012 11:38:46 AM
Operational Settings:

Does not include correction for passby trips
Does not include double counting adjustment for internal trips
Analysis Year: 2030 Temperature (F): 60 Season: Winter
Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	114.00	7.65	dwelling units	621.00	4,750.65	22,086.25
Apartments low rise	71.70	4.50	dwelling units	1,429.00	6,430.50	29,896.04
Elementary school		5.50	1000 sq ft	497.00	2,733.50	12,765.44
Junior high school		5.50	1000 sq ft	915.00	5,032.50	23,501.77
City park		5.00	acres	28.00	140.00	656.95
Strip mall		26.20	1000 sq ft	250.00	6,550.00	30,765.35
General office building		9.00	1000 sq ft	50.00	450.00	2,091.37
Community Purpose Facility		5.00	1000 sq ft	5.80	29.00	136.21
					26,116.15	121,899.38

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	90.9	0.0	100.0	0.0
Light Truck < 3750 lbs	1.0	0.0	100.0	0.0
Light Truck 3751-5750 lbs	1.0	0.0	100.0	0.0
Med Truck 5751-8500 lbs	1.0	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	0.5	0.0	83.3	16.7
Lite-Heavy Truck 10,001-14,000 lbs	0.5	0.0	60.0	40.0
Med-Heavy Truck 14,001-33,000 lbs	0.5	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.5	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.1	0.0	0.0	100.0
Motorcycle	2.7	33.3	66.7	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.1	0.0	90.9	9.1

Travel Conditions

2/20/2012 11:38:46 AM

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	4.6	4.6	4.7	4.6	4.6	4.7
Rural Trip Length (miles)	17.6	12.1	14.9	15.4	9.6	12.6
Trip speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
City park				5.0	2.5	92.5
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
Community Purpose Facility				2.0	1.0	97.0

```
           CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                    JUNE 1989 VERSION
                    PAGE   1

               JOB: Main St - Magdalena Ave 2010 PM
               RUN: Hour 1            (WORST CASE ANGLE)
         POLLUTANT: Carbon Monoxide

   I.  SITE VARIABLES

       U=   1.0 M/S             Z0= 100. CM            ALT=     0. (M)
     BRG= WORST CASE            VD=   .0 CM/S
    CLAS=     7 (G)             VS=   .0 CM/S
    MIXH=   10. M              AMB=  2.0 PPM
   SIGTH=   25. DEGREES       TEMP=  4.4 DEGREE (C)

  II.  LINK VARIABLES

      LINK      *  LINK COORDINATES (M)   *                 EF     H     W
   DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
 ---------------*-------------------------*-----------------------------
 A. Main-west   *  -150     0     0     0 *  AG   1269   7.4     .0  13.2
 B. Main-east   *     0     0   150     0 *  AG      0   7.4     .0  13.2
 C. Magdalena-N *     0   150     0     0 *  AG   1289   7.4     .0  13.2
 D. Magdalena-S *     0     0     0  -150 *  AG      0   7.4     .0  13.2

 III.  RECEPTOR LOCATIONS

             *    COORDINATES (M)
   RECEPTOR  *    X      Y      Z
 ------------*---------------------
 1. SE Recep *     9     -9   1.5
 2. NW Recep *    -9      9   1.5
 3. NE Recep *     9      9   1.5
 4. SW Recep *    -9     -9   1.5

  IV.  MODEL RESULTS (WORST CASE WIND ANGLE )

             *       * PRED  *      CONC/LINK
             *  BRG  * CONC  *        (PPM)
  RECEPTOR   * (DEG) * (PPM) *   A    B    C    D
-------------*-------*-------*--------------------
 1. SE Recep *  346. *   2.5 *   .0   .0   .5   .0
 2. NW Recep *   18. *   2.5 *   .0   .0   .5   .0
 3. NE Recep *  260. *   2.8 *   .5   .0   .3   .0
 4. SW Recep *   10. *   2.8 *   .3   .0   .5   .0
```

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Olympic Pkwy-805 NB ramp 2015 AM
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

```
     U=   1.0 M/S              Z0= 100. CM            ALT=     0. (M)
   BRG= WORST CASE             VD=   .0 CM/S
  CLAS=     7 (G)              VS=   .0 CM/S
  MIXH=   10. M               AMB=  2.0 PPM
 SIGTH=   25. DEGREES        TEMP=  4.4 DEGREE (C)
```

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Olympic-west	-150	0	0	0	AG	3141	4.6	.0	13.2
B. Olympic-east	0	0	150	0	AG	4724	4.6	.0	13.2
C. 805NB-N	0	150	0	0	AG	2388	4.6	.0	13.2
D. 805NB-S	0	0	0	-150	AG	1361	4.6	.0	13.2

LINK COORDINATES (M)

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. SE Recep	9	-9	1.5
2. NW Recep	-9	9	1.5
3. NE Recep	9	9	1.5
4. SW Recep	-9	-9	1.5

COORDINATES (M)

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. SE Recep	347.	3.3	.0	.7	.5	.0
2. NW Recep	104.	3.5	.1	1.0	.4	.0
3. NE Recep	251.	3.2	.6	.2	.4	.0
4. SW Recep	74.	3.4	.1	1.0	.0	.2

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          CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                   JUNE 1989 VERSION
                   PAGE   1

              JOB: Olympic Pkwy-805 NB ramp 2020 AM
              RUN: Hour 1           (WORST CASE ANGLE)
        POLLUTANT: Carbon Monoxide

   I.  SITE VARIABLES

       U=   1.0 M/S            Z0= 100. CM            ALT=     0. (M)
     BRG= WORST CASE           VD=   .0 CM/S
    CLAS=     7 (G)            VS=   .0 CM/S
    MIXH=   10. M             AMB=  2.0 PPM
   SIGTH=   25. DEGREES      TEMP=  4.4 DEGREE (C)

  II.  LINK VARIABLES

      LINK      *  LINK COORDINATES (M)   *                EF     H     W
   DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
----------------*-------------------------*-------------------------------
A. Olympic-west *  -150     0     0     0 *  AG   3333   3.2     .0  13.2
B. Olympic-east *     0     0   150     0 *  AG   5009   3.2     .0  13.2
C. 805NB-N      *     0   150     0     0 *  AG   2374   3.2     .0  13.2
D. 805NB-S      *     0     0     0  -150 *  AG   1352   3.2     .0  13.2

III.  RECEPTOR LOCATIONS

             *    COORDINATES (M)
  RECEPTOR   *    X      Y      Z
-------------*---------------------
1. SE Recep  *      9     -9   1.5
2. NW Recep  *     -9      9   1.5
3. NE Recep  *      9      9   1.5
4. SW Recep  *     -9     -9   1.5

  IV.  MODEL RESULTS (WORST CASE WIND ANGLE )

             *       * PRED  *      CONC/LINK
             *  BRG  * CONC  *        (PPM)
 RECEPTOR    * (DEG) * (PPM) *   A    B    C    D
-------------*-------*-------*--------------------
1. SE Recep  *  347. *   2.9 *   .0   .5   .4   .0
2. NW Recep  *  104. *   3.1 *   .0   .7   .2   .0
3. NE Recep  *  251. *   2.9 *   .5   .2   .2   .0
4. SW Recep  *   76. *   3.0 *   .0   .7   .0   .1
```

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Birch Rd-East Lake PM 2025
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	10. M	AMB=	2.0 PPM		
SIGTH=	25. DEGREES	TEMP=	4.4 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M) X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Birch-west	-150	0	0	0	AG	5442	2.4	.0	13.2
B. Birch-east	0	0	150	0	AG	1225	2.4	.0	13.2
C. Eastlake-N	0	150	0	0	AG	1675	2.4	.0	13.2
D. Eastlake-S	0	0	0	-150	AG	4354	2.4	.0	13.2

III. RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M) X	Y	Z
1. SE Recep	9	-9	1.5
2. NW Recep	-9	9	1.5
3. NE Recep	9	9	1.5
4. SW Recep	-9	-9	1.5

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. SE Recep	282.	3.0	.6	.0	.0	.3
2. NW Recep	168.	3.0	.4	.0	.0	.5
3. NE Recep	257.	2.8	.6	.0	.1	.0
4. SW Recep	22.	2.7	.4	.0	.2	.1

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CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: Main St-Magdalena PM 2030
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U=	1.0 M/S	Z0=	100. CM	ALT=	0. (M)
BRG=	WORST CASE	VD=	.0 CM/S		
CLAS=	7 (G)	VS=	.0 CM/S		
MIXH=	10. M	AMB=	2.0 PPM		
SIGTH=	25. DEGREES	TEMP=	4.4 DEGREE (C)		

II. LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. Main-west	-150	0	0	0	AG	7567	2.1	.0	13.2
B. Main-east	0	0	150	0	AG	6660	2.1	.0	13.2
C. Magdalena-N	0	150	0	0	AG	1451	2.1	.0	13.2
D. Magdalena-S	0	0	0	-150	AG	0	2.1	.0	13.2

LINK COORDINATES (M): X1, Y1, X2, Y2

III. RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. SE Recep	9	-9	1.5
2. NW Recep	-9	9	1.5
3. NE Recep	9	9	1.5
4. SW Recep	-9	-9	1.5

COORDINATES (M): X, Y, Z

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	BRG (DEG)	PRED CONC (PPM)	CONC/LINK (PPM) A	B	C	D
1. SE Recep	287.	2.9	.7	.1	.0	.0
2. NW Recep	107.	2.9	.1	.6	.0	.0
3. NE Recep	256.	2.9	.7	.1	.1	.0
4. SW Recep	287.	2.9	.9	.0	.0	.0

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APPENDIX D

Noise Impact Study

Otay Ranch Village 8 West Sectional Planning Area Project

Final Noise Technical Report

May 2013

Prepared for

CITY OF
CHULA VISTA

276 Fourth Avenue
Chula Vista, California 91910

Prepared by

ATKINS

3570 Carmel Mountain Road, Suite 300
San Diego, California 92130

Contents

Figures

Tables

1.0 Summary

This report assesses potential noise and vibration impacts associated with the implementation of the Otay Ranch Village 8 West Sectional Planning Area (SPA) plan, herein referred to as the project. The project consists of approximately 300 acres of land in Otay Ranch known as Village 8 West, located entirely within the City of Chula Vista, California, near the southeasterly edge of the City's limits. Chula Vista is located in San Diego County, approximately two miles south of the City of San Diego, and approximately two miles north of the US-Mexico International Border. This report is intended to satisfy the City's requirement for a noise impact analysis by examining the impacts of the proposed project on noise-sensitive uses in the area and proposing mitigation measures where feasible to address significant noise impacts.

Construction of the proposed Village 8 West project would not result in construction noise or groundborne vibration that would result in a significant direct or cumulative impact with implementation of the mitigation measures required in the Biological Resource Report prepared for the proposed project. Buildout of the proposed project would result in significant traffic noise increases along La Media Road, Main Street, Otay Valley Road, and Street A within the project site. Mitigation measures Noi-1 through Noi-5 would reduce direct and cumulative impacts to a less than significant level. Short-term increases in traffic noise off-site on La Media Road, Birch Road, and Magdalena Avenue would be significant and unavoidable until roadway circulation system improvements are complete. Completion of the roadway circulation system improvements are required as part of required mitigation included in the traffic study prepared for the project. Long-term traffic noise impacts would be less than significant with implementation of the circulation system improvements. Operation of the proposed project would have the potential to result in excessive noise levels related to heating, ventilation, and air conditioning (HVAC) equipment, commercial land use, and recreational facilities. Mitigation measures Noi-2 through Noi-4, and Noi-6 through Noi-8 would reduce direct and cumulative impacts to a less than significant level. Future residents of Village 8 West would have the potential to be exposed to nuisance noise from Brown Field aircraft operations. Mitigation measure Noi-9 would reduce impacts to a less than significant level.

2.0 Introduction

2.1 Purpose

The objectives of this noise study are to:

1. Describe the existing noise environment and regulatory requirements;
2. Provide an assessment of the potential noise impacts that would result from implementation of the project related to construction, traffic, and operational noise sources.
3. Compare the changes in estimated noise levels due to the implementation of the project to applicable guidelines contained in local and state planning documents to determine significance.
4. Provide a general discussion of the potential impacts from groundborne vibration that would result from implementation of the proposed project.

5. Provide mitigation measures where necessary to avoid or reduce significant noise impacts to the degree feasible in order to meet applicable noise regulations and standards.

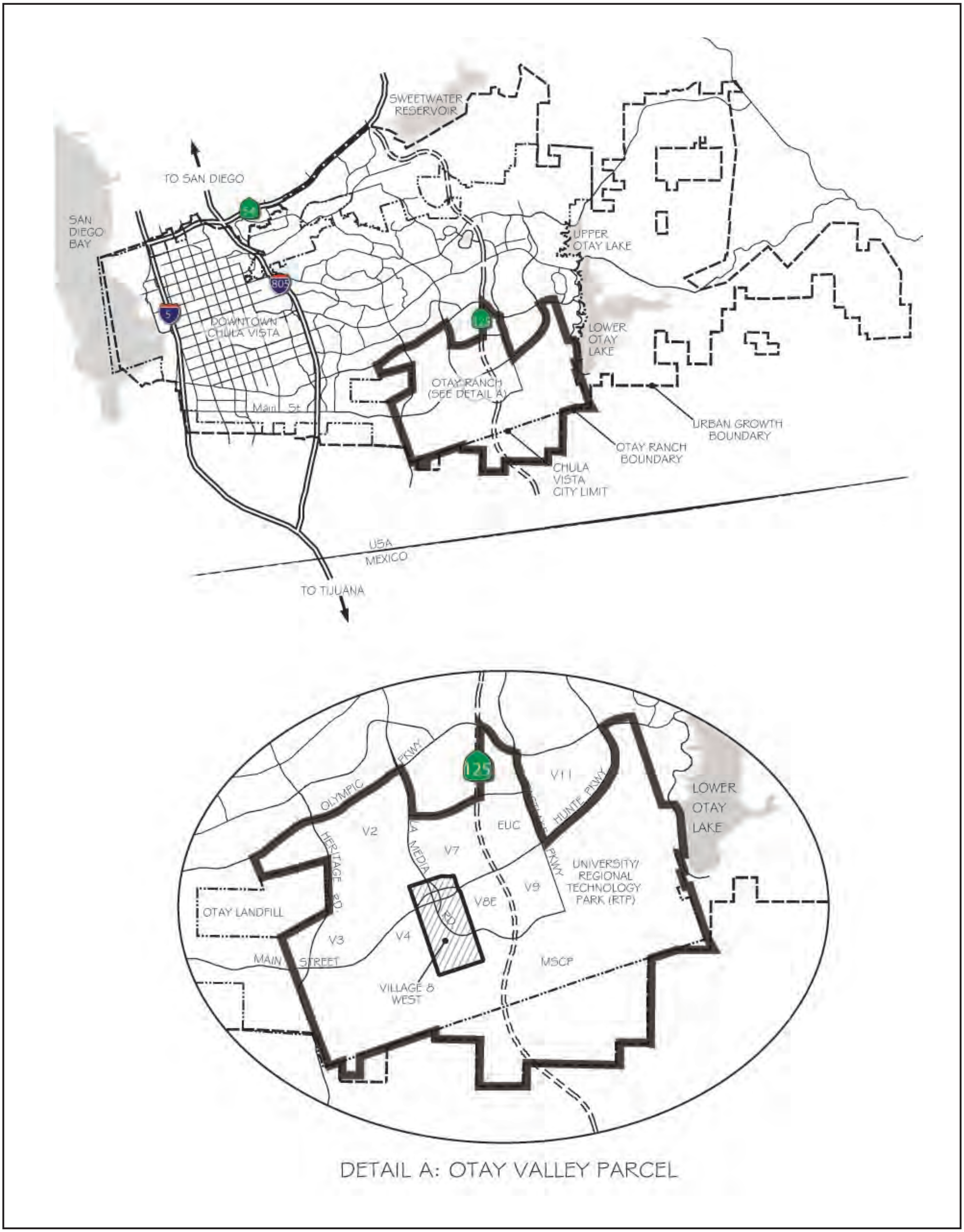
2.2 Project Description

Figure 1, Project Vicinity, and Figure 2, Existing and Planned Land Uses in the Project Vicinity, illustrate the project's location and surrounding uses. Village 8 West is one of the designated fourteen villages within the Otay Ranch General Development Plan (GDP) area. As prescribed in the Otay Ranch GDP, Village 8 West is proposed as an Urban Village with a mixed-use Town Center, higher density uses around the Town Center and low-medium density residential uses to the south of the Town Center. Urban Villages are intended to be adjacent to existing urban development and planned for transit-oriented development with higher densities and mixed uses within one quarter mile of a transit stop or station. Figure 3, Site Utilization Plan, illustrates the land use plan for the SPA. The proposed land uses for Village 8 West are provided in Table 1. The Village 8 West SPA Plan includes the extension of a utility easement off-site to the south of the SPA to extend sewer facilities to connect to existing facilities, and connect the storm drain to Otay River. A 12-foot paved trail would be included within the 30-foot easement to provide access to the offsite utilities and a trail connection to the Otay Valley Regional Park trail system.

Table 1 Village 8 West SPA Land Uses

Land Use	Area (Acres)	Residential (Units)	Office (Square feet)	Commercial (Square feet)
Mixed Use	40.7	899	50,000	250,000
Multi-family	29.5	530	--	--
Cluster Single-Family/Town homes	26.2	290	--	--
Single-Family	67.0	331	--	--
Schools(1)	31.6	--	--	--
Community Purpose Facility (CPF)	5.8	--	--	--
Parks	27.9	--	--	--
Open Space	39.1	--	--	--
Arterial Rights-of-Way and Basin	32.5	--	--	--
Total	**300.3**	**2,050**	**50,000**	**250,000**

(1) If the proposed school sites are ultimately not chosen to be used by the school district, the sites would be developed with multi-family residential uses. Maximum residential development for the site would remain the same; densities in adjacent planning areas would be reduced to accommodate the additional residential planning area(s).

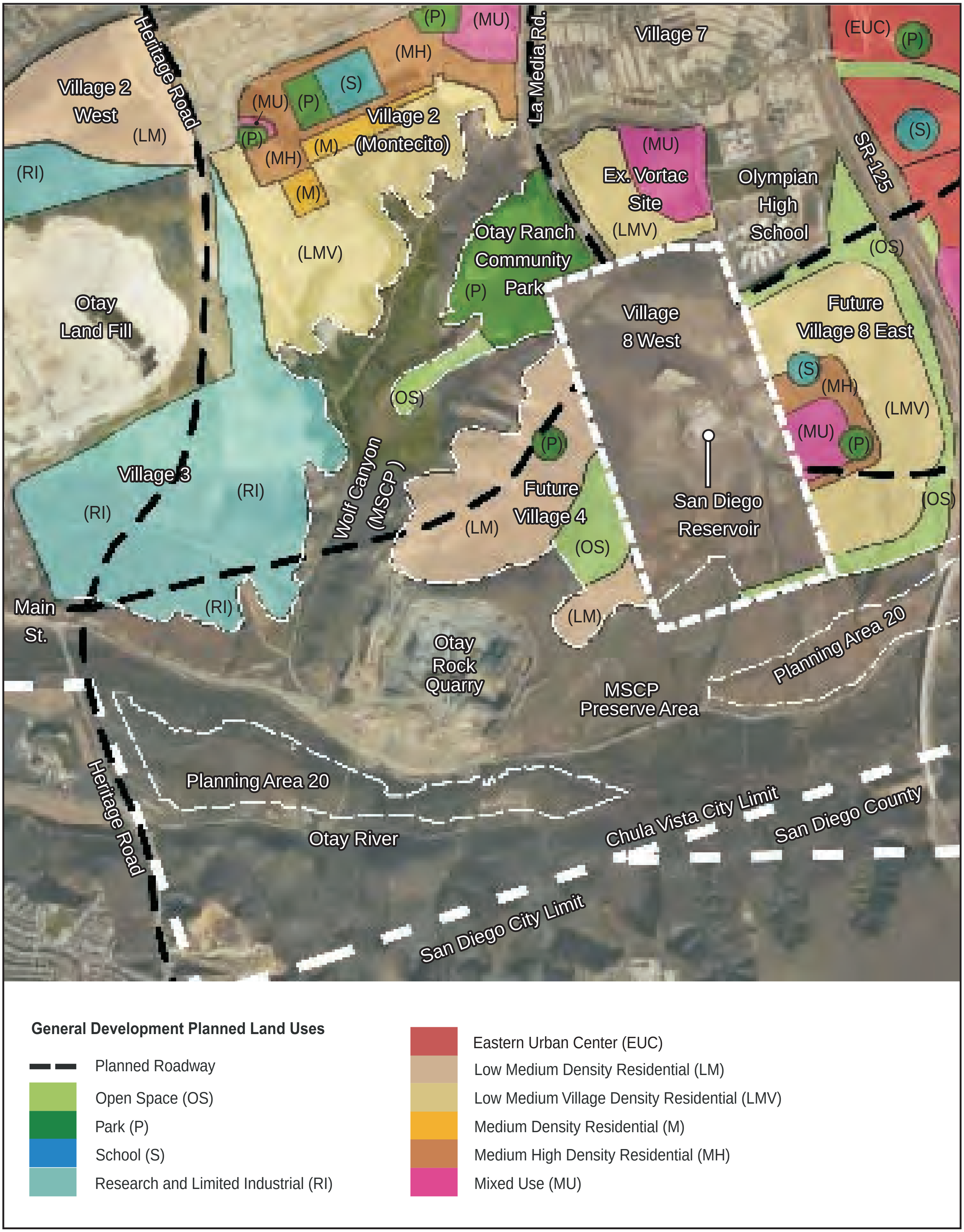


Source: William Hezmalhalch Architects, Inc. 2010

Not to Scale

N

PROJECT VICINITY
FIGURE 1



Source: William Hezmalhalch Architects, Inc. 2010

Not to Scale

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EXISTING AND PLANNED LAND USES IN THE PROJECT VICINITY
FIGURE 2

Land Use

- Town Center (TC))
- Medium High Density Residential (MH)
- Medium Density Residential (M)
- Low Medium Density Residential Village (LMV)
- Open Space (OS)
- Open Space (Preserve)
- Park (P)
- School

* Lotting and grading to be determined at Tentative Map

Commercial and Residential

Planning Area	Gross Acres	Transect	Target Res. Units	Target C'ml Sq.Ft. (K)
Town Center - 18-45 du/ac				
B	1.4	T-4: TC	35	0
C	6.9	T-4: TC	156	36
F	3.0	T-4: TC	54	25
H-1	7.8	T-4: TC	33	144
H-2	1.3	T-4: TC	0	12
J	5.4	T-4: TC	161	18
L	14.2	T-4: TC	460	65
X	0.7	T-4: TC	0	0
Subtotal	**40.7**		**899**	**300**
Medium High Density Residential - 11-18 du/ac				
E	5.3	T-3:NC	95	0
I	6.8	T-3:NC	122	0
M	8.5	T-3:NC	153	0
O	8.9	T-3:NC	160	0
Subtotal	**29.5**		**530**	0
Medium Density Residential Attached/Detached - 6-11 du/ac				
Q	14.7	T-2:NG	160	0
U	11.5	T-2:NG	130	0
Subtotal	**26.2**		**290**	0
Low Medium Density Residential Village - 3-6 du/ac				
N	19.6	T-2:NE	117	0
P	26.9	T-2:NE	124	0
V	20.5	T-2:NE	90	0
Subtotal	**67.0**		**331**	0
TOTAL	**163.4**		**2,050**	**300**

Public, Quasi Public, and Other

Planning Area	GDP Land Use	Gross Acres	Transect	Description
Community Purpose Facility (CPF)				
R	MH	5.8	SD: CPF	As defined by CVMC Chapter 19.48
Subtotal		**5.8**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Description
Potential School (S) Sites*				
D	TC	20.2	T-4: TC	Middle
S	MH	11.4	T-3: NC	Elementary
Subtotal		**31.6**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Classification
Parks (P)				
A	P	17.4	SD: P	Community
G	TC	3.0	SD: P	Town Square
T	P	7.5	SD: P	Neighborhood
Subtotal		**27.9**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Classification
Open Space (OS)				
Y	CVOSP**	15.6	T-1: OP	Preserve (MSCP)
OS-1	OS	23.5	T-1: OS	Open Space
Subtotal		**39.1**		

Planning Area	GDP Land Use	Gross Acres (Ac.)	Transect	Description
Other				
W	TC	2.4	SD: R	Basin
Right-of-Way	NA	30.1	NA	Arterials
Subtotal		**32.5**		
TOTAL		**136.9**		

SPA Total Area: 300.3 Gross Acres

* School sites will revert to the underlying use if sites are not accepted by the school district. Parcel D shall revert to Town Center and Parcel S shall revert to Medium High Density Residential.
** Chula Vista Open Space Preserve.

Source: William Hezmalhalch Architects, Inc. 2010

0 400 800
Feet

N

SITE UTILIZATION PLAN
FIGURE 3

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The Village 8 West circulation system would provide a system of roadway and trail corridors to support both vehicular and non-vehicular modes of transportation. This system includes the extension of existing and planned roads, trails, and transit from adjacent villages as well as internal systems to serve the SPA. Community streets are designed as “complete” streets, considering all modes of transportation by providing vehicular travel lanes, bike lanes or bike routes, sidewalks, and transit lanes where appropriate. The Village 8 West circulation system would organize traffic into a hierarchy of roadways, arranged according to anticipated volumes and modes of travel. This organization is consistent with the roadway classifications established by the Otay Ranch GDP. The proposed roadway circulation system is shown on Figure 4.

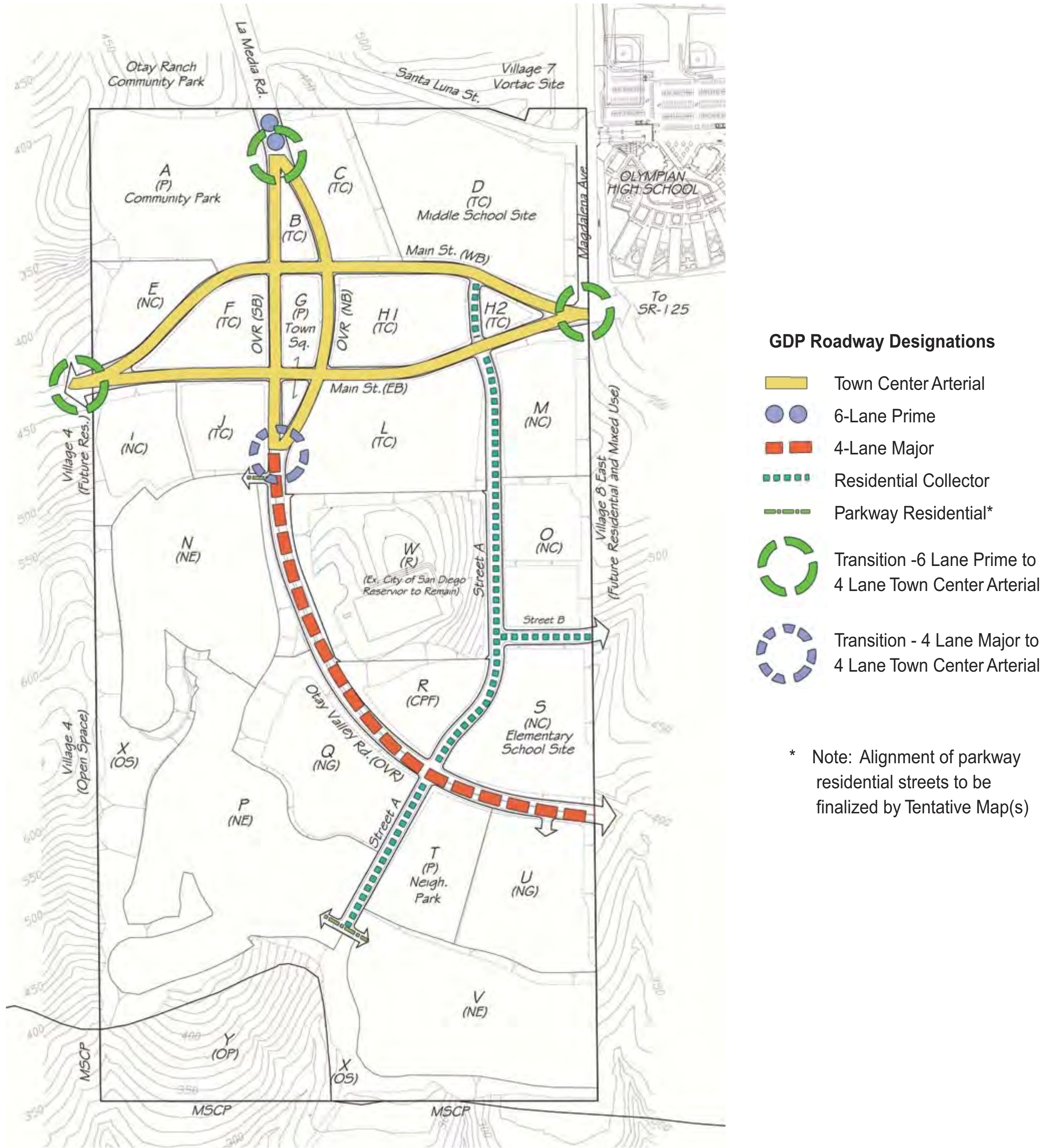
Main Street would provide the main east-west connection through Village 8 West and is planned to be extended east to provide a connection to Village 8 East and a future Main Street interchange at State Route 125(SR-125). La Media Road would be extended from its existing terminus just north of the site and become Otay Valley Road south of the proposed couplet in the Town Center.

Otay Valley Road would extend south and then curve to the east, providing a future connection to Village 8 East. Otay Valley Road is planned to extend further to a future Otay Valley Road interchange at SR-125. Central to the circulation concept for Village 8 West is the use of urban couplets on Otay Valley Road and Main Street, through the heart of the Town Center. An urban couplet or Town Center Arterial is an arterial roadway that splits into two one-way roadways through the urban core.

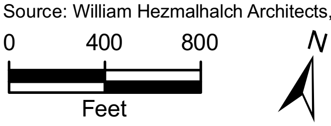
Secondary access through the village would be provided via a residential collector, Street A. The residential collector would provide an alternate route through the village, connecting residential neighborhoods to the Town Center. Street B would provide an additional connection to Village 8 East. The remaining roadways in Village 8 West would be Parkway Residential Streets and private streets. Parkway Residential Streets would provide direct access to single family homes in the southern and western portions of the SPA. Additional private streets and lanes would be provided as part of the site plan for single family cluster, multi-family, and mixed use neighborhoods.

The traffic impact analysis (TIA) prepared for Village 8 West (RBF 2013) analyzes the potential traffic impacts of the proposed project under five scenarios:

- **Existing Plus Project** includes project-generated trips associated with buildout of Village 8 West. The project-generated trips were added to the existing roadway network.
- **Year 2015** includes project-generated trips associated with the construction of 105 single family and 246 multi-family residential dwelling units in Village 8 West.
- **Year 2020** includes development assumed in 2015, plus project-generated trips associated with the construction of 354 single family and 824 multi-family residential dwelling units, 50,000 square feet of office use, 40,000 square feet of commercial retail, and 5.5 acres of park within Village 8 West.
- **Year 2025** includes development assumed in 2020 plus project-generated trips associated with the construction of 162 single family dwelling units, 359 multi family dwelling units, an elementary school, 150,000 square feet of commercial retail, and 13.1 acres of park space.
- **Year 2030** includes development assumed in 2025 plus a middle school, 60,000 square feet of commercial retail, and 9.4 acres of park space.



Source: William Hezmalhalch Architects, Inc. 2010



ROADWAY CIRCULATION SYSTEM
FIGURE 4

Each traffic scenario includes assumptions for road improvements to be constructed by the applicant to provide access and frontage to the development in Village 8 West assumed in each scenario. In addition, the traffic study identifies mitigation measures to address potential long-term impacts to the circulation system as a result of the project and cumulative development under each scenario. The traffic scenario that considers full buildout of the Village 8 West SPA and cumulative development through the Year 2030 with implementation of the mitigation measures is referred to as the Year 2030 Mitigated scenario. As described in the traffic study prepared for Village 8 West (RBF 2013), the 2030 buildout traffic scenario includes future roads that are proposed as part of the development plans for other villages. According to the traffic report, if the equivalent dwelling unit assumption for the buildout study year (2030) is reached prior to implementation of these roadways being open to traffic, then one of the following steps shall be taken as determined by, and to the satisfaction of, the City Engineer to mitigate potential traffic impacts:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or
2. City and Otay Land Company shall meet to determine the need for the incomplete roadway segments. A number of factors, including changes to the tolling structure at SR-125, may affect the traffic patterns in the Otay Ranch. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or
3. Developer shall construct the missing roadway links and receive Transportation Development Impact Fee (TDIF) credit for those improvements as applicable; or
4. An alternative measure is selected by the city in accordance with the Chula Vista Growth Management Ordinance.

The measures listed above have been established in the traffic study to ensure that this circulation system would be implemented concurrently with Village 8 West. This plan is required as mitigation in the traffic study for the project's potential traffic impacts and will be included in the Mitigation Monitoring and Reporting Program (MMRP) for the proposed project.

The project area ranges in elevation from approximately 600 feet above mean sea level (AMSL) in the east to 400 feet AMSL in the west. The project site is located less than 0.5 mile west of SR-125 and is surrounded on three sides by undeveloped land. Rock Mountain is located to the west of the site, and bluffs along the Otay River Valley are located to the south. The future location for Village 8 East (currently undeveloped) is located to the east of the site; Otay Valley Regional Park and the Otay River Valley form the southerly boundary; the Otay Valley Quarry and future Village 4 (currently undeveloped) form the westerly boundary; and the partially developed Village 7, including Olympian High school, is located adjacent to the northeast corner of the project area. An existing City of San Diego Reservoir facility is located in approximately the center of the site. The facility is not part of the proposed project.

This noise technical report is being prepared in support of the Environmental Impact Report (EIR) being prepared for the Village 8 West SPA project. The EIR for Village 8 West is a Second Tier EIR. Pursuant to CEQA Section 21093, the Village 8 West EIR tiers from the Supplemental EIR (SEIR 09-01) to the General Plan Update EIR (EIR 05-01; SCH #2004081066). The SEIR addresses the General Plan/General Development Plan Amendments (GPA/GDPA) that redefine boundaries for Villages 4, 7, and 8 to provide a clear definition of the proposed SPA. A program-level noise technical report has been prepared for the GPA/GDPA (City of Chula Vista 2013). This technical report tiers from the analysis in the GPA/GDPA noise technical report and provides more project-specific analysis. The analysis and conclusions of the GPA/GDPA noise technical report are incorporated into the impact analysis sections for the proposed project where appropriate. The noise technical report for the GPA/GDPA SEIR concluded that implementation of the GPA/GDPA, including Village 8 West, would result in direct and cumulative impacts related to increases in traffic noise. The report also concluded that implementation of the GPA/GDPA would not result in exposure of noise-sensitive land uses to excessive noise from the Brown Field airport and that operational noise sources would be less than significant with conformance to General Plan and GDP Policies, and the City's noise ordinance.

3.0 Environmental Setting

3.1 Noise Basics

3.1.1 Quantification of Noise

Noise is commonly defined as unwanted sound. Sound pressure magnitude is measured and quantified using a logarithmic ratio of pressures, the scale of which gives the level of sound in decibels (dB). Sound pressures in the environment have a wide range of values and the sound pressure level was developed as a convenience in describing this range as a logarithm of the sound pressure. The sound pressure level is the logarithm of the ratio of the unknown sound pressure to a reference quantity of the same kind. To account for the pitch of sounds and the corresponding sensitivity of human hearing to them, the raw sound pressure level is adjusted with an A-weighting scheme based on frequency that is stated in units of decibels (dBA). Typical A-weighted noise levels are listed in Table 2.

A given level of noise may be more or less tolerable depending on the sound level, duration of exposure, character of the noise sources, the time of day during which the noise is experienced, and the activity affected by the noise. For example, noise that occurs at night tends to be more disturbing than that which occurs during the day because sleep may be disturbed. Additionally, rest at night is a critical requirement in the recovery from exposure to high noise levels during the day. In consideration of these factors, different measures of noise exposure have been developed to quantify the extent of the effects anticipated from these activities. For example, some indices consider the 24-hour noise environment of a location by using a weighted average to estimate its habitability on a long term basis. Other measures consider portions of the day and evaluate the nearby activities affected by it as well as the noise sources. The most commonly used indices for measuring community noise levels are the Equivalent Energy Level (Leq), and the Community Noise Equivalent Level (CNEL).

Leq, the Equivalent Energy Level, is the average acoustical or sound energy content of noise, measured during a prescribed period, such as 1 minute, 15 minutes, 1 hour, or 8 hours. It is the decibel sound level that contains an equal amount of energy as a fluctuating sound level over a given period of time.

CNEL, Community Noise Equivalent Level, is the average equivalent A-weighted sound level over a 24-hour period. This measurement applies weights to noise levels during evening and nighttime hours to compensate for the increased disturbance response of people at those times. CNEL is the equivalent sound level for a 24-hour period with a +5 dBA weighting applied to all sound occurring between 7:00 p.m. and 10:00 p.m. and a +10 dBA weighting applied to all sound occurring between 10:00 p.m. and 7:00 a.m. Similar to the CNEL, Ldn, the day-night average noise level, is a 24-hour average Leq with a +10 dBA weighting applied to noise during the hours of 10:00 p.m. to 7:00 a.m. Ldn and CNEL are typically within one dBA of each other and, for most intents and purposes, are interchangeable.

Table 2 Typical A-Weighted Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet		
	— 100 —	
Gas lawn mower at 3 feet		
	— 90 —	
Diesel truck at 50 feet at 50 mph		Food blender at 3 feet
	— 80 —	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawn mower, 100 feet	— 70 —	Vacuum cleaner at 10 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	— 60 —	
		Large business office
Quiet urban daytime	— 50 —	Dishwasher next room
Quiet urban nighttime	— 40 —	Theater, large conference room (background)
Quiet suburban nighttime		
	— 30 —	Library
Quiet rural nighttime		Bedroom at night
	— 20 —	
		Broadcast/recording studio
	— 10 —	
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: Caltrans 1998.

The decibel level of a sound decreases (or attenuates) exponentially as the distance from the source of that sound increases. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Sound that originates from a linear, or "line" source such as a heavily traveled traffic corridor, attenuates by approximately 3 dBA per doubling of distance, provided that the surrounding site conditions lack ground effects or obstacles that either scatter or reflect noise. Noise from roadways in environments with major ground effects due to vegetation and loose soils may either absorb or scatter the sound yielding attenuation rates as high as 4.5 dBA for each doubling of distance. Other contributing factors that affect sound reception include meteorological conditions and the presence of manmade obstacles such as buildings and sound barriers.

3.1.2 Noise Effects

Noise has a significant effect on the quality of life. An individual's reaction to a particular noise depends on many factors such as the source of the noise, its loudness relative to the background noise level, and the time of day. The reaction to noise can also be highly subjective; the perceived effect of a particular noise can vary widely among individuals in a community. Because of the nature of the human ear, a sound must be about 10 dBA greater than the reference sound to be judged as twice as loud. In general, a 5 dBA change in community noise levels is clearly noticeable, and a 3 dBA change is the smallest increment that is perceivable by most receivers. Generally, 1 to 2 dBA changes generally are not detectable. Although the reaction to noise may vary, it is clear that noise is a significant component of the environment, and excessively noisy conditions can affect an individual's health and well-being. The effects of noise are often only transitory, but adverse effects can be cumulative with prolonged or repeated exposure. The effects of noise on a community can be organized into six broad categories: sleep disturbance; permanent hearing loss; human performance and behavior; social interaction of communication; extra-auditory health effects; and general annoyance.

3.2 Environmental Vibration Basics

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of input excitation. Vibration consists of waves transmitted through solid material. There are several types of wave motion in solids, unlike in air, including compressional, shear, torsional, and bending. The solid medium can be excited by forces, moments, or pressure fields. This leads to the terminology of "structure-borne/ground-borne" vibration.

Vibration energy spreads out as it travels through the ground, causing the vibration amplitude to decrease with distance away from the source. Soil properties also affect the propagation of vibration. When groundborne vibration interacts with a building there is usually a ground-to-foundation coupling loss, but the vibration can also be amplified by the structural resonances of the walls and floors. Vibration in buildings is typically perceived as rattling of windows or items on shelves or the motion of building surfaces. The vibration of building surfaces can also be radiated as sound and heard as a low-frequency rumbling noise, known as groundborne noise.

Ambient and source vibration information for this study are expressed in terms of the peak particle velocity (PPV) in inches per second (in/sec) that correlates best with human perception. The particle velocity is the velocity of the soil particles resulting from a disturbance. Agencies such as California Department of Transportation (Caltrans) use the PPV descriptor because it correlates well with damage or complaints. Caltrans estimates that the threshold of perception is approximately 0.006 in/sec PPV and the level at which continuous vibrations begins to annoy people is approximately 0.010 in/sec PPV.

3.3 Regulatory Framework

3.3.1 Federal

Federal Aviation Administration (FAA) Standards

Enforced by the Federal Aviation Administration, Code of Federal Regulations (CFR) Title 14, Part 150 prescribes the procedures, standards and methodology governing the development, submission, and review of airport noise exposure maps and airport noise compatibility programs, including the process for evaluating and approving or disapproving those programs. Title 14 also identifies those land uses which are normally compatible with various levels of exposure to noise by individuals. The FAA has determined that interior sound levels up to 45 dBA Ldn (or CNEL) are acceptable within residential buildings. The FAA also considers residential land uses to be compatible with exterior noise levels at or less than 65 dBA Ldn (or CNEL).

Federal Highway Administration (FHWA) Standards

CFR Title 23, Part 772 sets procedures for the abatement of highway traffic noise and construction noise. Title 23 is implemented by the Department of Transportation FHWA. The purpose of this regulation is to provide procedures for noise studies and noise abatement measures to help protect the public health and welfare, to supply noise abatement criteria, and to establish requirements for information to be given to local officials for use in the planning and design of highways. All highway projects which are developed in conformance with this regulation shall be deemed to be in conformance with the Department of Transportation (DOT) Federal Highway Administration Noise Standards. Title 23 establishes 67 dBA as the worst-case hourly average noise level standard for impacts of federal highway projects to land uses including residences, recreational uses, hotels, hospitals, and libraries [23 CFR Chapter 1, Part 772, Section 772.19].

Federal Transit Administration (FTA) Standards and Federal Railroad Administration (FRA) Standards

Although the FTA standards are intended for federally funded mass transit projects, the impact assessment procedures and criteria included in the FTA Transit Noise and Vibration Impact Assessment Manual (May 2006) are routinely used for projects proposed by local jurisdictions. The FTA and FRA have published guidelines for assessing the impacts of groundborne vibration associated with rail projects, which have been applied by other jurisdictions to other types of projects. The FTA measure of the threshold of architectural damage for conventional sensitive structures from groundborne vibration is 0.2 inches/second PPV.

3.3.2 State

California Noise Control Act of 1973

Sections 46000 through 46080 of the California Health and Safety Code, known as the California Noise Control Act of 1973, finds that excessive noise is a serious hazard to the public health and welfare and that exposure to certain levels of noise can result in physiological, psychological, and economic damage. It also finds that there is a continuous and increasing bombardment of noise in the urban, suburban, and rural areas. The California Noise Control Act declares that the State of California has a responsibility to protect the health and welfare of its citizens by the control, prevention, and abatement of noise. It is the policy of the state to provide an environment for all Californians free from noise that jeopardizes their health or welfare.

California Noise Insulation Standards (CCR Title 24)

In 1974, the California Commission on Housing and Community Development adopted noise insulation standards for hotels, motels, dormitories, and multi-family residential buildings (CCR Title 24, Part 2). Title 24 establishes standards for interior room noise (attributable to outside noise sources). The regulations also specify that acoustical studies must be prepared whenever a multi-family residential building or structure may be exposed to exterior noise levels of 60 dBA CNEL (or Ldn) or greater. Such acoustical analysis must demonstrate that the residence has been designed to limit intruding noise to an interior CNEL (or Ldn) of a maximum noise level of 45 dBA [California's Title 24 Noise Standards, Chap. 2-35].

2010 California Green Building Standards Code

Section 5.507 of the California Green Building Standards Code (CalGreen) establishes requirements for acoustical control in non-residential buildings. The standards require that wall and roof-ceiling assemblies making up the building envelope shall have a sound transmission class value of at least 50, and exterior windows shall have a minimum sound transmission class of 30 for any of the following building locations: 1) within 1,000 feet (300 meters) of right of ways of freeways, 2) within 5 miles (8 kilometers) of airports serving more than 10,000 commercial jets per year, and 3) where sound levels at the property line regularly exceed 65 dBA, other than occasional sound due to church bells, train horns, emergency vehicles and public warning systems. Wall and floor-ceiling assemblies separating tenant spaces and tenant spaces and public places shall have a sound transmission class of at least 40. Additionally, Section A5.507.5 requires that classrooms have a maximum interior background noise level of no more than 45 dBA Leq.

3.3.3 Local

City of Chula Vista General Plan

The Environmental Element of the Chula Vista General Plan contains goals and policies related to environmental noise in Section 3.5, Noise. The General Plan defines noise sensitive land uses (NSLU) as residences, schools, hospitals, libraries, parks, and places of worship. To establish the compatibility of various land uses with exterior noise levels, the City uses CNEL in its planning guidelines. Table 3 illustrates Chula Vista's exterior land use-noise compatibility guidelines. Shading in this table represents the maximum noise level considered compatible for each land use category. These guidelines reflect the levels of noise exposure that are generally considered to be compatible with various types of land uses. The City of Chula Vista states that these guidelines are to be used at the land use planning stage, for noise impact assessments, and to determine mitigation requirements for development proposals.

As stated in the General Plan, the noise control ordinance of the Chula Vista Municipal Code, discussed below, establishes noise level limits for individual generators. The noise control ordinance limits in the Municipal Code are used in noise impact assessments to determine mitigation requirements for individual noise generators, such as industrial equipment, to ensure that they will not adversely impact surrounding land uses. Conversely, the guidelines listed in Table 3 reflect the total noise exposure that is compatible with a particular land use, including vehicular traffic that contribute to permanent ambient noise levels that are not regulated by the noise control ordinance.

Table 3 Exterior Land Use/Noise Compatibility Guidelines

Land Use	Annual CNEL in decibels					
	50	55	60	65	70	75
Residential						
Schools, Libraries, Daycare Facilities, Convalescent Homes, Outdoor Use Areas, and Other Similar Uses Considered Noise Sensitive						
Neighborhood Parks, Playgrounds						
Community Parks, Athletic Fields						
Offices and Professional						
Places of Worship (excluding outdoor use areas)						
Golf Courses						
Retail and Wholesale Commercial, Restaurants, Movie Theaters						
Industrial, Manufacturing						

Note: Shading represents the maximum noise level considered compatible for each land use category
Source: City of Chula Vista 2005

City of Chula Vista Multiple Species Conservation Program Subarea Plan

The Multiple Species Conservation Program (MSCP) Subarea Plan regulates impacts to sensitive biological resources, including noise impacts. In accordance with Section 7.5.2 of the Chula Vista Subarea Plan, Adjacency Management Issues, uses in or adjacent to the Preserve should be designed to minimize noise impacts. Berms or walls should be constructed adjacent to commercial areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the Preserve. Excessively noisy areas or activities adjacent to breeding areas, including temporary grading activities, must incorporate noise reduction measures or be curtailed during the breeding season of sensitive bird species, consistent with Table 3-5 of the MSCP Subregional Plan, included as Appendix A to the MSCP Subarea Plan. In general, the noise threshold for sensitive biological resources is an hourly average noise level of 60 dBA and no clearing, grubbing, and/or grading is permitted within the MSCP Preserve during the breeding season of the sensitive species present.

City of Chula Vista Municipal Code

CVMC Chapter 19.68, Performance Standards and Noise Control (Noise Ordinance), establishes noise criteria for Chula Vista. Section 19.68.030 defines exterior noise standards for various land uses. The noise standards are not to be exceeded at the portion of a property used for a particular land use. For nuisance noise, the noise standards cannot be exceeded at any time. Examples of nuisance noise provided in the noise ordinance include pets in residential neighborhoods, private parties of limited duration, sound amplifiers and musical instruments, and any activities in commercial areas other than permitted uses. For environmental noise, the Leq in any one hour cannot exceed the noise standards. These standards are shown in Table 4. The noise standards in Table 4 do not apply to construction activities.

Table 4 Exterior Noise Limits

Receiving Land Use Category	Noise Level (dBA)[1,2,3] 10:00 p.m. to 7:00 a.m. (Weekdays) 10:00 p.m. to 8:00 a.m. (Weekends)	7:00 a.m. to 10:00 p.m. (Weekdays) 8:00 a.m. to 10:00 p.m. (Weekends)
All residential (except multiple dwelling)	45	55
Multiple dwelling residential	50	60
Commercial	60	65
Light industry – I-R and I-L zone	70	70
Heavy Industry – I zone	80	80

(1) Environmental Noise – Leq in any hour, Nuisance Noise – not be exceeded any time
(2) According to Section 19.68.030(B)(2), if the alleged offensive noise contains a steady, audible sound such as a whine, screech or hum, or contains a repetitive impulsive noise such as hammering or riveting, the standard limits shall be reduced by 5 dB.
(3) If the measured ambient level, measured when the alleged noise violation source is not operating, exceeds the standard noise limit, the allowable noise exposure standard shall be the ambient noise level.
Source: City of Chula Vista Municipal Code Section 19.68.030

CVMC Section 19.68.050 regulates vibration from construction and operational sources. It prohibits operating or permitting the operation of any device that creates a vibration that is above the vibration perception threshold of any individual at or beyond the property boundary of the source if on private property or at 150 feet from the source if on a public space or public right-of-way.

Construction noise is regulated by Section 17.24.040 of the Municipal Code. The ordinance prohibits construction and building work in residential zones that would cause noises disturbing to the peace, comfort, and quiet enjoyment of property of any person residing or working in the vicinity between the hours of 10:00 p.m. and 7:00 a.m., Monday through Friday, and between the hours of 10:00 p.m. and 8:00 a.m., Saturday and Sunday.

3.4 Existing Noise Environment

Existing noise sources, including transportation, operation, and construction that affect the project site are described below.

3.4.1 Existing Noise Levels

An ambient sound level survey was conducted on March 18, 2011, to quantify the noise environment in Village 8 West and surrounding vicinity. A total of four measurements were taken across the project site and one was taken in the existing residential neighborhood north of the project site in Village 7. The measurements were taken during the daytime (9:00 a.m. to 1:00 p.m.) and were 15 minutes in duration. A Larson Davis 820 ANSI (American National Standards Institute) Type I Integrating Sound Level Meter calibrated with a Larson Davis CAL200 calibrator was used to record ambient sound levels. Weather conditions during the measurements were calm with a mild temperature and partly-cloudy to clear skies. Table 5 summarizes the measured Leq and noise sources for each monitoring location, and the on-site monitoring locations are shown on Figure 5.

Source: Hale Engineering 2010

Not to Scale

N

NOISE MEASUREMENT LOCATIONS
FIGURE 5

Table 5 Ambient Sound Level Measurements (dBA)

Site	Location	Daytime Noise Sources	Date/Time	Leq	Lmax	Lmin
1	Western edge of Planning Area E in the northwest area of Village 8 West. Proposed site of multi-family housing in Neighborhood Center Zone.	Birds, planes taking off from Brown Field, distant traffic	3-18-2011 / 9:11 a.m.	53	68	41
2	Northern boundary of Planning Area L in the middle of Village 8 West. Proposed site of mixed-use development in the Town Center.	Distant construction noise and traffic, birds, rustling grasses	3-18-2011 / 9:36 a.m.	42	55	37
3	Lot 56 in Planning Area B in the southeast area of Village 8 West. Proposed site of single-family development in the Neighborhood Edge Zone.	Birds, distant traffic and construction, plane and helicopters flyovers	3-18-2011 / 9:58 a.m.	43	50	36
4	Eastern end of Main Street on the northeast edge of Village 8 West at the intersection of Magdalena Avenue and Main Street.	Occasional traffic on Main Street and Magdalena Avenue, loudspeaker announcements at Olympian High School, distant noise from children playing	3-18-2011 / 12:01 p.m.	55	71	33
5	Southeast corner of Fleishbein Street and Kincaid Avenue in the residential development northwest of Olympian High School and Wolf Canyon Elementary School in Village 7.	Traffic, sanitation pickup trucks, construction	3-18-2011 / 12:25 p.m.	57	76	36
Source: Atkins 2013. Ambient measurements were 15 minutes in duration.						

The results of the ambient noise survey reflect noise levels that range between 42 dBA and 55 dBA Leq within the project site. This is consistent with the noise measurement taken along the northern border of the project site for the2013 GPA/GDPA SEIR, which measured a noise level of 52 dBA Leq. The primary noise sources included birds, planes and helicopters taking off from Brown Field, and distant traffic and construction. Although the SR-125 is the closest major roadway to the project site, traffic noise was primarily from the I-805, located west of the project site. The measured noise level at the existing residential development north of the project site in Village 7 was 57 dBA Leq. Noise sources in this development include traffic, sanitation truck noise, and construction. As described previously, noise levels up to 65 dBA CNEL are considered compatible with residential development as specified in the Chula Vista General Plan. Based on the Chula Vista noise compatibility guidelines, ambient noise levels measured within the project site and adjacent area would be compatible with the land uses proposed in the SPA Plan and TM.

3.4.2 Transportation Noise Sources

Aviation

The nearest airport to the project site is Brown Field, located approximately 1.5 miles to the southwest of Village 8 West. This general aviation airport is located in and operated by the City of San Diego. It accommodates propeller and jet powered aircraft and serves as a port of entry for private aircraft entering the United States from Mexico. It is also used for military and law enforcement agencies and is classified as a “reliever airport” by the FAA. According the Airport Land Use Compatibility Plan (ALUCP) for Brown Field, the airport has an 8,000 foot long runway. The predominant runway alignments are east-west. The types of aircraft that use the airport vary from small single-engine pistons to large corporate jets and military aircraft, including helicopters. There were 101,117 operations at Brown Field in 2011, and 91,025 operations in 2010. Due to distance and the orientation of the runway, the project area is not located within 60 dBA CNEL noise contour for the airport, or within the airport's area of influence.

Roadways

No paved roadways currently exist on the project site. A few dirt roads are located on the project site for occasional vehicle trips for maintenance of the City of San Diego reservoir. Vehicular traffic along roadways in the vicinity contributes to the overall noise environment on the project site. La Media Road currently terminates at the northerly boundary of Village 8 West, and Magdalena Avenue terminates at the northeast corner of the Village 8 West boundary. Magdalena Avenue serves Olympian High School, which currently generates traffic and traffic noise, particularly at the beginning and end of school days. Major roadways in the area surrounding Village 8 West include SR-125, located approximately 0.5 mile east of the project site, and Olympic Parkway, which is located approximately 0.75 mile north of the project site. Table 6 shows the existing noise levels generated by the roadways surrounding the project site. Existing noise levels were calculated using the methodology described in Section 4.1.3, Permanent Increase in Ambient Noise. As shown in Table 6, noise levels along Olympic Parkway, Birch Road, Main Street, Hunte Parkway, Heritage Road, La Media Road, and Eastlake Parkway currently exceed the Chula Vista noise compatibility standard of 65 dBA CNEL for residences, schools, and other NSLU.

Railroads

Chula Vista is served by the San Diego trolley system, which is operated by the San Diego Metropolitan Transit System. The San Diego Trolley Blue Line passes through the western part of Chula Vista, along the east side of I-5, with stations at E Street, H Street, and Palomar Street. Freight trains also utilize the same rail line during nighttime hours. Two primary rail haulers of freight, the Burlington Northern Santa Fe (BNSF) and the San Diego and Imperial Valley (SDIV) railroads, link the San Diego County coastal region (including Chula Vista) to the larger national railway system. The SDIV operates freight service on the SANDAG-owned railway in the southwestern part of San Diego County, including Chula Vista, where it is known as the San Diego and Arizona Eastern (SD&AE) Railway. The rail line is located in the coastal area of Chula Vista near Interstate 5, approximately 6 miles west of the project site. Due to distance, railway noise is not audible at the project site.

3.4.3 Operational Noise Sources

The project site is currently undeveloped. A City of San Diego Reservoir facility is located in the approximate center of the site. The reservoir is a passive facility that does not generate operational noise. The lands surrounding the project site on the south, west, and east are primarily undeveloped. Village 7, to the north of the project site, is partially developed. Olympian High School and Magdalena Avenue border the northeast corner of Village 8 West. Land uses north of the high school include an elementary school and residences. The portion of Village 7 east of La Media Road and north of Village 8 West is designated for future low density residential development. Village 7 has been planned in accordance with the traditional village model consisting of predominantly low-medium village residential neighborhoods, a small mixed use village core, and limited multi-family uses adjacent to SR-125.

Table 6 Existing Off-Site Roadway Noise Levels

Roadway	Segment	Existing Average Daily Trips	Noise Level at 50 feet from Roadway Centerline (dBA CNEL)
Olympic Parkway	I-805 to Brandywine Avenue	47,000	75
	Brandywine Avenue to Heritage Road	48,721	75
	Heritage Road to La Media Road	50,538	75
	La Media Road to SR-125 Ramps	43,563	75
	SR-125 Ramps to Eastlake Parkway	40,478	79
	Eastlake Parkway to Hunte Parkway	13,926	70
	East of Hunte Parkway	7,846	66
Birch Road	La Media Road to SR-125	11,084	69
	SR-125 to Eastlake Parkway	10,250	68
Main Street	I-805 to Brandywine Avenue	26,896	73
	Brandywine Avenue to Heritage Road	18,729	71
Hunte Parkway	Eastlake Parkway to Olympic Parkway	1,406	60
	Olympic Parkway to Otay Lakes Road	9,580	67
Heritage Road	Palomar Street to Olympic Parkway	12,383	69
	Main Street to Entertainment Circle	10,035	65
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	9,846	65
La Media Road	East Palomar Street to Olympic Parkway	12,658	69
	Olympic Parkway to Birch Road	11,037	69
Magdalena Avenue	Birch Road to Main Street	9,122	64
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	18,945	70
	Olympic Parkway to Birch Road	9,199	68
	Birch Road to Main Street	1,310	59

Source: RBF 2013 (traffic data); FHWA 2004 (noise level estimates).
Noise levels were calculated using the methodology described in Section 4.1.3, Permanent Increase in Ambient Noise.

Olympian High School is a source of operational noise. Noise sources associated with Olympian High School includes bells, other signaling devices, and activities on the campus such as crowd noise and loudspeakers at football games. Bells and other signaling devices are classified as stationary non-emergency signaling devices by the city, and schools are prohibited in the noise ordinance from sounding these devices for more than 120 seconds continually in an hourly period or intermittent sounding over a five-minute period in any hour. Typically, the main sources of noise from high schools to the surrounding area are organized sports activities at the football stadium that involve amplified speakers and crowd noise. The football field is located on the east side of the campus, approximately 0.25 mile from the project site, and is separated from the site by the campus buildings. The Noise Technical Report for Otay Ranch Villages 2 and 3, Planning Area 1B, and a Portion of Village 4 (RECON 2005) determined that the worst-case noise level for a championship game event at the Otay Ranch High School would be 71 dBA at a distance of 50 feet from stadium loudspeakers located approximately

30 feet above the playing field. This type of event is considered a worst-case scenario for game noise because championship games generally include a full stadium of spectators. Otay Ranch High School has a maximum stadium capacity of 5,500 people. The maximum capacity of the Olympian High School stadium is 3,071 people; therefore, this estimate is conservative for Olympian High School (SUHSD 2011). When the speakers were not in use, crowd noise was estimated to emit a noise level of approximately 65 dBA at 60 feet from the top of the stadium stands. Based on these estimates, football games currently generate a noise level of 43 dBA at the Village 8 West site when speakers are in use, and 39 dBA when crowd noise is the noise source, and thus do not exceed the city noise standards. However, large events may occasionally be audible in the northeastern area of the SPA.

Village 8 East, to the east of the site, is also planned for mixed-use and residential development in the GDP. Future land uses planned for Village 4, to the west of the project site, include residential development and a community park. However, these areas have not yet been developed and do not generate operational noise. Otay Valley Regional Park and the Otay River Valley form the southerly boundary of the project site and are proposed to remain undeveloped.

Otay Valley Rock Quarry produces rock products for construction material. Rock material is extracted on the site and processed into several types of building material, including aggregates, fill, sand, and rip rap. The quarry also offers an on-site recycling service for concrete and asphalt paving materials (Otay Valley Rock, LLC 2010). The quarry is located southwest of Village 4, approximately 0.3 mile from the project site. The project site and the quarry are separated by Rock Mountain and operation of the quarry is generally not audible on the project site. Intermittent noise from particularly loud operations, such as blasting, is occasionally audible on the project site. The quarry has been approved to expand operations east to within approximately 300 feet of the Village 8 West boundary. The Otay Valley Quarry Reclamation Plan Amendment was approved, and the accompanying EIR certified, in June 2011.

3.4.4 Noise Sensitive Land Uses

Noise sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise. The Chula Vista General Plan defines NSLUs as residences, schools, hospitals, libraries, parks, places of worship, and outdoor use areas, including outdoor dining spaces. Industrial and commercial land uses are generally not considered sensitive to noise. There are no NSLU currently located on the project site. The nearest NSLU to the project site is Olympian High School, located across Magdalena Avenue from the project, approximately 150 feet east of the northeast corner of the project site. Other NSLU in the project vicinity are the Wolf Canyon Elementary school and residences located north of the high school. The elementary school is located approximately 875 feet (0.2 mile) northeast of the project site, and the nearest residence is located approximately 1,500 feet (0.3 mile) northeast of the project site. Residences are also located 1,750 feet (0.3 mile) north of the project site. The Chula Vista MSCP Subarea Plan defines sensitive wildlife species as noise sensitive. MSCP Preserve area is located adjacent to the southern boundary of the Village 8 West SPA, and approximately 50 feet west of Planning Area E.

3.4.5 Vibration Sensitive Land Uses

Land uses in which groundborne vibration could potentially interfere with operations or equipment, such as research, manufacturing, hospitals, and university research operations (FTA 2006) are considered vibration-sensitive. The degree of sensitivity depends on the specific equipment that would be affected by the groundborne vibration. Excessive levels of groundborne vibration of either a regular or an intermittent nature can result in annoyance to residential uses. The nearest vibration sensitive land use to the project site is the Sharp Chula Vista Medical Center, located approximately 2.25 miles to the northwest of the project site on Medical Center Court.

4.0 Methodology and Significance Criteria

4.1 Methodology

4.1.1 Excessive Noise Levels

Impacts related to potential exposure to excessive noise levels as a result of the Village 8 West SPA Plan are assessed based on a comparison of the land uses proposed in the Site Utilization Plan (Figure 3) to the noise levels potentially generated by on-site land uses and existing off-site noise sources. Estimated noise levels are based on a variety of sources, including noise technical reports for similar facilities. Noise levels at a particular receptor from a stationary noise source are based on an attenuation rate of 6 dBA for every doubling of distance. Future on-site traffic noise levels are calculated for buildout (2030) traffic volumes along roadway segments using the FHWA Traffic Noise Model (TNM) Version 2.5 (2006). The modeling calculations take into account the posted vehicle speed, traffic volume, the estimated vehicle mix, and site topography. The traffic volumes are based upon data from the traffic study prepared for the project by RBF Consulting (2013). The Unmitigated Year 2030 scenario represents the worst-case condition for off-site roadway noise impacts. However, the Mitigated Year 2030 scenario included in the traffic study represents the worst-case condition for traffic that traverses the project site because of the redistribution of regional traffic that would occur as a result of the implementation of the required traffic measures. Therefore, this scenario was used for the analysis of long-term on-site traffic noise impacts on proposed NSLU. There are currently no major sources of traffic noise and no noise-sensitive land uses on the project site; therefore, the Existing Plus Project traffic scenario is not applicable for the on-site analysis relating to noise exposure of NSLU.

4.1.2 Groundborne Vibration

Groundborne vibration impacts are assessed based on screening distances determined by the FTA and Caltrans. According to the FTA, vibration sensitive land uses within 600 feet of a railroad may be exposed to disruptive vibration (FTA 2006). According to Caltrans, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002).

4.1.3 Permanent Increase in Ambient Noise

The potential for implementation of the Village 8 West SPA Plan to permanently increase ambient noise levels as a result of increased traffic noise is assessed using standard noise modeling equations adapted from the FHWA noise prediction model. The modeling calculations take into account the posted vehicle speed, average daily traffic volume, and the estimated vehicle mix. The noise model assumes that roadways would experience a decrease of approximately 3 dBA for every doubling of distance from the roadway. The analysis is based on the project-specific traffic study prepared for Village 8 West by RBF Consulting (RBF 2013), and the Village 8 West SPA Plan.

One ambient noise measurement was taken along Olympic Parkway between Heritage Road and La Media Road to verify and/or calibrate model results. The measured 15-minute Leq at 50 feet from the roadway centerline was 66 dBA and was measured during a non-peak daytime hour. The 5 minute traffic count along the segment measured 222 passenger vehicles and five medium-duty trucks, or approximately 2,724 vehicles per hour. If the 15-minute Leq is extrapolated to 24 hours, the measured Leq of 66 dBA would result in a CNEL of 73 dBA. The noise level calculated along this segment by the traffic noise model based on the ADT provided in the traffic study is 75 dBA (as shown on Table 6). Therefore, the FHWA noise prediction model is similar, but more conservative than the measured noise level. The noise model would be expected to be more conservative than measured noise levels because the model cannot account for ground effects, wind, and other factors and that may reduce actual noise level. Therefore, the modeled traffic noise levels represent a conservative analysis.

4.1.4 Temporary Increase in Ambient Noise

Impacts related to temporary increases in ambient noise levels are assessed using estimates of sound levels from typical construction equipment provided by the FHWA in the Roadway Construction Noise Model (FHWA 2008), assuming an attenuation rate of 6 dBA per doubling of distance from the source.

The construction equipment list was provided by the applicant.

4.1.5 Aircraft Noise

Impacts related to aircraft noise are assessed based on the ALUCP for Brown Field (SDCRAA 2004).

4.2 Significance Criteria

Based on Appendix G of the CEQA Guidelines and the City of Chula Vista, implementation of the project would result in a significant adverse impact if it would:

- **Threshold 1:** Expose persons to or generate noise levels in excess of standards established in the Chula Vista General Plan or noise ordinance, or applicable standards of other agencies. This includes exposure of persons to or generation of noise levels in excess of the interior noise standard of 45 dBA CNEL in single and multi-family residences, or noise levels that violate the Chula Vista Noise Ordinance (Chapter 19.68 of the Chula Vista Municipal Code);
- **Threshold 2**: Expose persons to or generation of excessive ground borne vibration or ground borne noise levels, which is defined as groundborne vibration equal to or in excess of 0.2 in/sec PPV. Construction activities within 200 feet and pile driving within 600 feet of a vibration sensitive use would be potentially disruptive to vibration-sensitive operations (Caltrans 1996).
- **Threshold 3:** Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project. A substantial permanent increase would occur if implementation of the proposed project results in an ambient noise level that exceeds the exterior noise limits established in the Chula Vista General Plan, including 65 dBA CNEL for schools, recreational uses, and residences; 70 dBA CNEL for offices, community parks and

athletic fields; and 75 dBA CNEL for commercial uses. For transportation-related noise, a significant impact would occur if the proposed project results in a 3 dBA CNEL or greater increase in traffic noise on a roadway segment and the resultant noise level would exceed the General Plan exterior noise limits;

- **Threshold 4:** Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project. Construction activity would be considered significant if it violates the limits established in Section 17.24.040 of the Chula Vista Municipal Code. The ordinance prohibits construction and building work between the hours of 10:00 p.m. and 7:00 a.m., Monday through Friday, and between the hours of 10:00 p.m. and 8:00 a.m., Saturday and Sunday;
- **Threshold 5:** For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public use airport or private airstrip, expose people residing or working in the project area to excessive noise;
- **Threshold 6:** Be inconsistent with General Plan, GDP or other objectives and policies regarding noise thereby resulting in a significant physical impact.

5.0 Impact Analysis and Mitigation Measures

5.1 Impact Analysis

Potential project-related noise impacts from construction activity, transportation sources, and operational sources are discussed below.

5.1.1 Issue 1: Excessive Noise Levels

Impact Analysis

The project would have the potential to generate noise levels in excess of established standards by developing new stationary sources of noise, by increasing human activity throughout the project site, and by constructing roadways. NSLU both on and beyond the project site may be affected by the proposed project. Proposed NSLU associated within the project site include schools, parks, and residential development. Other NSLU, including libraries and places of worship, are permitted to be developed throughout the project area. Potential noise generating land uses on site include mixed-use commercial and resident serving commercial; public or quasi-public uses including day care, schools, or parks; and a CPF. This section addresses the potential for on-site sensitive receptors to be exposed to excessive noise levels from the proposed roadways. The permanent increase in noise levels that would occur as a result of increased traffic on roadways is addressed in Section 4.2.3, Issue 3: Substantial Permanent Increase in Noise Levels.

Operational Noise Associated with Proposed Development

The proposed project includes a range of uses that have the potential to generate noise that may affect adjacent noise-sensitive receptors. These uses include commercial development, residential development, and recreational facilities. The noise technical report prepared for the GPA/GDPA determined that operational impacts would be less than significant with conformance to Chula Vista noise ordinance; however, the analysis was at a programmatic level and did not take into account the specific land uses and their placement proposed in the Village 8 West SPA Plan. The following analysis tiers from the GPA/GDPA EIR, and determines whether the proposed land uses would have the potential to conflict with Chula Vista's noise standards.

Commercial Development and the Community Purpose Facility

Commercial development would be located throughout the Town Center. Potential operational noise sources associated with commercial development within the project site include HVAC equipment, commercial truck deliveries, loading docks, and parking lots. Future uses in the CPF are unknown at this time. Therefore, it would speculative to analyze the potential noise generated by a specific use at the CPF location. However, it can reasonably be assumed the CPF would include a structure for community use that would involve HVAC equipment. Therefore, the CPF is included in the discussion of commercial HVAC equipment below.

Mechanical HVAC equipment located on the ground or on rooftops of new buildings would have the potential to generate noise levels which average 65 dBA at a distance of 50 feet (City of Santa Ana 2010), and may run continuously during the day and night. Depending on where it is located, HVAC equipment could have the potential to generate noise that may exceed the city hourly noise limit for adjacent single-family residences and NSLU (such as parks) of 55 dBA during daytime hours (45 dBA at night), the limit for adjacent multi-family residences of 60 dBA during daytime hours (50 dBA at night), or the limit for daytime-only NSLU (such as a school) of 55 dBA. For a single point source such as a piece of mechanical equipment, the sound level normally decreases by about 6 dBA for each doubling of distance from the source. Therefore, it is assumed that HVAC equipment would generate noise levels that exceed 45 dBA within 500 feet for the equipment, 50 dBA within approximately 275 feet of the equipment, and 55 dBA within 155 feet of the equipment. Consequently, residences or other NSLU located in or in close proximity to a mixed-use building or other building that requires an HVAC system could result in a potentially significant impact.

Large commercial facilities that would require HVAC systems are only permitted in the Town Center. Within the mixed-use Town Center, residential development and commercial development would be located adjacent to or with the same building as each other. The proposed middle school is in the Town Center would potentially be exposed to excessive noise from a commercial HVAC unit. Additionally, multi-family and single-family residences or other NSLU located on the northern edge of Planning Area N in the Neighborhood Edge Zone, and the eastern edge of Planning Areas E and I and western edge of Planning Areas M and O in the Neighborhood Center Zone would be located adjacent to Town Center development and may be exposed to HVAC noise. Single-family residences in the Planning Areas Q and U, the elementary school in Planning Area S, and multi-family residences in Planning Area O would be located near the CPF site. HVAC noise would have the potential to exceed the city nighttime noise standard of 45 dBA at single family residences up to 500 feet from the source. Therefore, proposed schools with 155 feet of a commercial HVAC unit, multi-family residences within 275 feet of a commercial HVAC unit, and single-family residences and parks within 500 feet, could be exposed to noise levels that exceed the city noise standards. A potentially significant noise impact would occur. If Planning Areas D was ultimately not chosen to be a school site and instead proposed for multi-family residential development, a potentially significant impact related to HVAC noise would still occur in this planning area.

Olympian High School is located approximately 150 feet east of the project site, and approximately 400 feet northeast of the nearest proposed commercial land use. Schools are a daytime NSLU. As discussed above, HVAC units have the potential to generate noise levels which average 65 dBA at a distance of 50 feet, which would attenuate to 55 dBA at approximately 155 feet from the source. Therefore, HVAC noise would not exceed the most conservative daytime standard of 55 dBA more than 155 feet from the source. The nearest off-site residences are located approximately 1,800 feet north of the project site on Fleishbein Street. The project would not result in a significant noise impact to existing off-site receivers related to on-site HVAC equipment.

In addition to HVAC systems, commercial land uses also have the potential to generate noise from truck deliveries, such as engines idling and beeping from backing warning signals at commercial loading docks. Truck deliveries to Village 8 West would involve deliveries of supplies to the offices and commercial uses. State law currently prohibits heavy-duty diesel delivery trucks from idling more than five minutes. Therefore, noise from idling would be limited to five minutes during truck deliveries. Additionally, truck trips would be periodic throughout the Town Center and would not be concentrated in one location. Given the intermittent and short duration of noise from truck deliveries in a given location, truck deliveries would not be a source of excessive ambient noise. Section 3.6 of the SPA Plan, Performance Standards, includes standards for parking and loading. This section requires loading activities to be located and operated so that they do not disturb neighboring residences, including compliance with the city noise ordinance standards. Therefore, impacts related to truck deliveries and loading would be less than significant.

Noise sources from parking lots include car alarms, door slams, radios, tire squeals. These sources typically range from about 30 to 66 dBA at a distance of 100 feet (Gordon Bricken & Associates 1996), and are generally short-term and intermittent. Parking lots have the potential to generate noise levels that exceed 65 dBA depending on the location of the source; however, noise sources from the parking lot would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect noise-sensitive receptors at the same time. Therefore, noise generated from parking lots would be less than significant.

Residential Development

Residences would be developed across the project site. Multi-family residential development would be located in the northern area of the site in the Town Center and Neighborhood Center Zone. Single-family development would be located in the southern area of the site in the Neighborhood General and Neighborhood Edge Zones. Noise generated from residential uses is generally described as nuisance noise. Nuisance noise is defined as intermittent or temporary neighborhood noise from sources such as amplified music, barking dogs, and landscape maintenance equipment that may be disturbing to other residents. Nuisance noise impacts are more likely to occur in the more densely developed areas of the project site (such as the Town Center and Neighborhood Center Zone) where residences would be closer together and neighbors would be more likely to hear a neighbor's dog or music. However, single-family development would also likely be exposed to occasional nuisance noise. CVMC Section 19.68 prohibits nuisance noise from exceeding the noise standards at any time. Compliance with the noise ordinance would limit exposure to excessive nuisance noise. The Chula Vista Police Department enforces the nuisance noise provisions of the noise ordinance. Additionally, nuisance noises would be different from each other in kind, duration, and location, so that the overall effects would be separate and in most cases would not affect the receptors at the same time. Therefore, nuisance noise in residential neighborhoods would not result in significant impact.

Community Park

Visitors to the Community Park would participate in active and passive recreational activities. Visitors and recreational activity participants are expected to generate a range of noise levels typical of recreational activities. Community centers and parks would generate incidental recreational noise such as cheering for sports activities or children at play. Potential Community Park amenities and facilities include play equipment, seating areas, athletic fields, a skate park, sport courts, multi-purpose fields, a gymnasium, a recreation complex building, and walking trails. Passive recreational activities such as walking, reading, and dining in open turf areas and group picnic areas will typically generate lower noise levels as compared to active sports play. Normal park operating hours would be daily from 6:30 a.m. to 10:30 p.m.; however, indoor use areas (such as the gymnasium or recreation complex building at the Community Park) may be in use past 10:30 p.m.

The Community Park in the northwest area of Village 8 West is part of a larger proposed community park. The remaining park area is located in Village 4. The EIR for the Otay Ranch Village 2, 3, and Portion of 4 SPA Plan (SCH #2003091012) included an analysis of noise that would potentially be generated by activity at the Community Park (City of Chula Vista 2006). The analysis determined that multi-purpose fields would have the potential to generate noise levels of approximately 54 dBA at 50 feet, and a skate park facility would have the potential to generate noise levels of 70 dBA at 50 feet. The locations of any potential Community Park uses are not known at this time. However, consistent with the Community Park analysis in the EIR for the Otay Ranch Village 2, 3, and Portion of 4 SPA Plan, skate park noise is considered the worst-case noise level that could be generated at 50 feet from the Community Park. Therefore, the Community Park would have the potential to exceed the daytime one-hour 60 dBA Leq limit if the loudest noise sources are placed within 160 feet of the multi-family Town Center and Neighborhood Center Zones. Potentially affected would be the residences in Planning Areas B, C, E, and F.

According to CVMC Section 2.66.270, some parks in the city stay open as late as 10:30 p.m.; therefore, the Community Park could be subject to the stricter city nighttime one-hour noise standard of 50 dBA between 10:00 p.m. and 10:30 p.m. for multi-family residential uses if noise-generating activities are expected to operate after 10 p.m. However, it is reasonable to assume that noise levels would generally be lower than 70 dBA at 50 feet between 10:00 p.m. and 10:30 p.m. because activities would be winding down in anticipation of park closing, and few children would be generating noise levels during the late evening as high as those occurring during peak afternoon skate park hours. Therefore, noise levels from parks would not be expected to exceed nighttime noise standards between 10:00 p.m. and 10:30 p.m.

Electronic amplification equipment would not be permanently installed at the Community Park, but temporary systems may be used in conjunction with active sport activities such as skating, softball, soccer, court sports, and swimming. Public events may also occur that required amplified noise. Activities that would include amplified noise or other temporary noise generating equipment would be required to obtain a permit from the City of Chula Vista Director of Library and Recreation. If a permit is not obtained, CVMC Section 2.66.185 prohibits any park or recreation center user to operate a radio, television, stereo or any similar electronic or mechanical device capable of producing or emitting sound at a volume where the sound is audible at a distance greater than 100 feet from the point of emission.

Activities that require permitted amplified noise would be limited to normal park operation hours. Additionally, amplified noise would not be a constant source of noise. Activities would occur on various dates and times, and at varied locations. Permitted uses would still be subject to the city hourly exterior noise level limits established in the municipal code. The Chula Vista Police Department enforces the nuisance noise provisions of the city municipal code and the Development Services Department enforces the remaining provisions of the noise ordinance. Therefore, nuisance noise and permitted amplified noise from events at the Community Park would not result in significant impact.

Scheduled maintenance by maintenance crews would occur on a daily basis at the Community Park. Maintenance activities would include the use of gasoline-powered mowers, trimmers, blowers, and edgers resulting in intermittent short-term temporary noise increases. Maintenance activities are permitted uses and would be subject to the one-hour Leq noise limits of 60 dBA in multi-family neighborhoods. Additionally, maintenance equipment would not be operating at any one location for more than a few minutes, and all equipment would not be operating simultaneously. Due to the limited amount of time equipment would be operating in one location, operation of landscape equipment would generally not exceed the hourly noise level limit at a particular receptor. Therefore, landscape maintenance would result in a less than significant impact.

Neighborhood Park

A Neighborhood Park is proposed in the southern area of the project site and would accommodate uses such as athletic fields, sports courts, play equipment, and picnic areas. As discussed above under Community Park, athletic fields would potentially generate noise levels of 54 dBA at 50 feet. Therefore, the Neighborhood Park would generally not exceed the daytime noise limit of 55 dBA more than 45 feet from the park. However, some residences may be located at the western edge of Planning Area T within 45 feet of the park and would have the potential to be exposed to excessive noise.

As noted earlier, some parks in the city remain open until 10:30 p.m.; therefore, the Neighborhood Park could be subject to the stricter city nighttime one-hour noise standard of 45 dBA between 10:00 p.m. and 10:30 p.m. for single-family residential uses if noise-generating activities from sports fields are expected to operate after 10 p.m. Similar to the Community Park, it is reasonable to assume that noise levels would generally be lower than those occurring during peak park activity hours. Therefore, noise levels from Neighborhood Parks would not be expected to exceed nighttime noise standards between 10:00 p.m. and 10:30 p.m.

Similar to the Community Park, use of electronic amplification equipment would be subject to the City's permit and operation of landscaping equipment would be subject to the City's one-hour noise limits. Therefore, a significant impact would not occur as a result of these activities.

Town Square and Other Recreation Facilities

A Town Square would be located in the middle of the Town Center in Planning Area G. Additional parks, trails, and playgrounds are a permitted use throughout the SPA. The proposed trails throughout the project site and the off-site trail connection to the Otay River Valley would be used for walking and bicycling and would generally not support activities that would generate noise levels higher than normal conservation. The Town Square and small playgrounds would not include athletic fields or other major active use facilities. The Town Square and playground would generate noise levels less than the Neighborhood Park noise level of 54.3 dBA at 50 feet. The neighborhood playgrounds would generally not be in use after dark, and nighttime activity in the Town Square would be expected to be limited to normal conversation levels. Therefore, these facilities would not generate noise levels that exceed the City's noise level limits and significant impact would not occur. Similar to the Community Park and Neighborhood Park, use of electronic amplification equipment and maintenance activities at these facilities would not result in a significant impact.

Schools

A middle school and elementary school are proposed along the eastern boundary of the project site. The middle school would be located in Planning Area D in the Town Center, and the Elementary School would be located in Planning Area S in the Neighborhood Center Zone. Schools may generate noise from amplified noise such as bells and loudspeaker announcements. Bells or other announcement devices are classified at stationary non-emergency signaling devices by the city. The noise ordinance prohibits schools from sounding these devices for more than 120 seconds continually in an hourly period, or intermittent sounding over a five-minute period in any hour. The middle and elementary school would comply with city noise standards and would not result in significant impact related to bells and loudspeaker announcements.

The middle school and elementary school would also include recreational facilities such as sports fields at the middle school, and an elementary school playground. Noise from these facilities would be limited to daytime hours. The level of activity at these facilities during recess and afterschool activities is assumed to be similar to active use of the multi-purpose fields at the Neighborhood and Communities Parks. Therefore, the schools would have the potential to generate noise levels up to 54.3 dBA at 50 feet, which would exceed the daytime noise level limit of 55 dBA at single-family residences up to 45 feet from the schools, and the daytime noise level limit of 60 dBA up to 25 feet from the school. Impacts from the schools would generally be limited to residences located directly adjacent to the school property. All residences would be separated from the elementary school by a roadway and would not be exposed to excessive noise from the elementary school. The middle school site is adjacent to Planning Area C; however, a proposed slope would provide approximately 25 feet of separation between Planning Area C and the Middle School. A potentially significant impact would not occur. Similar to the Community Park and Neighborhood Park, use of electronic amplification equipment and maintenance activities at the schools would not result in a significant impact.

Operational Noise Associated with Infrastructure Improvements

The infrastructure improvements associated with Village 8 West include pipelines and electrical lines, which are passive systems and would not generate operational noise. Inspection of these facilities would not require intensive activities that would result in excessive noise levels. Occasional maintenance (2 to 4 times per year) may be required that necessitates the use of large equipment; however, such activities would be infrequent, temporary, and limited to the area close to the maintenance site. Maintenance equipment would be subject to the limits on operation hours in the Chula Vista Noise Ordinance for construction and building work in residential zones. Therefore, impacts that occur from operation of these facilities would be less than significant.

Exposure to Traffic Noise

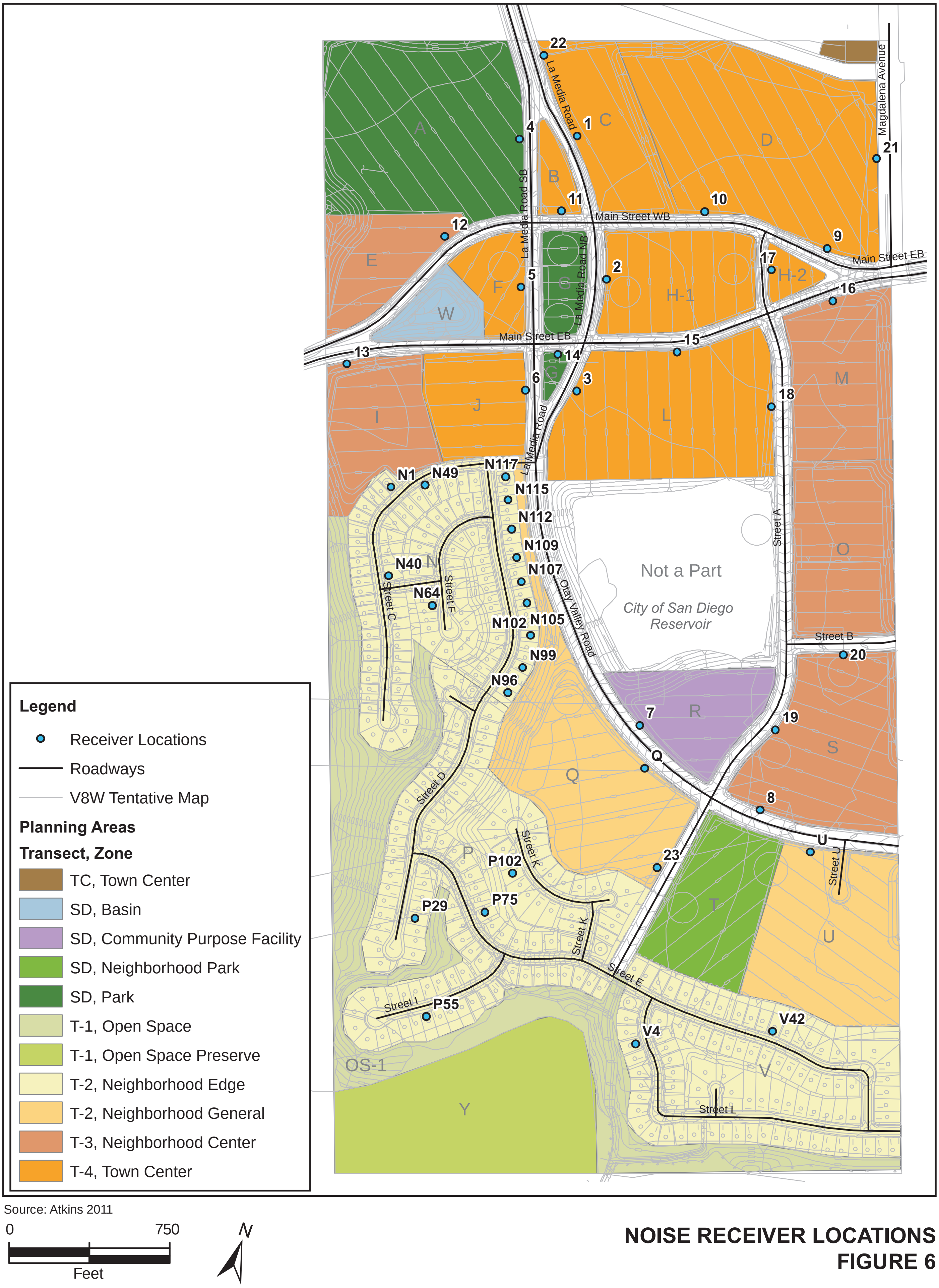
The primary way in which the project could result in the exposure of proposed NSLU to excessive noise levels is on-site vehicular traffic noise, which would be the main source of noise for the project.

Acoustical calculations were made for buildout (2030) traffic volumes along roadway segments using the FHWA Traffic Noise Model (TNM) Version 2.5 (2004). The modeling calculations take into account the posted vehicle speed, traffic volume, the estimated vehicle mix, and site topography. The traffic volumes are based upon data from the traffic study prepared for the project by RBF Consulting (2013). The Mitigated Year 2030 scenario included in the traffic study represents the worst-case condition for project-generated traffic volumes on the project site; therefore, this scenario was utilized for the analysis of long-term on-site traffic noise impacts on proposed NSLU. This scenario assumes full buildout of the proposed Village 8 West development and circulation network, as well as cumulative development through Year 2030. This scenario is more conservative than the Unmitigated Year 2030 scenario because implementation of the mitigation measures in the Traffic Impact Analysis would redistribute trips along roadways and result in more regional traffic traversing the project site, resulting in higher on-site traffic volumes. There are currently no major sources of traffic noise and no noise-sensitive land uses on the project site; therefore, the Existing Plus Project traffic scenario is not applicable for the on-site analysis relating to noise exposure of NSLU. Table 7 includes the traffic assumptions for the on-site roadways based on the project traffic study.

Noise levels were modeled for a series of receiver locations throughout the project area to determine the future noise traffic noise levels at locations where NSLU have been proposed according to the tentative map (TM) for Village 8 West (July 2011), as shown in Figure 6. In areas where individual lots have not been planned yet, receptor locations were placed 50 to 75 feet from the roadway centerline. Noise levels were modeled for ground level and upper story receptors at each location. Buildings proposed within Village 8 West range from two stories to four stories in height. The maximum floor height for the transect zones ranges from 26 feet (zone T2) to 51 feet (zone T4).

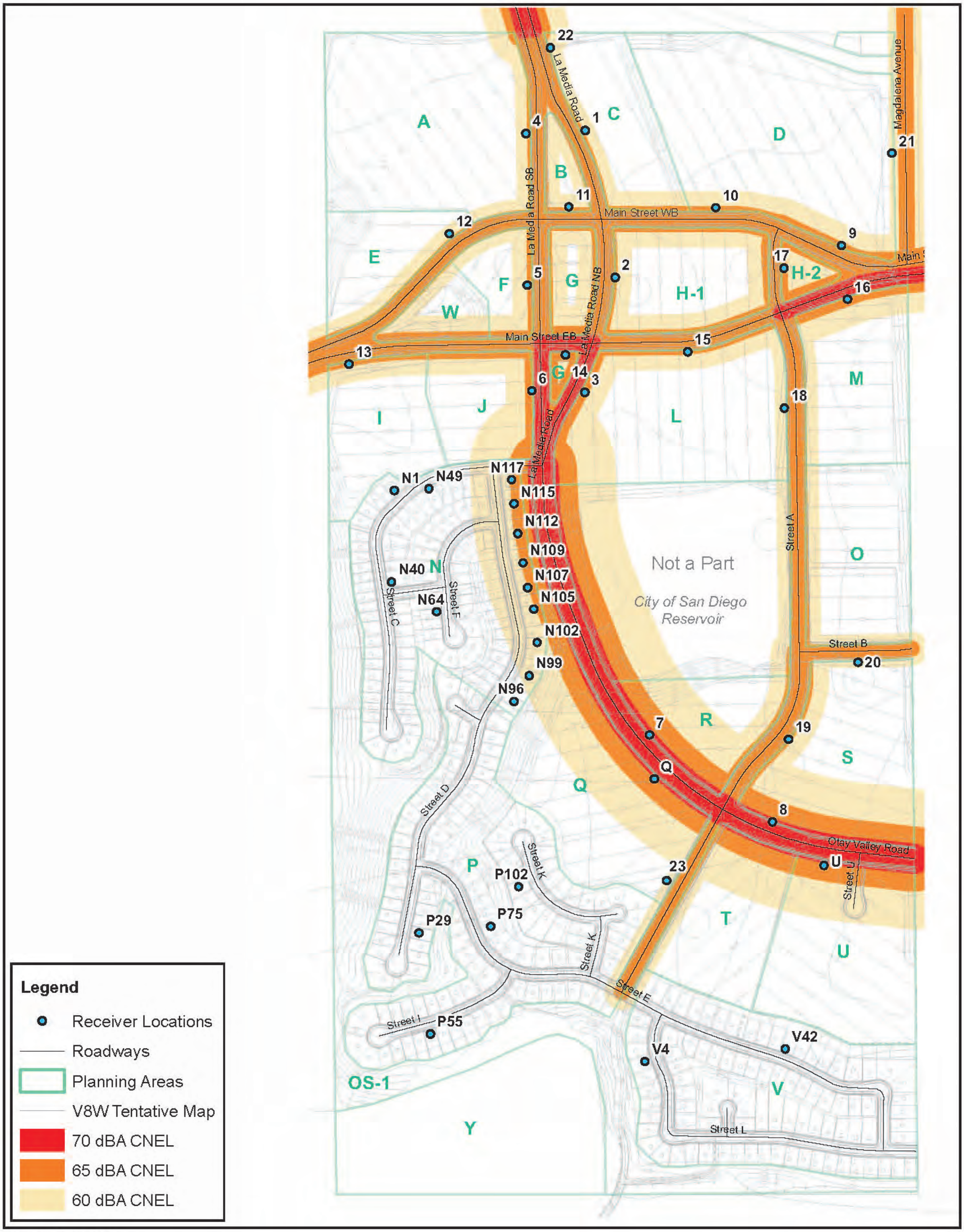
A floor height of 26 feet was used to provide a general estimate of upper story receivers, and a distance of 5 feet was added to the floor height to represent receiver ear height. The modeled noise level at each receiver location is shown in Table 8. Receivers at different heights may experience higher or lower noise levels than those provided in Table 8. Additionally, ground-level noise contours were calculated for the primary site roadways: La Media Road, Main Street, Otay Valley Road, Street A, Street B, and Magdalena Avenue. These contours are shown in Figure 7, and include the effects of future grading on the property but do not take into account any noise mitigation measures or shielding provided by the proposed buildings. Traffic noise modeling data is provided in Appendix A.

Existing measured daytime ambient noise levels on the project site range from 42 dBA to 55 dBA Leq. As shown in Table 8, the increase in vehicular traffic on the project site would result in ambient noise levels as high as 72 dBA (CNEL) at 50 feet from a major roadway. However, there are no existing NSLU on the project site. Therefore, the increase in noise levels on the project site would not result in the exposure of any on-site existing NSLU to noise levels in excess of the Chula Vista noise compatibility guidelines. No impact related to existing on-site NSLU would occur.



Source: Atkins 2011

NOISE RECEIVER LOCATIONS
FIGURE 6



Source: Atkins 2011

0 750 Feet

N

2030 BUILDOUT NOISE CONTOURS
FIGURE 7

Table 7 2030 Buildout On-site Roadway Traffic Volumes

Roadway	Segment	Speed (mph)(1)	ADT Volume(2)	Vehicle Mix		
				Autos	MDT	HDT
La Media Road	NB, northern project boundary to northern end of couplet	30	10,800	95%	3%	2%
La Media Road	NB, EB Main Street to WB Main Street	30	15,100	95%	3%	2%
La Media Road	NB, split to EB Main Street	30	17,380	95%	3%	2%
La Media Road	SB, northern project boundary to northern end of couplet	30	12,150	95%	3%	2%
La Media Road	SB, WB Main Street to EB Main Street	30	13,940	95%	3%	2%
La Media Road	SB, EB Main Street to split	30	18,750	95%	3%	2%
Otay Valley Road	Southern end of couplet to Street A	45	39,530	95%	3%	2%
Otay Valley Road	Street A to eastern project boundary	45	35,400	95%	3%	2%
Main Street	WB, eastern project boundary to Street A	30	21,400	95%	3%	2%
Main Street	WB, Street A to La Media Road NB couplet	30	19,450	95%	3%	2%
Main Street	WB, La Media Road NB to SB couplet	30	11,500	95%	3%	2%
Main Street	WB, SB La Media Road couplet to western project boundary	30	14,810	95%	3%	2%
Main Street	EB, western project boundary to La Media Road SB	30	19,560	95%	3%	2%
Main Street	EB, SB La Media Road to NB La Media Road	30	21,120	95%	3%	2%
Main Street	EB, NB La Media Road to Street A	30	21,000	95%	3%	2%
Main Street	EB, Street A to eastern project boundary	30	24,450	95%	3%	2%
Street A	WB Main Street to EB Main Street	30	3,650	97%	2%	1%
Street A	EB Main Street to Street B	30	8,300	97%	2%	1%
Street A	Street B to Otay Valley Road	25	13,750	97%	2%	1%
Street B	Street A to eastern project boundary	25	7,900	97%	2%	1%
Magdalena Ave	Santa Luna Street to Main Street	25	11,100	95%	3%	2%
La Media Road	NB, Birch Road to northern project boundary	45	18,000	95%	3%	2%
Street A	South of Otay Valley Road	25	8500	97%	2%	1%

(1) On-site roadway speed is the posted speed limit proposed for the roadway provided in the SPA Plan.
(2) ADT volumes are based on the peak hour intersection volumes provided in the TIA in Exhibits 39 and 41 (RBF 2013). ADT is assumed to be ten times the peak hour volume.
MDT = medium duty trucks; HDT = heavy duty trucks
Note: Traffic volumes assume the future construction of the road improvements required in the implementation program described in the project traffic study. This condition is referred to as the Year 2030 Mitigated scenario in the project traffic study.
Source: RBF 2013.

Table 8 On-site 2030 Buildout Noise Levels

Receiver Location[1]	Planning Area	Receiver Type	Acceptable Noise Level[2]	Ground Level Traffic Noise Level (dBA CNEL)	Upper Story Traffic Noise Level (dBA CNEL)	Significant Impact?
Lot N1	N	Single-Family Residence	65	59	59	No
Lot P29	P	Single-Family Residence	65	56	56	No
Lot N40	N	Single-Family Residence	65	59	59	No
Lot N49	N	Single-Family Residence	65	59	59	No
Lot N64	N	Single-Family Residence	65	57	57	No
Lot N96	N	Single-Family Residence	65	59	59	No
Lot N99	N	Single-Family Residence	65	61	61	No
Lot N102	N	Single-Family Residence	65	62	62	No
Lot N105	N	Single-Family Residence	65	65	65	No
Lot N107	N	Single-Family Residence	65	65	65	No
Lot N109	N	Single-Family Residence	65	**66**	**66**	**Yes**
Lot N112	N	Single-Family Residence	65	**66**	**66**	**Yes**
Lot N115	N	Single-Family Residence	65	**67**	**67**	**Yes**
Lot N117	N	Single-Family Residence	65	**67**	**67**	**Yes**
Lot P55	P	Single-Family Residence	65	56	56	No
Lot P75	P	Single-Family Residence	65	58	58	No
Lot P102	P	Single-Family Residence	65	58	58	No
Lot V4	V	Single-Family Residence	65	58	58	No
Lot V42	V	Single-Family Residence	65	59	59	No
#1	C	Multi-Family Residences, Commercial	65	64	64	No
#2	H-1	Multi-Family Residences, Commercial	65	**66**	65	**Yes**
#3	L	Multi-Family Residences, Commercial	65	**67**	**67**	**Yes**
#4	A	Multi-Family Residences, Commercial, Community Park	65	64	64	No
#5	F	Multi-Family Residences, Commercial	65	**66**	65	**Yes**
#6	J	Multi-Family Residences, Commercial	65	**68**	**67**	**Yes**
#7	R	CPF	65	**72**	**72**	**Yes**
#8	S	Elementary School	65	**72**	**71**	**Yes**
#9	D	Middle School	65	**67**	**67**	**Yes**
#10	C/D	Multi-Family Residences, Commercial, Middle School	65	**66**	**66**	**Yes**
#11	B	Multi-Family Residences	65	**66**	**66**	**Yes**
#12	E	Multi-Family Residences, Commercial	65	64	64	No
#13	I	Multi-Family Residences	65	**67**	**66**	**Yes**
#14	G	Town Square	65	**68**	**68**	**Yes**
#15	L	Multi-Family Residences, Commercial	65	**66**	**67**	**Yes**
#16	M	Multi-Family Residences	65	**68**	**68**	**Yes**
#17	H-2	Multi-Family Residences, Commercial	65	**66**	**66**	**Yes**
#18	L	Multi-Family Residences, Commercial	65	64	64	No
#19	S	Elementary School and CPF	65	**66**	**66**	**Yes**

Table 8 continued

Receiver Location[1]	Planning Area	Receiver Type	Acceptable Noise Level[2]	Ground Level Traffic Noise Level (dBA CNEL)	Upper Story Traffic Noise Level (dBA CNEL)	Significant Impact?
#20	S	Multi-Family Residences and Elementary School	65	63	62	No
#21	D	Middle School	65	63	62	No
#22	C	Multi-Family Residences, Commercial	65	**68**	**67**	**Yes**
#23	Q	Single-Family Residences	65	63	64	No
#Q	Q	Single-Family Residences	65	**70**	**70**	**Yes**
#U	U	Single-Family Residences	65	**70**	**70**	**Yes**

(1) Receivers #1 through 23 are located 50 feet from the roadway centerline. Receptors at Planning Areas Q and U are located 75 feet from the roadway centerline. Lot noise levels are calculated at the lot location and vary in distance from the roadway centerline. See Figure 6 for receptor locations. Upper story receivers are assumed to be located at a floor height of 26 feet.

(2) 65 dBA CNEL is the most conservative noise level that is acceptable for the land uses associated with the receiver location. Some land uses have an acceptable noise level higher than 65 dBA CNEL, including commercial land use.

Note: Significant impacts are shown in **bold** and shading.

Source: FHWA 2004. See appendix for noise model outputs.

As shown in Table 8 and on Figure 7, the ground level and upper story receivers in single-family residential lots in Planning Area N closest to Otay Valley Road, just south of the couplet, would potentially be exposed to noise levels in excess of 65 dBA CNEL, which is the city exterior noise level limit for residences. Additionally, as shown in Table 8 and the noise contours in Figure 7, ground floor and upper story multi-family residences and outdoor use areas in Planning Areas B, C, H-1, H-2, J, and L; ground level multi-family residences and outdoor use areas in Planning Area F; the Town Square (Planning Area G), and the middle school (Planning Area D) in the Town Center would potentially be exposed to noise levels in excess of the city noise compatibility guidelines from north and southbound La Media Road and east and westbound Main Street. If Planning Area D is ultimately not chosen to be used as a school site and instead developed with multi-family residential uses, the residential development would potentially be exposed to noise levels in excess of 65 dBA CNEL and impacts would also be significant. Ground level and upper story multi-family residences and outdoor use areas in Planning Areas I and M would potentially be exposed to excessive noise levels from eastbound Main Street.

The elementary school (Planning Area S) and CPF (Planning Area R) would potentially be exposed to excessive noise levels from Otay Valley Road and Street A, north of Otay Valley Road. If Planning Area S is ultimately not chosen to be used as a school site and instead developed with multi-family residential uses, the residential development would potentially be exposed to noise levels in excess of 65 dBA CNEL and impacts would also be significant. The Neighborhood Park (Planning Area T), which is subject to a 65 dBA CNEL standard, would potentially be exposed to excessive noise levels from Otay Valley Road. Single-family residences and outdoor use areas in Planning Areas Q and U along Otay Valley Road would potentially be exposed to excessive noise levels. Finally, some office uses would be potentially located in the Town Center, which are compatible with noise levels up to 70 dBA CNEL. As shown in Figure 7, traffic noise would not exceed 70 dBA CNEL outside of the roadway right-of-way in the Town Center, except for along La Media Road at the southern end of the couplet. If offices are located in this area, they may be exposed to noise levels in excess of 70 dBA CNEL. Therefore, potentially significant impacts to residences, parks, schools, and offices would potentially occur as a result of traffic noise that exceeds the city noise compatibility guidelines. As shown in Figure 7, noise levels would not exceed 70 dBA CNEL at the Community Park. Therefore, a potentially significant impact to the Community Park as a result of traffic noise would not occur.

Multi-family residences throughout the Town Center and Neighborhood Center Zone would potentially be exposed to exterior noise levels of 65 dBA CNEL or greater from traffic noise, which would exceed the city noise compatibility guidelines, and would also trigger the Title 24 requirement for the preparation of acoustical studies for all multi-family residences potentially exposed to noise levels greater than 60 dBA CNEL. Outdoor usable areas, such as outdoor dining patios, in the Town Center would also potentially be exposed to noise levels in excess of 65 dBA CNEL from traffic noise. Additionally, as shown in Table 8 and Figure 7, single-family residences along Otay Valley Road would potentially be exposed to exterior noise levels in excess of 60 dBA CNEL. Interior noise levels would have the potential to exceed 45 dBA CNEL in multi-family residences in the Town Center and Neighborhood Center Zone and single-family residences along Otay Valley Road; therefore, a potentially significant impact related to interior noise levels would also occur.

Also seen in Figure 7, Street B and Magdalena Avenue would not generate noise levels of 65 CNEL or greater. The noise contours in Figure 7 show that traffic noise in all of the commercial areas in the Town Center are projected to be below the 75 dBA CNEL standard for commercial uses that do not include outdoor usable areas, and that noise levels for the Community Park would not exceed 70 dBA CNEL. Therefore, impacts to commercial uses and the Community Park as a result of traffic noise would be less than significant. As discussed in the previous paragraph, commercial or retail uses that include outdoor useable space such as an outdoor dining area are compatible with noise levels up to 65 dBA CNEL and would have the potential to be exposed to traffic noise in excess of this standard.

MSCP Preserve Area

Following construction, the southernmost residences in Village 8 West would be located adjacent to MSCP Preserve area, and the off-site trail would traverse the Preserve. However, residences and trails are not sources of substantial noise. Occasional maintenance activities would be required along the trail and edge of development, such as vegetation and sediment removal; however, these activities would not require heavy construction equipment that would generate excessive noise. Occasional vehicle trips would not result in a substantial increase in noise levels. As described in the Preserve Edge Plan in the SPA Plan, a manual weeding program would be prepared for the Preserve edge. Occasional maintenance of the off-site utilities may require heavy equipment; however, such activities would be infrequent and temporary. The Chula Vista MSCP Plan states that infrastructure repairs and maintenance are allowable as needed in the MSCP Preserve. Maintenance would be subject to the MSCP requirement that, to the extent practicable, access for non-emergency routine maintenance will be limited during bird breeding seasons (April 1 through June 31) in areas where breeding and/or nesting activity may occur. Therefore, impacts would be less than significant.

Another MSCP preserve area (Wolf Canyon) is located approximately 50 feet west of the corner of Planning Area A and E. Planning Area E is planned for residential development and would not be a source of substantial noise. Planning Area A would be developed as a community park. The Community Park would potentially include sports fields, playgrounds, and other uses that could generate noise levels of 60 dBA up to 170 feet from the park. However, an energy dissipater for drainage would be located in the southwest corner of Planning Area A, at the bottom of a steep slope, as shown on the TM, provided in Figure 3-16. No park uses would be developed on this steep slope. The steep slope and drainage feature would provide an approximately 170 feet buffer, or more, between the Community Park and the edge of Planning Area A closest to the Preserve. Therefore, the preserve area to the southwest of Planning Area A would be located at least 170 feet from active park uses in the Community Park and would not be exposed to substantial noise levels. Impacts would be less than significant.

Impacts from Operation of Off-site Facilities

As discussed above under existing conditions, the Otay Valley Rock Quarry is located southwest of Village 4, approximately 0.3 mile from the project site. According to the EIR prepared for the proposed quarry reclamation plan amendment, daytime average noise levels along the perimeter of the quarry range from approximately 45 dBA to 55 dBA (City of Chula Vista 2011). The project site and the quarry are separated by Rock Mountain and operation of the quarry is generally not currently audible on the project site, as demonstrated by the ambient noise measurements taken at the site. Intermittent noise from particularly loud operations, such as blasting, is occasionally audible on the project site. Due to the temporary and periodic nature of noise from the quarry operations, it would not result in a significant impact to development in Village 8 West.

Olympian High School is a source of operational noise from bells or other signaling devices and activities on the campus such as cheering and loudspeakers at football games. As mentioned previously, the football field is located on the east side of campus, approximately 0.25 mile from the project site, and is separated from the site by the campus buildings. Noise levels for a high school championship game have been estimated to be 71 dBA at a distance of 50 feet. This estimate was used to represent the worst-case scenario for football games at Otay Ranch High School. Otay Ranch High School has a greater stadium capacity than Olympian High School, and therefore this estimate represents a conservative estimate of noise generated by Olympian High School. Based on this estimate, football games currently generate a worst-case noise level of 43 dBA at the Village 8 West boundary when speakers are in use. The noise measurement taken outside of Olympian High School during lunchtime recess as part of this analysis measured a noise level of 55 dBA Leq at the edge of the project area adjacent to the school, which would not exceed the 60 dBA Leq noise limit for multi-family residences in the Town Center. Therefore, noise from Olympian High School would not result in a significant impact to Village 8 West.

The San Diego Trolley Blue Line and SD&AE freight line pass through the western part of Chula Vista approximately 6 miles west of the project site. No noise contours have been established for rail line operations in Chula Vista. According the EIR prepared for the Downtown San Diego community, noise levels generated by railroad activity along the streets adjacent to the railroad tracks do not exceed 65 dBA CNEL. The rail line that runs through downtown San Diego is the same line that extends to Chula Vista and serves the trolley and freight lines. Diesel train engines may produce short-term levels of 85 dBA during maneuvering events and nuisance noise from train horns and crossing bells may reach a noise level of 95 dBA at a distance of 50 feet. It was determined in the EIR that, in cases where there are no noise obstructions, noise could be audibly intrusive in residential interiors up to 1,000 feet away (CCDC 2006). Due to distance, Village 8 West would not be exposed to railroad noise. No impact would occur.

Mitigation Measures

The following mitigation measures would minimize exposure to on-site NSLU from excessive traffic noise, and minimize noise generated from operational sources including HVAC equipment, commercial equipment, and recreational facilities.

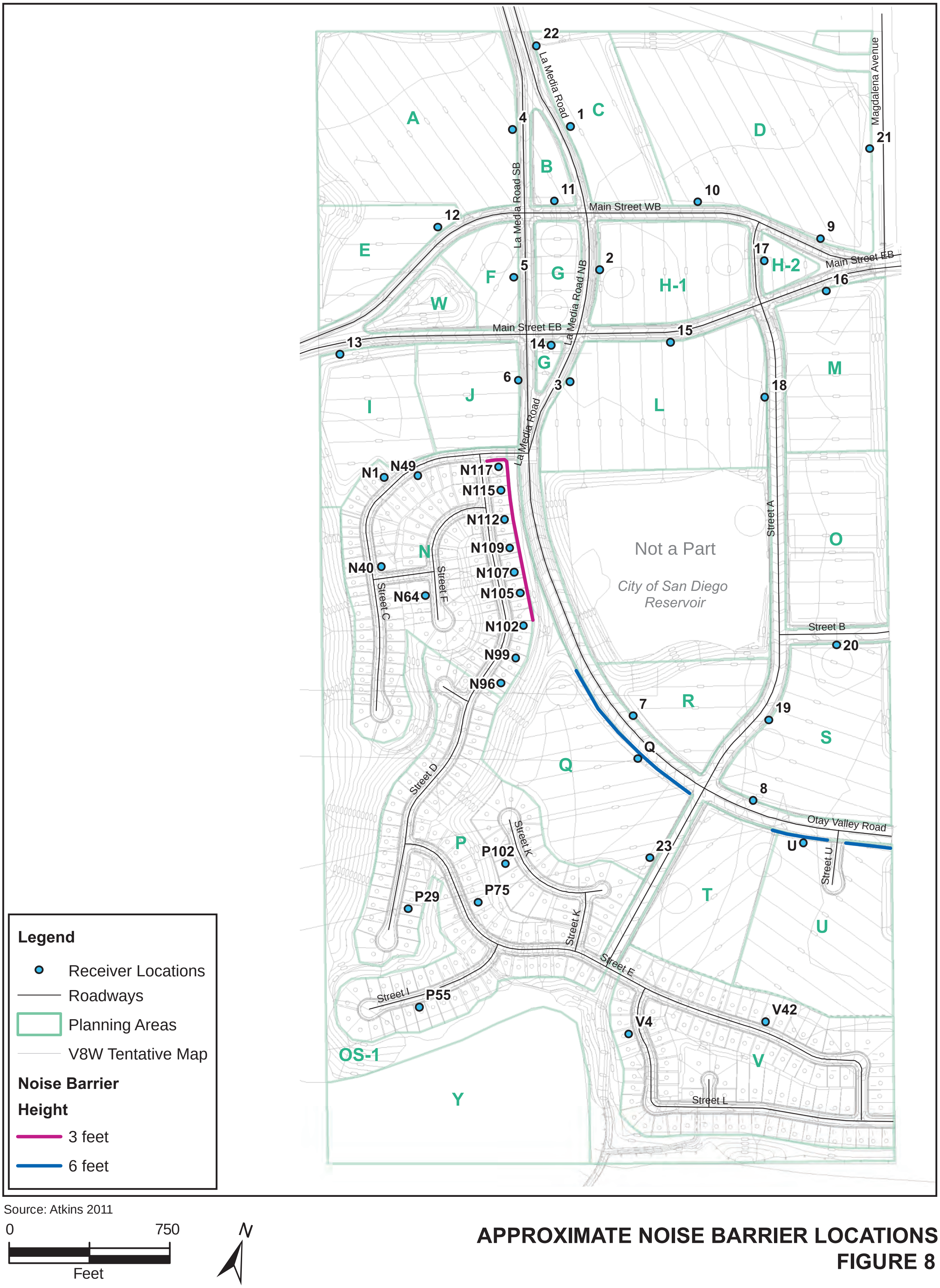
Noi-1 **Noise Attenuation in the Neighborhood Edge Zone (Planning Area N) and Neighborhood General Zone (Planning Areas Q and U)**. Prior to the approval of grading permits for residential development along Otay Valley Road within Planning Areas N, Q, and U in the Neighborhood Edge and Neighborhood General Zones (as shown in Figure 6), the applicant shall be responsible for the preparation of a subsequent acoustical study based on the final map design and implementation of any measures recommended as a result of the analysis to the satisfaction of the Development Services Director (or their designee). The study shall include, but not be limited to the following:

1. Location, height, and building material of the noise barriers in accordance with Figure 8. Heights are provided relative to final pad elevation. Required heights may be achieved through construction of walls, berms or a wall/berm combination;

2. A detailed analysis which demonstrates that barriers and/or setbacks have been incorporated into the project design, such that noise exposure to residential receivers placed in all useable outdoor areas, including multi-family residential patios and balconies, are at or below 65 dBA CNEL; and

3. Should grading, lot configuration, and/or traffic assumptions change during the processing of any final maps, the barriers shall be refined to reflect those modifications.

Noi-2 **Site-Specific Acoustic Analysis – Single-Family Residences**. Concurrent with design review and prior to the approval of building permits for single-family residential development where the exterior noise level exceeds 65 dBA CNEL (Planning Areas N, Q, and U), the applicant shall prepare an acoustical analysis ensuring that interior noise levels due to exterior noise sources will be at or below 45 dBA CNEL. Design-level architectural plans will be available during design review and will permit the accurate calculation of transmissions loss for habitable rooms. For these lots, it may be necessary for the windows to be able to remain closed to ensure that interior noise levels meet the interior standard of 45 dBA CNEL. Consequently, the design for these units may need to include ventilation or an air conditioning system to provide a habitable interior environment with the windows closed based on the result on the interior acoustical analysis.



Source: Atkins 2011

APPROXIMATE NOISE BARRIER LOCATIONS
FIGURE 8

Noi-3 **Site-Specific Acoustic Analysis – Multi-Family Residences**. Concurrent with design review and prior to the approval of building permits for multi-family areas where first and/or second floor exterior noise levels exceed 60 dBA CNEL and/or where required outdoor area (patios or balconies) noise levels exceed 65 dBA CNEL (Planning Areas B, C, E, F, H1, H2, I, J, L, M, and O), the applicant shall prepare an acoustical analysis demonstrating compliance with California's Title 24 Interior Noise Standards (i.e., 45 dBA CNEL) and the City's Exterior Land Use/Noise Compatibility Guidelines for outdoor use areas (i.e., 65 dBA CNEL). Design-level architectural plans will be available during design review and will permit the accurate calculation of transmissions loss for habitable rooms. For these areas, it may be necessary for the windows to be able to remain closed to ensure that interior noise levels meet the interior standard of 45 dBA CNEL. Consequently, the design for buildings in these areas may need to include a ventilation or air conditioning system to provide a habitable interior environment with the windows closed based on the result on the interior acoustical analysis.

Noi-4 **Site-Specific Acoustic Analysis – Non-Residential NSLU**. Concurrent with design review and prior to the approval of building permits for any non-residential noise sensitive land use (schools, neighborhood parks, outdoor use areas, some Community Purpose Facility uses, etc.) area where exterior noise levels exceed 65 dBA CNEL (Planning Areas B, C, D, F, G, H1, H2, I, J, M, L, R, S, and T), the applicant shall be responsible for the preparation of an acoustical analysis ensuring that exterior noise levels at the boundary of the proposed noise sensitive land use will be below 65 dBA CNEL and implementation of any measures recommended as a result of the analysis. Measures to reduce noise levels may include, but would not be limited to, setback of structures from the roadway, installing acoustic barriers, or orienting outdoor activity areas away from roadways so that surrounding structures provide noise attenuation. The analysis shall also demonstrate that barriers or setbacks have been incorporated into the project design, such that, when considered with proposed construction specifications, ground level and upper story interior noise levels shall not exceed 45 dBA CNEL. Roof-ceiling assemblies making up the building envelope shall have a sound transmission class value of at least 50, and exterior windows shall have a minimum sound transmission class of 30 in compliance with the California Green Building standards code.

Noi-5 **Site-Specific Acoustic Analysis – Office Uses**. Concurrent with design review and prior to the approval of building permits for any office area where exterior noise levels exceed 70 dBA CNEL (Planning Areas H2, J, and L), the applicant shall prepare an acoustical analysis, and construct any attenuation measures identified therein, to ensure that exterior noise levels at the property line of the proposed office building will be below 70 dBA CNEL. Measures to reduce noise levels may include, but would not be limited to, setback of structures from the roadway, installing acoustic barriers, or, in mixed-use buildings, orienting offices away from roadways so that surrounding structures provide noise attenuation.

Noi-6 **HVAC Mechanical Equipment Shielding.** Concurrent with design review and prior to the approval of building permits for non-residential development requiring HVAC equipment, the applicant shall prepare a report demonstrating that HVAC equipment is designed to ensure that noise levels from the equipment will not exceed the Chula Vista noise ordinance standards. Noise from HVAC equipment shall be reduced by either the installation of acoustical shielding around all new rooftop HVAC equipment, or by placing the HVAC equipment below grade in basement space.

Noi-7 **Shielded Private Outdoor Usable Space for Town Center Residences**. Private usable outdoor space for new residential or commercial development such as patios, balconies, or outdoor dining areas in the Town Center shall be located or protected from noise to ensure noise levels are below 65 dB CNEL. The proposed plan for private residential open space shall be designed to the satisfaction of the City Engineer prior to design review.

Noi-8 **Site Specific Acoustic Analysis - Community Park and Neighborhood Park.** Concurrent with the preparation of site-specific plan(s) and prior to the approval of a precise grading plan for the Community Park or Neighborhood Park, the applicant shall prepare, or in the case the City being the lead on the preparation of the site specific plan, the applicant shall fund the preparation of an acoustical analysis to ensure that noise levels generated from any active uses at the Community Park or Neighborhood Park, such as sports fields and a skate park, do not exceed the exterior noise limits of the receiving land use category as identified in the Chula Vista Noise Ordinance. The applicant shall be responsible for the implementation of any measures recommended as a result of the analysis. Measures to reduce noise levels may include, but would not be limited to, siting of structures or buildings to provide setbacks between active areas and adjacent noise sensitive uses or construction of a wall to provide noise attenuation. Final noise attenuation design shall be determined by a site-specific acoustic analysis conducted by a qualified acoustical engineer, to the satisfaction of the Development Services Director, or their designee.

Significance After Mitigation

Table 9 shows on-site ground level traffic noise levels with implementation of mitigation measure Noi-1. Table 9 applies only to the receptors that would be affected by the proposed noise wall. Walls are not feasible along La Media Road, Main Street, Street A, or Otay Valley Road north of Planning Area N because a wall would conflict with the Village 9 SPA policies. The SPA requires frontages along all public roads in the Town Center and Neighborhood Center Zone. These roadways include La Media Road/Otay Valley Road (within the couplet), Main Street, and Street A (see pages 3-26 and 3-30 of the Village 8 West SPA). Additionally, the SPA requires that buildings be oriented toward the street (see pages 4-12, 4-17, 4-18, 4-20, 4-22, and 4-38 of the Village 8 West SPA). Noise walls would block building frontages and views from buildings oriented toward the roadway, which would create conflicts with the SPA vision for cohesive character, pedestrian-friendly sidewalks, and quality public streetscapes within the SPA. Walls are feasible along the portions of Otay Valley Road south of the couplet shown in Figure 8 because the residences affected by the wall would be oriented towards public residential streets and are not required to provide frontages along Otay Valley Road. Walls are not feasible for all potential traffic noise impacts in the SPA; therefore, measures Noi-2 through Noi-5 are included to mitigate the traffic noise impacts to the remaining receptors. With implementation of the above measures (Noi-1 through Noi-8), operational noise sources would comply with the City's noise ordinance, the General Plan noise compatibility guidelines, and CalGreen. Operational noise impacts would be reduced to a less than significant level.

Table 9 On-site 2030 Buildout Ground Level Traffic Noise Levels with Implementation of Mitigation Measure Noi-1

Receiver Location	Receiver Type	Ground Level Traffic Noise Level (dBA CNEL)	Ground Level Traffic Noise Level with Implementation of Noi-1 (dBA CNEL)	Significant Impact?
Lot N109	Single-Family Residence	66	62	No
Lot N112	Single-Family Residence	66	62	No
Lot N115	Single-Family Residence	67	61	No
Lot N117	Single-Family Residence	67	61	No
Planning Area Q	Single-Family Residence	70	65	No
Planning Area U	Single-Family Residence	70	65	No

Source: FHWA TNM 2.5. See appendix for noise model outputs.
Note: As part of measure Noi-1, the noise barrier for receivers in Lots N109-N117 is assumed to be 3 feet in height, and the noise barrier for Planning Areas Q and U is assumed to be 6 feet in height as shown in Figure 8. Noise levels for upper level receivers were not attenuated discernibly from the implementation of Noi-1.

Cumulative Impacts

Buildout of Village 8 West, along with future regional growth, and other projects to be developed within the project vicinity would result in increases in traffic that would cumulatively increase traffic noise. The potential noise impacts that would result from cumulative projects and regional growth are included in the Buildout (2030) scenario. As shown in the noise contours in Figure 7, noise levels at the proposed locations of residences, parks, schools, and offices would potentially exceed the Chula Vista noise compatibility standards along Main Street, Otay Valley Road, and Street A. Therefore, a cumulative impact would occur. These NSLU and roadways would only be developed with implementation of the Village 8 West SPA Plan; therefore, implementation of the proposed project would result in a cumulatively considerable contribution to a significant cumulative impact. However, implementation of mitigation measures Noi-1 through Noi-5 would require future development to implement measures that would reduce noise levels to be compatible with the Chula Vista noise compatibility guidelines. Therefore, cumulative impacts from the project would be reduced to a contribution that is less than cumulatively considerable.

Village 8 West would be adjacent to future development to the east in Village 8 East, to the West in Village 4, and to the north in Village 7. According to the GDP, these villages would be developed with similar land uses compared to Village 8 West, including commercial, residential, and parkland development. Similar to Village 8 West, the residential land uses in adjacent villages would generate nuisance noise that would not be considered a significant impact. However, the mixed-use and commercial development would potentially include HVAC systems and commercial uses that would have the potential to result in significant impacts to NSLU up to 275 feet away from the source, and single-family residences up to 500 feet from the source. Activities at future parks would have the potential generate excessive noise levels at NSLU up to 300 feet from playgrounds or other facilities. If commercial development or parkland would be located along the edge of a future village adjacent to the project site, residences and schools along the eastern edge Village 8 West would have the potential be exposed to excessive noise levels. Likewise, development of the schools, parks, and structures requiring HVAC systems in Village 8 West would result in potentially significant impacts to NSLU along the adjacent edges of neighboring villages, if residences in the adjacent would be occupied prior to construction of the schools and commercial development in Village 8 West. Therefore, a potentially significant cumulative impact would occur. Mitigation measures Noi-2 through Noi-4 and Noi-7 would reduce impacts related to exposure of NSLU in Village 8 West to noise from adjacent villages to a less than cumulatively considerable level. Additionally, mitigation measures Noi-6 and Noi-8 would reduce the potentially significant impacts of the proposed schools, parks, and commercial buildings in Village 8 West to a less than cumulatively considerable level.

Operation of the existing quarry currently generates noise levels that range from approximately 45 dBA to 55 dBA at the edge of the quarry property (City of Chula Vista 2011) and does not exceed the city noise standards for Village 8 West. However, quarry operations have been approved to expand to approximately 300 feet from the western boundary of Village 8 West. Currently, mining is concentrated in the central portion of the quarry, approximately 1,000 feet from the site boundary. Similar mining activities would occur as operations expand. Therefore, based on existing noise levels, operation of mining equipment at the quarry boundary closest to the Village 8 West SPA would result in daytime noise levels up to 65 dBA at the nearest sensitive receptors in Village 8 West and would potentially exceed the City's noise standards. Potentially affected sensitive receptors include the single-family and multi-family residences closest to the western for the proposed project. However, the existing Declaration of Covenants of Operation for the quarry includes provisions to ensure that the quarry does not exceed the city noise ordinance standards at surrounding residences (City of Chula Vista 2008). These covenants include the following:

1. Upon issuance of the building permit for the first residential development within 1,500 feet of' an active Mining Operation or rock crushing activity, a noise mitigation plan shall be completed that identifies any mitigation or modifications to operations as may be needed to limit noise levels in order to be in compliance with the City's Noise Ordinance. A letter, verifying compliance with this standard shall be prepared by a qualified acoustician and sent to the City's Director of Planning and Building for review and approval prior to the occupancy of the first residential unit.
2. Once the first residence is occupied within 1,500 feet from the outer perimeter of an active Mining Operation, Mine Operators (including mining and processing plant operations) shall confirm that noise levels are in compliance with the noise standards set forth in the City's Noise Ordinance.
3. Mine equipment maintenance can occur 24 hours per day, as long as such activity is in compliance with the noise standards set forth in the City's Noise Ordinance (Municipal Code Section 19.68.030)

Therefore, implementation of the existing covenants for operation at the quarry would ensure that the expansion of the quarry and cumulative residential development surrounding the quarry would not result in the cumulatively considerable exposure of NSLU to excessive noise from quarry operation.

5.1.2 Issue 2: Groundborne Vibration

Impact Analysis

The main concern associated with groundborne vibration from this type of project is annoyance, however, vibration-sensitive instruments and operations, such as those found in hospitals and laboratories, can be disrupted at much lower levels than would typically affect other uses. In extreme cases, the vibration can cause damage to buildings, particularly those that are old or otherwise fragile. No vibration-sensitive land uses are proposed as part of the project; however, excessive levels of groundborne vibration may be an annoyance to residences. Some common sources of groundborne vibration are trains, and construction activities such as blasting, pile-driving and heavy earth-moving equipment. Vibration sensitive land uses within 600 feet of a railroad may be exposed to disruptive vibration (FTA 2006). Beyond 600 feet, vibration impacts would not occur. Since the project is located more than 6 miles away from the trolley and freight rail line in western Chula Vista, vibration from railroads would not be felt at the project site. Blasting and earth moving activities occur at the Otay Valley Rock Quarry. However, the quarry is located approximately 0.3 mile (1,600 feet) from the project site. Vibration from quarry operations would not be felt at the project site. Therefore, the primary source of groundborne vibration occurring as part of the project is construction activity.

Vibration-sensitive instruments and operations may require special consideration during construction. Vibration criteria for sensitive equipment and operations are not defined and are often case specific. In general, the criteria must be determined based on manufacturer specifications and recommendations by the equipment user. As a guide, major construction activity within 200 feet and pile driving within 600 feet may be potentially disruptive to sensitive operations (Caltrans 2002). No pile driving is anticipated to be necessary; however, construction activities on site may require blasting, which is also a significant source of groundborne vibration.

The nearest vibration-sensitive land use to the project site is the Sharp Chula Vista Medical Center, located approximately 2.25 miles northwest of the project site on Medical Center Court. At 2.25 miles from the nearest construction activity, the research facility would be located outside of the vibration screening distances for major construction activity (200 feet) and pile driving (600 feet). Therefore construction activity would not affect any off-site vibration-sensitive land use. Because construction across the project site would be phased, new construction on the project site would have the potential to expose developed on-site residences to groundborne vibration because construction activities would likely take place within 200 feet of a residence. If blasting is required during the Orange Phase, it would occur prior to any construction on-site; therefore, it would not expose any structures to groundborne vibration. However, blasting in the Blue Phase may occur after some construction in the Orange Phase is completed. It is unknown how development would be phased within each phase; therefore, development in the Orange Phase would potentially be located within 600 feet of blasting in the Blue Phase. If blasting is required, the City Engineer and Fire Marshal will require compliance with blasting restrictions placed on grading plans.

It should be noted that ground vibrations from construction activities do not often reach the levels that can damage structures or affect activities that are not vibration-sensitive, although the vibrations may be felt by nearby persons in close proximity and result in annoyance (FTA 2006). Additionally, the Village 8 West development would consist of new buildings constructed in accordance with all building codes and would not be susceptible to vibration damage. Vibration impacts would be temporary and would cease following construction. Therefore, impacts related to groundborne vibration during construction would be less than significant.

Mitigation Measures

Implementation of the Village 8 West SPA Plan would not result in a significant groundborne vibration impact; therefore, no mitigation is required.

Significance After Mitigation

No mitigation is required because impacts would be less than significant without mitigation.

Cumulative Impacts

In order to result in a cumulative vibration impact, major construction activities would have to be located within 200 feet of another project, or within 600 feet for pile driving. The future cumulative projects that would potentially be located within 600 feet of Village 8 West construction activity include a mixed-use village and residential development in Village 8 East, residential development and a community park in Village 4, and residential development in Village 7. These land uses are not considered vibration sensitive.

However, the existing quarry would potentially expand to approximately 300 feet from the western boundary of Village 8 West. Village 8 West would remain outside of the 200 feet screening distance for the operation of heavy equipment at the quarry.

Occasional blasting operations may occur within 600 feet for the Village 8 West boundary. However, the proposed residential, commercial, and park land uses along the western edge of Village 8 West are not vibration sensitive. Additionally, according to the Declaration of Covenants of Operation for the quarry, blasting would be limited to the hours between 10:00 a.m. and 4:00 p.m. and would not disturb sleep. The Mining Operator is also required to retain a qualified blasting specialist to develop a site specific blasting program report to assess, control, and monitor ground vibration from blasting, for any residences located within 1,000 feet of the mining operation. The Mine Operator is required to provide public notification of the blasting schedule for residents within 1,000 feet of blasting. The Mine Operator will give a monthly blasting schedule in writing to residences within 1,000 feet of potential blast locations. The notice will disclose the anticipated blasting schedule and provide a contact phone number for the blasting contractor. Unscheduled changes to the blasting schedule will require the blasting schedule to be reissued no less than 24 hours prior to the blasting. Therefore, cumulative groundborne vibration impacts would be less than significant.

5.1.3 Issue 3: Substantial Permanent Increase in Ambient Noise Levels

Impact Analysis

This section addresses the potential for implementation of the SPA Plan and TM to permanently increase ambient noise levels as a result of increased traffic noise. The potential for other noise sources associated with project implementation to result in increases in noise levels that would expose NSLU to excessive noise levels is addressed in Section 4.2.1, Issue 1: Excessive Noise Levels.

The noise technical report prepared for the GPA/GDPA SEIR determined that potential impacts related to increases in traffic under the GPA/GDPA would be significant (City of Chula Vista 2013). However, the report was based on a programmatic traffic analysis for the GPA/GDPA area. The following analysis tiers from the GPA/GDPA EIR, and updates the noise analysis based on the project-specific traffic study prepared for Village 8 West by RBF Consulting (RBF 2013), and the Village 8 West SPA Plan (January 2012). The potential for Village 8 West to permanently increase traffic noise is addressed under the following scenarios: existing plus project, interim (Year 2025), and buildout (Year 2030) with and without implementation of the mitigation measures proposed in the traffic study to reduce traffic congestion. The interim Year 2015 and Year 2020 traffic scenarios were not analyzed for traffic noise because fewer trips would be generated on the study area roadways under these scenarios compared to the Year 2025 and Year 2030 scenarios (RBF 2013). In addition, the roadways affected by the mitigation required for the Year 2025 scenario result in lower traffic volumes than the Unmitigated Year 2025 scenario (see Table 22 in the TIA, Year 2025 Levels of Service Without and With Proposed Mitigation); therefore, the Mitigated Year 2025 scenario is not included in the traffic noise analysis.

Traffic levels for each roadway are included in the appendix. Noise levels for area roadways were calculated using standard noise modeling equations adapted from the FHWA noise prediction model. The modeling calculations take into account the posted vehicle speed, average daily traffic volume, and the estimated vehicle mix. Noise levels are estimated at locations 50 feet from the roadway centerline. Noise levels at distances further from the source than the specific receptor would be lower due to attenuation provided by increased distance from the noise source. Generally, noise from heavily traveled roadways would experience a decrease of approximately 3 dBA for every doubling of distance from the roadway.

Existing Plus Project Scenario

Existing and future increases in traffic, with and without the proposed project, are provided in Table 10. As shown in Table 10, 17 of the 22 existing roadway segments currently generate noise levels that exceed 65 dBA CNEL, without implementation of the project. In this scenario, project-related traffic noise increases would cause noise along one roadway that currently does not exceed 65 dBA CNEL to exceed 65 dBA CNEL. Project-related traffic noise would result in an increase of three decibels or more along three roadway segments that already exceed 65 dBA CNEL. One roadway that currently does not exist would exceed 65 dBA CNEL with implementation of project. Five roadway segments would result in a significant noise impact under the Existing Plus Project scenario:

- Birch Road, La Media Road to SR-125
- Birch Road, SR-125 to Eastlake Parkway
- La Media Road, Olympic Parkway to Birch Road
- La Media Road, Birch Road to Main Street
- Magdalena Avenue, Birch Road to Main Street

Table 10 Existing Plus Project Traffic Noise Levels

Roadway	Segment	Existing Plus Project				
		Existing	Existing + Project	Exceeds 65 dBA CNEL?	Increase in Noise Level	Significant Impact?
Olympic Parkway	I-805 to Brandywine Avenue	75	76	Yes	+1	No
	Brandywine Avenue to Heritage Road	75	76	Yes	+1	No
	Heritage Road to La Media Road	75	76	Yes	+1	No
	La Media Road to SR-125 Ramps	75	75	Yes	0	No
	SR-125 Ramps to Eastlake Parkway	79	80	Yes	+1	No
	Eastlake Parkway to Hunte Parkway	70	71	Yes	+1	No
	East of Hunte Parkway	66	67	Yes	+1	No
Birch Road	La Media Road to SR-125	69	**72**	**Yes**	**+3**	**Yes**
	SR-125 to Eastlake Parkway	68	**71**	**Yes**	**+3**	**Yes**
Main Street	I-805 to Brandywine Avenue	73	73	Yes	0	No
	Brandywine Avenue to Heritage Road	71	71	Yes	0	No
Hunte Parkway	Eastlake Parkway to Olympic Parkway	60	63	No	N/A	No
	Olympic Parkway to Otay Lakes Road	67	68	Yes	+1	No
Heritage Road	Palomar Street to Olympic Parkway	69	71	Yes	+2	No
	Main Street to Entertainment Circle	65	65	No	N/A	No
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	65	65	No	N/A	No
La Media Road	East Palomar Street to Olympic Parkway	69	71	Yes	+2	No
	Olympic Parkway to Birch Road	69	**74**	**Yes**	**+5**	**Yes**
	Birch Road to Main Street	Does Not Exist	**72**	**Yes**	**N/A**	**Yes**
Magdalena Avenue	Birch Road to Main Street	64	**68**	**Yes**	**+4**	**Yes**
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	70	71	Yes	+1	No
	Olympic Parkway to Birch Road	68	70	Yes	+2	No
	Birch Road to Main Street	59	64	No	N/A	No

Note: The existing scenario represents conditions in 2010. Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by RBF Consulting (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. Significant impacts shown in **bold** and shading**.** See appendix for data sheets.

Unmitigated Year 2025 Scenario

The Unmitigated Year 2025 scenario includes development of all proposed residential development, the elementary school, 240,000 square feet of commercial development, and 18.6 acres of park space in Village 8 West, as well as cumulative development anticipated by Year 2025. In addition to the existing street network and improvements that would be implemented through the Year 2020, this scenario assumes construction of La Media Road/Otay Valley Road to Street A and the half of the Main Street couplet east of Otay Valley Road (see TIA Table 21, 2025 Roadway Segment Level of Service). Year 2025 traffic noise levels, with and without the proposed project, are provided in Table 11. As shown in

Table 11, all of the 25 roadway segments that would exist by Year 2025 would exceed 65 dBA CNEL without project traffic.

Table 11 Year 2025 Traffic Noise Levels

Roadway	Segment	Year 2025	Year 2025 + Project	Exceeds 65 dBA CNEL?	Increase in Noise Level	Significant Impact?
Olympic Parkway	I-805 to Brandywine Avenue	75	75	Yes	0	No
	Brandywine Avenue to Heritage Road	74	75	Yes	+1	No
	Heritage Road to La Media Road	76	76	Yes	0	No
	La Media Road to SR-125 Ramps	76	76	Yes	0	No
	SR-125 Ramps to Eastlake Parkway	80	80	Yes	0	No
	Eastlake Parkway to Hunte Parkway	74	74	Yes	0	No
	East of Hunte Parkway	69	70	Yes	+1	No
Birch Road	La Media Road to SR-125	74	75	Yes	+1	No
	SR-125 to Eastlake Parkway	74	75	Yes	+1	No
Main Street	I-805 to Brandywine Avenue	74	74	Yes	0	No
	Brandywine Avenue to Heritage Road	73	73	Yes	0	No
	Street A to Eastlake Parkway	72	72	Yes	0	No
Hunte Parkway	Eastlake Parkway to Olympic Parkway	72	72	Yes	0	No
	Olympic Parkway to Otay Lakes Road	69	69	Yes	0	No
Heritage Road	Palomar Street to Olympic Parkway	74	75	Yes	+1	No
	Olympic Parkway to Main Street/ Hunte Parkway	73	73	Yes	0	No
	Main Street to Entertainment Circle	68	68	Yes	0	No
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	68	68	Yes	0	No
La Media Road	East Palomar Street to Olympic Parkway	71	71	Yes	0	No
	Olympic Parkway to Birch Road	73	74	Yes	+1	No
	Birch Road to Main Street	70	**73**	**Yes**	**+3**	**Yes**
Magdalena Avenue	Birch Road to Main Street	66	67	Yes	+1	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	70	70	Yes	0	No
	Olympic Parkway to Birch Road	72	72	Yes	0	No
	Birch Road to Main Street	75	76	Yes	+1	No
Otay Valley Road	Village 9 Access to University Avenue	Does Not Exist	64	No	N/A	No

Note: Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by RBF Consulting (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. Significant impacts shown in **bold** and shading. See appendix for data sheets.

In the Year 2025 scenario, project-related traffic would result in an increase of three decibels or more along one roadway segment that would exceed 65 dBA CNEL without project traffic. This one roadway segment would result in a significant impact under the Year 2025 scenario:

- La Media Road, Birch Road to Main Street

Unmitigated Year 2030 Scenario

The Unmitigated Year 2030 scenario compares buildout (Year 2030) traffic volumes with and without the implementation of the project, and without implementation of the mitigation measures identified in the Traffic Impact Analysis. This scenario assumes full buildout of the proposed Village 8 West development and circulation network, as well as cumulative development through Year 2030. Unmitigated Year 2030 traffic noise levels, with and without the project, are provided in Table 12. As shown in Table 12, 27 of the 31 roadway segments would exceed 65 dBA CNEL without project-related traffic.

In the Unmitigated Year 2030 scenario, project-related traffic noise increases would not cause any roadway segments to exceed 65 dBA CNEL or result in an increase of three decibels or more along roadways that would exceed 65 dBA CNEL without implementation of the SPA Plan and TM. The project would not result in any significant impacts from noise increases along roadways under the Unmitigated Year 2030 scenario.

Mitigated Year 2030 Scenario

The Mitigated Year 2030 scenario compares buildout (Year 2030) traffic volumes with and without the implementation of the project, assuming implementation of the traffic mitigation measures identified in the Traffic Impact Analysis (RBF 2013). This scenario assumes full buildout of the project development and circulation network, as well as cumulative development through Year 2030. Mitigated Year 2030 traffic noise levels, with and without the project, are provided in Table 13. As shown in Table 13, 27 of the 31 roadway segments would exceed 65 dBA CNEL without project-related traffic.

In the Mitigated Year 2030 scenario, project-related traffic noise increases would not cause any roadway segments to exceed 65 dBA CNEL or result in an increase of three decibels or more along roadways that would exceed 65 dBA CNEL without implementation of the SPA Plan and TM. The project would not result in any significant impacts from noise increases along roadways under the Mitigated Year 2030 scenario.

Table 12 Unmitigated Year 2030 Traffic Noise Levels

Roadway	Segment	Unmitigated Year 2030	Unmitigated Year 2030 + Project	Exceeds 65 dBA CNEL?	Increase in Noise Level	Significant Impact?
Olympic Parkway	I-805 to Brandywine Avenue	75	75	Yes	0	No
	Brandywine Avenue to Heritage Road	74	74	Yes	0	No
	Heritage Road to La Media Road	73	74	Yes	+1	No
	La Media Road to SR-125 Ramps	75	75	Yes	0	No
	SR-125 Ramps to Eastlake Parkway	80	80	Yes	0	No
	Eastlake Parkway to Hunte Parkway	74	74	Yes	0	No
	East of Hunte Parkway	72	72	Yes	0	No
Birch Road	La Media Road to SR-125	76	76	Yes	0	No
	SR-125 to Eastlake Parkway	76	76	Yes	0	No
Main Street	I-805 to Brandywine Avenue	76	76	Yes	0	No
	Brandywine Avenue to Heritage Road	75	75	Yes	0	No
	Heritage Road to Couplet	70	71	Yes	+1	No
	Magdalena Avenue to SR-125	69	69	Yes	0	No
	SR-125 to Street A	75	76	Yes	+1	No
	Street A to Eastlake Parkway	73	73	Yes	0	No
Hunte Parkway	Eastlake Parkway to Olympic Parkway	74	74	Yes	0	No
	Olympic Parkway to Otay Lakes Road	70	70	Yes	0	No
Heritage Road	Palomar Street to Olympic Parkway	75	75	Yes	0	No
	Olympic Pkwy to Main Street/ Hunte Pkwy	75	75	Yes	0	No
	Main Street to Entertainment Circle	73	73	Yes	0	No
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	72	73	Yes	+1	No
La Media Road	East Palomar Street to Olympic Parkway	73	73	Yes	0	No
	Olympic Parkway to Birch Road	73	73	Yes	0	No
	Birch Road to Main Street	73	73	Yes	0	No
Magdalena Avenue	Birch Road to Main Street	64	65	No	N/A	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	71	71	Yes	0	No
	Olympic Parkway to Birch Road	73	73	Yes	0	No
	Birch Road to Main Street	74	74	Yes	0	No
Otay Valley Road	Street A to SR-125	62	63	No	N/A	No
	SR-125 to Village 9 Access	62	63	No	N/A	No
	Village 9 Access to University Avenue	64	64	No	N/A	No

Note: Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by RBF Consulting (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. The bold text indicates a significant impact. See appendix for data sheets.

Table 13 Mitigated Year 2030 Traffic Noise Levels

Roadway	Segment	Mitigated Year 2030	Mitigated Year 2030 + Project	Exceeds 65 dBA CNEL?	Increase in Noise Level	Significant Impact?
Olympic Parkway	I-805 to Brandywine Avenue	75	75	Yes	0	No
	Brandywine Avenue to Heritage Road	74	74	Yes	0	No
	Heritage Road to La Media Road	73	74	Yes	+1	No
	La Media Road to SR-125 Ramps	75	75	Yes	0	No
	SR-125 Ramps to Eastlake Parkway	80	80	Yes	0	No
	Eastlake Parkway to Hunte Parkway	74	74	Yes	0	No
	East of Hunte Parkway	72	72	Yes	0	No
Birch Road	La Media Road to SR-125	72	72	Yes	0	No
	SR-125 to Eastlake Parkway	74	74	Yes	0	No
Main Street	I-805 to Brandywine Avenue	76	76	Yes	0	No
	Brandywine Avenue to Heritage Road	75	75	Yes	0	No
	Heritage Road to Couplet	70	71	Yes	+1	No
	Magdalena Avenue to SR-125	70	71	Yes	+1	No
	SR-125 to Street A	77	77	Yes	0	No
	Street A to Eastlake Parkway	75	75	Yes	0	No
Hunte Parkway	Eastlake Parkway to Olympic Parkway	74	74	Yes	0	No
	Olympic Parkway to Otay Lakes Road	70	70	Yes	0	No
Heritage Road	Palomar Street to Olympic Parkway	75	75	Yes	0	No
	Olympic Pkwy to Main Street/Hunte Pkwy	75	75	Yes	0	No
	Main Street to Entertainment Circle	73	73	Yes	0	No
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	72	73	Yes	+1	No
La Media Road	East Palomar Street to Olympic Parkway	73	73	Yes	0	No
	Olympic Parkway to Birch Road	73	73	Yes	0	No
	Birch Road to Main Street	69	70	Yes	+1	No
Magdalena Avenue	Birch Road to Main Street	64	65	No	N/A	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	71	71	Yes	0	No
	Olympic Parkway to Birch Road	73	73	Yes	0	No
	Birch Road to Main Street	72	72	Yes	0	No
Otay Valley Road	Street A to SR-125	64	65	No	N/A	No
	SR-125 to Village 9 Access	64	65	No	N/A	No
	Village 9 Access to University Avenue	64	64	No	N/A	No

Note: Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by RBF Consulting (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. The bold text indicates a significant impact. See appendix for data sheets.

Mitigation Measures

Existing Plus Project Scenario

Five roadway segments would result in a significant noise impact under the Existing Plus Project scenario: Birch Road, La Media Road to SR-125; Birch Road, SR-125 to Eastlake Parkway; La Media Road, Olympic Parkway to Birch Road; La Media Road, Birch Road to Main Street; and Magdalena Avenue, Birch Road to Main Street. Traffic-related noise could be reduced either by constructing noise barriers, lowering traffic speeds, or by reducing traffic. However, implementation of the Village 8 West SPA Plan is planned to be constructed in a series of phases over a period of up to 20 years, and over time would include the construction of new roadways that would provide new connections from the project area to the regional transportation system. These new connections would reduce long-term traffic on the roadways surrounding the project site by routing some cumulative traffic through Village 8 West instead of the surrounding roadways. Additionally, these connections would direct traffic generated by Village 8 West away from the existing off-site roadways and reduce associated traffic noise. The 2030 buildout traffic scenario includes future roads that are proposed as part of the development plans for other villages. However, according to the traffic report, if the equivalent dwelling unit assumption for the buildout study year (2030) is reached prior to implementation of these roadways being open to traffic, then one of the following steps shall be taken as determined by, and to the satisfaction of, the City Engineer:

1. Development in Village 8 West will stop until those assumed future roadways are constructed by others; or

2. City and Otay Land Company shall meet to determine the need for the incomplete roadway segments. A number of factors, including changes to the tolling structure at SR-125, may affect the traffic patterns in the Otay Ranch. Additional traffic analysis of the roadway network and levels of service assessment may be necessary to determine if such improvements are necessary and the scope and timing of additional circulation improvements; or

3. Developer shall construct the missing roadway links and receive Transportation Development Impact Fee (TDIF) credit for those improvements as applicable; or

4. An alternative measure is selected by the city in accordance with the Chula Vista Growth Management Ordinance.

The condition listed above has been established in the traffic study to ensure that the circulation system would be implemented concurrently with the phased development of Village 8 West. The condition will be incorporated into the Transportation/Traffic section of the Village 8 West EIR as mitigation.

Year 2025 Scenario

One roadway segment would result in a significant impact under the Year 2025 scenario: La Media Road, Birch Road to Main Street. As described above under the Existing Plus Project scenario, the buildout circulation network for Village 8 West would reduce long-term traffic noise. The traffic study mitigation will be incorporated into the Transportation/Traffic section of the Village 8 West EIR. The MMRP for the proposed project will include requirements to ensure that the circulation network is implemented concurrently with development.

Unmitigated and Mitigated Year 2030 Scenarios

In the Unmitigated and Mitigated Year 2030 (Buildout) scenarios, Village 8 West not result in a significant traffic noise increase on any roadway.

Significance After Mitigation

Existing Plus Project Scenario and Unmitigated Year 2025 Scenario

Short-term increases in traffic noise off-site on La Media Road, Birch Road, and Magdalena Avenue would be significant and unavoidable until the proposed roadway circulation system is complete. Completion of the off-site circulation system improvements, such as the extension of Otay Valley Road to SR-125, would reduce project-related traffic noise increases by redistributing project-related traffic so that it would be not concentrated on the impacted roadways. Implementation of the Village 8 West circulation system would reduce project-generated traffic volumes on off-site roadways by providing new transportation routes and would reduce the project's short-term increases in noise levels during interim years on La Media Road, Birch Road, and Magdalena Avenue to a less than significant level. Impacts would be significant and unavoidable until the proposed circulation system is complete. With implementation of the proposed circulation system, future and long-term traffic noise impact would be less than significant.

Unmitigated and Mitigated Year 2030 Scenarios

Implementation of Village 8 West would not result in a significant traffic noise increase on any roadway in the Unmitigated Year 2030 or Mitigated Year 2030 scenario without mitigation.

Cumulative Impacts

Buildout of Village 8 West, along with future regional growth, and other projects to be developed within the project vicinity would result in increases in traffic that would cumulatively increase traffic noise. The potential noise impacts that would result from cumulative projects and regional growth are included in the Mitigated Year 2030 scenario. Table 14 compares Mitigated Year 2030 traffic noise levels to existing conditions. As shown in Table 14, 17 of the 22 existing roadway segments currently generate noise levels that exceed 65 dBA CNEL, without cumulative development. Cumulative growth, including the proposed project, would result in six new roadway segments that would exceed 65 dBA CNEL. Cumulative growth would cause three existing roadway segments to exceed 65 dBA, and would result in an increase in traffic noise of 3 dBA CNEL or more on 12 existing roadway segments. A cumulatively considerable impact would occur on a total of 21 roadway segments. The project's contribution to the cumulative noise impact is based on the increase in traffic noise attributable to the proposed project under the Year 2030 Mitigated scenario. Implementation of the proposed project would result in a 1 dBA increase on five impacted roadways. A 1 dBA noise increase is generally not discernable, although project traffic would incrementally contribute to an already noisy environment that may exceed compatibility standards for NSLU in the vicinity. The significance threshold for traffic-related noise increases is 3 dBA CNEL; therefore, implementation of the proposed project would not result in cumulatively considerable contribution to a significant cumulative roadway noise impact.

Table 14 Cumulative Traffic Noise Impacts

Roadway	Segment	Existing	Mitigated Year 2030	Increase in Noise Level	Significant Cumulative Impact?	Increase Attributable to Proposed Project[1]	Cumulatively Considerable Contribution?
Olympic Parkway	I-805 to Brandywine Avenue	75	75	0	No	0	No
	Brandywine Avenue to Heritage Road	75	74	-1	No	0	No
	Heritage Road to La Media Road	75	74	-1	No	+1	No
	La Media Road to SR-125 Ramps	75	75	0	No	0	No
	SR-125 Ramps to Eastlake Parkway	79	80	+1	No	0	No
	Eastlake Parkway to Hunte Parkway	70	**74**	**+4**	**Yes**	0	No
	East of Hunte Parkway	66	**72**	**+6**	**Yes**	0	No
Birch Road	La Media Road to SR-125	69	**72**	**+3**	**Yes**	0	No
	SR-125 to Eastlake Parkway	68	**74**	**+6**	**Yes**	0	No
Main Street	I-805 to Brandywine Avenue	73	**76**	**+3**	**Yes**	0	No
	Brandywine Avenue to Heritage Road	71	**75**	**+4**	**Yes**	0	No
	Heritage Road to Couplet	Does Not Exist	**71**	**N/A**	**Yes**	+1	No
	Magdalena Avenue to SR-125	Does Not Exist	**71**	**N/A**	**Yes**	+1	No
	SR-125 to Street A	Does Not Exist	**77**	**N/A**	**Yes**	0	No
	Street A to Eastlake Parkway	Does Not Exist	**75**	**N/A**	**Yes**	0	No
Hunte Parkway	Eastlake Parkway to Olympic Parkway	60	**74**	**+14**	**Yes**	0	No
	Olympic Parkway to Otay Lakes Road	67	**70**	**+3**	**Yes**	0	No
Heritage Road	Palomar Street to Olympic Parkway	69	**75**	**+6**	**Yes**	0	No
	Olympic Parkway to Main Street/Hunte Parkway	Does Not Exist	**75**	**N/A**	**Yes**	0	No
	Main Street to Entertainment Circle	65	**73**	**+8**	**Yes**	0	No
	Entertainment Circle to Avenida de Las Vistas (City of San Diego)	65	**73**	**+8**	**Yes**	+1	No
La Media Road	East Palomar Street to Olympic Parkway	69	**73**	**+4**	**Yes**	0	No
	Olympic Parkway to Birch Road	69	**73**	**+4**	**Yes**	0	No
	Birch Road to Main Street	Does Not Exist	**70**	**N/A**	**Yes**	+1	No
Magdalena Avenue	Birch Road to Main Street	64	65	0	No	N/A	No
Eastlake Parkway	Otay Lakes Road to Olympic Parkway	70	71	+1	No	0	No
	Olympic Parkway to Birch Road	68	**73**	**+5**	**Yes**	0	No
	Birch Road to Main Street	59	**72**	**+13**	**Yes**	0	No
Otay Valley Road	Street A to SR-125	Does Not Exist	65	N/A	No	N/A	No
	SR-125 to Village 9 Access	Does Not Exist	65	N/A	No	N/A	No
	Village 9 Access to University Avenue	Does Not Exist	64	N/A	No	N/A	No

(1) Based on the results in Table 13. The project's contribution to the cumulative noise impact is based on the increase in traffic noise attributable to the proposed project under the Year 2030 Mitigated scenario. If the project's contribution is less than three decibels, the project's contribution is not cumulatively considerable.
Note: Noise levels are calculated at 50 feet from roadway centerline. Noise levels are based upon traffic data provided by RBF Consulting (2013). Traffic levels for each roadway are included in the appendix. Decibel levels are rounded to the nearest whole number. The bold text indicates a significant impact. See appendix for data sheets.

5.1.4 Issue 4: Construction Noise

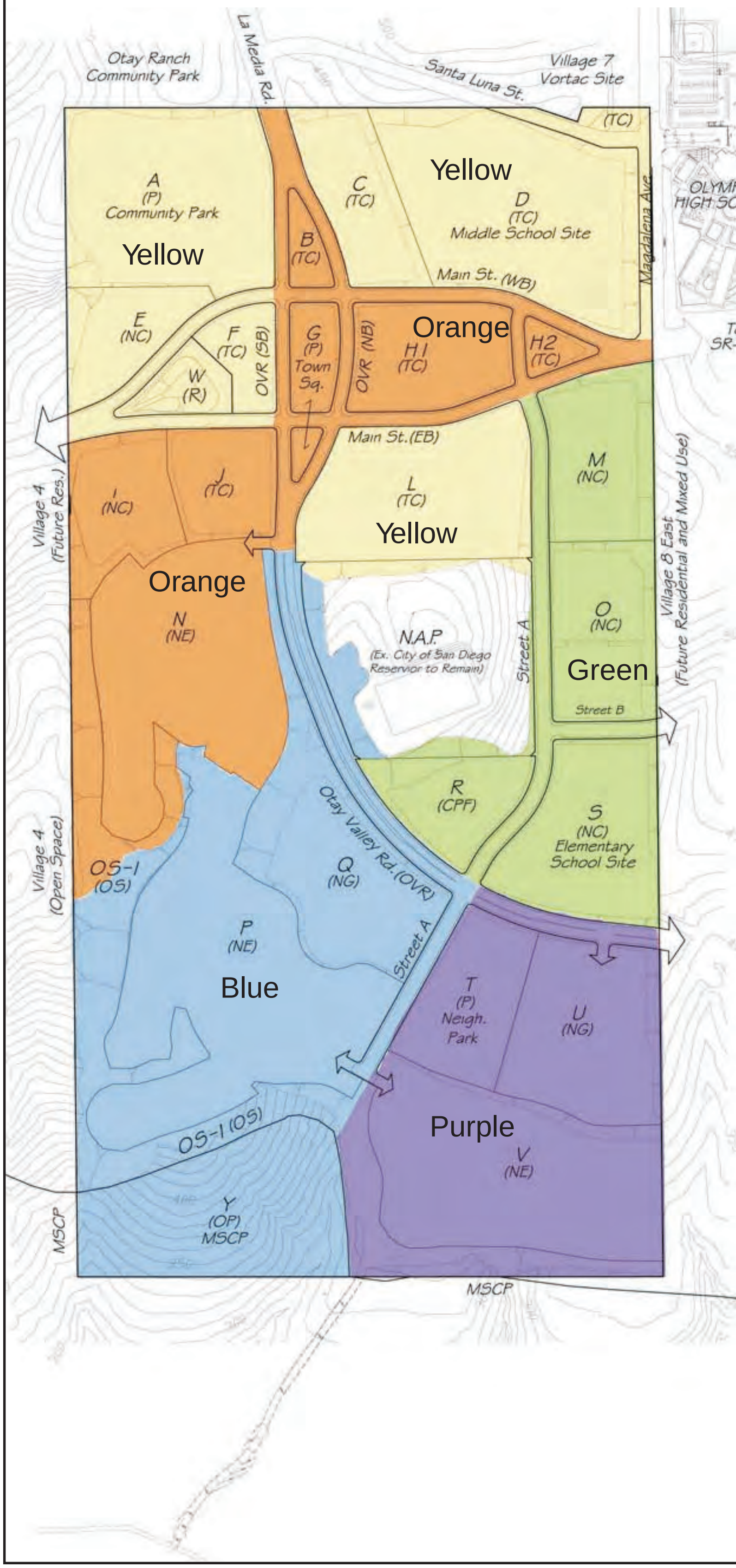
Impact Analysis

Construction of the development proposed in the SPA Plan and TM would generate noise that could expose nearby receptors to elevated noise levels that may disrupt communication and routine activities. The magnitude of the impact would depend on the type of construction activity, equipment, duration of the construction phase, distance between the noise source and receiver, and intervening structures. Sound levels from typical construction equipment range from 60 dBA to 90 dBA Leq at 50 feet from the source (FHWA 2008). Noise from construction equipment generally exhibits point source acoustical characteristics. Strictly speaking, a point source sound decays at a rate of 6 dBA per doubling of distance from the source. The rule applies to the propagation of sound waves with no ground interaction.

Construction of the development proposed as part of the project would be completed in five phases, generally west to east, as shown in Figure 9. The final order of phasing has not been determined; however, the Orange Phase and Blue Phase would be constructed first because these phases would involve blasting. The Orange Phase would involve construction of a portion of the Town Center including the Town Square, multi-family residences, and commercial development. Multi-family and single-family residences in the Neighborhood Commercial and Neighborhood Edge Zones would also be developed. The Blue Phase would involve construction of single-family residences in the Neighborhood General and Neighborhood Edge Zones. The Yellow Phase would involve construction of the remaining Town Center area, the Community Park, and multi-family development in the Neighborhood Commercial Zone. The Purple Phase would involve construction of the Neighborhood Park and single-family residences in the Neighborhood Edge and Neighborhood General Zones. The Green Phase would involve construction of multi-family residences in the Neighborhood Commercial Zone, the elementary school site, and the Community Purpose Facility. Construction of the off-site trail and utilities would occur during one of these phases.

The construction timeframe for the entire buildout of the project is expected to begin in 2013 and last for 8 to 12 years. All phases would involve grading and site preparation, as well as utilities installation, surface improvements including paving and landscaping, building construction, and external/internal building work. Grading for each phase would last approximately three months, utilities installation would take approximately two months, surface improvements would take approximately two months, and building construction would take place over two years. The grading, utility installation, and surface improvement activities of one phase would overlap with the last nine months of building construction in the previous phase. Although it is unlikely, it is possible that all four categories of construction activities could occur simultaneously on the site within different development phases. Construction of the off-site improvements would require vegetation clearing, underground utility installation, and paving.

Standard equipment, such as dozers, loaders, scrapers, and miscellaneous trucks would be used for construction of most of the project facilities. The grading, utility installation, and surface improvement activities in each phase would be completed prior to any building construction. However, building construction within each phase would not take place all at once; some areas would be completed before other structures within the phase are under construction. Therefore, building construction activities would have the potential to expose residents within developed, occupied buildings within an area to construction noise in adjacent areas.



Orange		
Plan Area	Target Units	C'ml Sq. Ft (K)
B	35	0
G (Town Sq.)	0	0
H1	33	144
H2	0	12
I	122	0
J	161	18
N	117	0
Subtotal	**468**	**174**
Blue		
Plan Area	Target Units	C'ml Sq. Ft (K)
P	124	0
Q	160	0
Subtotal	**284**	**0**
Yellow		
Plan Area	Target Units	C'ml Sq. Ft (K)
A (Comm. Park)	0	0
C	156	36
D (Mid. Sch'l)	0	0
E	95	0
F	54	25
L	460	65
Subtotal	**765**	**126**
Purple		
Plan Area	Target Units	C'ml Sq. Ft (K)
T (Neigh Park)	0	0
U	130	0
V	90	0
Subtotal	**220**	**0**
Green		
Plan Area	Target Units	C'ml Sq. Ft (K)
M	153	0
O	160	0
R (CPF)	0	0
S (Elem. Sch'l)	0	0
Subtotal	**313**	**0**
Total	**2,050**	**300**

Source: William Hezmalhalch Architects, Inc. 2010

0 400 800
Feet

N

DEVELOPMENT PHASES
FIGURE 9

Because the order of the development phases is unknown, the estimated noise level at a particular on-site receptor cannot be conclusively determined. However, based on the construction equipment list provided by the applicant and typical equipment noise levels determined by the Roadway Construction Noise Model (RCNM) (FHWA 2008), noise levels from simultaneous operation of the five noisiest pieces of construction equipment (excavator, roller, crane, dozer, and scraper) for each construction activity that could occur simultaneously from any development phase in the same location would have the potential to generate noise levels of up to 87 dBA at 50 feet from the construction site. These estimates are conservative because construction equipment for a single construction activity would be spread out over several acres and would not be operating all at once.

The nearest existing receptor to the project site is Olympian High School, located approximately 150 west of the project site. Construction in the northeast corner of the site in the Yellow Phase would generate the greatest amount of construction noise at the school. At this distance, the worst-case construction noise level would be approximately 77 dBA during grading operations. Simultaneous construction activities are not likely to occur within the same phase; therefore, the high school would be exposed to Yellow Phase construction, but would not be exposed to simultaneous construction activities from other phases. Additionally, on-site land uses would potentially be exposed to construction noise as buildings in some areas become occupied while other areas of Village 8 West are under construction. Although the Chula Vista exterior noise limits do not apply to construction activity, the noise level from construction would potentially exceed the day time exterior noise standards and may be considered disruptive to residences and the high school during construction operations.

In addition to the grading, utility installation, surface improvement, and building construction activities required for all five phases, blasting would be required along the southwest boundary of the project site during the grading activities of the Orange Phase and Blue Phase. A typical blasting operation includes drilling a hole, filling the hole with explosive material, capping the hole, and detonating the material. Sound levels from a rock drill have been measured at 90 to 100 dBA at 50 feet. Blasting is a short-term event, typically lasting no more than several seconds. Additionally, a rock crushing crushing/processing facility would be used during some construction activities in the Orange Phase and Blue Phase of construction where rock removal is involved. Noise measurements that have been conducted for portable rock crushing operations indicated that rock crushing activity would generate a 1-hour average noise level of approximately 86 dBA at a distance of 50 feet from the primary crusher (Dudek 2007). All blasting in the Orange Phase would take place prior to development on the project site. The nearest existing NSLU is Olympian High School, located approximately 2,800 feet from the blasting area, which is limited to the western edge of the project site. At this distance, noise from the rock drill and rock crusher would be reduced to 65 dBA and 51 dBA. Although the Chula Vista exterior noise limits do not apply to construction activity, the noise level from rock drilling would not exceed the day time exterior noise standard for non-residential land use. However, rock blasting during the grading phase of the Blue Phase would occur during the construction phase of the Orange Phase. Some buildings in the Orange Phase may be constructed and occupied prior to blasting activities and exposed to substantial noise from rock drilling and blasting activities.

Although the on-site residences could be exposed to excessive construction noise levels, the exposure would be short-term, and would cease upon project buildout. Additionally, construction activities associated with buildout of the project would occur between the hours of 7:00 a.m. and 10:00 p.m., Monday through Friday, and between the hours of 8:00 a.m. and 10:00 p.m., Saturday and Sunday, which is the limit specified in the Chula Vista construction noise ordinance. Because construction would comply with the applicable regulation for construction noise, temporary increases in noise level from construction activities at the on-site residences would be less than significant.

Noise from construction activities would also have the potential to impact sensitive wildlife species in the MSCP Preserve areas to the south and west of the project site. The Biological Resources Report prepared for Village 8 West (URS 2012) determined that construction noise exceeding an hourly average sound level of 60 dBA would potentially impact special status wildlife species by inhibiting audible communication between potential mates and between parents and offspring. Based on the worst-case construction noise level of 87 dBA at 50 feet, determined using the RCNM model, and an attenuation rate of 6 dBA for every double of distance, construction activities would have the potential to exceed 60 dBA up to 1,100 feet from the source. Blasting activities would have the potential to exceed 60 dBA up to 1,600 feet from the source. Assuming that construction noise would be emanating from a location on the project site closest to the MSCP Preserve areas (in the southern parcels within Planning Area P or the southern and western parcels within Planning Area V, the western portion of Planning Area E, and the southwest area of Planning Area A), construction noise would exceed 60 dBA within the MSCP Preserve area and significant construction noise impact would occur.

The Biological Resource Report includes mitigation that will be incorporated into the Biological Resources section of the Village 8 West EIR to reduce this impact to a less than significant level. The report's proposed mitigation requires pre-construction surveys, acoustical analyses to demonstrate that the average hourly 60 dBA noise level standard would not be exceeded at the location of any occupied sensitive habitat areas, and use of noise abatement methods that may include, but are not limited to, installation of noise abatement at the source, and/or installation of noise abatement at the receiving areas. These requirements will be included in the MMRP for the proposed project. Therefore, this impact would be reduced to a less than significant level with the implementation of the proposed biological resources mitigation measures.

Mitigation Measures

With implementation of the mitigation measures required in the Biological Resources Report, the proposed project would not result in significant temporary noise impacts from construction activities. No additional mitigation is required.

Significance After Mitigation

Impacts related to temporary construction noise would be less than significant with implementation of the mitigation measures required in the Biological Resources Report.

Cumulative Impacts

Construction noise impacts are localized in nature because they are limited to the construction site where construction equipment is operating. As discussed above, sound levels from project construction would be up to 87 dBA Leq at 50 feet from the source (FHWA 2008). However, the cumulative projects and the proposed project would be subject to the Chula Vista construction noise ordinance, which limits the hours of construction to 7:00 a.m. and 10:00 p.m., Monday through Friday, and between the hours of 8:00 a.m. and 10:00 p.m., Saturday and Sunday. Compliance with the Chula Vista ordinance would reduce impacts to a less than significant level. The proposed project would comply with the Chula Vista construction limits; therefore, the proposed project would not result in a cumulatively considerable contribution to a significant cumulative impact.

5.1.5 Issue 5: Aircraft Noise

Impact Analysis

The project site is located 1.5 miles northeast of the Brown Field airport. As discussed in Section 3.4.5, the project site is currently subject to overflights of planes and helicopters taking off from Brown Field, which are audible on the project site. The project site is not located within the 60 dBA CNEL noise contour of Brown Field, and is not anticipated to be exposed to excessive noise levels from the airport in excess of city standards. However, overflights from Brown Field may be considered a nuisance to residents. In accordance with standard condition #46 in Section 5-300 of the City's Subdivision Manual, applicants are required to record an Airport Overflight Agreement against the property to the satisfaction of the Director of Development Services prior to recordation of any Final Map. This condition would run with the property, and as such, potential nuisance noise from aircraft overflights would be disclosed to future residents. Therefore, impacts would be less than significant

Mitigation Measures

Impacts related to aircraft noise would be less than significant; therefore, no mitigation measures are required.

Significance After Mitigation

Impacts related to aircraft noise would be less than significant without mitigation.

Cumulative Impacts

No additional aviation uses are planned to be introduced in the immediate vicinity of the project site. In addition, the project does not propose any new air traffic. No new air traffic is proposed in the Otay Ranch GDP. No NSLU would be exposed to excessive noise levels from aviation as a result of the proposed project. Impacts related to nuisance noise from overflights are site specific and are not cumulative in nature. Therefore, a cumulative impact related to aviation would not occur.

5.1.6 Issue 6: General Plan Policies

Impact Analysis

Table 15 evaluates the consistency of the proposed project with the applicable General Plan policies. As shown in this table, the project would be consistent with the General Plan policies that pertain to noise.

Mitigation Measures

Implementation of the proposed project would not conflict with any applicable General Plan policies. No mitigation is required.

Table 15 Project Consistency with Applicable General Plan Noise Policies

Applicable Policies	Evaluation of Consistency
Objective E21: *Protect people from excessive noise through careful land use planning and the incorporation of appropriate mitigation techniques.* **Policy E 21.1**: Apply the exterior land use-noise compatibility guidelines listed in Table 9-2 of this Environmental Element to new development, where applicable, and in light of project-specific considerations. **Policy E 21.2**: Where applicable, the assessment and mitigation of interior noise levels shall adhere to the applicable requirements of the California Building Code with local amendments and other applicable established City standards. **Policy E 21.4**: Continue to implement and enforce the City's noise control ordinance.	The proposed SPA Plan is consistent with these noise policies. This noise impact analysis utilized the land use-noise compatibility guidelines in the Environmental Element, the Chula Vista Noise Ordinance, and CCR Title 24 as thresholds for determining significance between different land uses. The Noise Ordinance would continue to be enforced with implementation of the SPA Plan. As discussed under Issue 1 and Issue 3, the project would have the potential result in noise impacts that would conflict with the noise compatibility guidelines, the Noise Ordinance, and CCR Title 24; however, mitigation measures Noi-1 through Noi-8, including compliance with CalGreen, and buildout of the proposed circulation network would reduce potential impacts to a less than significant level, consistent with state and city standards. No significant noise impacts would occur as a result of project construction.
Objective E22: *Protect the community from the effects of transportation noise.* **Policy E 22.1**: Work to stabilize traffic volumes in residential neighborhoods by limiting throughways and by facilitating the use of alternative routes around, rather than through, neighborhoods. **Policy E 22.3**: Employ traffic calming measures, where appropriate, such as narrow roadways and on-street parking, in commercial and mixed use districts. **Policy E 22.4**: Encourage walking; biking; carpooling; use of public transit; and other alternative modes of transportation to minimize vehicular use and associated traffic noise.	The proposed SPA Plan is consistent with these noise policies. Village 8 West would connect to existing arterials, La Media Road and Main Street, and would include the Main Street and Otay Valley Road arterial roadways that traverse the project site. These roadways would serve as major throughways for the site and would minimize the use of streets within the residential districts as throughways. In addition, on-site streets are intentionally narrow with on-site parking to encourage slower traffic and encourage other modes of transportation such as bus, transit, walking and bicycling. Other traffic calming measures include bulb outs at corner sidewalks, traffic signals and/or signs, posted speed limit signs and allowing bicycles to share the road right-of-way. A bus rapid transit route is provided through the SPA Plan to encourage the use of public transit within the SPA Plan area as well as to/from other parts of Otay Ranch and the city. The mixed use nature of the project, which places residences, employment, services and entertainment in close proximity, would also result in a significant reduction of vehicle trips thereby reducing vehicular traffic volumes and noise impacts. The SPA Plan does not prohibit the use of new technologies to minimize traffic noise. As discussed under Issue 1 and Issue 3, the project would have the potential result in the exposure of on-site and off-site receptors to excessive traffic noise. However, mitigation measures Noi-1 through Noi-5 and buildout of the proposed circulation network would reduce potential impacts to a less than significant level.

Significance After Mitigation

Impacts related to General Plan policies would be less than significant without mitigation.

Cumulative Impacts

Consistency with General Plan policies is project specific. Similar to the proposed project, the cumulative projects in Chula Vista would be required to demonstrate compliance with applicable

General Plan policies prior to project approval. Therefore, a significant cumulative impact would not occur.

6.0 Conclusion

Construction of the proposed Village 8 West project would not result in construction noise or groundborne vibration that would result in a significant direct or cumulative impact with implementation of the mitigation measures required in the Biological Resource Report prepared for the proposed project. Buildout of the proposed project would result in significant traffic noise increases along La Media Road, Main Street, Otay Valley Road, and Street A within the project site. Mitigation measures Noi-1 through Noi-5 would reduce direct and cumulative impacts to a less than significant level. Short-term increases in traffic noise off-site on La Media Road, Birch Road, and Magdalena Avenue would be significant and unavoidable until the proposed roadway circulation system is complete. Completion of the proposed roadway circulation system is required in the traffic study prepared for the proposed project. Long-term traffic impacts would be less than significant with implementation of the circulation system. Operation of the proposed project would have the potential to result in excessive noise levels related to HVAC equipment, commercial land use, and recreational facilities. Mitigation measures Noi-2 through Noi-4 and Noi-6 through Noi-8 would reduce direct and cumulative impacts to a less than significant level. Future residents of Village 8 West would have the potential to be exposed to nuisance noise from Brown Field aircraft operations. Mitigation measure Noi-9 would reduce impacts to a less than significant level.

7.0 References

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Appendix
Noise Data

C:\LARDAV\SLMUTIL\18MAR11.bin Interval Data

Site	Location	Date	Time	Duration	Leq	SEL	Lmax	Lmin	Peak	Uwpk	L(5)	L(10)	L(50)	L(90)
1	NW Edge of V8 West - Future MF	18Mar 11	9:11:42	900	52.8	82.3	67.7	40.8	84	86.3	57.9	54.9	45	42.2
2	Middle of V8W - Future MU	18Mar 11	9:36:29	900	42.4	72	55.4	36.7	84	86.3	47.2	45.2	39.7	38.2
3	Southern Edge of V8West - Future SF	18Mar 11	9:58:01	900	42.8	72.3	50.1	36.4	76.3	0	45.9	45.1	42.2	39.2
4	NE Edge of V8 West near intersection of Magdalena Avenue and Rock Mtn Road	18Mar 11	12:01:54	900	55.3	84.8	70.9	32.9	92.4	95.1	61.7	55.1	42	36.1
5	SE Corner of Fleishbein & Kincaid - Residential Development just north of Olympian and Wolf Canyon Schools	18Mar 11	12:25:28	900	57.3	86.8	76.1	35.5	89.8	99.9	63.8	60.6	42.5	38.4

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99 Location # 1

Project: SW	Date: 3/18/11	Eqpt:	Photos: 1+2
Temp: Hot Warm Mild Cool Cold	Wind (mph): ≤2.5 2.5-5 5-10 ≥10 (dir): N E S W Δ	Cloud Cover: Clear Pt. Cld. Clouds Fog	
Location Desc.: NW edge of Site - Future Park	Noise Source(s): Birds, fly overs, distant traffic - from W - not 125		
Rcp. Info: 32° 36.217 N, W 116.58.900	Ground Effects: Dirt + grasses		
Barrier Effects: None			

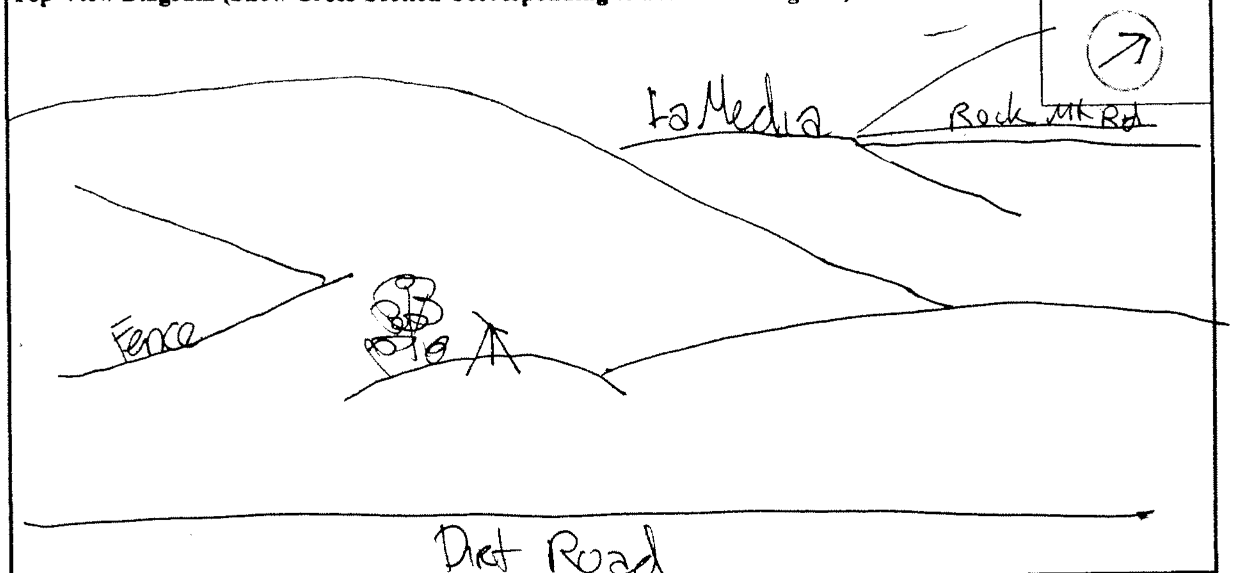
Meas. Int.:			
Roadway:			
Segment:			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	MT	HT	Dir.
			NB/EB
			SB/WB

Meas. Int.:			
Roadway: Rock Mtn			
Segment: 5 min			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	MT	HT	Dir.
||||			NB/EB
			SB/WB

Cal. Δ @Int1		Cal. √		Offset
Yes	No	Int #:		+1

Top-View Diagram (Show Cross-Section Corresponding to Elevation Diagram):

Show North



Elv. Diagram (vertical):

(ft) (ft)

General Comments: Traffic from Rck Mtn audible but infrequent, small planes, not commercial - Brown Field
9:21 - loudest flyover No Quarry Noise
This site may be in take off path or close to it

Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info Description	Lmax	Begin	End
	1	9:10	15		53.3									9:21 - loudest flyover			

 Data File: ______ Recorded By: ______

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99

Location #: 2

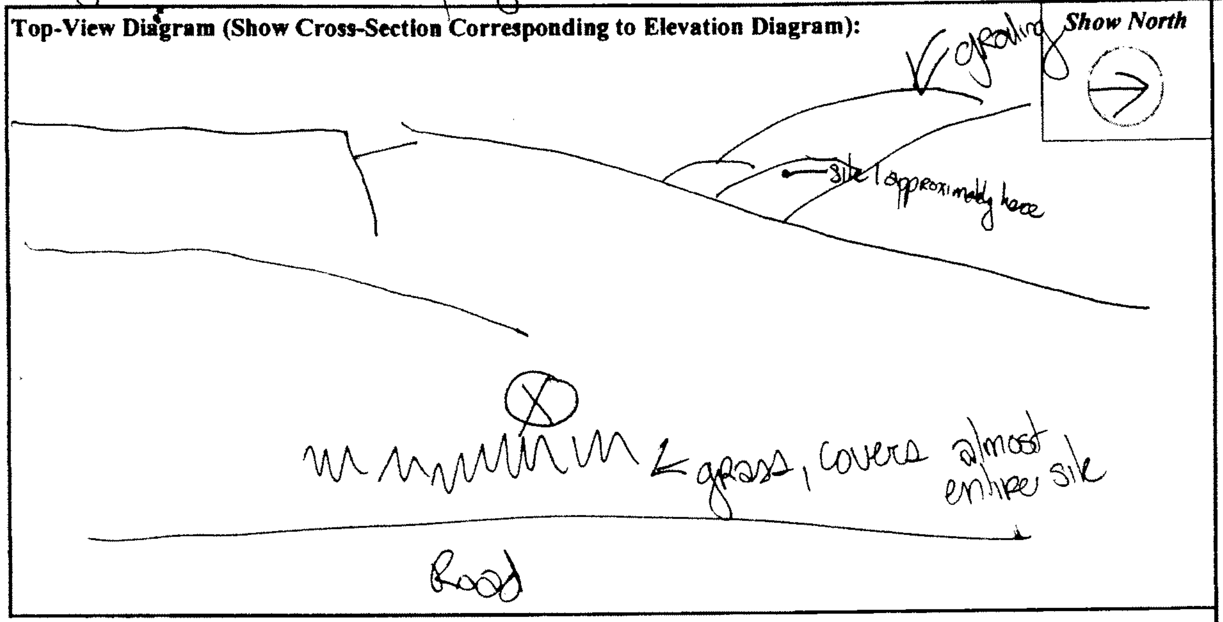
Project: 8W	**Date:** 3/18/11	**Eqpt:** LD820 Type 1	**Photos:** 3-4
Temp: Hot Warm (Mild) Cool Cold	**Wind (mph):** (≤2.5) 2.5-5 5-10 ≥10 (dir): N E S W Δ		**Cloud Cover:** Clear (Pt. Cld.) Clouds Fog
Location Desc.: 32° 36.253 N, W116° 58.656	**Noise Source(s):** Distant construction or unloading (truck beeping), traffic, birds, crickets, critters		
Rep. Info:	**Ground Effects:** Grass, about 1'-1.5' tall		
Barrier Effects: None immediately, hill to west (sloping hill)			

Meas. Int.:			
Roadway:			
Segment:			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	**MT**	**HT**	**Dir.**
			NB/EB
			SB/WB

Meas. Int.:			
Roadway:			
Segment:			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	**MT**	**HT**	**Dir.**
			NB/EB
			SB/WB

Cal. Δ @Int1		Cal. √		Offset
Yes	No	Int #:		+1

Top-View Diagram (Show Cross-Section Corresponding to Elevation Diagram): **Show North**



Elv. Diagram (vertical):

(ft) (ft)

General Comments: Traffic - probably 805, ~~[illegible]~~ fewer overflights - ~~[illegible]~~ 1 to the east

Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info Description	Lmax	Begin	End
Town Center	2	9:37	15		50.3												

Data File: ____________ **Recorded By:** ____________

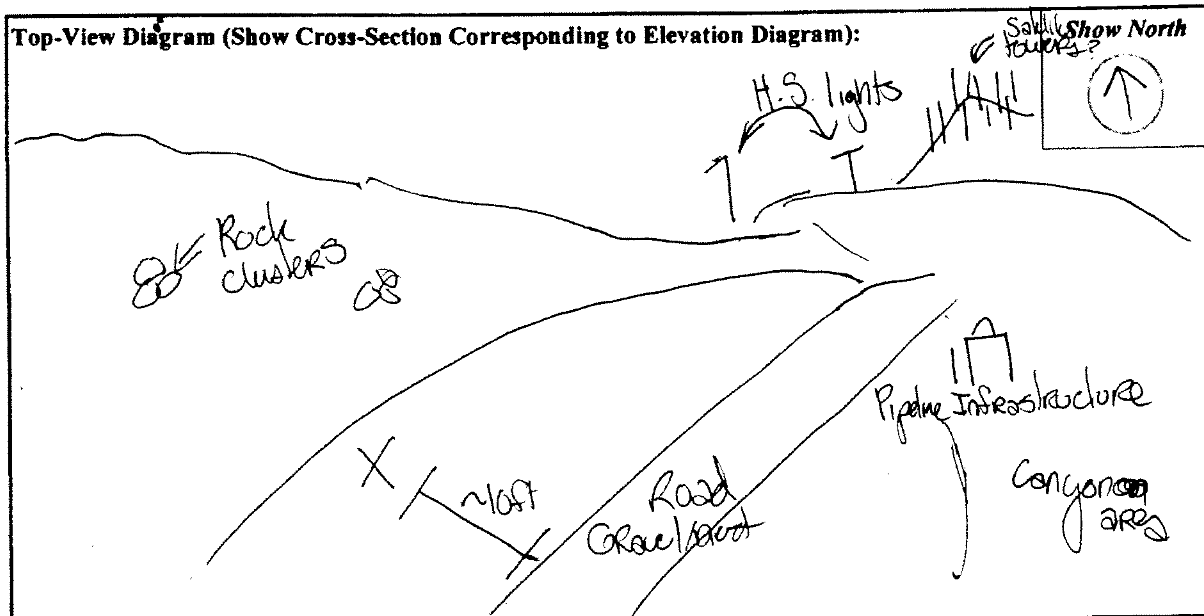
SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99 Location # 3

Project: 8W	Date: 3/18/11	Eqpt: LD820 Type 1	Photos: 5+6
Temp: Hot Warm Mild Cool Cold	Wind (mph): ≤2.5 2.5-5 5-10 ≥10 (dir): N E S W Δ		Cloud Cover: Clear Pt. Cld. Clouds Fog
Location Desc.: 32°35.784 N, 116°58.448	Noise Source(s): Birds, distant traffic + construction to east, planes		
Rcp. Info:	Ground Effects: Grass		
Barrier Effects: None			

Meas. Int.:			
Roadway:			
Segment:			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	MT	HT	Dir.
			NB/EB
			SB/WB

Meas. Int.:			
Roadway:			
Segment:			
Spd: *Post:* *Trav.:*			
Volumes			
Auto	MT	HT	Dir.
			NB/EB
			SB/WB

Top-View Diagram (Show Cross-Section Corresponding to Elevation Diagram):



Elv. Diagram (vertical):

(ft) (ft)

General Comments: 125 is audible, planes but not a direct flyover
↳ Visible to the SE
Lots of chirping

Cal. Δ @Int1		Cal. √	Offset
Yes	No	Int #:	+1

Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info Description	Lmax	Begin	End
SF in SE	3	10:00	15		48.8												

11/4/97(MSR-FORM.XLS; ST 1-10-50-90-95-99) Data File: ______ Recorded By: ______

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99

Location # 8

Project: 8W	**Date:** 3/18/11	**Eqpt:** LD820 Type 1	**Photos:** 15+16
Temp: Hot Warm Mild Cool Cold	**Wind (mph):** <2.5 2.5-5 5-10 ≥10 **(dir):** N E S W Δ		**Cloud Cover:** Clear Pt. Cld. Clouds Fog
Location Desc.: Corner of Rock + Mag	**Noise Source(s):** Crickets, occasional traffic on Rock Mtn/Mag		
Rep. Info:	**Ground Effects:** DIRT		
Barrier Effects: None			

Meas. Int.:

Roadway:	Mag
Segment:	5min
Spd: *Post:*	***Trav.:***

Volumes Auto	MT	HT	Dir.
11			NB/EB
			SB/WB

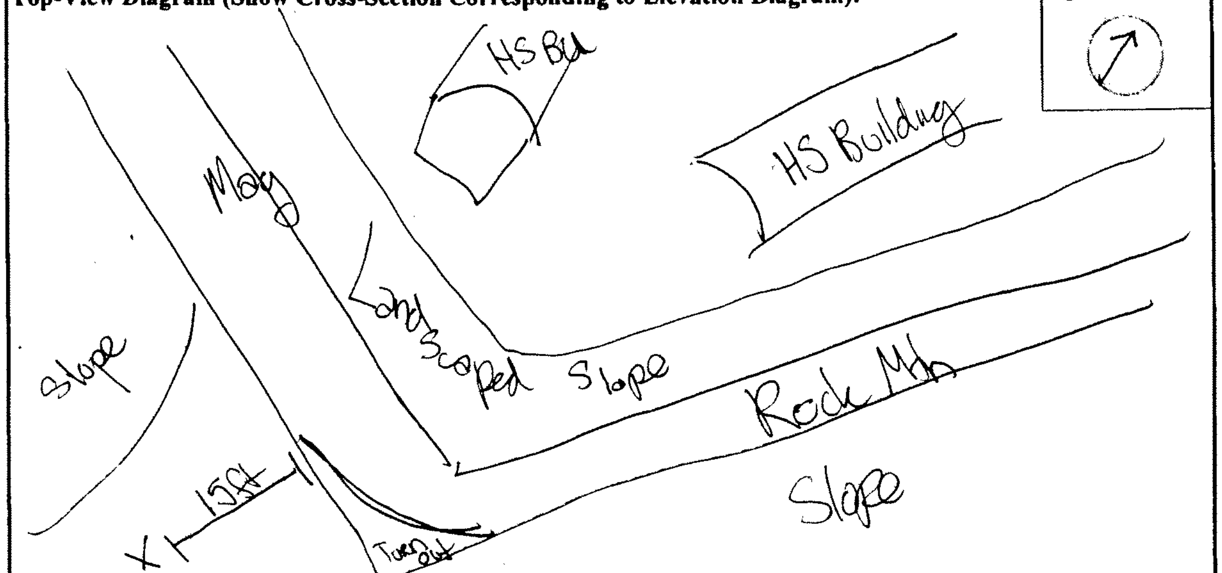
Meas. Int.:

Roadway:	Rock
Segment:	5min
Spd: *Post:*	***Trav.:***

Volumes Auto	MT	HT	Dir.
11			NB/EB
			SB/WB

Top-View Diagram (Show Cross-Section Corresponding to Elevation Diagram):

Show North



Elv. Diagram (vertical):

(ft) (ft)

General Comments: Lunchtime at school ~ some talking + kid noise
Occasional anouncements

Cal. Δ @Intl		Cal. √	Offset
Yes	No	Int #:	+1

Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info Description	Lmax	Begin	End
HS		12:00	15		52.1									12:10 - anouncemt			
														12:11 - overflight - plane			
														12:15 - anounceme nt			

11/4/97(MSR-FORM.XLS; ST 1-10-50-90-95-99) **Data File:** ______ **Recorded By:** ______

SOUND MEASUREMENT DATASHEET: SHORT-TERM (AMBIENT): L1-10-50-90-95-99 Location # 9

Project: SW/9		**Date:** 3/18	**Eqpt:** LD 820		**Photos:** 17 + 18
Temp: Hot Warm (Mild) Cool Cold		**Wind (mph):** ≤2.5 2-5 (5-10) ≥10 gusts (dir): N E S W Δ		**Cloud Cover:** (Clear) Pt. Cld. Clouds Fog	
Location Desc.: Corner (SE) of Fleshbein + Kincaid		**Noise Source(s):** Traffic - accelerating			
Rcp. Info:		**Ground Effects:** Pavement			
Barrier Effects:					

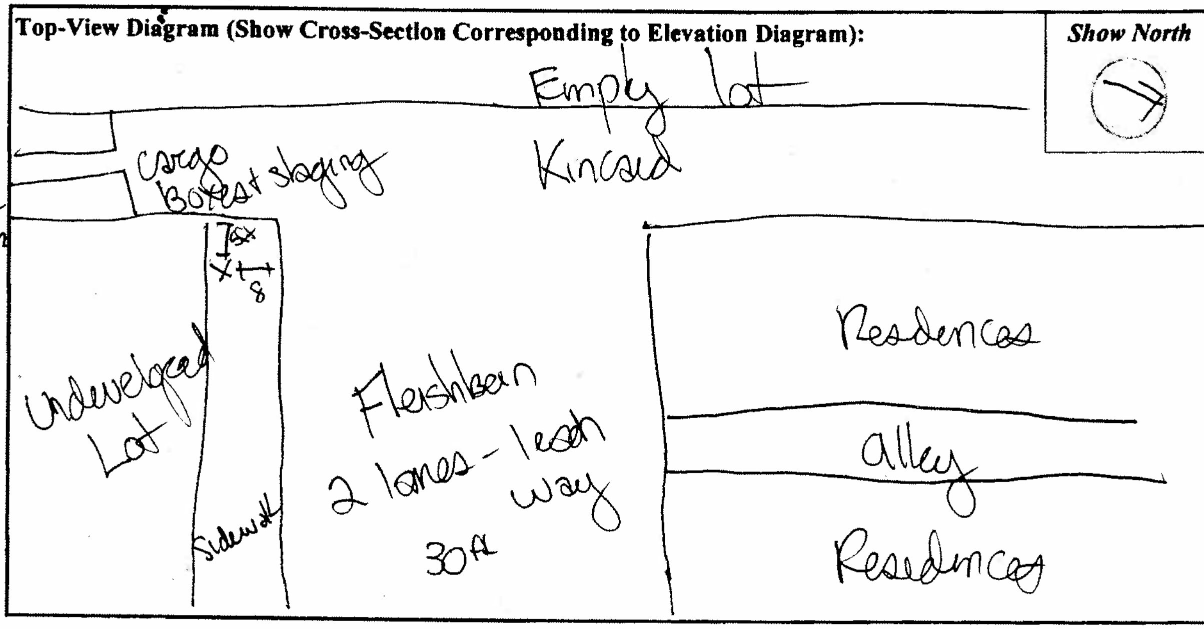
Meas. Int.:

Roadway: Fleshbein			
Segment: 15 m			
Spd: *Post:* *Trav.:*			
Volumes			**Dir.**
Auto	**MT**	**HT**	
III		II garbage truck	NB/EB
			SB/WB

Meas. Int.:

Roadway: Kincaid			
Segment: 15 m			
Spd: *Post:* *Trav.:*			
Volumes			**Dir.**
Auto	**MT**	**HT**	
III		I	NB/EB
			SB/WB

Top-View Diagram (Show Cross-Section Corresponding to Elevation Diagram):



Elv. Diagram (vertical):

(ft) (ft)

General Comments:

Development just N of Olympian + Wolf Canyon Schools
Construction on opposite side of complex + surrounding area
Place is occupied

Cal. Δ @Int1		Cal. √	Offset
Yes	No	Int #:	+1

Description	Int. #	Start (h:m(:s))	Duration ((h:)m:s)	SEL	Leq	Lmin	Lmax	L1	L10	L50	L90	L95	L99	Event/Anomaly Info Description	Lmax	Begin	End
Residential	9	12:25	15											12:28 - truck pickup			
														12:40 - pickup			

11/4/97(MSR-FORM.XLS; ST 1-10-50-90-95-99) **Data File:** ______ **Recorded By:** ______

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 100019662
Project Name: Otay Ranch Village 8 West
Off-site Roadway Segments

Background Information

Model Description: FHWA Highway Noise Prediction Model
Source of Traffic Volumes: RBF 2011
Community Noise Descriptor: L_{dn}: ______ CNEL: X

Assumed 24-Hour Traffic Distribution:	Day	Evening	Night
Total ADT Volumes	77%	13%	10%
Medium-Duty Trucks	87%	5%	8%
Heavy-Duty Trucks	89%	3%	8%

"-" = contour is located within the roadway right-of-way.
Distance is from the centerline of the roadway segment to the receptor location.

Analysis Condition	Lanes	Median Width	ADT Volume	Design Speed (mph)	Alpha Factor	Vehicle Mix: Medium Trucks	Vehicle Mix: Heavy Trucks	**CNEL at 50 Feet**	Distance from Centerline of Roadway – Distance to Contour: 70 CNEL	65 CNEL	60 CNEL	55 CNEL
Olympic Parkway												
805 to Brandywine - Existing	6	10	47,000	45	0.5	2.0%	1.0%	**75.0**	107	231	498	1,073
805 to Brandywine - Existing + Project	6	10	56,478	45	0.5	2.0%	1.0%	**75.8**	121	261	563	1,212
805 to Brandywine - 2025	6	10	41,736	45	0.5	2.0%	1.0%	**74.5**	99	213	460	991
805 to Brandywine - 2025 + Project	6	10	43,300	45	0.5	2.0%	1.0%	**74.6**	102	219	471	1,016
805 to Brandywine - 2030 (UM)	6	10	51,300	45	0.5	2.0%	1.0%	**75.4**	114	245	528	1,137
805 to Brandywine - 2030 (UM) + Project	6	10	51,300	45	0.5	2.0%	1.0%	**75.4**	114	245	528	1,137
805 to Brandywine - 2030 (M)	6	10	51,300	45	0.5	2.0%	1.0%	**75.4**	114	245	528	1,137
805 to Brandywine - 2030 (M) + Project	6	10	51,300	45	0.5	2.0%	1.0%	**75.4**	114	245	528	1,137
Olympic Parkway												
Brandywine Ave to Heritage Road - Existing	6	10	48,721	45	0.5	2.0%	1.0%	**75.1**	110	237	510	1,099
Brandywine Ave to Heritage Road - Existing + Project	6	10	59,061	45	0.5	2.0%	1.0%	**76.0**	125	269	580	1,249
Brandywine Ave to Heritage Road - 2025	6	10	40,590	45	0.5	2.0%	1.0%	**74.3**	97	210	451	973
Brandywine Ave to Heritage Road - 2025 + Project	6	10	42,600	45	0.5	2.0%	1.0%	**74.5**	100	216	466	1,005
Brandywine Ave to Heritage Road - 2030 (UM)	6	10	34,800	45	0.5	2.0%	1.0%	**73.7**	88	189	407	878
Brandywine Ave to Heritage Road - 2030 (UM) + Project	6	10	34,800	45	0.5	2.0%	1.0%	**73.7**	88	189	407	878
Brandywine Ave to Heritage Road - 2030 (M)	6	10	34,800	45	0.5	2.0%	1.0%	**73.7**	88	189	407	878
Brandywine Ave to Heritage Road - 2030 (M) + Project	6	10	34,800	45	0.5	2.0%	1.0%	**73.7**	88	189	407	878
Olympic Parkway												
Heritage Road to La Media Road - Existing	6	10	50,538	45	0.5	2.0%	1.0%	**75.3**	113	243	523	1,126
Heritage Road to La Media Road - Existing + Project	6	10	65,617	45	0.5	2.0%	1.0%	**76.4**	134	289	622	1,340
Heritage Road to La Media Road - 2025	6	10	59,549	45	0.5	2.0%	1.0%	**76.0**	126	271	583	1,256
Heritage Road to La Media Road - 2025 + Project	6	10	62,900	45	0.5	2.0%	1.0%	**76.2**	130	281	605	1,303
Heritage Road to La Media Road - 2030 (UM)	6	10	33,039	45	0.5	2.0%	1.0%	**73.4**	85	183	394	848
Heritage Road to La Media Road - 2030 (UM) + Project	6	10	33,300	45	0.5	2.0%	1.0%	**73.5**	85	184	396	852
Heritage Road to La Media Road - 2030 (M)	6	10	33,039	45	0.5	2.0%	1.0%	**73.4**	85	183	394	848
Heritage Road to La Media Road - 2030 (M) + Project	6	10	33,300	45	0.5	2.0%	1.0%	**73.5**	85	184	396	852
Olympic Parkway												
La Media Road to SR-125 Ramps - Existing	6	10	43,563	45	0.5	2.0%	1.0%	**74.6**	102	220	473	1,020
La Media Road to SR-125 Ramps - Existing + Project	6	10	48,302	45	0.5	2.0%	1.0%	**75.1**	109	235	507	1,092
La Media Road to SR-125 Ramps - 2025	6	10	55,530	45	0.5	2.0%	1.0%	**75.7**	120	258	556	1,199
La Media Road to SR-125 Ramps - 2025 + Project	6	10	56,200	45	0.5	2.0%	1.0%	**75.7**	121	260	561	1,208
La Media Road to SR-125 Ramps - 2030 (UM)	6	10	43,900	45	0.5	2.0%	1.0%	**74.7**	102	221	476	1,025
La Media Road to SR-125 Ramps - 2030 (UM) + Project	6	10	43,900	45	0.5	2.0%	1.0%	**74.7**	102	221	476	1,025
La Media Road to SR-125 Ramps - 2030 (M)	6	10	43,900	45	0.5	2.0%	1.0%	**74.7**	102	221	476	1,025
La Media Road to SR-125 Ramps - 2030 (M) + Project	6	10	43,900	45	0.5	2.0%	1.0%	**74.7**	102	221	476	1,025
Olympic Parkway												
SR-125 Ramps to Eastlake Parkway - Existing	8	10	40,478	45	0.5	2.0%	1.0%	**79.2**	204	440	947	2,040
SR-125 Ramps to Eastlake Parkway - Existing + Project	8	10	44,786	45	0.5	2.0%	1.0%	**79.6**	218	470	1,013	2,183
SR-125 Ramps to Eastlake Parkway - 2025	8	10	49,030	45	0.5	2.0%	1.0%	**80.0**	232	499	1,076	2,318
SR-125 Ramps to Eastlake Parkway - 2025 + Project	8	10	49,700	45	0.5	2.0%	1.0%	**80.1**	234	504	1,086	2,339
SR-125 Ramps to Eastlake Parkway - 2030 (UM)	8	10	49,400	45	0.5	2.0%	1.0%	**80.0**	233	502	1,081	2,330
SR-125 Ramps to Eastlake Parkway - 2030 (UM) + Project	8	10	49,400	45	0.5	2.0%	1.0%	**80.0**	233	502	1,081	2,330
SR-125 Ramps to Eastlake Parkway - 2030 (M)	8	10	49,400	45	0.5	2.0%	1.0%	**80.0**	233	502	1,081	2,330
SR-125 Ramps to Eastlake Parkway - 2030 (M) + Project	8	10	49,400	45	0.5	2.0%	1.0%	**80.0**	233	502	1,081	2,330
Olympic Parkway												
Eastlake Oarkway to Hunte Parkway - Existing	6	10	13,926	45	0.5	2.0%	1.0%	**69.7**	-	103	221	477
Eastlake Oarkway to Hunte Parkway - Existing + Project	6	10	18,234	45	0.5	2.0%	1.0%	**70.9**	-	123	265	571
Eastlake Oarkway to Hunte Parkway - 2025	6	10	34,853	45	0.5	2.0%	1.0%	**73.7**	88	189	408	879
Eastlake Oarkway to Hunte Parkway - 2025 + Project	6	10	35,300	45	0.5	2.0%	1.0%	**73.7**	89	191	411	886
Eastlake Oarkway to Hunte Parkway - 2030 (UM)	6	10	34,200	45	0.5	2.0%	1.0%	**73.6**	87	187	403	868
Eastlake Oarkway to Hunte Parkway - 2030 (UM) + Project	6	10	34,200	45	0.5	2.0%	1.0%	**73.6**	87	187	403	868
Eastlake Oarkway to Hunte Parkway - 2030 (M)	6	10	34,200	45	0.5	2.0%	1.0%	**73.6**	87	187	403	868
Eastlake Oarkway to Hunte Parkway - 2030 (M) + Project	6	10	34,200	45	0.5	2.0%	1.0%	**73.6**	87	187	403	868
Olympic Parkway												
East of Hunte Parkway - Existing	4	10	7,846	45	0.5	2.0%	1.0%	**65.8**	-	56	121	261
East of Hunte Parkway - Existing + Project	4	10	10,000	45	0.5	2.0%	1.0%	**66.8**	-	66	143	307
East of Hunte Parkway - 2025	4	10	17,953	45	0.5	2.0%	1.0%	**69.4**	-	98	211	454
East of Hunte Parkway - 2025 + Project	4	10	18,400	45	0.5	2.0%	1.0%	**69.5**	-	99	214	461
East of Hunte Parkway - 2030 (UM)	4	10	29,839	45	0.5	2.0%	1.0%	**71.6**	64	137	296	637

East of Hunte Parkway - 2030 (UM) + Project	4	10	30,100	45	0.5	2.0%	1.0%	**71.6**	64	138	297	641
East of Hunte Parkway - 2030 (M)	4	10	29,839	45	0.5	2.0%	1.0%	**71.6**	64	137	296	637
East of Hunte Parkway - 2030 (M) + Project	4	10	30,100	45	0.5	2.0%	1.0%	**71.6**	64	138	297	641
Birch Road												
La Media to SR-125 - Existing	6	10	11,084	45	0.5	2.0%	1.0%	**68.7**	-	88	190	409
La Media to SR-125 - Existing + Project	6	10	22,717	45	0.5	2.0%	1.0%	**71.8**	66	142	307	661
La Media to SR-125 - 2025	6	10	40,825	45	0.5	2.0%	1.0%	**74.4**	98	210	453	976
La Media to SR-125 - 2025 + Project	6	10	51,100	45	0.5	2.0%	1.0%	**75.3**	113	244	526	1,134
La Media to SR-125 - 2030 (UM)	6	10	53,156	45	0.5	2.0%	1.0%	**75.5**	116	251	540	1,164
La Media to SR-125 - 2030 (UM) + Project	6	10	54,200	45	0.5	2.0%	1.0%	**75.6**	118	254	547	1,179
La Media to SR-125 - 2030 (M)	6	10	25,695	45	0.5	2.0%	1.0%	**72.3**	72	154	333	717
La Media to SR-125 - 2030 (M) + Project	6	10	26,200	45	0.5	2.0%	1.0%	**72.4**	73	157	337	726
Birch Road												
SR-125 to Eastlake Parkway - Existing	6	10	10,250	45	0.5	2.0%	1.0%	**68.4**	-	84	180	389
SR-125 to Eastlake Parkway - Existing + Project	6	10	18,005	45	0.5	2.0%	1.0%	**70.8**	-	122	263	566
SR-125 to Eastlake Parkway - 2025	6	10	39,852	45	0.5	2.0%	1.0%	**74.3**	96	207	446	961
SR-125 to Eastlake Parkway - 2025 + Project	6	10	47,000	45	0.5	2.0%	1.0%	**75.0**	107	231	498	1,073
SR-125 to Eastlake Parkway - 2030 (UM)	6	10	64,156	45	0.5	2.0%	1.0%	**76.3**	132	284	613	1,320
SR-125 to Eastlake Parkway - 2030 (UM) + Project	6	10	65,200	45	0.5	2.0%	1.0%	**76.4**	133	287	619	1,334
SR-125 to Eastlake Parkway - 2030 (M)	6	10	36,604	45	0.5	2.0%	1.0%	**73.9**	91	196	421	908
SR-125 to Eastlake Parkway - 2030 (M) + Project	6	10	37,200	45	0.5	2.0%	1.0%	**74.0**	92	198	426	918
Main Street												
I-805 tp Brandywine Avenue - Existing	6	10	26,896	45	0.5	2.0%	1.0%	**72.5**	74	159	343	739
I-805 tp Brandywine Avenue - Existing + Project	6	10	27,327	45	0.5	2.0%	1.0%	**72.6**	75	161	347	747
I-805 tp Brandywine Avenue - 2025	6	10	40,706	45	0.5	2.0%	1.0%	**74.3**	97	210	452	975
I-805 tp Brandywine Avenue - 2025 + Project	6	10	41,600	45	0.5	2.0%	1.0%	**74.4**	99	213	459	989
I-805 tp Brandywine Avenue - 2030 (UM)	6	10	57,384	45	0.5	2.0%	1.0%	**75.8**	123	264	569	1,225
I-805 tp Brandywine Avenue - 2030 (UM) + Project	6	10	61,300	45	0.5	2.0%	1.0%	**76.1**	128	276	594	1,280
I-805 tp Brandywine Avenue - 2030 (M)	6	10	55,512	45	0.5	2.0%	1.0%	**75.7**	120	258	556	1,198
I-805 tp Brandywine Avenue - 2030 (M) + Project	6	10	59,300	45	0.5	2.0%	1.0%	**76.0**	125	270	581	1,252
Main Street												
Brandywine Ave to Heritage Road - Existing	6	10	18,729	45	0.5	2.0%	1.0%	**71.0**	-	125	270	581
Brandywine Ave to Heritage Road - Existing + Project	6	10	18,729	45	0.5	2.0%	1.0%	**71.0**	-	125	270	581
Brandywine Ave to Heritage Road - 2025	6	10	30,306	45	0.5	2.0%	1.0%	**73.1**	80	172	372	801
Brandywine Ave to Heritage Road - 2025 + Project	6	10	31,200	45	0.5	2.0%	1.0%	**73.2**	82	176	379	816
Brandywine Ave to Heritage Road - 2030 (UM)	6	10	47,762	45	0.5	2.0%	1.0%	**75.0**	108	234	503	1,084
Brandywine Ave to Heritage Road - 2030 (UM) + Project	6	10	52,200	45	0.5	2.0%	1.0%	**75.4**	115	248	534	1,150
Brandywine Ave to Heritage Road - 2030 (M)	6	10	45,932	45	0.5	2.0%	1.0%	**74.9**	106	228	490	1,056
Brandywine Ave to Heritage Road - 2030 (M) + Project	6	10	50,200	45	0.5	2.0%	1.0%	**75.3**	112	241	520	1,121
Main Street												
Heritage Road to Couplet - Existing	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Heritage Road to Couplet - Existing + Project	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Heritage Road to Couplet - 2025	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Heritage Road to Couplet - 2025 + Project	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Heritage Road to Couplet - 2030 (UM)	4	0	38,635	35	0.5	2.0%	1.0%	**69.9**	49	107	229	494
Heritage Road to Couplet - 2030 (UM) + Project	4	0	44,900	35	0.5	2.0%	1.0%	**70.6**	55	118	254	546
Heritage Road to Couplet - 2030 (M)	4	0	38,635	35	0.5	2.0%	1.0%	**69.9**	49	107	229	494
Heritage Road to Couplet - 2030 (M) + Project	4	0	44,900	35	0.5	2.0%	1.0%	**70.6**	55	118	254	546
Main Street												
Magdalena to SR-125 - Existing	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalena to SR-125 - Existing + Project	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalena to SR-125 - 2025	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalena to SR-125 - 2025 + Project	4	0	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Magdalena to SR-125 - 2030 (UM)	4	0	28,401	35	0.5	2.0%	1.0%	**68.6**	-	87	187	403
Magdalena to SR-125 - 2030 (UM) + Project	4	0	33,100	35	0.5	2.0%	1.0%	**69.3**	45	96	207	446
Magdalena to SR-125 - 2030 (M)	4	0	41,272	35	0.5	2.0%	1.0%	**70.2**	52	111	240	517
Magdalena to SR-125 - 2030 (M) + Project	4	0	48,100	35	0.5	2.0%	1.0%	**70.9**	57	123	266	572
Main Street												
SR-125 Ramps to Street A - Existing	6	24	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 Ramps to Street A - Existing + Project	6	24	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 Ramps to Street A - 2025	6	24	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 Ramps to Street A - 2025 + Project	6	24	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 Ramps to Street A - 2030 (UM)	6	24	31,484	45	0.5	2.0%	1.0%	**75.0**	108	233	502	1,081
SR-125 Ramps to Street A - 2030 (UM) + Project	6	24	35,400	45	0.5	2.0%	1.0%	**75.5**	117	252	543	1,169
SR-125 Ramps to Street A - 2030 (M)	6	24	47,493	45	0.5	2.0%	1.0%	**76.8**	142	306	660	1,422
SR-125 Ramps to Street A - 2030 (M) + Project	6	24	53,400	45	0.5	2.0%	1.0%	**77.3**	154	331	714	1,538
Main Street												
Street A to Eastlake - Existing	6	16	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to Eastlake - Existing + Project	6	16	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to Eastlake - 2025	6	16	19,696	45	0.5	2.0%	1.0%	**71.8**	66	142	306	660
Street A to Eastlake - 2025 + Project	6	16	22,600	45	0.5	2.0%	1.0%	**72.4**	72	156	336	723
Street A to Eastlake - 2030 (UM)	6	16	23,456	45	0.5	2.0%	1.0%	**72.6**	74	160	344	742
Street A to Eastlake - 2030 (UM) + Project	6	16	24,500	45	0.5	2.0%	1.0%	**72.8**	76	164	354	763
Street A to Eastlake - 2030 (M)	6	16	40,689	45	0.5	2.0%	1.0%	**75.0**	107	231	497	1,071
Street A to Eastlake - 2030 (M) + Project	6	16	42,500	45	0.5	2.0%	1.0%	**75.1**	110	237	512	1,102
Hunte Parkway												
Eastlake to Olympic Parkway - Existing	6	10	1,406	45	0.5	2.0%	1.0%	**59.7**	-	-	-	103
Eastlake to Olympic Parkway - Existing + Project	6	10	2,699	45	0.5	2.0%	1.0%	**62.6**	-	-	74	160
Eastlake to Olympic Parkway - 2025	6	10	22,119	45	0.5	2.0%	1.0%	**71.7**	65	140	301	649
Eastlake to Olympic Parkway - 2025 + Project	6	10	24,800	45	0.5	2.0%	1.0%	**72.2**	70	151	325	700
Eastlake to Olympic Parkway - 2030 (UM)	6	10	39,217	45	0.5	2.0%	1.0%	**74.2**	95	205	441	951

Eastlake to Olympic Parkway - 2030 (UM) + Project	6	10	40,000	45	0.5	2.0%	1.0%	**74.3**	96	208	447	963
Eastlake to Olympic Parkway - 2030 (M)	6	10	39,217	45	0.5	2.0%	1.0%	**74.2**	95	205	441	951
Eastlake to Olympic Parkway - 2030 (M) + Project	6	10	40,000	45	0.5	2.0%	1.0%	**74.3**	96	208	447	963
Hunte Parkway												
Olympic Parkway to Otay Lakes Road - Existing	4	10	9,580	45	0.5	2.0%	1.0%	**66.6**	-	64	139	299
Olympic Parkway to Otay Lakes Road - Existing + Project	4	10	11,734	45	0.5	2.0%	1.0%	**67.5**	-	74	159	342
Olympic Parkway to Otay Lakes Road - 2025	4	10	15,553	45	0.5	2.0%	1.0%	**68.7**	-	89	191	413
Olympic Parkway to Otay Lakes Road - 2025 + Project	4	10	16,000	45	0.5	2.0%	1.0%	**68.9**	-	91	195	420
Olympic Parkway to Otay Lakes Road - 2030 (UM)	4	10	20,439	45	0.5	2.0%	1.0%	**69.9**	49	107	230	495
Olympic Parkway to Otay Lakes Road - 2030 (UM) + Project	4	10	20,700	45	0.5	2.0%	1.0%	**70.0**	50	108	232	499
Olympic Parkway to Otay Lakes Road - 2030 (M)	4	10	20,439	45	0.5	2.0%	1.0%	**69.9**	49	107	230	495
Olympic Parkway to Otay Lakes Road - 2030 (M) + Project	4	10	20,700	45	0.5	2.0%	1.0%	**70.0**	50	108	232	499
Heritage Parkway												
Palomar Street to Olympic Parkway - Existing	6	10	12,383	45	0.5	2.0%	1.0%	**69.2**	-	95	205	441
Palomar Street to Olympic Parkway - Existing + Project	6	10	17,553	45	0.5	2.0%	1.0%	**70.7**	-	120	258	556
Palomar Street to Olympic Parkway - 2025	6	10	40,866	45	0.5	2.0%	1.0%	**74.4**	98	211	454	977
Palomar Street to Olympic Parkway - 2025 + Project	6	10	43,100	45	0.5	2.0%	1.0%	**74.6**	101	218	470	1,012
Palomar Street to Olympic Parkway - 2030 (UM)	6	10	50,439	45	0.5	2.0%	1.0%	**75.3**	112	242	522	1,124
Palomar Street to Olympic Parkway - 2030 (UM) + Project	6	10	50,700	45	0.5	2.0%	1.0%	**75.3**	113	243	524	1,128
Palomar Street to Olympic Parkway - 2030 (M)	6	10	50,439	45	0.5	2.0%	1.0%	**75.3**	112	242	522	1,124
Palomar Street to Olympic Parkway - 2030 (M) + Project	6	10	50,700	45	0.5	2.0%	1.0%	**75.3**	113	243	524	1,128
Heritage Parkway												
Olympic Parkway to Main Street/Hunte - Existing	6	10	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Olympic Parkway to Main Street/Hunte - Existing + Project	6	10	DNE	45	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Olympic Parkway to Main Street/Hunte - 2025	6	10	31,160	45	0.5	2.0%	1.0%	**73.2**	82	176	379	815
Olympic Parkway to Main Street/Hunte - 2025 + Project	6	10	32,500	45	0.5	2.0%	1.0%	**73.4**	84	181	389	839
Olympic Parkway to Main Street/Hunte - 2030 (UM)	6	10	42,039	45	0.5	2.0%	1.0%	**74.5**	100	215	462	996
Olympic Parkway to Main Street/Hunte - 2030 (UM) + Project	6	10	42,300	45	0.5	2.0%	1.0%	**74.5**	100	215	464	1,000
Olympic Parkway to Main Street/Hunte - 2030 (M)	6	10	42,039	45	0.5	2.0%	1.0%	**74.5**	100	215	462	996
Olympic Parkway to Main Street/Hunte - 2030 (M) + Project	6	10	42,300	45	0.5	2.0%	1.0%	**74.5**	100	215	464	1,000
Heritage Parkway												
Main Street to Entertainment Circle - Existing	4	0	10,035	40	0.5	2.0%	1.0%	**65.3**	-	53	114	245
Main Street to Entertainment Circle - Existing - Existing + Projec	4	0	10,035	40	0.5	2.0%	1.0%	**65.3**	-	53	114	245
Main Street to Entertainment Circle - Existing - 2025	4	0	19,053	40	0.5	2.0%	1.0%	**68.1**	-	81	174	375
Main Street to Entertainment Circle - Existing - 2025 + Project	4	0	19,500	40	0.5	2.0%	1.0%	**68.2**	-	82	177	381
Main Street to Entertainment Circle - Existing - 2030 (UM)	4	0	59,834	40	0.5	2.0%	1.0%	**73.1**	81	173	374	805
Main Street to Entertainment Circle - Existing - 2030 (UM) + Pro	4	0	61,400	40	0.5	2.0%	1.0%	**73.2**	82	176	380	819
Main Street to Entertainment Circle - Existing - 2030 (M)	4	0	59,834	40	0.5	2.0%	1.0%	**73.1**	81	173	374	805
Main Street to Entertainment Circle - Existing - 2030 (M) + Proje	4	0	61,400	40	0.5	2.0%	1.0%	**73.2**	82	176	380	819
Heritage Parkway												
Entertainment Circle to Avenida de Las Vistas - Existing	4	0	9,846	40	0.5	2.0%	1.0%	**65.3**	-	52	112	242
Entertainment Circle to Avenida de Las Vistas - Existing + Proje	4	0	9,846	40	0.5	2.0%	1.0%	**65.3**	-	52	112	242
Entertainment Circle to Avenida de Las Vistas - 2025	4	0	19,053	40	0.5	2.0%	1.0%	**68.1**	-	81	174	375
Entertainment Circle to Avenida de Las Vistas - 2025 + Project	4	0	19,500	40	0.5	2.0%	1.0%	**68.2**	-	82	177	381
Entertainment Circle to Avenida de Las Vistas - 2030 (UM)	4	0	51,034	40	0.5	2.0%	1.0%	**72.4**	72	156	336	724
Entertainment Circle to Avenida de Las Vistas - 2030 (UM) + Pro	4	0	52,600	40	0.5	2.0%	1.0%	**72.5**	74	159	343	739
Entertainment Circle to Avenida de Las Vistas - 2030 (M)	4	0	51,034	40	0.5	2.0%	1.0%	**72.4**	72	156	336	724
Entertainment Circle to Avenida de Las Vistas - 2030 (M) + Proje	4	0	52,600	40	0.5	2.0%	1.0%	**72.5**	74	159	343	739
La Media Road												
E. Palomar Street to Olympic Parkway - Existing	6	10	12,658	45	0.5	2.0%	1.0%	**69.3**	-	96	208	447
E. Palomar Street to Olympic Parkway - Existing + Project	6	10	19,982	45	0.5	2.0%	1.0%	**71.3**	-	131	281	606
E. Palomar Street to Olympic Parkway - 2025	6	10	16,696	45	0.5	2.0%	1.0%	**70.5**	-	116	250	538
E. Palomar Street to Olympic Parkway - 2025 + Project	6	10	19,600	45	0.5	2.0%	1.0%	**71.2**	-	129	278	599
E. Palomar Street to Olympic Parkway - 2030 (UM)	6	10	28,334	45	0.5	2.0%	1.0%	**72.8**	77	165	355	765
E. Palomar Street to Olympic Parkway - 2030 (UM) + Project	6	10	29,900	45	0.5	2.0%	1.0%	**73.0**	79	171	368	793
E. Palomar Street to Olympic Parkway - 2030 (M)	6	10	28,334	45	0.5	2.0%	1.0%	**72.8**	77	165	355	765
E. Palomar Street to Olympic Parkway - 2030 (M) + Project	6	10	29,900	45	0.5	2.0%	1.0%	**73.0**	79	171	368	793
La Media Road												
Olympic Parkway to Birch Road - Existing	6	10	15,888	45	0.5	2.0%	1.0%	**70.3**	-	112	242	520
Olympic Parkway to Birch Road - Existing + Project	6	10	43,031	45	0.5	2.0%	1.0%	**74.6**	101	218	469	1,011
Olympic Parkway to Birch Road - 2025	6	10	26,742	45	0.5	2.0%	1.0%	**72.5**	74	159	342	736
Olympic Parkway to Birch Road - 2025 + Project	6	10	35,900	45	0.5	2.0%	1.0%	**73.8**	90	193	416	896
Olympic Parkway to Birch Road - 2030 (UM)	6	10	26,473	45	0.5	2.0%	1.0%	**72.5**	73	158	340	732
Olympic Parkway to Birch Road - 2030 (UM) + Project	6	10	28,300	45	0.5	2.0%	1.0%	**72.8**	76	165	355	765
Olympic Parkway to Birch Road - 2030 (M)	6	10	26,473	45	0.5	2.0%	1.0%	**72.5**	73	158	340	732
Olympic Parkway to Birch Road - 2030 (M) + Project	6	10	28,300	45	0.5	2.0%	1.0%	**72.8**	76	165	355	765
La Media Road												
Birch Road to Main - Existing	6	10	DNE	40	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Birch Road to Main - Existing + Project	6	10	31,451	40	0.5	2.0%	1.0%	**72.1**	69	148	318	685
Birch Road to Main - 2025	6	10	20,927	40	0.5	2.0%	1.0%	**70.3**	-	113	242	522
Birch Road to Main - 2025 + Project	6	10	35,000	40	0.5	2.0%	1.0%	**72.5**	74	159	342	736
Birch Road to Main - 2030 (UM)	6	10	35,129	40	0.5	2.0%	1.0%	**72.5**	74	159	342	738
Birch Road to Main - 2030 (UM) + Project	6	10	38,000	40	0.5	2.0%	1.0%	**72.9**	78	168	361	777
Birch Road to Main - 2030 (M)	6	10	15,129	40	0.5	2.0%	1.0%	**68.9**	-	91	195	421
Birch Road to Main - 2030 (M) + Project	6	10	18,000	40	0.5	2.0%	1.0%	**69.6**	-	102	219	472
Magdalena Avenue												
Birch Road to Main Street - Existing	4	10	9,122	35	0.5	2.0%	1.0%	**64.0**	-	-	92	198
Birch Road to Main Street - Existing + Project	4	10	20,755	35	0.5	2.0%	1.0%	**67.6**	-	74	159	343
Birch Road to Main Street - 2025	4	10	14,292	35	0.5	2.0%	1.0%	**65.9**	-	58	124	268
Birch Road to Main Street - 2025 + Project	4	10	20,100	35	0.5	2.0%	1.0%	**67.4**	-	72	156	336
Birch Road to Main Street - 2030 (UM)	4	10	10,090	35	0.5	2.0%	1.0%	**64.4**	-	-	99	212

Birch Road to Main Street - 2030 (UM) + Project	4	10	12,700	35	0.5	2.0%	1.0%	**65.4**	-	53	115	247
Birch Road to Main Street - 2030 (M)	4	10	9,772	35	0.5	2.0%	1.0%	**64.3**	-	-	96	208
Birch Road to Main Street - 2030 (M) + Project	4	10	12,300	35	0.5	2.0%	1.0%	**65.3**	-	52	112	242
Eastlake Parkway												
Otay Lakes Road to Olympic Parkway - Existing	4	10	18,945	45	0.5	2.0%	1.0%	**69.6**	-	101	218	471
Otay Lakes Road to Olympic Parkway - Existing + Project	4	10	24,115	45	0.5	2.0%	1.0%	**70.7**	55	119	257	553
Otay Lakes Road to Olympic Parkway - 2025	4	10	20,530	45	0.5	2.0%	1.0%	**70.0**	50	107	230	496
Otay Lakes Road to Olympic Parkway - 2025 + Project	4	10	21,200	45	0.5	2.0%	1.0%	**70.1**	51	109	235	507
Otay Lakes Road to Olympic Parkway - 2030 (UM)	4	10	23,739	45	0.5	2.0%	1.0%	**70.6**	55	118	254	547
Otay Lakes Road to Olympic Parkway - 2030 (UM) + Project	4	10	24,000	45	0.5	2.0%	1.0%	**70.6**	55	119	256	551
Otay Lakes Road to Olympic Parkway - 2030 (M)	4	10	23,739	45	0.5	2.0%	1.0%	**70.6**	55	118	254	547
Otay Lakes Road to Olympic Parkway - 2030 (M) + Project	4	10	24,000	45	0.5	2.0%	1.0%	**70.6**	55	119	256	551
Eastlake Parkway												
Olympic Parkway to Birch Road - Existing	6	10	9,199	45	0.5	2.0%	1.0%	**67.9**	-	78	168	362
Olympic Parkway to Birch Road - Existing + Project	6	10	14,369	45	0.5	2.0%	1.0%	**69.8**	-	105	226	487
Olympic Parkway to Birch Road - 2025	6	10	24,253	45	0.5	2.0%	1.0%	**72.1**	69	149	320	690
Olympic Parkway to Birch Road - 2025 + Project	6	10	24,700	45	0.5	2.0%	1.0%	**72.2**	70	150	324	698
Olympic Parkway to Birch Road - 2030 (UM)	6	10	27,339	45	0.5	2.0%	1.0%	**72.6**	75	161	347	747
Olympic Parkway to Birch Road - 2030 (UM) + Project	6	10	27,600	45	0.5	2.0%	1.0%	**72.7**	75	162	349	752
Olympic Parkway to Birch Road - 2030 (M)	6	10	27,339	45	0.5	2.0%	1.0%	**72.6**	75	161	347	747
Olympic Parkway to Birch Road - 2030 (M) + Project	6	10	27,600	45	0.5	2.0%	1.0%	**72.7**	75	162	349	752
Eastlake Parkway												
Birch Road to Main Street - Existing	6	10	1,310	45	0.5	2.0%	1.0%	**59.4**	-	-	-	99
Birch Road to Main Street - Existing + Project	6	10	3,895	45	0.5	2.0%	1.0%	**64.2**	-	-	95	204
Birch Road to Main Street - 2025	6	10	49,016	45	0.5	2.0%	1.0%	**75.2**	110	238	512	1,103
Birch Road to Main Street - 2025 + Project	6	10	54,600	45	0.5	2.0%	1.0%	**75.6**	119	255	550	1,185
Birch Road to Main Street - 2030 (UM)	6	10	41,039	45	0.5	2.0%	1.0%	**74.4**	98	211	455	980
Birch Road to Main Street - 2030 (UM) + Project	6	10	41,300	45	0.5	2.0%	1.0%	**74.4**	98	212	457	984
Birch Road to Main Street - 2030 (M)	6	10	22,656	45	0.5	2.0%	1.0%	**71.8**	66	142	306	659
Birch Road to Main Street - 2030 (M) + Project	6	10	22,800	45	0.5	2.0%	1.0%	**71.8**	66	143	307	662
Otay Valley Road												
Street A to SR-125 - Existing	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to SR-125 - Existing + Project	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to SR-125 - 2025	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to SR-125 - 2025 + Project	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Street A to SR-125 - 2030 (UM)	4	14	5,995	35	0.5	2.0%	1.0%	**62.3**	-	-	71	154
Street A to SR-125 - 2030 (UM) + Project	4	14	7,300	35	0.5	2.0%	1.0%	**63.2**	-	-	81	175
Street A to SR-125 - 2030 (M)	4	14	9,362	35	0.5	2.0%	1.0%	**64.3**	-	-	96	207
Street A to SR-125 - 2030 (M) + Project	4	14	11,400	35	0.5	2.0%	1.0%	**65.1**	-	-	110	236
Otay Valley Road												
SR-125 to Village 9 Access - Existing	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 to Village 9 Access - Existing + Project	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 to Village 9 Access - 2025	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 to Village 9 Access - 2025 + Project	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
SR-125 to Village 9 Access - 2030 (UM)	4	14	5,995	35	0.5	2.0%	1.0%	**62.3**	-	-	71	154
SR-125 to Village 9 Access - 2030 (UM) + Project	4	14	7,300	35	0.5	2.0%	1.0%	**63.2**	-	-	81	175
SR-125 to Village 9 Access - 2030 (M)	4	14	9,362	35	0.5	2.0%	1.0%	**64.3**	-	-	96	207
SR-125 to Village 9 Access - 2030 (M) + Project	4	14	11,400	35	0.5	2.0%	1.0%	**65.1**	-	-	110	236
Otay Valley Road												
Village 9 Access to University - Existing	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Village 9 Access to University + Project	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Village 9 Access to University - 2025	4	14	DNE	35	0.5	2.0%	1.0%	**#VALUE!**	#VALUE!	#VALUE!	#VALUE!	#VALUE!
Village 9 Access to University + Project	4	14	9,700	35	0.5	2.0%	1.0%	**64.4**	-	-	98	212
Village 9 Access to University - 2030 (UM)	4	14	8,195	35	0.5	2.0%	1.0%	**63.7**	-	-	88	189
Village 9 Access to University - 2030 (UM) + Project	4	14	9,500	35	0.5	2.0%	1.0%	**64.3**	-	-	97	209
Village 9 Access to University - 2030 (M)	4	14	7,462	35	0.5	2.0%	1.0%	**63.3**	-	-	83	178
Village 9 Access to University - 2030 (M) + Project	4	14	9,500	35	0.5	2.0%	1.0%	**64.3**	-	-	97	209

TRAFFIC NOISE LEVELS AND NOISE CONTOURS

Project Number: 100019662
Project Name: Otay Village 8 West
On-site roadway segments (2030 w/traffic mitigation)

Background Information

Model Description: FHWA Highway 2.5 Noise Prediction Model
Source of Traffic Volumes: RBF, Jan 2012
Community Noise Descriptor: L_{dn}: CNEL: X

"-" = contour is located within the roadway right-of-way.
Distance is from the centerline of the roadway segment to the receptor location.

						Design		Vehicle Mix		**Distance from Centerline of Roadway**				
	2030 With Project with Traffic Mitigation			Median	ADT	Speed	Alpha	Medium	Heavy	**CNEL at**	Distance to Contour			
#	Roadway	Segment	Lanes	Width*	Volume	(mph)	Factor	Trucks	Trucks	**50 Feet**	70 CNEL	65 CNEL	60 CNEL	55 CNEL
1	La Media Road	Northbound, northern project boundary to	2	0	10,800	30	0.5	3.0%	2.0%	**64**	-	44	94	202
2	La Media Road	NB, EB main to WB Main	2	0	15,110	30	0.5	3.0%	2.0%	**66**	-	57	124	266
3	La Media Road	NB, split to EB main	2	0	17,380	30	0.5	3.0%	2.0%	**67**	33	70	151	325
4	La Media Road	SB, northern project boundary to northern	2	0	12,150	30	0.5	3.0%	2.0%	**64**	-	46	98	212
5	La Media Road	SB, WB Main to EB	2	0	13,940	30	0.5	3.0%	2.0%	**66**	-	58	126	271
6	La Media Road	SB, EB Main to split	2	0	18,750	30	0.5	3.0%	2.0%	**68**	35	76	163	351
7	Otay Valley Roac	Southern end of couplet to Street A	4	0	39,530	45	0.5	3.0%	2.0%	**72**	71	153	330	712
8	Otay Valley Road	Street A to eastern project boundary	4	0	35,400	45	0.5	3.0%	2.0%	**72**	69	149	320	690
9	Main Street	WB, eastern project boundary to Street A	2	0	21,400	30	0.5	3.0%	2.0%	**67**	-	68	146	315
10	Main Street	WB, St A to La Media NB couplet	2	0	19,450	30	0.5	3.0%	2.0%	**66**	-	60	130	279
11	Main Street	WB, La Media NB to SB couplet	2	0	11,500	30	0.5	3.0%	2.0%	**66**	-	54	116	251
12	Main Street	WB, SB couplet to western project	2	0	14,810	30	0.5	3.0%	2.0%	**64**	-	45	97	208
13	Main Street	EB, western project boundary to La Media	2	0	19,560	30	0.5	3.0%	2.0%	**67**	-	63	136	292
14	Main Street	EB, La Media SB to NB	2	0	21,120	30	0.5	3.0%	2.0%	**68**	37	80	173	374
15	Main Street	EB, La Media NB to St A	2	0	21,000	30	0.5	3.0%	2.0%	**66**	-	59	128	275
16	Main Street	EB, Street A to eastern project boundary	2	0	24,450	30	0.5	3.0%	2.0%	**68**	37	80	173	374
17	Street A	Westbound Main Street to eastbound Main	2	0	3,650	30	0.5	2.0%	1.0%	**66**	-	57	124	266
18	Street A	Eastbound Main Street to Street B	2	0	8,300	30	0.5	2.0%	1.0%	**64**	-	46	98	212
19	Street A	Street B to Otay Valley Road	2	0	13,750	25	0.5	2.0%	1.0%	**66**	-	62	134	288
20	Street B	Street A to eastern project boundary	2	0	7,900	25	0.5	2.0%	1.0%	**63**	-	36	77	166
21	Magdalena Avenue	Birch Road to Main St	2	0	11,100	25	0.5	3.0%	2.0%	**63**	-	36	78	168
22a	La Media Rd	Birch Rd to northern project boundary NB	2	0	9,000	45	0.5	3.0%	2.0%	**68**	34	73	158	341
22b	La Media Rd	Birch Rd to northern project boundary SB	2	0	9,000	45	0.5	3.0%	2.0%	**68**	34	73	158	341
23	Street A	s/o OVR	2	0	8,500	25	0.5	2.0%	1.0%	**63**	-	37	80	173

Otay Village 8 West TNM 2.5 Noise Results	Ground Floor							
3/8/2012								
Receiver	**TNM #**	**Site #**	**Pk Hr Leq**	**W/Barrier**	**Reduction**	**CNEL***	**CNEL w/barrier**	**Reduction**
50 ft La Media Rd NB n/o couplet	52	1	65.6	65.6	0	**64.1**	**64.1**	0
50 ft La Media Rd NB couplet	58	2	67.4	67.4	0	**65.9**	**65.9**	0
50 ft La Media Rd NB split to Main	79	3	68.7	68.7	0	**67.2**	**67.2**	0
50 ft La Media Rd SB boundary-couplet	53	4	65.9	65.9	0	**64.4**	**64.4**	0
50 ft La Media Rd SB couplet	57	5	67.5	67.5	0	**66**	**66**	0
50 ft La Media Rd SB split to Main	80	6	69.2	69.2	0	**67.7**	**67.7**	0
50 ft Otay Valley Rd mid	69	7	73.8	73.8	0	**72.3**	**72.3**	0
50 ft Otay Valley Rd east	71	8	73.6	73.6	0	**72.1**	**72.1**	0
50 ft Main e/o St A	49	9	68.5	68.5	0	**67**	**67**	0
50 ft Main St WB e/o couplet	50	10	67.7	67.7	0	**66.2**	**66.2**	0
50 ft Main WB couplet	77	11	67	67	0	**65.5**	**65.5**	0
50 ft Main St WB w/o couplet	54	12	65.8	65.8	0	**64.3**	**64.3**	0
50 ft Main St EB near west boundary	55	13	68	68	0	**66.5**	**66.5**	0
50 ft Main St EB couplet	59	14	69.6	69.6	0	**68.1**	**68.1**	0
50 ft Main St EB e/o couplet	61	15	67.6	67.6	0	**66.1**	**66.1**	0
50 ft EB Main east	63	16	69.6	69.6	0	**68.1**	**68.1**	0
50 ft Street A upper	62	17	67.4	67.4	0	**65.9**	**65.9**	0
50 ft Street A mid	66	18	65.9	65.9	0	**64.4**	**64.4**	0
50 ft Street A mid lower	70	19	67.9	67.9	0	**66.4**	**66.4**	0
50 ft Street B	75	20	64.3	64.3	0	**62.8**	**62.8**	0
50 ft Magdalena Ave	48	21	64.4	64.4	0	**62.9**	**62.9**	0
50 ft La Media Rd east	46	22	69	69	0	**67.5**	**67.5**	0
50 ft Street A lower	68	23	64.6	63.7	0.9	**63.1**	**62.2**	0.9
Parcel N1	24	N1	60.8	61	0.2	**59.3**	**59.5**	-0.2
Parcel N102	44	N102	63.6	61.2	2.4	**62.1**	**59.7**	2.4
Parcel N105	88	N105	66.2	62.6	3.6	**64.7**	**61.1**	3.6
Parcel N107	43	N107	66.6	63.2	3.4	**65.1**	**61.7**	3.4
Parcel N109	87	N109	67.2	63.6	3.6	**65.7**	**62.1**	3.6
Parcel N112	42	N112	67.1	63	4.1	**65.6**	**61.5**	4.1
Parcel N115	86	N115	68.6	62.9	5.7	**67.1**	**61.4**	5.7
Parcel N117	3	N117	68.7	62.9	5.8	**67.2**	**61.4**	5.8
Parcel N40	40	N40	60.9	60.6	0.3	**59.4**	**59.1**	0.3
Parcel N49	5	N49	60.5	61.5	0.6	**59**	**60**	-1
Parcel N64	41	N64	58.2	57.9	0.3	**56.7**	**56.4**	0.3

Parcel N96	89	N96	60.9	60.9	0	**59.4**	**59.4**	0
Parcel N99	94	N99	62.9	62.8	0.1	**61.4**	**61.3**	0.1
Parcel P102	37	P102	59.9	58.7	1.2	**58.4**	**57.2**	1.2
Parcel P29	35	P29	57.4	57	0.4	**55.9**	**55.5**	0.4
Parcel P55	34	P55	57.1	56.7	0.4	**55.6**	**55.2**	0.4
Parcel P75	36	P75	59.5	58.9	0.6	**58**	**57.4**	0.6
75ft PA Q	92	Q	71.8	66.4	5.4	**70.3**	**64.9**	5.4
75 ft PA U	72	U	71.4	66.3	5.1	**69.9**	**64.8**	5.1
Parcel V4	31	V4	59.8	59.4	0.4	**58.3**	**57.9**	0.4
Parcel V42	27	V42	60.6	60.4	0.2	**59.1**	**58.9**	0.2
** CNEL is assumed to be 1.5 dBA less than the Leq for the Peak Hour, in accordance with FTA guidance (FTA 2006).*								

Otay Village 8 West TNM 2.5 Noise Results	Upper Floor (26 feet)							
3/8/2012								
Receiver	**TNM #**	**Site #**	**Pk Hr Leq**	**W/Barrier**	**Reduction**	**CNEL***	**CNEL w/barrier**	**Reduction**
50 ft La Media Rd NB n/o couplet	52	1	65	65	0	**63.5**	**63.5**	0
50 ft La Media Rd NB couplet	58	2	66.9	66.9	0	**65.4**	**65.4**	0
50 ft La Media Rd NB split to Main	79	3	68	68	0	**66.5**	**66.5**	0
50 ft La Media Rd SB boundary-couplet	53	4	65.6	65.6	0	**64.1**	**64.1**	0
50 ft La Media Rd SB couplet	57	5	66.9	66.9	0	**65.4**	**65.4**	0
50 ft La Media Rd SB split to Main	80	6	68.6	68.6	0	**67.1**	**67.1**	0
50 ft Otay Valley Rd mid	69	7	73.1	73.1	0	**71.6**	**71.6**	0
50 ft Otay Valley Rd east	71	8	72.8	72.8	0	**71.3**	**71.3**	0
50 ft Main e/o St A	49	9	68.4	68.4	0	**66.9**	**66.9**	0
50 ft Main St WB e/o couplet	50	10	67.1	67.1	0	**65.6**	**65.6**	0
50 ft Main WB couplet	77	11	67	67	0	**65.5**	**65.5**	0
50 ft Main St WB w/o couplet	54	12	65.4	65.4	0	**63.9**	**63.9**	0
50 ft Main St EB near west boundary	55	13	67.5	67.5	0	**66**	**66**	0
50 ft Main St EB couplet	59	14	69.2	69.2	0	**67.7**	**67.7**	0
50 ft Main St EB e/o couplet	61	15	68	68	0	**66.5**	**66.5**	0
50 ft EB Main east	63	16	69.2	69.2	0	**67.7**	**67.7**	0
50 ft Street A upper	62	17	67.5	67.5	0	**66**	**66**	0
50 ft Street A mid	66	18	65.4	65.4	0	**63.9**	**63.9**	0
50 ft Street A mid lower	70	19	67.2	67.2	0	**65.7**	**65.7**	0
50 ft Street B	75	20	63.5	63.5	0	**62**	**62**	0
50 ft Magdalena Ave	48	21	63.8	63.8	0	**62.3**	**62.3**	0
50 ft La Media Rd east	46	22	68.1	68.1	0	**66.6**	**66.6**	0
50 ft Street A lower	68	23	65	63.9	1.1	**63.5**	**62.4**	1.1
Parcel N1	24	N1	60.8	60.5	0.3	**59.3**	**59**	0.3
Parcel N102	44	N102	67.9	67.9	0	**66.4**	**66.4**	0
Parcel N105	88	N105	69.8	69.8	0	**68.3**	**68.3**	0
Parcel N107	43	N107	70.5	70.5	0	**69**	**69**	0
Parcel N109	87	N109	70.7	70.7	0	**69.2**	**69.2**	0
Parcel N112	42	N112	70.7	70.7	0	**69.2**	**69.2**	0
Parcel N115	86	N115	71.1	71.1	0	**69.6**	**69.6**	0
Parcel N117	3	N117	71.1	71.1	0	**69.6**	**69.6**	0
Parcel N40	40	N40	60.8	60.5	0.3	**59.3**	**59**	0.3
Parcel N49	5	N49	62.2	61.5	0.7	**60.7**	**60**	0.7
Parcel N64	41	N64	59.7	59.2	0.5	**58.2**	**57.7**	0.5

Parcel N96	89	N96	62.5	62.3	0.2	**61**	**60.8**	0.2
Parcel N99	94	N99	65.7	65.5	0.2	**64.2**	**64**	0.2
Parcel P102	37	P102	59.6	58.6	1	**58.1**	**57.1**	1
Parcel P29	35	P29	57.3	56.8	0.5	**55.8**	**55.3**	0.5
Parcel P55	34	P55	56.5	56.2	0.3	**55**	**54.7**	0.3
Parcel P75	36	P75	59.3	58.8	0.5	**57.8**	**57.3**	0.5
75ft PA Q	92	Q	71.4	71.3	0.1	**69.9**	**69.8**	0.1
75 ft PA U	72	U	70.7	70.7	0	**69.2**	**69.2**	0
Parcel V4	31	V4	59.6	59.2	0.4	**58.1**	**57.7**	0.4
Parcel V42	27	V42	60.6	60.3	0.3	**59.1**	**58.8**	0.3
** CNEL is assumed to be 1.5 dBA less than the Leq for the Peak Hour, in accordance with FTA guidance (FTA 2006).*								

Roadway Construction Noise Model (RCNM),Version 1.1

Report date: 03/12/2012
Case Description: Village 8 West Construction

**** Receptor #1 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
Onsite Adjacent Use	Residential	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40	85.0		50.0	0.0
Roller	No	20	85.0		50.0	0.0
Crane	No	16	85.0		50.0	0.0
Dozer	No	40	85.0		50.0	0.0
Scraper	No	40	85.0		50.0	0.0

Results

	Calculated (dBA)		Noise Limits (dBA) Day		Evening		Night		Noise Limit Exceedance (dBA) Day		Evening		Night	
Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	85.0	78.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	85.0	77.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	85.0	81.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	85.0	86.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

**** Receptor #2 ****

Description	Land Use	Baselines (dBA) Daytime	Evening	Night
School	Commercial	65.0	60.0	55.0

Equipment

Description	Impact Device	Usage (%)	Spec Lmax (dBA)	Actual Lmax (dBA)	Receptor Distance (feet)	Estimated Shielding (dBA)
Excavator	No	40	85.0		150.0	0.0
Roller	No	20	85.0		150.0	0.0
Crane	No	16	85.0		150.0	0.0
Dozer	No	40	85.0		150.0	0.0
Scraper	No	40	85.0		150.0	0.0

Results

Calculated (dBA)	Noise Limits (dBA) Day	Evening	Night	Noise Limit Exceedance (dBA) Day	Evening	Night

Equipment	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq	Lmax	Leq
Excavator	75.5	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roller	75.5	68.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Crane	75.5	67.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dozer	75.5	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Scraper	75.5	71.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	75.5	77.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

APPENDIX E

Biological Resources Report

REPORT

OTAY LAND COMPANY VILLAGE 8 WEST BIOLOGICAL RESOURCES REPORT

Prepared for

Otay Land Company
1903 Wright Place, Suite 220
Carlsbad, CA 92008

URS Project No. 27659026.00100

Patrick Mock, Ph.D., CSE, CWB®
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October 2012

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ACOE	Army Corps of Engineers
ASMD	Area Specific Management Directives
BCC	Bird of Conservation Concern
BMP	Best Management Practices
CAGN	California Gnatcatcher
CAWR	Cactus Wren
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFD	Community Facilities District
CFGC	California Fish and Game Commission
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
Corps	United States Army Corps of Engineers
CPF	Community Purpose Facility
CSS	Coastal Sage Scrub
CTB	concrete-treated base
dB(A) Leq-h	Decibel hourly equivalent Level
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EUC	Otay Ranch Eastern Urban Center
F	Degrees Fahrenheit
FAC	Facultative
FACW	Facultative Wetland Species
ft	Feet
GDP	Otay Ranch General Development Plan
GIS	Geographical Information System
GPS	Global Positioning System
HLIT	Habitat Loss and Incidental Take
LBVI	Least Bell's vireo
MBTA	Migratory Bird Treaty Act
mph	Miles per hour
MSCP	City of Chula Vista Multiple Species Conservation Program Subarea Plan
MSL	Mean Sea Level
MSS	Maritime Succulent Scrub
NNG	Non-Native Grassland
NPDES	National Pollution Discharge Elimination System
NRCS	Natural Resource Conservation Service
OHWM	Ordinary High Water Mark
OVRP	Otay Valley Regional Park
OWUS	Other Waters of the United States
PC	Planned Community
PEIR	Program Environmental Impact Report
PFFP	Public Facilities Finance Plan
PIA	Project Impact Area

POM	Preserve Owner Manager
Project	Village 8 West SPA Plan, Off-site Fuel Modification Zones, Off-site Facilities
QCB	Quino Checkerspot Butterfly
RMP	Otay Ranch Resource Management Plan
ROW	Right-of-Way
RPO	Resource Protection Ordinance
RWQCB	Regional Water Quality Control Board
SANDAG	San Diego Association of Governments
sf	Square feet
SPA	Sectional Planning Area
SSC	Species of Special Concern
SUSMP	Standard Urban Stormwater Management Plan
SWPPP	Storm Water Pollution Prevention Plan
TM	Tentative Map
U.S.	United States
U.S.	Waters of the United States
URS	URS Corporation
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WPP	Chula Vista MSCP Wetlands Protection Program
WUS	Waters of the U.S.

This report is based on data, site conditions and other information that is generally applicable as of August, 2010, and the conclusions and recommendations herein are therefore applicable to that time frame. Opinions presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which URS Corporation (URS) is unaware and has not had the opportunity to review. Changes in the condition of the project site or on adjacent properties may occur with time due to natural processes or works of man. Changes in applicable standards may also occur as a result of legislation or the broadening of knowledge.

EXECUTIVE SUMMARY

URS Corporation (URS) biologists conducted biological surveys of the Otay Land Co. 284.94-acre Village 8 West Sectional Planning Area (SPA), which includes development and fuel modification zone areas, 15.62 acres of onsite open space preserve, 4.57 acres of temporary grading within the Not-a-Part parcel encompassed by the Village 8 West Parcel, and 1.95 acres of off-site Planned Facility (sewer and access road) and Future Facilities (storm drain pipeline and trail) within a 50-foot construction right-of-way (ROW) through offsite MSCP Preserve lands, in May, June, and July of 2008, June and July 2009, and May and June 2010. The Project is located in the southeastern portion of Chula Vista, California. The Village 8 West SPA Plan area includes impacts to approximately 284.68 acres of land. The Project also includes the conservation of approximately 15.62 acres of mainly coastal sage scrub (CSS) in the MSCP Preserve that is located within the Village 8 West SPA Plan boundary. Off-site impacts includes 4.57 acres of temporary grading within the Not-a-Part parcel encompassed by the Village 8 West Parcel, 0.26 acre of off-site fuel modification zone, and Planned and Future Facilities alignments encompassing 1.95 acres of land. The majority of the impacts are to agricultural land, disturbed vegetation, or developed lands; however approximately 36.31 acres of native vegetation is also proposed to be impacted, including three mostly unvegetated drainages within the Village 8 West SPA Plan parcel and 0.07 acre of off-site wetlands (mulefat scrub) in the Otay River floodplain. The development of Village 8 West Project is associated with the larger, adjacent development of Otay Ranch off-site to the north, and is a Covered Project under the City of Chula Vista's Multiple Species Conservation Program (MSCP) Subarea Plan.

Surveys included the observation and documentation of all plant and wildlife species currently existing on the proposed Village 8 West Project. Special status and MSCP covered species that occur within or adjacent to the Project are discussed in this report. A formal jurisdictional waters and wetland delineation was also conducted, and is discussed in this report.

The purpose of this Project is to provide residential and commercial land uses as previously planned and approved under the Otay Ranch General Development Plan (GDP) and Program Environmental Impact Report (EIR). This Project is consistent with the GDP, Program EIR, Otay Ranch Resource Management Plan (RMP Phase I and II), Narrow Endemic Species Protection Program, and Chula Vista MSCP Subarea Plan. The Project proponent will be required to mitigate impacts to habitat in accordance with the ratios established by both the Otay Ranch RMP and the Chula Vista MSCP Subarea Plan.

SECTION 1 INTRODUCTION

The proposed Village 8 West Project (Project) consists of the follow five components:

- The Village 8 West Sectional Planning Area (**SPA**) Plan parcel owned by Otay Land Company;
- **Temporary grading area within the Not-a-Part parcel** encompassed by the Village 8 West Parcel;
- **Off-site fuel modification zone** located along the western Village 8 West SPA Plan boundary;
- **Off-site Planned Facilities** that includes a sewer lateral and paved access road (this component is associated with Salt Creek Intercept/Otay Trunk Sewer); and
- **Off-site Future Facilities** that includes a storm drain pipeline with associated drainage outfall/energy dissipater structure and pedestrian trail with post and rail fencing along the trail alignment.

The Project is one of the designated fourteen villages within the Otay Ranch General Development Plan (GDP) area (Figure 1). The Otay Ranch GDP also includes five planning areas. The GDP designates Village 8 West as an Urban Village with a mixed-use Town Center and low-medium density residential uses to the south of the Town Center. Urban Villages are intended to be adjacent to existing urban development and planned for transit-oriented development with higher densities and mixed uses within a quarter mile of a transit stop or station (Figure 2).

This Project is consistent with the Otay Ranch GDP and Program Environmental Impact Report (EIR), Otay Ranch Resource Management Plan (RMP Phase I and II), and the City of Chula Vista's Multiple Species Conservation Program (MSCP) Subarea Plan.

The definition of each of the Project components under the MSCP Subarea Plan is provided here to facilitate the understanding of the impacts analysis for this Project, because the impacts are analyzed based on the component's status as Covered, Planned or Future facilities. Covered Projects are those projects involving land use development within the City of Chula Vista for which hard-line Preserve boundaries have been established pursuant to the approved Chula Vista Subarea Plan, and where conservation measures consistent with the MSCP Subregional Plan and Chula Vista Subarea Plan have been or will be specified as binding conditions of approval in such Project's plans and approvals. Planned Facilities are facilities within the Preserve that have been specifically identified by the City to serve development approved by the City and are specified in Table 6-1 of the Subarea Plan. Future Facilities are defined as those components of the Project that are necessary to support City services or planned development in the future, but are not specifically listed in the Subarea Plan. As it relates the to the City's MSCP Subarea Plan, the Village 8 West SPA Plan is considered a Covered Project, while the off-site sewer line and associated access road, are considered off-site Planned Facilities, and the off-site storm drain pipeline and trail are considered off-site Future Facilities in the Subarea Plan (Figure 2). The Planned Facilities are within a 20-foot easement, and the Future Facilities are located within a 10-foot easement immediately adjacent to the Planned Facilities easement. These off-site facilities have been co-located to minimize impacts to the Preserve.

Surrounding land uses include existing development to the north and northeast, agricultural lands to the east and west, open space in the MSCP Preserve to the west and south, and an access road that parallels the Otay River to the south (Figure 1). The site is located on the U.S. Geological Survey (USGS) Otay Mesa 7.5' Topographic Quadrangle. The topography in the immediate area is a large relatively flat mesa dissected on the southern end by ephemeral drainage swales and the Otay River. The site elevation is approximately 400 feet above mean sea level (MSL). The flat mesa tops have been subjected to annual tilling associated with agricultural land uses. The vegetation associated with the river valley slope at the southern end of the Project supports a mixture of disturbed to relatively undisturbed natural vegetation. An existing water reservoir that is not a part of the Project is in the center of the Project and water pipelines pass through the site on the south, east and north sides of the reservoir (Figure 2). These pipelines will be relocated within public street right-of-ways as part of the development and will not create additional areas of grading beyond the current development grading plan.

The proposed development has been organized into transects. Transect, or form-based, planning focuses on the form of development rather than land use and seeks to provide a gradual transition from intense urban development to open space areas. The proposed Project would implement form-based regulations and standards that focus on the physical relationships between buildings, streets, and public spaces. Form-based codes approach the development of land by regulating the form, character, and street presence of a building to focus attention on the public presentation of buildings, creating a public realm that is comfortable for pedestrians. Land uses are still controlled but they play a secondary role to the creation of walkable, pedestrian-friendly communities and streetscapes. This approach eliminates the need for separate Planned Community (PC) Regulations and a Design Plan by providing a more integrated approach to defining neighborhoods in terms of form and character.

Development of the Project would be completed in five phases. Phase I would develop 197 to 341 multi-family residential units, 109 to 114 single-family units, and 130,000 to 174,000 square feet (sf) of commercial space in the western portion of the Project. Phase II would develop 260 to 286 single-family residential units in the southwestern area of the Project. Phase III would develop 472 to 776 multi-family units and 70,000 to 126,000 sf of commercial land use in the northern portion of the Project. Phase IV would develop 185 to 220 single-family residential units in the southeast portion of the Project. Phase V would develop 192 to 313 multi-family residential in the eastern portion of the Project. The sequencing of phases will be determined by current market conditions. A Public Facilities Finance Plan (PFFP) is required as part of the Project. The PFFP would implement the City of Chula Vista Growth Management Program and Ordinance. The intent of the document is to ensure that the phased development of the Project is consistent with the overall goals and policies of the City's General Plan, Growth Management Program, and the Otay Ranch GDP. The PFFP components include an analysis of infrastructure facilities, such as water and sewer, and the provision of community services and facilities including fire protection and emergency services, law enforcement, libraries, schools, and parks. The PFFP will require specific facilities to be built in conjunction with development to ensure that improvements adequately serve such development and meet the City's threshold standards.

The proposed land uses for Village 8 West SPA Plan include mixed use, multi-family, cluster single-family/townhomes, single family homes, schools, community purpose facility, parks, open space, arterial rights-of-way, and the existing City of San Diego reservoir. The Town Center area includes the most intense level of development, has minimal setbacks to the street, and includes high intensity development.

The neighborhood edge zone includes the lowest level of development, greater setbacks to the street, and low-density development patterns to respect the adjacent open space area. The Village 8 West SPA Plan proposes 42.2 acres of mixed use in the Town Center. This mixed-use area would be centered on pairs of one-way streets, also known as urban couplets, and would be served by transit. Commercial uses would occur on ground floors with minimal setbacks to create an urban, pedestrian-oriented street environment. Also proposed are several recreational opportunities: a Community Park that would extend into the Town Center, providing 17.4 acres of a future 70-acre Community Park within the heart of the Village; a 5.8-acre community purpose facility (CPF) site; a 7.5-acre neighborhood park, to serve residents south of La Media/Otay Valley Road; and an additional 3.1 acres of town square parkland that would serve as a focal point for the Town Center. A 21-acre middle school site and an 11.4-acre elementary school site are proposed within the Town Center. In the event the school district does not select the proposed sites, the sites would be developed as mixed-use or multi-family residential land use, but will not increase the overall densities of the Village. Housing units and commercial area would be redistributed from other mixed use planning areas.

The Village 8 West SPA Plan and Tentative Map (TM) include provisions for an off-site pedestrian trail connection to the Otay Valley Regional Park (OVRP). The proposed trail connection would extend from the Village 8 West SPA Plan's southernmost parcel boundary down to an existing public utilities access road, passing through the City's MSCP Preserve and areas designated for planned active recreation development under the City's MSCP Subarea Plan.

Residential land uses proposed in the Village 8 West SPA Plan includes multi-family and single-family homes. Multi-family units would occur within and just outside the Town Center, providing a gradual transition in density between the Town Center and single-family homes. Design guidelines would control the design of these multi-family communities to create a strong relationship to the public street and reinforce the pedestrian-oriented character of the adjacent Town Center. Small lot single-family detached homes/town homes are proposed adjacent to La Media/Otay Valley Road. These homes would consist of clustered housing, alley-loaded homes, or other small, detached residences in a variety of possible configurations. This area also could accommodate town homes or other attached residential units that are compatible with single-family neighborhoods. Single-family units on 4,000 square feet minimum lots are also proposed. Second dwelling units would be allowed on lots greater than 4,000 square feet and would provide opportunities for affordable housing.

The Project also includes related infrastructure, including a multi-modal transportation network, and open space. The existing City of San Diego Reservoir would remain and is not considered part of this application. Water will be provided to the Project via a connection to the existing 12-inch line located in La Media Road. Water service would be stubbed to both ends of Main Street and the southerly termination of La Media/Otay Valley Road to allow for future connection to adjacent villages. Recycled water would be provided via an existing 12-inch line located in La Media Road. The Project may also be required to construct off-site recycled water lines, in the existing Magdalena Road and Main Street rights-of-way but no service from these lines to the proposed Project will be provided. Recycled water would be stubbed at the westerly termination of Main Street and the southerly termination of La Media/Otay Valley Road to allow for a connection to adjacent villages. The proposed Project will provide electric, gas, telephone and cable television utilities in conjunction with the requirements of the City, Cox

Communication, AT&T, and San Diego Gas & Electric. A non-renewable Energy Conservation Plan will be prepared for the Project.

The off-site improvements required for the proposed Project include construction of a sewer line and access road (off-site Planned Facilities), and storm drain pipeline, and trail facilities (off-site Future Facilities) in the Preserve. The off-site Planned and Future Facilities have been co-located to minimize impacts to the Preserve, and would include a paved all-weather access road that will also provide trail access to the OVRP. The Planned and Future Facilities alignment shall have a post and rail fence designed and installed along both sides of the alignment to discourage pedestrians from leaving the trail without obstructing wildlife movement. The total width of the construction right-of-way (ROW) for the off-site Planned and Future Facilities is 50 feet; this includes 30 feet of permanent impacts, and 20 feet (a 10-foot buffer on each side of the linear alignment) of temporary construction impacts. A 25-foot construction buffer around the storm drain outfall is included as temporary impact associated with the Future Facilities. All of the temporary impact areas will be revegetated after construction in accordance with the City's MSCP Subarea Plan.

All off-site Planned and Future Facilities proposed within the Preserve were subject to the facilities siting criteria contained in the City's MSCP Subarea Plan and Otay Ranch RMP. These criteria require that the facilities be located in the least environmentally sensitive location to minimize impacts to Covered Species, Narrow Endemic Species, and Wetlands, and to minimize habitat disruption, habitat fragmentation, impediments to wildlife movement and impacts to breeding areas. Based on these criteria, discussed further in Section 4.2.6 of this report, the Future and Planned Facilities were located on existing roads, trails and other disturbed areas where feasible and placed in areas with minimal slope, and outside of wetlands and other areas that may support sensitive habitats where practicable. Agricultural uses will continue to be permitted within the proposed Project to allow utilization of vacant parcels until such time those parcels are developed. An Agricultural Plan has been prepared in conjunction with the Village 8 West SPA Plan to control these uses and ensure that agricultural operations do not conflict with proposed development.

Grading for the proposed Project would include primarily on-site improvements with grading practices consistent with the requirements of the City of Chula Vista General Plan, Otay Ranch GDP/EIR, the Otay Ranch Overall Design Plan, and the Otay Ranch Phase 2 RMP. Slopes would occur along roadways, in the 3.5 acres of open space adjacent to the perimeter of the Project, and around the perimeter of the existing City of San Diego Reservoir site. Slopes over 25 feet in height would feature contour grading. All slopes would be landscaped. Grading for the proposed Project will result in 4.8 million cubic yards of balanced cut and fill material on-site.

This report addresses biological resources within the Village 8 West Project, potential impacts on those biological resources resulting from the proposed land use, and mitigation measures that would be implemented to reduce these impacts to below a level of significance. The report includes the results of surveys conducted by URS Corporation (URS) and data from previous survey work conducted by other biological consultants for the Otay Ranch GDP EIR.

SECTION 2 METHODS

URS biologists conducted biological surveys in the Project survey area, defined as the entire approximately 300.3-acre parcel owned by Otay Land Company, LLC. The survey area includes both the approximately 284.68 acres proposed for development and the approximately 15.62 acre area proposed for habitat conservation in the southwestern portion of the Village 8 West SPA Plan parcel. The survey area also includes 0.26 acre of off-site fuel modification zone located along the western Village 8 West SPA Plan parcel boundary and 1.95 acres of off-site Planned and Future Facilities alignments within a 50-foot construction ROW, which make up the sewer and storm drain pipeline alignments, access road, and trail facilities located off-site in the Preserve (Figures 2 and 3). As shown in Figure 3, the Project survey area is defined by the Village 8 West SPA Plan parcel boundary with mapping buffer that extends 100 feet beyond the parcel boundary. The off-site Planned and Future Facilities alignments are defined by a 100-ft wide survey area for the linear alignments south of the Village 8 West SPA Plan parcel boundary through the City's MSCP Preserve and areas designated for planned active recreation development under the City's MSCP Subarea Plan.

URS biologists conducted vegetation mapping, special status plant surveys including surveys for MSCP narrow endemics in 2008, 2009, and 2010 within the Project (Figure 3). Biologists also conducted general wildlife surveys, U.S. Fish Wildlife Service (USFWS) protocol California gnatcatcher surveys, protocol Quino Checkerspot Butterfly (QCB; *Euphydryas editha quino*) surveys, burrowing owl surveys, and a jurisdictional wetland delineation on the Project in May, June, and July of 2008, June and July of 2009, May and June of 2010, and additional surveys on the Project alignments in March through April of 2010 (Appendix A).

The Project area was surveyed on foot. Plant and wildlife species were identified and recorded. Wildlife was identified by direct observation with the aid of 8 x 42 power binoculars, aurally, and/or based on the presence of "sign" (scat, tracks, burrows, etc.). Biological resources were mapped in the field with the aid of a handheld global positioning unit (GPS) unit (10-16 foot accuracy) and plotted on a 1-inch = 250 feet rectified 2007 aerial photograph (AirPhoto USA 2007). Vegetation communities were digitized and their acreages calculated using geographic information system (GIS) software. Regional biological databases (California Natural Diversity Database, United Fish and Wildlife Service (USFWS), San Diego Bird Atlas, and San Diego Association of Governments [SANDAG]) were queried to determine historical sightings of sensitive plant and animal species nearing the vicinity of the Project.

2.1 VEGETATION MAPPING

Vegetation communities were mapped according to the Holland Vegetation Classification (Holland 1986) as amended by Oberbauer (2002) to fit the unique vegetation communities of San Diego County. Vegetation communities were delineated on aerial photographs (Airphoto USA 2007) at a scale of 1 inch = 200 feet. The minimum mapping unit for vegetation communities is 0.1 acre (estimated as a square approximately 66 feet on a side). Digital photographs of representative areas were taken during the mapping survey for reference. GPS waypoints (10-16 foot accuracy) were plotted using GIS and were compared with the polygons drawn in the field to fine-tune the location of boundaries between various vegetative communities. Polygons were then digitized into GIS for display and to calculate acreages.

Vegetation communities were identified according to the percent cover of the combination of dominant plant species observed. Vegetation community classifications are based on a dominant species comprising approximately 50 percent or more of the total cover within the mapped unit relative to the list of dominant species for a given Holland vegetation community (*e.g.*, grasslands must have at least a 50 percent cover of dominant grass species to be mapped as that particular community). Mixed communities are identified where species comprising a second vegetation community are present at approximately 35 percent or higher percent cover and intermixed with the dominant vegetation community. When necessary, modifiers were added to certain vegetation classifications to describe a single species that dominates the vegetation class. Additionally, certain natural vegetation communities were given a “disturbed” modifier when they showed evidence of disturbance, and supported a high density of non-native grasses or weedy species. This is notated on the vegetation maps as a “D” placed in front of the name or acronym of the habitat.

2.2 PLANT SURVEYS

Botanical surveys were conducted by qualified biologists familiar with the special status plant species potentially occurring within the Project (Appendix E). Special status plants are defined as any species covered by the Chula Vista MSCP Subarea plan, including covered species and MSCP narrow endemics, federal and state threatened or endangered plants and any plant on California Native Plant Society (CNPS) List 1-4 (see definitions in Section 3). Special status plant surveys were conducted in 2008 throughout the Project to coincide with the blooming periods of the greatest number of target species as possible. Additional late season sensitive plant species surveys were performed in 2009 and 2010 to target Otay tarplant (*Deinandra conjugens*); the 2010 surveys included the Planned and Future Facilities alignments. Surveys were intensified at locations in unique microhabitats that could potentially support sensitive species, such as clay soils. Locations of individual special status plants were recorded using a GPS unit and imported to a GIS database for display and analysis.

2.2.1 MSCP Narrow Endemic Plant Surveys

Southwestern San Diego County includes specific geographic and climatological conditions that support species with limited habitat ranges. These species are referred to as narrow endemic species. They are highly restricted by their habitat affinities, soil conditions and/or other ecological factors, and require additional measures to ensure that their long-term viability is maintained (Chula Vista MSCP Subarea Plan). Surveys for narrow endemic plant species covered by the Chula Vista MSCP Subarea plan were performed concurrently with special status plant surveys detailed above. Surveys for Otay tarplant, an MSCP narrow endemic, were initiated following blooming at a known reference population. Surveys for this species were conducted on the Village 8 West SPA Plan parcel and off-site fuel modification zone in June and July of 2009 by URS biologists Sundeep Amin and Lee Ripma, and Jim Rocks of Rocks Biological. Surveys were conducted in the Planned and Future Facilities alignments in June 2010 by Brian Lohstroh of Lohstroh Biological Services.

2.3 WILDLIFE SURVEYS

2.3.1 California Gnatcatcher Surveys

Surveys for the coastal California gnatcatcher (CAGN) were conducted in accordance with the USFWS Protocol for presence/absence surveys (USFWS 1997) during 2008. Suitable CAGN habitat, including coastal sage scrub, disturbed coastal sage scrub, maritime succulent scrub, disturbed maritime succulent scrub was surveyed. Surveys were conducted by USFWS-permitted biologists and recorded CAGN vocalizations were played only to initially detect CAGN. CAGN individuals and family groups, including paired individuals or individuals with nestlings or fledglings, were mapped according to the perceived central location of their territory. These locations were then imported into a GIS database for display and analysis.

2.3.2 Quino Checkerspot Butterfly Surveys

Protocols for QCB followed USFWS protocol (2002) and consisted of an initial survey to determine areas which should be excluded from surveys in February 2009 and again in March 2010. Within included survey areas, surveyors were required to conduct a minimum of five survey days during the QCB flight season, which is determined by USFWS based on a number of reference sites throughout QCB’s range. Each of the five survey days were conducted a week apart. Surveys were conducted by URS biologists with valid 10(a)(1)(a) permits and only took place when the following conditions were present: no rain, fog, or drizzle; no sustained winds above 15 miles per hour (mph), and temperatures greater than 60 degrees Fahrenheit (F) on a sunny day and 70 F on an overcast day, with temperatures taken in the shade. Focused flight surveys took place during QCB flight season to determine presence on site. Five surveys were conducted between March 3 and April 9, 2009 on the Project, and between March 29 and April 25, 2010 in the Planned and Future Facilities alignments.

2.3.3 Burrowing Owl Surveys

A burrowing owl habitat assessment took place February 27, 2009 in which potential burrowing owl habitat was assessed to determine the potential for burrowing owls to occur within the Project. Burrowing owl suitable habitats, including native and non-native grassland, disturbed habitat, and agricultural vegetation communities were surveyed. Key habitat features, including the presence of fossorial mammal burrows, were identified and recorded. Additional surveys took place July 11, 2009 and June 10, 2010 in conjunction with focused Otay tarplant surveys.

2.4 JURISDICTIONAL DELINEATION

This section summarizes the methods used to delineate Federal wetlands, other waters of the U.S. (OWUS), California Department of Fish and Game (CDFG) jurisdiction, and surface waters of the State of California, subject to the Porter Cologne Water Quality Act, which are described below. Jurisdictional waters were delineated within the study area for the Project and are shown on Figure 8.

Waters of the U.S., including wetlands, were delineated based on field surveys. Supplemental material that was used to facilitate the delineation included information such as USGS topographic maps, recent and historic aerial photographs, published information, mapped or modeled floodplains, and Natural Resource Conservation Service (NRCS) soil maps.

Boundaries were mapped in the field to the extent practicable on aerial photographs at a scale of 1 inch = 200 feet. Subsequent review in the office and/or through subsequent field review was performed to generate mapped boundaries of wetlands and waters of the U.S. URS used handheld GPS units with published accuracy ranges of approximately 10 to 16 feet to generate waypoints to assist in the delineation. Maps were finalized in GIS format. Soil pits were dug at locations within the observed ordinary high water mark (OHWM) where there was a potential for hydric soils to occur along with hydrophytic vegetation. Wetland delineation data sheets were completed in the field and in the office to determine wetland and jurisdictional status.

The jurisdictional delineations were conducted on June 27, 2008 and July 31, 2008 by URS Biologists Theresa Miller and Brittany Benson. A jurisdictional delineation was conducted in May 7, 2010 on the off-site Planned and Future Facilities alignment and 100-foot buffer of the alignment by Brian Lohstroh of Lohstroh Biological Services. Wetland data sheets are provided in Appendix B.

SECTION 3 EXISTING CONDITIONS

A summary of the biological survey dates and conditions is provided in Appendix A. Details of survey protocol used can be found in Section 2 and results of those surveys can be found in this section. A summary of the regulatory setting is provided below.

3.1 REGULATORY SETTING

3.1.1 Otay Ranch Resource Management Plan

The Project is part of the Otay Ranch GDP and Otay Ranch RMP. The GDP and RMP were approved by the County of San Diego and the City of Chula Vista in October of 1993. The RMP is comprised of two separate documents, the Phase 1 RMP and Phase 2 RMP. The Phase 1 RMP identifies Preserve areas within Otay Ranch, and contains policies regarding species and habitat conservation and long-term management of the Preserve. The Phase 2 RMP includes ranch-wide studies that were conducted pursuant to the Phase 1 RMP and provides additional detail on conveyance, management and funding. The Otay Ranch RMP identifies a Preserve system of 11,375 acres dedicated within Otay Ranch. Within the Project area, the Preserve includes portions of Wolf Canyon, Salt Creek Canyon, and Otay Valley. To ensure that transfer of Preserve land occurs in step with development, the RMP incorporates a preserve conveyance plan, which includes a conveyance ratio of 1.188 acres of Preserve for each acre of non-common development area. The Otay Ranch RMP and the Otay Ranch Preserve were the primary basis for California Environmental Quality Act (CEQA) impact analysis and mitigation of biological impacts identified in the GDP Program EIR resulting from development of less sensitive areas of the GDP.

3.1.2 Chula Vista MSCP Subarea Plan

The Chula Vista Subarea Plan was prepared pursuant to the MSCP Subregional Plan for southern San Diego, as approved by the City of Chula Vista in 2003, and permits were issued by the USFWS and CDFG in 2005. The Subarea Plan identifies lands that would conserve habitat for covered federal and state endangered, threatened, or sensitive species. The Subarea Plan also designates a Preserve and provides a regulatory framework for determining impacts to the Preserve and sensitive habitat throughout the City and identifies mitigation to reduce those impacts. The Subarea Plan also provides a process that allows the City to convey take authorization under the federal and state Endangered Species Acts (ESA) for the incidental take of threatened and endangered species. The Subarea Plan authorizes take in two ways: (1) it establishes "Covered Projects" for which take is authorized and, (2) for projects located within mapped Development Areas that are outside of Covered Projects, take of covered species requires the issuance of a Habitat Loss and Incidental Take (HLIT) Permit. In addition, the Subarea Plan requires issuance of an HLIT permit for "all development within the City's jurisdiction which is not located within the Development Areas of Covered Projects prior to issuance of any land development permit." Otay Ranch is a "Covered Project" in the Subarea Plan. The 100 percent Conservation Areas are either already in public ownership or will be dedicated to the Otay Ranch Preserve as part of the development approval process for Covered Projects. Any portions of Covered Projects that are located within 100 percent Conservation Areas must be consistent with conditions allowing specific land uses within the preserve as outlined in Sections 6.1, 6.2 and 6.3 of the Subarea Plan and will be subject to the Narrow Endemic

Species Policy (avoidance and minimization) and Wetlands Protection Program. The MSCP 100% Preserve Area (Preserve) is located just south of the Village 8 West Project.

3.1.3 Otay Ranch General Development Plan (GDP)

The Otay Ranch General Development Plan (GDP) serves as the main document that is used to make fundamental decisions regarding the future development of the city. The GDP contains the city's goals for land use, circulation, housing, conservation, open space, noise, public safety, and other economic and social services. The Chula Vista MSCP Subarea Plan was adopted by the GDP and serves as the vehicle that establishes areas of conservation and development within the Chula Vista MSCP Planning Area.

3.1.4 Narrow Endemic Species Protection

The following specific provisions are applicable to the Project to protect narrow endemic species:

Development Areas within Covered Projects:

Covered Projects provide protection of Narrow Endemic Species through consideration of Narrow Endemic Species in the Preserve design for those projects, Take of Covered Species, including Narrow Endemic Species, for development areas within Covered Projects will be extended at the time of development approval, There are no limitations on impacts to Narrow Endemic Species within the development areas of Covered Projects, like the proposed Village 8 West Project.

100% Conservation Areas within Covered Projects:

Projects located within the 100% Conservation Areas of Covered Projects (i.e., within the Preserve) are limited to uses described in Sections 6.1, 6.2 and 6.3 of the City's Subarea Plan. Impacts to covered Narrow Endemic Species from planned and future facilities located within the 100% Conservation Areas of Covered Projects will be avoided to the maximum extent practicable. Where impacts are demonstrated to be unavoidable, impacts will be limited to 5% of the total Narrow Endemic Species population within the Preserve.

If impacts exceed 5% of the covered Narrow Endemic Species population within the Preserve after comprehensive consideration of avoidance and minimization measures, the City must make a determination of biologically superior preservation, consistent with Section 5.2.3.7 of the City's Subarea Plan.

City of Chula Vista Wetlands Protection Program

As part of the CEQA review, development projects that contain wetlands will be required to demonstrate that impacts to wetlands have been avoided to the greatest extent practicable and, where impacts are nonetheless proposed, such impacts have been minimized. Generally, all jurisdictional waters under State and Federal regulations are addressed as City wetlands. For unavoidable impacts to wetlands, the City will apply the wetlands mitigation ratios identified in Table 5-6 of the City's Subarea Plan. The wetlands mitigation ratios provide a standard for each habitat type, but may be adjusted depending on the functions and values of both the impacted wetlands as well as the wetlands mitigation proposed by the project. The

City may also consider the wetland habitat type(s) being impacted and utilized for mitigation in establishing whether the Subarea Plan standards have been met.

Adjacency Management

Section 7.5.2 of the City's MSCP Subarea Plan also provides guidelines to address adjacency Management Issues, in order to address indirect impacts associated with development adjacent to the Preserve areas. All new development must adhere to these guidelines, which address potential drainage issues, overspill of lighting, noise into the Preserve, use of non-invasive plant species, and limiting of public access in sensitive preserve areas. The Project applicant has developed an Edge Plan to ensure consistency with the City's Adjacency Management Guidelines.

3.2 VEGETATION

Four native vegetation communities occur within the proposed Project: freshwater marsh, mulefat scrub, maritime succulent scrub and coastal sage scrub. A disturbed qualifier (D-) is placed on some areas of native habitat to denote that those areas of native vegetation have undergone a significant amount of disturbance, but that they still support enough native vegetation to be considered a functionally native habitat. Four non-native vegetation communities also occur within the Project boundary, including agricultural lands, disturbed vegetation, non-native grassland, and developed land. Figure 3 shows the distribution of vegetation communities documented within a 100-foot buffer of the Project boundary and 100-foot wide assessment area associated with the Planned and Future Facilities alignments. Table 1 presents the acreage of various plant communities that exist within Village 8 West Project. A floral species list compiled from the survey efforts is provided in Appendix C.

Table 1
Acreages of Existing Habitats within the Village 8 West Project

Vegetation Type	Village 8 West SPA Plan		Temporary Grading Area within the Not-a-Part Parcel	Off-site Fuel Modification Zone	Planned / Future Facilities Alignments in 50-ft Construction ROW	Existing Acreage in Entire Project Area
	Development Area	Conserved Habitat Area				
Agriculture	223.31	0.70	4.57	0	0.97	229.55
Developed	10.07	0.09	0	0	0.05	10.21
Disturbed Vegetation	15.36	0	0	0	0.01	15.37
Non-Native Grassland	0.62	0	0	0	0.19	0.81
Coastal Sage Scrub	14.88	14.83	0	0.26	0.01	29.97
Disturbed Coastal Sage Scrub	19.83	0	0	0	0.16	19.99
Freshwater Marsh	0.05	0	0	0	0	0.05
Maritime Succulent Scrub	0.56	0	0	0	0.49	1.05
Mulefat Scrub	0	0	0	0	0.07	0.07
Grand Total	284.68	15.62	4.57	0.26	1.95	307.08

3.2.1 Coastal Sage Scrub

Coastal sage scrub (CSS) is comprised of low, soft-woody sub-shrubs of up to one meter (three feet) high, many of which are facultative drought-deciduous. This association is typically found on dry sites, such as steep, south- and west-facing slopes with clay-rich soils that are slow to release stored water (Holland 1986). Dominant shrub species in this vegetation type may vary depending on local site factors and levels of disturbance. The dominant shrub species found within the coastal sage scrub on-site are San Diego sunflower (*Viguiera laciniata*), California sagebrush (*Artemisia californica*), jojoba (*Simmondsia chinensis*), and California buckwheat (*Eriogonum fasciculatum*). San Diego sunflower makes up a significant proportion (up to 20%) of cover in non-disturbed coastal sage scrub; the amount of cover depends upon local site factors and levels of disturbance. Common tarplant (*Deinandra fasciculata*) and purple needlegrass (*Nassella pulchra*) make up the herbaceous understory in some of the non-disturbed coastal sage scrub on-site. Non-native, weedy species such as brome grasses (*Bromus* spp.) and Russian thistle (*Salsola tragus*) are also common as herbaceous understory species in disturbed coastal sage scrub areas. Approximately 29.97 acres of coastal sage scrub, and 19.99 acres of disturbed coastal sage scrub occur within the Project (Figure 3).

3.2.2 Maritime Succulent Scrub

Maritime succulent scrub (MSS), a form of sage scrub, occurs on thin, rocky, or sandy soils on steep slopes or bluffs near the coast. This habitat type reaches its northern distributional limits in San Diego County on the mainland and offshore on the California Channel Islands. It is typically confined to dry, south-facing slopes along the coastal areas, from Torrey Pines State Park south to El Rosario in northern Baja California, Mexico. This community is usually a low, open vegetation type with a poorly developed understory (Holland 1986). Within the proposed impact area, maritime succulent scrub is present in the canyons along the northwest side of the Project boundary (Figure 2). The dominant shrub species in this community includes some of the coastal sage scrub dominants, but it is notable for having a high percentage of cacti and other succulent species. Within the Project area, shrub and suffrutescent species include jojoba, San Diego sunflower, lemonadeberry (*Rhus integrifolia*), California buckwheat, and California sagebrush. Succulent species include coast barrel cactus (*Ferocactus viridescens*), coast cholla (*Cylinopuntia prolifera*), coastal prickly pear (*Opuntia littoralis*), fishhook cactus (*Mammillaria dioica*), and chalk-leaf live-forever (*Dudleya pulverulenta*). Approximately 1.05 acres of maritime succulent scrub occurs within the Village 8 West SPA Plan and associated off-site Planned and Future Facilities alignments.

3.2.3 Non-native Grassland

Non-native grassland (NNG) generally occurs on fine-textured loam or clay soils which are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats and is characterized by a dominate cover (greater than 50% cover) of non-native annual grasses, and occasionally native and nonnative annual forbs (Holland 1986). Non-native grasses have replaced native grassland and coastal sage scrub at many localities throughout Southern California. Approximately 0.62 acre of NNG is present within the Village 8 West SPA Plan. Approximately 0.19 acre of NNG occurs in the off-site Planned and Future Facilities alignments. This vegetation includes slender wild oat (*Avena barbata*), wild oat (*Avena fatua*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), foxtail chess (*Bromus madritensis* ssp. *Rubens*), cheatgrass (*Bromus tectorum)*, crabgrass (*Cynodon dactylon*), nit grass (*Gastridium ventricosum*), hare barley (*Hordeum murinum* ssp. *leporinum)*, goldentop (*Lamarckia aurea*), perennial ryegrass (*Lolium perenne)*, canary grass (*Phalaris aquatica*), annual beard grass (*Polypogon monspeliensis*), Mediterranean schismus (*Schismus barbatus*), and wheat (*Triticum aestivum*).

3.2.4 Mulefat Scrub (MFS)

Mulefat Scrub is characterized as a depauperate, tall, herbaceous riparian scrub strongly dominated by mule fat (*Baccharis salicifolia*). This community is found within intermittent stream channels with fairly coarse substrate and moderate depth to the water table, and is maintained by frequent flooding (Holland 1986). Mulefat scrub may also contain several willow species, including arroyo willow (*Salix lasiolepis*), narrow-leaf willow (*Salix exigua*), or red willow (*Salix laevigata*). Approximately 0.07 acre of mulefat scrub is associated with the off-site Future Facilities alignment.

3.2.5 Freshwater Marsh

Freshwater marsh is dominated by perennial, emergent monocots that grow to 1.3 to 2 m (4.3 to 6.6 feet [ft]) tall. Uniform stands of bulrushes (*Scirpus* spp.) or cattails (*Typha* spp.) often characterize this habitat. Freshwater marsh occurs in wetlands that are permanently flooded by standing fresh water (Holland 1986). Examples of this habitat occur around several of the larger bodies of open water, such as

Sweetwater Reservoir, as well as around many of the smaller lakes, ponds, creeks, and reservoirs in the study region. Approximately 0.05 acre of freshwater marsh is present in Drainage 1 in the northwestern corner of the Village 8 West SPA Plan.

3.2.6 Agricultural Land

Agricultural land is defined as habitat that is regularly plowed or cultivated to produce a dense crop of vegetation that functions as forage for cattle. The approximately 229.55 acres of pasture/agricultural land within the Village 8 West SPA Plan, Not-a-Part parcel, and off-site Planned and Future Facilities alignments occurs primarily on the relatively flat mesa terraces where repeatedly tilled land had been planted with cereal wheat (*Triticum aestivum*) and cucumber (*Cucumus* sp.). Other subdominant species observed within the agricultural land included wild oat, foxtail chess, fennel (*Foeniculum vulgare*), Russian thistle, and short-pod mustard (*Hirschfeldia incana*).

3.2.7 Disturbed Vegetation

Disturbed vegetation typically develops on sites with heavily compacted soils following intense levels of disturbance such as grading, agriculture, off-road activities, or previous development. Disturbed areas are dominated by broad-leaf herbaceous species such as mustards (*Brassica* spp., *Hirschfeldia incana*), fennel, thistles (*Centaurea* spp., *Silybum* spp., *Carduus* spp. etc.), and often have a subdominant cover (less than 50% cover) of annual non-native grasses. Approximately 15.36 acres of disturbed vegetation occurs within the Village 8 West SPA Plan and 0.01 acre is associated with the off-site Planned and Future Facilities alignments (Figure 3).

3.2.8 Developed

Developed areas support no native vegetation and may be additionally characterized by the presence of human-made structures such as buildings or roads. The level of soil disturbance is such that only the most ruderal plant species would be expected. The agricultural component of developed areas includes actively cultivated lands or lands that support nursery operations; however, pasturelands are mapped as disturbed or undisturbed grassland, depending upon the intensity of grazing. Developed areas are found in varying densities in rural areas. Approximately 10.21 acres of developed land occurs within the Village 8 West SPA Plan and associated off-site Planned and Future Facilities alignments.

3.2.9 Special Status Vegetation Communities

Special status vegetation communities are those that are considered rare within the region, support special status plant and/or wildlife species, or are important in providing connections for wildlife movement. Maritime succulent scrub and coastal sage scrub are special status vegetation communities that occur within the Project area. Both are considered a special status vegetation community by USFWS and CDFG (Holland 1986) because they are limited geographically, support special status species, and are under development pressure throughout their respective ranges.

Coastal sage scrub is considered a special status habitat by USFWS and CDFG. CSS has been assigned global and state conservation status rankings of G5 and S5 respectively. In San Diego County, CSS was listed as the third most extensive vegetation community in the county over 25 years ago (CDFG 1965);

however, Oberbauer (1991) suggested that up to 72% of the county's original sage scrub habitat has been destroyed or modified, and this loss has continued throughout the last decade, primarily due to agriculture, grazing, and urban expansion. Additional evidence of the decline of this once common habitat is the growing number of declining wildlife species dependent upon it, including the California gnatcatcher, cactus wren, southern California rufous-crowned sparrow, coast horned lizard, orange-throated whiptail, as well as many of the County's sensitive plant species.

Maritime succulent scrub is also considered a special status habitat by the resource agencies because it is limited geographically, supports special status species, and is under development pressure. MSS has been assigned global and state conservation status rankings of G2 and S1 respectively. MSS has been known to support the highest species diversity compared to other sage scrub communities (Rundel and Gustafson 2005).

Wetland vegetation types include the freshwater marsh and mulefat scrub vegetation that occur within the Village 8 West Project. These vegetation types are regulated as sensitive resources by federal, state and City wetland regulations.

Non-native grassland is considered sensitive vegetation under the City's MSCP, requiring compensatory mitigation for the loss of this habitat due to its use by MSCP Covered Species.

3.3 PLANTS

In general, undisturbed areas of the Project are comprised of CSS shrubs such as San Diego sunflower, California sagebrush, jojoba, and California buckwheat. Active agriculture areas consist almost exclusively of cereal wheat and weedy non-native plant species.

3.3.1 Special Status Plant Species

Biologists conducted focused surveys for special status plants, including covered MSCP narrow endemic species. Species with historic records from the area, or which were thought to have a high likelihood of occurring due to the presence of suitable habitat, were the focus of surveys. A list of sensitive species with a potential to occur in the Project vicinity is provided in Appendix E. Biologists recorded special status plant species detected within the Project and in adjacent MSCP Preserve. Results of the surveys are discussed below and Figure 4 displays the special status species that were observed within the Project survey area. Table 2 provides a summary of the CNPS Rare plant list ranking, as well as Global and State conservation status ranking descriptions of plants used by USFWS and CDFG.

3.3.2 CNPS List 1 and List 2 species

3.3.2.1 Coast barrel cactus (Ferocactus viridescens var. *viridescens)*

MSCP: Covered
CNPS: List 2.1

Coast barrel cactus is limited to San Diego County and Baja California. In San Diego County, this species is occasional on dry slopes below 5,000 feet and is found along the coastal slope from Oceanside south to Boundary Monument. Coast barrel cactus is seriously threatened by urbanization, off-road vehicle activity, and commercial exploitation. It can grow in many different soil types and in varying habitats (Reiser 1994), but it is most often found on cliff faces and open areas within CSS and MSS communities. It often makes up a large percentage of the succulent component within MSS regions. Approximately 200 individuals of coast barrel cactus occur within the Project (Figure 4).

3.3.2.2 Otay Tarplant (Deinandra conjugens)

MSCP: Covered; Narrow Endemic
CDFG: Endangered
USFWS: Threatened
CNPS: List 1B.1

Otay tarplant is an annual ranging from 25-100 inches tall with yellow flower heads, each of which has a characteristic eight to10 ray flowers. This species was State Listed as Endangered by the CDFG in 1979, and was listed as Federally Threatened by the USFWS in 1998. It is currently listed by CNPS as List 1B.1. Otay tarplant is narrowly endemic to southern San Diego County and is listed as a Covered, MSCP narrow endemic species. It typically occurs on fractured clay soils with little or no woody shrub cover (Reiser 1994). During surveys in 2009 approximately 3,500 individuals were documented within the Village 8 West SPA Plan parcel (Figure 4).

3.3.2.3 San Diego Marsh Elder (Iva hayesiana)

CNPS: List 2.2

San Diego marsh elder is a low-growing, conspicuous shrub with bright green foliage and gland-dotted leaves (Hickman 1993) that grows below 800 feet and blooms from April to September (Beauchamp 1986). It grows along creeks or intermittent streambeds with an open riparian canopy which allows substantial sunlight to reach the marsh elder. Sandy alluvial embankments with cobbles are also frequently utilized. Within the southwestern portion of the County this plant may occur in steep watercourses where other riparian vegetation is not present. San Diego marsh elder is considered stable but potentially affected by modifications and degradation of coastal drainages in San Diego County (Reiser 1994). Less than 10 individuals of San Diego marsh elder were observed within the Village 8 West Project (Figure 4).

3.3.2.4 South Coast Saltbush (Atriplex pacifica)

CNPS: List 1B.2

South coast saltbush is a small annual with prostrate to decumbent reddish stems (Holland 1993). It grows in xeric, often mildly disturbed locales (Reiser 1994). It occurs on bluffs and in coastal scrublands in areas with elevations less than 300 ft (CNPS 2009). South coast saltbush is severely declining throughout its coastal range on the mainland (Reiser 1994). South coast saltbush occurs within the conserved areas of the Village 8 West SPA Plan parcel and will not be directly impacted (Figure 4).

Table 2
Summary of CNPS List, Global, and State Rankings

CNPS List	Comments
List 1A – Presumed Extinct in California	Thought to be extinct in California based on a lack of observation or detection for many years.
List 1B – Rare or Endangered in California	Species that are generally rare throughout their range that are also judged to be vulnerable to other threats such as declining habitat.
List 2 - Rare or Endangered in California, More Common Elsewhere	Species that are rare in California, but more common outside of California
List 3 – Need More Information	Species that are thought to be rare or in decline but CNPS lacks the information needed to assign to the appropriate list. In most instances, the extent of surveys for these species is not sufficient to allow CNPS to accurately assess whether these species should be assigned to a specific list. In addition, many of the List 3 species have associated taxonomic problems such that the validity of their current taxonomy is unclear.
List 4 – Plants of Limited Distribution	Species that are currently thought to be limited in distribution or range whose vulnerability or susceptibility to threat is currently low. In some cases, as noted above for List 3 species above, CNPS lacks survey data to accurately determine status in California. CNPS recommends that species currently included on this list should be monitored to ensure that future substantial declines are minimized.
List is followed by threat code (e.g. CNPS List 1B.2)	.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
	.2 – Fairly endangered in California (20-80% occurrences threatened)
	.3 – Not very endangered in California (<20% of occurrences threatened)
Global and State Rankings	Comments
G1/S1	Critically Imperiled —At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.
G2/S2	Imperiled —At high risk of extinction or elimination due to very restricted range, very few populations, steep declines, or other factors.
G3/S3	Vulnerable —At moderate risk of extinction or elimination due to a restricted range, relatively few populations, recent and widespread declines, or other factors.
G4/S4	Apparently Secure —Uncommon but not rare; some cause for long-term concern due to declines or other factors.
G5/S5	Secure —Common; widespread and abundant.

3.3.3 CNPS List 4 Species

3.3.3.1 Graceful Tarplant (Holocarpha virgata ssp. *elongata)*

CNPS: List 4.2

Graceful tarplant is a strongly scented glandular annual with yellow flower heads (Hickman 1993). This plant frequents annual and perennial grasslands without well-developed shrub cover, often including a heavy incidence of invasive non-native grasses and herbs (Reiser 1994). Like Otay tarplant, it is a late blooming species usually detected from May to November (CNPS 2009). It is often abundant where it occurs, usually in mildly disturbed or overgrazed grassland. Since occupied habitat is usually situated on comparatively level, sparsely vegetated terrain, it is presumed to be substantially declining in San Diego County and western Riverside County due to urban development (Reiser 1994). A population of approximately one hundred individuals was detected within the western boundary of the Village 8 West SPA Plan (Figure 4).

3.3.3.2 Palmer's Grappling-hook (Harpagonella palmeri)

CNPS: List 4.2

Palmer's grappling-hook is a small and easily overlooked annual member of the Borage family with distinctive hooked fruit. It occurs in dry sites in chaparral, coastal scrub and grassland under 3000 ft (CNPS 2009). Clay soils with open grassy slopes or open Diegan Sage Scrub are typical habitats for this plant. Palmer's grappling hook is declining throughout Southern California. Many historical sites are likely extirpated by urban development and agricultural disking (Reiser 1994). A small population of this species was detected within the Village 8 West SPA Plan (Figure 4).

3.3.3.3 San Diego sunflower (Viguiera laciniata)

CNPS: List 4.2

This species occurs in southern San Diego County and northwestern Baja California. In San Diego County, San Diego sunflower is a yellow-flowered, spring-blooming (January-July), xerophytic shrub that occurs in coastal sage scrub. San Diego sunflower is declining but still found at hundreds of locales where it is occasionally a dominant shrub. This species shows some ability to colonize areas of mild disturbance and is readily grown from seed. This species is recommended for de-listing by the CNPS; it is too common and wide-ranging in San Diego County to warrant such a listing (Reiser 1994). This species is a relatively common component of CSS habitat within the Project (Figures 4 and 6).

3.3.3.4 Seaside Calandrinia (Calandrinia maritima)

CNPS: List 4.2

Seaside calandrinia is an annual with flat spoon-shaped leaves and red to purple petals (Hickman 1993). Sandy bluffs near the beach and sandy openings in CSS are the preferred habitat of this distinctive annual. Seaside calandrinia is severely declining in mainland Southern California, and is approaching extirpation in San Diego County and Orange County; only a limited number of small sites are now known from San Diego (Reiser 1994). Seaside calandrinia occurs within the conserved areas of the Village 8 West SPA Plan parcel and will not be directly impacted (Figure 4).

3.3.3.5 Small-Flowered Morning-Glory (Convulvulus simulans)

CNPS: List 4.2

Small-flowered morning-glory is a diminutive annual found in chaparral openings, coastal scrubs, and grasslands including non-native grasslands, clay lenses and serpentine seeps. Its current range is the San Francisco bay area south into Baja, Mexico. In San Diego County this species is found below 800 feet and blooms between March and May (Reiser 1994). A small population of small-flowered morning-glory was found within Preserve areas located adjacent to the Village 8 West Project.

3.3.3.6 Southwestern spiny rush (Juncus acutus ssp. *leopoldii)*

CNPS List 4.2

Southwestern spiny rush is a relatively common plant associated with moist, saline or alkaline soils. This species is found in drainages and wetland areas south of Aqua Hedionda to the Otay River Valley. The sensitivity of this plant is due to the decline in wetland habitats throughout the County (Reiser 1994). Populations of this species occur within the three drainages on-site (Figures 4 and 8). Approximately 50 individuals occur within the Village 8 West SPA Plan parcel.

3.4 WILDLIFE

The Project supports a diverse assemblage of wildlife species, which were primarily distributed throughout the south facing slopes of the Otay River Valley in the southern portion of the site. However, a few wildlife species were present in the highly disturbed agricultural land in the northern and eastern portion of the Village 8 West SPA Plan parcel. A list of wildlife species detected can be found in Appendix D. Bird species that were common within the Project vicinity included California towhee (*Pipilo crissalis*), western meadowlark (*Sturnella neglecta*), Anna’s hummingbird (*Calypte anna*), mourning dove (*Zenaida macroura*), common raven (*Corvus corax*), and blue grosbeak (*Passerina caerulea*).

The Project area also supports sensitive wildlife species including, but not limited to, the federally threatened California gnatcatcher (*Polioptila californica californica)*, northern harrier (*Circus cyaneus*, CDFG Species of Special Concern [SSC]), and southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*, watch list, MSCP Covered Species). A detailed discussion of these and other MSCP-covered wildlife species observed on-site is found below.

Mammal species detected include coyote (*Canis latrans*), bobcat (*Felis rufus*), California ground squirrel (*Spermophilus beecheyi nudipes*), Audubon’s cottontail (*Sylvilagus auduboni*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*, SSC). Reptiles that were observed or recorded previously on or near the Project include orange-throated whiptail (*Cnemidophorus hyperythrus*, SSC), western fence lizard (*Sceloporus occidentalis*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*).

The primary larval host plant for QCB (dot-seed plantain [*Plantago erecta*]) was observed within the Project area. Although no historical QCB observations are known within the Project (CNDDB 2010), QCB has been documented previously within 3 miles of the Project (USFWS database). Protocol QCB surveys performed in 2009 and 2010 were negative.

3.4.1 MSCP Covered Wildlife Species

Four MSCP covered bird species were observed within the Project: California gnatcatcher, northern harrier, rufous-crowned sparrow, and burrowing owl (Figure 4). Least Bell's vireo was not detected during the various project survey efforts, but this listed species is known to occur within the Otay River flood plain in the vicinity of the Project. Coastal cactus wren is known to occur in the MSCP Preserve west of the Project, but was not detected within the Project.

3.4.1.1 Coastal California Gnatcatcher (Polioptila californica californica)

USFWS: Threatened
CDFG: Species of Special Concern
MSCP: Covered

The population of the coastal California gnatcatcher within the United States is estimated to be approximately 5,000 pairs. Of this, roughly 2,500 pairs reside in San Diego County (Mock 2004). Like other species that rely on coastal sage scrub, the decline of the coastal California gnatcatcher has been instigated by cumulative loss of coastal sage scrub vegetation to urban and agricultural development. Coastal California gnatcatchers are federally listed as Threatened, and are covered under the Chula Vista MSCP Subarea Plan. A single adult male of this species was observed within the preserve but not in the Project impact area (PIA); multiple sightings of this individual were made were during protocol surveys. The lone gnatcatcher was detected within CSS habitat within the conserved area of the Village 8 West SPA Plan parcel (Figure 4). Gnatcatchers were not detected in the off-site components of the Project, but the CSS habitat associated with these off-site areas are assumed to be utilized by gnatcatcher.

3.4.1.2 Burrowing Owl (Athene cunicularia)

USFWS: Bird of Conservation Concern
CDFG: Species of Special Concern
MSCP: Covered

The western burrowing owl (*Athene cunicularia*) is a ground dwelling bird that inhabits grasslands, agricultural fields, and disturbed areas in the western half of the United States down into Baja California and central Mexico (Johnsgard 1988). Burrowing owls use rodent burrows throughout the year for shelter from weather and predators and for nesting during the breeding season (February 1 to August 31). In southern California the most commonly used rodent burrow is that of the California ground squirrel *(Spermophilus beecheyi)* and nesting distribution is strongly correlated to local burrow distribution (Collins 1979). Burrowing owls form short term pair bonds with male territoriality peaking during pair formation and declining after egg-laying. Not all individuals capable of breeding do so every year. Burrowing owls have declined through much of their range because of habitat loss due to urbanization, agricultural conversion, and control of ground squirrel colonies (Remsen 1978). The incidental poisoning of burrowing owls and the destruction of their burrows during rodent eradication programs aimed at squirrel colonies has also been a large factor in their decrease (Collins 1979; Remsen 1978; Zarn 1974). Burrowing owls are relatively tolerant of lower levels of human activity, but have been negatively impacted by high levels of human related disturbances such as shooting and the introduction of non-native predators (Zarn 1974). This species often nests and perches near roads where they are vulnerable to roadside shooting, being hit by cars, road maintenance operations, and general harassment (Remsen 1978).

Two active burrowing owl burrows were documented in the Village 8 West SPA Plan parcel, and one active owl burrow was detected in the adjacent Preserve (Figure 4). Both active burrows that were observed on-site in July 2009 will be directly impacted by the Village 8 West SPA Plan. Four burrowing owl individuals were detected in 2010; three individuals at one location within the conservation area of the Village 8 West SPA Plan parcel, and one individual outside the Project limits. No burrowing owls were detected within the off-site component areas of the Project; however, the CSS, grassland and agricultural habitats are potentially used by owls as foraging habitat.

3.4.1.3 Southern California Rufous-Crowned Sparrow (Aimophila ruficeps canescens)

CDFG: Watch List
MSCP: Covered

Southern California rufous-crowned sparrow is a resident species in San Diego County that prefers grassy or rocky slopes with open scrub at elevations from sea level to 600 meters. It forages and nests on the ground, usually near vegetative cover, and maintains year-round territories. Most of the species' population occurs in coastal sage scrub, so it has undoubtedly been reduced greatly by urban development. This species was formerly listed as a State of California SSC, but was removed due to it being relatively common within suitable habitat. It is currently a covered species under the Chula Vista MSCP Subarea plan. One individual of this species was observed within the conserved area of the Village 8 West SPA Plan parcel (Figure 4). This species was not detected in the off-site component areas of the Project.

3.4.2 Least Bell's Vireo *(Vireo bellii pusillus)*

USFWS: Endangered
CDFG: Endangered
MSCP: Covered

Historically, this subspecies was a common summer visitor to riparian habitat throughout much of California. Currently, Least Bell's vireo (LBVI) *(Vireo bellii pusillus)* is found only in riparian woodlands in southern California, with the majority of breeding pairs in San Diego, Santa Barbara, and Riverside Counties. Substantial vireo populations are currently found on five rivers in San Diego County: Tijuana, Sweetwater, San Diego, San Luis Rey, and Santa Margarita, with smaller populations on other drainages. Least Bell's vireo is restricted to riparian woodland and is most frequent in areas that combine an understory of dense young willows or mulefat with a canopy of tall willows. The least Bell's vireo arrives in San Diego County in late March and early April and leaves for its wintering ground in September. Because the vireos build their nests in dense shrubbery three to four feet above the ground, they require young successional riparian habitat or older habitat with a dense understory. Therefore, riparian plant succession is an important factor maintaining vireo habitat. Nests are also often placed along internal or external edges of riparian thickets. Six site visits to the vicinity of the off-site storm drain outfall were made by Brian Lohstroh during the 2010 vireo breeding season. No vireo were detected during this survey effort, but vireo are known from the project vicinity and suitable vireo habitat (mulefat scrub) is impacted by the off-site Future Facilities alignment. For the purposes of impact assessment this mulefat scrub vegetation is assumed to be utilized by LBVI.

3.4.3 San Diego Cactus Wren (*Campylorhynchus brunneicapillus sandiegensis*)

CDFG: SSP
USFWS: Bird of Conservation Concern (BCC)
MSCP: Covered

The San Diego cactus wren is a subspecies of the coastal California cactus wren (*Campylorhynchus brunneicapillus sandiegensis*). The San Diego cactus wren is seriously endangered throughout its range, which is restricted to coastal lowlands from the San Juan Creek drainage basin in Orange County south to the River drainage basin in extreme northwestern Baja California (Rea and Weaver 1990). The San Diego cactus wren is found only in CSS and MSS with extensive stands of *Opuntia* sp. cacti. Once widespread in San Diego County by 1990 it had been reduced to fewer than 400 pairs in about 55 colonies. Most of the remaining San Diego cactus wrens are threatened by proposed developments and viability is doubtful (Mock 1993). The long term viability of almost all others is questionable because of habitat fragmentation and degradation. Some of the larger colonies occur near Lake Jennings and around the San Diego Wild Animal Park. Coastal cactus wrens found in San Diego County nest almost exclusively in prickly pear or cholla cactus. Cactus wren was detected several hundred feet from southwestern site corner outside of the site boundary during surveys in cactus patches. Sighting location occurs within MSCP open space west of the project, beyond the mapping limits of this report.

3.4.3.1 Northern Harrier (Circus cyaneus)

CDFG: Species of Special Concern
MSCP: Covered

The northern harrier is distributed throughout North America and Eurasia (Johnsgard 1990). Northern harriers breed from northern Alaska and Canada south into roughly the northern two-thirds of the western United States, and the northern one-third of the eastern United States, and are uncommon to fairly common winter visitor and rare and local summer resident in the coastal lowlands of San Diego County (Unitt 2004). Since the mid-1970s, documented nesting locations in San Diego County include Camp Pendleton and Sweetwater River estuary (Bloom 1983), Otay Ranch Mesa and Proctor Valley (Ogden 1993, Unitt 2004). Nesting has also been suspected at Otay Mesa, Tijuana River Estuary, Sorrento Valley, northeast Lake Hodges, and south of San Marcos (Unitt 2004). Harriers breed in marshes and grasslands and forage in grasslands, agricultural fields, wetlands, and open coastal sage scrub. This species responds to local prey abundance and can therefore be spatially unpredictable. Harriers have declined in California in recent decades, but can be locally abundant where sufficient suitable habitat remains, especially from intensive agriculture (Zeiner et al. 1990). This species is listed as a State of California SSC. One northern harrier was observed foraging along the northern most drainage channel on-site (Figure 4). Foraging is the primary use for the Project area, but harriers may use the land as breeding habitat when it is not actively used for agriculture. Active agricultural tilling would prevent harriers from nesting on-site. Raptor breeding activity was not detected during the URS biological surveys.

3.4.3.2 White-tailed Kite (Elanus leucurus)

CDFG: Fully Protected
MSCP: Covered

In North America, the white-tailed kite (*Elanus leucurus)* is distributed along the Pacific Coast from Washington south to Baja California Norte, Mexico, with a small population in southeast Arizona, and along the Gulf Coast from Florida south into Mexico (Johnsgard 1990). This species also occurs in Central and South America, Australia, southern Eurasia, and Africa. In California, kites are found along the coast and in the Central Valley (Zeiner et al. 1990). The white-tailed kite is a fairly common resident in San Diego County (Unitt 1984). Apparently uncommon in the county in the 19th century, the kite was extirpated from 1892 to 1920. In the 1930s, it began to recolonize with the population increasing rapidly between the late 1940s and 1970 (Unitt 1984). This species nests in riparian or oak woodland adjacent to grassland or open fields where it hunts rodents. This species was detected within the Otay River flood plain in the project vicinity and potentially uses the Project component areas as foraging habitat.

3.4.3.3 Quino Checkerspot Butterfly (Euphydryas editha quino)

USFWS: Endangered
MSCP: Covered

The QCBs historical range included Los Angeles, Riverside, Orange, and San Diego Counties, extending south into Baja California. It formerly occurred from Otay Mesa in southern San Diego County north to Rancho Bernardo. Fifty years ago, this species was described as one of the most common in the county (Murphy 1990). However, the current distribution of this species has been greatly reduced due to loss of habitat to development, habitat degradation, complex metapopulation dynamics, and pressures resulting from a prolonged drought in California during the late 1980s and early 1990s (Murphy 1991; Brown 1991). Currently, populations are known from a single location in northern San Diego County and from Otay Mesa east through Otay Mountain to Jamul, Marron Valley, Tecate Border Crossing, Potrero, La Posta, Campo, and Jacumba in the southern part of the county.

Distribution of this species is complicated by complex metapopulation dynamics involving local extinctions and population explosions which lead to recolonization of habitat. Further complications arise from the fact that the QCB larvae can diapause for as long as seven years. Adults emerge from mid-January through April but peak emergence is from March to April. There is very little migration of adults between centers of population abundance (Ehrlich et al. 1980). According to Ehrlich *et al.* (1975) the principal larval host plants of this species in San Diego are dot-seed plantain, wooly plantain (*Plantago patagonica*), white snapdragon (*Antirrhinum coulterianum*), Thread-leaved bird's beak (*Cordylanthus rigidus*), purple owl's clover (*Castilleja exserta*), and Chinese houses (*Collinsia concolor*). Adults will take nectar from plants such as chia *(Salvia columbariae)* and tidy-lips *(Layia platyglossa)*. Potential habitat for QCB in the region includes vegetation communities with relatively open areas that typically include patches of dot-seed and other plantains, owl's clover, and nectaring plants. These habitats include vernal pools (Allen 1990), lake margins (Emmel and Emmel 1973), nonnative grassland, perennial grassland, disturbed habitat, disturbed wetlands, and open areas within shrub communities. It is estimated that the two primary *Plantago* host species are expected to occur in scattered patches within portions of these habitats. Although no historical QCB observations were known within the Project boundary (CNDDB), QCB has been previously documented within four miles of the Project (USFWS database) and suitable host plant habitats (*Plantego erecta* patches) were detected in the conserved area of the Village 8 West SPA Plan parcel. No QCB were detected within the Project area during protocol surveys in 2009 or 2010.

3.4.3.4 Orange-Throated Whiptail (Aspidocelis hyperythrus beldingi)

CDFG: SSC
MSCP: Covered

The orange-throated whiptail is restricted to the extreme southwest of California and northwest of Baja California Norte, Mexico (Stebbins 1985). In California, it is found on the west side of the Peninsular Ranges between sea level and 3,000 feet, in Los Angeles, San Bernardino, Orange, Riverside, and San Diego counties (Zeiner *et al* 1988). This species appears to prefer sage scrub that covers about 50 percent of the ground without dense grasses in between, but it also inhabits dense to extremely open stands of sage as well as chamise chaparral and floodplain areas. A limiting factor to the species’ range is the availability of its primary food item, the termite. The mean home range of this lizard has been estimated at 0.11 acre (Bostic 1965) and is documented at up to one acre. The principal threated to this species is loss of open sage scrub, its preferred habitat. One individual orange-throated whiptail was detected in the western portion of the Village 8 West SPA Plan parcel. This species was not detected in the off-site component areas of the Project.

3.4.4 Special Status Wildlife Species not Covered by the MSCP

3.4.4.1 Grasshopper Sparrow (Ammodramus savannarum)

CDFG: Species of Special Concern
MSCP: Not Covered

This species occurs in grassland with sparse brush, primarily in the coastal lowland. Grasshopper sparrows are seen mainly from late March through mid-July, when they sing from exposed perches; the species is nearly impossible to find when not singing, and most or all of the population migrates out of California for the winter. Grasshopper sparrows were detected within the Village 8 West SPA Plan parcel. This species was not detected in the off-site component areas of the Project.

3.4.4.2 San Diego Black-tailed jackrabbit (Lepus californicus bennettii)

CDFG: Species of Special Concern
MSCP: Not Covered

The San Diego black-tailed jackrabbit is found from the coast to the western slope of the coastal mountains, up to 6,000 feet, in San Diego County. It inhabits relatively open land, but requires some shrubs for cover. Typical habitats include early stages of chaparral, open coastal sage scrub, and grasslands near the edges of brush. Grasses and forbs are the rabbit's preferred foods. Chew and Chew (1970) reported a diet of 65% shrub browse and 35% herbage. Breeding occurs throughout the year, and young are born under shrubs with no special nest structure. Home ranges averaging 45 acres have been recorded in California (Lechleitner 1958). Black-tailed jackrabbit is a state SSC. Three San Diego black-tailed jackrabbit were observed within the Village 8 West SPA Plan parcel (Figure 4). This species was not detected in the off-site component areas of the Project.

3.4.4.3 Northwestern San Diego Pocket Mouse (Chaetodipus fallax fallax)

CDFG: Species of Special Concern
MSCP: Not Covered

Northwestern San Diego pocket mouse occurs on the coastal slope of Southern California and northern Baja California. Its range extends as far north as Claremont and San Bernardino and as far east as Banning and Jacumba in California (Hall 1981). This is often associated with open, arid habitats including CSS, annual grassland, and desert habitat. Small mammal trapping was not performed onsite; therefore, no northwestern San Diego pocket mice were detected. This species is presumed to occur within the CSS and MSS located within the Project.

3.4.4.4 Dulzura California Pocket Mouse (Chaeodipus californicus femoralis)

CDFG: Species of Special Concern
MSCP: Not Covered

The range of Dulzura California pocket mouse extends from north of the Santa Margarita River mouth to northern Baja California, and as far east as Dulzura in San Diego County (Hall 1981). It generally occurs in coastal sage scrub, chaparral, woodlands and grasslands, often at the scrub-grassland interface. Much of the suitable habitat within the small range of the Dulzura California pocket mouse has been converted to urban and agricultural uses and the remainder is vulnerable to similar conversion. Small mammal trapping was not performed onsite; therefore, no Dulzura California pocket mice were detected. This species is presumed to occur within the CSS and MSS located within the Project component areas

3.4.4.5 San Diego Desert Woodrat (Neotoma lepida intermedia)

CDFG: Species of Special Concern
MSCP: Not Covered

This San Diego desert woodrat occurs in coastal Southern California south of San Luis Obispo and northern Baja California (Hall 1981). Like other woodrats, it constructs large middens, usually of small twigs, cactus pads and other plant material. Middens are often constructed under patches of prickly pear or cholla (*Opuntia* spp.), or in rock outcrops or under low trees. Although the middens are easily detectable, trapping is usually necessary to distinguish between the middens of the dusky-footed woodrat (*Neotoma fuscipes*) and those of the desert woodrat. The primary threat to this species is urbanization and habitat degradation. Small mammal trapping was not performed onsite; therefore, no San Diego desert woodrat were detected. This species is presumed to occur within the CSS and MSS located within the Project component areas.

3.5 WILDLIFE MOVEMENT

A wildlife corridor is defined as a linear area that allows for the movement of wildlife between patches of habitat or from habitat to some other resource such as water. The quality of a particular corridor to wildlife is evaluated based on the focal target species expected to use the corridor. Focal species commonly used to evaluate corridor usage in San Diego County include large mammals such as mule deer (*Odocoileus hemionus*), bobcat, or coyote, or special status birds such as coastal California gnatcatcher or San Diego cactus wren. Types of corridors often used by focal target species include canyons and road underpasses such as culverts, bridges, and freeway interchanges of varying dimensions (Ogden Environmental 1993).

The Project currently supports a movement area utilized by CAGN and Cactus Wren (CAWR). The Planned and Future Facilities alignments will traverse through a known wildlife corridor associated the Otay River (Ogden Environmental 1993; Figure 7). The Wolf Canyon linkage is west of the Project and the Otay River is the main east-west linkage in the Project vicinity. The canyons west of the Project are conserved open space, and the biological open space associated with Rock Mountain provides access to Wolf Canyon. Therefore, the continuity of suitable wildlife habitat associated with the adjacent east-west trending Otay River Valley and Rock Mountain open space is conserved per the Chula Vista Subarea Plan and Otay Ranch GDP and RMP. Wolf Canyon will not be isolated by the proposed project. Installation of the linear facilities in the preserve will be a temporary construction impact and will not interfere with wildlife movement over the long-term. The post and rail fencing associated with the off-site pedestrian trail will allow for continued wildlife movement through this area.

3.6 SOILS

Soils found on the Project are predominantly Diablo clay 9-15 percent slope in the upper 2/3 of the site (with some areas of 2-9 percent slopes). Las Posas stony fine sandy loam is most common in the southwestern third of the Site and Huerhuero loam, Linne clay, and Olivenhain cobbly loams are present in the southeastern corner. Soils in the Preserve area beyond the limits of the Project are dominated by Olivenhain loams (Figure 5).

3.7 JURISDICTIONAL WETLAND DELINEATION

The results of the jurisdictional delineations performed for the Project are displayed in Figure 8 and described in the following sections. Field work for the jurisdictional delineation was conducted on June 27, 2008 and July 31, 2008 by URS Biologists Theresa Miller and Brittany Benson. A jurisdictional delineation was conducted on May 7, 2010 on the off-site Planned and Future Facilities alignments by Brian Lohstroh of Lohstroh Biological Services. Wetland data sheets are provided in Appendix B.

3.7.1 Waters of the United States

Waters of the United States (U.S.) include potential jurisdictional wetlands and other waters that may occur in the study area. URS biologists conducted formal jurisdictional/wetland delineations along three drainages on the north side of the Otay River Valley that exist within the Project component areas, and along the Otay River to delineate the limits of the wetland and thus the best location for the off-site Planned and Future Facilities alignment.

The definition of waters of the U.S., including Federal wetlands, are based on the Federal Clean Water Act. Waters of the U.S., including wetlands, will be delineated based on the definition and guidance described in the following text.

Waters of the U.S. are defined at 33 CFR 328.3 and 328.4:

Section 328.3 - Definitions

"For the purpose of this regulation these terms are defined as follows:

a. The term "waters of the United States" means

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;

2. All interstate waters including interstate wetlands;

3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:

i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or

ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or

iii. Which are used or could be used for industrial purpose by industries in interstate commerce;

4. All impoundments of waters otherwise defined as waters of the United States under the definition;

5. Tributaries of waters identified in paragraphs (a)(1)-(4) of this section;

6. *The territorial seas;*

7. *Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in paragraphs (a)(1)-(6) of this section.*

(Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not waters of the United States.)

8. *Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with the EPA.*

b. *The term "wetlands" means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.*

c. *The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are "adjacent wetlands."*

d. *The term "ordinary high water mark" means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*

Section 328.4 - Limits of jurisdiction

a. *Territorial Seas. The limit of jurisdiction in the territorial seas is measured from the baseline in a seaward direction a distance of three nautical miles. (See 33 CFR 329.12)*

b. *Tidal Waters of the United States. The landward limits of jurisdiction in tidal waters:*

   1. *Extends to the high tide line, or*

2. *When adjacent non-tidal waters of the United States are present, the jurisdiction extends to the limits identified in paragraph (c) of this section.*

c. *Non-Tidal Waters of the United States. The limits of jurisdiction in non-tidal waters:*

1. *In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or*

2. *When adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands.*

3. *When the water of the United States consists only of wetlands the jurisdiction extends to the limit of the wetland.*

Isolated, intrastate waters, including wetlands, will not be delineated as waters of the U.S.

Guidance from the Corps (2001), *Final Summary Report: Guidelines for Jurisdictional Determinations for Waters of the United States in the Arid Southwest*, was used. Guidance of relevance to this delineation includes consideration that: *"In dryland fluvial systems typical of the desert areas, the most common physical characteristics indicating the OHWM for a channel usually include, but are not limited to: a clear natural scour line impressed on the bank; recent bank erosion; destruction of native terrestrial vegetation; and the presence of litter and debris. For many small desert wash systems, the presence of continuous well-developed upland vegetation in the stream channel is a good indicator that it only conveys surface flow during extremely large storm events and, as a result, would not usually constitute a jurisdictional water of the United States."* This guidance is also consistent with the Corps Regulatory Guidance Letter (RGL) 88-06, which states "*…the OHWM is meant to mark the within-channel high flows, not the average annual flood elevation that generally extends beyond the channel. …*" and guidance provided in Corps (2004).

The U.S. Army Corps of Engineers has issued specific guidance that excavations on dry land, temporary puddles, and ditches constructed in uplands for the purpose of stormwater conveyance are not jurisdictional waters of the United States. This guidance will also be applied to ephemeral drainages. Ephemeral drainages were not be mapped as waters of the U.S. unless they bear a true OHWM. Drainages with discontinuous waters marks, such as may result from human induced events or rare high rainfall years, do not meet the definition of an OHWM and such drainages were not be delineated as waters of the U.S.

Federal jurisdictional wetlands were delineated according to the U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual Online Edition (Corps 1987), which is published at http://el.erdc.usace.army.mil/elpubs/pdf/wlman87.pdf. Corps regional supplements for arid southwest delineation methodology were also used to delineate waters on the Project component areas (ACOE 2008a and 2008b).

3.7.2 California Department of Fish and Game Jurisdictional Lakes and Streams

Lakes and streams are delineated to support potential Lake or Streambed Alteration Agreements with the CDFG as required pursuant to Section 1602(a) of the California Fish and Game Code, if it is necessary to substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

Streams are defined at 14 CCR 1.72 as:

> *A stream is a body of water that flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life. This includes watercourses having a surface or subsurface flow that supports or has supported riparian vegetation.*

Lakes are defined at 14 CCR 1.56 as:

> *Includes natural lakes or man-made reservoirs.*

Streams and lakes meeting the definitions described above will be mapped based on field observation and use of collateral material, such as aerial photographs, USGS topographic maps, and other information. Streams and lakes subject to CDFG jurisdiction will be mapped based on their OHWMs.

The California Fish and Game Commission (CFGC) has issued a policy statement regarding wetlands, which is published on the internet at http://www.fgc.ca.gov/html/p4misc.html#WETLANDS and is summarized herein. The CFGC's wetland policy is not a regulatory program. The CDFG and the CFGC possess only limited regulatory authority over potential uses within wetlands not owned by the Department. The CFGC's role in wetland protection is primarily advisory in nature. Wetlands are not defined pursuant to CFGC or CDFG rules or regulations. The CFGC recommends using the wetland classification presented in Cowardin *et al.,* (1979), which states:

> *The primary objective of this classification is to impose boundaries on natural ecosystems for the purposes of inventory, evaluation, and management. …*
>
> *In general terms, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil or on its surface. The single feature that most wetlands share is soil or substrate that is at least periodically saturated with or covered by water. The water creates severe physiological problems for life in water or in saturated soil.*
>
> *Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land*

> *supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year.*
>
> *The term wetland includes a variety of areas that fall into one of five categories: (1) areas with hydrophytes and hydric soils, such as those commonly known as marshes, swamps, and bogs; (2) areas without hydrophytes but with hydric soils – for example, flats where drastic fluctuation in water level, wave action, turbidity, or high concentration of salts may prevent the growth of hydrophytes; (3) areas with hydrophytes but nonhydric soils, such as margins of impoundments or excavations where hydrophytes have become established but hydric soils have not yet developed; (4) areas without soils but with hydrophytes such as the seaweed-covered portion of rocky shores; and (5) wetlands without soil and without hydrophytes, such as gravel beaches or rocky shores without vegetation.*

The context and environmental setting of a wetland relative to periodic and regular saturation or inundation of the soil or substrate is, therefore, an important consideration in designating wetlands using the classification system in Cowardin *et al.,* (1979).

The Cowardin *et al.,* (1979) wetland classification publication also describes the upper (landward) and lower (waterward) limits of wetlands. These limits are described in Cowardin *et al.,* (1979) as follows:

> *The upland limit of wetland is designated as (1) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic or xerophytic cover; (2) the boundary between soil that is predominantly hydric and soil that is predominantly non-hydric; or (3) in the case of wetlands without vegetation or soil, the boundary between land that is flooded or saturated at some time each year and land that is not.*
>
> *The boundary between wetland and deepwater habitat in the Marine and Estuarine Systems coincides with the elevation of the extreme low water of spring tide; permanently flooded areas are considered deepwater habitats in these Systems. The boundary between wetland and deepwater habitats in the Riverine and Lacustrine Systems lies at a depth of 2 m (6.6 feet) below low water; however, if emergent, shrubs, or trees grow beyond this depth at any time, their deepwater edge is the boundary.*

The CFGC policy states that the Cowardin et al. (1979) wetland definition includes swamps; freshwater, brackish water, and saltwater marshes; bogs; vernal pools; periodically inundated saltflats; intertidal mudflats; wet meadows; wet pastures; springs and seeps; portions of lakes, ponds, rivers and streams; and all other areas which are periodically or permanently covered by shallow water; or dominated by hydrophytic vegetation, or in which the soils are predominantly hydric in nature. The CDFG recommends the Cowardin *et al.,* (1979) definition as its principal means of wetland identification in conjunction with on-site inspections for implementation of the CFGC's advisory policy.

Therefore, vegetation communities that are otherwise defined within the Cowardin *et al.*, (1979) classification system are also indicated in this report to assist the CDFG in its review and advisory comment pursuant to the CFGC policy. These areas with Cowardin classifications will generally coincide with vegetation communities described according to the approach for vegetation mapping.

3.7.3 Regional Water Quality Control Board Jurisdictional Surface Waters

Section 401 of the Federal Clean Water Act and the California Porter Cologne Water Quality Act is administered through the Regional Water Quality Control Boards within California. Section 401 Water Quality Certification applies to any person applying for a Federal permit or license which may result in a discharge of pollutants into waters of the United States, and 401 Water Quality Certification must document that the activity complies with applicable water quality standards, limitations, and restrictions. The following permits are usually considered subject to 401 Water Quality Certification by the California Water Boards: Clean Water Act Section 404 permits and authorizations; permits issued under Sections 9 and 10 of the Rivers and Harbors Act; licenses for hydroelectric power plants issued by the Federal Energy Regulatory Commission under the Federal Power Act; and licenses issued by the Nuclear Regulatory Commission. In this case, the primary applicable Federal permit that will be associated with the Project will be Section 404 permits for the construction of the Project where discharges of dredged or fill material will occur within waters of the U.S. Section 401 Water Quality Certification only applies to waters of the U.S. because this certification is a Federal rule within the Federal Clean Water Act that has been delegated to the State. Waters of the U.S., including wetlands, delineated using the approach described above will, therefore, serve to meet the requirements of delineation of waters that may be subject to Section 401 Water Quality Certification as delegated to the Regional Water Quality Control Boards in California.

The Porter Cologne Water Quality Act otherwise defines waters of the State as any surface water or groundwater, including saline waters, within the boundaries of the State. Therefore, surface waters subject to potential regulation pursuant to the Porter Cologne Water Quality Act include isolated, intrastate waters, which are not considered pursuant to Section 401 Water Quality Certification. The limits of surface waters of the State, including wetlands, are not defined within the Porter Cologne Water Quality Act. Wetlands are not defined within the Porter Cologne Water Quality Act.

The Porter Cologne Water Quality Act also accepts the Federal definition of waters of the U.S. within its sections dealing with Section 401 Water Quality Certification. Therefore, waters of the State pursuant to the Porter Cologne Water Quality Act were delineated if they bear an OHWM or meet the criteria for wetlands from the Federal Wetland Delineation Manual Online Edition (Corps 1987), and regional supplements, if appropriate, with the addition of isolated, intrastate waters considered as potentially subject to regulation pursuant to the Porter Cologne Water Quality Act. As such, vernal pools, including isolated, intrastate vernal pools, would be delineated at their boundaries if boundaries can be determined based on the presence of an OHWM or wetlands as defined by the Corps.

3.7.4 City of Chula Vista Wetlands Protection Program

Wetlands regulated by the City of Chula Vista are generally defined as those areas that are inundated or saturated by surface or ground water at a frequency or duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. For purposes of the Chula Vista MSCP Subarea Plan, wetlands are those lands which contain naturally occurring wetland communities listed on Table 5-6 of the Chula Vista MSCP Subarea Plan. Wetlands also include areas lacking wetland communities due to non-permitted filling of previously existing wetlands. Other waters of the U.S./State are regulated under the category of ‘natural flood channel’ under the WPP, and therefore, this program applies to all OWUS/State found on the Project component areas.

The Wetlands Protection Program has been adapted as part of the City of Chula Vista MSCP Subarea plan for all projects impacting wetland areas. These measures have been enacted in addition to the federal and state wetlands permits that are required for projects. To avoid double mitigation for projects, the City may allow the substitution of alternative mitigation requirements imposed through the Federal and State permitting processes as described in Appendix B of the Subarea Plan, "provided that the mitigation measures are equivalent or greater than those imposed by the City". As part of the CEQA review, development projects that contain wetlands will be required to demonstrate that impacts to wetlands have been avoided to the greatest extent practicable and, where impacts are nonetheless proposed, such impacts have been minimized. For unavoidable impacts to wetlands, the City will apply the wetlands mitigation ratios identified in Table 5-6 of the City's Subarea Plan. The wetlands mitigation ratios provide a standard for each habitat type, but may be adjusted depending on the functions and values of both the impacted wetlands as well as the wetlands mitigation proposed by the Project. The City may also consider the wetland habitat type(s) being impacted and utilized for mitigation in establishing whether the Subarea Plan standards have been met.

3.7.5 Waters of the United States within the Village 8 West Project

The three drainages present within the Village 8 West SPA Plan parcel are identified as waters of the U.S. (WUS) under the jurisdiction of the Army Corps of Engineers (ACOE), as shown in Figure 8. The estimated federal jurisdictional WUS, including vegetated wetlands, within the Project component areas is approximately 0.23 acre (see Table 5 in Section 4).

Drainage 1 is located along the northern border of the Village 8 West SPA Plan parcel. It drains water from a cement culvert that is located in the northeastern corner of the Village 8 West SPA Plan parcel; a concrete-lined French drain that is identified as an OWUS also feeds into this cement culvert. Drainage 1 can be distinctly separated into two portions, one being the eastern portion that has been channelized by man, and the other as a western portion that appears to be a natural channel. The ACOE jurisdiction is defined by the width at the OHWM, which ranges from six inches to six feet throughout both portions of the drainage. Throughout the eastern portion, there are hydric soils and approximately three inches of standing water, but wetland vegetation is not present. The vegetation within the standing water does contain a facultative (FAC) wetland plant (horseweed, *Conyza canadensis*), but the dominance of this facultative species’ cover does not meet the criteria for hydrophytic vegetation, which must be greater than 20% cover to qualify as a dominant cover. This portion of the drainage does not qualify as ACOE-jurisdictional wetlands because there is not sufficient cover of hydrophytic vegetation. There is a small wetland present along the western section of Drainage 1, located in the northwest corner of the Village 8 West SPA Plan parcel. Although the majority of this section of this drainage is not a wetland, it is an OWUS. The drainage that begins along the boundary of the western edge of the Village 8 West SPA Plan parcel is an OWUS that starts out at a width of two feet and opens up into a wide swale with large banks

(15' wide) and a distinct OHWM, and also supports ruderal/upland vegetation (black mustard, red brome, and wild oats). The unvegetated OWUS within Drainage 1 encompasses 0.08 acre.

Drainage 1 swale quickly narrows to a 0.05-acre freshwater marsh wetland that has an OHWM and bank width of approximately one foot. This wetland is dominated by hydrophytic plant species such as salt grass (*Distichlis spicata*), cat-tail (*Typha latifolia*), and bulrush (*Scirpus americanus*). This location is classified as a wetland under ACOE jurisdiction because in addition to hydrophytic vegetation, hydric soils and hydrology are also present.

Drainage 2 is located throughout most of the eastern border of the Village 8 West SPA Plan parcel and flows in a southerly direction, ultimately draining into the Otay River flood basin. The channel on-site does not support wetland plant species or hydric soil types, but does form a steep water-eroded drainage channel within a well-defined bed and bank, along with a distinct OHWM. The ACOE jurisdiction is defined by the 1 foot width of the OHWM. Several southwestern spiny rush (facultative wetland species [FACW] wetland indicator species) individuals were observed throughout the southern half of the channel; however, because it is not the dominant species (does not account for greater than 20% cover), this drainage does not meet the parameters for the presence of hydrophytic vegetation. Two cement culverts are present along the northern half of this channel. The unvegetated OWUS within Drainage 2 encompasses 0.07 acre.

Drainage 3 is the smallest of the channels on-site, and is located within the southwestern portion of the Village 8 West SPA Plan parcel. The drainage flows off-site to the south into the Otay River. This area was found to lack wetland vegetation and soil types, but flowing water leaves a discrete channel with a poorly defined bed and bank. Approximately ten southwestern spiny rush individuals were observed growing on the banks of the channel; however, this species is not dominant and does not indicate the presence hydrophytic vegetation. The dominant species at this location include upland species such as lemonadeberry (*Rhus integrifolia*), Russian thistle (*Salsola tragus*), ripgut brome (*Bromus diandrus*), and deerweed (*Lotus scoparius*). The roughly one-foot wide OHWM defines the ACOE jurisdiction. The unvegetated OWUS within Drainage 3 encompasses 0.03 acre.

The limits of Otay River federal jurisdictional waters associated with the off-site Future Facility component were delineated on May 2010, and are shown on Figure 8. The wetland area is shown along the edge of the Otay River flood plain, approximately 1 foot from the surface of open water. The off-site Planned and Future Facilities alignments were designed to avoid the federal jurisdictional wetland boundary within the Otay River. No federal waters or wetlands are within the construction ROW for the off-site Planned and Future Facilities alignments.

3.7.6 California Department of Fish and Game Jurisdictional Lakes and Streams within the Village 8 West Project

CDFG jurisdiction generally parallels the federal waters boundaries found in all three drainages, except that CDFG jurisdiction is taken from the top of the channel banks. No riparian vegetation occurs outside the channels. The estimated state jurisdictional waters within the Project is approximately 0.95 acre, including 0.12 acre of vegetated wetlands. See Table 5 in Section 4. The CDFG jurisdiction of Drainage 1 is measured between the top of the channel banks and ranges from 1.5 to 15 feet wide. The banks of

Drainage 2 range in width from 3 to 8 feet. Well defined bed and banks are not present north of the Not-a-Part reservoir. The CDFG jurisdiction of Drainage 3, as defined by the top of the banks, ranges in width from 2 to 5 feet. The bank of Otay River is well defined and defines the CDFG jurisdictional boundary. Approximately 0.07 acre of mulefat scrub habitat associated with the Planned and Future Facilities alignments is considered state jurisdictional waters.

3.7.7 Regional Water Quality Control Board Jurisdictional Surface Waters within the Village 8 West Project

All delineated waters of the U.S. are also waters of the State, subject to the jurisdiction of the Regional Water Quality Control Board (RWQCB). No non-Federal isolated, intrastate waters, such as vernal pools, exist at this location. The site is dominated by agricultural and coastal sage scrub habitat, and has been graded in many locations as shown in photographs 1-3, 7, 9 and 11 in Appendix F of this document. Soils that may potentially support vernal pools are found in a portion of the Project (Diablo clay with 2-9 percent slope); however, no vernal pools or vernal pool indicative plant species were detected on the Project during any surveys conducted over the last 3 years. The Project supports a 0.05-acre area of vegetated wetlands and three jurisdictional OWUS. The ACOE and CDFG will likely claim jurisdiction over the channel and OHWM of all of the drainages. The estimated state jurisdictional waters within the Project is approximately 0.95 acre. The estimated federal jurisdictional waters within the Project is approximately 0.23 acre (see Table 5 in Section 4).

3.7.8 City of Chula Vista Wetlands Protection Program

As part of the CEQA review, development Projects which contain wetlands will be required to demonstrate that impacts to wetlands have been avoided to the greatest extent practicable and, where impacts are nonetheless proposed, that such impacts have been minimized. The 0.05-acre freshwater marsh at the western end of the Project and 0.07 acre of mulefat scrub are classified as wetlands under ACOE or CDFG jurisdiction, and is also protected under the City's WPP. The total impact area applicable to the WPP is 0.95 acre, which includes the jurisdictional waters of the US/State. Impacts to these wetlands are considered significant under the WPP. The City will apply the wetlands mitigation ratios identified in Table 5 in the City's MSCP Subarea Plan, which range from 1:1 to 2:1 for freshwater marsh and mulefat scrub habitats. Jurisdictional other waters of the U.S/State are also regulated by the WPP and mitigation ratios provide a standard mitigation for each habitat type, but may be adjusted depending on the functions and values of both of the impacted wetlands and OWUS/State as well as the wetlands mitigation proposed by the Project.

SECTION 4 IMPACT ASSESSMENT

4.1 SIGNIFICANCE CRITERIA

The California Environmental Quality Act (CEQA) Guidelines define "significant effect on the environment" as a "substantial or potentially substantial adverse change in the environment". According to Appendix G of the state-wide CEQA Guidelines, impacts to biological resources would be considered significant if the project:

1. Has a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, polices, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

   The Project will result in significant impacts on several special status species. As part of the Otay Ranch Planning component, the Project is a Covered Project under the Chula Vista MSCP Subarea Plan. Impacts from this Project will be mitigated through land conveyance and habitat restoration, as specified in the MSCP and Otay Ranch RMP, as well as through preparation and implementation of species-specific ASMDs. The off-site sewer, storm drain, access road, and trail facilities are Planned and Future Facilities under the Chula Vista MSCP Subarea Plan, and thus impacts from these facilities are also covered through the MSCP and are mitigable through consistency with the MSCP and the RMP.

2. Has a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, polices, or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

   The proposed Project will result in the direct impact to 15.15 acres of CSS, 19.99 acres of disturbed CSS, 1.05 acres of MSS, 0.81 acre of NNG, 0.07 acre of MFS, and 0.05 acre of FWM. Impacts to special status vegetation communities are considered significant, but mitigable through consistency with the RMP, MSCP Subarea Plan and wetland permitting processes.

3. Has a substantial adverse effect on any federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, hydrological interruption, or other means;

   Approximately 0.23 acre of federally regulated jurisdictional waters, including 0.05 acre of federal vegetated wetlands will be impacted by implementation of the Project, which is considered significant, but mitigable.

4. Interferes substantially with the movement of any native resident or migratory fish or wildlife species or with established native or migratory wildlife corridors, or impedes the use of wildlife nursery sites;

   Implementation of the Project will not interfere substantially with the movement of fish or wildlife species or with established native or migratory wildlife corridors and no wildlife nursery sites are present in the Project area. Therefore, impacts to wildlife corridors are not significant.

5. Conflicts with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;

   The Village 8 West Project, a MSCP Covered Project, complies with the MSCP Subarea Plan and MSCP Siting Criteria, which are described in detail in Section 4.2.6 (See Section 3.1 for a summary of the Regulatory Setting). Consistent with the Otay Ranch GDP, the proposed Project is in conformance with the conservation goals and Preserve boundaries of the Otay Ranch GDP and RMP. The Project shall implement the open space land conveyance plan, Edge Plan, and Fire Plan, which are consistent with the City's Adjacency Management Guidelines. The Project properly addresses Narrow Endemic Species protection requirements and limits impacts to 100% Conservation Areas to only specific planned and future facilities that are required to support the Project. The Project shall restore wetlands and MSS habitats as required by the RMP and City Wetland Protection Plan.

   The project would comply with the Preserve design and conservation standards of the RMP. An Edge Plan has been prepared in accordance with RMP Policy 7.2 for the control edge effects, and the project will be required to meet the RMP's restoration requirements for impacts to MSS. Without compliance with the Edge Plan and MSS restoration requirements of the RMP, development of Village 8 West would result in significant impacts to implementation of the RMP.

   As previously discussed, the Otay Ranch RMP and the Otay Ranch Preserve were the primary basis for CEQA mitigation of biological impacts identified in the GDP Program EIR. The RMP includes conveyance procedures for dedicating parcels of land to the Otay Ranch Preserve and for determining the proportionate share for each village. The Otay Ranch GDP identified that the entire Otay Ranch GDP area contained 9,575 developable acres. The estimated conveyance obligation of 11,375 acres to the Otay Ranch Preserve would be met on a village-by-village basis. The conveyance ratio for all development is 1.188 acres for each acre of project area, less common areas, including schools, parks, and roadways. The proposed project would have significant impact related to biological resources management unless the Otay Ranch regional open space is preserved proportionally and concurrently with development.

   The development of Village 8 West would be within the area designated for development under the RMP and the MSCP Subarea Plan (which is based on the RMP in the Otay Ranch area) with the exception of some offsite facilities that encroach into the Preserve. The Village 8 West off-site facilities include the construction of a sewer lateral and associated access road (MSCP Planned Facilities) and a storm drain pipeline and a recreation trail (MSCP Future Facilities), a portion of which would impact the Preserve. The City's MSCP Subarea contains siting criteria for "planned facilities" and "future facilities" that are to be located within the Preserve. See Section 4.2.6 for details.

   Therefore, the Project does not conflict with local policies or ordinances that protect biological resources.

6. Conflicts with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan.

   The Village 8 West Project is a Covered Project under the Chula Vista MSCP; the Project and the off-site Future and Planned facilities associated with the Project comply with the MSCP Siting Requirements, which are described in detail in Section 4.2.6. Therefore, the Project does not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Communities Conservation Plan, or other approved local, regional, or state habitat conservation plan.

4.2 DIRECT IMPACTS

4.2.1 Vegetation

The Village 8 West SPA Plan will develop approximately 291.46 acres of land (including 4.57 acres of temporary grading within the Not-a-Part parcel and 0.26 acre of off-site fuel modification zone) and conserves approximately 15.62 acres of mostly CSS as biological open space (Table 3). The majority of this open space is located within the Chula Vista MSCP 100% Preserve Area. Approximately 1.54 acres of MSCP Preserve habitats will be impacted by the Planned and Future Facilities alignments. About 0.56 acre of impact through a planned active recreation area is also associated with the off-site Planned/Future Facilities component. Sensitive habitats are those that support sensitive species and are identified as Tier I, Tier II, or Tier III in the City's MSCP Subarea Plan (Table 4). Impacts to three upland vegetation types are considered significant and will require mitigation: MSS (Tier I), CSS (Tier II), and non-native grassland (Tier III). Tier IV vegetation types do not require mitigation. Freshwater marsh and mulefat scrub are wetland habitat types that are not covered by the MSCP Tier classification system; however, impacts to these wetland vegetation types are considered significant and will be mitigated.

Table 3
Development Impacts (acres) to Vegetation for Village 8 West Project

Vegetation Type	MSCP Habitat Tiers	Existing Acreage in Entire Project Area	Village 8 West SPA Plan			Off-site Planned / Future Facilities				
			SPA Development Area, Off-site Fuel Modification Zones, (1)	Conserved Habitat Area	Off-site Grading in Not-a-Part Parcel (2)	Off-site Planned and Future Facilities within Planned Active Recreation Area (3)	Off-site Planned Facilities Permanent Impacts within MSCP Preserve (4)	Off-site Future Facilities Permanent Impacts within MSCP Preserve (5)	Temporary Construction Impacts of Planned and Future Facilities within MSCP Preserve (6)	Grand Total Impacts (Columns 1-6 combined)
Coastal Sage Scrub	II	29.97 *	15.14 *	14.83		0	0	0	0.01	15.15
Disturbed Coastal Sage Scrub	II	19.99	19.83	0		0.16	0	0	0	19.99
Maritime Succulent Scrub	I	1.05	0.56	0		0	0.17	0.08	0.24	1.05
Non-Native Grassland	III	0.81	0.62	0		0.19	0	0	0	0.81
Freshwater Marsh	wetland	0.05	0.05	0		0	0	0	0	0.05
Mulefat Scrub	wetland	0.07	0	0		0	0	0.01	0.06	0.07
Agriculture	IV	229.55	223.31	0.70	4.57	0	0.39	0.19	0.39	228.85
Developed	IV	10.21	10.07	0.09		0.05	0	0	0	10.12
Disturbed Vegetation	IV	15.37	15.36	0		0.01	0	0	0	15.37
Total		307.08	284.94	15.62	4.57	0.41	0.56	0.28	0.70	291.46

includes SPA, off-site Planned and Future Facilities, and off-site fuel modification zone. * includes 0.26 acre of off-site CSS impacts associated with fuel modification zone.

4.2.1.1 Special Status Vegetation Communities

The Project will result in direct impacts to five special status vegetation communities: freshwater marsh, coastal sage scrub (including disturbed coastal sage scrub), maritime succulent scrub, mulefat scrub, and non-native grassland. Approximately 0.05 acre of freshwater marsh in the northern drainage (Drainage 1) would be impacted by the Project. Coastal sage scrub and disturbed coastal sage scrub occurs primarily in the southwest portion of the Project, with an additional band of disturbed coastal sage scrub in the southeast section. The Project will impact 15.15 acres of coastal sage scrub and 19.99 acres of disturbed coastal sage (Tables 1, 3, and 4, Figure 6). Approximately 0.56 acre and 0.49 acre of MSS habitat will be impacted by the Village 8 West SPA Plan and associated off-site Planned / Future Facilities. Approximately 0.07 acre of mulefat scrub (0.06 acre of which would a temporary impact) will be impacted by the off-site Future Facilities alignment. Impacts to non-native grassland will occur within the Village 8 West SPA Plan parcel (0.62 acre) and within the off-site Planned / Future Facilities alignments (0.19 acre). Impacts to special status vegetation communities are considered significant, but mitigable.

Table 4
Village 8 West Project Impacts (acres) to Special Status Vegetation

Vegetation Type	MSCP Habitat Tier	SPA Plan Impacts including Off-site Fuel Modification Zones	Off-site Planned and Future Facilities within Planned Active Recreation Area	Off-site Planned Facilities Permanent Impacts within MSCP Preserve	Off-site Future Facilities Permanent Impacts within MSCP Preserve	Temporary Impacts of Planned and Future Facilities within MSCP Preserve	Grand Total
Coastal Sage Scrub	II	15.14	0	0	0	0.01	15.15
Disturbed Coastal Sage Scrub	II	19.83	0.16	0	0	0	19.99
Maritime Succulent Scrub	I	0.56	0	0.17	0.08	0.24	1.05
Non-Native Grassland	III	0.62	0.19	0	0	0	0.81
Freshwater Marsh	wetland	0.05	0	0	0	0	0.05
Mulefat Scrub	wetland	0	0	0	0.01	0.06	0.07
Grand Total		36.20	0.35	0.17	0.09	0.31	37.12

4.2.2 Special Status Plants

4.2.2.1 CNPS List 1 and List 2 species

The Project will result in impacts to approximately 200 coast barrel cactus. The Project will result in a direct impact to approximately 3,500 Otay tarplant individuals. Otay tarplant is a MSCP covered narrow endemic. The Project will result in impacts to approximately ten San Diego marsh elder individuals. The Project will not result in impacts to south coast saltbush, which is only found within the conserved area within the Village 8 West SPA Plan parcel. Direct impacts to special status plant species including MSCP Narrow Endemic and CNPS List 1 and List 2 plant species are considered significant, but mitigable.

4.2.2.2 CNPS List 4 species

Impacts to graceful tarplant, Palmer's grappling-hook, San Diego sunflower and southwestern spiny rush would occur as part of the Project; however, these species are also conserved in the Otay Ranch Preserve. Additionally, impacts to CNPS List 4 ("watch list") plant species are not considered significant because List 4 plant species are still relatively common in San Diego County. No impacts would occur to small-flowered morning glory or seaside calandrinia as they only occur with the conserved area of the Village 8 West SPA Plan.

4.2.3 Wildlife

4.2.3.1 MSCP Covered Wildlife Species

One occupied CAGN territory occurs in coastal sage scrub within the Preserve. Sufficient CSS is being conserved on-site to support this one gnatcatcher territory. The CSS and MSS habitats proposed for impact are also suitable habitat for CAGN. Direct impacts to CAGN from the Project are considered significant, but will be mitigated to less than significant through consistency with the MSCP and RMP. Per the MSCP Subarea Plan, no clearing of CAGN-occupied habitat shall occur during the breeding season for this species (February 15 to August 15). Please see Section 5 for detailed mitigation measures and pre-construction survey requirements.

Potentially significant impact to least Bell's vireo and coastal cactus wren may occur if these two species are detected in suitable habitat during pre-construction surveys and subsequent construction biological monitoring. No clearing cover of species-suitable vegetation can occur during the species' breeding season (least Bell's vireo: March 15 to September 15; coastal cactus wren: February 15 to August 15). Potential impacts to LBVI and CAWR are considered significant, but mitigable. Please see Section 5 for detailed mitigation measures and pre-construction survey requirements for these two species.

The rufous-crown sparrow sighting location will not be impacted. The CSS and MSS habitats proposed for impact are also suitable for this species. Impacts to rufous-crowned sparrow and loss of suitable habitat are considered significant, but mitigable.

One orange-throated whiptail was observed in CSS habitat that will be impacted by the Project. Impacts to orange-throated whiptail are considered significant, but mitigable.

Burrowing owl occupied habitat will be impacted by the Project. Two burrows (active in 2009) will be directly impacted by the Project. Burrowing owls are known to occupy agricultural areas such as those found on-site, and use such areas for both nest and foraging. Although the agricultural areas on-site have been recently surveyed for burrowing owl with no observations, the potential for this species to occur on-site is high based on 2009 detections and presence of burrows. A third active burrow is located outside the impact area within the adjacent preserve area and no impacts to this burrow location will occur as a result of the proposed Project. If pre-construction survey results for this species are positive, impacts would be considered significant, but mitigable. See Section 5 for details regarding owl survey requirements and mitigation measures for occupied owl habitat.

No suitable QCB habitat will be impacted by the Project and associated off-site components. Focused flight season surveys were negative for QCB in 2009 and 2010. Impacts to QCB are not considered significant due to the absence of this species and lack of suitable habitat. The habitat in the Project falls in three categories: Non-Preserve Habitat Category B, Preserve Habitat Category B, and Planned Development Areas excluded from the QCB habitat suitability assessment based on regulatory and habitat considerations. Impacts to QCB are considered less than significant.

Habitats in the existing on-site agricultural areas provide foraging areas for sensitive raptor species including burrowing owl, white-tailed kite, northern harrier, and golden eagle. The Project would reduce foraging area available to these species by reducing the size of the agricultural area on Otay Ranch Mesa. Impacts on these species as a result of the Project are considered significant, but mitigable.

Impacts to avian species protected under the Migratory Bird Treaty Act (MBTA) may occur if habitat that may potentially support active nests is removed or impacted during the bird breeding season (February 15 through August 31). All vegetated habitats found within the Project may potentially support active bird nests. Direct impacts to breeding migratory birds are considered significant, but mitigable.

4.2.3.2 Wildlife Species not Covered by MSCP

San Diego black-tailed jackrabbit would be adversely affected by the loss of CSS, MSS, and grassland habitats, but this impact is less than significant due to this species being still common in the project vicinity. Northwestern San Diego pocket mouse, Dulzura California pocket mouse, San Diego woodrat, and coast rosy boa were not observed on the Project, but are typically found in CSS and may be impacted by removal of this vegetation on-site if they are present. Direct impacts to regional populations of these species are considered to be less than significant due to the relatively small amount of CSS and MSS being impacted on-site and the low risk of endangerment associated with these species. Grasshopper sparrow would be impacted by the loss of grassland and fallow agricultural lands, but this species is still too common for such an impact to be considered significant at a range-wide scale.

4.2.4 Wildlife Movement

Figure 7 identifies the wildlife movement corridors in the vicinity of the Project. A wildlife corridor is defined as a linear area that allows for the movement of wildlife between patches of habitat or from live-in habitat to some other resource such as water. The quality of a particular corridor to wildlife is evaluated based on the focal target species expected to use the corridor. Focal species commonly used to evaluate corridor usage in San Diego County include large mammals such as mule deer (*Odocoileus hemionus*), bobcat, or coyote, or special status birds such as coastal California gnatcatcher or San Diego cactus wren. Types of corridors often used by focal target species include canyons and road underpasses such as culverts, bridges, and freeway interchanges of varying dimensions (Ogden Environmental 1993). The Project currently supports a wildlife movement for CAGN and CAWR (Ogden Environmental 1993; Figure 7). The Wolf Canyon linkage is west of the Project and the Otay River is the main east-west linkage in the Project vicinity. The canyons west of the Project are within designated conservation areas, and the biological open space around Rock Mountain provides access to Wolf Canyon. Therefore, the continuity of suitable wildlife habitat associated with the adjacent east-west trending Otay River Valley and Rock Mountain open space is conserved per the Chula Vista Subarea Plan and Otay Ranch GDP and RMP. Wolf Canyon will not be isolated by the proposed project. Installation of the linear facilities in the preserve will be a temporary construction impact and will not interfere with wildlife movement over the long-term since this much of the construction impact area and easement will be revegetated. The post and rail fencing associated with the off-site pedestrian trail shall be designed and constructed to allow for wildlife movement across the trail.

4.2.5 Jurisdictional Waters

Formal jurisdictional delineations conducted by URS, show that the Project will impact a total of 0.05 acre of ACOE-jurisdictional wetlands (freshwater marsh), and 0.18 acre of ACOE-jurisdictional OWUS (Table 5). Direct impacts to ACOE jurisdictional wetlands adjacent to the Future Facilities alignment will be avoided during construction. Impacts to federal jurisdictional waters are considered significant and will require mitigation in accordance with the terms and conditions of a 404 permit from the ACOE. A Section 401 Water Quality Certification from the San Diego Regional Water Quality Control Board must be issued before the Project can receive a 404 permit from the ACOE.

A total of 0.83 acre of CDFG non-vegetated channel within the impact limits for the Project (Table 5). Approximately 0.12 acre of CDFG wetlands (0.5 acre of freshwater marsh in the Village 8 West SPA Plan parcel and 0.07 acre of mulefat scrub within the Future Facilities alignment). Impacts to 0.95 acre of State jurisdictional waters are considered significant and will require mitigation in accordance with the terms and conditions of a 1602 agreement with the California Department of Fish and Game.

Impacts to 0.95 acre of wetlands and channels must be mitigated to be consistent with the City of Chula Vista Wetlands Protection Program. The impacted wetlands and other waters of the U.S. /State delineated meets the definition of Chula Vista's Wetlands Protection Program (WPP) and mitigation ratios presented in Table 5 are consistent with Table 5-6 in the Chula Vista's MSCP Subarea Plan.

Table 5
Impacts to Jurisdictional Waters and Wetlands

	ACOE OWUS					CDFG Channel				
	Length (ft)	Width (ft)	Area (sq ft)	Area (acres)	2:1 Mitigation Ratio (acres)	Length (ft)	Width (ft)	Area (sq ft)	Area (acres)	2:1 Mitigation Ratio (acres)
SPA Plan - Drainage 1 OWUS/State	1,828	1-3	3,644	0.08	0.16	1,828	4-6	9,996	0.23	0.46
Drainage 1 Wetland	726	3	2,178	0.05	0.1	726	3	2,178	0.05	0.1
SPA Plan - Drainage 2 OWUS/State	2,953	1	2,953	0.07	0.14	2,953	8	2,2651	0.52	1.04
SPA Plan - Drainage 3 OWUS/State	1,403	1	1,403	0.03	0.06	1,403	2.5	3,508	0.08	0.16
Future Facilities Alignment (Storm Drain Outfall) Wetland	0	0	0	0	0	0	0	3,050	0.07	0.14
Total	6,910		10,178	0.23	0.46	6,910		41,383	0.95	1.90

4.2.6 Consistency with MSCP City of Chula Vista Subarea Plan and Otay Ranch Resource Management Plan

The Project design is consistent with the MSCP Subarea Plan and the Otay Ranch RMP through specific adherence to conditions of coverage and mitigation/conveyance requirements for Covered Projects, as defined in the Chula Vista MSCP, Section 7.6 and the Otay Ranch RMP. The Planned and Future facilities that are located within the Preserve were designed to minimize impacts to covered habitats and species by following the MSCP Siting Criteria described in Section 4.2.6.1 of this report.

The Otay Ranch RMP and the Otay Ranch Preserve were the primary basis for CEQA mitigation of biological impacts identified in the GDP Program EIR. The RMP includes conveyance procedures for dedicating parcels of land to the Otay Ranch Preserve and for determining the proportionate share for each village. The Otay Ranch GDP identified that the entire Otay Ranch GDP area contained 9,575 developable acres. The estimated conveyance obligation of 11,375 acres to the Otay Ranch Preserve would be met on a village-by-village basis. The conveyance ratio for all development is 1.188 acres for each acre of project area, less common areas, including schools, parks, and roadways. The proposed Project would have significant impact related to biological resources management unless the Otay Ranch

Preserve is assembled proportionally and concurrently with development in accordance with provisions of the City's MSCP and Otay Ranch RMP.

The development of Village 8 West SPA Plan would be within the area designated for development under the Otay Ranch RMP and the MSCP Subarea Plan with the exception of the off-site facilities component that will traverse through designated Preserve areas. The off-site facilities component include the construction of a sewer lateral and associated access road (MSCP Planned Facilities) and a storm drain pipeline and a pedestrian trail (MSCP Future Facilities). Land uses within the Preserve (including roads and infrastructure) that are considered compatible with the need to permanently protect Covered Species and their habitats are further described in Section 6.0 (Land Use Consideration in the Preserve) of the City's MSCP Subarea Plan. In accordance with Section 6.0 of the City's MSCP Subarea Plan, projects located within the Preserve shall be subject to the Facilities Siting Criteria contained in Section 6.3.3.4 of the City's MSCP Subarea Plan. Compliance with the Facilities Siting Criteria ensures that the facilities located within the Preserve have been sited within the least environmentally sensitive areas and that impacts to the Preserve have been minimized to the maximum extent practical. The following section provides an analysis of the Facilities Siting Criteria relative to the Project's off-site Planned and Future Facilities component.

4.2.6.1 Planned and Future Facilities/Siting Criteria Located within the Preserve (CCV MSCP Sections 6.3.3, 6.3.3.1, 6.3.3.4)

The proposed off-site Planned (sewer pipeline and access road) and Future Facilities (storm drain pipeline and pedestrian trail) supporting a Covered Project are allowed in the Preserve under the City's MSCP Subarea Plan, subject to the Siting Criteria identified in Sections 6.3.3,6.3.3.1, and 6.3.3.4 of the City's Subarea Plan.

The following is an analysis of the Facilities Siting Criteria (Section 6.3.3.4 and Table 6-1 of the Subarea Plan) relative to the Project's off-site Planned and Future Facilities that have been co-located within a single 50-foot construction ROW:

> *(a) Such facilities will be located in the least environmentally sensitive location feasible, and use existing roads, trails and other disturbed areas, including use of the active recreation areas in the Otay River Valley, as much as possible (except where such areas are occupied by the QCB). Facilities should be routed through developed or developing areas where possible. If no other routing is feasible, alignments should follow previously existing roads, easements, rights of way, and disturbed areas, minimizing habitat fragmentation.*

The off-site facilities were co-located within a single construction ROW and clustered with existing facilities (i.e., City of San Diego waterlines) to minimize habitat fragmentation and impacts to covered species. To further reduce impacts within designated Preserve areas, the off-site facilities alignment was sited to align with and utilize development areas associated with planned active recreation to the maximum extent practicable.

The permanent easement width needed for the storm drain pipeline was reduced from the City's engineering standard width of 20-feet down to 10-feet due to the co-location with the 20-foot easement width required for the sewer pipeline. In addition, the access road associated with the planned sewer lateral will be also be used to not only access the storm drain pipeline but will also serve as the future pedestrian trail connection to the OVRP. As a result, a separate ROW will not be required for the construction of the pedestrian trail. Through the co-location of these facilities, impacts associated with habitat fragmentation have been minimized as compared to if these facilities were geographically separated. Temporary impacts associated with the construction the Project's off-site facilities component will be revegetated pursuant to an approved revegetation plan (see Section 5 for the timing and requirements of the revegetation plan).

(b) Such facilities shall avoid, to the maximum extent practicable, impacts to Covered Species and Wetlands, and will be subject to the provisions, limits, and mitigation requirements for Narrow Endemic Species and Wetlands pursuant to Section 5.2.3 and 5.2.4 of the Subarea Plan.

As previously discussed, the off-site facilities were co-located within a single alignment and clustered with existing facilities to minimize impacts to covered species and their habitats. Given the relatively even distribution of CSS, MSS, and NNG located along the Project's southern boundary the southern boundary, moving the alignment further east or west would not substantially reduce impacts to these habitat communities and the Covered Species that they support. While these sensitive habitat communities cannot be avoided, it is important to note that the majority of the off-site facilities alignment has been sited through less sensitive agricultural areas and designated active recreation development areas.

Wetland impacts have been minimized to the greatest extent possible by placing the off-site Planned and Future Facilities alignments adjacent to, but not within federal wetlands and other jurisdictional waters. Impacts to mulefat scrub were minimized by restricting the temporary construction ROW associated with the storm drain outfall/point of discharge to 25 feet to avoid ACOE jurisdictional waters. The construction and location of the facilities has been sited and designed to avoid, to the maximum extent practicable, minimize impacts to Covered Species, their potential habitats and wetlands by co-locating the facilities and minimizing the extent of the construction ROW. Alternative alignments nearby would result in equal or greater impacts to habitats potentially utilized by Covered Species. A previous alignment considered at the southeastern portion of the Project area supported several sensitive plant species, including Otay tarplant, a narrow endemic species. The proposed alignment avoids direct impacts to Narrow Endemic Species. All temporary impacts associated with the construction of the off-site Planned and Future Facilities component will be revegetated (see Section 5 for the timing and requirements of the revegetation plan). This criterion has been satisfied.

(c) Where roads cross the Preserve, they should provide for wildlife movement in areas that are graphically depicted on and listed in the MSCP Subregional Plan Generalized Core Biological Resource Areas and Linkages map as a core biological area or a regional linkage between core biological areas. All roads crossing the Preserve should be designed to result in the least impact feasible to Covered Species and Wetlands. Where possible at wildlife crossings, road bridges for vehicular traffic rather than tunnels for wildlife use will be employed. Culverts will only be used when they can achieve the wildlife crossing/movement goals for a specific location. To the extent feasible, crossings will be designed as follows: the substrate will be left in a natural condition or revegetated if soils engineering requirements force subsurface excavation

and vegetated with native vegetation if possible; a line-of-sight to the other end will be provided; and if necessary, low-level illumination will be installed in the tunnel.

The proposed construction associated with the off-site Planned and Future Facilities alignments will include a permanent access road and pedestrian trail that will be paved with concrete or asphalt. The access road will not impede a major regional linkage and culverts will not be required within the Preserve. In addition, the post and rail fence associated with pedestrian trail will be designed and constructed to allow for continued wildlife movement through this area. By co-locating the facilities within a minimal width construction ROW and revegetating areas of temporary construction impact, these linear facilities would not impede wildlife movement. Redundant facilities through the preserve are avoided. These facilities do not include lighting that may indirectly impact wildlife. The remainder of the Otay River Valley south of the proposed facilities is also available for wildlife movement (Figure 7). Therefore, this criterion has been satisfied.

(d) To minimize habitat disruption, habitat fragmentation, impediments to wildlife movement and impact to breeding areas, road and/or right-of-way width shall be narrowed from existing City design and engineering standards, to the maximum extent practicable. In addition, roads shall be located in lower quality habitat or disturbed areas to the maximum extent practicable.

The access road has been narrowed to 12 feet wide from the original design of 25 feet wide and will be used for both sewer and storm water facilities, thus avoiding redundant access roads through the preserve and minimizing impacts to wildlife habitats. The inclusion of the pedestrian trail will not cause additional habitat impacts, as the trail throughway will overlap the paved access road.

As previously discussed, given the relatively even distribution of CSS, MSS, and NNG located along the Project’s southern boundary the southern boundary, moving the access road/pedestrian trail east or west would not substantially reduce impacts to sensitive habitat communities and the Covered Species that they support. While these sensitive habitat communities cannot be avoided, it is important to note that the majority of the off-site facilities alignment has been sited through less sensitive agricultural areas and designated active recreation development areas. Therefore, this criterion has been satisfied.

(e) Impacts to Covered Species and habitats within the Preserve resulting from construction of Future Facilities will be evaluated by the City during project review and permitting. The City may authorize Take for impacts to Covered Species and habitats resulting from construction of Future Facilities located outside the Preserve, pursuant to the Subarea Plan and consistent with the Facility Siting Criteria in this Section.

The off-site storm drain facilities and pedestrian trail are considered Future Facilities under the City’s MSCP Subarea Plan. Impacts to Covered Species and habitats in the Preserve have been minimized by co-locating the trail, storm drain, and sewer facilities within a single 30-foot permanent easement within a 50-foot construction ROW though the Preserve. Covered Species potentially utilizing the 0.57 acre of impacted Preserve habitats are California gnatcatcher, burrowing owl, cactus wren, and least Bell’s vireo.

(f) The City may authorize "Take" for impacts to Covered Species resulting from construction of Future Facilities located within the Preserve, subject to a limitation of 2 acres of impact for individual projects and a cumulative total of 50 acres for all Future Facilities. Wildlife Agency

concurrence will be required for authorization of Take for any impacts to Covered Species and habitat within the Preserve that exceed 2 acres that may result from construction of any individual Future Facility. Wildlife Agency concurrence will be required for authorization of Take for impacts to Covered Species and habitat within the Preserve that exceed 50 acres that may result from all Future Facilities combined.

The total permanent impact to Covered Species habitat associated with the development of the Future Facilities component is 0.09 acres, which is consistent with the 2 acre per project limitation. Temporary impacts shall be revegetated and are not subject to the Future Facilities acreage limitations (see Section 5 for the timing and requirements of the revegetation plan). This criterion has been satisfied.

(g) Planned and Future Facilities must avoid impacts to covered Narrow Endemic Species and the QCB to the maximum extent practicable. When such impacts cannot be avoided, Planned and Future facilities located within the Preserve are subject to the provisions of Section 5.2.3.6 of the Subarea Plan. Impacts to QCB that will result from construction of Planned and Future Facilities within the Preserve are subject to the provisions of Section 5.2.8 of the Subarea Plan.

No narrow endemic species were observed during the updated surveys conducted for the off-site Planned and Future Facilities. Likewise, results for updated QCB surveys that were conducted for the alignment were negative. Therefore, consistent with Section 5.2.8 of the Subarea Plan, the Project as designed will avoid impacts to covered narrow endemic species and QCB, and this criterion is satisfied.

(2) Additional Measures

In accordance with Section 5.2.8.1 of the Subarea Plan, infrastructure projects constructed within the Preserve will be subject to the following sequence of measures to avoid and minimize impacts to QCB and QCB habitat:

(a) A habitat assessment will be conducted in potential facility locations as part of the project siting and design process.

As noted above, multiple habitat assessments have been conducted within the Future and Planned Facilities alignment within the Preserve. Therefore, this criterion has been satisfied.

(b) QCB surveys will be conducted in appropriate habitat by a qualified biologist in accordance with the most recent survey protocol adopted by the USFWS.

Surveys for the QCB using current USFWS protocol were conducted in 2009, and 2010. No QCB were detected during these surveys. Therefore, this criterion has been satisfied.

(c) If QCB are observed within the proposed project area, the project will be designed to avoid impacts to QCB habitat to the maximum extent practicable.

No QCB were observed within or adjacent to the Planned and Future Facilities alignments, and no avoidance is required. Therefore this criterion has been satisfied.

(d) The following avoidance criteria will be applied specifically to Preserve Habitat-Category A areas located east of SR 125.

The Planned and Future Facilities alignment is located west of SR-125. Therefore this criterion is not applicable.

(e) For construction in areas adjacent to occupied habitat, dust control measures (i.e., watering) will be applied during grading activities.

Because there is no occupied, Category A Modeled Habitat, this measure does not apply. Therefore this criterion has been satisfied. However, air quality dust control measures and previously adopted air quality mitigation measures from the Otay Ranch GDP Program Environmental Impact Report (PEIR) will be implemented during project construction, which will minimize indirect impacts to sensitive biological resources.

(f) As part of the overall Preserve management strategy, a weed control program will be established for all water/sewer line access roads built through potential QCB habitat. This will include road construction using a concrete-treated base material with aggregate rock to prevent vegetation growth on the road surface, while allowing sufficient percolation to minimize flows. The zone of influence to be subject to the weed control program will be determined by the City's Habitat Manager based on-site-specific conditions.

No occupied habitat has been found adjacent to the Planned and Future Facilities alignments; however, suitable habitat exists in the vicinity. The access road has been designed to be consistent with this requirement. The access road/pedestrian trail will be 12 feet wide and constructed of concrete or asphalt. The areas on either side will contain aggregate to minimize vegetation growth. Therefore this criterion has been satisfied.

(3) Implementation Criteria/Assurances

Table 6-1 of the MSCP Subarea Plan identifies Implementation Criteria/Assurances for Planned Facilities. The offsite sewer lateral and access road are associated with the Salt Creek Intercept/Otay Trunk Sewer. These Implementation Criteria/Assurances include:

(a) Siting of these sewer facilities is subject to the Otay Ranch RMP Phase 1 Policy 6.6 and the RMP Infrastructure Plan, Section 6.0; and Otay Ranch RMP Phase 2 Conceptual Infrastructure Plan.

The development associated with the Planned Facilities in the Preserve are consistent with the Otay Ranch RMP Phase 2 Conceptual Infrastructure Plan in that the Project has been sited primarily in development, disturbed and/or low quality agricultural areas to the extent practicable, temporary impacts to Diegan coastal sage scrub and maritime succulent scrub will be mitigated, potential impacts to sensitive wildlife species will be mitigated, erosion control is required through Project BMPs, and wetland impacts have been minimized through site design. Therefore, this criterion is satisfied.

(b) Best Management Practices (BMPs) will be used to design and maintain these facilities.

Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits, the Project Applicant shall prepare a Storm Water Pollution Prevention Plan (SWPPP) to the satisfaction of the City Engineer. The BMPs contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydro-seeding. Therefore, this criterion is satisfied.

(c) Sewer lines will be sited to avoid mitigation-sites created as mitigation for other projects.

No mitigation sites are known to occur within the immediate vicinity of the Planned Facilities alignments. Therefore, this criterion is satisfied.

(d) Maintenance access roads related to these sewer facilities will be sited to avoid to the maximum extent practicable impacts to Covered Species and habitats, including Covered Narrow Endemic Species, pursuant to the Facilities Siting Criteria in Section 6.3.3.4 of the Subarea Plan.

A new access road will be constructed in conjunction with the Planned Facilities component. The access road has been narrowed, to the maximum extent practical to 12 feet wide from the original design of 25 feet wide, This access road will also be used to access the storm water facilities, thus avoiding redundant access roads through the preserve and minimizing impacts to wildlife habitats. No narrow endemic species are located within the access road footprint. Therefore, this criterion is satisfied.

(e) Through the Otay River Valley where existing unpaved roads will be utilized, road widths will be limited to 20 feet. Maintenance access roads will be constructed as follows:

- *Access roads will be constructed of concrete-treated base (CTB) material with aggregate rock to minimize frequency of maintenance.*
- *Where access roads exceed a 5 percent grade, concrete or asphalt may be permitted to ensure maintenance vehicle traction.*
- *Where cross-drainage occurs, concrete aprons may be permitted to minimize erosion.*

The proposed access road will be constructed in association with the off-site sewer lateral (Planned Facility). The access road has been narrowed, to the maximum extent practical to 12 feet wide from the original design of 25 feet wide. This access road will also be used to access the storm water facilities, thus avoiding the need to construct redundant access roads through the Preserve and minimizing impacts to wildlife habitats. Therefore, this criterion is satisfied.

(f) Temporary impacts related to these sewer facilities will be revegetated pursuant to Section 6.3.3.5 of the Subarea Plan.

All temporary impacts resulting from the Planned and Future Facilities alignments will be revegetated (see Section 5 for the timing and requirements of the revegetation plan). Therefore, this criterion is satisfied.

(g) Public access to finger canyons associated with the primary canyons involving these facilities will be limited, pursuant to the Otay River Valley Framework Management Plan, Section 7.6.3 of the Subarea Plan.

The proposed pedestrian trail connection to OVRP will include signage and lodge pole fencing along the trail throughway to direct pedestrian traffic along designated trail routes and discourage public access to potentially sensitive habitat areas. Access connecting the Village 8 West SPA Plan development area to future OVRP trail connections to the south will be restricted using gates, fences, and signs until the OVRP trail system in this area has been completed. This criterion is satisfied.

Based on the preceding discussion, the proposed off-site Planned and Future Facilities alignments that will be located within the Preserve are considered to be consistent with the requirements and criteria of the City's MSCP Subarea Plan and would not conflict with the adopted MSCP. The proposed off-site facilities will not impact MSCP Narrow Endemic Species. All impacts to Covered Species and their habitats within the Preserve are mitigated through implementation criteria for these facilities and through conservation strategies of the City's MSCP Subarea Plan. Therefore, impacts would be considered less than significant.

4.2.6.2 Adjacency Management

In accordance with Policy 7.2 of the Otay Ranch RMP II, a Preserve Edge Plan has been developed for this Project (OLC 2010). The Preserve Edge is located within the SPA and consists of a 100-foot buffer strip of land adjacent to the Preserve. The Preserve Edge Plan addresses adjacency issues such as drainage, contaminants, invasive species, lighting and noise, and measures to minimize impacts to the adjacent habitats.

In accordance with the Otay Ranch GDP and RMP, a Draft Agricultural Plan has also been developed to discuss the phased elimination of agricultural activities on site. Grazing and dry farming are the only activities currently permitted on the Project. The plan also includes measures to reduce agricultural impacts such as a requiring a minimum 200-foot buffer between agricultural operations and developed areas, the use of vegetation to shield development within at least 400 feet from areas where pesticide may be applied, fencing off of areas for safety/security, and preliminarily notifying local residents of any pesticide use.

A Fire Protection Plan has been developed to address fire safety for the Project (OLC 2010). The Fire Protection Plan outlines fire response strategies, fire prevention strategies, and fire potential in relation to the native habitat along the southern edge of the Project, in the Preserve area. This document also outlines fuel modification specifications for vegetation, including acceptable plant lists. The fuel modification zone does not encroach into the Preserve.

To further reduce indirect impacts to special status vegetation communities as a result of edge effects from development, the following directives are included in the Village 8 West SPA Plan and must be implemented accordingly.

1) No invasive, non-native plant species shall be introduced into areas immediately adjacent to the Preserve. All slopes immediately adjacent to the Preserve shall be planted with native species that are consistent with the adjacent native habitat. The Edge Plan includes plant lists that can and cannot be used in the revegetation of natural areas. (see Appendix G)
2) All agricultural uses, including animal-keeping activities, and recreational uses that use chemicals or general by-products such as manure, potentially toxic to special status habitats or plants need to incorporate methods on-site to reduce impacts caused by the application and/or drainage of such material into Preserve areas.
3) A 100 ft. buffer has been installed around the edge of the Preserve areas. This buffer is not part of the Preserve, but is a privately or publicly owned area included in lots within the urban portion of Otay Ranch. This buffer may include the fuel modification zones.
4) An onsite detention basin will be installed to control the post-development peak stormwater runoff discharge rates and velocities prior to discharging project flows into Wolf Canyon. This is consistent with the City's storm water management plans and the MSCP's adjacency management guidelines related to reducing the potential for erosion and protecting downstream habitat.

These documents are incorporated into the Village 8 West SPA Plan and were prepared to address the relevant adjacency management guidelines including, but not limited to, access control, noise, drainage, lighting, buffers/brush management, and toxic substances. Implementation of the design features contained in these SPA Plan documents will reduce short and long-term indirect impacts associated with the Project to a level below significant.

4.3 INDIRECT IMPACTS

4.3.1 Vegetation Communities

Indirect impacts to vegetation communities would result primarily from adverse "edge effects." Sensitive vegetation located at or near the limits of grading for the Project have the greatest probability of suffering from edge effects. Edge effects can be observed in habitats that are 100 or more feet beyond the limits of grading, depending on the species of concern. During construction of the Project, edge effects may include dust that could disrupt plant vitality in the short term, or construction-related soil erosion and runoff. Long-term indirect impacts on vegetation communities most likely would occur as a result of invasion by exotic species, alteration of the natural fire regime, or chronic erosion and sedimentation, noise and lighting impacts. Indirect impacts to vegetation communities are considered potentially significant. An Edge Plan was developed for the Project to offset and minimize edge effects within the MSCP Preserve, consistent with the Adjacency Management requirements in the MSCP.

Indirect adverse effects to jurisdictional waters as a result of the Project include potential increased runoff, sedimentation, erosion, and invasive exotic plant introduction. Indirect impacts to vegetation are reduced to below significant levels through the design features outlined in the Project drainage and hydromodification studies and water quality technical report (Hale Engineering 2011). Indirect impacts to downstream vegetation in Otay River and Wolf Canyon are less than significant. See Section 4.3.4 for more detailed discussion.

4.3.2 Special Status Plant Species

Most of the indirect impacts to vegetation communities cited above can also affect special status and MSCP covered plants. During construction of the Project, excess dust from construction work could disrupt short term plant vitality by clogging reproductive structures. Development related soil erosion and runoff could also have a negative short-term effect on sensitive species. Long-term negative edge effects on sensitive plants are also possible. These could include intrusions by exotic plant species, continued exposure to agricultural pollutants (fertilizers, pesticides, and herbicides), soil erosion, and fire. These potential indirect impacts are considered significant.

4.3.3 Special Status Wildlife Species

Short-term indirect impacts to sensitive nesting bird species consists of noise, lighting, toxic substances and water quality and drainage. Species potentially affected by such activities include, but are not limited to: California gnatcatchers located adjacent to the Project, nesting raptors, such as northern harrier, burrowing owl, and black-tailed jackrabbits. Construction noise exceeding 60 Decibel hourly equivalent level (dB(A) Leq-h) at the location of any occupied habitat areas can impact special status wildlife species in many ways by inhibiting audible communication between potential mates and between parents and offspring.

Long-term indirect impacts to covered wildlife species would also occur as a result of the Project. The long-term indirect impacts could include increased human activity in the Preserve, and domestic animal predation on listed wildlife species in the Preserve. These impacts are all considered to be adverse to covered species residing in this area. Indirect impacts to covered wildlife species as a result of the Project are considered significant and will require mitigation. Impacts to wildlife species not covered by the MSCP would be similar to covered species, but would be less than significant due to their less sensitive status and the extensive habitat conservation in the project vicinity.

4.3.4 Jurisdictional Waters

Indirect adverse effects to jurisdictional waters as a result of the Project include potential increased runoff, sedimentation, erosion, and invasive exotic plant introduction. Indirect impacts to jurisdictional waters are reduced to below significant levels through the design features outlined in the Project drainage and hydromodification studies and water quality technical report (Hale Engineering 2011).

The expected velocities at the end of the energy dissipation structure and rip-rap apron of the storm water outfall in Otay River will be reduced to below the calculated velocities in Otay River during the 100-year and 50-year frequency storms events. It is not anticipated that the dissipated flows from the Village 8 West Otay River outfall will significantly affect the river streambed (Hale Engineering, pers. comm., February 2011, AGS 2011a). Outfall velocities for less intense storm events are predicted to be slower and non-erosive. No significant impacts to downstream riparian vegetation within Otay River are anticipated as a result of scouring and/or erosion.

The inclusion of an onsite retention basin at Wolf Canyon will preclude potential downstream erosion/hydromodification. The post-construction discharge velocity from the outfall is expected to be less than the pre-construction condition, thus no significant project-related erosion within Wolf Canyon is anticipated (Hale Engineering, pers. comm. February 2011, AGS 2011b).

Discharge of storm water runoff associated with construction activities will be addressed in a SWPPP. The Construction General Permit SWPPP will be prepared in accordance with the RWQCB and City of Chula Vista Development Storm Water Manual requirements. The construction activity BMPs will be implemented to reduce construction-related impacts and provide acceptable stabilization of the Project. It may be necessary to implement some BMPs prior to clearing and grubbing. If the proposed Project incorporates phased grading operations, the construction activity BMPs shall take into account the interim grading conditions. The Village 8 West Development Water Quality Technical Report addresses post-construction water quality requirements and related BMPs during the operational phase of the project.

4.4 CUMULATIVE IMPACTS

Implementation of the Project would contribute to the cumulative loss of biological resources within the Otay Ranch and City of Chula Vista Subarea. Compliance with the Subarea plan conditions for coverage, the Otay Ranch RMP, and conveyance of compensatory mitigation lands to the Preserve Owner Manager (POM) and compensatory wetland mitigation required by state and federal wetlands permitting agencies will ensure long-term sustainability of Covered Species, their associated habitats,

Cumulative impacts consider the potential regional effects of a project and how a project may affect an ecosystem or one of its members beyond the project limits and on a regional scale. The Otay Ranch PEIR analyzed the existing conditions, potential impacts, and mitigation measures related to biological resources for the entire Otay Ranch area, including the Project site, which consists of approximately 23,000 acres in the County of San Diego, the City of Chula Vista, and the City of San Diego. The Otay Ranch PEIR identified significant unavoidable impacts to biological resources in Otay Ranch due to loss of raptor foraging habitat. Subsequent to the certification of the PEIR and adoption of the Otay GDP, the City adopted the Chula Vista MSCP Subarea Plan, which is described in more detail in Section 3.1 of this report. The MSCP planning program provided for mitigation of impacts on sensitive species and their habitats on a regional, basis. Such mitigation was not available at the time the Otay Ranch PEIR was certified. Because of the level of conservation provided for habitats that support raptor foraging on a regional basis, new feasible mitigation for the impacts not identified in the PEIR to raptor foraging habitat is now available to mitigate project-level impacts.

The Project would also result in the loss of 0.05 acre of freshwater marsh, 0.07 acre of mulefat scrub, 15.15 acres of coastal sage scrub, 19.99 acres of disturbed coastal sage scrub, and 1.05 acre maritime succulent scrub, which would be mitigated with conveyance of Preserve lands as required by the Otay Ranch RMP. Temporary construction areas and the graded portion of the fuel modification zone will be revegetated with native vegetation. Additional wetlands mitigation is also expected as conditions of wetlands permits. The loss of sensitive plant species and vegetation communities would be mitigated through the conveyance of 1.188 acres of land to the City of Chula Vista for every developed acre impacted, along with habitat restoration of maritime succulent scrub at a 1:1 ratio, pursuant to the Otay Ranch RMP. This conveyance program, coupled with the maritime succulent scrub restoration program will adequately conserve a greater or equal amount of special status vegetation types within Otay Ranch. Implementation of these measures and consistency with the Chula Vista Subarea Plan and Otay Ranch RMP mitigates cumulative biological impacts to MSCP Covered Species and their associated habitats.

SECTION 5 MITIGATION

Mitigation for Project Effects on Sensitive Species and Habitats, including Riparian Habitats

- Prior to the approval of the First Final Map for the Project, the project Applicant shall coordinate with the City Engineer and annex the project area within the Otay Ranch Preserve Community Facilities District (CFD) No. 97-2.
- Prior to recordation of each Final Map Applicant shall convey land within the Otay Ranch Preserve to the Otay Ranch POM or its designee at a ratio of 1.188 acres for each acre of development area, as defined in the RMP. Access for maintenance purposes shall also be conveyed to the satisfaction of the POM, and each tentative map shall be subject to a condition that the Applicant shall execute a maintenance agreement with the POM stating that it is the responsibility of the Applicant to maintain the conveyed parcel until the Preserve CFD has generated sufficient revenues to enable the POM to assume maintenance responsibilities. The Applicant shall maintain and manage the offered conveyance property consistent with the RMP Phase 2 until the Preserve CFD has generated sufficient revenues to enable the POM to assume maintenance and management responsibilities.
- Prior to the POM's formal acceptance of the conveyed land in fee title, the project Applicant shall prepare, to the satisfaction of the POM, Area Specific Management Directives (ASMDs) for the associated conveyance areas. The ASMDs shall incorporate the guidelines and specific requirements of the Otay Ranch RMP plans and programs, management requirements of Table 3-5 of the MSCP Subregional Plan and information and recommendations from any relevant special studies. Guidelines and requirements from these documents shall be evaluated in relationship to the Preserve configuration and specific habitats and species found within the associated conveyance areas and incorporated into the ASMDs to the satisfaction of the POM.
- Prior to the issuance of any land development permits (including clearing and grubbing or grading permits) the project Applicant shall prepare a restoration plan to restore 1.05 acres of MSS. The MSS restoration shall be prepared by a City approved biologist and to the satisfaction of the Development Services Director (or their designee) pursuant to the Otay Ranch RMP restoration requirements. The restoration plan shall include, at a minimum, an implementation strategy; species salvage and relocation, appropriate seed mixtures and planting method; irrigation; quantitative and qualitative success criteria; maintenance, monitoring, and reporting program; estimated completion time; and contingency measures. The project Applicant shall also be required to implement the revegetation plan subject to the oversight and approval of the Development Services Director (or their designee).
- Prior to issuance of land development permits, including clearing or grubbing and grading permits, the project Applicant shall prepare a Resource Salvage Plan for areas with salvageable resources, including, but not limited to, Otay tarplant – a Chula Vista Narrow Endemic Species, *Plantago erecta* (QCB larval host plant), coast barrel cactus, and San Diego sunflower. The Resource Salvage Plan shall be prepared by a City approved biologist and to the satisfaction of the Development Services Director (or their designee). The Resource Salvage Plan shall, at a minimum, evaluate options for plant salvage and relocation, including native plant mulching, selective soil salvaging, application of plant materials on manufactured slopes, and

application/relocation of resources within the preserve. Relocation efforts may include seed collection and/or transplantation to a suitable receptor site and will be based on the most reliable methods of successful relocation. The program shall contain a recommendation for method of salvage and relocation/application based on feasibility of implementation and likelihood of success. The program shall include, at a minimum, an implementation plan, maintenance and monitoring program, estimated completion time, and any relevant contingency measures. The Project Applicant shall also be required to implement the Resource Salvage Plan subject to the oversight of the Development Services Director (or their designee).

- For any work proposed between February 15 and September 15, prior to issuance of any land development permits, including clearing, grubbing, grading, and construction permits associated with the off-site facilities located within the preserve, a pre-construction survey for the coastal California gnatcatcher, coastal cactus wren, and least Bell's vireo shall be performed in order to reaffirm the presence and extent of occupied habitat. The pre-construction survey area for the species shall encompass all potentially suitable habitat within the project work zone, as well as a 300-foot survey buffer.

  The pre-construction survey shall be performed to the satisfaction of the Development Services Director (or their designee) by a qualified biologist familiar with the City's MSCP Subarea Plan. The results of the pre-construction survey must be submitted in a report to the Development Services Director (or their designee) for review and approval prior to the issuance of any land development permits and prior to initiating any construction activities. If California gnatcatcher, cactus wren or least Bell's vireo is detected, a minimum 300-foot buffer delineated by orange biological fencing shall be established around the detected species to ensure that no work shall occur within the occupied habitat from February 15 through August 15 for California gnatcatcher, February 15 to August 15 for cactus wren, and March 15 through September 15 for least Bell's vireo and on-site noise reduction techniques shall be implemented to ensure that construction noise levels not exceed 60 dB(A) Leq-h at the location of any occupied sensitive habitat areas. The Development Services Director (or their designee) shall have the discretion to modify the buffer width depending on-site-specific conditions. If the results of the pre-construction survey determine that the survey area is unoccupied, the work may commence at the discretion of the Development Services Director (or their designee) following the review and approval of the pre-construction report.

- Prior to issuance of any land development permits (including clearing and grubbing or grading permits), the project Applicant shall retain a City-approved biologist to conduct focused pre-construction surveys for burrowing owls. The surveys shall be performed no earlier than 30 days prior to the commencement of any clearing, grubbing, or grading activities. If occupied burrows are detected, the City-approved biologist shall prepare a passive relocation mitigation plan subject to the review and approval by the Wildlife agencies and City including any subsequent burrowing owl relocation plans to avoid impacts from construction-related activities.

- Prior to issuance of land development permits, including clearing or grubbing and grading permits that impact jurisdictional waters, the developer(s) shall prepare a Wetlands Mitigation and Monitoring Plan to the satisfaction of the City, ACOE, and CDFG. This plan shall include, at a minimum, an implementation plan, a maintenance and monitoring program, estimated completion time, and any relevant contingency measures. Areas under the jurisdictional authority of ACOE and CDFG shall be delineated on all grading plans. Creation areas shall occur within the Otay River watershed in accordance with the Wetlands Mitigation and Monitoring Plan to the satisfaction of the City, ACOE, and CDFG. The project Applicant shall also be required to implement the Wetlands Mitigation and Monitoring Plan subject to the oversight of the City, ACOE, and CDFG.

- Prior to issuance of land development permits, including clearing or grubbing and grading permits for areas that impact jurisdictional waters, the project Applicant shall provide evidence that all required regulatory permits, such as those required under Sections 404 and 401 of the federal Clean Water Act, Section 1600 of the California Fish and Game Code, and the Porter Cologne Water Quality Act.
- Prior to issuance of land development permits, including clearing, grubbing, grading and construction permits for the off-site facilities, the project Applicant shall provide a revegetation plan for temporary impacts to 0.01 acre of CSS, 0.24 acre of MSS, and 0.06 acre of mulefat scrub. The revegetation plan must be prepared by a qualified City-approved biologist familiar with the City's MSCP Subarea Plan and must include, but not be limited to, an implementation plan; appropriate seed mixtures and planting method; irrigation method; quantitative and qualitative success criteria; maintenance, monitoring, and reporting program; estimated completion time; and contingency measures. The Project Applicant shall be required to prepare and implement the revegetation plan subject to the oversight and approval of the Development Services Director (or their designee).
- Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits for any areas adjacent to the preserve and the off-site facilities located within the preserve, the project Applicant shall provide written confirmation that a City-approved biological monitor has been retained and shall be on-site during clearing, grubbing, and/or grading activities. The biological monitor shall attend all pre-construction meetings and be present during the removal of any vegetation to ensure that the approved limits of disturbance are not exceeded and provide periodic monitoring of the impact area including, but not limited to, trenches, stockpiles, storage areas and protective fencing. The biological monitor shall be authorized to halt all associated project activities that may be in violation of the City's MSCP Subarea Plan and/or permits issued by any other agencies having jurisdictional authority over the project.
- Before construction activities occur in areas containing sensitive biological resources within the off-site facilities area, all workers shall be educated by a City-approved biologist to recognize and avoid those areas that have been marked as sensitive biological resources.
- To avoid any direct impacts to raptors and/or any migratory birds protected under the MBTA, removal of habitat that supports active nests on the proposed area of disturbance should occur outside of the breeding season for these species (January 15 to August 31). If removal of habitat on the proposed area of disturbance must occur during the breeding season, the project Applicant shall retain a City-approved biologist to conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction survey must be conducted within 10 calendar days prior to the start of construction, the results of which must be submitted to the City for review and approval prior to initiating any construction

activities. If nesting birds are detected, a letter report or mitigation plan as deemed appropriate by the City, shall be prepared and include proposed measures to be implemented to ensure that disturbance of breeding activities are avoided. The report or mitigation plan shall be submitted to the City for review and approval and implemented to the satisfaction of the City. The City's Mitigation Monitor shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction.

- Prior to issuance of any land development permits, including clearing and grubbing or grading permits, the project Applicant shall retain a City-approved biologist to conduct focused surveys for northern harrier to determine the presence or absence of this species within 900-feet of the construction area. The pre-construction survey must be conducted within 10 calendar days prior to the start of construction. The results of the survey must be submitted to the City for review and approval. If active nests are detected by the City-approved biologist, a bio-monitor shall be on-site during construction to minimize construction impacts and ensure that no nests are be removed or disturbed until all young have fledged.
- Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits, the project Applicant shall install fencing in accordance with CVMC 17.35.030. Prominently colored, well-installed fencing and signage shall be in place wherever the limits of grading are adjacent to sensitive vegetation communities or other biological resources, as identified by the qualified monitoring biologist. Fencing shall remain in place during all construction activities. All temporary fencing shall be shown on grading plans for areas adjacent to the preserve and for all off-site facilities constructed within the preserve. Prior to release of grading and/or improvement bonds, a qualified biologist shall provide evidence that work was conducted as authorized under the approved land development permit and associated plans.
- In accordance with the City's Adjacency Management Guidelines and the Otay Ranch Village 8 West Edge Plan, the following Mitigation Measures shall be implemented to further reduce indirect impacts (from lighting, noise, invasives, toxic substances, and public access) to sensitive biological resources located in the adjacent Preserve areas:
  - Prior to issuance of a building permit, a lighting plan and photometric analysis shall be submitted to the satisfaction of the Development Services Director (or their designee) to ensure lighting of all developed areas adjacent to the preserve has been directed away from the Preserve, wherever feasible and consistent with public safety. The lighting plan shall illustrate the location of the proposed lighting standards and, if applicable, type of shielding measures required to minimize light spillage into the preserve. Where necessary, development shall provide adequate shielding with non-invasive plant materials (preferably native), berming, and/or other methods to protect the Preserve and special status species from night lighting. Consideration shall be given to the use of low-pressure sodium lighting.
  - Construction-related noise shall be limited within and adjacent to the preserve during the typical breeding season of January 15 to August 31. Construction activity within and adjacent to any occupied sensitive habitat areas must not exceed 60 dB(A) Leq-h, or ambient noise levels if higher than 60 dB(A) Leq-h, during the breeding season. Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits for areas within or adjacent to the preserve, the Project Applicant shall prepare and submit to

the satisfaction of the Development Services Director (or their designee) , an acoustical analysis to demonstrate that the 60 dB(A) Leq-h noise level is not exceeded at the location of any occupied sensitive habitat areas as determined based on the results the required biological pre-construction surveys. The acoustical analysis shall describe the methods by which construction noise will not exceed 60 dB(A) Leq-h. Noise abatement methods may include, but are not limited to, reoperation of specific construction activities, installation of noise abatement at the source, and/or installation of noise abatement at the receiving areas.

– Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits, the Project Applicant shall obtain an National Pollutant Discharge Elimination System (NPDES) Permit for Construction Activity from SWRCB. Adherence to all conditions of the General Permit for Construction Activity is required. The project Applicant shall be required under the RWQCB General Construction Permit to develop a SWPPP and a Monitoring Program Plan. The SWPPP shall specify both construction and post-construction structural and non-structural pollution prevention measures. The SWPPP shall also address operation and maintenance of post-construction pollution prevention measures, including short-term and long-term funding sources and the party or parties that will be responsible for the implementation of said measures. Permanent Treatment, Site Design, and Source Control BMPs shall be included as part of the project in accordance with the City of Chula Vista Standard Urban Stormwater Management Plan (SUSMP) requirements. At a minimum, the SWPPP shall incorporate the following construction and post-construction BMPs as described in the Village 8 West Edge Plan.

Construction-Related Measures:

- Existing vegetation will be retained where possible. To the extent feasible, grading activities will be limited to the immediate area required for construction.
- Temporary erosion control measures will be installed in disturbed areas. These control measures may include but are not limited to silt fencing, straw waddles, jute netting, or hydroseeding.
- Disturbed surfaces will not be left without erosion control measures in place from October 1 through April 1, or when there is a potential for a rain event.
- Landscaping will be installed as soon as practical to reduce erosion potential.

Design/Post-Construction Measures:

- Sediment will be retained on-site by a system of sediment basins, traps, or other appropriate measures.
- Where deemed necessary, storm drains will be equipped with silt and oil traps to remove oils, debris, and other pollutants. Storm drain inlets shall be labeled “NO Dumping-Drains to Ocean.” Storm drain inlets shall be regularly maintained to ensure their effectiveness.
- The parking lots will be designed where possible to allow storm water runoff to be directed to vegetative filter strips and/or oil-water separators to control sediment, oil, and other contaminants.

- Permanent energy dissipation structures will be installed for each drainage outfall to a natural watercourse.
- The project area drainage basins will be designed to provide effective water quality control measures, as outlined in the Water Quality Technical Report (Hale Engineering 2010). Design and operational features of the drainage basins will include design features to provide maximum infiltration, maximum detention time for settling of fine particles; maximize the distance between basin inlets and outlets to reduce velocities; and establish maintenance schedules for periodic removal of sedimentation, excessive vegetation and debris.
  - Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits for areas within the 100-foot preserve edge, the project Applicant shall prepare and submit to the satisfaction of the Development Services Director (or their designee), landscape plans to ensure that the proposed plant palette is consistent with the plant list contained in Attachment A of the Otay Ranch Village 8 West Preserve Edge Plan. The landscape plan shall also incorporate a manual weeding program for areas adjacent to the preserve. The manual weeding program that shall describe at a minimum, the entity responsible for controlling invasive species, the maintenance activities and methods required to control invasives, and a maintenance/monitoring schedule.
  - Prior to issuance of land development permits, including clearing or grubbing and grading and/or construction permits for the Project, the Project owner shall submit wall and fence plans depicting appropriate barriers to prevent unauthorized access into the Preserve. The wall and fence plans shall, at a minimum, illustrate the locations and cross-sections of proposed walls, fences, informational and directional signage, access controls, and/or boundary markers along the preserve boundary and off-site pedestrian trails as conceptually described in the Otay Ranch Village 8 West Edge Plan. The required wall and fence plan shall be subject to the approval the Development Services Director (or their designee).

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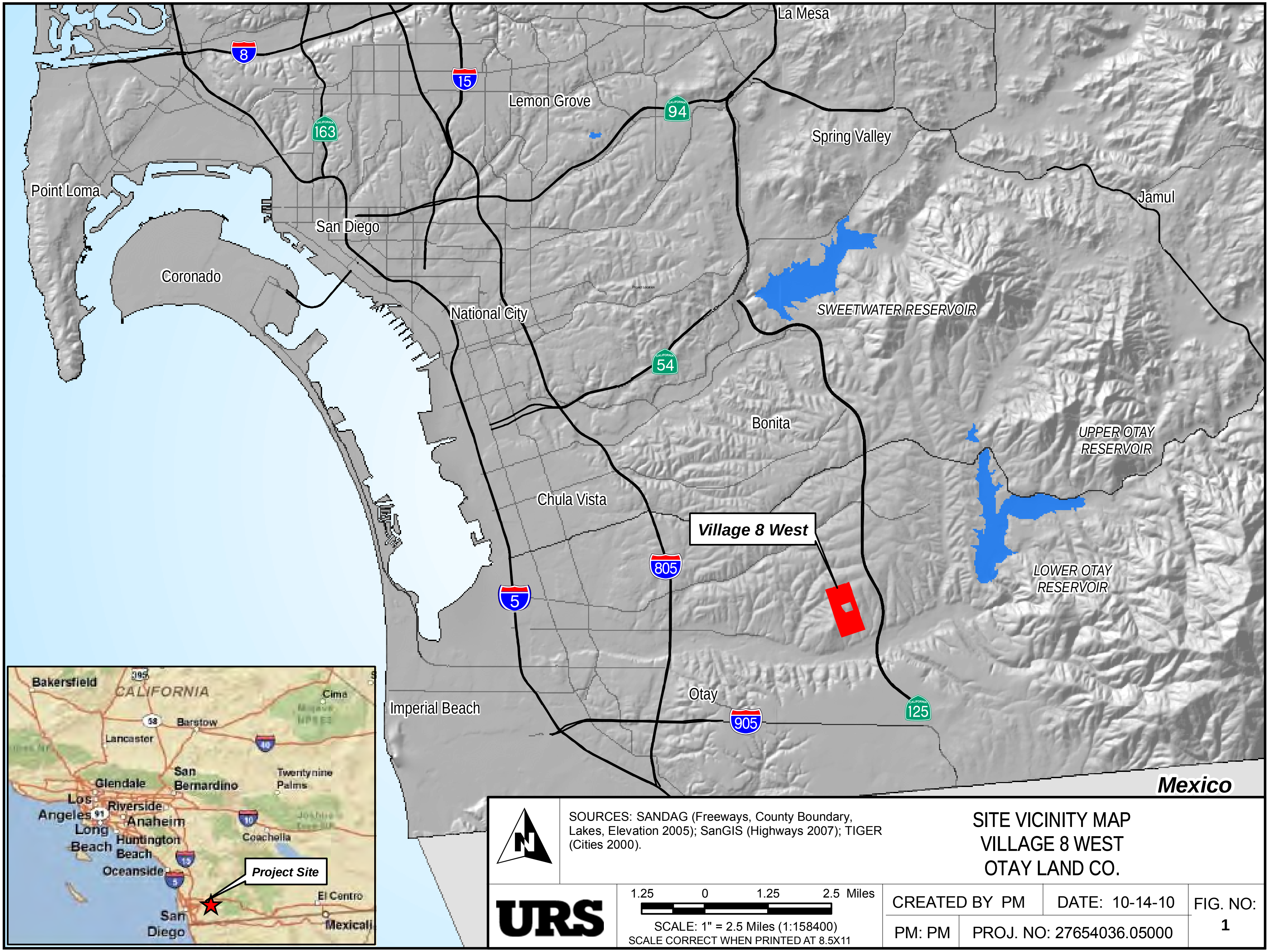

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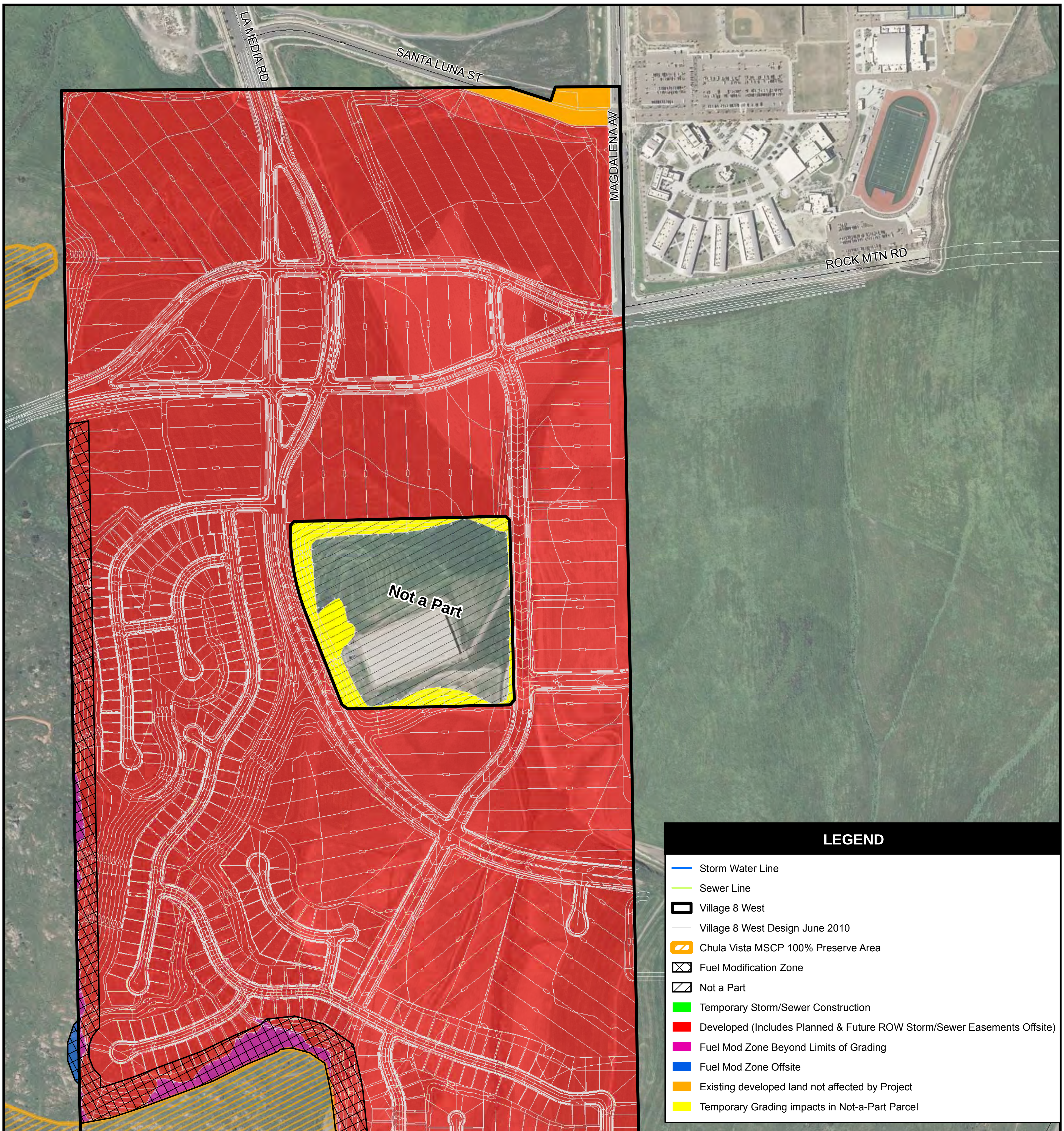

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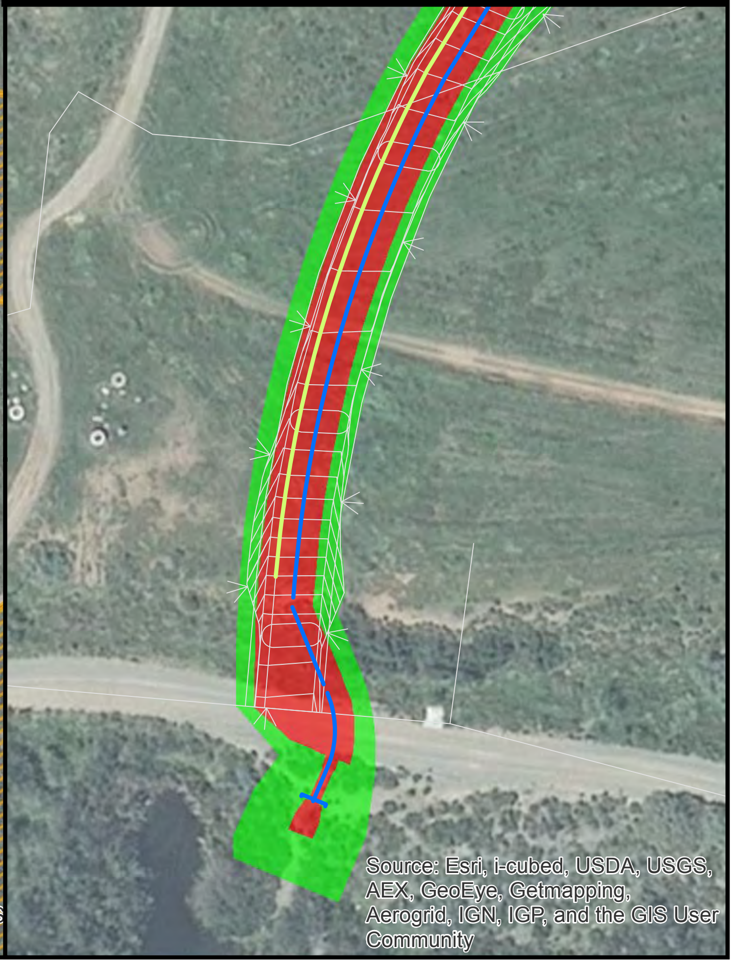

SOURCES: HALE ENGINEERS, (June 2010)
SanGIS (Parcels, Roads, 2010)
AERIALS EXPRESS, (JAN 2009)

DEVELOPMENT PLAN
VILLAGE 8 WEST
OTAY LAND CO

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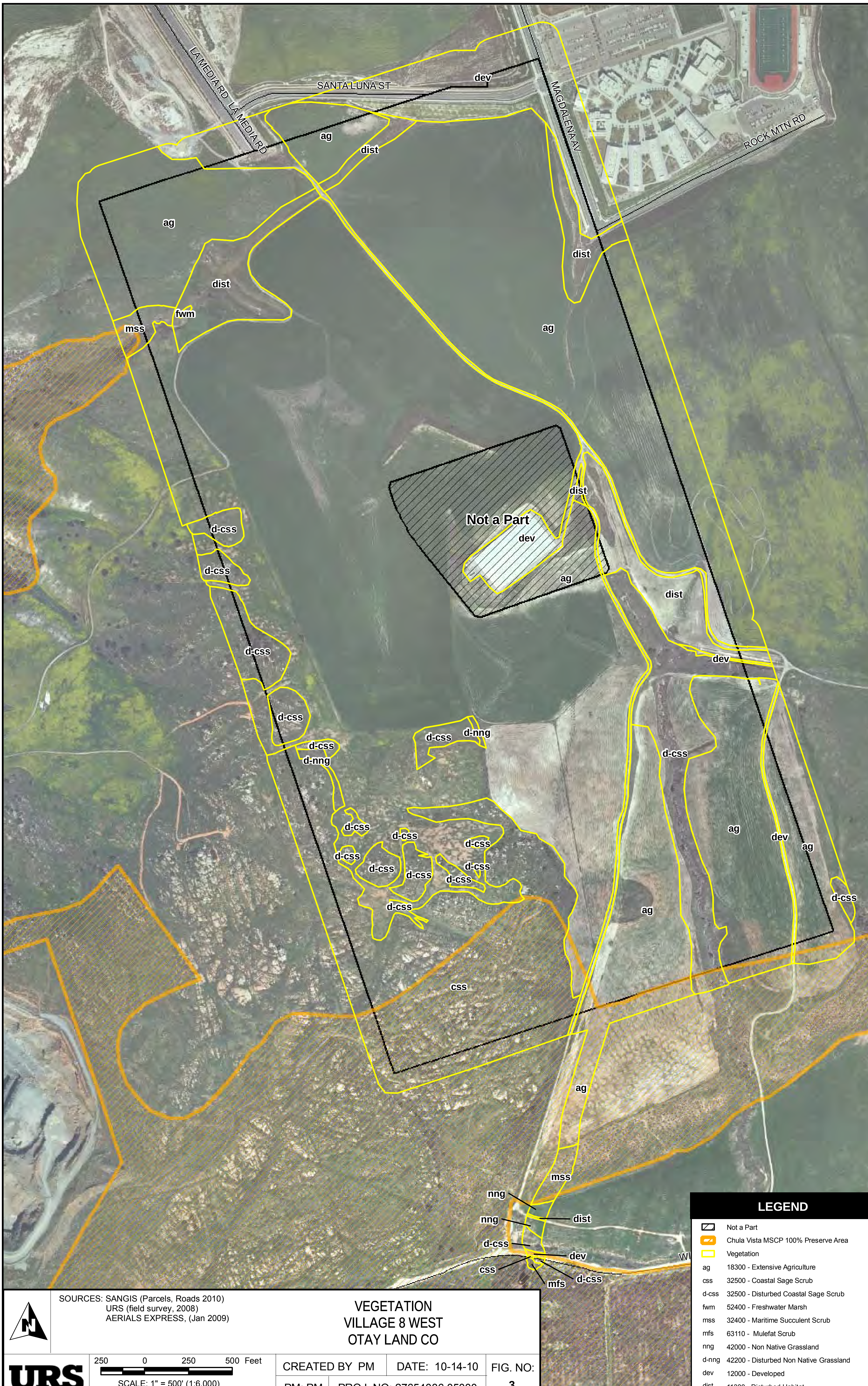

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VEGETATION
VILLAGE 8 WEST
OTAY LAND CO

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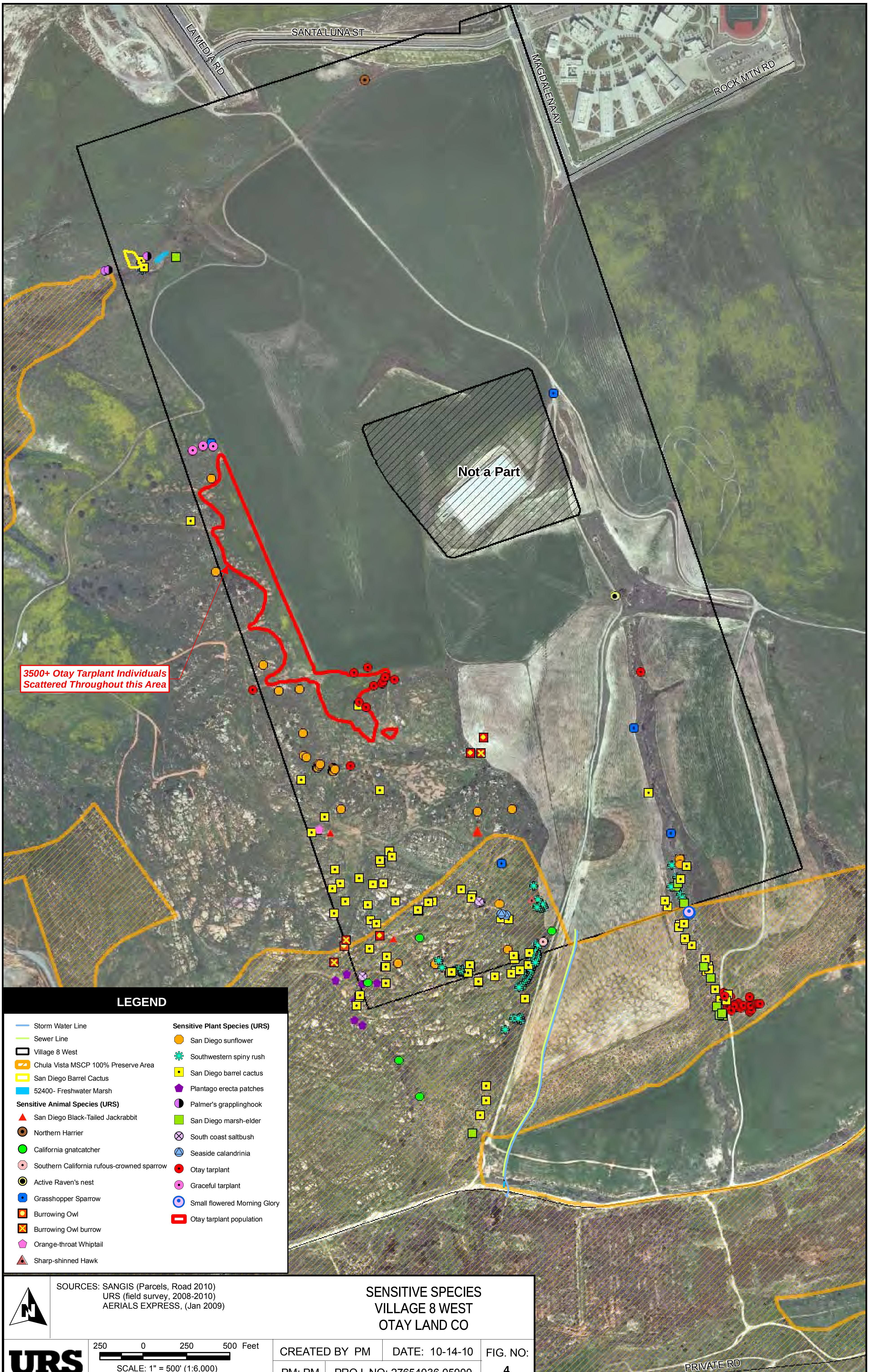

SENSITIVE SPECIES
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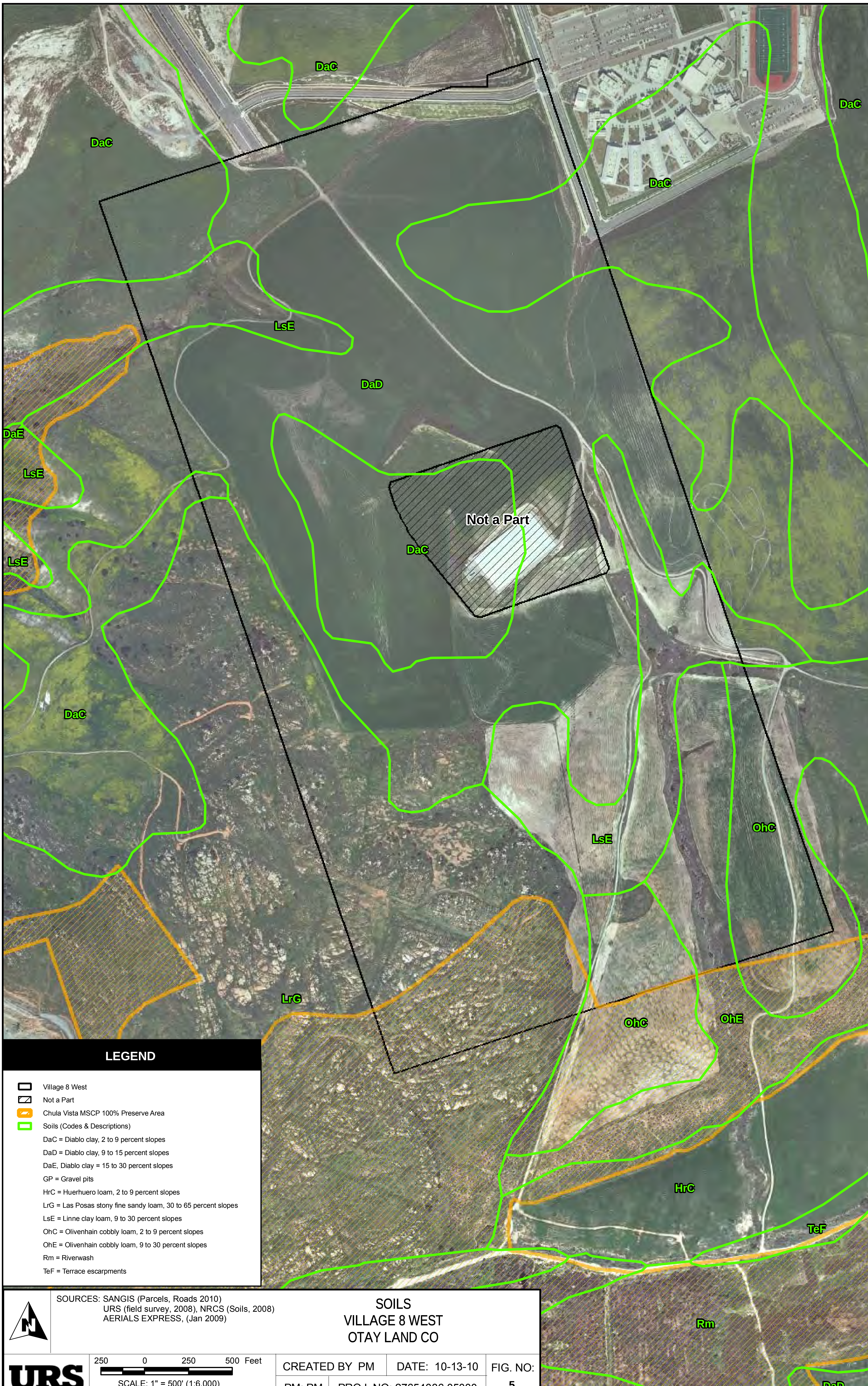

LEGEND

- Village 8 West
- Not a Part
- Chula Vista MSCP 100% Preserve Area
- Soils (Codes & Descriptions)

DaC = Diablo clay, 2 to 9 percent slopes
DaD = Diablo clay, 9 to 15 percent slopes
DaE, Diablo clay = 15 to 30 percent slopes
GP = Gravel pits
HrC = Huerhuero loam, 2 to 9 percent slopes
LrG = Las Posas stony fine sandy loam, 30 to 65 percent slopes
LsE = Linne clay loam, 9 to 30 percent slopes
OhC = Olivenhain cobbly loam, 2 to 9 percent slopes
OhE = Olivenhain cobbly loam, 9 to 30 percent slopes
Rm = Riverwash
TeF = Terrace escarpments

SOURCES: SANGIS (Parcels, Roads 2010)
URS (field survey, 2008), NRCS (Soils, 2008)
AERIALS EXPRESS, (Jan 2009)

N

SOILS
VILLAGE 8 WEST
OTAY LAND CO

URS

250 0 250 500 Feet
SCALE: 1" = 500' (1:6,000)
SCALE CORRECT WHEN PRINTED AT 11X17

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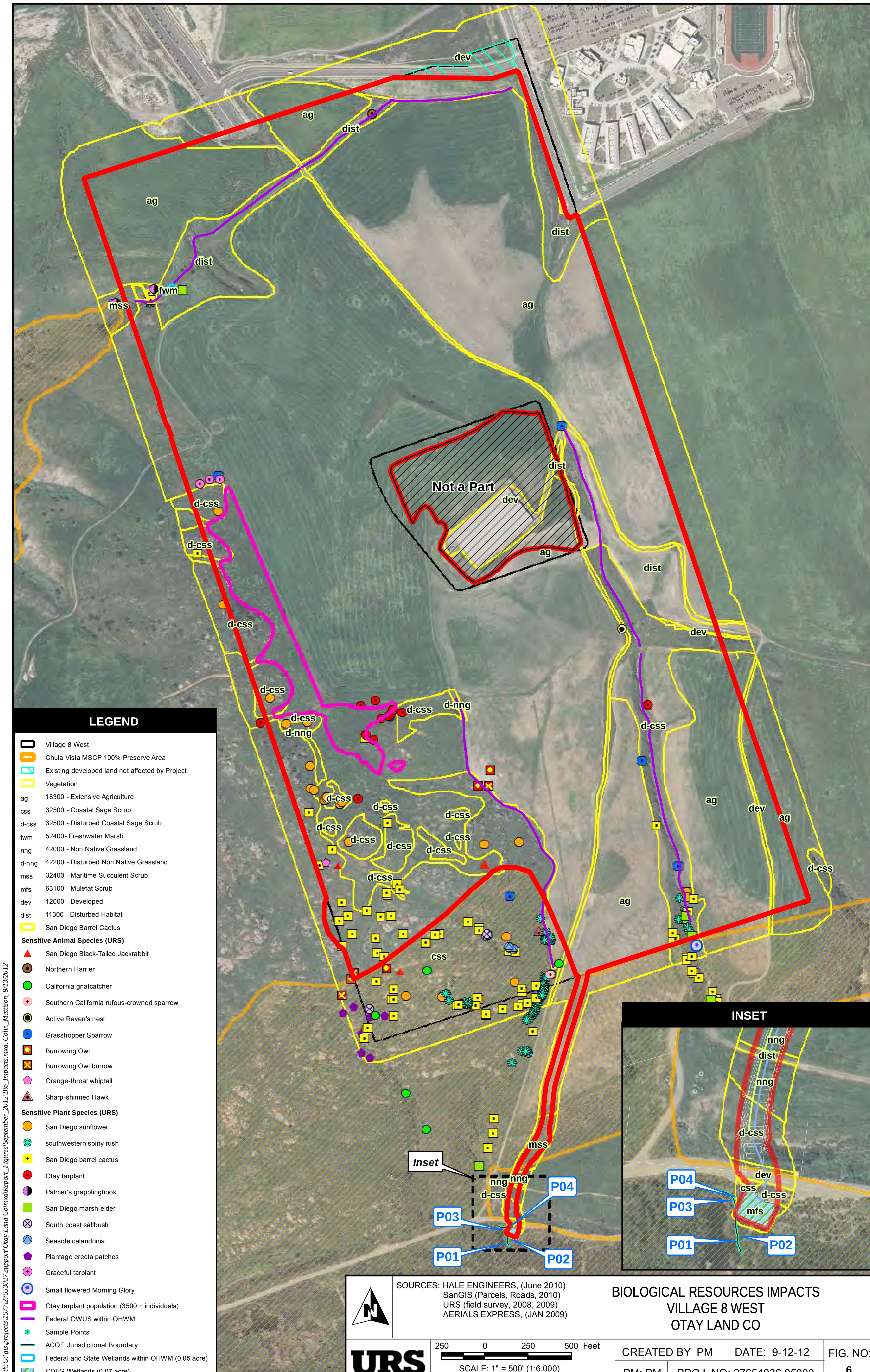

Not a Part
ag
dist
dev
fwm
mss
d-css
d-nng
nng
css
mfs
Inset
P01
P02
P03
P04
INSET
LEGEND
Village 8 West
Chula Vista MSCP 100% Preserve Area
Existing developed land not affected by Project
Vegetation
ag 18300 - Extensive Agriculture
css 32500 - Coastal Sage Scrub
d-css 32500 - Disturbed Coastal Sage Scrub
fwm 52400- Freshwater Marsh
nng 42000 - Non Native Grassland
d-nng 42200 - Disturbed Non Native Grassland
mss 32400 - Maritime Succulent Scrub
mfs 63100 - Mulefat Scrub
dev 12000 - Developed
dist 11300 - Disturbed Habitat
San Diego Barrel Cactus
Sensitive Animal Species (URS)
San Diego Black-Tailed Jackrabbit
Northern Harrier
California gnatcatcher
Southern California rufous-crowned sparrow
Active Raven's nest
Grasshopper Sparrow
Burrowing Owl
Burrowing Owl burrow
Orange-throat whiptail
Sharp-shinned Hawk
Sensitive Plant Species (URS)
San Diego sunflower
southwestern spiny rush
San Diego barrel cactus
Otay tarplant
Palmer's grapplinghook
San Diego marsh-elder
South coast saltbush
Seaside calandrinia
Plantago erecta patches
Graceful tarplant
Small flowered Morning Glory
Otay tarplant population (3500 + individuals)
Federal OWUS within OHWM
Sample Points
ACOE Jurisdictional Boundary
Federal and State Wetlands within OHWM (0.05 acre)
CDFG Wetlands (0.07 acre)
SOURCES: HALE ENGINEERS, (June 2010)
SanGIS (Parcels, Roads, 2010)
URS (field survey, 2008, 2009)
AERIALS EXPRESS, (JAN 2009)
N
BIOLOGICAL RESOURCES IMPACTS
VILLAGE 8 WEST
OTAY LAND CO
URS
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SCALE: 1" = 500' (1:6,000)
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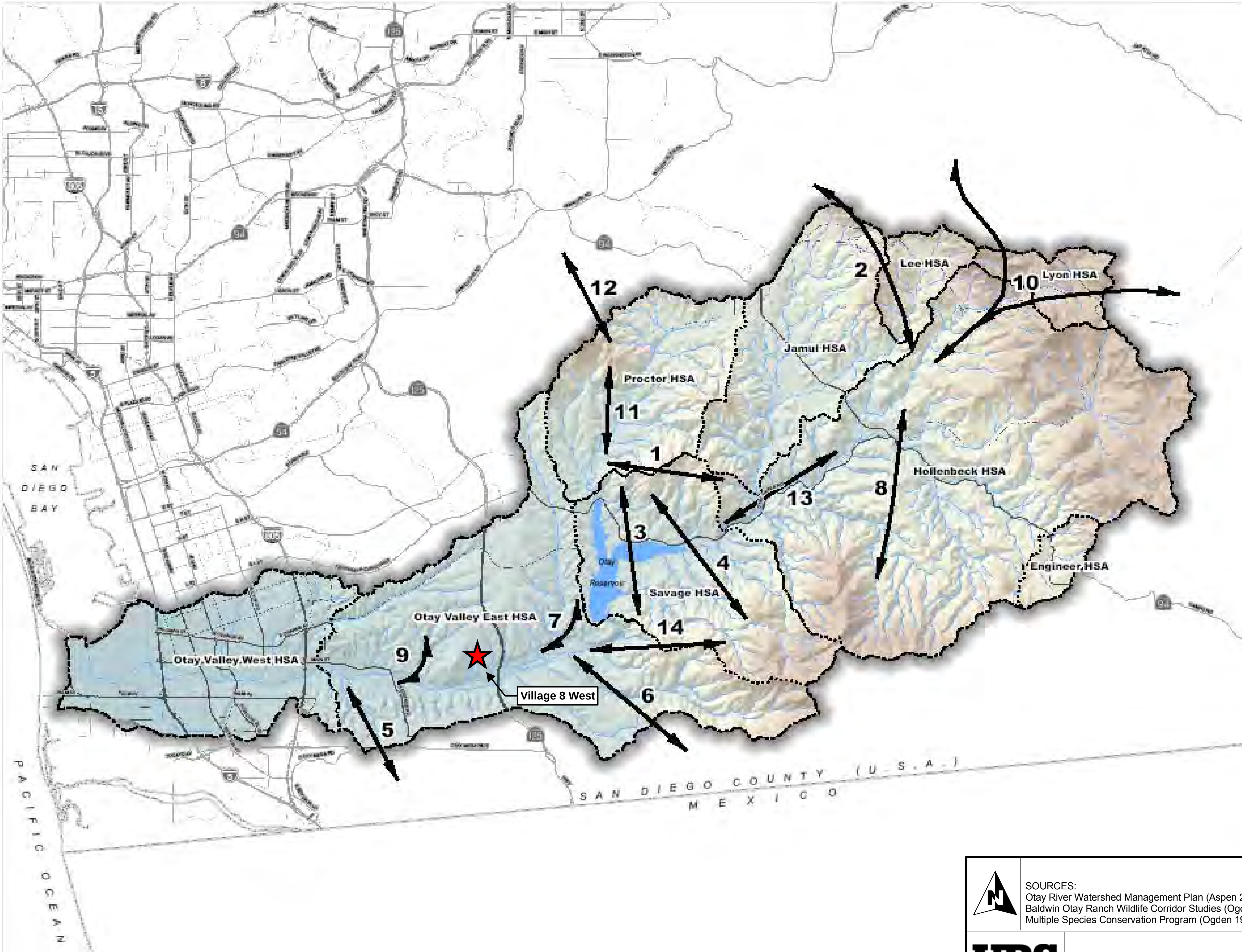

LEGEND

- Wildlife Corridors/Habitat Linkage
- Otay Watershed
- Watershed - Hydologic Sub-Area
- Otay Reservoir
- Main Stem/Tributary

Wildlife Corridors/Habitat Linkages

1. Proctor Valley/Jamul Mountains
2. Sweetwater River/McGinty Mountain/Hollenbeck Canyon
3. Jamul Mountains/Lower Otay Reservoir
4. Jamul Mountains/San Ysidro Mountains
5. Spring Canyon/Dennery Canyon/West Otay Mesa
6. Johnson Canyon/East Otay Mesa/Otay Mountain
7. Salt Creek/Otay Valley
8. Hollenbeck Canyon/Rancho Jamul
9. Poggi Canyon/Wolf Canyon/Otay River Valley
10. Hollenbeck Canyon/Lyons Valley/Lee Valley
11. Proctor Valley
12. Sweetwater River/Proctor Valley
13. Otay Lakes/Hollenbeck Canyon
14. O'Neal Canyon/Otay Mountain

SOURCES:
Otay River Watershed Management Plan (Aspen 2006),
Baldwin Otay Ranch Wildlife Corridor Studies (Ogden 1993),
Multiple Species Conservation Program (Ogden 1993).

WILDLIFE CORRIDORS AND HABITAT LINKAGES
VILLAGE 8 WEST
OTAY LAND CO

URS

Not to Scale

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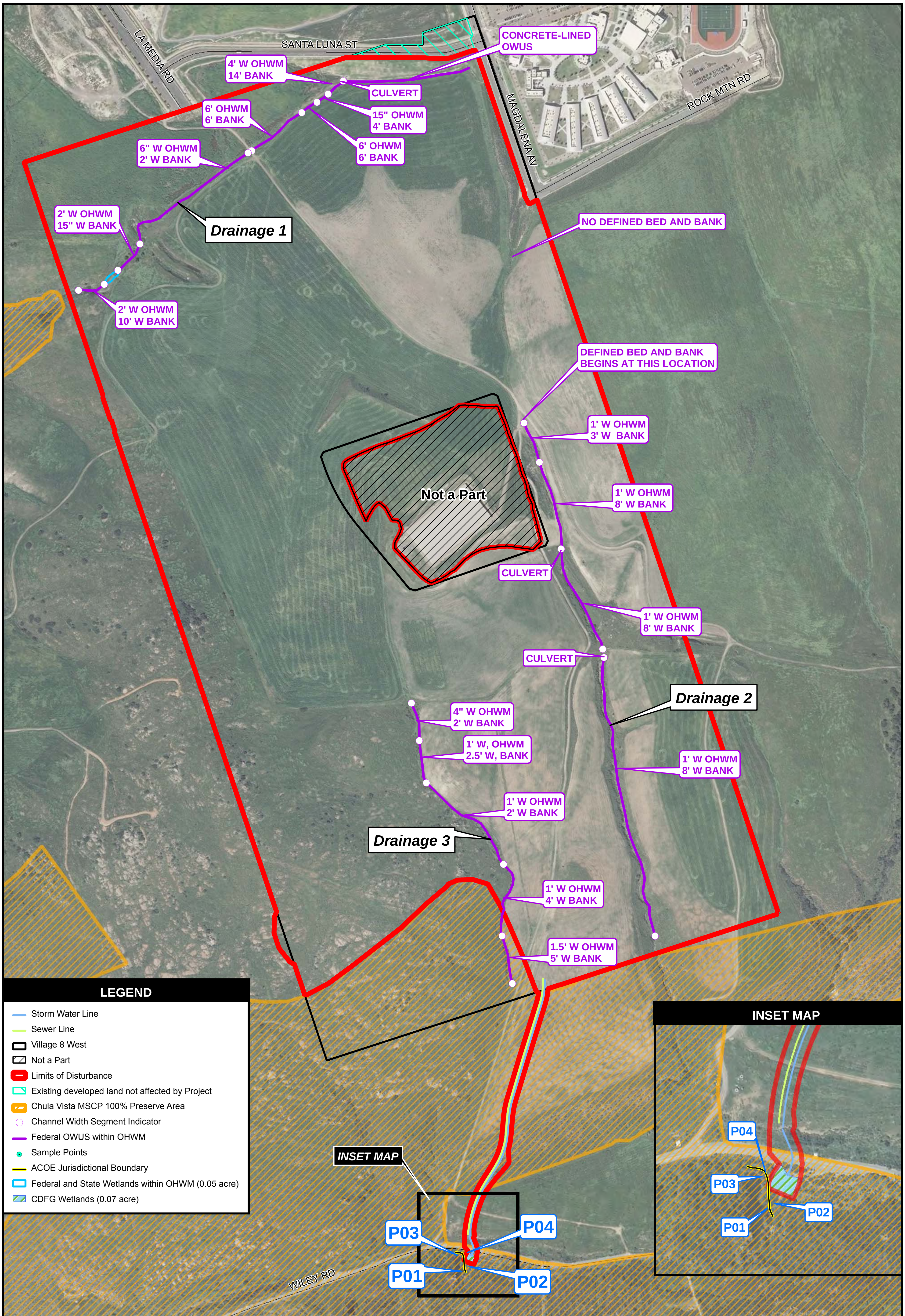

SOURCES:
Parcels, Roads (SanGIS, 2010).
Field Survey (URS, 2008).
Aerial (Aerial Express, 2010).

JURISDICTIONAL IMPACTS
VILLAGE 8 WEST
OTAY LAND CO

URS

250 0 250 500 Feet
SCALE: 1" = 500' (1:6,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY PM	DATE: 10/1/2012	FIG. NO:
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APPENDIX A

Summary of Biological Surveys Conducted on the Village 8 West Project

Date	Time on site	Survey Type	Personnel	Weather Conditions
5/27/2008	0800-1205	Vegetation Mapping; Focused CAGN survey	Brittany Benson, Ellen Howard	Partly cloudy sky, 70-75°F; winds 0-2mph
6/9/2008	0715-1130	Vegetation Mapping; Focused CAGN survey	Ricky Bailey, Brittany Benson	Cloudy to clear, 59-77°F; winds 0-6mph
6/18/2008	0955-1255	Vegetation Mapping; Focused Plant Survey	Brittany Benson, Darren Burton	Clear sky, 78-92°F, winds 0-15mph
6/27/2008	0755-1118	Focused CAGN Survey; Wetland Delineation	Brittany Benson, Theresa Miller	Clear sky, 68-82°F; winds 0-5mph
7/30/2008	0745-1010	Focused Plant Survey	Brittany Benson, Glen Kinoshita	Cloudy to partly cloudy sky, 73-80°F; winds 0-6mph
2/26/2009	0945-1410	QCB Assessment	B. Lohstroh, S. Amin	Clear, 62-68ºF, 2-5 mph
2/27/2009		BUOW survey	S. Amin, T. Miller	
3/3/2009	0930-1300	QCB Survey	B. Lohstroh	40% cirrus, 70-75ºF, 1-4 mph
3/13/2009	1030-1220	QCB Survey	B. Lohstroh, S. Amin	Clear, 67-71ºF, 0-4 mph
3/17/2009	0845-1030	QCB Survey	B. Lohstroh, J. Rocks, S. Amin	Clear, 60-74ºF, 0 mph
3/26/2009	1100-1400	QCB Survey	B. Lohstroh, S. Amin	Clear, 67-73ºF 0-8 mph
4/9/2009	0845-1015	QCB Survey	B. Lohstroh, S. Santulli	40% Cover, 68-65ºF, 0-4 mph
6/18/2009		Reference population for Otay tarplant	Lee Ripma, Michelle Balk	Overcast, 74.2°F, wind 2.3-3.3 mph
6/29/2009		Reference population for Otay tarplant	Lee Ripma, Jim Rocks	Clear, 70°F, winds 0.8-3.1 mph
6/29/2009	0800-0340	Rare plant survey for Otay tarplant on waterline	Lee Ripma, Jim Rocks	Clear, 70-84°F, winds 0.8-3.1 mph
7/9/2009	0750-0230	Rare plant survey for Otay tarplant on waterline	Lee Ripma, Jim Rocks	Clear, 66-81.4°F, winds 1.3-4.1 mph
7/11/2009	1620-1745	Rare plant survey for Otay tarplant	Lee Ripma, Sundeep Amin	Clear, 82.3-87.2°F, winds 1-2.7 mph
3/29/2010	0900-1520	Assessment/ QCB Protocol Survey	Brian Lohstroh	Clear, 70-77°F, winds 0-7 mph
4/2/2010	1040-1500	QCB Protocol Survey	Brian Lohstroh	Clear, 62-66°F, winds 0-9 mph
4/10/2010	1130-1430	QCB Protocol Survey	Brian Lohstroh	Clear, 70-69°F, winds 0-10 mph

Date	Time on site	Survey Type	Personnel	Weather Conditions
4/19/2010	1300-1530	QCB Protocol Survey	Brian Lohstroh	Clear, 76-77°F, winds 4-12 mph
4/25/2010	1130-1320	QCB Protocol Survey	Brian Lohstroh	Clear, 69-70°F, winds 0-3 mph
5/7/2010	1045-1545	Jurisdictional delineation of off-site sewer and storm drain conveyance utilities alignment	Brian Lohstroh	Clear, 68-78°F, winds 0-6 mph
6/11/2010	0915-1230	Rare Plant Survey (Otay tarplant)	Brian Lohstroh	100-60% Cover, 65-67°F, winds 0-3 mph

APPENDIX B

Jurisdictional Delineation Data Sheets for the Village 8 West Project

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: OLC Parcel B	City/County: Chula Vista/San Diego		Sampling Date: 5/7/2010
Applicant/Owner: Otay Land Company, LLC		State: CA	Sampling Point: P01
Investigator(s): Brian Lohstroh		Section, Township, Range: NA, T18S, R1W	
Landform (hillslope, terrace, etc.): River Bank	Local Relief (concave, convex, none): none		Slope (%): 10
Subregion (LRR): LRR C	Lat: N32.58954	Long: W116.97573	Datum: WGS 84
Soil Map Unit Name: Riverwash (Rm)		NWI Classification: PSS/EMA	

Are climatic/hydrological conditions on the site typical for this time of the year? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" Present? ☑ Yes ☑ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ naturally problematic? (If needed, explain answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No
Hydric Soil Present?	☑ Yes	☐ No
Wetland Hydrology Present?	☑ Yes	☐ No

Is the Sampled Area within a Wetland? ☑ Yes ☐ No

Remarks:
Site is on bank of river, 3.5 feet from surface water.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarix ramosissima*	30	Y	FAC
2.			
3.			
4.			
Total Cover:	30		
Sapling/Shrub Stratum			
1. *Juncus acutus*	20	Y	FACW
2.			
3.			
4.			
5.			
Total Cover:	30		
Herb Stratum			
1. *Polypogon monspeliensis*	60	Y	FACW+
2. *Cyperus eragrostis*	20	Y	FACW
3. *Cotula coronopifolia*	20	Y	FACW+
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum: 0%	% Cover of Biotic Crust:		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiplied by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

Sampling Point: P01

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
6	10YR 5/2	90	G2 2.5/5PB	10	RM	M	loamy clay	Coarse gravel also present
12	10YR 5/1	100					loamy clay	

[2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

- ☐ ...stosol (A1)
- ☐ ...stic Epipedon (A2)
- ☐ ...ck Histic (A3)
- ☑ ...drogen Sulfide (A4)
- ☐ ...atified Layers (A5) (**LRR C**)
- ☐ ...m Muck (A9) (**LRR D**)
- ☐ ...pleted Below Dark Surface (A11)
- ☐ ...ck Dark Surface (A12)
- ☐ ...ndy Mucky Mineral (S1)
- ☐ ...ndy Gleyed Matrix (S4)

- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

...)
Type: ______
Depth (inches): ______

Hydric Soil Present? ☑ Yes ☐ No

Secondary Indicators (2 or more required)

- ☐ ...rface Water (A1)
- ☑ ...gh Water Table (A2)
- ☑ ...turation (A3)
- ☐ ...ater Marks (B1) (**Nonriverine**)
- ☐ ...diment Deposits (B2) (**Nonriverine**)
- ☐ ...ft Deposits (B3) (**Nonriverine**)
- ☐ ...rface Soil Cracks (B6)
- ☐ ...ndation Visible on Aerial Imagery (B7)
- ☐ ...ater-Stained Leaves (B9)

- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence Of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☑ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)

	☐ Yes	☑ No	Depth (inches):	
	☑ Yes	☐ No	Depth (inches):	10
Saturation Present? (Includes capillary fringe)	☑ Yes	☐ No	Depth (inches):	9

Wetland Hydrology Present? ☑ Yes ☐ No

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: OLC Parcel B	City/County: Chula Vista/San Diego		Sampling Date: 5/7/2010
Applicant/Owner: Otay Land Company, LLC		State: CA	Sampling Point: P02
Investigator(s): Brian Lohstroh		Section, Township, Range: NA, T18S, R1W	
Landform (hillslope, terrace, etc.): River Bank	Local Relief (concave, convex, none): none		Slope (%): 10
Subregion (LRR): LRR C	Lat: N32.58956	Long: W116.97570	Datum: WGS 84
Soil Map Unit Name: Riverwash (Rm)		NWI Classification: PSS/EMA	

Are climatic/hydrological conditions on the site typical for this time of the year? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" Present? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ naturally problematic? (If needed, explain answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes ☐ No	**Is the Sampled Area within a Wetland?**	☐ Yes ☑ No
Hydric Soil Present?	☐ Yes ☑ No		
Wetland Hydrology Present?	☐ Yes ☑ No		

Remarks:

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1. *Tamarix ramosissima*	10	Y	FAC
2.			
3.			
4.			
Total Cover:	10		
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	100	Y	N/A
2.			
3.			
4.			
5.			
Total Cover:	100		
Herb Stratum			
1. *Ambrosia psilostachya*	70	Y	FAC
2. *Polypogon monspeliensis*	30	Y	FACW+
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	100		
Woody Vine Stratum			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum: 0%	% Cover of Biotic Crust:		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiplied by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species		x3 =	
FACU species		x4 =	
UPL species		x5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point: P02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
7	10YR 4/3	100					sandy loam	Coarse gravel also present
14	10YR 3/3	100					sandy loam	Coarse gravel also present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5) (**LRR C**)
☐ 1 cm Muck (A9) (**LRR D**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)
☐ Loamy Mucky Mineral (F1)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

☐ 1 cm Muck (A9) (**LRR C**)
☐ 2 cm Muck (A10) (**LRR B**)
☐ Reduced Vertic (F18)
☐ Red Parent Material (TF2)
☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ____________
Depth (inches): ____________

Hydric Soil Present? ☐ Yes ☑ No

Remarks:
Coarse gravel fill material present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

☐ Surface Water (A1)
☐ High Water Table (A2)
☐ Saturation (A3)
☐ Water Marks (B1) (**Nonriverine**)
☐ Sediment Deposits (B2) (**Nonriverine**)
☐ Drift Deposits (B3) (**Nonriverine**)
☐ Surface Soil Cracks (B6)
☐ Inundation Visible on Aerial Imagery (B7)
☐ Water-Stained Leaves (B9)
☐ Salt Crust (B11)
☐ Biotic Crust (B12)
☐ Aquatic Invertebrates (B13)
☐ Hydrogen Sulfide Odor (C1)
☐ Oxidized Rhizopheres along Living Roots (C3)
☐ Presence Of Reduced Iron (C4)
☐ Recent Iron Reduction in Plowed Soils (C6)
☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

☐ Water Marks (B1) (**Riverine**)
☐ Sediment Deposits (B2) (**Riverine**)
☐ Drift Deposits (B3) (**Riverine**)
☐ Drainage Patterns (B10)
☐ Dry-Season Water Table (C2)
☐ Thin Muck Surface (C7)
☐ Crayfish Burrows (C8)
☐ Saturation Visible on Aerial Imagery (C9)
☐ Shallow Aquitard (D3)
☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? ☐ Yes ☑ No Depth (inches): ________
Water Table Present? ☐ Yes ☑ No Depth (inches): ________
Saturation Present? (Includes capillary fringe) ☐ Yes ☑ No Depth (inches): ________

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: OLC Parcel B	City/County: Chula Vista/San Diego		Sampling Date: 5/7/2010
Applicant/Owner: Otay Land Company, LLC	State: CA		Sampling Point: P03
Investigator(s): Brian Lohstroh	Section, Township, Range: NA, T18S, R1W		
Landform (hillslope, terrace, etc.): River Bank	Local Relief (concave, convex, none): none		Slope (%): 60
Subregion (LRR): LRR C	Lat: N32.58976	Long: W116.97575	Datum: WGS 84
Soil Map Unit Name: Riverwash (Rm)	NWI Classification: PSS/EMA		

Are climatic/hydrological conditions on the site typical for this time of the year? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" Present? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ naturally problematic? (If needed, explain answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☑ Yes	☐ No	**Is the Sampled Area within a Wetland?**	☑ Yes ☐ No
Hydric Soil Present?	☑ Yes	☐ No		
Wetland Hydrology Present?	☑ Yes	☐ No		

Remarks:
Site is on Bank of river, 1 foot from surface water

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. *Baccharis salicifolia*	20	Y	FACW
2.			
3.			
4.			
5.			
Total Cover:	20		
Herb Stratum			
1. *Typha latifolia*	70	Y	OBL
2. *Heliotropium curassavicum*	10	N	OBL
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:	80		
Woody Vine Stratum			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum: 20%	% Cover of Biotic Crust:		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiplied by:
OBL species		x1 =
FACW species		x2 =
FAC species		x3 =
FACU species		x4 =
UPL species		x5 =
Column Totals:	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

☑ Dominance Test is >50%

☐ Prevalence Index is ≤3.0[1]

☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? ☑ Yes ☐ No

Remarks:

SOIL

Sampling Point: P03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
4	10YR 3/2	100					clayey sand	
8	10YR 4/1	90	G2 2.5/5PB	10	RM	M	sandy clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☑ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: Rock

Depth (inches): 10

Hydric Soil Present? ☑ Yes ☐ No

Remarks:

Cobbles common, created restrictive layer at 10 inches.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☑ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizopheres along Living Roots (C3)
- ☐ Presence Of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☑ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	☐ Yes	☑ No	Depth (inches):	
Water Table Present?	☑ Yes	☐ No	Depth (inches):	8
Saturation Present? (Includes capillary fringe)	☑ Yes	☐ No	Depth (inches):	7

Wetland Hydrology Present? ☑ Yes ☐ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Arid West Region

Project/Site: OLC Parcel B	City/County: Chula Vista/San Diego		Sampling Date: 5/7/2010
Applicant/Owner: Otay Land Company, LLC		State: CA	Sampling Point: P04
Investigator(s): Brian Lohstroh		Section, Township, Range: NA, T18S, R1W	
Landform (hillslope, terrace, etc.): River Bank	Local Relief (concave, convex, none): none		Slope (%): 0
Subregion (LRR): LRR C	Lat: N32.58956	Long: W116.97570	Datum: WGS 84
Soil Map Unit Name: Riverwash (Rm)		NWI Classification: PSS/EMA	

Are climatic/hydrological conditions on the site typical for this time of the year? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" Present? ☑ Yes ☐ No

Are Vegetation, ☐ Soil, ☐ or Hydrology ☐ naturally problematic? (If needed, explain answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☑ No	**Is the Sampled Area within a Wetland?**	☐ Yes ☑ No
Hydric Soil Present?	☐ Yes ☑ No		
Wetland Hydrology Present?	☐ Yes ☑ No		

Remarks: Pit on bank, approximately 6 feet above surface water.

VEGETATION

Tree Stratum (Use scientific names.)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Total Cover:			
Sapling/Shrub Stratum			
1. *Isocoma menziesii*	30	Y	N/A
2. *Baccharis sarothroides*	30	Y	FAC
3. *Salvia apiana*	20	Y	N/A
4. *Artemisia californica*	20	Y	N/A
5.			
Total Cover:			
Herb Stratum			
1. *Hirschfeldia incana*	20	Y	N/A
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cover:			
Woody Vine Stratum			
1.			
2.			
Total Cover:			
% Bare Ground in Herb Stratum: 80	% Cover of Biotic Crust:		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiplied by:	
OBL species		x1 =	
FACW species		x2 =	
FAC species	30	x3 =	90
FACU species		x4 =	
UPL species	90	x5 =	450
Column Totals:	120 (A)		540 (B)

Prevalence Index = B/A = 4.5

Hydrophytic Vegetation Indicators:

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Hydrophytic Vegetation Present? ☐ Yes ☑ No

Remarks:

SOIL

Sampling Point: P04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12	2.5Y 5/3	100					sandy loam	Coarse gravel and cobbles also present

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (**LRR C**)
- ☐ 1 cm Muck (A9) (**LRR D**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (**LRR C**)
- ☐ 2 cm Muck (A10) (**LRR B**)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if present):
Type: ____________
Depth (inches): ____________

Hydric Soil Present? ☐ Yes ☑ No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1) (**Nonriverine**)
- ☐ Sediment Deposits (B2) (**Nonriverine**)
- ☐ Drift Deposits (B3) (**Nonriverine**)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizopheres along Living Roots (C3)
- ☐ Presence Of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Plowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1) (**Riverine**)
- ☐ Sediment Deposits (B2) (**Riverine**)
- ☐ Drift Deposits (B3) (**Riverine**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? ☐ Yes ☑ No Depth (inches): ________
Water Table Present? ☐ Yes ☑ No Depth (inches): ________
Saturation Present? (Includes capillary fringe) ☐ Yes ☑ No Depth (inches): ________

Wetland Hydrology Present? ☐ Yes ☑ No

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

FERNS AND FERN ALLIES	
PTERIDACEAE	BRAKE FAMILY
Pellaea mucronata var. *mucronata*	bird's foot cliff-brake
SELAGINELLACEAE	SPIKE-MOSS FAMILY
Selaginella bigelovii	Bigelow's spike-moss
Selaginella cinerascens	ashy spike-moss
ANGIOSPERMS (DICOTYLEDONS)	
ADOXACEAE	ADOXA FAMILY
Sambucus mexicana	blue elderberry
AMARANTHACEAE	AMARANTH FAMILY
*Amaranthus albus**	white tumbleweed
Atriplex canescens	four-wing saltbush
Atriplex pacifica (CNPS list 1B.2)	south coast saltbush
Atriplex suberecta	peregrine Saltbush
*Atriplex semibaccata**	Australian saltbush
*Chenopodium album**	lambsquarters
*Salsola tragus**	Russian thistle
ANACARDIACEAE	SUMAC OR CASHEW FAMILY
Malosma laurina	laurel sumac
Rhus integrifolia	lemonadeberry
Rhus ovata	sugarbush
*Schinus molle**	Peruvian pepper tree
APIACEAE	CARROT FAMILY
Daucus pusillus	rattlesnake weed
Foeniculum vulgare	fennel
ASTERACEAE	SUNFLOWER FAMILY
Ambrosia acanthicarpa	annual bur-sage
Ambrosia psilostachya	western ragweed
Artemisia californica	California sagebrush
Baccharis pilularis	coyote brush
Baccharis salicifolia	mulefat
Baccharis sarothroides	broom baccharis
*Centaurea melitensis**	tocalote
*Cirsium vulgare**	bull thistle
Conyza canadensis	horseweed
Corethrogyne filaginifolia var. filaginifolia	common sand-aster
*Deinandra conjugens (*FT, SE, CNPS List 1B.1, MSCP covered*)*	Otay tarplant
Deinandra fasciculata	fascicled tarplant
Ericameria linearifolia	interior goldenbush
Ericameria palmeri var. *palmeri*	Palmer's goldenbush
Filago californica	California filago
*Lactuca serriola**	prickly lettuce
Gnaphalium sp.	everlasting
Gutierrezia californica	California matchweed
Hazardia squarrosa	sawtooth goldenbush

FERNS AND FERN ALLIES	
*Hedypnois cretica**	crete hedypnois
Helianthus annuus	annual sunflower
Heterotheca grandiflora	telegraph weed
Holocarpha virgata ssp. *elongata* (CNPS List 4.2)	graceful tarplant
*Hypochaeris glabra**	smooth cat's ear
Isocoma menziesii	coastal goldenbush
Iva hayesiana (CNPS List 2.1)	San Diego Marsh-elder
*Lactuca serriola**	prickly lettuce
Lasthenia gracilis	common goldfields
*Picris echioides**	bristly ox-tongue
*Sonchus asper**	prickly sow thistle
*Sonchus oleraceus**	sow thistle
Stephanomeria exigua	small wreath-plant
Viguiera laciniata(CNPS List 4.2)	San Diego sunflower
BORAGINACEAE	BORAGE FAMILY
Harpagonella palmeri	Palmer's grappling-hook
BRASSICACEAE	MUSTARD FAMILY
*Brassica nigra**	black mustard
*Brassica rapa**	field mustard
*Hirschfeldia incana**	short-pod mustard
*Lepidium nitidum*var. *nitidum*	shining peppergrass
Sisymbrium irio	London rocket
CACTACEAE	CACTUS FAMILY
Cylindropuntia prolifera	coast cholla
Cylindropuntia californica var. *californica*	snake cholla
Ferocactus viridescens (CNPS List 2.1)	coast barrel cactus
Mammillaria dioica	fish-hook cactus
Opuntia littoralis	coast prickly-pear
CAPPARACEAE	CAPER FAMILY
Isomeris arborea	bladder pod
CARYOPHYLLACEAE	PINK FAMILY
*Silene gallica**	common catchfly
CONVOLVULACEAE	MORNING-GLORY FAMILY
Calystegia macrostegia ssp. intermedia	California morning glory
*Convolvulus arvensis**	bindweed
Convolvulus simulans (CNPS List 4.2)	small-flower bindweed
CRASSULACEAE	STONECROP FAMILY
Crassula connata	pygmy-weed
Dudleya pulverulenta	chalk leaf liveforever
CUCURBITACEAE	GOURD FAMILY
Cucumus sp.*	cucumber (agricultural variety)
Marah macrocarpus	wild cucumber
EUPHORBIACEAE	SPURGE FAMILY
Chamaesyce polycarpa	golondrina

FERNS AND FERN ALLIES	
Croton setigerus	doveweed
FABACEAE	LEGUME FAMILY
Lathyrus vestitus var. *alefeldi*	San Diego sweet pea
Lotus scoparius	deerweed
Lupinus bicolor	miniature lupine
*Vicia villosa**	winter vetch
GERANIACEAE	GERANIUM FAMILY
Erodium cicutarium	red-stem filaree
*Erodium moschatum**	white-stem filaree
HYDROPHYLLACEAE	WATERLEAF FAMILY
Phacelia cicutaria var. *hispida*	caterpillar phacelia
Phacelia sp.	scorpionweed
Pholistoma membranaceum	white fiesta flower
LAMIACEAE	MINT FAMILY
*Marubium vulgare**	horehound
Salvia apiana	white sage
Salvia mellifera	black sage
LOASACEAE	LOASA FAMILY
Mentzelia sp.	blazing star
MALVACEAE	MALLOW FAMILY
Malacothamnus fasciculatus	chaparral bushmallow
*Malva neglecta**	common mallow
*Malva parviflora**	cheeseweed
Sidalcea malviflora ssp. *sparsifolia*	checker-bloom
NYCTAGINACEAE	FOUR O'CLOCK FAMILY
Mirabilis laevis var. *crassifolia*	coastal wishbone plant
ONAGRACEAE	EVENING-PRIMROSE FAMILY
Epilobium canum	California fuchsia
PAPAVERACEAE	POPPY FAMILY
Eschscholzia californica	California poppy
PLANTAGINACEAE	PLANTAIN FAMILY
Plantago erecta	dot-seed plantain
POLYGONACEAE	BUCKWHEAT FAMILY
Eriogonum fasciculatum var. *fasciculatum*	California buckwheat
Polygonum arenastrum	common knotweed
*Rumex crispus**	curly dock
PORTULACEAE	PURSLANE FAMILY
Calandrinia maritima (CNPS list 4.2)	seaside calandrinia
PRIMULACEAE	PRIMROSE FAMILY
*Anagallis arvensis**	scarlet pimpernel
Dodecatheon clevelandii ssp. *clevelandii*	padre's shooting star
RHAMNACEAE	BUCKTHORN FAMILY
Rhamnus crocea	spiny redberry
RUBIACEAE	MADDER OR COFFEE

FERNS AND FERN ALLIES	
	FAMILY
Galium aparine	common bedstraw
SALICACEAE	WILLOW FAMILY
Salix goodingii	Gooding's willow
Salix lasiolepis	arroyo willow
SCROPHULARIACEAE	FIGWORT FAMILY
Scrophularia californica	California figwort
SIMMONDSIACEAE	JOJOBA FAMILY
Simmondsia chinensis	jojoba
SOLANACEAE	NIGHTSHADE FAMILY
*Nicotiana glauca**	tree tobacco
Datura wrightii	jimson weed
TAMARICACEAE	TAMARISK FAMILY
*Tamarix ramosissima**	tamarisk
ANGIOSPERMS (MONOCOTYLEDONS)	
AGAVACEAE	AGAVE FAMILY
Yucca schidigera	Mojave yucca
CYPERACEAE	SEDGE FAMILY
Scirpus americanus	bulrush
IRIDACEAE	IRIS FAMILY
Sisyrinchium bellum	blue-eyed-grass
JUNCACEAE	RUSH FAMILY
Juncus acutus ssp. leopoldii (CNPS List 4.2)	southwestern spiny rush
Juncus mexicanus	Mexican rush
LILIACEAE	LILY FAMILY
Bloomeria crocea	common goldenstar
Calochortus splendens	lilac mariposa lily
Calochortus sp.	mariposa lily
Chlorogalum parviflorum	small-flowered amole
Dichelostemma capitatum ssp. *capitatum*	blue dicks
POACEAE	GRASS FAMILY
Achnatherum coronatum	giant stipa
*Avena barbata**	slender wild oat
*Avena fatua**	wild oat
*Brachypodium distachyon**	false-brome
*Bromus diandrus**	ripgut brome
*Bromus hordeaceus**	soft chess
*Bromus rubens**	foxtail chess
*Bromus tectorum**	cheatgrass
*Cynodon dactylon**	crabgrass
Distichlis spicata	spiked salt grass
*Gastridium ventricosum**	nit grass
Hordeum murinum ssp. *leporinum**	hare barley
Hordeum vulgare var. *trifurcatum**	cultivated barley
*Lamarckia aurea**	goldentop

FERNS AND FERN ALLIES	
*Lolium multiflorum**	Italian ryegrass
Mellica imperfecta	oniongrass
Muhlenbergia asperifolia	scratch grass
Muhlenbergia microsperma	little seed muhly
Muhlenbergia rigens	deer grass
Nassella lepida	foothill needlegrass
Nassella pulchra	purple needlegrass
*Phalaris aquatica**	canary grass
*Piptatherum miliaceum**	smilo grass
*Polypogon monspeliensis**	rabbits foot grass
*Schismus barbatus**	Mediterranean schismus
*Triticum aestivum**	cereal wheat
Vulpia myuros var. *myuros**	rat-tail fescue
TYPHACEAE	CATTAIL FAMILY
Typha latifolia	cat-tail

Notes:
* = non-native
FT: Federally Listed as Threatened by USFWS
SE: Califoronia Listed as Endangered by CDFG
MSCP Covered: Chula Vista Multiple Species Conservation Program Covered Species
CNPS: California Native Plant Society
List 1A: Plants presumed extinct in California.
List 1B: Plants rare and endangered in California and throughout their range.
List 2: Plants rare, threatened, or endangered in California but more common elsewhere in their range.
List 3: Plants about which we need more information; a review list.
List 4: Plants of limited distribution; a watch list.
Threat Codes:
1 Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
2 Fairly endangered in California (20-80% occurrences threatened)
3 Not very endangered in California (<20% of occurrences threatened or no current threats known)

Scientific Name	Common Name
Butterflies	
Anthocharis sara sara	Pacific sara orangetip
Apodemia mormo virgulti	Behr's metalmark
Brephidium exila	western pygmy blue
Coenonympha californica californica	common California ringlet
Danaus gilippus	striated queen
Erynnis funeralis	funereal duskywing
Junonia coenia grisea	commom buckeye
Papilio eurymedon	pale swallowtail
Papilio zelicaon	anise swallowtail
Pontia protodice	checkered white
Vanessa annabella	west coast lady
Vanessa atalanta rubria	red admiral
Vanessa cardui	painted lady
Amphibians and Reptiles	
Lichanura trivirgata roseofusca	Coastal rosy boa
Aspidocelis hyperythrus ssp. *beldingi*	Orange-throated whiptail
Pseudacris regilla	Pacific chorus frog
Sceloporus occidentalis biseriatus	western fence lizard
Uta stansburiana elegans	California side-blotch lizard
Birds	
Accipiter striatus	sharp-shinned hawk (WL)
Aeronautes saxatalis	white-throated swift
Agelaius phoeniceus	red-winged blackbird
Aimophila ruficeps canescens	So. Cal. rufous-crowned sparrow (WL)
Ammodramus savannarum	grasshopper sparrow (SSC)
Aphelocoma californica	western scrub-jay
Athene cunicularia	burrowing owl (SSC)
Buteo jamaicenis	red-tailed hawk
Callipepla californica	California quail
Calypte anna	Anna’s hummingbird
Campylorhynchus brunneicapillus	coastal cactus wren
Carduelis lawrencei	Lawrence's goldfinch
Carduelis psaltria	lesser goldfinch
Carpodacus mexicanus	house finch
Chamaea fasciata	wrentit
Charidrius vociferus	killdeer
Circus cyaneus	northern harrier
Colaptes auratus	northern flicker
Corvus corax	common raven
Elanus leucurus	white-tailed kite (FP)
Eremophila alpestris	horned lark
Eremophila alpestris actia	California horned lark (WL)
Falco sparverius	American kestrel
Geococcyx californianus	greater roadrunner

Scientific Name	Common Name
Icteria virens	Yellow-breasted chat
Larus californicus	California gull
Melospiza melodia	song sparrow
Mimus polyglottos	northern mockingbird
Myiarchus cinerascens	ash-throated flycatcher
Passerina amoena	lazuli bunting
Passerina caerulea	blue grosbeak
Pipilo crissalis	California towhee
Pipilo maculatus	spotted towhee
Polioptila californica californica	coastal California gnatcatcher (SSC, FT)
Psaltriparus minimus	bushtit
Salpinctes obsoletus	rock wren
Sayornis nigricans	black phoebe
Sayornis saya	Say's phoebe
Selasphorus sp.	Selasphorus hummingbird
Stelgidopteryx serripennis	northern rough-winged swallow
Sturnella neglecta	western meadowlark
Thryomanes bewickii	Bewick's wren
Toxostoma redivivum	California thrasher
Zenaida macroura	mourning dove
Mammals	
Canis latrans	coyote
Felis rufus	bobcat
Lepus californicus bennettii	San Diego black-tailed jackrabbit (SSC)
Spermophilus beecheyi nudipes	California ground squirrel
Sylvilagus audubonii	Audubon's cottontail

Notes:
FE= Federally listed as Endangered
FT = Federally listed as Threatened
FP = State Fully Protected
SE = State listed as Endangered
SSC = California Species of Special Concern

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Plants				
San Diego thornmint	*Acanthomintha ilicifolia*	FT/SE/Covered Narrow Endemic/ CNPS 1B.2	Chaparral, coastal sage scrub, Valley and foothill grassland, vernal pools, clays/annual herb/April-June	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.
San Diego County needlegrass	*Achnatherum diegoense*	CNPS 4.1	Chaparral, coastal sage scrub/perennial herb/May-June	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.
California adolphia	*Adolphia californica*	CNPS 2.1	Chaparral, coastal sage scrub, Valley and foothill grassland, clays/shrub/December-April	Not detected during focused surveys conducted at the appropriate time of year. Moderate potential to occur on-site.
Shaw's agave	*Agave shawii*	FSC/CNPS 2.3	Coastal bluff scrub, coastal sage scrub/shrub/May-July	Not detected during focused surveys. Low potential to occur on-site.
San Diego bursage	*Ambrosia chenopodiifolia*	CNPS 2.3	Coastal sage scrub/shrub/April-June	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.
San Diego ambrosia	*Ambrosia pumila*	FE/SE/CNPS 1B.2	Chaparral, coastal sage scrub, Valley and foothill grassland, vernal pools, clays/perennial herb/June-September	Not detected during focused surveys. Low potential to occur on-site.
Alphanisma	*Aphanisma blitoides*	FSC/CNPS 1B.2	Coastal bluff scrub, coastal sage scrub, sandy soils/annual herb/April-May	Not detected during focused surveys. Low potential to occur on-site.
San Diego sagewort	*Artemisia palmeri*	CNPS 4.1	Chaparral, coastal sage scrub, riparian forest and scrub, sandy soils/shrub/July-September	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
San Diego milkvetch	*Astragalus oocarpus*	FSC/CNPS 1B.3	Chaparral (openings), cismontane woodland/perennial herb/May-August	Not detected during focused surveys. Low potential to occur on-site.
South Coast saltscale	*Atriplex pacifica*	FSC/CNPS 1B.3	Coastal bluff scrub, coastal sage scrub, playas/annual herb/March-October	Detected on site.
Brewer's calindrinia	*Calindrinia breweri*	CNPS 4.1	Chaparral, coastal sage scrub, disturbed and burned areas/annual herb/March-June	Not detected during focused surveys. Low potential to occur on-site.
Seaside calindrinia	*Calindrinia maritima*	CNPS 4.1	Coastal bluff scrub, Valley and foothill grassland, sandy soils/annual herb/March-May	Detected on site.
Dunn's mariposa lily	*Calochortus dunnii*	FSC/SR/MSCP Covered/CNPS 1B.2	Closed-cone conifer forest, chaparral, gabbroic soils/perennial herb/May-June	Not detected during focused surveys. Low potential to occur on-site.
Lewis's evening primose	*Camissonia lewisii*	CNPS 3	Coastal bluff scrub, cismontane woodland, coastal dunes, coastal sage scrub, Valley and foothill grassland, sandy or clay soils/annual herb/March-June	Not detected during focused surveys. Low potential to occur on-site.
Payson's jewelflower	*Caulanthus simulans*	FSC/CNPS 4.1	Chaparral, coastal sage scrub, sandy and granitic soils/annual herb/March-June	Not detected during focused surveys. Low potential to occur on-site.
Slender-pod jewelflower	*Caulanthus stenocarpus*	FSC/SR/MSCP Covered	Chaparral, coastal sage scrub/annual herb, fire follower/March-May	Not detected during focused surveys. Low potential to occur on-site.
Southern mountain misery	*Chamaebatia australis*	CNPS 4.1	Chaparral/shrub/ November-May	Not detected during focused surveys. Low potential to occur on-site.

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Peninsular spineflower	*Chorizanthe leptotheca*	CNPS 4.1	Chaparral, coastal sage scrub, lower montane conifer forest, alluvial fan, granitic soils/annual herb/May-August	Not detected during focused surveys. Low potential to occur on-site.
Orcutt's spineflower	*Chorizanthe orcuttiana*	FE/SE/CNPS 1B.3	Chaparral, closed-cone conifer forest, coastal sage scrub/annual herb/March-April	Not detected during focused surveys. Low potential to occur on-site.
Small-flower bindweed	*Convolvulus simulans (CNPS List 4.2) small-flower bindweed*	CNPS 4.2	Non-native perennial herb found in orchards and agricultural fields/May-October	Detected on the Project.
Snake cholla	*Cylindropuntia californica var. californica*	MSCP Covered/CNPS 1B.3	Coastal sage scrub, chaparral, shrub (stem succulent)/April-May	Detected during focused surveys..
Coast Cholla	*Cylindropuntia prolifera*	CNPS-not listed	Dry coastal scrub slopes/April-June.	Detected during focused surveys.
Tecate tarplant	*Deinandra (Hemizonia) floribunda*	FSC/CNPS 1B.2	Chaparral, coastal sage scrub/annual herb/August-October	Not detected during focused surveys. Low potential to occur on-site.
Otay tarplant	*Deinandra conjugens*	FT/CE/MSCP Covered Narrow Endemic/CNPS 1B.3	Openings in coastal sage scrub, chaparral, grasslands; clay soils. Annual/May-June	Detected during focused surveys.
Western dichondra	*Dichondra occidentalis*	CNPS 4.2	Chaparral, cismontane woodland, coastal sage scrub, Valley and foothill grassland/perennial herb/March-May	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.
Blochman's dudleya	*Dudleya blochmaniae spp. blochmaniae*	FSC/CNPS 1B.1	Coastal bluff scrub, coastal sage scrub, Valley and foothill grassland, rocky, often clay or serpentinite soil/perennial herb/April-June/	Not detected during focused surveys. Low potential to occur on-site.
Short-leaved dudleya	*Dudleya brevifolia*	FSC/SE/MSCP Covered/CNPS 1B.1	Chaparral, coastal sage scrub, Torrey sandstone/perennial herb/April	Not detected during focused surveys. Low potential to occur on-site.

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Variegated dudleya	*Dudleya variegata*	FSC/Covered Narrow Endemic/ CNPS 1B.2	Chaparral, cismontane woodland, coastal sage scrub, Valley and foothill grassland, vernal pools/ perennial herb/May-June	Not detected during focused surveys conducted at the appropriate time of year. Moderate potential to occur on-site.
Palmer's goldenbush	*Ericameria palmeri ssp. palmeri*	FSC/MSCP Covered/CNPS 2.3	Coastal sage scrub/ shrub/September-November	Not detected during focused surveys conducted at the appropriate time of year. Moderate potential to occur on-site.
Coastal wallflower	*Erysimum ammophilum*	FSC/MSCP Covered/CNPS 1B.2	Coastal dunes/perennial herbs/February-June	Not detected during focused surveys. Low potential to occur on-site.
Cliff spurge	*Euphorbia misera*	CNPS 2.2	Coastal bluff scrub, coastal sage scrub, rocky areas/shrub/January-August	Not detected during focused surveys. Low potential to occur on-site.
coast barrel cactus	*Ferocactus viridescens var. viridescens*	FSC/MSCP Covered/CNPS 2.1	Chaparral, coastal sage scrub, Valley and foothill grassland, vernal pools/shrub/May-June	Detected during focused surveys. This species is common within the scrub in the southwestern portion of the Project that is MHCP preserve. A few individuals were also found within impact area.
Mexican flannelbush	*Fremontodendron mexicanum*	FE/SR/CNPS 1B.3	Closed-cone conifer forest, chaparral, cismontane woodland, gabbroic or serpentinite soils/shrub/March-June	Not detected during focused surveys. Low potential to occur on-site
San Diego gumplant	*Grindelia hirsutula var. hallii*	CNPS 1B.2	Chaparral, lower montane conifer forest, meadows and seeps, Valley and foothill grassland/perennial herb/July-October	Not detected during focused surveys. Low potential to occur on-site.
Palmer's grapplinghook	*Harpagonella palmeri*	CNPS 4.1	Chaparral, coastal sage scrub, Valley and foothill grassland, clays/annual herb/March-April	Detected on site

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Graceful tarplant	*Holocarpha virgata ssp. elongata*	FSC/CNPS 4.1	Coastal sage scrub, cismontane woodland, chaparral, Valley and foothill grassland/annual herb/August-November	Detected on site.
Southwestern spiny rush	*Juncus acutus ssp. leopoldii*	CNPS List 4.2	Coastal dunes, meadows and alkaline seeps and coastal salt marshes and swamps/ May- June.	Found in all drainages on-site.
Short-lobed broom-rape	*Orobanche parishii ssp. brachyloba*	CNPS 4.1	Coastal bluff scrub, coastal dunes, coastal sage, scrub, sandy soils/perennial herb/May-August	Not detected during focused surveys. Low potential to occur on-site.
Brand's phacelia	*Phacelia stellaris*	CNPS 1B.3	Coastal dunes, coastal sage scrub/annual herb/March-June	Not detected during focused surveys. Low potential to occur on-site.
San Diego mesa mint	*Pogogyne abramsii*	FE/SE/MSCP Covered/CNPS 1B.2	Vernal pools/annual herb/April-June	Not detected during focused surveys. Low potential to occur on-site due to lack of vernal pools.
Otay Mesa mint	*Pogogyne nudiuscula*	FE/SE/Covered; CNPS 1B.3	Vernal pools/annual herb/May-June	Not detected during focused surveys. Low potential to occur on-site.
Nuttall's scrub oak	*Quercus dumosa*	FSC/CNPS 1B.2	Chaparral, coastal sage scrub, sandy and clay loam soils/shrub/February-March	Not detected during focused surveys. Low potential to occur on-site.
Engelmann oak	*Quercus engelmannii*	CNPS 4.1	Chaparral, cismontane woodland, riparian woodland, Valley and foothill grassland/tree/April-May	Not detected during focused surveys. Low potential to occur on-site.
Small-leaved rose	*Rosa minutifolia*	FSC/SE/MSCP Covered; CNPS 2.3	Chaparral/shrub/January-June	Not detected during focused surveys. Low potential to occur on-site.

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Munz's sage	*Salvia munzii*	CNPS 2.2	Chaparral, coastal sage scrub/shrub/February-April	Not detected during focused surveys conducted at the appropriate time of year.. Moderate potential to occur on-site.
San Miguel savory	*Satureja chandleri*	CNPS 1B.2	Chaparral, cismontane woodland, coastal, sage scrub, riparian woodland, Valley and foothill grassland/perennial herb/March-May	Not detected during focused surveys. Low potential to occur on-site.
Invertebrates				
Quino checkerspot butterfly	*Euphydryas editha quino*	FE/MSCP covered	Open coastal sage scrub, chaparral and grasslands	Not detected during 2009 or 2010 focused surveys.
Reptiles				
Orange-throated whiptail	*Aspidocellis (Cnemidophorus) hyperythrus beldingi*	SSC/MSCP Covered	Open coastal sage scrub, chaparral and often in brushy patches on stream terraces and other sandy areas.	Detected on site.
Coastal rosy boa	*Charina [Lichanura] trivirgata roseofusca*	SSC	Coastal sage scrub and chaparral and drainages	Not detected, but suitable habitat is present at base of canyons.
San Diego horned lizard	*Phrynosoma coronatum blainvillei*	SSC/MSCP Covered	Openings in coastal sage scrub and chaparral with sandy, friable soils	Not detected on-site, but suitable habitat is present within the undisturbed portions of the site; moderate potential to occur on site
Birds				
Golden eagle	*Aquila chrysaetos*	SSC/MSCP Covered	Open grasslands, usually in mountainous areas away from people	Not detected on site. Site does not support suitable habitat for nesting, but does provide foraging habitat.
Grasshopper sparrow	*Ammodramus savannarum*	SSC	Grasslands and open CSS	Detected on-site
So. California rufous-crowned sparrow	*Aimophila ruficeps canescens*	CDFG watch list/MSCP Covered	Coastal sage scrub and chaparral – typically with prominent rock outcrops	Detected on-site.

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
Ferruginous hawk	*Buteo regalis*	SSC	Arid grasslands, treeless areas	Not detected on-site, site does not support suitable habitat for nesting, but there is a moderate potential for foraging to occur, during migration.
Swainson's hawk	*Buteo swainsonii*	CT/MSCP Covered	Open grasslands, agricultural land	Not detected on-site, but known from the Otay River Valley and mesas immediately east of Project, during migration.
Coastal cactus wren	*Campylorhnchus brunneicapillus couesi*	SSC/MSCP Covered	Cactus patches in coastal sage scrub/chaparral	Detected several hundred feet from southwestern site corner outside of the site boundary during surveys in cactus patches. Sighting location occurs within MSCP open space west of the project.
Least Bell's Vireo	*Vireo bellii pusillus*	FE/CE/MSCP Covered	Riparian Scrub and Woodlands	Not detected in the immediate vicinity, but is known to occur within the Otay River floodplain. Mulefat scrub habitat potentially used by this species
Southwestern willow flycatcher	*Empidonax trailli extimus*	FE/CE/MSCP Covered	Riparian thickets, woodlands and forests	Not detected within the Project area. No suitable habitat is present.
American peregrine falcon	*Falco peregrinus anatum*	CE/MSCP Covered	Open grasslands, agricultural fields especially near water	Not detected within the Project area. Not expected to nest, but low potential for foraging to occur.
Northern harrier	*Circus cyaneus*	SSC/MSCP Covered	Marshes, agricultural fields, grasslands	Detected on-site, and known from the Otay River Valley and mesas immediately east and west of Project, Potential nesting habitat is present if agricultural land is fallowed.
Coastal California gnatcatcher	*Polioptila californica californica*	FT/MSCP Covered	Coastal sage scrub, occasional in chaparral	Detected on-site. There is one territory within the Project that is within the MSCP lands.
Burrowing owl	*Athene cunicularia*	SSC/MSCP Covered	Open grasslands, agricultural fields	Detected within MSCP area in SW corner of Project. One

Common Name	*Scientific Name*	Sensitivity Status	Primary Habitat Associations/Life Form/Blooming Period	Potential to Occur or Status On-site
				burrow was detected within the impact area.
Tri-colored blackbird	*Agelaius tricolor*	SSC/MSCP Covered	Freshwater marsh for breeding; grasslands and agriculture for foraging	Not detected during recent surveys. No suitable breeding habitat occurs on-site although the species may utilize the site for foraging.
Mammals				
Pacific pocket mouse	*Perognathus longimembris pacificus-*	FE/SSC	Fine or sandy soils with sparse coastal sage scrub or disturbed grassland	Not encountered. Outside of known range and appropriate soil type do not occur on-site. Suitable habitat is present.
Northwestern San Diego pocket mouse	*Chaetodipus fallax*	SSC	Coastal sage scrub and chaparral	Not encountered. Presumed to occur in coastal sage scrub and maritime succulent scrub. Suitable habitat is present.
Dulzura California pocket mouse	*Chaetodipus californicus femoralis*	SSC	Coastal sage scrub and chaparral	Not encountered. Presumed to occur in coastal sage scrub and maritime succulent scrub. Suitable habitat is present.
San Diego desert woodrat	*Neotoma lepida intermedia*	SSC	Coastal sage scrub and chaparral	Not encountered. Presumed to occur in coastal sage scrub and maritime succulent scrub. Suitable habitat is present.
San Diego black-tailed jackrabbit	*Lepus californicus bennettii*	SSC	Coastal sage scrub, grassland	Detected; known to be relatively common in the area.

Status:
Federal Endangered (FE)
Federal Threatened (FT)Federal Species of Concern (FSC)
State Endangered (SE)
State Threatened (ST)
State Species of Special Concern (SSC)
State Fully Protected (SFP)
California Native Plant Society listed (CNPS).
CNPS Lists:
List 1A Plants Presumed Extinct in California
List 1B Plants Rare, Threatened or Endangered in California and Elsewhere
List 2 Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
List 3 Plants About Which We Need More Information, A Review List
List 4 Plants of Limited Distribution, A Watch List
List is follwed by threat code (e.g. CNPS List 1B.2)
.1 - Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
.2 – Fairly endangered in California (20-80% occurrences threatened)
.3 – Not very endangered in California (<20% of occurrences threatened)

Photograph # 1

May 28, 2008

Overall view of Village 8 West standing along the southwestern border facing SR125 bridge crossing the Otay River to the southeast.

Photograph # 2

May 28, 2008

A portion of historic coastal sage scrub was tilled in the southwestern portion of the Project. The area is now dominated by non-natives and weedy species, such as Russian thistle (*Salsola tragus*), black mustard (*Brassica nigra)*, and slender wild oat (*Avena barbata*).

	**Photograph # 3** **May 28, 2008** Overall view of the graded areas on the east facing slopes.
	**Photograph # 4** **June 18, 2008** San Diego sunflower (*Viguiera laciniata*) makes up a significant proportion (up to 20%) of cover in nondisturbed coastal sage scrub; the amount of cover depends upon local site factors and levels of disturbance.

Photograph # 5

July 31, 2008

As stated above, San Diego sunflower is prominent in coastal sage scrub habitat. Note the change in appearance of the sunflower later in the blooming season. The blooming season of this species occurs from February-June.

Photograph # 6

June 9, 2008

An adult male California gnatcatcher, a federally threatened species, occupying portions of the coastal sage scrub within the southwest portion of the site. Multiple sightings of this individual were made during several site visits.

Photograph # 7

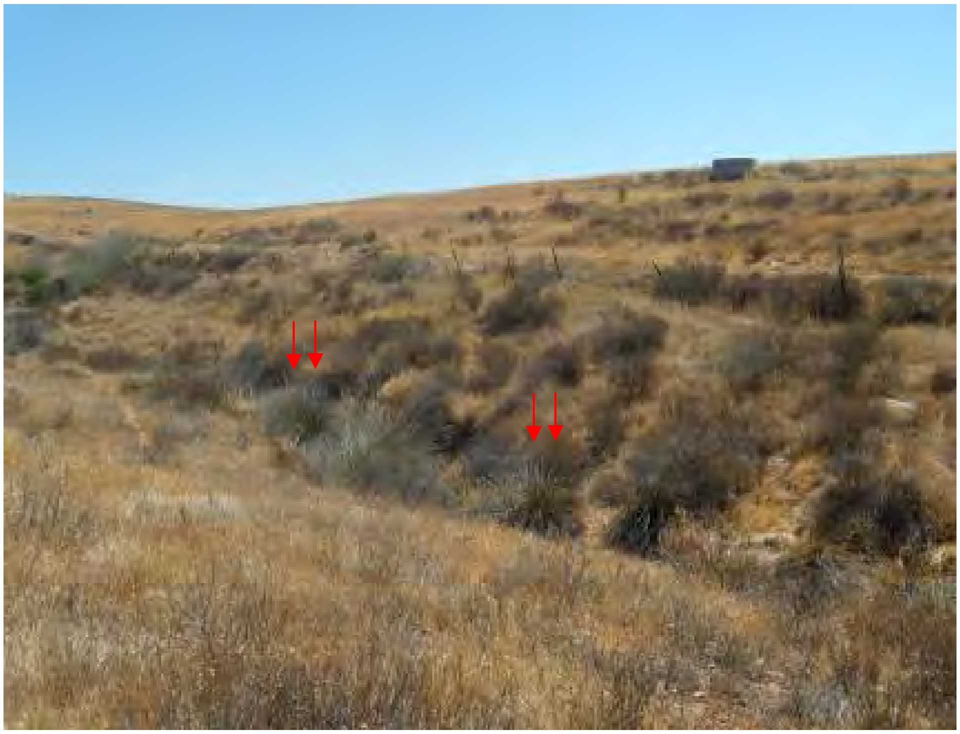
June 27, 2008

Overall view of the disturbed coastal sage scrub throughout the channel on the east side of the Project. A large culvert exists at the northern limit of the disturbed coastal sage scrub. Note that the channel is surrounded by active and extensive agriculture fields.

Photograph # 8

June 18, 2008

View of a cement culvert that is located in the eastern drainage. Disturbed coastal sage scrub continues from this point on into a southerly direction.

	**Photograph # 9** **June 18, 2008** Southeastern corner of the site showing a drainage with highly disturbed coastal sage scrub along the banks. Southwestern spike rushes (*Juncus acutus* ssp. *leopoldii*, CNPS list 4.2) are interspersed throughout the middle of the drainage, as indicated by the arrows.
	**Photograph # 10** **June 16, 2008** Southwestern spike rush is found in all 3 of the major drainages on Village 8 West. They are typically found in/along waterways, but a few individuals were interspersed throughout the hillsides of the coastal sage scrub.

	**Photograph # 11** **June 18, 2008** A patch of maritime succulent scrub exists on the far northwestern-most corner of the Project; this region is dominated by a high proportion of succulent taxa,
	**Photograph # 12** **June 18, 2008** Close-up of coast barrel cactus. This species is frequently found in dense clusters that form between rock crevices with an open slope. Fishhook cactuses (*Mammillaria dioica*) are seen at lower right (arrow).

	**Photograph # 13** **July 31, 2008** A waters delineation pit that was dug in the freshwater marsh located in the northwestern portion of the Project. In order to meet the definition of a wetland, 3 parameters must be met. All wetland parameters are met at this location.
	**Photograph # 14** **July 31, 2008** Cattail (*Typha latifolia)* is an example of wetland vegetation. Hydric soils and hydrology are also present.

	**Photograph # 15** **July 31, 2008** An upland pit that was dug in close proximity to the wetland. This specific location was chosen to delineate the boundary of the wetland. Note the absence of all wetland indicators: hydrology, hydric soils, and wetland vegetation.
	**Photograph # 16** **July 31, 2008** View of a cement culvert and rip-rap that is located in the northeastern corner of Village 8 West. Run-off from nearby development accumulates here and travels in a southwesterly direction.

Photograph # 17

July 31, 2008

A wetland pit that was dug in the drainage near the culvert in photograph # 16. Note the relatively bare ground cover and lack of hydrology within the area.

Photograph # 18

July 31, 2008

View of the vegetation present along the northern drainage. This photograph was taken approximately 100 feet from the culvert in photograph # 16.

<table>
<tr><td></td><td>Photograph # 19

July 31, 2008

View of vegetation present along the northern drainage. This photograph was taken approximately 350 feet from the culvert in photograph # 16. Note the prevalence of weedy species as the distance from the culvert increases.</td></tr>
<tr><td></td><td>Photograph # 20

February 27, 2009

Burrowing owl burrow located in the southwestern corner of Village 8 West within planned MSCP conservation area.</td></tr>
</table>

APPENDIX G Invasive and Non-invasive Plant Species Lists for Village 8 West

APPENDIX "B"

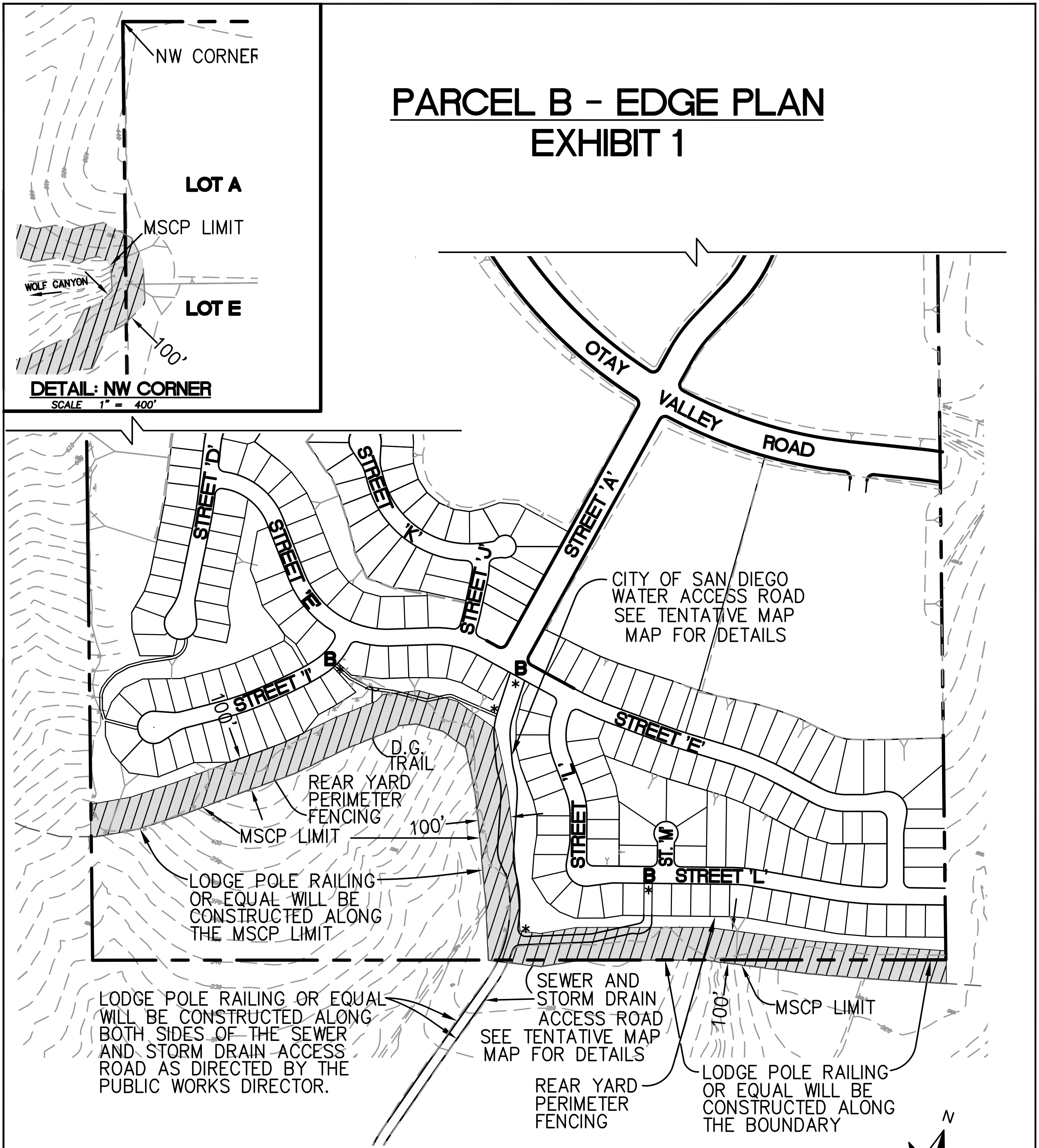
Approved Plant List for the Village 8-West Preserve Edge

Existing Natives On Site*	Approved Village 2 Species**	BOTANICAL NAME - Common Name
		LARGE SHRUBS:
	▲	HETEROMELES ARBUTIFOLIA - Toyon
◆	▲	ISOMERIS ARBOREA - Bladder Pod
◆	▲	RHAMNUS CROCEA - Redberry
◆	▲	SIMMONDSIA CHINENSIS - Jojoba
◆		YUCCA SCHIDIGERA - Mojave Yucca
		SUBSHRUBS / PERENNIALS / SUCCULENTS:
◆		BACCHARIS PILULARIS - Coyote Brush
◆	▲	CYLINDROPUNTIA CALIFORNICA - Snake Cholla
◆	▲	DEINANDRA (HEMIZONIA) FASCICULATA - Fascicled Tarplant
◆	▲	DISTICHLIS SPICATA - Spiked Salt Grass
◆		IVA HAYESIANA - San Diego Marsh-elder
◆	▲	LUPINUS SUCCULENTUS - Arroyo Lupine
◆		MALACHOTHAMNUS FASCICULATUS - Chaparrel Bushmallow
◆	▲	NASSELLA PULCHRA - Purple Needlegrass
◆	▲	OPUNTIA LITTORALIS - Coastal Prickly Pear
◆		SALVIA APIANA - White Sage
◆	▲	SISYRINCHIUM BELLUM - Blue-eyed Grass
◆	▲	VIGUIERA LACINIATA - San Diego Sunflower
		SEEDED PLANTS:
◆		BLOOMERIA CROCEA - Common Goldstar
◆	▲	DEINANDRA (HEMIZONIA) FASCICULATA - Fascicled Tarplant
◆		HAZARDIA SQUARROSA - Sawtooth Goldenfields
◆	▲	LUPINUS SUCCULENTUS - Arroyo Lupine
◆		PLANTAGO ERECTA - Dot-seed Plantain
◆	▲	SISYRINCHIUM BELLUM - Blue-eyed Grass

NOTES:
All listed species are suitable for fuel modification zones

* Existing species on site per Biological Resources Report by URS, July 26, 2010
** Approved for Villages 2, 3, & portions of 4

PARCEL B - EDGE PLAN
EXHIBIT 1



* MAINTENANCE ACCESS POINTS AND SIGNAGE

B ACCESS CONTROL BOLLARDS

100' BUFFER ZONE

0 400 800 1200

SCALE 1" = 400'

APPENDIX F1

Cultural Resources Survey

CULTURAL RESOURCE SURVEY AND TEST FOR OTAY RANCH PARCEL B CHULA VISTA, SAN DIEGO COUNTY, CALIFORNIA

Prepared for:
Otay Land Company, LLC
1903 Wright Place, Suite 220
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PJ. 6-08

Revised by:
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Noah Archaeological Consulting
5989 Jackson Drive
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(619) 733-2070

National Archaeological Data Base Information

Type of Study: Survey and Test
Area Covered: Approximately 300 acres
USGS 7.5' Quadrangle: Otay Mesa
Previously Recorded Sites: CA-SDI-4726, CA-SDI-12287, CA-SDI-12809, CA-SDI-14176, CA-SDI-14235, CA-SDI-14236
Previously Recorded Isolates: P-37-014531, P-37-014532, P-37-014533, P-37-015008, P-37-015145
Newly Recorded Isolates: OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7
Key Words: Habitation site, Steep-edged unifacial tool (SEUT/adze), Battered implement, Core, Biface, Discoidal, Metate, Mano, Shell

Authors

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Project Manager

Contributors

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Stephen Van Wormer – Project Historian
Karen E. Doose – Lab Director, Report Production
Nick Doose – GIS Specialist, Graphics
Brian Spelts – Field Crew, Graphics
Lucas Piek – Field Crew
Brian Williams – Field Crew
Larry Tift – Field Crew
Carmen Lucas – Native American Monitor

February 2009 (Revised July 2010)

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* Bound separately in Confidential Appendix

EXECUTIVE SUMMARY

TITLE:	Cultural Resource Survey and Test for Otay Ranch Village 8 West Chula Vista, San Diego County, California
AUTHORS:	Monica Guerrero and Dennis R. Gallegos Gallegos & Associates 5671 Palmer Way, Suite A Carlsbad, California 92010
DATE:	July 2010
SOURCE OF COPIES:	South Coastal Information Center San Diego State University 4283 El Cajon Blvd, Suite 250 San Diego, California 92105

ABSTRACT:

This study provides the results of a cultural resource record search, literature review, field survey, and test program for the approximately 300-acre Otay Ranch Village 8 West (Otay Ranch) project and associated offsite improvements (storm drain, sewer line, and associated easement access road, which would accommodate a trail connection to the Otay Valley Regional Park connector trail north of Otay River). This study was conducted in compliance with City of Chula Vista and California Environmental Quality Act (CEQA) guidelines.

The literature review was positive, identifying 4 cultural resource sites (CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236) and 5 isolates (P-37-014531, P-37-014532, P-37-014533, P-37-015008, and P-37-015145) within or adjacent to the Village 8 West parcel. Two sites (CA-SDI-4789 and CA-SDI-12809) are located within the Area of Potential Effect (APE) for the offsite improvement area.

As a result of the field survey, previously recorded sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 were relocated, and five new isolates (OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7) were identified. Sites CA-SDI-4789 and CA-SDI-12809 in the offsite improvement area were also relocated. Site CA-SDI-14236 and isolates P-37-014531, P-37-014532, P-37-014533, and P-37-015008 could not be relocated. Isolate P-37-015145 was previously collected by ERCE (1991). Ground visibility within the project area was poor along drainage areas, steep slopes, and in most valley areas, and fair on knoll tops, dirt roads, and some valley areas.

Testing/evaluation to determine site significance was conducted for previously recorded sites CA-SDI-14176 and CA-SDI-14235. Testing at these precontact sites consisted of

collection of surface artifacts, excavation of shovel test pits, and artifact cataloging and analysis. Site CA-SDI-12287 was previously tested and identified as not significant (Clowery-Moreno and Smith 2008), and additional surface artifacts were collected as a result of the present study. Disturbance at the sites consisted of agricultural activity, cattle ranching, previous grading, and fill soil dumping.

Cultural material recovered from CA-SDI-14176 consists of 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14235 consists of 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements.

The lithic samples recovered from sites CA-SDI-14176 and CA-SDI-14235 produced a specialized lithic assemblage that suggests the inhabitants visited the site locations for two specific reasons: wood working and plant processing. The kinds of tools and debitage recovered primarily represent SEUTs/adzes, which were likely used for wood working activities. In addition, the presence of milling tools, battered implements, and battered implement debitage supports processing of floral and/or faunal material and maintenance of milling implements. The artifact assemblage primarily reflects the use of local lithic materials.

Sites CA-SDI-14176 and CA-SDI-14235 have poor site integrity, and produced no faunal materials and a low amount of artifacts to address the research questions posed. Site CA-SDI-12287 was previously tested by Clowery-Moreno and Smith (2008) and identified as not significant under CEQA criteria. Given the results of the test program, additional work at the sites would not significantly contribute to the understanding of the sites or past use of the site locations or the site occupants. Given the poor site integrity, low subsurface artifact counts, absence of ecofactual materials, and site disturbance, sites CA-SDI-14176 and CA-SDI-14235 are identified as not significant under City of Chula Vista and CEQA criteria and are recommended ineligible for listing on the CRHR. Site CA-SDI-12287 was previously identified as not significant (Clowery-Moreno and Smith 2008). Site CA-SDI-14236 was likely destroyed or mapped incorrectly and is also identified as not significant.

Schaefer et al. (1994) previously tested site CA-SDI-4789, which is in the offsite improvement area. The researchers concluded that the testing and analysis program had exhausted the research potential of the site. Based on this conclusion, impacts to the site from the proposed project are identified as not significant. The western edge of CA-SDI-12809 is within the offsite improvement area APE. This major habitation site may be a remnant of the ethnohistoric village of Otay or one of its satellite villages, although archival research did not reveal the location of the village complex (McDonald et al. 1993). An extensive testing program was carried out at this site in 1993 (McDonald et al. 1993) and two major site occupational areas were identified. The closest of these is located 0.2 miles from the APE. Previous testing was negative inside of and within 0.15 miles of the APE.

As presently planned, sites CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, CA-SDI-14236, CA-SDI-4789, and CA-SDI-12809; and, isolates P-37-014531, P-37-014532, P-37-014533, P-37-015008, P-37-015145, OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7 will be directly impacted by the proposed development.

No further cultural resource work is recommended for sites CA-SDI-4789, CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, CA-SDI-14236, and CA-SDI-12809. Construction monitoring by an archaeologist and a Native American is recommended for all sites located within the Otay Ranch project area to ensure that if buried features (i.e., burials, hearths) are encountered, they will be evaluated in a timely and appropriate manner. As required by the standard mitigation measures from the Otay Ranch General Development Plan Program EIR, monitoring is also recommended during all cutting of previously undisturbed soils.

SECTION 1
INTRODUCTION

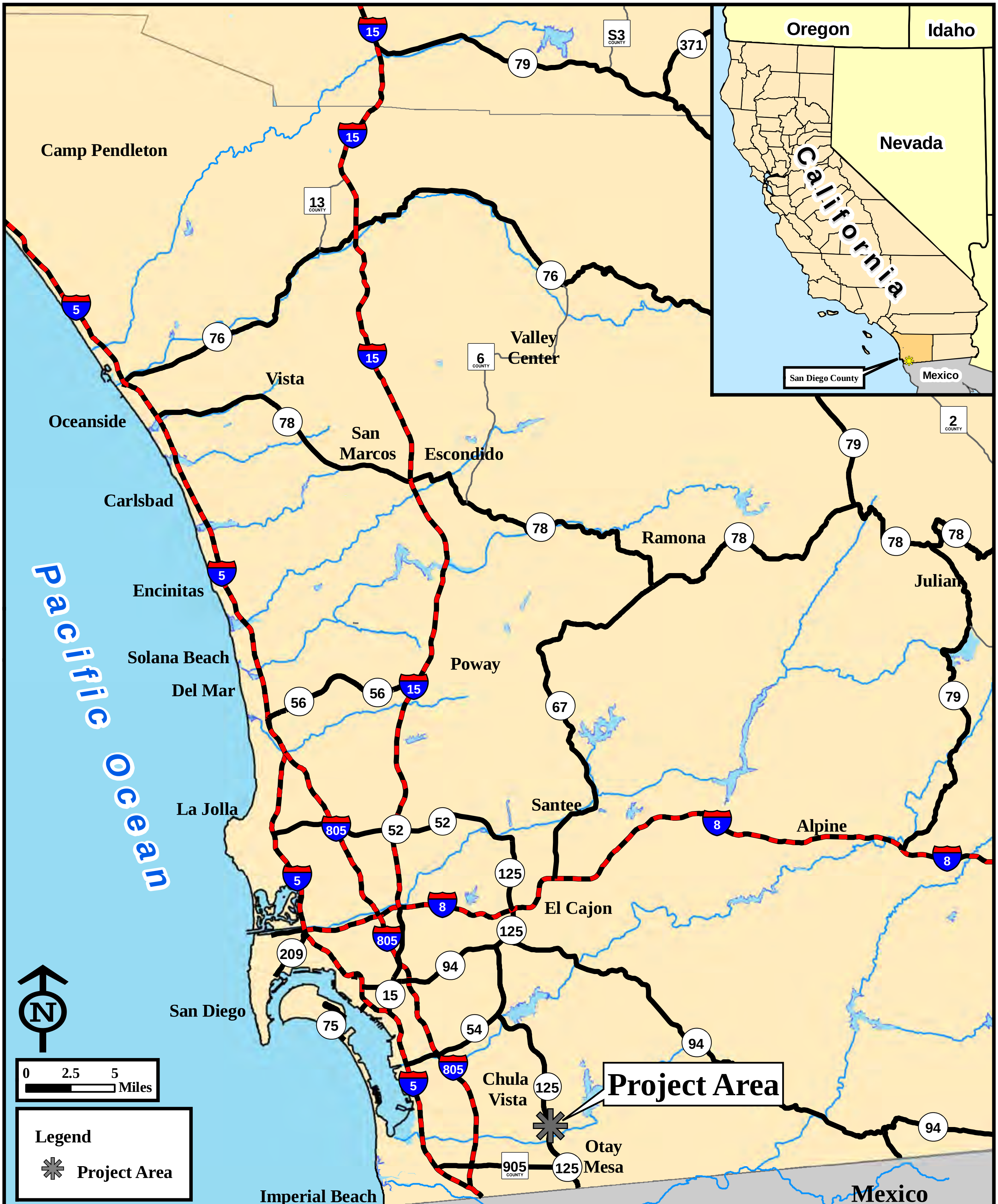
1.1 PROJECT DESCRIPTION

This study was prepared by Gallegos & Associates and submitted to the Otay Land Company, LLC for Otay Ranch Village 8 West (Otay Ranch project). The project area consists of an approximately 300-acre parcel that is proposed for commercial and residential development. Within the 300-acre parcel is a City of San Diego water pipeline, which will be relocated elsewhere within the parcel to accommodate the development. The project also includes an offsite improvement area consisting of an approximately 1600-foot alignment for a storm drain, a sewer line, and an associated easement access road, which would accommodate an offsite trail connection to the Otay Valley Regional Park connector trail north of Otay River. The project area is located within Otay Ranch surrounded by undeveloped land, north of Brown Field, west of Lower Otay Reservoir, and southeast of Wolf Canyon. The project area is depicted on the Otay Mesa 7.5' USGS topographic quadrangle (Figures 1-1 and 1-2). This study was conducted in compliance with City of Chula Vista and California Environmental Quality Act (CEQA) guidelines.

Resumes of key personnel are included in Appendix A; Record Search Results are provided in Appendix B; Glossary of Terms and Technological Category Abbreviations is provided in Appendix C; catalogs in Appendix D; site record forms and updates in Appendix E; Native American Correspondence in Appendix F; and a cultural resource survey report for the proposed offsite storm drain and sewer line improvement area, prepared by Anna C. Noah, Ph.D., in Appendix G.

1.2 ENVIRONMENTAL SETTING

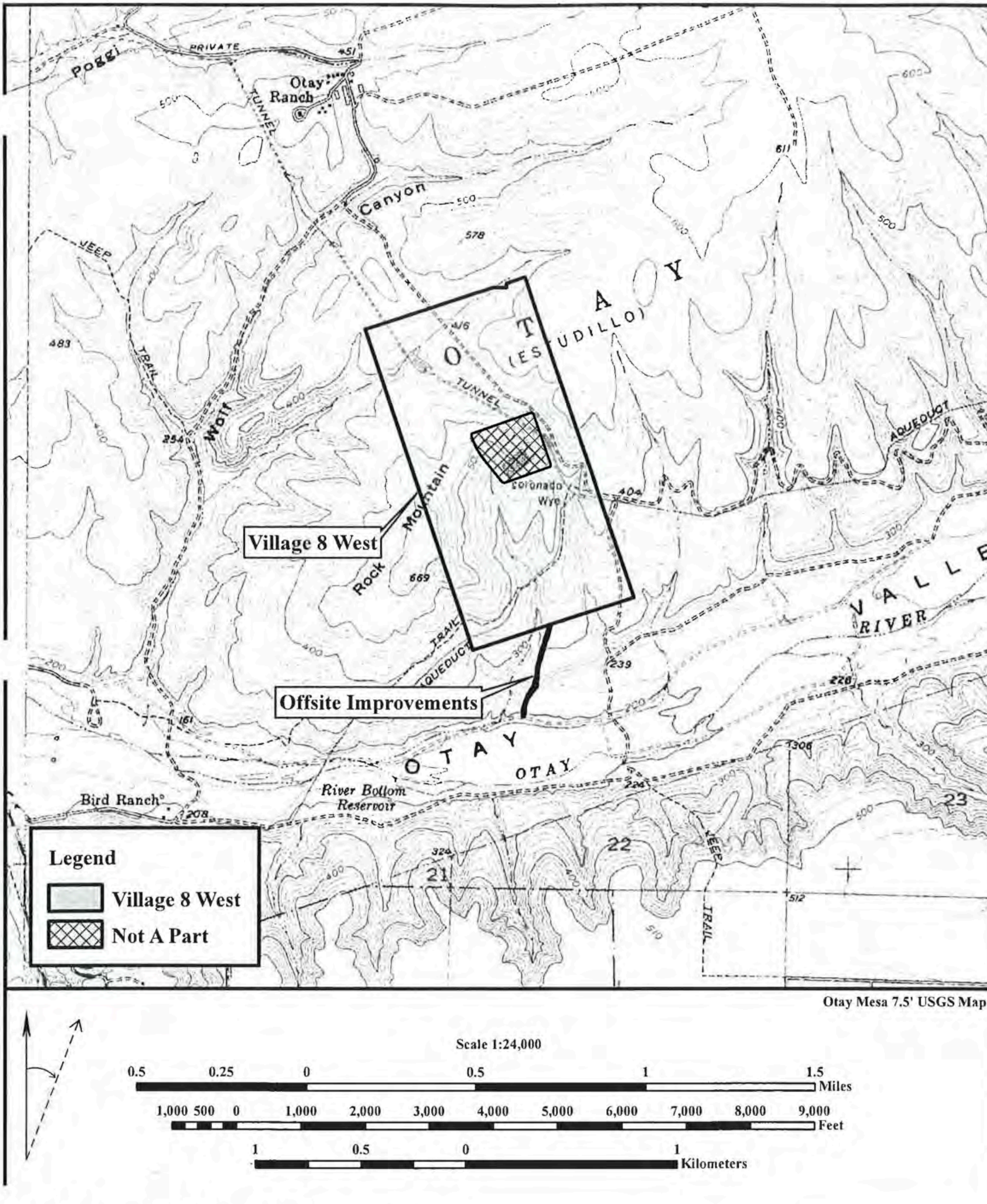
The Otay Ranch project area comprises a series of rolling ridges cut by seasonal gullies along the north side of the river. The ridge and gully system originate from a larger



Gallegos & Associates

Regional Project Location

FIGURE 1-1



Noah Archaeological Consulting

Project area shown on USGS Map	FIGURE 1-2

central ridge created by Salt Creek to the east and Poggi Canyon and Wolf Canyon drainages to the northwest. The parcel is located on the east-facing slope of Rock Mountain and north of the Otay River Valley. The major drainages surrounding the project area include Otay River, Jamul Creek, Dulzura Creek, and Proctor Canyon.

The geology of the project area consists principally of two geologic formations: the Otay Formation and the Santiago Peak Volcanics. The Otay Formation, which characterizes a portion of the project area, is described by Kennedy and Tan (1977) as:

> ...composed of light-gray and light-brown, moderately well sorted, poorly indurated, massive sandstone and claystone…The sandstone is locally cemented but generally it is weakly cemented. The claystone is waxy and composed almost exclusively of bentonite…the topographic expression developed on these beds is rolling and subdued.

The Otay Formation makes up most of the low rolling hills in the project area, and soils characteristic of this formation are usually clayey and include various types of Diablo clay and Linne clay loam (USDA 1973). Diablo clay, which is the principal soil in the project area, is often very calcareous and may contain a caliche layer. The Otay Formation is a member of the Rosarito Beach Formation and contains numerous cobble clasts, a high percentage of which are derived from local Santiago Peak Volcanics (Kennedy and Tan 1977). These clasts are predominately dacites and andesites that are embedded within poorly indurated sandstones and siltstones. Because these clasts are derived from the nearby basement strata, they contain a relatively high percentage of fine-grained metavolcanics that were favored by Native Americans as the raw materials for lithic tool manufacture. Adjacent to and east of the Otay Formation are the Santiago Peak Volcanics (San Ysidro Mountains), described as cropping…

> ...out along the eastern margin of the area and in the central part of the Otay Valley. These rocks are mostly volcanic and range in composition from basalt to rhyolite but are predominantly dacite and andesite. The succession also includes a wide variety of breccia, agglomerate, volcanic conglomerate, fine-grained tuff and tuff breccia. Highly silicified rock, probably tuff, and a variety of dark, dense, fine-grained hornfels occur locally (Kennedy and Tan 1977).

Soils associated with the Santiago Peak Volcanics are characteristically red in color because of the high iron content in this formation. Within the region these soils include the San Miguel-Exchequer rocky silt loam, Olivenhain cobbly loam, and Friant fine sandy loam (USDA 1973).

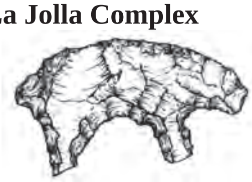
The project area has been disturbed by agricultural activities over the past 100 years. Vegetation consists primarily of agricultural land with some remnant coastal sage scrub. Riparian vegetation including sycamores, willows, rushes, mule fat, and cattails are present along the Otay River.

1.3 BACKGROUND - PRECONTACT

The body of current research of Native American (Precontact) occupation in San Diego County recognizes the existence of at least two major cultural traditions, discussed here as Early Period/Archaic and Late Period, based upon general economic trends and material culture (Table 1-1). Within San Diego County, the Early Period/Archaic includes the period from 10,000 to 1,300 years ago, while the Late Period is from 1,300 years ago to historic contact. The Post-Contact/Historic Period covers the time from Spanish contact to present. Terminology used for the past 10,000-year history of San Diego County includes a mixture of ideas of ordering cultural resource sites using terms for peoples, collections of artifacts, and temporal time frames. The first ordering was by Malcolm Rogers who used the terms: Shell-Midden people, Scraper-Maker culture (scraper-makers), and Yuman (Rogers 1929). Rogers later revised his chronology to use the terms San Dieguito (Scraper-Maker), La Jolla culture (Shell-Midden people) and Yuman (Rogers 1945). Claude Warren (1968) characterized the San Dieguito Tradition as:

> …a wide range of scraper types made on side-struck flakes and finished by well-controlled percussion flaking, leaf-shaped knives or large points of several varieties, leaf-shaped, lanceolate and slightly shouldered points in small number. Chipped stone crescents, often eccentric in form, hammerstones and crudely flaked tools are few in number. Milling stones and manos are noticeable absent.

Table 1-1
Terminology for Culture History in the San Diego Area
(Adapted from Gallegos 2002)

Geologic Time	Period	Years Before Present	Other Names	Diagnostic Cultural Materials
Late Holocene	Late Period	Present 1,300	Historic/Contact Precontact/Yuman Kumeyaay/Luiseño Cuyamaca Complex San Luis Rey I, II  	Bow and arrow, small triangular and side-notched points, fish hooks, ceramics, cremations Obsidian Butte obsidian
Late Holocene	Early Period (Archaic)	2,000 3,000		Stone bowls, triangular points, fishing gorges, burials
Middle Holocene	Early Period (Archaic)	4,000 5,000 6,000	 	Atlatl (dart) points, cogged stones, plummet stones, leaf-shaped points/knives, corner-notched and stemmed points, Coso Obsidian, gorges, burials
Early Holocene	Early Period (Archaic)	7,000 8,000 9,000 10,000	Pauma Complex Encinitas Tradition La Jolla Complex   San Dieguito Tradition/Complex	Spear, crescentic, lanceolate and leaf-shaped points, leaf-shaped knives, adze/SEUTs, Casa Diablo and Coso obsidian, burials

Warren's revision to Rogers' La Jolla culture was called Encinitas Tradition, "a simple gathering people" wherein he identifies:

> …flaked stone tools are characteristically crude, the great majority being percussion flaked and made from local macrocrystalline rock. A large percentage of the tool assemblage is composed of crude chopping, scraping and cutting tools and hammerstones. Projectile points are rare, crudely made and rather large, suggesting the use of darts, rather than bow and arrow. Ground stone items include large numbers of manos and milling stones usually shaped through use, and occasional items such as doughnut stones, discs and cogstones…Bone tools are rare but include awls, antler flakers, beads…Shell items are also limited, but include beads, pendants…Basketry is represented…Loosely flexed burials are found throughout the area…(Warren et al. 1998).

Warren has more recently updated his chronology and for the San Dieguito Tradition (Initial Occupation) has since included milling tools and a wider range of tools and food sources. In addition, Warren now discusses the potential of Transitional and Intermediate stages of occupation to cover the past 10,000 years of Native American occupation in San Diego County (Warren et al. 1998). Early Man in San Diego County was discussed by George Carter in the 1950s; however, little to no evidence of Pleistocene human occupation supports this hypothesis (Carter 1957).

1.3.1 Early Period/Archaic

The Early Period/Archaic includes the San Dieguito, La Jolla and Pauma complexes, which are poorly defined, as are the interrelationships between contemporaneous inland, desert, and coastal assemblages (Gallegos 1987). Initially believed to represent big game hunters, the San Dieguito people are better typified as a hunting and gathering society. These people had a relatively diverse and non-specialized economy wherein relatively mobile bands accessed and used a wide range of plant, animal, and lithic resources. Movement of early groups from the California desert may have been spurred by the gradual desiccation of the vast pluvial lake system that dominated inland basins and valleys during the early to middle Holocene. This hypothesis is supported by the similarity between Great Basin assemblages and those of early Holocene Archaic sites in

San Diego County. Several researchers recognized the regional similarity of artifacts and grouped these contemporaneous complexes under the nomenclature of either the Western Pluvial Lakes Tradition or the Western Lithic Co-tradition (Bedwell 1970; Davis et al. 1969; Moratto 1984; Rogers 1939; Warren 1967).

Early migrations into San Diego County may have come from the north. Recent work on the northern Channel Islands near Santa Barbara demonstrates island occupation dating back to the terminal Pleistocene, roughly 11,600 years ago (Erlandson et al. 1996; Johnson et al. 2000). At this early date, a fully maritime-adapted population exploited shellfish and used seaworthy boats to ply channel waters. Fish were captured using bone gorges by 10,000 years ago (Rick et al. 2001). Such early dates are lacking for the adjacent Santa Barbara mainland; presumably because the rise in sea level brought about by post-Pleistocene deglaciation would have inundated sites along the late Pleistocene/early Holocene coastlines. At this time in San Diego County, the shoreline was situated two to six km farther seaward than today's coast (Masters and Gallegos 1997). Therefore, any evidence for early coastal adaptation coeval with that of the northern Channel Islands may have been destroyed within this two to six km paleo-shoreline area by sea encroachment thousands of years ago.

The origin of coastal populations in San Diego County and subsequent interaction between these populations and Great Basin/desert groups is a subject of some debate (Gallegos 1987). Whether coastal or inland migration into San Diego County, the first occupants immediately exploited coastal and inland resources of plants, animals, shellfish, and fish (Gallegos 1991; Kaldenberg 1982; Kyle et al. 1998; Moriarty 1967).

The development of a generalized economic system indicates that the initial occupation, referred to here as San Dieguito, can be placed within the general Archaic pattern. Archaic cultures occur within North America at slightly different times in different areas, but are generally correlated with local economic specialization growing out of the earlier Paleo-Indian Tradition (Willig et al. 1988). Archaic cultures are often represented by more diverse artifact assemblages and more complex regional variation than Paleo-Indian traditions. This cultural pattern is generally thought to have resulted from the gradual shift away from a herd-based hunting focus to a more diverse and area specific economy. The earliest sites are found near coastal lagoons and river valleys of San Diego County. These sites are the Harris site (CA-SDI-149), Agua Hedionda Lagoon sites (CA-SDI-210/UCLJ-M-15 and CA-SDI-10695), Rancho Park North (CA-SDI-4392/SDM-W-49), and Remington Hills (CA-SDI-11069), dating from 9,500 to 8,000 years ago. The north San Diego County coastal lagoons supported large populations, circa 6,000 years ago, as shown by the numerous radiocarbon-dated sites adjacent to these lagoons. After 3,000 to roughly 1,500 years ago, there are fewer cultural resource sites in north San Diego County. This reduction in number of cultural resource sites can be attributed to the slowing of the rise in sea level and concomitant siltation of coastal lagoons causing the depletion of shellfish and other lagoon resources (Gallegos 1985; Miller 1966; Warren and Pavesic 1963). Cultural resource sites dated to circa 2,000 years ago are found in the Camp Pendleton area (Byrd and Reddy 2002), wherein shellfish (*Donax gouldii*) were collected from open-shore sandy beach habitat; and, bay species were still abundant in San Diego Bay, and present but not as dominant in other lagoons. Batiquitos Lagoon, and perhaps other lagoons, reopened circa 1,500 years ago and began producing shellfish again, but not at the quantity, size or variety of shellfish documented for the early to middle Holocene (Gallegos 1985; Miller 1966).

The La Jolla and Pauma complexes, which are referred to as following the San Dieguito Complex, may simply represent seasonal or geographic variations of the somewhat older and more general San Dieguito Complex. Inland Early Period /Archaic occupation sites have been reported in coastal settings, transverse valleys, sheltered canyons, benches and knolls (True 1958; Warren et al. 1961). In north San Diego County, non-coastal sites were termed "Pauma Complex" by True (1958, 1980), and were defined as containing a predominance of grinding implements (manos and metates), a general lack of shellfish remains, a greater tool variety, and expressing an emphasis on both gathering and hunting (True 1958, 1980; Warren et al. 1961; Waugh 1986).

Early Period/Archaic sites from 10,000 to 1,300 years ago within San Diego County include a range of sites to include coastal and inland valley habitation sites, inland hunting and milling camps, and quarry sites usually in association with fine-grained metavolcanic material. Material culture assemblages during this long period are remarkably similar in many respects. These deposits may well represent a process of relative terrestrial economic stability and presumably slow cultural change. Although various cultural traits developed or disappeared during the long span of 10,000 to 1,300 years ago, there is a clear pattern of cultural continuity during this period.

1.3.2 Late Period

During the Late Period (circa 1,300 to historic contact), a material culture pattern similar to that of Historic Period Native Americans becomes apparent in the archaeological record. The economic pattern during this period appears to be one of more intensive and efficient exploitation of local resources. The prosperity of these highly refined economic patterns is well evidenced by the numerous Kumeyaay/Diegueño and Luiseño habitation sites scattered throughout San Diego County. This increase in Late Period site density probably reflects both better preservation of the more recent archaeological record and a gradual population increase within the region. Artifacts and cultural attributes reflecting this Late Period pattern include small projectile points, pottery, the establishment of permanent or semi-permanent seasonal habitation sites, a proliferation of bedrock milling for acorn and grass seed processing in the uplands, the presence of obsidian from the Imperial Valley source Obsidian Butte, and interment by cremation.

Luiseño occupation in north San Diego County during the late Holocene has been viewed as an occupation that resulted from the migration of a population from the desert to the coast (Rogers 1966), a resettlement called “the Shoshonean Wedge” (Kroeber 1925). Late Period cultural patterns were shared with groups along the northern and eastern periphery of San Diego County, incorporating many elements of their neighbors’ cultures into their own cultures. This transference and melding of cultural traits between neighboring groups makes positive association of archaeological deposits with particular ethnographically known cultures difficult. This is particularly true of the groups within

San Diego County. Although significant differences exist between Luiseño and Kumeyaay/Diegueño cultures (including linguistic stock), the long interaction of these groups during the Late Period resulted in the exchange of many social patterns. Archaeologists must rely heavily on ethnographic accounts of group boundaries as recorded during the Historic Period, although it is not known how long these boundaries had been in place or the validity of these boundaries as presently reported.

Kroeber (1925) placed the Kumeyaay and Luiseño boundary between Agua Hedionda and Batiquitos lagoons. According to Luomala (1978) the territory of the Ipai (northern Kumeyaay) extended along the coast from the San Luis Rey River in the north to San Diego Bay in the south with San Felipe Creek marking the east boundary. The territory of the Tipai (southern Kumeyaay) extended south from San Diego Bay to include parts of Mexico and the southern mountains. Florence Shipek (1993) identified the northern and southern Kumeyaay/Diegueño tribal boundary as:

> In 1769, Kumeyaay national territory starting at the coast about 100 miles south of the Mexican border (below Santo Tomas), thence north to the coast at the drainage divide south of the San Luis Rey River including its tributaries. Using the U.S. Geological Survey topographic maps, the boundary with the Luiseño then follows that divide inland. The boundary continues on the divide separating Valley Center from Escondido and then up along Bear Ridge to the 2240 contour line and then north across the divide between Valley Center and Woods Valley up to the 1880-foot peak, then curving around east along the divide above Woods Valley…

Further readings pertinent to the Luiseño and Kumeyaay (Diegueño) Native Americans include: Almstedt (1974); Barrows (1900); Bean (1972); Bean and Saubel (1972); Bean and Shipek (1978); Burrus (1967); Cuero (1968); Drucker (1939); Dubois (1908); Gifford (1918); Harrington (1978); Hedges and Beresford (1986); Heizer and Almquist (1971); Heizer and Whipple (1957); Hooper (1920); Keneally (1965); Kroeber (1925); Langdon (1970); Merrill (1973); Pourade (1960); Priestley (1937); Rudkin (1956); Shipek (1977, 1978, 1980, 1986a, 1986b, 1987, 1988, 1989a, 1989b, 1991, 1993); Sparkman (1908); Spicer (1962); Spier (1923); Strong (1929); Tibesar (1955); Underhill (1941); White (1963); Wolcott (1929); and Woodward (1934).

1.4 HISTORICAL BACKGROUND

The history of San Diego County is commonly presented in terms of Spanish, Mexican, and American political domination. A discussion of historic land use and occupation under periods of political rule by people of European and Mexican origin is justified on the basis of characteristics associated with each period, with the prevailing laws and customs influenced economic, political, and social activities. Certain themes are common to all periods, such as the development of transportation, settlement, and agriculture. Robinson (1969) provides a comprehensive account of public and privately owned land in California, with a discussion of laws, activities, and events related to the development of the state.

1.4.1 Spanish Period (1769-1821)

The Spanish Period represents exploration, the establishment of the San Diego Presidio and missions at San Diego (1769) and San Luis Rey (1798), and *asistencias* (chapels) to the San Diego Mission at Santa Ysabel (1818) and to the San Luis Rey Mission at Pala (1816). Horses, cattle, agricultural foods and weed seeds, and a new architectural style and method of building construction were also introduced. Spanish influence continued after 1821 when California became a part of Mexico. For a period of time under Mexican rule, the missions continued to operate as in the past, and laws governing the distribution of land were also retained.

1.4.2 Mexican Period (1821-1848)

The Mexican Period includes the initial retention of Spanish laws and practices until shortly before secularization of the missions in 1834, a decade after the end of Spanish rule. Although several grants of land were made prior to 1834, vast tracts of land were dispersed through land grants offered after secularization. Cattle ranching prevailed over agricultural activities, and the development of the hide and tallow trade increased during the early part of this period. The Pueblo of San Diego (present-day Old Town) was established and transportation routes were expanded. The Mexican Period ended in 1848 as a result of the Mexican-American War.

1.4.3 American Period (1848 to Present)

The American Period began when Mexico ceded California to the United States under the Treaty of Guadalupe Hidalgo. Terms of the treaty brought about the creation of the Lands Commission, in response to the Homestead Act of 1851 that was adopted as a means of validating and settling land ownership claims throughout the state. Few Mexican ranchos remained intact because of legal costs and the difficulty of producing sufficient evidence to prove title claims. Much of the land that once constituted rancho holdings became available for settlement by immigrants to California. The influx of people to California and the San Diego region resulted from several factors including the discovery of gold in the state, the conclusion of the Civil War, the availability of free land through passage of the Homestead Act, and later, the importance of San Diego County as an agricultural area supported by roads, irrigation systems, and connecting railways. The growth and decline of towns occurred in response to population fluxes and economic boom and bust cycles.

1.4.4 Local History of Otay Ranch

Rancho Otay (Otay Ranch) was originally a Mexican period land grant located in the southwest portion of San Diego County. Otai (Otay is the European spelling) is a Kumeyaay Native American word that has been variously translated as meaning "a wide level knoll," "big hill," "a solitary hill in a flat valley," "a brushy place," and "a place filled with rushes and reeds" (SDHS n.d.; Rush 1965). The century-long occupied Native American village of Otai was located in this region. The Native Americans of the Otay ranchería were reported by Lt. José Francisco Ortega as being part of the group that attacked and destroyed Mission San Diego de Alcalá in 1775 (Brackett 1951).

Doña Magdalena Estudillo, daughter of Captain José María Estudillo, received a land grant from Governor José María Echendia in 1829, which encompassed the village of

Otai. The property was rectangular in shape and contained an area of one league or 6,647 acres. At the same time, Doña Magdalena's brother, José Antonio Estudillo, received the smaller (4,436 acres) grant of Rancho Janal, which adjoined Rancho Otay (Ritz et al. 1989). Governor Pío Pico reaffirmed these grants on May 4, 1846.

The Land Act of 1851 required all holders of property in California to prove their rights of ownership to the lands they claimed. The Estudillo's petitions for the Otay and Janal properties lasted 10 years, followed by lengthy court hearings (Pourade 1963, 1969). The United States Land Commission finally confirmed Doña Magdalena's claim on January 21, 1872, and José G. Estudillo (son of José Antonio) received the final patent for Rancho Janal from the United States Land Commission at the same time (SDHS n.d.; Rush 1965).

Both properties were known as Rancho Otay at this time with the Janal Rancho designated as Otay Dominguez and the original Rancho Otay called Otay Estudillo (Ritz et al. 1989). Although both ranchos were administrated together, they each had their own cattle brand (Pourade 1969).

During the 10-year delay for confirmation, Otay Ranch changed ownership several times. Doña Magdalena deeded the rancho to Don Santiago and Guadalupe Arguello in August 1854. They in turn deeded the property to José Ruiz Escajadillo, who sold an undivided two-thirds of Rancho Otay to Antonio F. Somellera for $6,288.31 in 1869 (*San Diego Evening Tribune* 1/19/1938; SDHS n.d.).

The first American owner of the property was Solon S. Sanborn, who purchased it on July 1, 1872. Captain Mathew Sherman bought a half interest in the property in the same year. Sherman was mayor of San Diego in 1891, owner of Sherman's Addition, and a Civil War veteran (*San Diego Evening Tribune* 1/19/1938). By 1879, the ranch belonged to Antonio Somellera (SDHS n.d.). In 1883, the San Diego Land and Town Company, a subsidiary of the Santa Fe Railroad, owned Otay Ranch. The San Diego Land and Town

Company filed a subdivision map on part of the property in 1900 (*San Diego Evening Tribune* 1/19/1938).

John D. Spreckles bought Otay Ranch around 1900 (Rush 1965). Mr. Spreckles sold both Otay and Janal to his friend and business associate Elisha Spurr Babcock. An avid sportsman, Babcock hunted ducks, quail, rabbits, and other game in Otay. During these outings, he and his guests resided in a hunting lodge built by him and Spreckles in Upper Otay (Janal) (Ritz et al. 1989). Babcock died suddenly in 1922.

In 1923, Otay Ranch was purchased by real estate dealer Rube Harrison. In 1936, Harrison sold the property to Stephen Birch (*San Diego Evening Tribune* 12/21/1988). Birch was a wealthy man who had made a fortune as a mining engineer in Alaska (SDHS n.d.). He was chairman of the board of Kennecott Copper Corporation, and the president of the Alaska Steamship Company. Some of his associates in the Alaskan enterprises included J. P. Morgan and Simon Guggenheim (*Los Angeles Times* 5/10/1984).

Birch had come to California on vacation in the 1920s. He liked San Diego so much that he purchased several large tracts of land, including Otay Ranch. By combining the properties, the original area of Rancho Otay, which was nearly 6,658 acres, grew to about 29,000 acres. The Birch family resided in houses on the Janal portion of the property originally built as hunting lodges by Babcock and Spreckles. Birch hired Thomas Newberry as superintendent of the large ranch, which operated under the name Otay Agricultural Corporation and later United Enterprises, Inc. Stephen Birch Jr. was president, daughter Mary R. Birch Patrick was vice president, and Robert Newell was secretary and treasurer (Rush 1965). In 1957, operation of the ranch was turned over to Edward Loula, who was in charge of accounting and other office work; James E. Schutte, who supervised farming and cropping; and Robert W. Steele, who supervised livestock operations (Rush 1965; *San Diego Union* 7/28/1968; SDHS n.d.).

The land was intensively farmed, producing principally lima beans, hay, and grain. In 1939, 6,000 acres were planted in lima beans, and the remaining ranch land was used to graze about 1,000 head of livestock. Fifty carloads of lima beans, which was about one third of the lima bean crop of San Diego County, were produced at Otay Ranch. Foreman D. E. Scarbery developed machinery to harvest the bean crop (*Southern California Rancher* April 1944). Scarbery also hybridized a new red and white variety of lima bean (Scarbery 1991). Much of this experimental plant breading was done with various departments of agriculture including the Biological Survey Bureau of the U.S. Department of Agriculture and the California Department of Fish and Game (*Southern California Rancher* May 1944). Lima beans were abandoned as a major crop when bindweed morning glory infested the fields so badly that the bean plants could not grow properly. The last year of lima bean production was 1949 (Cagel 1991). Later crops included barley, wheat, and oat hay (SDHS n.d.).

Cattle ranching at Otay Ranch specialized in raising Polled Herefords, Black Angus, and Santa Gertrudis. The brand used to identify them was the same one that had been used by Doña Magdalena Estudillo in the 1800s (Pourade 1969).

Stephen Birch Sr. died in 1940 (Rush 1965). His daughter Mary inherited the ranch, and family farming business. In 1955, she married a retired commander of the Royal Air Force, Patrick R. Patrick. They moved to Otay Ranch and lived there for the rest of their lives (*Los Angeles Times* 5/10/1984; *National City Star News* 4/1/1984). Mr. Patrick died in 1971. Mary Birch Patrick died in 1983, leaving a hotly contested will, which was still in litigation five years later (*San Diego Evening Tribune* 12/21/1988:A-14). The ranch was ultimately sold to the Baldwin Company of Irvine in 1988 for $180,000,000 (*San Diego Evening Tribune* 12/21/1988).

1.5 PREVIOUS WORK

The record search and literature review were completed at the South Coastal Information Center (SCIC), San Diego State University (SDSU), San Diego, California, and at the research library at Gallegos & Associates. Record search results are provided in Appendix B. Sixty-seven studies (Baksh 1991; Banks 1980; Berryman and Berryman

1987; Buysse and Smith 1999a, 1999b, 2000, 2001; Caltrans 1995, 1998; Carrico et al. 1993; City of San Diego 1981; Clowery-Moreno and Smith 2008; Cook and Wright 2005; Cooley et al. 1996; Corum 1989; CRMC 1985; CSRI 1983; Department of Parks and Recreation and Abeyta 1998; Eighmey 1997; ERCE 1991; Fink 1975; Gallegos and Flenniken 2000; Gallegos and Kyle 1992, 1997a, 1997b; Gallegos and Pigniolo 1988; Gallegos et al. 2003; Gross et al. 1996; Hargrove 1985; Hector 1986; Hector and Andrews 2004; McCorkle-Apple and Shaver 2006; McDonald and Case 1994; McDonald and Eighmey 1997; McDonald et al. 1993; McGowan 1997; Mooney 1992; Ogden 1992; Ogden and Gallegos & Associates 1993; Pallette and Serr 1994; Pierson 2003; Pierson and Henry 2007; Ritz et al. 1989; Rosen 1990, 2006; Schaefer et al. 1994a, 1994b; Smith 1989a, 1989b, 1995, 1996, 2003; Smith and Clowery-Moreno 2006; Smith and Moriarty 1984; Smith and Pierson 1999; Smith and Rosenberg 2007; Thesken and Carrico 1982; Tierra Environmental Services and Underwood 2002; Tuma 2002, 2003; Underwood 2000; USDI n.d.; WESTEC 1979, 1982, 1987, 1988; WESTEC and EDAW, Inc. 1986) have been conducted, and 173 cultural resource sites and 49 isolates are recorded within a one-mile radius of the project area.

Twelve studies (Berryman and Berryman 1987; Caltrans 1990, Carrico et al. 1993; Clowery-Moreno and Smith 2008; Cook and Wright 2005; Hector and Andrews 2004; McDonald et al. 1993; McGowan 1997; Ogden 1992; Rosen 1990; Schaefer et al. 1994a, 1994b; Smith 1996) have been conducted, and 4 cultural resource sites (CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236) and 5 isolates (P-37-014531, P-37-014532, P-37-014533, P-37-015008, and P-37-015145) are recorded within or adjacent to the Village 8 West parcel. An additional 2 sites, CA-SDI-4789 and CA-SDI-12809 are located within the offsite improvement area (Figure 1-3).

1.5.1 Previously Recorded Sites

- **CA-SDI-4789**

Site CA-SDI-4789 is within the offsite improvement area and is discussed in the "Cultural Resource Survey of Offsite Improvements for Otay Ranch Village 8 West,

FIGURE 1-3

CULTURAL RESOURCES WITHIN OR ADJACENT TO THE OTAY RANCH VILLAGE 8 WEST PROJECT AREA

(See Confidential Appendix)

Chula Vista, San Diego County, California" found in Appendix G. This site has been previously tested to determine site significance. The researchers concluded that the site was essentially a surface scatter and that the testing and analysis program had exhausted the site's research potential (Schaefer et al. 1994a).

- **CA-SDI-12287**

Site CA-SDI-12287 straddles the Village 8 West project boundary, a portion of the site being within the parcel and a portion adjacent outside the project area. Rader and James (1991a) originally recorded the site as an artifact scatter consisting of one metate fragment, one scraper, and one flake. In 2007, the site was tested using surface collection of artifacts and excavation of 9 shovel test pits (STPs) to determine site significance (Clowery-Moreno and Smith 2008). As a result of the test program, a total of 5 debitage and 85.1 g of shell (including *Chione* sp., *Ostrea* sp., and *Tagelus* sp.) fragments were recovered. The site was identified as not significant and monitoring during construction was recommended (Clowery-Moreno and Smith 2008).

- **CA-SDI-12809 (SDM-W-2391)**

CA-SDI-12809 is in and adjacent to the offsite improvement area, which is discussed in Appendix G. This site was originally recorded by McGowan in 1971. Between 1977 and 1983, the Southwestern College Field School recorded and excavated the site, which was identified as Cal. F:5:1 at that time. However, after the death of the property owner, the excavation contract was not renewed (McGowan 1997). Extensive pot-hunting was noted at the site after the field school was closed. The site was re-recorded and updated by Rosen (1989) and was assigned the trinomial CA-SDI-12809, which subsumed trinomials CA-SDI-11369 and CA-SDI-11376. The site was described as "an extensive village area, which, according to Charlotte McGowan, contains San Dieguito, La Jollan, Late Prehistoric and Ethnohistoric components." Lithics, ground stone, ceramics, shell beads, an abalone pendant, a shell fish hook, glass trade beads, bone tools, hearth features, shell and bone faunal remains, fire-affected rock, and charcoal were recorded at the site (Rosen 1989). In 1993, site CA-SDI-12809 was tested by McDonald et al. as part of the State Route 125-South project. The test program included additional survey and subsurface excavation using STPs and 1x1-m units. As a result of the test, the site was recommended as eligible for listing on the NRHP and the CRHR (McDonald et al. 1993 and Caltrans 1994). On May 25, 1995, the Office of Historic Preservation concurred with this recommendation (Office of Historic Preservation 1995). Because the site has had a formal determination of eligibility to the NRHP, it is automatically included in the California Register of Historic Resources, meaning it is presumed to be a significant cultural resource for CEQA purposes. In 1996, Smith re-surveyed site CA-SDI-12809 for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). In 2004, monitoring of CA-SDI-12809 was conducted for the Salt Creek Interceptor Sewer project (Hunt 2004). As a result of monitoring, five artifact deposits associated with CA-SDI-12809 were identified. The collected artifacts include lithic tools, debitage, ground stone, pottery, and shell. Hunt (2004) noted that the south side of site CA-SDI-12809 had the potential to produce cultural materials.

- **CA-SDI-14176**

Site CA-SDI-14176 straddles the parcel boundary, with a portion located within the parcel. The site was recorded by BFSA (1996a) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The site was described as a temporary camp that consists of flakes, one metate, one chopper, three scrapers, one Tizon Brown Ware pottery sherd, and marine shell. This site has not been tested to determine site significance.

- **CA-SDI-14235**

Site CA-SDI-14235 is located within the Village 8 West parcel. The site was recorded by BFSA (1996e) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The site was described as a lithic scatter that consists of 5+ scrapers, 12+ flakes, and 1 hammerstone. This site has not had a previous determination of significance.

- **CA-SDI-14236**

Site CA-SDI-14236 was recorded by BFSA (1996f) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The site is located within the Village 8 West parcel and was previously described as a lithic scatter that consists of 7+ flakes, 2 retouched flakes, and 1 scraper. Disturbance at the site consists of an adjacent fence and cattle pasture. This site has not had a previous determination of significance.

1.5.2 Previously Recorded Isolates

- **P-37-014531**

Isolate P-37-014531 was recorded by BFSA (1996g) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The isolate consists of one flake.

- **P-37-014532**

Isolate P-37-014532 was recorded by BFSA (1996h) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The isolate consists of one scraper.

- **P-37-014533**

Isolate P-37-014533 was recorded by BFSA (1996i) for the Otay Valley Parcel of the Otay Ranch project (Smith 1996). The isolate consists of one flake.

- **P-37-015008**

Isolate P-37-015008 was recorded by Carol Serr (1990) for the Proposed Otay-2 Pipeline project. The isolate consists of one metavolcanic flake.

- **P-37-015145**

Isolate P-37-015145 was recorded by Rader and Mitchell (1991b) for the 22,873-Acre Otay Ranch project (ERCE 1991). The isolate consists of one metavolcanic core, which was collected by ERCE.

1.6 HISTORICAL MAP REVIEW

Early maps (1769-1885 Historic Roads and Trails; 1872 Official Map of the Western Portion of San Diego County, California; 1903 Cuyamaca 30' USGS topographic quadrangle; 1943 and 1955 Jamul 15' topographic quadrangle; and, 1955 Otay Mesa 7.5' topographic quadrangle) were reviewed for historical structures, features, and roads; however, no items of historical significance were identified within the Otay Ranch project area on the early maps.

1.7 SUMMARY

The record search and literature review identified 12 studies (Berryman and Berryman 1987; Caltrans 1990; Carrico et al. 1993; Clowery-Moreno and Smith 2008; Cook and Wright 2005; Hector and Andrews 2004; McDonald et al. 1993; McGowan 1997; Ogden 1992; Rosen 1990; Schaefer et al. 1994a, 1994b; Smith 1996), 4 cultural resource sites (CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236) and 5 isolates (P-37-014531, P-37-014532, P-37-014533, P-37-015008, and P-37-015145) that are within or adjacent to the project area. An additional 2 sites, CA-SDI-4789 and CA-SDI-12809 are located within the offsite improvement area.

Sites CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236 have not been previously tested and site status is unknown. Site CA-SDI-12287 was tested and identified as not significant (Clowery-Moreno and Smith 2008). In the offsite improvement area (Appendix G), site CA-SDI-4789 was previously tested and identified as not significant (Schaefer et al. 1994), and site CA-SDI-12809 was previously tested and identified as significant and eligible for listing on the NRHP. The Office of Historic Preservation concurred with this recommendation of eligibility in 1995, resulting in an automatic listing of the site on the CRHR (Caltrans 1994; McDonald et al. 1993; McGowan 1997; Office of Historic Preservation 1995).

Research Orientation and Methods are provided in Section 2, Survey Results in Section 3, Test Results in Section 4, Analytical Results in Section 5, Site Discussions in Section 6, and Significance Discussion in Section 7. References Cited are found in Section 8.

SECTION 2
RESEARCH ORIENTATION AND METHODS

2.1 INTRODUCTION

This section identifies research orientation, field and lab methods, special studies, and curation of recovered artifacts and ecofacts (i.e., bone, shell) for sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 located within the Otay Ranch project area. The objective of the test program was to evaluate site significance with respect to City of Chula Vista and CEQA criteria.

2.2 RESEARCH ORIENTATION

Project description, environmental setting, and cultural history are discussed in Section 1, as are previous studies conducted for sites within the Otay Ranch project area. Selection of the research questions presented below is based on previous work and the potential of habitation, temporary camp, and artifact scatter sites to yield information important to the regional prehistory of San Diego County. Five research topics are presented: chronology, subsistence and paleoenvironmental reconstruction, settlement patterns, trade and travel, and lithic technology.

2.2.1 Chronology

What was the period(s) of use and/or occupation for the sites?

Determining the period of occupation of a site or a region can be accomplished by the use of radiocarbon dating and relative dating. Radiocarbon dating depends on the retrieval of materials (i.e., bone, shell, charcoal) amenable to scientific analysis. Given previous work for Otay Mesa, radiocarbon dates for the Otay Ranch area may range from roughly 10,000 years ago to historic contact.

Alternatively, relative dating is based on the recovery of specific artifacts that are temporally diagnostic. Temporally diagnostic artifacts recovered in context with associated radiocarbon dates include atlatl-dart points, arrow points, and ceramics. Obsidian sourcing and hydration rind measurements are also relative dating measures, as obsidian absorbs water at slow and somewhat constant rates. Obsidian from sources such as Obsidian Butte in Imperial Valley was available during the late Holocene, while obsidian from the Coso Volcanic Fields was available throughout the Holocene. In order to address the research questions posed, temporal placement of the sites is necessary.

Previous work at site CA-SDI-12809 identified Late Period components as defined by the presence of pottery, small projectile (arrow) points, and radiocarbon dates (McGowan 1997).

Data Needs

Shell, bone, and/or charcoal will be needed for radiocarbon dating. These samples will be obtained from fire hearth features and lenses, whenever possible. If present, obsidian can be used to provide relative comparative temporal data. Relative dates can be inferred by the presence of temporally diagnostic artifacts.

2.2.2 Subsistence and Paleoenvironmental Reconstruction

Given the numerous sites in the Otay River Valley region, what subsistence patterns can be identified and have these patterns changed over time? Were acorns used at the sites? Did the collection of shellfish change over time? What influenced the changes: environment, populations, technologies, or combinations of these? What climatic changes occurred between 10,000 and 2,000 years ago and how did these changes affect available resources?

The most pronounced environmental change for coastal southern California was the rise in sea level that occurred during the early to middle Holocene, with associated flooding of coastal valleys and the creation of lagoons. Evidence of environmental change in lagoons is based on analysis of core samples combined with radiocarbon dates and radiocarbon-dated shellfish samples taken from precontact sites near lagoons. Environmental studies using shellfish to explain site patterning and environmental change include Bull and Kaldenberg (1976), Gallegos (1985), Masters (1988), Miller (1966), Warren and Pavesic (1963), and Warren et al. (1961).

Circa 3,500 years ago, sea level stabilized, causing an increase in siltation processes that eventually caused degradation of the lagoons during the late Holocene. In contrast to San Diego Bay, the environmental change for lagoons in San Diego County was more complex. San Diego Bay formed in the early Holocene and stayed open to the ocean throughout the Holocene (Gallegos and Kyle 1988). Similar to the north San Diego County lagoons, the Tijuana Lagoon cycled from an open lagoon to a closed mudflat estuary by 3,500 years ago. Thus, some precontact sites may reflect a changing environment and the loss of lagoonal shellfish and fish, whereas other sites dependent on San Diego Bay for resources may not reflect a shellfish change.

Environmental changes have been documented for the coast, suggesting that climatic drying and accompanying vegetation changes took place over the past 7,000 years (Davis 1992). Special studies conducted on cultural material and recovered matrix at several Otay Mesa sites (located southeast of the present study area) have identified a number of plants that may have been present during the early and middle Holocene, but are not present today.

Pollen studies suggest that pine trees, oak trees, and grassland communities were present in Otay Mesa during the early and middle Holocene. These resources were not present historically and possibly would not have been present during the late Holocene. This change in the environment would have influenced precontact availability of plants and animals, and the use of the region itself.

Pine pollen and oak pollen were recovered from features at CA-SDI-8654 Locus D, a habitation site dated to more than 7,000 years ago, and from CA-SDI-8654 Locus B (CSRI 1983; Kyle et al. 1990). The pine pollen was attributed to "pollen rain," probably from a source located near or in Otay Mesa or on adjacent mountains. Protein residue studies have identified piñon pine on two tools: a scraper plane and a scraper from CA-SDI-11674/12229/H, dated to circa 7,500 years ago (Cooley et al. 1996). Fossil pollen from CA-SDI-11079 included composites (sunflower family), blackberry (*Celus*), Cheno-Ams (*Chenopodeaceae* and *Amaranthus* in the family Aranthaceae), pine (*Pinus*), oak (*Quercu*s), mustard (*Brassica*), wild buckwheat (*Erodium cirutarium*), and cattail (*Typha angustifolia*). Historically, pines were not present in the Otay Mesa region. Relic pine populations are currently present at Torrey Pines near Del Mar, 48.3 km (30 miles) northwest of Otay Mesa, and in the upper elevations (5,000 to 6,500 feet) of the Laguna Mountains, 56 km (35 miles) northeast of Otay Mesa (Beauchamp 1986). In addition, protein residue analysis has identified agave on one mano; prickly pear, deer, and rabbit on milling tools from CA-SDI-11424; and, Chenopodiaceae, Chia (*Salvia columbar)*, grasses (*Gramineae),* deer, dog, and rabbit on flake and core tools from CA-SDI-11079. Future research should focus on pollen and phytolith studies, along with identification of protein residue on ground stone and flaked lithic tools recovered from habitation sites and temporary camps.

Another research focus should be to determine the role of core/nodule tools and large unpatterned flake tools in the daily activities of early and middle Holocene populations (Schroth and Flenniken 1997a, 1997b). This topic raises several questions: What resources were present and being exploited that necessitated the use of these tools? Is tool use related to a wood working industry, a fiber production industry, or some other resource processing not yet determined? Did the prehistorically used tool kits reflect environmental change and associated changes in available resources? This research should focus on replicative use-wear studies along with microscopic analysis of tools. Environmental reconstruction to determine which resources were present should be integrated into the studies.

Research Issues

Precontact use of shellfish, fish, plants, and animals changed as environmental and subsequent resource availability changed. Early to middle Holocene Otay River Valley sites should reflect a change in resource availability and/or use. Protein residue studies on recovered tools, pollen studies, and phytolith analyses will identify plants not historically present.

Data Needs

Shellfish and bone fragments will be necessary for identification of species and frequency of occurrence. Pollen and phytolith from soil samples will be necessary for analysis. Pollen and phytolith preservation may be poor, and therefore, large quantities of soil may need to be processed to produce informative results. Since this is a costly procedure, it should only be undertaken when intact subsurface levels and/or features are present. Protein residue analysis from recovered ground stone implements and flaked lithic tools will also be necessary. It may be necessary to process relatively large numbers of ground stone and lithic tools to obtain protein residue information for habitation sites.

2.2.3 Settlement Patterns

What form of settlement pattern was practiced in the region? Did it change over time and in what manner?

Early Period occupation in San Diego County is poorly understood. One hypothesis inferred by Warren (1964) is that La Jolla/Encinitas Tradition sites are restricted to the coastal zone. In California, ethnographic sources have been used to develop models for prehistoric hunter-gatherer settlement and subsistence patterns. Shipek's model for the Luiseño (Shipek 1977) was one of sedentary villages located between the coast and the mountains in various ecological zones in northern San Diego County. True and Waugh (1982) propose a settlement configuration of foraging patterns with several residential shifts during the year. This settlement/subsistence configuration is correlated with particular river drainage systems, shifting in time to a bipolar system of permanent winter camps or villages in the western foothills and permanent summer camps in the mountains.

This pattern during the Late Period included two or more permanent base camps with a number of associated special-purpose sites, such as quarry and milling sites (True et al. 1974; True and Waugh 1982). The winter base camp, occupied four to six months of a year, was the location where most ceremonies took place. The summer-fall camp was the acorn-collecting, hunting camp, usually located near an oak grove.

During the spring, the village group was divided into smaller family groups, with each group occupying a small area where fresh vegetal resources could be procured, or where coastal shellfish could be collected. The small group compensated for the lack of resources after the depletion of the winter stores and prior to the next year's harvest. The summer-fall camps reflected a coalescence of the kin group, with the larger winter camp composed of the total population (Bean and Shipek 1978; True and Waugh 1982; True et al. 1974).

What form of settlement pattern was practiced in the region as reflected by the sites located within the portion of Otay Ranch presently under study? How does this form relate to patterns known for southern California as a whole and for the surrounding area specifically?

Study Topics

(a) Temporally, how do these sites fit into the overall pattern for San Diego County? That is, what group or culture is being examined in the context of the known culture history, and can we differentiate between period of occupation?

(b) If the sites are representative of a specialized camp and/or gathering group, what were the sites' function(s) and how do these sites relate to other sites: as base camps, special-use sites, or as extractive sites?

(c) How did occupation and use of these sites contribute to seasonal or year-round occupation of the region in general?

Data Needs

(a) Recovery of temporally-sensitive and diagnostic materials (i.e., organic material for radiocarbon dating; obsidian source analysis; and, time-sensitive artifacts such as bifaces, projectile points, and beads).

(b) Recovery of an adequate sample of artifacts and cultural debris (ecofacts) from the sites to determine site function.

2.2.4 Trade and Travel

To what extent are trade and travel evidenced in the region? The presence of Native American trails and trade activities between different cultural groups in the southern California regions was noted by early travelers and ethnographers. The procurement of lithic resources, such as desert lithics (i.e., certain types of chalcedony, chert, jasper, obsidian, and steatite) would identify contact with other cultural groups or travel away from the Otay River Valley and the surrounding area, as these materials are not available in the Otay River Valley area. Although trade items were often perishable, what archaeological evidence exists at the Otay Ranch sites?

Several exotic lithic materials, such as steatite and obsidian, have been identified as trade items. Their occurrence at the Otay Ranch sites would aid in delineating travel/trade routes. More research with exotic lithic material found in context will be necessary to determine the extent of trade, what materials were traded, and if trade materials and routes changed through time. Generally, if obsidian is present at early and middle Holocene sites in San Diego County, then it was obtained from the Coso Range, located over 300 miles to the north of the Otay River Valley in north central California. Obsidian from late Holocene sites is usually Obsidian Butte obsidian from Imperial Valley. Obsidian was also available from Mexico and other sources not presently identified.

Other lithic materials not local to the Otay River Valley region, but which may have come from nearby sources, include jasper, chert and chalcedony. These materials generally occur at sites as small retouch flakes or as finished items, suggesting that the items were procured in a finished stage, and that they were likely trade items. If they had been obtained by direct procurement, then the raw material and early stages of tool production would be present. Sources for these materials, as well as sites near the sources where the material was worked, need to be identified to more fully understand the trade network involved. Neutron activation analysis has been used successfully to source these exotic lithic materials.

Steatite sources are present in southern San Diego County, and include a fairly large quarry: the Stonewall Quarry in Rancho Cuyamaca State Park in southern San Diego County (True 1970). Another known quarry, the Jacumba Valley Quarry, is located near the U.S./Mexico border, about 95 km (59 miles) from the Pacific Ocean (Polk 1972). Neutron activation has been used successfully to match specific steatite artifacts to specific sources or quarries and would provide valuable information for identifying trade/travel directions.

The shell that occurs in cultural resource sites is evidence of travel to the coast, or trade with groups occupying coastal regions. The closest source of shellfish is approximately 10 miles to the west of the sites. Given the short distance, the occupants likely traveled to the bay and beaches to acquire local shellfish for food. Did they obtain the *Olivella* sp. shell and make the spire-lopped beads, or did they trade for these decorative items? Were the *Olivella* sp. shells Pacific coast or Gulf of California species?

Research Issues

The trade network that brought obsidian to the Otay Ranch area should exhibit change through time. For the early to middle Holocene, obsidian trade will consist of north-south trending routes from the Coso Range to the Otay River Valley region; for the late Holocene, the obsidian trade pattern will change to east-west trending routes to Imperial Valley and south to Mexico.

The steatite will come from one of the southern San Diego County sources, probably to the east. Other exotic lithics (jasper, chert, and chalcedony) will be from nearby sources. Early to middle Holocene *Olivella* sp. shell will be sourced to the Pacific Coast, whereas some of the late Holocene *Olivella* sp. shell will include Gulf of California species.

Data Needs

Obsidian artifacts need to be large enough (1-cm diameter minimum) for source identification and hydration rind measurements. A data bank of source fingerprinting should be compiled for chert, jasper, chalcedony, steatite, and other exotic lithics found in southern San Diego County.

2.2.5 Lithic Technology

How do the assemblages reflect the technological trajectories used by the precontact inhabitants? Which lithic reduction strategies were in use and when?

Several flake-tool reduction strategies have been identified for the southern California coastal region. These include biface reduction, split-nodule core reduction, small blade core reduction, bipolar core reduction, and nodule reduction. The decision to use one or the other of these techniques was dependent on several factors, but the most important factors were the type of material that was worked, the morphology of the parent material, and the intended tool. Some lithic materials, such as Monterey chert and Piedra de

Lumbre chert, are more easily worked, and with heat-treatment become some of the best knappable material in the western United States. Problems exist, however, in the form of the material in its raw state. Piedra de Lumbre chert generally occurs in small pieces, thus it was used extensively in the late Holocene for small arrow points (Pigniolo 1992). This material has been recovered from a site dating to 8,000 years ago (Gallegos 1991). Monterey chert occurs in small cobbles and in layers. For small cobbles, bipolar reduction would be the most efficient method of producing usable flakes. For the layered Monterey chert, biface reduction was the most expedient method of producing tools, as the layers were already thin, and only the outer perimeter needed to be worked (Cooley 1982). Other chert sources in San Diego County need to be identified and the material chemically characterized.

Large biface production and reduction requires pieces of material large enough to be reduced, and homogeneous enough to produce workable items. Santiago Peak Volcanics found in San Diego County have been used extensively for the production of large tools (i.e., adzes, scrapers, scraper planes, cores, hammerstones) and bifaces (Schroth and Flenniken 1997a, 1997b). The use of quarry material from these formations may be an early to middle Holocene marker, as the larger spear and dart points would have necessitated the use of larger blocks of parent material.

Nodule core reduction comprises numerous techniques with specific trajectories such as pyramidal-shaped split-nodule core reduction (used to produce thick, contracting flakes for flake tools), the production of Teshoa flakes for large flake tools and nodule core tools wherein the parent material rather than the removed flakes become tools. Cobble layers found in streambeds, across coastal terraces, and along the coast provided materials for these reduction sequences.

Ground stone artifacts (i.e., manos, metates, and pestles) occur on sites throughout San Diego County, and especially at habitation sites, milling stations, and temporary camps. To date, little analysis has been conducted regarding ground stone manufacture and use, or change of use through time in the San Diego region. An analysis of debitage and lithic tools from site CA-SDI-10148, located south of the San Diego River near Santee, was completed by Flenniken (Kyle and Gallegos 1993). Flenniken determined that all of the flaked core/cobble tools recovered from the site were used for ground stone manufacture and rejuvenation, and that the debitage was the result of both tool manufacture and rejuvenation of ground stone grinding surfaces. Analysis of debitage and tools from habitation sites can provide information regarding manufacture, use, and rejuvenation of ground stone. Changes in resources and task-specific uses should be analyzed to determine if ground stone tools were designed for specific tasks, and if technological changes occurred through time as climate and resources changed.

Assuming that sufficient quantities of lithic materials will be recovered, the following research hypotheses will be addressed.

H_0: Specific lithic reduction techniques have changed through time, with large biface reduction and steep-edged unifacial tools (SEUTs) dominating during the early and middle Holocene, and small biface reduction and nodule core reduction dominating during the late Holocene.

H_1: All reduction strategies were equally important throughout the Holocene.

Study Topics

(a) Which technological reduction strategies are present based on the debitage at the sites?

(b) Which reduction strategies were used to produce which tools? Were these strategies the same or different?

(c) Are recovered tools made from local or imported materials?

(d) If ground stone tools are present, are the cobble materials local or non-local?

(e) Is there evidence that ground stone tools were produced at the sites, or were they produced elsewhere and then carried to the sites?

(f) How do technologies and stages of tool reduction relate to site function and tools recovered at the sites?

(g) Can the recovered tool forms be assigned to specific culture groups?

Data Needs

(a) Collection of a sample of cores and debitage.

(b) Detailed analysis of cores and debitage for technological attributes and reduction sequence classification.

(c) Identification of the technological attributes and reduction sequences used to produce the tools.

2.2.6 Research Priorities

Many of the research questions overlap, as they address environmental setting and precontact occupation. Research priorities for this study are: chronology, lithic technology, settlement pattern, and trade and travel.

Data Needs

Sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 contain a moderate range of artifacts including flaked lithic tools and milling implements to address the research questions posed. The various lithic tools provide material for relative dating and assist in addressing questions concerning chronology and settlement pattern. Artifact types were analyzed with respect to chronology.

2.3 FIELD METHODS

The objective of the cultural resource study was to survey approximately 300 acres within the Otay Ranch project area, and to determine site significance under City of Chula Vista and CEQA criteria for cultural resources identified within the project area. (The proposed offsite storm drain, sewerline, and trail improvement area was separately surveyed and is discussed in Appendix G.) Testing and field methods included collection of surface artifacts, GPS site mapping, and excavation of shovel test pits (STPs) to determine site size, depth, content, integrity, and significance. (No testing of sites in offsite improvement areas was required, as the two sites had been previously tested.) Dennis R. Gallegos and Monica Guerrero provided project direction and overall management. Field personnel included Nick Doose, Lucas Piek, Brian Spelts, Brian Williams, and Larry Tift. GIS mapping was completed by Nick Doose. Carmen Lucas (Kwaaymii, Laguna Band of Indians) provided Native American monitoring services for fieldwork conducted.

2.3.1 Survey Methods

To the extent possible, the project area was intensively surveyed on foot using 10-m intervals between survey transects. Steep rugged terrain was not surveyed.

2.3.2 STP Excavation

STPs, 30 centimeters (cm) in diameter, were used to determine site size and depth. STPs were excavated in 10-cm levels, with all soil dry-screened using 1/8-inch hardware mesh. The artifacts and/or ecofacts removed were bagged by STP and by level. All results were provided on tables by STP number and are discussed by site number within this report. Intervals for STPs were 10, 20, and 40 meters (m), or placement near site boundaries. STPs were placed at the periphery of the sites to determine the site boundaries and locations.

2.4 LABORATORY METHODS

Karen E. Doose provided laboratory direction and ensured that artifacts were handled in a professional and proper manner, and that materials for special studies were submitted to subconsultants. Gallegos & Associates' standard system of cleaning, cataloging, and analyzing cultural remains was used for artifacts recovered during this study. These procedures include cleaning and separating artifacts and ecofacts by material class by provenience prior to cataloging. Each item, or group of items, was counted, weighed and/or measured, and the information was entered into an electronic database, along with provenience, material class, functional category, and documentation of manufacturer marks and dates (for historical artifacts), and other diagnostic characteristics. Each item, or group of items, was given a consecutive catalog number marked on a separate label placed with the artifact in a 4-mm acid-free plastic curation bag. Additionally, each item was analyzed for specific characteristics particular to each material class. All cataloged items were divided into typological categories and placed within appropriately labeled boxes for interim storage at Gallegos & Associates' cultural resource laboratory. Final curation will be at the San Diego Archaeological Center.

All artifacts and ecofacts collected were treated using accepted and appropriate archaeological procedures. Initial laboratory work included washing and/or brushing artifacts and cataloging. Artifacts were sorted into classes, such as bifaces, cores, bone tools, beads, milling tools, and flakes. Cataloging provides basic data such as count, measurement, weight, material, condition, and provenience. The catalog also offers information as to horizontal and vertical distribution of cultural material.

Specialized studies are conducted after the initial sorting and cataloging. The number and type of specialized studies completed for this report depends on the materials recovered and the level of research. Studies completed include lithic technological analysis.

2.4.1 Lithic Analysis

Analytical Methods

Technological analyses based upon replicative data were conducted for all flaked stone artifacts recovered from the surface and subsurface from sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235. All flaked stone artifacts were also examined to identify raw materials and reduction stage categories. Reduction stage flake categories were defined by comparing technological attributes of replicated artifacts from known and cataloged flaked stone tool reduction technologies to prehistoric controls. In turn, by comparing the prehistoric artifacts to the known artifacts in terms of manufacture, reduction stages were assigned to technologically diagnostic debitage. Some debitage, however, was considered technologically nondiagnostic, because of the lack of identifying attributes on fragmentary pieces.

Technological debitage analysis based upon replicative data (Flenniken 1981) was selected over other analytical methods to obtain processual reduction stage identifications. Methods such as size grading (Ahler 1989), or morphological attribute analyses, which includes length, width, thickness, weight, or completeness of flake (Sullivan and Rozen 1985), do not allow processual anthropological modeling of specific technological activities. Analyses dependent on metric data provide the analyst with size-descriptive information only; they do not allow reliable identification of prehistoric behaviors. Metric analyses do not take into account crucial variables such as raw material quality, shape, and flakeability, nor do they consider the skill level of the prehistoric knapper, the reduction sequence(s), or the intended end product(s).

Size grading of debitage as a form of "technological" analysis is also ineffectual as a means of providing accurate prehistoric lithic technological information (Scott 1985, 1990, 1991). In one, older, but relevant case study where samples of debitage from six different sites were subjected to both size-grading analyses and technological analyses in an effort to define the lithic reduction activities that occurred at each site, Scott (1985) found that "…size-grading artificially separates debitage into classes that do not accurately reflect lithic reduction."

Ahler's (1989) twenty-year-old work concerning "mass analysis of flaking debris" is still considered to be a comprehensive study on the subject of size-grading analysis. However, even using experimental controls, size-grading analysis proves inadequate for making inferences as to the reduction process because of the qualifications placed on interpretive comparisons. For example, Ahler's (1989) reduction model does not apply to multiple toolstone material sites wherein the size, shape, and quality of the original raw materials may have influenced reduction strategies. Multiple flaking episodes are said to require interpretation through multivariate statistical analysis even though statistics are not capable of "interpreting" data. Ahler's (1989) approach provides little or no accurate technological information concerning lithic reduction techniques because of inherent methodological errors regarding scientific experimental procedure. Sampling of large assemblages combined with technological attribute and stage analysis is more informative than are low-level description of complete, large assemblages.

Replicative systems analysis is a methodological concept designed to understand the behavior prehistorically applied to flaked stone artifacts (Flenniken 1981). The method involves replicating, through flintknapping experimentation, a hypothesized sequence (based upon debitage frequencies documented during analysis) of lithic reduction employed at a particular archaeological site. By comparing the prehistoric debitage with cataloged experimental debitage, it is possible to determine the reduction techniques and sequence(s) that were employed at a given site by prehistoric knappers. Experimentation has also demonstrated flakes associated with tool manufacture are frequently misidentified as functional tools, because of natural edge damage, most frequently small flake removal caused by production attrition and post-depositional activities (Flenniken and Haggarty 1979).

The replicative systems analysis approach offers a reliable means to both identify and demonstrate the method(s) utilized by prehistoric knappers to reduce available toolstone into flaked stone tools and weapons. Because flintknapping techniques are learned rather than an innate behavior, reduction strategies can be both culturally and temporally diagnostic (Flenniken 1985; Flenniken and Stanfill 1980). Thus, by studying the reduction technologies employed at archaeological sites, it is possible, once the technological foundation based upon numerous technological analyses has been established, to correlate sites in time and space by identifying related or similar lithic technologies (Flenniken and Stanfill 1980). The correlations may aid future research involving descriptions of regional mosaics of human activity patterns as they vary through time. In regions where volcanic or acidic sediments preserve very little of the archaeological record except stone artifacts, or where prehistoric activities left little or no trace, this method of gathering information can be extremely productive. This approach to lithic analysis is useful and appropriate because it focuses on determining what lithic technologies were used at a particular site, how these technologies may have changed through time, and whether these changes correlate to specific time periods and/or geographic locations.

Attributes identified on the prehistoric debitage, in conjunction with experimental analogs, were used to define technologically diagnostic debitage, enabling flakes to be assigned to specific experimentally derived reduction stages (Flenniken 1978, 1981). The remaining debitage was not ascribed to any reduction stage, because of the fragmentary nature of the specimens. These specimens were characterized as technologically nondiagnostic, although attributes such as material type and presence/absence and type of cortex were noted.

Not all flaked stone reduction technologies are the same throughout prehistory even within one locality, or within one formed artifact class. For example, biface reduction sequences may vary technologically from site to site as a result of cultural/temporal differences even though the same raw lithic material is present at these sites. By identifying technologically diagnostic debitage from sites, specific reduction technologies can be easily segregated.

A 100% sample of the flaked stone artifacts recovered from CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 was analyzed, identified, and assigned to specific technological categories ("tecats") and reduction stages. Technologically diagnostic debitage was assigned to a specific reduction category, and served as the basis for interpretation of lithic technology. The surface and STP assemblages recovered from each site are intra-site similar in technological character. Because the assemblages are small and technological change was not spatially identified, all artifacts from each site were combined to form intra-site assemblages for the purpose of interpretation of the lithic technology at each site.

- **Ground Stone Tools**

These tools were used primarily for vegetal processing; however, ethnographic records indicate that bone, clay for pottery, and pigments for paint were also ground with these implements (Gayton 1929; Kroeber 1925; Spier 1978). Ground stone tools were first separated into four groups: manos, metates, pestles, and mortar/bowls, recognizing, of course, that all four groups in actuality feature complex tools that have two primary parts. Attributes selected for the discussion of ground stone tools are most amenable to comparisons with similar artifacts from other sites in the region.

Manos: Attributes important in the classification of manos include natural cobble or shaped, number of faces used (bifacial or unifacial) to determine extent of usage, end battering (presence or absence resulting from roughening grinding surfaces), outline, and cross-section. The shape of a mano can aid in identifying the type of metate (i.e., shallow or deep basin) used with the mano. Shaping is important in determining the length of occupation of the site, as the time needed to shape a proper mano would not be taken if the user only meant to employ the mano for a day or two and then discard it. Shaping denotes an unnecessary amount of time expended to make an object aesthetically pleasing.

Metates: Ground stone fragments were identified as metate fragments based on the presence of at least one concave ground surface. Both slab (thin and portable) and block (thick and heavy) metates may be present. Some may have been used unifacially and others bifacially; denoting the amount of time spent grinding.

2.5 NATIVE AMERICAN CONSULTATION

The Native American Heritage Commission (NAHC) was contacted to request information and/or input regarding Native American concerns either directly or indirectly associated with the Otay Ranch project, as well as names of individuals in the area who should be contacted prior to completion of this study. Those individuals identified by the NAHC were contacted by letter and information as to cultural resources within the project area was requested. Additional project notification will be conducted through general public distribution of the environmental report. Carmen Lucas (Kwaaymii, Laguna Band of Indians) provided Native American monitoring services for fieldwork conducted. Carlene Chamberlain and Jesse Pinto from the Jamul Indian Village also visited the project area.

2.5.1 Provisions for Encountering Human Remains

If burials were encountered, fieldwork would cease at once in the immediate area of the burial. The person in direct charge of the project would contact the County of San Diego Coroner. If the Coroner determines that the remains are not subject to his or her authority, and if the Coroner has reason to believe that the human remains are those of a Native American, the Coroner is required to contact the NAHC by telephone within 24 hours. The California NAHC, the local agency representative, and the authorized local tribal representative will review the case and provide input as to further action.

Alternatives for the disposition of human remains and associated artifacts include: (1) leaving the human remains in situ; (2) uncovering the human remains for analysis in situ; (3) removing the human remains for analysis and curation; (4) removing the human remains for analysis and repatriation to Native Americans affiliated with the local area; and (5) removing the human remains with no analysis for repatriation to Native Americans affiliated with the local area.

2.6 CURATION

All cultural materials, except burial-related artifacts and unless otherwise required by law, excavated or removed from precontact or historical cultural resource sites during testing and/or data recovery programs, along with associated project data, will be permanently curated at a qualified repository as defined by the "State of California Guidelines for the Curation of Archaeological Collections," such as the San Diego Archaeological Center. Curation includes, but is not limited to, field notes, photographs, catalogs, and final reports. Additionally, the owner agrees to execute a release of title form and to pay the required curation fees in effect at the time of curation. All curation shall be accomplished within six months from the completion of the project.

SECTION 3
SURVEY RESULTS

3.1 INTRODUCTION

This study included a field survey of approximately 300 acres for the Otay Ranch Village 8 West project. A total of six cultural resource sites (CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, CA-SDI-14236, CA-SDI-17103, and P-37-014554) and 5 isolates (P-37-014531, P-37-014532, P-37-014533, P-37-015008, and P-37-015145) were previously recorded within or adjacent to the project area. Survey methods, results, and summary are provided below.

3.2 SURVEY METHODS

The entire project area was intensively surveyed on foot using 10-m intervals between survey transects. Field personnel included Nick Doose, Lucas Piek, Brian Spelts, Brian Williams, and Larry Tift. Carmen Lucas (Kwaaymii, Laguna Band of Indians) provided Native American monitoring services for fieldwork conducted. Within the boundaries of Village 8 West are areas identified as "Not a Part." These include a reservoir area, which was previously studied, and a linear aqueduct. Both of these areas have been heavily impacted by construction. Both areas were included in the literature review and record search, which identified no recorded cultural resources within them. The reservoir area was not surveyed, but the aqueduct areas were revisited and surveyed as part of the present project.

3.3 SURVEY RESULTS

The Otay Ranch project area was surveyed in October 2008. Ground visibility within the project area was poor along drainage areas, steep slopes, and most valley areas, and fair on knoll tops, dirt roads, and some valley areas. Portions not surveyed included limited areas of dense vegetation in drainage bottoms and very steep slopes. Vegetation, which was dense throughout much of the project area, consists of coastal sage scrub, cholla, and non-native grasses.

The field survey was positive, relocating previously recorded sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 and identifying five new isolates (OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7) (Figure 3-1). Site CA-SDI-14236 and isolates P-37-014531, P-37-014532, P-37-014533, P-37-015008, P-37-015141, and P-37-015145 were not relocated during the current survey. It should be noted that a number of isolates had been previously collected (see Section 3.3.2). (Sites CA-SDI-4789 and CA-SDI-12809 were relocated during the survey of the offsite improvement area. One artifact was observed on the surface of each site. Survey methods and results are discussed in Appendix G.)

3.3.1 Previously Recorded Sites

- **CA-SDI-12287**

Site CA-SDI-12287 was originally recorded by Rader and James (1991a) as an artifact scatter consisting of one metate fragment, one scraper, and one flake. A test program was conducted at CA-SDI-12287 that included collection of surface artifacts and excavation of nine STPs and one test unit (Clowery-Moreno and Smith 2008). As a result of the test program, site CA-SDI-12287 was identified as not significant under CEQA criteria (Clowery-Moreno and Smith 2008). The site was relocated during the current survey and additional cultural material was collected from the surface including 2 debitage, 2 manos, and 1 unidentified ground stone fragment (see Figure 3-1). Disturbance at the site consists of previous agricultural activities and fill soil dumping.

- **CA-SDI-14176**

Site CA-SDI-14176 was recorded by BFSA (1996a) as a temporary camp that consists of flakes, one metate, one chopper, three scrapers, one brown ware pottery sherd, and marine shell. The site was relocated during the current survey and cultural material was identified including 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2

FIGURE 3-1

SURVEY RESULTS FOR THE OTAY RANCH VILLAGE 8 WEST PROJECT

(See Confidential Appendix)

battered implement flakes, and 1 unidentified ground stone fragment (see Figure 3-1). Disturbance at the site consists of previous agricultural activities.

- **CA-SDI-14235**

Site CA-SDI-14235 was recorded by BFSA (1996e) as a lithic scatter that consists of 5+ scrapers, 12+ flakes, and 1 hammerstone. The site was relocated during the current survey and the site boundary was expanded to incorporate additional artifacts including 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements (see Figure 3-1). Disturbance at the site consists of previous agricultural activities.

- **CA-SDI-14236**

Site CA-SDI-14236 was recorded by BFSA (1996f) as a lithic scatter that consists of 7+ flakes, 2 retouched flakes, and 1 scraper. The site was not relocated during the current survey (see Figure 3-1).

3.3.2 Previously Recorded Isolates

- **P-37-014531**

Isolate P-37-014531 was recorded by BFSA (1996h) as one isolate flake. The isolate was not relocated during the current survey (see Figure 3-1).

- **P-37-014532**

Isolate P-37-014532 was recorded by BFSA (1996i) as one scraper. The isolate was not relocated during the current survey (see Figure 3-1).

- **P-37-014533**

Isolate P-37-014533 was recorded by BFSA (1996j) as one flake. The isolate was not relocated during the current survey (see Figure 3-1).

- **P-37-015008**

Isolate P-37-015008 was recorded by Serr (1990) as one metavolcanic flake. The isolate was not relocated during the current survey (see Figure 3-1).

- **P-37-015145**

Isolate P-37-015145 was recorded by Rader and Mitchell (1991b) as one metavolcanic core (see Figure 3-1). The isolate was previously collected by ERCE.

3.3.3 Newly Recorded Isolates

- **OR-I-3**

Isolate OR-I-3 was identified within the Village 8 West parcel. This isolate consists of one metavolcanic debitage, which was not collected (see Figure 3-1). No features or additional artifacts were noted.

- **OR-I-4**

Isolate OR-I-4 was identified within the Village 8 West parcel. This isolate consists of one metavolcanic SEUT, which was not collected (see Figure 3-1). No features or additional artifacts were noted.

- **OR-I-5**

Isolate OR-I-5 was identified within the Village 8 West parcel. This isolate consists of one metavolcanic SEUT, which was not collected (see Figure 3-1). No features or additional artifacts were noted.

- **OR-I-6**

Isolate OR-I-6 was identified within the the Village 8 West parcel. This isolate consists of one metavolcanic SEUT, which was not collected (see Figure 3-1). No features or additional artifacts were noted.

- **OR-I-7**

Isolate OR-I-7 was identified within the Village 8 West parcel. This isolate consists of one metavolcanic biface fragment (midsection), which was not collected (see Figure 3-1). No features or additional artifacts were noted.

3.4 SUMMARY

A field survey was conducted for the approximately 300-acre Otay Ranch Village 8 West project area. Ground visibility within the project area was poor along drainage areas, steep slopes, and most valley areas, and fair on knoll tops, dirt roads, and some valley areas. The field survey was positive, relocating previously recorded sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 and identifying five new isolates (OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7). Site CA-SDI-14236 and isolates P-37-014531, P-37-014532, P-37-014533, and P-37-015008 were not relocated during the current survey. Isolate P-37-015145 was previously collected by ERCE. (Previously recorded sites in the offsite improvement area, CA-SDI-4789 and CA-SDI-12809, were relocated and are discussed in Appendix G.)

SECTION 4
TEST RESULTS

4.1 INTRODUCTION

As a result of the field survey for the approximately 300-acre Otay Ranch Village 8 West project, previously recorded sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 were relocated, and five new isolates (OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7) were identified. Site CA-SDI-14236, and isolates P-37-014531, P-37-014532, P-37-014533, and P-37-015008 were not relocated. Isolate P-37-015145 was previously collected by ERCE. Testing was conducted at sites CA-SDI-14176 and CA-SDI-14235. Although site CA-SDI-12287 was previously tested (Clowery-Moreno and Smith 2008), additional artifacts were collected from the site surface during the current study.

4.2 TEST RESULTS

Testing included collection of surface artifacts, excavation of STPs, and artifact cataloging and analysis (see Section 5 for analytical results). Test results are discussed below, with surface collection and subsurface testing discussed separately for each site.

4.2.1 Surface Collection

- **CA-SDI-12287**

Five surface artifacts were collected from site CA-SDI-12287 (Table 4-1 and Figure 4-1). Cultural material recovered from the surface collection includes 2 debitage, 2 manos, 1 unidentified ground stone fragment, and shell.

- **CA-SDI-14176**

Twenty surface artifacts were collected from site CA-SDI-14176 (Table 4-2). Cultural material recovered from the surface collection includes 3 SEUTs, 1 SEUT flake, 11

Table 4-1
CA-SDI-12287: Cultural Material Recovered

Cultural Material	Surface	Quantity
Debitage	2	2
Ground Stone	1	1
Mano	2	2
Total	5	5

FIGURE 4-1

CA-SDI-12287 AND SURFACE COLLECTION

(See Confidential Appendix)

Table 4-2
CA-SDI-14176: Cultural Material Recovered

Cultural Material	Surface	STP 1	STP 2	Quantity
Battered Implement	2			2
Battered Implement Flake	2			2
Debitage	11		1	12
Ground Stone	1			1
Steep-Edged Unifacial Tool (SEUT/adze)	3			3
SEUT Flake	1			1
Total	20		1	21

debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentifed ground stone fragment.

- **CA-SDI-14235**

Four surface artifacts were collected from site CA-SDI-14235 (Table 4-3). Cultural material recovered from the surface collection includes 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements.

4.2.2 Shovel Test Pits (STPs)

- **CA-SDI-14176**

Two STPs were excavated to determine the presence or absence of subsurface materials and extent of the subsurface deposit (Figure 4-2). STP excavation resulted in one positive and one negative STP. Cultural material recovered from STP excavation includes one debitage (see Table 4-2).

- **CA-SDI-14235**

Two STPs were excavated to determine the presence or absence of subsurface materials and extent of the subsurface deposit (Figure 4-3). STP excavation resulted in two negative STPs (see Table 4-3).

4.3 SUMMARY

Subsurface testing was conducted for previously recorded CA-SDI12287, CA-SDI-14176, and CA-SDI-14235. Cultural material recovered from CA-SDI-12287 consists of 2 debitage, 2 manos, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14176 consists of 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14235 consists of 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements. Site CA-SDI-12287 was previously tested and identified as not significant under CEQA criteria (Clowery-Moreno and Smith

Table 4-3
CA-SDI-14235: Cultural Material Recovered

Cultural Material	Surface	STP 1	STP 2	Quantity
Battered Implement	2			2
Debitage	5			5
Steep-Edged Unifacial Tool (SEUT/adze)	2			2
SEUT Flake	1			1
Total	10			10

FIGURE 4-2

CA-SDI-14176: SURFACE COLLECTION AND STP LOCATIONS

(See Confidential Appendix)

FIGURE 4-3

CA-SDI-14235: SURFACE COLLECTION AND STP LOCATIONS

(See Confidential Appendix)

Smith); however, additional surface artifacts were identified and collected during the current survey.

SECTION 5

ANALYTICAL RESULTS FOR CA-SDI-12287, CA-SDI-14176, AND CA-SDI-14235

5.1 INTRODUCTION

This section provides the analytical results for cultural material recovered during the survey and test program for the Otay Ranch project. Total cultural material recovered from CA-SDI-12287 consists of 2 debitage, 2 manos, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14176 consists of 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14235 consists of 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements. A special study lithic analysis was performed by J. Jeffrey Flenniken.

5.2 LITHIC ANALYSIS (by J. Jeffrey Flenniken)

Technological lithic analyses based upon replicative data were conducted for all flaked stone artifacts identified from the samples recovered from CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235. Technological identifications were determined for all analyzed flaked stone artifacts. Lithic artifacts were categorized according to toolstone material type, technological category, and reduction stage (Appendix C).

As discussed above, reduction stage flake categories were defined by comparing technological attributes of replicated (experimental) artifacts from known and cataloged flaked stone tool reduction technologies to the prehistoric controls. In turn, by comparing the technological attributes of prehistoric artifacts (controls) to the technological attributes of known artifacts in terms of manufacture, reduction stages were assigned to technologically diagnostic debitage. Some debitage, however, was considered technologically nondiagnostic because of the lack of technological attributes (i.e., platforms) on fragmentary pieces. Therefore, attributes evidenced on the prehistoric debitage, in conjunction with experimental analogs, were used to identify technologically diagnostic debitage that enabled flakes to be assigned to specific experimentally derived reduction stages (Flenniken 1978, 1981). The remaining debitage was not ascribed to any reduction stage because of the fragmentary nature of the artifacts. Fragmentary debitage was characterized as technologically nondiagnostic, although attributes such as material type, and presence/absence and type of cortex were noted.

5.2.1 Analyzed Samples

The flaked lithic assemblage from CA-SDI-12287 consists of only two artifacts, both flakes (Table 5-1); the CA-SDI-14176 assemblage is made up of 15 flakes and 5 formed artifacts (Table 5-2); and CA-SDI-14235 comprises 6 flakes and 4 formed artifacts (Table 5-3). The assemblages from all three sites provide technological evidence for nodule core reduction.

Collections recovered from these sites are valuable additions to the identified reduction technologies as well as insights into site activities. Each flaked stone artifact from these three samples was analyzed and recorded as a separate entity in an attempt to identify reduction technologies and site activities. These samples provided technological information concerning one reduction technology (nodule core reduction) and at least two site activities, which included wood working (SEUTs/adzes) and plant processing (battered implements).

5.2.2 Technological Artifact Categories (tecats)

Analysis of the debitage and formed artifacts from these samples identified one technology, nodule core reduction continuum (Figure 5-1). Debitage classification attributes were divided into technological categories that reflect technological differences in the reduction continuum and reduction stages that occurred at these sites. *Continuum* is defined as a process that includes the entire life cycle of a specific flaked stone tool (including all debitage) from the selection of the raw lithic material, initial decortication,

Table 5-1
CA-SDI-12287: Flaked Stone Assemblage

Debitage

	Toolstone Material	
TECAT	MV	Totals
NP-11	1	1
Flake Frag/wc	1	1
Totals	2	2
Artifact Total	2	2

MV = Metavolcanic
/wc = with cortex

Table 5-2
CA-SDI-14176: Flaked Stone Assemblage

Debitage

	Toolstone Material	
TECAT	MV	Totals
NP-10	1	1
SFP-10	1	1
SFP-11	5	5
1005.AZ Flake	1	1
1021.BI Flake	2	2
Flake Frag/wc	2	2
Flake Frag/woc	3	3
Totals	15	15

Formed Artifacts

TECAT	MV	Totals
1005.AZ	3	3
1021.BI	2	2
Totals	5	5

Artifact Total	20	20

MV = Metavolcanic
/wc = with cortex
/woc = without cortex

Table 5-3
CA-SDI-14235: Flaked Stone Assemblage

Debitage

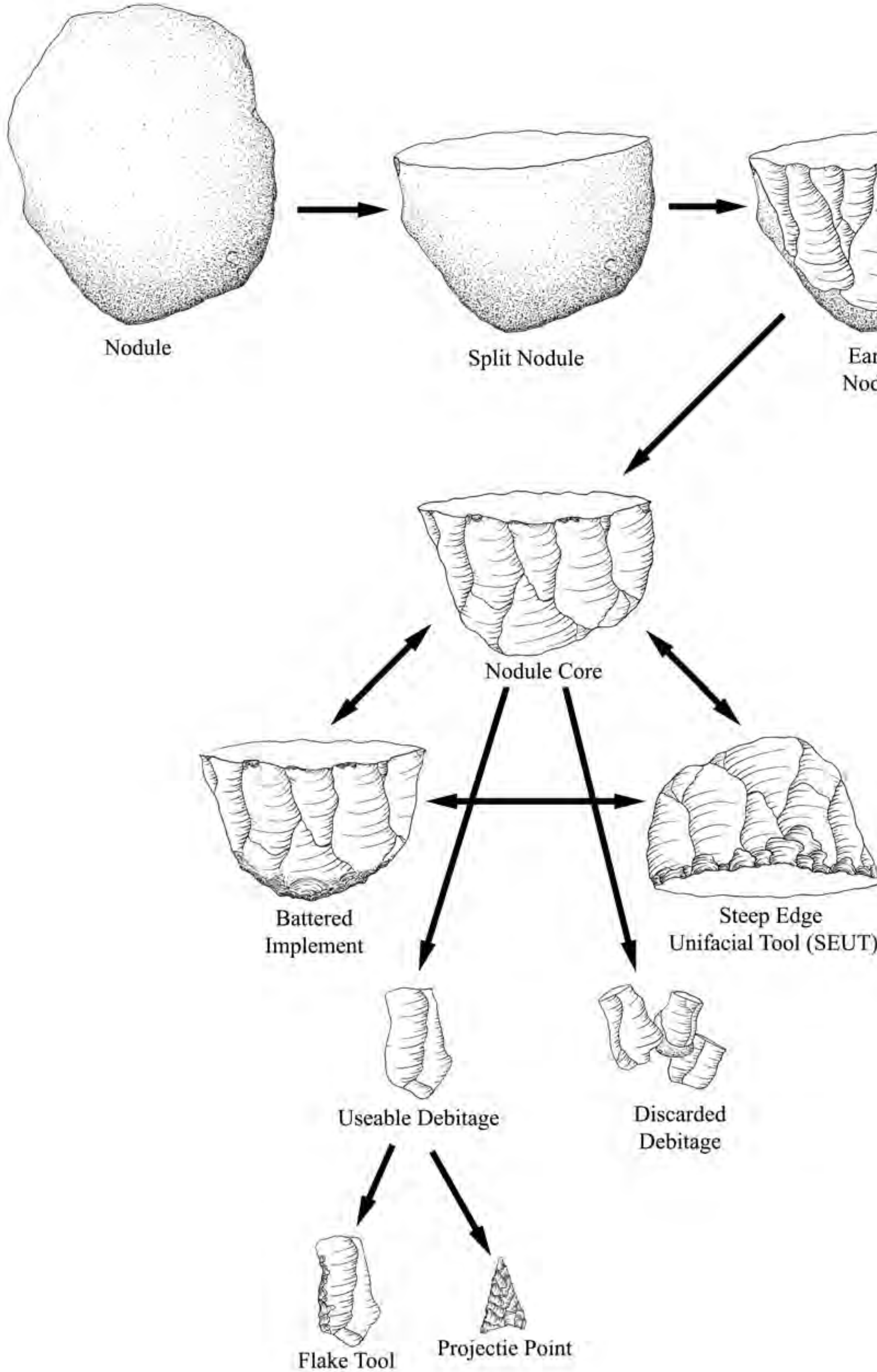
	Toolstone Material	
TECAT	MV	Totals
NP-2	1	1
NP-11	1	1
SFP-10	2	2
MFP-11	1	1
1005.AZ Flake	1	1
Totals	6	6

Formed Artifacts

TECAT	MV	Totals
1005.AZ	2	2
1021.BI	2	2
Totals	4	4

Artifact Total	10	10

MV = Metavolcanic



Gallegos & Associates

Simplified Example of Nodule Core Reduction Process

FIGURE 5-1

heat treatment (if applicable), reduction into the original tool, use and reuse of that tool (which may be multi-functional), rejuvenation of that tool, the deposition of that tool into archaeological context, and possible reuse of that tool later in prehistoric time (see Figure 5-1). *Reduction stage*, as employed for analytical purposes only, is a concept designed to separate a flintknapping continuum. The reduction-oriented technological stages (processes) employed in this analysis, the flake categories, based upon replicated artifacts that correspond to those processes, and the flake attributes used to define those categories are within the nodule core reduction technology that was well established in prehistoric southern California.

5.2.3 Nodule Core Reduction

Nodule core reduction is known in the southern California archaeological literature as "Cobble Core Reduction" (Gallegos et al. 2002; Gallegos et al. 2003). The term *nodule* was substituted for *cobble* because the term cobble is geologically defined as a size clast (64-256 mm) and many prehistoric core and core-based artifacts (such as some battered implements, adzes, etc.) were manufactured from boulders (>256 mm), and to a much lesser extent, pebbles (4-64 mm). The term nodule was selected because a nodule can be any size and tends to be somewhat rounded to subrounded.

Nodule core debitage was recognized and grouped into technological categories based on the amount and location of dorsal cortex, platform attributes, dorsal arris count and direction, and flake cross/long-section shape. Debitage was classified according to three platform types identified among the flakes from nodule core reduction: natural/cortical platforms (NP), single-facet platforms (SFP), and multi-faceted platforms (MFP). Flakes were further subdivided according to the location of dorsal cortex: tecats include NP-1 through NP-11, SFP-1 through SFP-11, and MFP-1 through MFP-11 (see Appendix C).

The reduction-oriented technological categories of diagnostic flakes were also segregated on the basis of geological material (metavolcanic and quartz). Flake fragments that lacked the necessary attributes to be placed in one of these reduction-oriented tecats were classified as technologically nondiagnostic debitage (Flake Fragment) with cortex (/wc) and without cortex (/woc). Only raw material type and presence or absence of cortex were recorded for these artifacts. Interpretation of the reduction sequence from this sample of sites was determined using only the technologically diagnostic debitage, whereas discussions concerning lithic raw material types include all debitage and formed artifacts.

Metavolcanic nodules (cobbles and boulders) were selected for size, shape, material quality, and platform location. Nodules with natural platforms were reduced directly by percussion in a circular manner around the natural platform. The location of dorsal cortex indicates the sequence of flake removals. Cores with faceted platforms were nodules that required platform preparation prior to reduction. This occurred usually when a nodule of quality material was selected, but the nodule did not possess a naturally appropriate platform. It was, therefore, necessary to create a platform by percussion flaking. The desired products of nodule core reduction were flake blanks that were thick in cross-section, long and narrow in plan-view, and ranged in length depending upon intended use, but were most likely 3 to 12 cm in length.

5.2.4 Toolstone Materials

The lithic materials employed by the prehistoric knappers at these three sites included a variety of metavolcanic rocks collected from alluvial deposits. All (100%) of the identified cortex was incipient cone cortex resulting from water transportation of the lithic nodules. Toolstone was prehistorically collected from alluvial environments.

Metavolcanic materials are found as pebbles, cobbles, boulders, and bedrock derived from Eocene volcanic rhyolites, andesites, and diabase of basaltic composition (Clevenger 1982). These materials have been extensively metamorphosed causing structural recrystallization and a rather porphyritic nature (Clevenger 1982). Metavolcanic rocks range in color from green to brown to black, and require great dynamic loading forces to fracture conchoidally. Distinctive Santiago Peak Metavolcanic (green, fine-grained metavolcanic material known locally as “felsite”), found as bedrock in San Diego County and redeposited as float, was well represented in these analyzed assemblages.

5.2.5 Analytical Results for CA-SDI-12287

CA-SDI-12287 produced only two artifacts, one NP-11 flake (natural cortical platform, no dorsal cortex) and one flake fragment with cortex (Flake Frag/wc) (see Table 5-1).

5.2.6 Analytical Results for CA-SDI-14176

The CA-SDI-14176 collection includes 20 flaked stone artifacts (see Table 5-2). Fifteen artifacts are complete and fragmentary flakes: one represents natural platform reduction (NP-10), six represent single-facet platform nodule core reduction (SFP-10 and SFP-11), one was identified as a SEUT/adze resharpening flake (1005.AZ Flake), one was identified as a battered implement use flake (1021.BI Flake), two are flake fragments with cortex (Flake Frag/wc), and three are flake fragments without cortex (Flake Frag/woc). The five remaining artifacts included three SEUTs/adzes (1005.AZ) and two battered implements (1021.BI). Site activities included nodule core reduction, woodworking, and plant processing.

5.2.7 Analytical Results for CA-SDI-14235

This analyzed assemblage consists of 10 flaked stone artifacts (see Table 5-3). All three platform configurations are represented in the debitage (NP-2, NP-11, SFP-10, and MFP-11) in this small sample along with one SEUT/adze resharpening flake (1005.AZ Flake), two SEUT/adzes (1005.AZ), and two battered implements (1021.BI). Site activities included nodule core reduction, woodworking, and plant processing.

5.2.8 Technological Summaries

Nodule Core Reduction

Nodule core reduction technology is the most common core technology identified in these samples (Gallegos et al. 2002; Gallegos et al. 2003). Products of nodule core reduction are also the most abundant as measured by percent of technologically diagnostic flakes (see Tables 5-1 through 5-3). Expedient technology may have been so commonly used because it provided a simple and relatively effortless way to produce flakes intended for immediate use or transport. Because of the local (San Diego County) abundance of metavolcanic materials, there was often little need for more material-efficient and consequently more time-consuming technologies (see Figure 5-1).

Debitage produced from nodule core reduction was classified according to the pattern of dorsal cortex present (if any), dorsal arris patterns, and platform attributes. Dorsal cortex attributes provide clues concerning two processes: stage of reduction and patterning of flake removals. The amount of cortex will decrease through the reduction sequence. Flakes with 100% dorsal cortex (NP/SFP/MFP-1s), therefore, usually result from earlier portions of the sequence while flakes with no dorsal cortex (NP/SFP/MFP-11s) result from the latter portions of the sequence. The abundance of flakes that lack dorsal cortex exist because, once cortex is removed from a nodule early in the reduction sequence, all subsequent flakes will lack dorsal cortex.

The positioning of dorsal cortex results from the patterning of flake removals (clockwise, counter-clockwise, or unpatterned in relation to the platform). The analysis of these debitage samples did, to a limited degree, reveal a potentially meaningful pattern regarding flake removal (very little cortex).

Another aspect of variability seen in the nodule core reduction debitage assemblages relates to platform characteristics. This variability also appears to result purely from technological considerations, rather than, for instance, a “mental template” to which might be attached some chronological or ethnic significance. Three examples of platforms are frequently found (unprepared/natural/cortical [NP], single-facet [SFP], and multi-faceted [MFP]), and they vary, in part, according to the amount of shaping required to obtain a suitable platform configuration for successful flake removals (a uniform platform surface and adequate platform-to-core face angle). Some nodules did not require shaping (natural platforms) to obtain a proper platform configuration; others required more (multi-faceted platforms) or less (single-facet platforms) shaping. It is expected that these different platform types could be produced within a single reduction sequence as a result of adjustments made in response to the changing shape of the core as it was reduced.

One source of inter-site variation may relate to the portion of the nodule core reduction sequence conducted at these sites. It appears that cores were not always entirely reduced at a single location, but rather initial shaping may have been performed at one site, and subsequent core reduction performed at another. This is indicated at some sites where few early stage flakes were found, but later stage flakes were common. Alternatively, this pattern could be explained as a result of sampling bias resulting from the randomness of mainly surface collections.

5.2.9 Functional Summaries

Wood Working

A total of 5 SEUTs/adzes (1005.AZ) were identified from these collections (see Tables 5-1 through 5-3) and combined with SEUT/adze resharpening flakes (1005.AZ Flake), a strong argument can be supported for wood working as a major activity that occurred at these sites. These formed artifacts as well as debitage exhibit use-wear in the form of working-edge polish and planer-surface striations.

SEUTs/adzes, effective wood working tools (Gallegos et al. 2002; Gallegos et al. 2003), are typically "...circular or semi-circular in outline form and have a low profile from the frontal view with the contiguous planer use-wear located near the working element" (Schroth and Flenniken 1997a, 1997b). SEUTs/adzes also may possess different shaped working/cutting edges or elements. These different shaped cutting edges provide different woodcutting functions, much like modern, metal wood working tools. Adzes varied in size and weight, both attributes were related to specific functions. The larger adzes were employed to remove larger amounts of wood-mass, whereas the smaller adzes were used for more well controlled wood-mass removal.

Plant Processing

The identification of 4 battered implements (1021.BI) and 2 battered implement flakes (1021.BI Flake) from these sites suggest plant processing tools (mano and metates) were used and resharpened at these sites (see Tables 5-1 through 5-3). Prehistoric flaked stone assemblages from southern California, Utah, Nevada, as well as the American Southwest contain a common artifact identified by archaeologists by a variety of names including chopper, hammerstone, pounder, muller, milling stone, flaked hammerstone, handstone, battered hammerstone, masher, basher, utilized core, scraper planes, pecking stone, fist ax, hand ax, to name a few (Dodd 1979; Wallace 1978). Many of these artifacts are employed as archaeological identifiers of specific prehistoric cultures (Wallace 1954; Kowta 1969). Others are simply weighed, measured, and described generally as plant and animal resource processing tools.

Dodd (1976, 1979) and others (Ambler 1985; Geib 1986), however, have devoted considerable time and energy to the identification and function of a rather unsophisticated, but highly specialized and important prehistoric tool class, battered hammerstones. Battered hammerstones are separated from the other artifact classes on the basis of pock marks located on one or more intentionally prepared areas on a single tool that are a result of repeated pounding against another hard object. These implements are most frequently produced from conchoidal fracturing, subrounded to subangular, spherical to discoidal, cobble-sized, quartzite, chert, metavolcanic, and volcanic nodular alluvial materials.

The manufacturing process includes the selection of a check-free rock (or, most likely an exhausted nodule core or exhausted SEUT/adze) of the appropriate material and size. After material selection, a unifacial or bifacial sinuous edge (or platform edge on a flake core) was produced by direct free hand percussion. The sinuous edge may have been situated on the side of the nodule, end of the nodule, or completely surrounding the nodule. The debitage produced as a result of edge manufacture is characteristic of initial cobble reduction, but is not well-patterned because of the variation in size, shape, and quality of the selected cobble. Because a sinuous edge was the "intended end product," general debitage characteristics may include cortex (in varying amounts) on the dorsal surfaces and platforms, few dorsal surface arrises, hinge terminations, thick flake cross-sections, angular flake plan-views, single-facet platforms, and more rarely, multi-faceted platforms.

Once the sinuous edges were produced to satisfaction, the linear-edged hammerstone was ready for use. The use of these hammerstones produced battered edges: the longer the use, the more intense the battering. At some time during the use process, the battered hammerstone required resharpening. Resharpening included the removal of flakes by direct free hand percussion along the sinuous margin until the battered edge surfaces were partially or totally eliminated. A portion of the debitage produced during the resharpening process is very distinctive in that the battered edge that was once on the hammerstone is present on the proximal end of the dorsal surface of the resharpening flake. Additionally, some battered implement flakes are produced during use (block [battered implement] on block [metate]). However, flakes that do not exhibit battering on their dorsal surface were also produced, and are impossible to assign to the resharpening process. Once again, the hammerstone was ready for use. After numerous use/resharpening events, battered tools were discarded into archaeological context. These discarded battered implements occur as exhausted, well-worn, intensely battered tools or as resharpened, sharp-edged, small hammerstones with isolated areas of intense battering on one or more previously used margins. The latter were discarded because they were too small and lacked the specific gravity to function efficiently.

Experimental (Flenniken et. al 1993) and ethnographic data (Bartlett 1933; Hayden and Nelson 1981; Hill 1982; Hough 1897; Lange 1959; Michelsen 1967; Simpson 1952) document ground stone tools (mainly manos and metates) were manufactured, sharpened, and resharpened with battered implements (Flenniken et al. 1993). The sample of battered implements and battered implement flakes from these sites support resharpening of manos and metates, plant processing tools.

5.2.10 Lithic Analysis Summary

Nodule core reduction provided prehistoric southern Californian knappers with the flake blanks necessary to manufacture all of the needed formed artifacts to effectively exploit their environments (see Figure 5-1). The most common formed artifacts recovered from southern California sites included unaltered flake tools as cutting and/or scraping implements, minimally altered flake tools used for cutting and/or scraping, SEUTs/adzes (frequently classified as a type of flake core), and battered implements.

Exhausted nodule cores varied in size depending upon the required size of the intended flake blanks and/or the size needed for laterally cycled artifacts such as a SEUT/adze or battered implement. Often, adzes and battered implements were manufactured from exhausted cores (see Figure 5-1). Therefore, core reduction may have been terminated at a specific size and weight, so that the "exhausted" core could serve as a "blank" for some other tool where a specific size and weight were required. SEUTs/adzes and battered implements appear to have been manufactured from both large flake blanks, as well as exhausted nodule cores (see Figure 5-1). Therefore, based upon the above discussions, near-exhausted nodule cores were likely transported to these sites, were exhausted (by flake blank removal) and/or reworked to serve as blanks for SEUTs/adzes and battered implements. Alternatively, because exhausted nodule cores were not identified from these sites, adzes and battered implements, as completed formed artifacts, may have been transported to these sites to conduct wood working activities and resharpening plant processing tools. In addition, because metavolcanic materials are readily available at these locations, some large flakes may have been produced “on the spot” to manufacture both SEUTs/adzes and battered implements.

5.3 Ground Lithic Artifacts

5.3.1 Manos

As a result of the survey and test program one mano fragment and one complete mano were recovered from site CA-SDI-12287. Both manos recovered from this site are composed of natural unshaped granitic cobbles from locally available sources. The overall curvature of each mano face is slight indicating that the opposing milling surface the manos were ground against (i.e., metates, bedrock milling slicks or basins) was shallow in form.

5.3.2 Ground Stone Fragment

Two unidentified ground stone fragments were recovered from sites CA-SDI-12287 and CA-SDI-14176. A ground stone fragment is a piece of a ground stone implement that has at least one ground surface, but lacks any defining attributes that would facilitate tool identification.

5.4 Faunal Remains

A total of 119 g of shell was collected from the surface at CA-SDI-12287; however, the presence of shell on the surface appears to be a secondary deposit from fill soil that had been deposited at the site.

5.5 Summary

Cultural material recovered from CA-SDI-12287 consists of 2 debitage, 2 manos, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14176 consists of 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14235 consists of 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements.

Given the artifact assemblages, activities that occurred at sites CA-SDI-14176 and CA-SDI-14235 likely included woodworking and plant processing. In addition, sites CA-SDI-14176 and CA-SDI-14235 provided an assemblage of adequate size to interpret site flaked stone reduction techniques (nodule core reduction). As only two debitage were recovered from CA-SDI-12287, flaked stone reduction techniques were not identified. However, the presence of two manos and one unidentified ground stone fragment suggests that minimally plant processing occurred at the site. All lithic artifacts were composed of locally available metavolcanic and granitic lithic materials.

SECTION 6
SITE DISCUSSION

6.1 PRECONTACT RESEARCH QUESTIONS

Research questions were addressed to provide a theoretical framework for the test program. The following section addresses research questions posed in Section 2. For the test program, these research topics were used to generally guide the study; however, sufficient materials to answer all the research questions were not recovered. Given the nature of the project, the research questions were addressed on the level of the cultural material recovered. Research questions regarding chronology, subsistence and paleoenvironmental reconstruction, settlement patterns, trade and travel, and lithic technology are addressed below.

6.1.1 Chronology

What was the period of Native American occupation for the Otay River Valley region?

No materials were collected during the current study to provide radiocarbon dates; however, the presence of SEUTs/adzes (wood working tools) offers a relative date of early to middle Holocene. Given the present climate and the near absence of trees in the Otay River Valley region, it can be surmised that the environment has changed from a wetter, cooler climate (early to middle Holocene) that once supported trees to the drier present-day climate (late Holocene) that does not support trees. In addition, previous work at site CA-SDI-12809 identified Late Period components as defined by the presence of pottery, small projectile (arrow) points, and radiocarbon dates (McGowan 1997).

6.1.2 Subsistence and Paleoenvironmental Reconstruction

Given the numerous sites in the Otay River Valley region, what subsistence patterns can be identified and have these patterns changed over time? Were acorns used at

the sites? Did the collection of shellfish change over time? What influenced the changes: environment, populations, technologies, or combinations of these? What climatic changes occurred between 10,000 and 2,000 years ago and how did these changes affect available resources?

As discussed previously, the kinds of tools and debitage recovered were identified as SEUTs/adzes and battered implements. The presence of wood working tools suggests that trees were available at the time of occupation. Given the present climate and the near absence of trees in the Otay River Valley region, it can be surmised that the environment has changed from a wetter, cooler climate that once supported trees to the drier present-day climate that does not support trees. In addition, the presence of milling tools, battered implements, and battered implement debitage supports milling of vegetal materials.

6.1.3 Settlement Pattern

What form of settlement pattern was practiced in the region? Did it change over time and in what manner?

The precontact sites within and/or adjacent to the Otay Ranch Village 8 West project area comprise 3 lithic scatters, 1 artifact scatter, 1 temporary camp, and 1 habitation site. Previous work at site CA-SDI-12809 (habitation site) identified primarily Late Period occupation (McGowan 1997). However, the presence of SEUTs suggests Early Period occupation for some of the Otay Ranch sites. The smaller sites and isolates are likely representative of satellite and/or task-specific campsites to a main habitation/village site in the region.

6.1.4 Trade and Travel

To what extent are trade and travel evidenced in the region?

Early travelers and ethnographers noted the presence of Native American trails and observed trade activities among different cultural groups in the southern California region. The procurement of lithic resources, such as desert lithics (i.e., certain types of chalcedony, chert, jasper, obsidian, and steatite), would identify contact with other cultural groups or travel from the Otay River Valley region to acquire these stone resources, as these materials are not locally available.

For sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235, the lithic material employed by Native American knappers was metavolcanic and granitic. Santiago Peak Metavolcanic, found locally as bedrock and redeposited as float on the Otay Formation, primarily represented the non-milling tool assemblage. Milling tools are primarily composed of granitic material found in the Otay River Valley or east of the San Ysidro Mountains. Therefore, all lithic materials collected as a result of this study are identified as local materials.

6.1.5 Lithic Technology (by J. Jeffrey Flenniken)

What technological trajectories were used by the precontact inhabitants? Which lithic reduction strategies were in use and when?

Only sites CA-SDI-14176 and CA-SDI-14235 provided an assemblage of adequate size to interpret site flaked stone reduction techniques. Flintknapping activities at CA-SDI-14176 and CA-SDI-14235 were limited to nodule core reduction. Usable flake blanks, defined here as cortex-free flakes of usable length, width, and thickness, were not identified at this site, which suggests that usable flakes were transported to another location and were used as tools (flake tools). Debitage recovered from CA-SDI-14176 and CA-SDI-14235 represents primarily SEUT/adze use/resharpening debitage and battered implement use/resharpening debitage. SEUT/adze manufacture generally produces debitage that is unsuitable for flake blanks, as the flintknapping goal in SEUT production is not to generate usable flake blanks, but rather to create an acceptable cutting edge while maintaining tool weight. Flakes produced from SEUT manufacture frequently terminate in steps and hinges, leaving negative steps and hinges on the tools and creating the appearance of poorly made flake cores. The interpretation of the SEUT as a poorly-made tool or an exhausted core is common in the southern California archaeological literature. This interpretation further suggests that precontact inhabitants of southern California used "crude" tools to perform simple tasks, when actually these tools were specifically designed and well suited for a wide variety of sophisticated wood working tasks. The variation in wood working tools can be seen in six different classes of SEUT edges or bits.

Nodule Core Reduction

Nodule core reduction technology is the core technology identified at CA-SDI-14176 and CA-SDI-14235. Nodule core reduction debitage and/or exhausted nodule cores (some battered implements) are present in the site assemblages. Products of nodule core reduction are also the most abundant at the sites when measured as a percentage of technologically diagnostic flakes. This simple and expedient technology may have been commonly used because it provided a quick and relatively effortless way to produce useful flakes and flake blanks intended for further reduction. Because of the local abundance of metavolcanic materials, there was little need for more material-efficient and consequently more time-consuming technologies. Variability in comparison to other assemblages is explained by several factors: the shape and size of raw material packages, stage of reduction, and site-specific knapping activities.

Battered Implements

Battered implements are defined as tools employed prehistorically and ethnographically to shape, sharpen, and resharpen manos and metates (Flenniken et al. 1993). Two battered implements were recovered from CA-SDI-14176 and two from CA-SDI-14235 (Table 6-1). The presence of battered implements and milling implements from the Otay Ranch sites strongly suggests the inhabitants exploited plant and animal materials that required processing using manos and metates.

Table 6-1
Total Artifacts Recovered

Cultural Material	CA-SDI-12287	CA-SDI-14176	CA-SDI-14235	Total
Battered Implement		2	2	4
Battered Implement Flake		2		2
Debitage	2	12	5	19
Ground Stone	1	1		2
Mano	2			2
Steep-Edged Unifacial Tool (SEUT/adze)		3	2	5
SEUT Flake		1	1	2
Total	5	21	10	36

Steep-Edged Unifacial Tools (SEUTs/Adzes)

Southern California archaeology has been plagued for years with amorphous lumps of metavolcanic stone that possess steep unifacial edges. These objects have long been recognized by archaeologists as artifacts, and have been placed into numerous morphological and functional categories (i.e., horse-hoof scraper, scraper plane, flake scraper, biscuit scraper, humped-back scraper, various core types, push plane, and cobble chopper). Schroth and Flenniken's (1997a, 1997b) analysis of flaked stone tools from CA-SDI-11424 is, by far, the best effort to sort these artifacts into technological and functional categories. These SEUTs are likely adzes specifically designed for a wide variety of wood working tasks.

SEUTs were manufactured from thick flake blanks (8 cm or more), exhausted nodule cores, and, more frequently, directly from nodules specifically selected for SEUT manufacture. SEUTs are plano-convex in cross-section, have steep sides, are almost circular in plan-view, are heavy, and, most importantly, have a variety of strong, acute cutting edges. Many examples possess use-wear in the form of polish on their edges as well as on their flat or plano surfaces. These tools are ideal for wood working because they are sharp, weighted, and durable.

Brian Hayden's (1979) ethnographic study in Australia, *Palaeolithic Reflections*, describes in detail the manufacture and use of SEUTs. SEUTs were used as adzes in heavy-duty wood working tasks by the native people of Australia. Given that the environments of Australia and southern California are very similar, and that wood was essential for many precontact items, southern California SEUTs were likely used in a similar manner. This functional interpretation is suggested because the tools from California are the same as those from Australia in terms of manufacture, material quality, size, shape, wear-patterns, and overall variation. Additionally, experiments described by Schroth and Flenniken (1997a, 1997b) support the use of SEUTs as adzes.

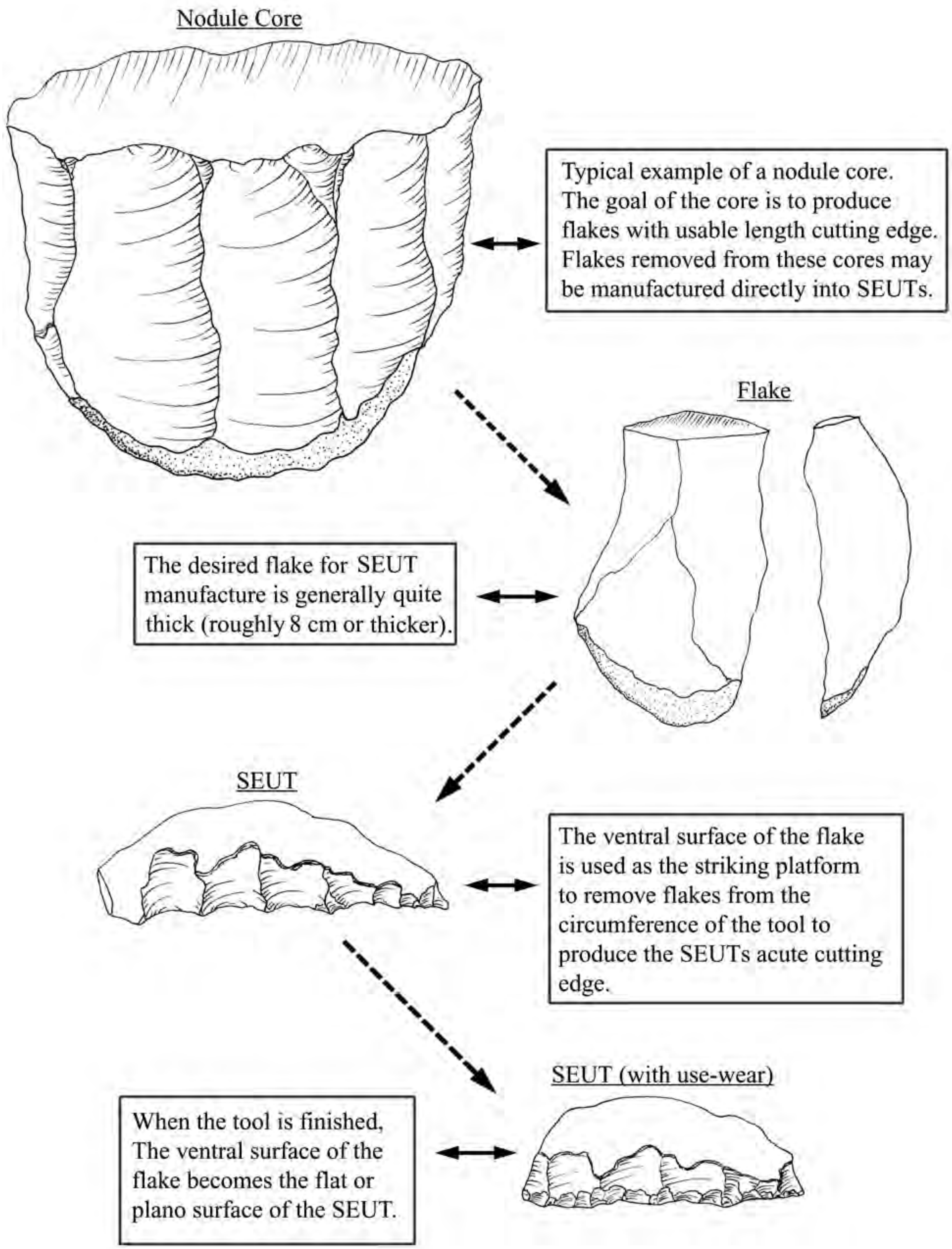
Morphological variation within the SEUT category is, perhaps, the main reason for the numerous scraper and plane categories. However, this variation in size and weight was a technological consideration for the various tasks required of these tools. With basically the same attributes, except size and weight, these tools functioned as adzes where different sizes and weights were essential for the different tasks at hand. In addition to size and weight, the most critical attribute was the acute, sharp cutting edge. When this edge became dull through wood working, the tool was resharpened or rejuvenated by removing flakes from the steep face while employing the plano-surface as a platform. These flakes (URFs) are diagnostic of SEUT rejuvenation.

In previous analyses (Gallegos et al. 2000), these adzes were divided into thick (SEUT) and thin (TEUT) categories. The thin-edged unifacial tool or TEUT category of adze has been determined, through continued analyses of Otay Mesa artifact assemblages from early to middle Holocene sites and through experimental use, to be of minimal archaeological value. Thin-edged unifacial tools were originally defined as the same technologically and functionally as SEUTs, with the exception that all TEUTs were manufactured from flake blanks, and were thinner. It is suggested that the actual cutting edges of both tool classes are virtually identical, and that the steepness of the tool's edge has to do with added weight, not cutting ability. In other words, heavier tools have steeper edges, but the actual cutting edges on both thin and thick adzes have the same cutting ability. Additional analyses also determined that both thick and thin adzes were manufactured from flake blanks and exhausted cores, as well as from nodules. As mentioned above, the thickness of the tool is important because of the weight required for a specific woodworking task, but cutting edge shape has also been identified as an important woodworking attribute.

Recent experimental use of SEUTs suggests that the tool must possess a strong, sharp, and contoured cutting edge. The angle of the actual cutting edge is determined by flake removal. Most SEUTs have adequate cutting edges once the edges have been initially sharpened or rejuvenated by percussion flake removal. Flake production, as intended end products during edge preparation, was not the knapper's goal. Therefore, step and hinge terminations on the "face" (or steep sides) of SEUTs are common. Large flakes were not intentionally removed because the weight of the adze would have been diminished; an unwanted result.

The SEUT manufacturing process at sites CA-SDI-14176 and CA-SDI-14235 may have taken a minimum of four trajectories. The production of SEUTs from flakes may have occurred as a result of two different technologies. First, flakes for SEUT manufacture may have been produced from large flake blanks produced from nodule cores (Figure 6-1). The SEUTs that are manufactured via this trajectory will have remnant right-angle platforms (if present) that are either natural, single-facet, or multi-faceted. SEUTs may also be manufactured from flakes produced from bifacial block core reduction (Figure 6-2). The SEUTs that are manufactured via this trajectory will have remnant platforms (if present) that are bifacial and more acute than those produced from nodule core flake blank production. Once a flake has been selected, the process for manufacturing an SEUT from a nodule core flake and a bifacial block core flake is identical. The ventral surface of the flake is used as the striking platform to remove flakes from the circumference of the tool to produce the SEUT acute cutting edge. When the tool is finished, the ventral surface of the flake becomes the flat or plano surface of the SEUT.

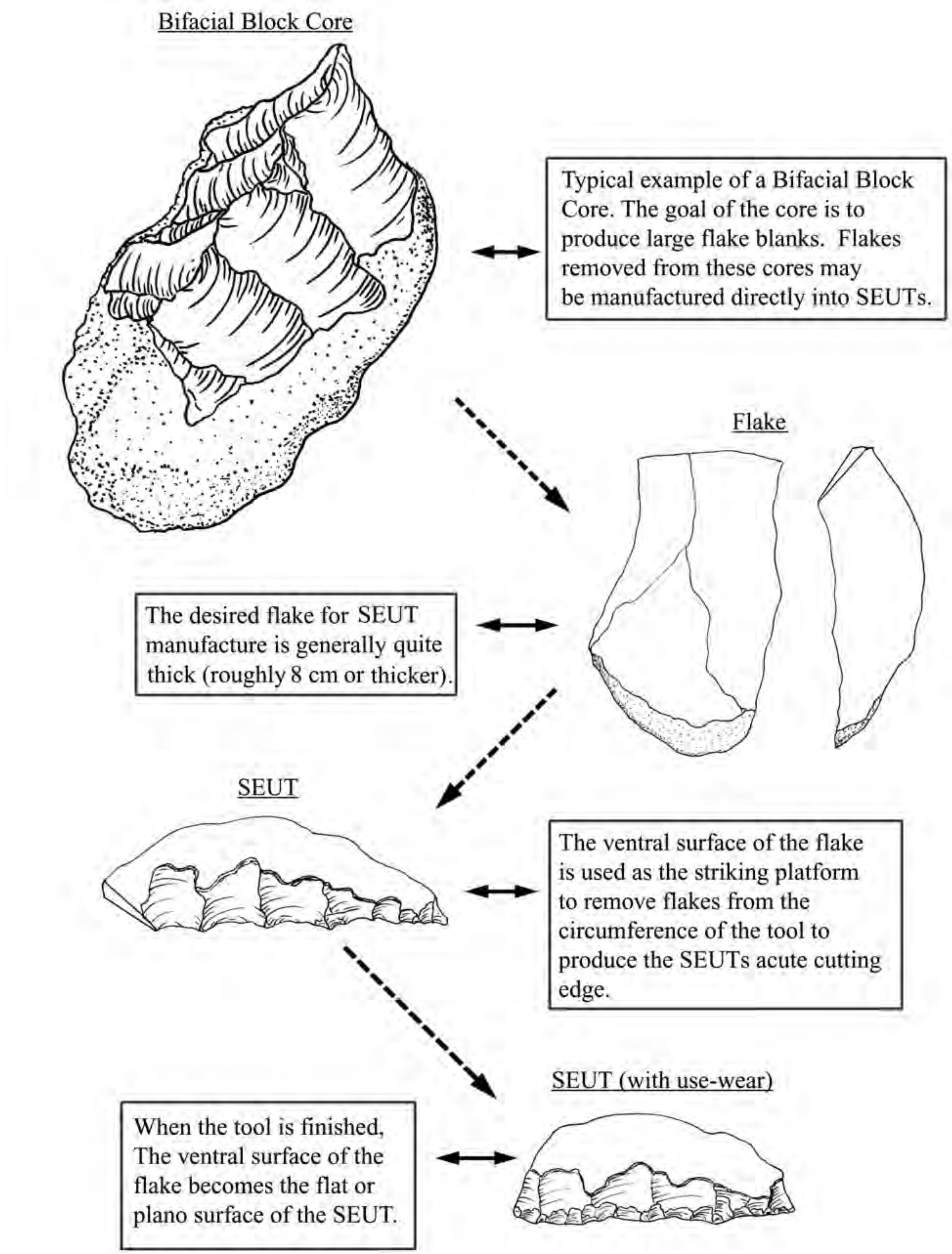
Exhausted nodule cores may also be laterally cycled for use as SEUTs (Figure 6-3). During the process of production of flake blanks the nodule core becomes exhausted. As the size of the core decreases and manufacturing errors occur, the exhausted core is then laterally cycled in the continuum. The core is still usable and is inverted and manufactured into an SEUT (see Figure 6-3). Debitage from this process results in a higher frequency of step and hinge terminal fractures. These negative step/hinge scars on the face of the SEUT giving the appearance of a poorly made flake core. The goal in SEUT production is not to produce usable flake blanks, but to produce an acceptable cutting edge while maintaining tool weight. The former nodule core becomes an SEUT and may often maintain flake scars from its former life as a core.



Gallegos & Associates

SEUT Manufactured from Nodule Core Flake

FIGURE 6-1

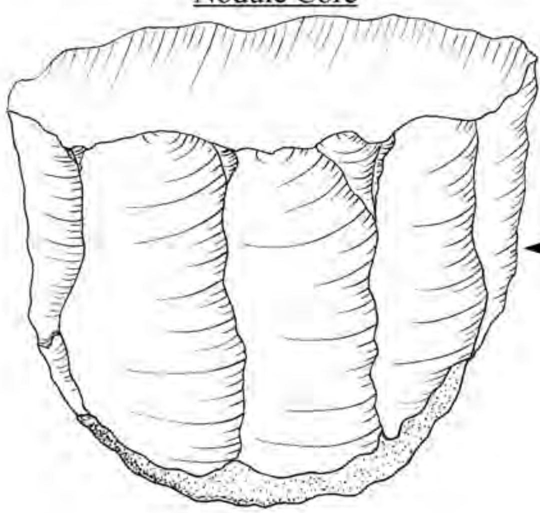


Gallegos & Associates

SEUT Manufactured from Bifacial Block Core Flake

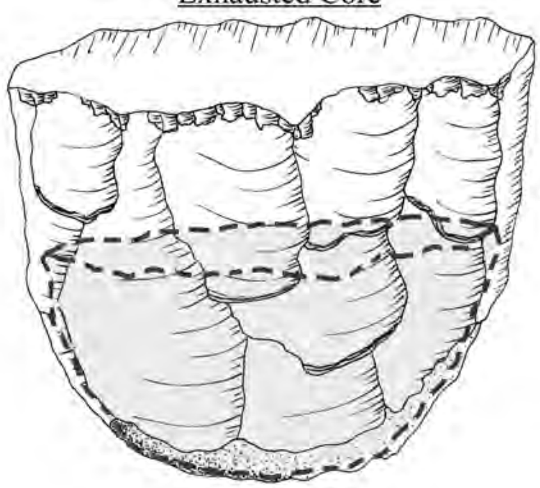
FIGURE 6-2

Nodule Core



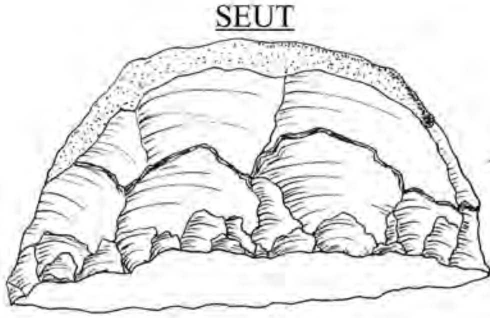
This is a typical example of a nodule core. The goal of the core is to produce flake blanks with a usable cutting edge. Flakes removed from nodule cores will have a higher frequency of "feather" terminations at the distal end.

Exhausted Core



The removal of flake blanks from the core reduces the mass of the core and the exhausted core is then laterally cycled in the system. The core is still usable and is inverted and manufactured into an SEUT. Debitage from this process results in a higher frequency of step and hinge terminal fractures. This leaves negative step/hinge scars on the face of the SEUT giving the appearance of a poorly-made flake core.

SEUT



The goal in SEUT production is not to produce usable flake blanks, but to produce an acceptable cutting edge while maintaining tool weight. The former nodule core becomes an SEUT and may often maintain flake scars from its former life as a core.

Gallegos & Associates

SEUT Manufactured from Exhausted Nodule Core

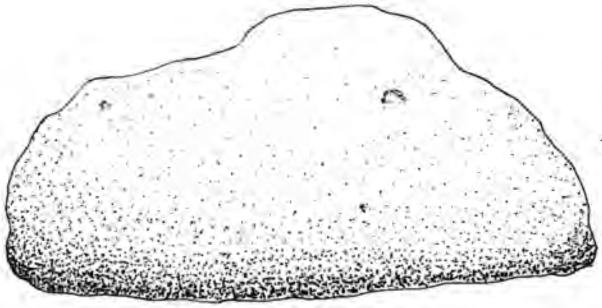
FIGURE 6-3

Finally, SEUTs are often produced from advantageously shaped pieces of raw material that lend themselves to SEUT manufacture (Figure 6-4). Nodules (from cobble- to boulder-sized) were selected for manufacture into SEUTs. The nodules may be split and approached in a similar manner. Nodules with relatively plano-convex forms or those created by splitting the core may be easily manufactured into an SEUT. The flat portion of the nodule is used as a striking platform and a series of flakes are removed from the circumference of the nodule. Debitage produced from the manufacture of SEUTs directly from nodules may result in debitage with a higher frequency of hinge or step fracture terminations. In addition, the debitage will have a higher frequency of dorsal surface cortex and natural platforms.

The actual cutting edge of a SEUT was engineered for specific cutting activities. Edges were intentionally flaked into one of six potential cutting edge classes: Class 1, excurvate/irregular; Class 2, excurvate/regular; Class 3, straight/irregular; Class 4, straight/regular; Class 5, incurvate/irregular; and, Class 6, incurvate/regular (Figure 6-5). Irregular or serrated edges were produced for more coarse cutting to move mass, such as felling trees, while regular edges were created for removing less mass during even cutting, such as hewing a piece of wood. Excurvate edges were probably used on large wood and incurvate edges were employed on wood with a smaller diameter. The incurvate edge kept the cutting edge centered on the work area. Straight edges provided the wood worker with a flat surface. A single SEUT may possess more than one class of cutting edge.

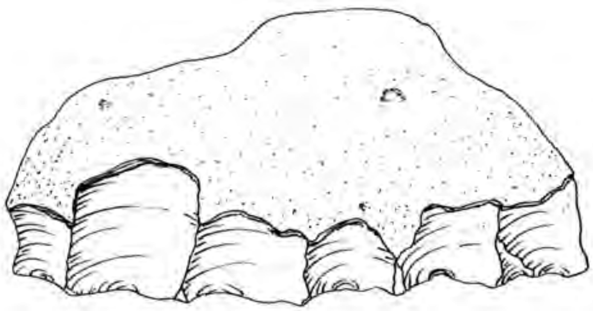
A total of 3 SEUTs were recovered from CA-SDI-14176 and 2 SEUTs from CA-SDI-14235 (see Table 6-1). The interpretations presented in this section suggest that the cultural resource sites within the Otay Ranch project area wherein SEUTs are well represented may have been wood procurement and/or wood working sites.

Nodule



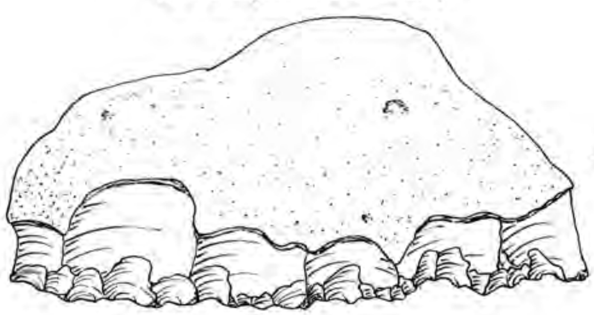
Nodules (from cobble to boulder in size) were selected for manufacture into SEUTs. In addition, nodules may be split and approached in a similar manner.

SEUT



A nodule with a relatively plano -convex form may be easily manufactured into an SEUT. The flat portion of the noudle is used as a striking platform and a series of flakes are removed from the circumference of the nodule. The debitage produced from manufacture of SEUTs directly from nodules may result in debitage with a higher frequency of hinge or step fracture terminations. In addition, the debitage will have a higher frequency of dorsal surface cortex and natural platforms.

SEUT (with use-wear)

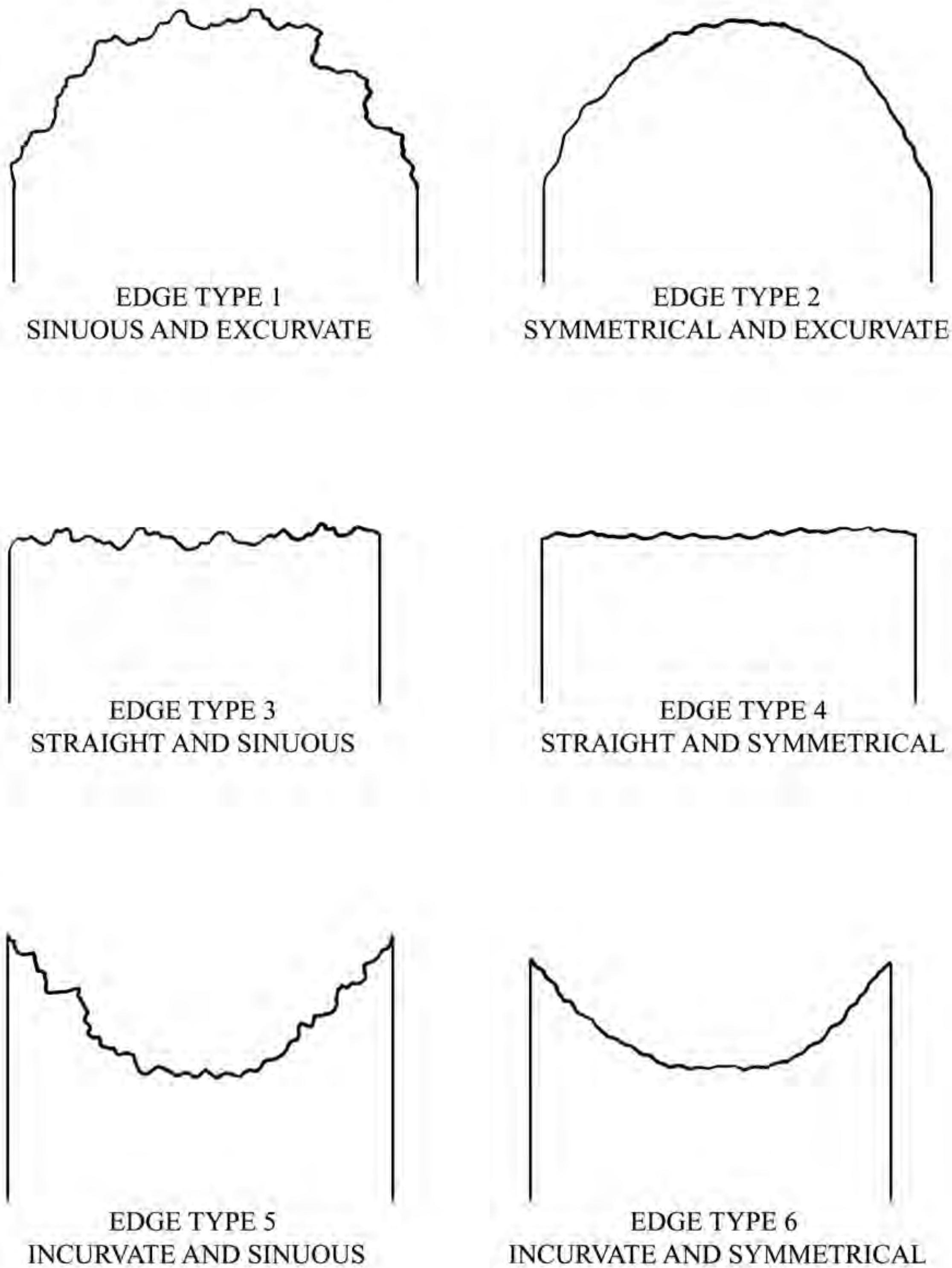


Although the finished SEUT may appear as a poorly manufactured core, this is not the case. The reduction process of SEUT manufacture is not for the production of flake blanks, but the creation of an acute cutting edge and maintenance of tool weight. Often SEUTs display evidence of use-wear in the form of polish on edges and flat or plano-convex surfaces.

Gallegos & Associates

SEUT Manufactured from Cobble- to Boulder-Sized Nodules

FIGURE 6-4



Gallegos & Associates

SEUT Edge Forms

FIGURE 6-5

6.2 SUMMARY

Testing for the Otay Ranch project produced an artifact assemblage from CA-SDI-12287 consisting of 2 debitage, 2 manos, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14176 consists of 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Cultural material recovered from CA-SDI-14235 consists of 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements.

The lithic samples recovered from sites CA-SDI-14176 and CA-SDI-14235 produced a specialized lithic assemblage that suggests the inhabitants visited the sites for two specific reasons: wood working and plant processing. The kinds of tools and debitage recovered represent primarily SEUT/adze use/resharpening for wood working activities. The presence of milling tools, battered implements, and battered implement debitage supports processing of floral and/or faunal material and maintenance of milling implements. The artifact assemblage reflects the use of local lithic materials.

The precontact sites within and/or adjacent to the Otay Ranch Village 8 West project area comprise 3 lithic scatters, 1 artifact scatters, 1 temporary camps, and 1 habitation site. The presence of SEUTs/adzes (wood working tools) offers a relative date of early to middle Holocene, which was a wetter, cooler climate that would have supported trees. Previous work at site CA-SDI-12809 (habitation site) identified primarily Late Period occupation (McGowan 1997).

SECTION 7

SIGNIFICANCE, IMPACTS, AND MITIGATION

7.1 INTRODUCTION

A significance evaluation was conducted for cultural resource sites located within the Otay Ranch project area. Testing was conducted at previously recorded sites CA-SDI-14176 and CA-SDI-14235 to determine site significance under the City of Chula Vista and CEQA guidelines. Site CA-SDI-14236 was not relocated and therefore was not tested. This sparse lithic scatter site may have been mismapped during the initial recording and is identified here as not significant. Site CA-SDI-12287 was previously tested and identified as not significant (Clowery-Moreno and Smith 2008), and additional surface artifacts were collected and analyzed during the current study. Isolates (isolate finds), by their very nature are identified as not significant and are not discussed in this section.

Sites located within the offsite improvement area are discussed in Appendix G. Site CA-SDI-4789 was previously tested and recommended as not significant (Schaefer 1994a). Site CA-SDI-12809 is a major village site with human remains and has been previously tested and has been identified as a significant cultural resource (McDonald et al. 1993 and Caltrans 1994). However, testing in the portion of the site within the offsite improvement area demonstrated that no subsurface deposits are present there (Mcdonald et al. 1993)

7.2 SITE SIGNIFICANCE AND IMPACT SIGNIFICANCE CRITERIA

Determination of what is and what is not an important resource is not a straightforward task. As suggested by Moratto and Kelly (1976), the significance of archaeological resources should be assessed in several terms, including research value to the scientist, aesthetic/cultural value to the community at large, and value to the Native American community. The importance of an archaeological resource must be demonstrated. According to Section 15064.5 of the State CEQA Guidelines, the term "historical resources" shall include the following:

(1) A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4850 et seq.).

(2) A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in an historical resource survey meeting the requirements Section 5024.1(g) of the Public Resources Code shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (Pub. Res. Code §5024.1, Title 14 CCR, Section 4852) including the following:

(A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
(B) Is associated with the lives of persons important in our past;
(C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
(D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified in an historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1.

(b) A project with an effect that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.

(1) Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired.

(2) The significance of an historical resource is materially impaired when a project:

(A) Demolishes or materially alters in an adverse manner those physical characteristics of an historical resource that convey its historical significance and that justify its inclusion in, or eligibility for, inclusion in the California Register of Historical Resources; or
(B) Demolishes or materially alters in an adverse manner those physical characteristics that account for its inclusion in a local register of historical resources pursuant to Section 5020.1(k) of the Public Resources Code or its identification in an historical resources survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, unless the public agency reviewing the effects of the project establishes by a preponderance of evidence that the resource is not historically or culturally significant; or
(C) Demolishes or materially alters in an adverse manner those physical characteristics of a historical resource that convey its historical significance and that justify its eligibility for inclusion in the California Register of Historical Resources as determined by a lead agency for purposes of CEQA.

(3) Generally, a project that follows the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (1995), Weeks and Grimmer, shall be considered as mitigated to a level of less than a significant impact on the historical resource.

(4) A lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource. The lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures.

(5) When a project will affect state-owned historical resources, as described in Public Resources Code Section 5024, and the lead agency is a state agency,

> the lead agency shall consult with the State Historic Preservation Officer as provided in Public Resources Code Section 5024.5. Consultation should be coordinated in a timely fashion with the preparation of environmental documents.

Appendix G of the State CEQA Guidelines consists of an Environmental Checklist Form to be used by a Lead Agency in evaluating whether a project may have a potentially significant effect on the environment. The criteria to be considered with respect to cultural resources are the following:

a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

d) Would the project disturb any human remains, including those interred outside of formal cemeteries?

Recognizing that cultural resources often contain information that archival research cannot answer, there exists the potential for each resource to provide important information relevant to several theoretical and regional research questions. As part of the test program, research questions concerning chronology, subsistence and paleoenvironmental reconstruction, settlement patterns, trade and travel, and lithic technology were addressed. Given the nature of the project, the research questions were addressed on the level of the cultural material recovered. Testing provided the necessary information to determine site size, depth, content, integrity, and potential to address important research questions.

7.3 SITE SUMMARIES

The test program for sites CA-SDI-14176 and CA-SDI-14235 included collection of surface artifacts, excavation of STPs, and analysis of materials recovered. Testing was not conducted at CA-SDI-14236 because this sparse lithic scatter was not relocated during the current survey. Site CA-SDI-12287 was previously tested (Clowery-Moreno and Smith 2008), and additional artifacts were collected from the site surface during the current survey. Sites CA-SDI-4789 and CA-SDI-12809 in the offsite improvement area were both previously tested, and the results are summarized in Appendix G.

- **CA-SDI-4789**

This site was previously tested and identified as not significant

- **CA-SDI-12287**

Cultural material recovered from CA-SDI-12287 includes 2 debitage, 2 manos, and 1 unidentified ground stone fragment. Site activities included plant processing.

- **CA-SDI-12809**

This major habitation site was previously tested and identified as significant and eligible for the National Register of Historic Places and is listed on the California Register of Historical Resources. As a result of testing by Mooney and Associates for SR 125 (McDonald 1993), areas of artifact concentration were identified within the larger site boundary. Those significant portions of CA-SDI-12809 are outside the offsite improvement area.

- **CA-SDI-14176**

Cultural material recovered from CA-SDI-14176 includes 3 SEUTs, 1 SEUT flake, 12 debitage, 2 battered implements, 2 battered implement flakes, and 1 unidentified ground stone fragment. Site activities included wood working and plant processing.

- **CA-SDI-14235**

Cultural material recovered from CA-SDI-14235 includes 2 SEUTs, 1 SEUT flake, 5 debitage, and 2 battered implements. Site activities included wood working and plant processing.

- **CA-SDI-14236**

This site was not relocated and as such is identified as not significant.

7.4 RESEARCH VALUE

7.4.1 Site Integrity

Current archaeological methods allow a great deal of information to be extracted from cultural resources, providing certain criteria are met. Generally speaking, cultural resource sites that are useful for addressing important research questions must retain a minimum amount of stratigraphic integrity and/or an assemblage that can be confidently assigned to a cultural group. If these criteria are not in place, cultural materials recovered within the course of an excavation cannot be differentiated by time period or by culture. This greatly diminishes the value of the resource as a record of the human story.

Site integrity is low for all of the sites, except for the significant portion of CA-SDI-12809 (outside the project APE), given past ranching and farming activities.

7.4.2 Research Potential

The test program conducted by Gallegos & Associates identified CA-SDI-14235 as an artifact scatter, and CA-SDI-14176 as a temporary camp. As both sites contain primarily surface artifacts that have been collected, have a low subsurface artifact count, and have been previously disturbed by ranching and agricultural activity, the cultural resources have poor research potential.

Site CA-SDI-4789 in the offsite improvement area was previously tested (Appendix G). The site is located in a plowed agricultural field and few artifacts were recovered subsurface. The researchers concluded that the testing and analysis program had exhausted the site's research potential (Schaefer 1994a).

The extensive testing program conducted at site CA-SDI-12809 identified areas of artifacts concentration within the larger site boundary, identified the site as eligible for the NRHP, and listed this site on the CRHR (McDonald et al. 1993 and Caltrans 1994). Testing for that portion of CA-SDI-12809 within the offsite improvement area revealed an absence of subsurface deposits (McDonald et al. 1993 and Caltrans 1994). Therefore, the portion of site CA-SDI-12809 within the offiste improvement area lacks significant research potential

7.5 Significance and Eligibility Discussion

Precontact Sites

Sites CA-SDI-12287, CA-SDI-14176, and CA-SDI-14235 have poor site integrity and a low amount of artifacts to address important research questions. CA-SDI-14236 is a sparse lithic scatter that was not relocated during the current study and therefore is identified here as not significant. Given the results of the test program, additional work at these sites would not significantly contribute to the understanding of the sites or past use of the site locations or the site occupants. Given the poor site integrity, low subsurface artifact counts, absence of ecofactual materials, and site disturbance, sites CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236 are identified as not significant under City of Chula Vista and CEQA criteria, and are recommended ineligible for listing on the CRHR.

In the offsite improvement area, CA-SDI-4789 has been previously tested, with a recommendation that the testing had exhausted the site's research potential. The site is identified as not significant and ineligible for listing on the CRHR. Site CA-SDI-1280, was previously tested, has been determined eligible for listing in the NRHP, and is listed on the CRHR (McDonald et al. 1993 and Caltrans 1994) (see Appendix G). However, that portion of CA-SDI-12809 within the offsite improvement area was identified as not significant (McDonald et al. 1993 and Caltrans 1994).

7.6 IMPACTS AND MITIGATION MEASURES

As presently planned, sites CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, and CA-SDI-14236 will be directly impacted by the proposed development. In the offsite improvement area, CA-SDI-4789 and that portion of CA-SDI-12809 identified as not significant will be directly impacted (Table 7-1 and Figure 7-1).

Isolates P-37-014531, P-37-014532, P-37-014533, P-37-015008, P-37-015145, OR-I-3, OR-I-4, OR-I-5, OR-I-6, and OR-I-7 are identified as not significant and no further work is recommended. As a result of the current study, sites CA-SDI-14176 and CA-SDI-14235 are identified as not significant (see Table 7-1 and Figure 7-1). Previous testing of CA-SDI-12287 identified the site as not significant (Clowery-Moreno and Smith 2008). Because CA-SDI-14236 (lithic scatter) was not relocated, this site may have been destroyed have likely been destroyed or was mapped incorrectly and is also identified as not significant (see Table 7-1 and Figure 7-1). In the offsite improvement area, CA-SDI-4789 is identified as not significant on the basis of previous testing (Schaefer et al. 1994a). Site CA-SDI-12809 has been previously tested and identified as a significant resource (Caltrans 1994; McDonald et al. 1993). However, an extensive subsurface testing program within and beyond the off-site improvement area APE did not identify significant deposits within 0.2 miles of the APE. Potentially significant impacts could result within the significant portion of CA-SDI-12809 if construction activities inadvertently extended beyond the APE.

No further work is recommended for CA-SDI-12287, CA-SDI-14176, CA-SDI-14235, CA-SDI-14236, CA-SDI-4789, and that portion of CA-SDI-12809 within the offsite improvement area/APE. However, the proposed project could result in significant

Table 7-1

Potential Impacts and Mitigation Recommendations

Site Type	Evaluation of Resource	Impacts	Mitigation Recommendations/Comments
Temporary Camp	Not Significant	Yes	In offsite improvement area; No further work; Monitor during construction
Artifact Scatter	Not Significant	Yes	No further work; Monitor during construction
Habitation Site	Significant	No	In offsite improvement area; Site area within APE identified as not significant; Avoidance by fencing construction zone; Monitor during construction
Temporary Camp	Not Significant	Yes	No further work; Monitor during construction
Lithic Scatter	Not Significant	Yes	No further work; Monitor during construction
Lithic Scatter	Not Relocated	Yes	No further work; Monitor during construction

FIGURE 7-1

CULTURAL RESOURCE SITES IN RELATIONSHIP TO SITE PLAN AND OFFSITE IMPROVEMENT AREA FOR OTAY RANCH VILLAGE 8 WEST

(See Confidential Appendix)

impacts to archaeological resources, which may be buried and/or present on the surface but could not be identified during the field survey due to vegetation cover.

It is recommended that the following standard mitigation measures from the Program EIR for the Otay General Development Plan also be implemented for Otay Ranch Village 8 West project:

"Prior to issuance of land development permits, including clearing or grubbing and grading permits, the applicant shall provide written confirmation and incorporate into grading plans, to the satisfaction of the Deputy City Manager /Development Services Director (or their designee), that a principal investigator (PI) as listed by the Secretary of the Interior (36 CFR 61) has been retained in an oversight capacity to ensure that an archaeological monitor(s) will be present during all cutting of previously undisturbed soil. If these cutting activities occur in more than one location, multiple monitors shall be provided to monitor these areas, as determined necessary by the PI.

"During the initial grading of previously undisturbed soils within Village Eight West SPA Plan area and associated off-site facilities, prehistoric and historic resources may be encountered. In the event that the monitor identifies a potentially significant site, the archaeological monitor shall secure the discovery site from further impacts by delineating the site with staking and flagging, and by diverting grading equipment away from the archaeological site. Following notification to the City, the archaeological monitor shall conduct investigations as necessary to determine if the discovery is significant under the criteria listed in CEQA and the environmental guidelines of the City. If the discovery is determined to be not significant, grading operations may resume and the archaeological monitor shall summarize the findings in a letter report to the City following the completion of mass grading activities. The letter report shall describe the results of the on-site archaeological monitoring, each archaeological site observed, the scope of testing conducted, results of laboratory analysis (if applicable), and conclusions. The letter report shall be completed to the satisfaction of the Deputy City Manager /Development Services

Director (or their designee) prior to release of grading bonds. Any artifacts recovered during the evaluation shall be curated at a curation facility approved by the City.

“For those prehistoric/historic resources that are determined to be significant, alternate means of achieving mitigation shall be pursued. In general, these forms of mitigation include: 1) site avoidance by preservation of the site in a natural state in open space or in open space easements, 2) site avoidance by preservation through capping the site and placing landscaping on top of the fill, 3) data recovery through implementation of an excavation and analysis program, or 4) a combination of one or more of the above measures. Procedures for implementing the alternative forms of mitigation described herein are further detailed in the Mitigation Monitoring and Reporting Program adopted as part of the Otay Ranch General Development Program EIR, EIR 90-01.

“For those sites that are found to be significant resources and for which avoidance and reservation is not feasible or appropriate, the Applicant shall prepare a Data Recovery Plan. The plan will, at a minimum, include the following: 1) a statement of why data recovery is appropriate as a mitigating measure, 2) a research plan that explicitly provides the research questions that can reasonably be expected to be addressed by excavation and analysis of the site, 3) a statement of the types and kinds of data that can reasonably be expected to exist at the site and how these data will be used to answer important research questions, 4) a step-by-step discussion of field and laboratory methods to be employed, and 5) provisions for curation and storage of the artifacts, notes, and photographs will be stated. In cases involving historic resources; however, archival research and historical documentation shall be used to augment field-testing programs.

“Grading operations within the affected area may resume once the site has been fully evaluated and mitigated to the satisfaction of the Deputy City Manager / Development Services Director (or their designee). All significant artifacts collected during the implementation of the Data Recovery Plan shall be curated at a facility approved by the City.

“Following the completion of mass grading operations, the Applicant shall prepare a plan that addresses the temporary onsite presentation and interpretation of the results of the archaeological studies for the proposed project. This could be accomplished through exhibition within a future community center, civic building and/or multi-purpose building. This exhibition will only be for temporary curation display of those materials being actively used for interpretation and display, and that permanent curation of artifacts and data will be at a regional repository that meets the standards of the State Historical Resource Commission’s *Guidelines for the Curation of Archaeological Collections*, dated May 7, 1993, when one is established. All significant artifacts collected during the implementation of the Data Recovery Plan shall be permanently curated at a facility approved by the City.

“If human remains are discovered during grading or site preparation activities within Otay Ranch Village 8 West, the archaeological monitor shall secure the discovery site from any further disturbance. State Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the San Diego County Coroner has made the necessary findings as to the origin and disposition of the remains pursuant to PRC Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person(s) thought to be the Most Likely Descendent (MLD) of the deceased Native American. The MLD will assist the City in determining what course of action shall be taken to deal with the remains. Grading operations within the affected area may resume once the site has been fully evaluated and mitigated to the satisfaction of the Deputy City Manager /Development Services Director (or their designee). The Archaeological Monitor shall summarize the findings in a letter report to the City following the completion of mass grading activities.”

In addition to the standard mitigation measures from the Program EIR for the Otay General Development Plan listed above, the following project specific mitigation measure is recommended:

Prior to the issuance of any land development permits for the Village Eight West SPA Plan area and associated off-site facilities, including clearing, grubbing, and grading, the applicant shall install protective fencing (i.e., orange snow fence or similar) along the Area of Potential Effect (APE) in the area of CA-SDI-12809 as directed by a qualified archaeologist. A qualified archaeologist shall monitor the site throughout the construction of the off-site facilities (including clearing, grubbing, grading, and installation) to ensure that unanticipated finds are handled in an appropriate and professional manner and that required fencing remains intact and project related construction activities do not extend beyond the approved limits of work.

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1964 Cultural Change and Continuity on the San Diego Coast. Ph.D. dissertation, Department of Anthropology, University of California, Los Angeles.

1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity*, Vol. 32, No. 2, pp. 168-185.

1968 Cultural Tradition and Ecological Adaptation on the Southern Coast. In *Archaic Prehistory in the Western United States*, edited by C. I. Williams. *Eastern New Mexico University Contributions in Anthropology* 1(3):1-14.

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WESTEC

1979 Proponent's Environmental Assessment Miguel to Tijuana Interconnection Project 230 kV Transmission Line. On file, South Coastal Information Center, San Diego State University, California.

1982 California State Prison at San Diego Final Environmental Impact Report State Clearinghouse Number 61010704. On file, South Coastal Information Center, San Diego State University, California.

1987 East Mesa County Detention Facility Draft Environmental Impact Report. On file, South Coastal Information Center, San Diego State University, California.

1988 East Mesa Detention Facility Supplemental Draft Environmental Impact Report. On file, South Coastal Information Center, San Diego State University, California.

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Wolcott, Marjorie T.
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Woodward, Arthur
1934 Notes on the Indians of San Diego County from the Manuscripts of Judge Benjamin Hayes. *The Masterkey* 8(5):140-150. Southwest Museum, Los Angeles, California.

APPENDIX A

RESUMES OF KEY PERSONNEL

Dennis R. Gallegos
Principal

Gallegos & Associates

GENERAL EXPERIENCE AND QUALIFICATIONS

Mr. Gallegos has served as Project Manager/Principal Investigator for cultural resource studies within southern California for federal, state and local compliance. These projects include constraint level evaluations, surveys, CEQA testing programs, evaluations for National Register status, Section 106 compliance, and data recovery programs. Mr. Gallegos is knowledgeable of federal legal requirements, as well as City, County and CEQA requirements, having worked on over 500 projects within the past 30 years. These projects include: surveys and test programs for MWD Pipelines 4, 5, and 6; Oceanside-Escondido Rail Line; SR 905 and the widening of Otay Mesa Road; Camp Pendleton Santa Margarita River Valley Inventory (5,000 acres); NAS Miramar inventory (sample inventory of 20,000 acres); Naval Radio Receiving Facility inventory; Cleveland National Forest report preparation; and, testing of 9,000 to 1,000 year-old sites within San Diego County, as well as historic projects, such as data recovery programs for the Aguirre Adobe and the McCool/Lohman Homestead projects.

Mr. Gallegos' experience in major cultural resource overviews includes: the Otay Mesa Management Plan for 30,000 acres on the U.S./Mexico border, BLM Kuchamaa Inventory (30,000 acres SE San Diego County); San Dieguito River Valley Park overview of 80,000 acres; and, overviews for the cities of Escondido, San Marcos, Encinitas, and for the San Diego, Otay, and San Luis Rey River valleys. Additional projects managed by Mr. Gallegos include: an inventory for Anza-Borrego Desert State Park; Oceanside-Escondido Bike Trail and Rail Line; Viejas Village inventory and test; survey and testing for Carlsbad Ranch; constraint level study for Carrillo Ranch Specific Plan; Batiquitos Lagoon Enhancement Project; and, inventories for Subarea III (3,000 acres), Subarea IV (1,500 acres), and Subarea V (2,000 acres) for the City of San Diego. Data Recovery programs include: Windsong Shores, PacBell, Twin Oaks Valley Ranch, Batiquitos Ridge, Rogers Ridge, Torrey Ranch, Calpine Otay Mesa Generating Plant Sites, Kuebler Ranch, and Legoland.

EMPLOYMENT

Principal, Gallegos & Associates, 1990 to Present
Ogden/ERC Environmental and Energy Services Company, 1978 to 1990
Archaeological Consultant, 1977 to 1978
Bureau of Land Management, 1975 to 1977
State of California, 1970 - 1975

EDUCATION & REGISTRATIONS

B.A, Anthropology, California State University, Northridge, 1974
B.S., Business, California State University, Northridge, 1973

AFFILIATIONS

San Diego Archaeological Center, Board Member 2001 to 2007
San Diego County Archaeological Society, Vice President 2004
San Diego Presidio Peer Review and Oversight Committee, 2000-2002
Carlsbad Historic Preservation Commission, 1989-1993
Society for American Archaeology
Society for California Archaeology

PUBLICATIONS

Southern California in Transition: Late Holocene Occupation of Southern San Diego County, California. In: *Catalysts to Complexity: Late Holocene Societies of the California Coast, edited by Erlandson and Jones*, Institute of Archaeology, University of California, Los Angeles, 2003.

Management Plan for Otay Mesa Prehistoric Resources, San Diego, California. Authors: D. Gallegos, A. Schroth, and C. Kyle. Coyote Press, Salinas, California, Agency Reports, 1998.

Five Thousand Years of Maritime Subsistence at Ballast Point Prehistoric Site SDi-48 (W-164), San Diego, California. (with Carolyn Kyle). Coyote Press, Salinas, California, No. 40, 1998.

Environmental Change and Coastal Adaptations in San Diego County (with Patricia Masters, Ph.D.). In: *Archaeology of the California Coast During the Middle Holocene*, University of California, Los Angeles, California, Vol. 4, 1997.

A Review and Synthesis of the Archaeological Record for the Lower San Diego River Valley. Society for California Archaeology, San Diego, California, Volume 8, 1995.

Patterns and Implications of Coastal Settlement in San Diego County: 9000 to 1300 Years Ago. In: *Essays on the Prehistory of Maritime California*. Center for Archaeological Research at Davis, No. 10, 1992.

Antiquity and Adaptation at Agua Hedionda, Carlsbad, California. In: *Hunter-Gatherers of Early Holocene Coastal California*, Institute of Archaeology, University of California, Los Angeles, 1991.

A Review and Synthesis of Environmental and Cultural Material for the Batiquitos Lagoon Region. In: *San Dieguito - La Jolla, Chronology and Controversy*, San Diego County Archaeological Society, Research Paper, Number 1, 1987.

Relocation of the Ballast Point Tryworks Oven Foundation (with Adella Schroth). In *Fort Guijarros Quarterly*, 3:2,1989.

Early Man and a Cultural Chronology for Batiquitos Lagoon. In: *Casual Papers*, Cultural Resource Management Center, Department of Anthropology, San Diego State University, 1986.

Batiquitos Lagoon Revisited. In: *Casual Papers*, Cultural Resource Management Center, Department of Anthropology, San Diego State University, 1985.

Class II Cultural Resource Inventory, East Mesa and West Mesa Region, Imperial Valley, California, (with others). USDI, BLM, 1980.

Cultural Resource Inventory of the Central Mojave and Colorado Desert Regions, (with others). USDI, BLM, Cultural Resources Publications, Archaeology, 1980.

AWARDS

Excellence in Archaeology Award for the Management Plan for Otay Mesa Cultural Resources, (Education), San Diego Archaeological Center (SDAC), 2007

Excellence in Archaeology Awards (Honorable Mention) for Torrey Ranch Site Data Recovery and Monitoring Program (Scientific Research); and for the Naval Training Center (Cultural Heritage), San Diego Archaeological Center, 2007

Award of Excellence for Historic Preservation, City of San Diego Historical Resources Board, 2004

Certificate of Merit, Association of Environmental Planners, 2002

Outstanding Achievement in the Field of Historic Preservation, Leo Carrillo Ranch Master Plan, California Preservation Foundation, 1998

Special Achievement Award, Bureau of Land Management, California Desert Planning Staff, 1977

Monica Guerrero
Project Archaeologist

Gallegos & Associates

GENERAL EXPERIENCE AND QUALIFICATIONS

Ms. Monica Guerrero's experience in the field of Archaeology includes literature reviews, record searches, project management, direction of field crews for survey and testing programs, ceramic analysis, design of surface collection maps, graphics, GPS/GIS mapping, and contributing author for various San Diego County reports. Her recent projects include the survey report for the SDG&E Firestorm project, the test/evaluation report for the Lilac Ranch project, Merriam Mountains project and the NCTD Oceanside-Escondido Rail project; inventory, testing, data recovery, and monitoring programs for the Calpine Otay Mesa Generating Plant project; Carlsbad Water and Sewer Master Plan Inventory, BLM Kuchamaa Overview study; and, Otay Mesa Trunk Sewer Inventory. Her laboratory experience includes artifact identification, sorting, cataloging of artifacts, and ceramic analyses. As a teaching assistant at San Diego State University, her duties included instruction of field techniques, laboratory analysis, and lower division cultural and physical anthropology courses. She has also served as a collections manager developing skills that included revitalization of artifact collections, identification and re-cataloging of artifacts, entering data into a Collections Management database, and providing public-based educational programs to local elementary school students. She has assisted with an archaeological field class in Mocollope, Peru, where she provided student field instruction and supervision of field excavation and laboratory analysis. Her work at the Central Coast Information Center included documentation of all maps, site forms, and reports, and data entry for both archaeological and historical resources.

PROJECT RESUME AND SPECIFIC EXPERIENCE

Contributing Author

- 2008 Cultural Resource Survey for the Firestorm 2007 SDG&E Regional Permit 63 Emergency Activities Project, County of San Diego, California. Prepared for U. S. Army Corps of Engineers.
- 2008 Cultural Resource Survey for the VCMWD South Village Water Reclamation Project, Valley Center, California. Prepared for the Valley Center Municipal Water District.
- 2007 Cultural Resource Survey and Boundary Test Report for the Lilac Ranch Project, San Diego County, California. Prepared for Sage Community Group, Inc.
- 2007 Cultural Resource Report for the Merriam Mountains Project, County of San Diego, California. Prepared for Dudek & Associates.
- 2004 Cultural Resource Survey for the Carlsbad Desalination Plant Project, Carlsbad, California. Prepared for Dudek & Associates.
- 2003 City of Carlsbad Water and Sewer Master Plans – Cultural Resources Background Study, City of Carlsbad. Prepared for Dudek & Associates.
- 2003 Cultural Resource Inventory for the Otay Mesa Trunk Sewer Project, San Diego, California. Prepared for PBS&J.
- 2002 Otay/Kuchamaa Cultural Resource Background Study, San Diego County, California. Prepared as Part of the Otay/Kuchamaa Resource Management Plan. Prepared for USDI Bureau of Land Management.
- 2001 Cultural Resource Test Report for the Oceanside-Escondido Rail Project, Oceanside, California. Prepared for Dudek & Associates.
- 2001 Data Recovery Program for Pacbell Site CA-SDI-5633, San Marcos, California. Prepared for Joseph Wong Design Associates.

EMPLOYMENT

- Gallegos & Associates, 2000 to Present
- San Diego State University, San Diego, CA, 1998-2001
- University of California, Los Angeles, 1999
- University of California, Santa Barbara 1994-1996

EDUCATION & AFFILIATIONS

- 2001 M.A. Anthropology, San Diego State University
- 2001 Register of Professional Archaeologists
- 1996 B.A. Anthropology, University of California, Santa Barbara

- Society for California Archaeology
- Society for American Archaeology

PUBLICATIONS & PRESENTATIONS

- 2003 New Perspectives on San Diego County Ceramics. Presented to the Annual Southern Data-Sharing Meeting Society, for California Archaeology, San Diego, California.
- 2001 *Hual-Cu-Cuish: A Late Prehistoric Kumeyaay Village Site in the Cuyamaca Rancho State Park, San Diego County, California*. Master's Thesis on file at San Diego State University, San Diego, California.
- 2001 *Archaeological Investigations at CA-SDI-945, San Diego County, California*. In: Society for California Archaeology, Volume 14, 2001.
- 2000 Preliminary Archaeological Investigations at Hual-Cu-Cuish (CA-SDI-945), San Diego County, California. Presented at the Thirty-Fourth Annual Meeting, Society for California Archaeology, Riverside, California.

Anna C. Noah, Ph.D.
Archaeologist

GENERAL EXPERIENCE AND QUALIFICATIONS

Dr. Noah's thirty years experience as an archaeologist in southern California includes field studies in coastal, mountain, and desert regions of southern California and on both the northern and southern California Channel Islands. She has conducted over one hundred archaeological studies for federal, state, and local compliance. These projects include alignment surveys for State Highway 52 from Tierra Santa to Santee, survey and mapping of sites at Drinkwater Lake, Fort Irwin, and prehistoric site excavations at Palomar Airport, Jacumba Airport, San Elijo Lagoon County Park, and Jacumba Park, and in numerous road and public utility corridors. In addition to extensive involvement in prehistoric archaeology, Dr. Noah served as principal investigator for historic period excavations at the mid-nineteenth century Guajome Ranch House, and has performed National Register evaluations of numerous historic buildings and structures. Dr. Noah's work for the County of San Diego resulted in the State Office of Historic Preservation agreement to enter into the first Memorandum of Understanding with a local agency to delegate State responsibilities for HUD-related historic site evaluation to a local authority. As coordinator of a 5 to 14-member environmental unit, Dr. Noah served as project manager for the County of San Diego's largest and most complex archaeological and environmental studies. In addition to Dr. Noah's extensive work in California, she has also performed field studies and conducted zooarchaeological studies at sites in Arizona, Mexico's Baja California Sur, Peru, British Columbia, and Iceland.

EMPLOYMENT

Principal, Noah Archaeological Consulting, 2008 to present
Project Archaeologist, Gallegos & Associates, 2005 to 2008
Teaching Associate, UCLA Department of Anthropology, 1999-2002
Project Archaeologist, Archaeological Research Unit, UC Riverside, 1997
Environmental Management Coordinator/Archaeologist, County of San Diego Department of Public Works, 1988-1997
County Archaeologist, County of San Diego Department of Public Works, 1981-1988
Environmental Management Specialist/Archaeologist, County of San Diego Planning Department
Zooarchaeological Consultant 1992-present
Archaeological Consultant 1978-present

EDUCATION AND REGISTRATIONS

Ph.D., Anthropology, UCLA, 2005
M.A., Anthropology, San Diego State University, 1987
B.A., Anthropology, San Diego State University, 1979
Register of Professional Archaeologists (RPA)

AFFILIATIONS

UCLA Cotsen Institute of Archaeology Research Associate, 2005 to 2010
San Diego County Archaeological Society, President Elect/President, 1996-1998
State of California Preservation Task Force, Archaeology Subcommittee, Governor-appointed member, 1995
International Council for Archaeozoology
Society for American Archaeology
Society for California Archaeology

PUBLICATIONS AND PRESENTATIONS

A Cross-Cultural Study of Subsistence Practices and Food Choice Among Indigenous Communities Following European Contact (with A. Graesch and J. Bernard). In *Across a Great Divide, Continuity and Change in Native North American Societies, 1400-1900*, edited by L. Scheiber and M. Wagner, University of Arizona Press, Tucson, 2010.

Dogs, Humans, and Island Ecosystems: The Distribution, Antiquity, and Impacts of Domestic Dogs (*Canis familiaris*) on California's Channel Islands (with T. Rick, P. Walker, L. Willis, J. Erlandson, R. Vellanoweth, T. Braje, and D. Kennett). *The Holocene* 18(7):1-11, 2008.

PUBLICATIONS AND PRESENTATIONS con't.

Status and Fish Consumption: Inter-Household Variability in a Simple Chiefdom Society on the California Coast. *Presencia de la Arqueoichtiología en México*, edited by Ana Fabiola Guzmán, Óscar J. Polaco, and Felisa J. Aguilar. Libro de Memorias de la 12ª Reunión del Grupo de Trabajo en Restos de Peces del Consejo Internacional para la Arqueozoología, Guadalajara, Jalisco, México, September 4-12, 2003. Instituto Nacional de Antropología e Historia and Museo de Paleontología de Guadalajara "Federico A. Solórzano Barreto", 2003.

Common and Prestige Foods in an Elite Household: An Island Chumash Case (and J. E. Arnold). Paper presented at the annual meeting of the Society for American Archaeology, New Orleans, 2001.

Early Holocene Coastal-Inland Connections in San Diego County: Evidence from the Windsong Shores Site Faunal Collection. Paper presented at the 35th Annual Meeting of the Society for California Archaeology, Riverside, 2001.

Prehistoric Fishing on the San Diego Coast. *Pacific Coast Archaeological Quarterly* 34(2):1-31, 1998.

Using Sample Survey Results to Address Regional Research Designs: An Example from Joshua Tree National Park. *Proceedings of the Society for California Archaeology* 10:60-67. Society for California Archaeology, San Diego, 1997.

Brass, Glass, Stone, and Bone: Items of Adornment from Riverside Chinatown. In *Wong Ho Leun, An American Chinatown*, Volume 2, edited by the Great Basin Foundation, pp. 395-414. Great Basin Foundation, San Diego, 1987.

AWARDS

Amerind Foundation Grant Recipient for Participation in Organized Symposium *Across the Great Divide, Continuity and Change in Native North American Societies, AD 1400-1900*, Society for American Archaeology Annual Meetings, Austin, April 25-29, 2007.
Chancellor's Dissertation Year Fellowship, UCLA, 2004-2005
National Science Foundation Dissertation Improvement Grant, 2002-2003
Ivor Noel Hume Fellowship for Historical Archaeology, UCLA Cotsen Institute of Archaeology, 2002

APPENDIX B

RECORD SEARCH RESULTS

SDSU
San Diego State University

South Coastal Information Center
College of Arts and Letters
4283 El Cajon Blvd., Suite 250
San Diego CA 92105
TEL: 619-594-5682

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM
SITE FILES RECORD SEARCH

Company:	Gallegos & Associates
Company Representative:	Nick Doose
Date of Request:	6/5/2008
Date Processed:	6/11/2008
Project Identification:	Otay Ranch, Project # 06-08
Search Radius:	within designated boundaries

Historical Resources: DSL **Date:** 6/11/2008

Trinomial (CA-SDI) and Primary (P-37) 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 Archaeological Project Boundaries: DSL **Date:** 6/11/2008

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 Maps: DSL **Date:** 6/11/2008

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

Historic Addresses: DSL **Date:** 6/11/2008

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

HOURS: 3 **COPIES:** 1718 **RUSH:** No

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

APPENDIX C

TECHNOLOGICAL CATEGORY ABBREVIATIONS

NODULE CORE TECHNOLOGICAL CATEGORY ABBREVIATIONS

NATURAL PLATFORM

NP-1: Flake with natural cortical platform and 100% dorsal surface cortex
NP-2: Flake with natural cortical platform and left and right lateral and distal dorsal surface cortex
NP-3: Flake with natural cortical platform and left and right lateral dorsal surface cortex
NP-4: Flake with natural cortical platform and left lateral and distal dorsal surface cortex
NP-5: Flake with natural cortical platform and right lateral and distal dorsal surface cortex
NP-6: Flake with natural cortical platform and left lateral dorsal surface cortex
NP-7: Flake with natural cortical platform and right lateral dorsal surface cortex
NP-8: Flake with natural cortical platform and a central strip of dorsal surface cortex
NP-9: Flake with natural cortical platform and an isolated island of dorsal surface cortex
NP-10: Flake with natural cortical platform and distal dorsal surface cortex
NP-11: Flake with natural cortical platform and no dorsal surface cortex

SINGLE-FACETED PLATFORM

SFP-1: Flake with single-faceted platform and 100% dorsal surface cortex
SFP-2: Flake with single-faceted platform and left and right lateral and distal dorsal surface cortex
SFP-3: Flake with single-faceted platform and left and right lateral dorsal surface cortex
SFP-4: Flake with single-faceted platform and left lateral and distal dorsal surface cortex
SFP-5: Flake with single-faceted platform and right lateral and distal dorsal surface cortex
SFP-6: Flake with single-faceted platform and left lateral dorsal surface cortex
SFP-7: Flake with single-faceted platform and right lateral dorsal surface cortex
SFP-8: Flake with single-faceted platform and a central strip of dorsal surface cortex
SFP-9: Flake with single-faceted platform and an isolated island of dorsal surface cortex
SFP-10: Flake with single-faceted platform and distal dorsal surface cortex
SFP-11: Flake with single-faceted platform and no dorsal surface cortex

MULTI-FACETED PLATFORM

MFP-1: Flake with multi-faceted platform and 100% dorsal surface cortex
MFP-2: Flake with multi-faceted platform and left and right lateral and distal dorsal surface cortex
MFP-3: Flake with multi-faceted platform and left and right lateral dorsal surface cortex
MFP-4: Flake with multi-faceted platform and left lateral and distal dorsal surface cortex
MFP-5: Flake with multi-faceted platform and right lateral and distal dorsal surface cortex
MFP-6: Flake with multi-faceted platform and left lateral dorsal surface cortex

MFP-7: Flake with multi-faceted platform and right lateral dorsal surface cortex
MFP-8: Flake with multi-faceted platform and a central strip of dorsal surface cortex
MFP-9: Flake with multi-faceted platform and an isolated island of dorsal surface cortex
MFP-10: Flake with multi-faceted platform and distal dorsal surface cortex
MFP-11: Flake with multi-faceted platform and no dorsal surface cortex

NONDIAGNOSTIC DEBITAGE

Flake Frag/wc:	Flake fragment with cortex
Flake Frag/woc:	Flake fragment without cortex
Mod Fire Spall:	Fire spall with flake removals
Fire Spall:	Flake resulting from fire
Fire-F Cobble:	Fire-fractured cobble
Fire-F Flake:	Fire-fractured flake
Nat Unalt Cob:	Natural unaltered cobble
Nat unalt Flake:	Natural unaltered flake

FORMED ARTIFACT CATEGORY ABBREVIATIONS

SFP Nodule Core:	Nodule flake core with a single faceted platform
Block Core:	Flake core with a bifacial edge made on a large block
1005.AZ:	Adze or SEUT (Steep Edged Unifacial Tool) or fragment
1021.BI:	Battered implement or battered implement fragment

APPENDIX D

CATALOGS

Accession	Cat No	Unit Type	Date Collected	SC No	Level	Artifact	Portion	Material	Mod 1	Quan	Length	Width	Thick	Weight (g)	Comments
CA-SDI-12287	1	Surface	9/16/2008	SC-13	Surface	Faunal	com	shell	3 Chione; 1 Argopecten	4				14.1	Likely not cultural; from fill soil
CA-SDI-12287	2	Surface	9/16/2008	SC-13	Surface	Debitage	com	metavolcanic		1				1.5	
CA-SDI-12287	3	Surface	9/16/2008	SC-11	Surface	Debitage	com	metavolcanic		1				16.8	
CA-SDI-12287	4	Surface	9/16/2008	SC-10	Surface	Faunal	com	shell	Chione	1				0.2	Likely not cultural; from fill soil
CA-SDI-12287	5	Surface	9/16/2008	SC-6	Surface	Ground Stone	frag	metavolcanic		1	31.7	26.2	33.3	32.3	
CA-SDI-12287	6	Surface	9/16/2008	SC-8	Surface	Mano	frag	granitic		1	62.3	60.6	43.6	158.3	
CA-SDI-12287	7	Surface	9/16/2008	SC-1	Surface	Faunal	com	shell	Chione	1				8.6	Likely not cultural; from fill soil
CA-SDI-12287	8	Surface	9/16/2008	SC-3	Surface	Faunal	com	shell	Chione	1				3.8	Likely not cultural; from fill soil
CA-SDI-12287	9	Surface	9/16/2008	SC-12	Surface	Faunal	com	shell	2 Chione; 1 Cerithidea; 1 fossil shell	4				27.9	Likely not cultural; from fill soil
CA-SDI-12287	10	Surface	9/16/2008	SC-2	Surface	Faunal	com	shell	Chione	1				2.1	Likely not cultural; from fill soil
CA-SDI-12287	11	Surface	9/16/2008	SC-9	Surface	Faunal	frag	shell	Fossil shell	1				34.8	Likely not cultural; from fill soil
CA-SDI-12287	12	Surface	9/16/2008	SC-4	Surface	Faunal	frag	shell	Chione	1				12.3	Likely not cultural; from fill soil
CA-SDI-12287	13	Surface	9/16/2008	SC-5	Surface	Faunal	com	shell	Chione	1				15.2	Likely not cultural; from fill soil
CA-SDI-12287	14	Surface	9/16/2008	SC-7	Surface	Mano	com	granitic		1	132.1	118.1	72.3	1700.0	

Accession	Cat No	Unit Type	SC No	GPS Pt	Level	Artifact	Portion	Material	Quan	Length	Width	Thick	Weight (g)
CA-SDI-14176	1	Surface		9-26-c	Surface	SEUT	com	metavolcanic	1	70.2	36.4	20.7	61.0
CA-SDI-14176	2	Surface		9-26-e	Surface	Battered Implement	com	metavolcanic	1	85.5	65.1	70	400.0
CA-SDI-14176	3	Surface		9-26-h	Surface	Debitage	com	metavolcanic	1				4.2
CA-SDI-14176	4	Surface		9-26-i	Surface	Debitage	com	metavolcanic	1				2.5
CA-SDI-14176	5	Surface		9-26-i	Surface	SEUT	com	metavolcanic	1	52	31	18.3	41.0
CA-SDI-14176	6	STP 2		9-26-g	0-10 cm	Debitage	com	metavolcanic	1				1.2
CA-SDI-14176	7	Surface	21		Surface	SEUT	frag	metavolcanic	1	70	37.7	24.9	62.5
CA-SDI-14176	8	Surface	30		Surface	Debitage	com	metavolcanic	1				32.3
CA-SDI-14176	9	Surface	9		Surface	Debitage	com	metavolcanic	1				4.2
CA-SDI-14176	10	Surface	27		Surface	Battered Implement	com	metavolcanic	1	42.4	37	42.9	60.8
CA-SDI-14176	11	Surface	4		Surface	Debitage	com	metavolcanic	2				2.2
CA-SDI-14176	12	Surface	11		Surface	Ground Stone	frag	granitic	1	66.7	57.8	53	156.5
CA-SDI-14176	13	Surface	25		Surface	Battered Implement Flake	com	metavolcanic	1				6.8
CA-SDI-14176	14	Surface	2		Surface	Battered Implement Flake	com	metavolcanic	1				0.8
CA-SDI-14176	15	Surface	6		Surface	Debitage	com	metavolcanic	1				8.8
CA-SDI-14176	16	Surface	1		Surface	Debitage	com	metavolcanic	1				1.0
CA-SDI-14176	17	Surface	8		Surface	Debitage	com	metavolcanic	1				1.1
CA-SDI-14176	18	Surface	22		Surface	SEUT Flake	com	metavolcanic	1				3.1
CA-SDI-14176	19	Surface	5		Surface	Debitage	com	metavolcanic	1				4.8
CA-SDI-14176	20	Surface	3		Surface	Debitage	com	metavolcanic	1				1.9

Pj. 6-08 Otay Ranch
CA-SDI-14235 Master Catalog

Accession	Cat No	Unit Type	SC No	Level	Artifact	Portion	Material	Quan	Length	Width	Thick	Weight (g)	Comments
CA-SDI-14235	1	Surface	2	Surface	Debitage	com	metavolcanic	1				15.7	
CA-SDI-14235	2	Surface	13	Surface	Battered Implement	com	metavolcanic	1	118.7	88.3	38.2	500.0	
CA-SDI-14235	3	Surface	5	Surface	Non-Artifact	com	metavolcanic	1				53.6	Discarded
CA-SDI-14235	4	Surface	1	Surface	Debitage	com	metavolcanic	1				1.4	
CA-SDI-14235	5	Surface	3	Surface	Debitage	com	undif	2				50.3	
CA-SDI-14235	6	Surface	12	Surface	Debitage	com	metavolcanic	1				35.3	
CA-SDI-14235	7	Surface	16	Surface	FAR - Non-Artifact	com	metavolcanic	1				205.8	Discarded
CA-SDI-14235	8	Surface	11	Surface	SEUT	com	metavolcanic	1	62.9	62	31.3	119.3	
CA-SDI-14235	9	Surface	4	Surface	SEUT Flake	com	metavolcanic	1				8.8	
CA-SDI-14235	10	Surface	15	Surface	Battered Implement	com	metavolcanic	1	240	70.9	70	1700.0	
CA-SDI-14235	11	Surface	7	Surface	SEUT	com	metavolcanic	1	137.1	120.9	54.6	1100.0	

SITE NUMBER	CAT #	TECAT	COMMENT
CA-SDI-12287	2	Flake Fragment/wc	
	3	Nodule Core Flake, NP-11	

SITE NUMBER	CAT #	TECAT	COMMENT
CA-SDI-14176	1	1005.AZ	made on flake
	2	1021.BI	
	3	Nodule Core Flake, SFP-11	sheared cone
	4	Nodule Core Flake, SFP-11	sheared cone
	5	1005.AZ made on flake	
	6	Flake Fragment/woc	
	7	1005.AZ Fragment	
	8	Flake Fragment/wc	
	9	Nodule Core Flake, NP-10	
	10	1021.BI 11 Flake Fragment/wc	
	11	Nodule Core Flake, SFP-11	
	12	1021.BI Flake	
	13	1021.BI Flake	
	14	Nodule Core Flake, SFP-10	
	15	Nodule Core Flake, SFP-11	
	16	Flake Fragment/woc	
	17	1005.AZ Resharpen Flake	
	18	Nodule Core Flake, SFP-11	
	19	Flake Fragment/woc	

NP=Natural Platform
SFP-Single Faceted Platform
MFP=Multifaceted Platform
/wc=With Cortex
/woc=Without Cortex
AZ=Adze/SUET
BI=Battered Implement

SITE NUMBER	CAT #	TECAT	COMMENT
CA-SDI-14235	1	Nodule Core Flake, SFP-10	
	2	1021.BI	on natural unaltered
		cobble	
	3	Natural Flake	
	4	Nodule Core Flake, SFP-10	
	5	Nodule Core Flake, NP-2	
	6	Nodule Core Flake, NP-11	
	7	Nodule Core Flake, MFP-11	
	8	Fire-Fractured Cobble	
	9	1005.AZ	made on flake
	10	1005.AZ Resharpen Flake	
	11	021.BI	made on cylindrical
		cobble	
	12	1005.AZ	made on large cobble

NP=Natural Platform
SFP-Single Faceted Platform
MFP=Multifaceted Platform
/wc=With Cortex
/woc=Without Cortex
AZ=Adze/SEUT
BI=Battered Implement

APPENDIX E

SITE RECORD FORMS AND UPDATES

(See Confidential Appendix)

APPENDIX F

NATIVE AMERICAN CORRESPONDENCE

GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 12, 2008

Larry Myers
Native American Heritage Commission
915 Capitol Mall, Room 364
Sacramento, CA 95814

Dear Mr. Myers,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

The record search will identify: previously recorded sites; sites nominated to the National Register of Historic Places (NRHP) and potential National Register Properties; Traditional Cultural Properties; and will provide recommendations to protect any identified significant cultural resources within the Otay Ranch project area.

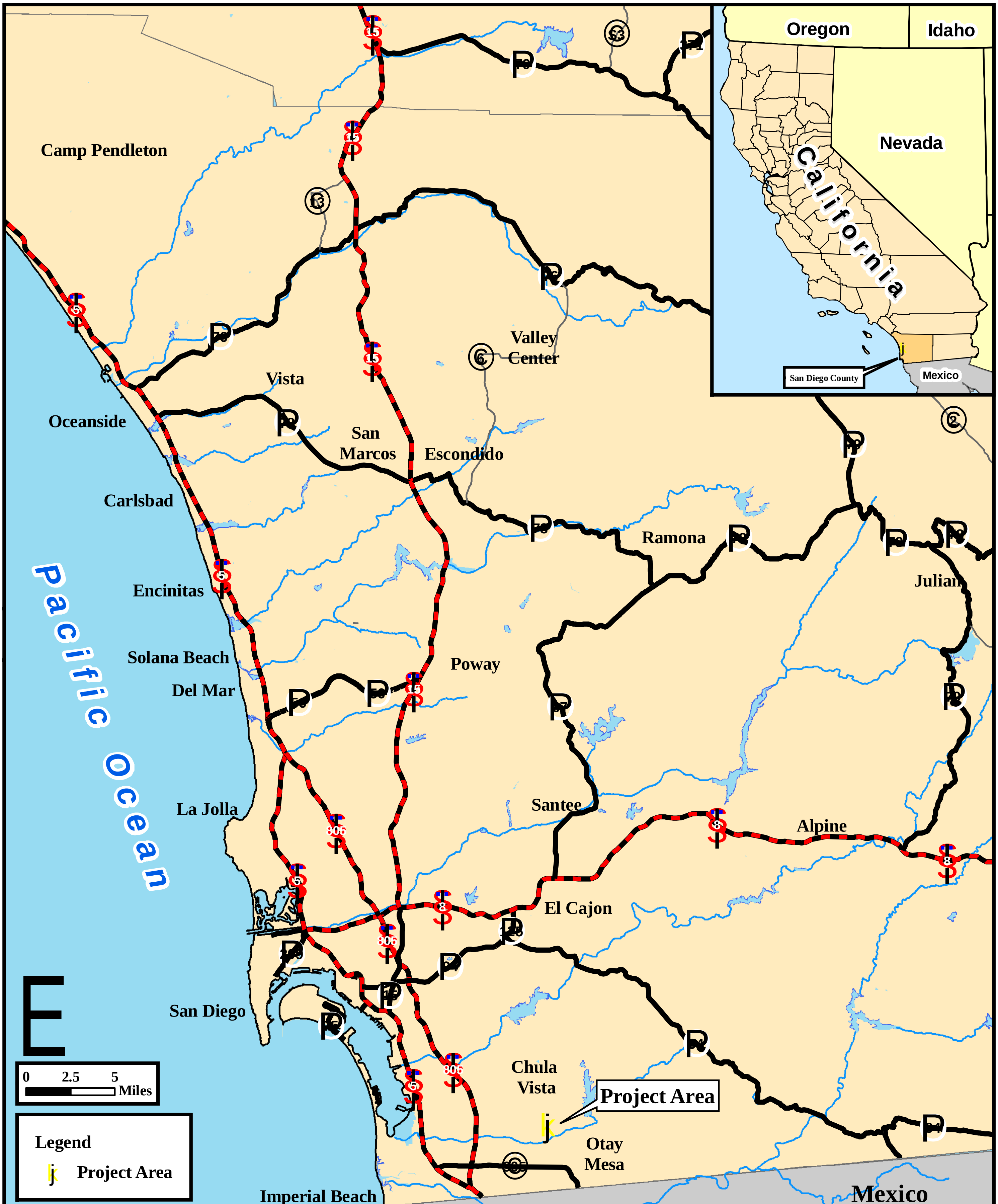
We respectfully request any information and/or input that you may have regarding Native American concerns either directly or indirectly associated with this project. We are also interested in knowing if there are individuals in the area who should be contacted prior to completion of this study.

We appreciate your assistance in this matter. If you have any questions or require any further information, please do not hesitate to call.

Best regards,

Dennis Gallegos
Project Manager

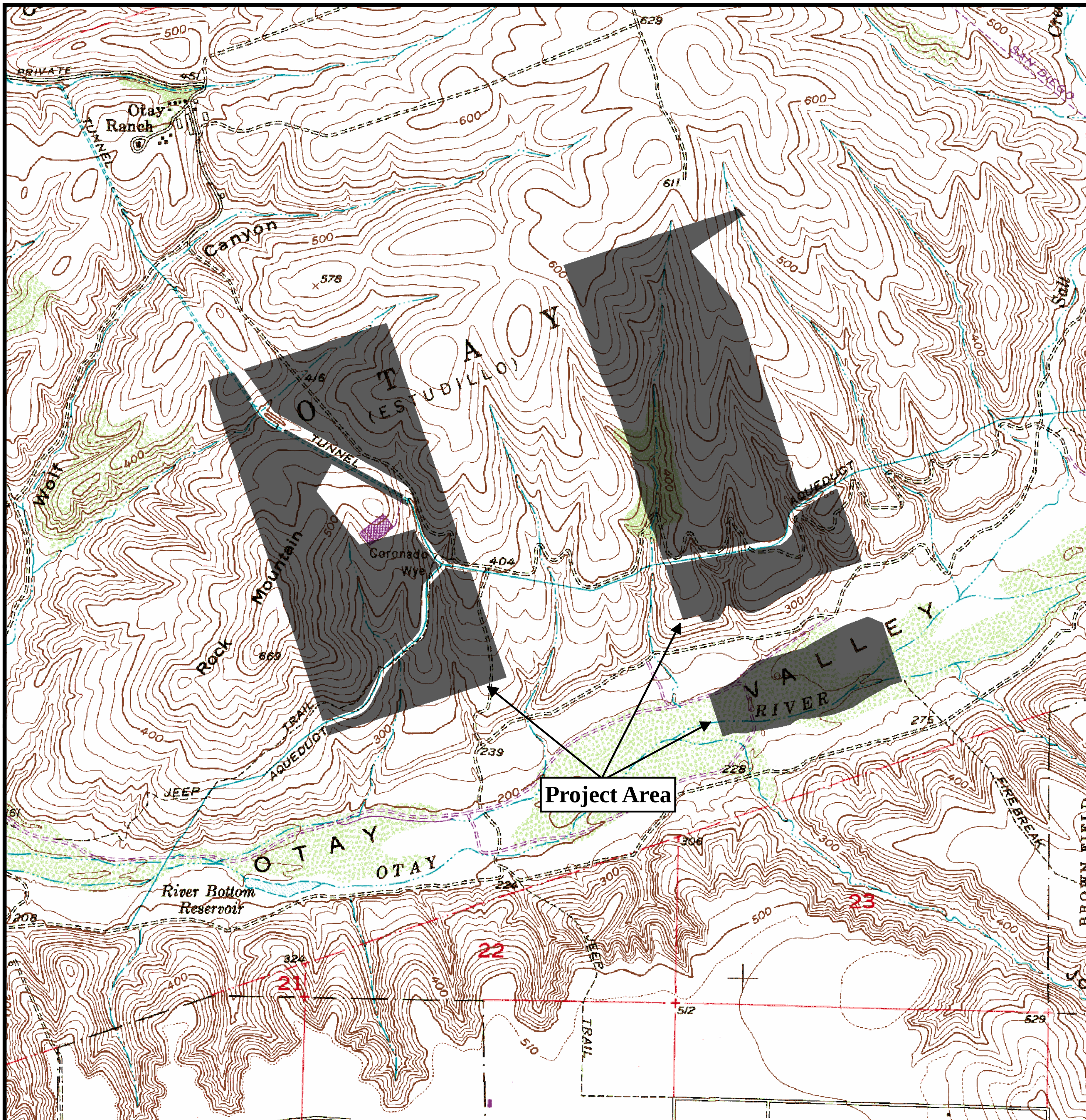
Enclosures



Gallegos & Associates

Regional Project Location

FIGURE 1



Otay Mesa 7.5' USGS Map

Scale 1:24,000

0.5 0.25 0 0.5 1 1.5 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 Feet

1 0.5 0 1 Kilometers

Gallegos & Associates

Project Area Shown on USGS Map	FIGURE 2

STATE OF CALIFORNIA — Arnold Schwarzenegger, Governor

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

June 18, 2008

Mr. Dennis Gallegos, Project Manager
GALLEGOS & ASSOCIATES
5671 Palmer Way, Suite A
Carlsbad, CA 92010

Sent by FAX to: 760-929-0056
No. of Pages: 3

Re: Request for a Sacred Lands File records search for the proposed Otay Ranch Field Survey Project located in San Diego County, California

Dear Mr. Gallegos:

The Native American Heritage Commission was able to perform a record search of its Sacred Lands File (SLF) for the affected project area. The SLF failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any project area. This project site is in close proximity to previously discovered prehistoric burial sites and is believed to hold numerous cultural resources.

Early consultation with Native American tribes in your area is the best way to avoid unanticipated discoveries once a project is underway. Enclosed is the name of the nearest tribes that may have knowledge of cultural resources in the project area. A list of Native American contacts is attached to assist you. It is advisable to contact the persons listed; if they cannot supply you with specific information about the impact on cultural resources, they may be able to refer you to another tribe or person knowledgeable of the cultural resources in or near the affected project area.

Lack of surface evidence of archeological resources does not preclude the existence of archeological resources. 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 15064.5(f) and Section 15097.98 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.

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 Contact List

Native American Contacts
San Diego County
June 18, 2008

Barona Group of the Capitan Grande Rhonda Welch-Scalco, Chairperson 1095 Barona Road — Diegueno Lakeside , CA 92040 sue@barona-nsn.gov (619) 443-6612 619-443-0681	Sycuan Band of the Kumeyaay Nation Danny Tucker, Chairperson 5459 Sycuan Road — Dieguenо/Kumeyaay El Cajon , CA 92021 ssilva@sycuan-nsn.gov 619 445-2613 619 445-1927 Fax
La Posta Band of Mission Indians Gwendolyn Parada, Chairperson PO Box 1120 — Dieguenо Boulevard , CA 91905 (619) 478-2113 619-478-2125	Viejas Band of Mission Indians Bobby L. Barrett, Chairperson PO Box 908 — Dieguenо/Kumeyaay Alpine , CA 91903 daguilar@viejas-nsn.gov (619) 445-3810 (619) 445-5337 Fax
San Pasqual Band of Mission Indians Allen E. Lawson, Chairperson PO Box 365 — Dieguenо Valley Center , CA 92082 (760) 749-3200 (760) 749-3876 Fax	Kumeyaay Cultural Historic Committee Ron Christman 56 Viejas Grade Road — Dieguenо/Kumeyaay Alpine , CA 92001 (619) 445-0385
Santa Ysabel Band of Dieguenо Indians Johnny Hernandez, Spokesman PO Box 130 — Dieguenо Santa Ysabel , CA 92070 brandietaylor@yahoo.com (760) 765-0845 (760) 765-0320 Fax	Jamul Indian Village William Mesa, Chairperson P.O. Box 612 — Dieguenо/Kumeyaay Jamul , CA 91935 jamulrez@sctdv.net (619) 669-4785 (619) 669-48178 - Fax

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 propose Otay Ranch Project as part of a Cultural Survey to Identify Traditional Cultural Properties pursuant to the provisions of the National Historic Preservation Act and Native American cultural resources that are included in the NAHC Sacred Lands File; San Diego County, California.

San Diego County
June 18, 2008

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

Kumeyaay Cultural Repatriation Committee
Steve Banegas, Spokesperson
1095 Barona Road — Diegueno/Kumeyaay
Lakeside , CA 92040
(619) 742-5587
(619) 443-0681 FAX

Kumeyaay Cultural Heritage Preservation
Paul Cuero
36190 Church Road, Suite 5 — Diegueno/ Kumeyaay
Campo , CA 91906
chairman@campo-nsn.gov
(619) 478-9046
(619) 478-9505
(619) 478-5818 Fax

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

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

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

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GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Steve Banegas
Kumeyaay Cultural Repatriation Committee
1095 Barona Road
Lakeside, CA 92040

Dear Mr. Banegas:

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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We appreciate your assistance in this matter. If you have any questions or require any further information, please do not hesitate to call.

Best regards,

Dennis Gallegos
Project Manager

Enclosures

GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Bobby L. Barrett
Viejas Band of Kumeyaay Indians
P.O. Box 908
Alpine, CA 91903

Dear Mr. Barrett,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Best regards,

Dennis Gallegos
Project Manager

Enclosures

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& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Ron Christman
Kumeyaay Cultural Historic Committee
56 Viejas Grade Road
Alpine, CA 92001

Dear Mr. Christman:

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Dennis Gallegos
Project Manager

Enclosures

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& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Paul Cuero
Kumeyaay Cultural Heritage Preservation
36190 Church Road, Suite 5
Campo, CA 91906

Dear Mr. Cuero:

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5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Johnny Hernandez
Santa Ysabel Band of Diegueño Indians
P.O. Box 130
Santa Ysabel, CA 92070

Dear Mr. Hernandez:

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Project Manager

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5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2007

Allen E. Lawson
San Pasqual Band of Indians
P.O. Box 365
Valley Center, CA 92082

Dear Mr. Lawson,

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Dennis Gallegos
Project Manager

Enclosures

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Fax: (760) 929-0056
gallegos@aol.com

June 20, 2007

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P.O. Box 365
Valley Center, CA 92082

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Project Manager

Enclosures

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5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Carmen Lucas
Kwaaymii
P.O. Box 775
Pine Valley, CA 91962

Dear Carmen:

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Best regards,

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Project Manager

Enclosures

GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

William Mesa
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

Dear Mr. Mesa:

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

William Mesa
Jamul Indian Village
P.O. Box 612
Jamul, CA 91935

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Best regards,

Dennis Gallegos
Project Manager

Enclosures

GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Rebecca Osuna
Inaja Band of Mission Indians
309 S. Maple Street
Escondido, CA 92025

Dear Ms. Osuna,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Best regards,

Dennis Gallegos
Project Manager

Enclosures

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& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Gwendolyn Parada
La Posta Band of Mission Indians
P.O. Box 1120
Boulevard, CA 91905

Dear Ms. Parada,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Dennis Gallegos
Project Manager

Enclosures

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5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Mark Romero
Mesa Grande Band of Mission Indians
P.O. Box 270
Santa Ysabel, CA 92070

Dear Mr. Romero,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

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Dennis Gallegos
Project Manager

Enclosures

GALLEGOS
& Associates

5671 Palmer Way, Suite A
Carlsbad, California, 92010
Phone: (760) 929-0055
Fax: (760) 929-0056
gallegos@aol.com

June 20, 2008

Danny Tucker
Sycuan Band of the Kumeyaay Nation
5459 Sycuan Road
El Cajon, CA 92021

Dear Mr. Tucker:

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

The record search will identify: previously recorded sites; sites nominated to the National Register of Historic Places (NRHP) and potential National Register Properties; Traditional Cultural Properties; and will provide recommendations to protect any identified significant cultural resources within the Otay Ranch project area.

We respectfully request any information and/or input that you may have regarding Native American concerns either directly or indirectly associated with this project. We are also interested in knowing if there are individuals in the area who should be contacted prior to completion of this study.

We appreciate your assistance in this matter. If you have any questions or require any further information, please do not hesitate to call.

Best regards,

Dennis Gallegos
Project Manager

Enclosures

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& Associates

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Carlsbad, California, 92010
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gallegos@aol.com

June 20, 2008

Rhonda Welch-Scalco
Barona Group of the Capitan Grande
1095 Barona Road
Lakeside, CA 92040

Dear Ms. Welch-Scalco,

Gallegos & Associates is in the process of preparing a record search, literature review, and field survey for the Otay Ranch project. The project area is located in Otay Mesa, south San Diego County (Figures 1 and 2).

The record search will identify: previously recorded sites; sites nominated to the National Register of Historic Places (NRHP) and potential National Register Properties; Traditional Cultural Properties; and will provide recommendations to protect any identified significant cultural resources within the Otay Ranch project area.

We respectfully request any information and/or input that you may have regarding Native American concerns either directly or indirectly associated with this project. We are also interested in knowing if there are individuals in the area who should be contacted prior to completion of this study.

We appreciate your assistance in this matter. If you have any questions or require any further information, please do not hesitate to call.

Best regards,

Dennis Gallegos
Project Manager

Enclosures

APPENDIX G

CULTURAL RESOURCE SURVEY OF OFFSITE IMPROVEMENTS FOR OTAY RANCH VILLAGE 8 WEST

CULTURAL RESOURCE SURVEY OF OFFSITE IMPROVEMENTS FOR OTAY RANCH VILLAGE 8 WEST, CITY OF CHULA VISTA, SAN DIEGO COUNTY, CALIFORNIA

Anna C. Noah, Ph.D.

July 2, 2010

INTRODUCTION

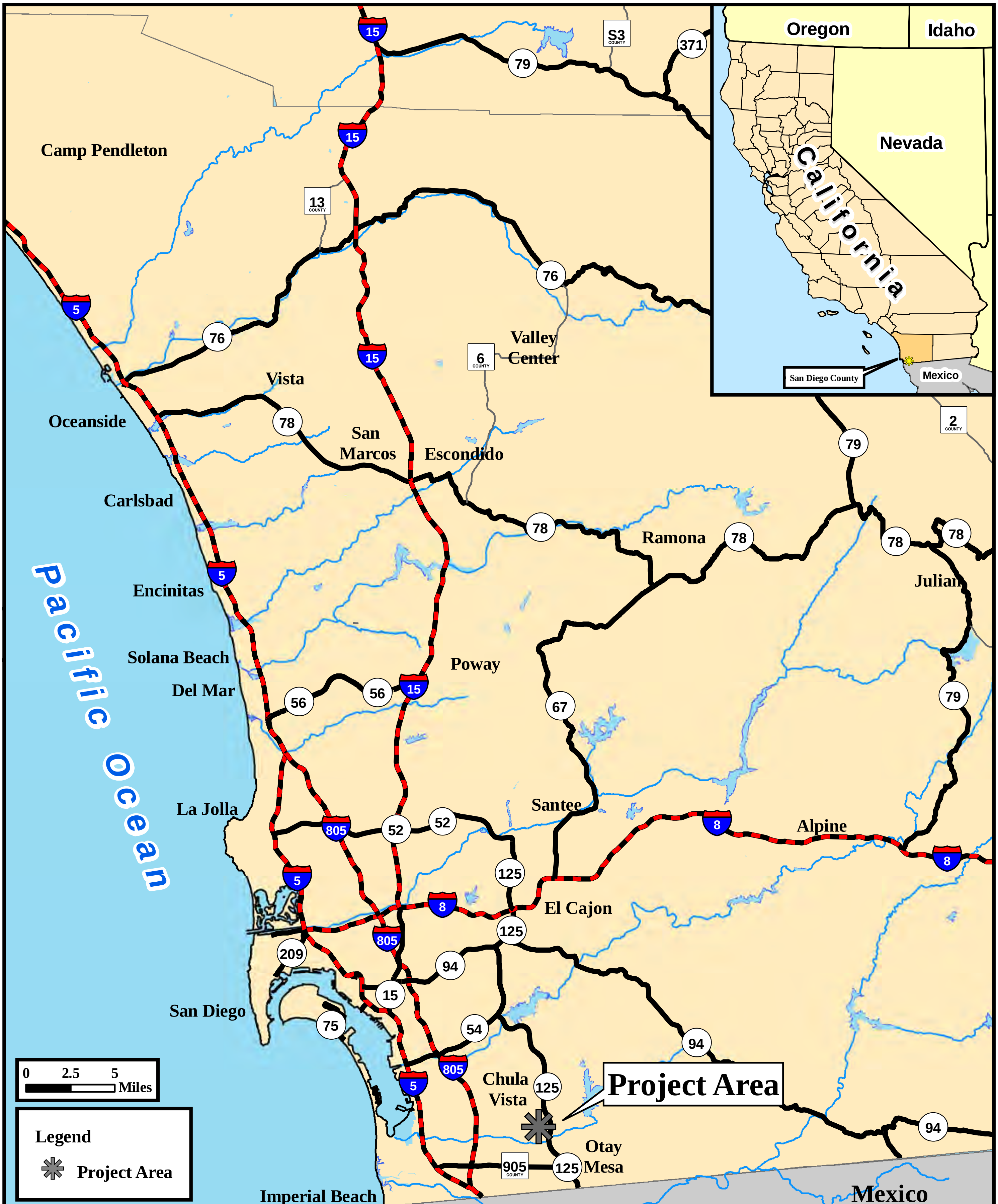
This cultural resource report addresses proposed offsite improvements associated with development of Otay Ranch Village 8 West in Chula Vista, San Diego County, California (Figure 1). These improvements consist of a storm drain and sewer line and associated easement access road, which would accommodate a trail connection to the Otay Valley Regional Park connector trail north of Otay River. The storm drain and sewer line would be constructed within a 50-foot-wide trench extending from the southern end of the Village 8 West parcel southwesterly to an existing sewer trunk line in a dirt road (Figure 2). The storm drain outlet would drain into the Otay River. The easement road/trail would occupy the same 50-foot area.

The Area of Potential Effect (APE) consists of a 150-foot-wide area generally centered on the proposed 50-foot-wide trench. All construction activity, including vehicular access, trenching operations, soil stockpiling, and materials storage would be confined to the APE.

This report is an addendum to a larger report addressing Village 8 West, entitled *Cultural Resource Survey and Test for Otay Ranch Village 8 West, Chula Vista, San Diego County, California*, prepared by Gallegos & Associates (2010).

PREVIOUS RESEARCH

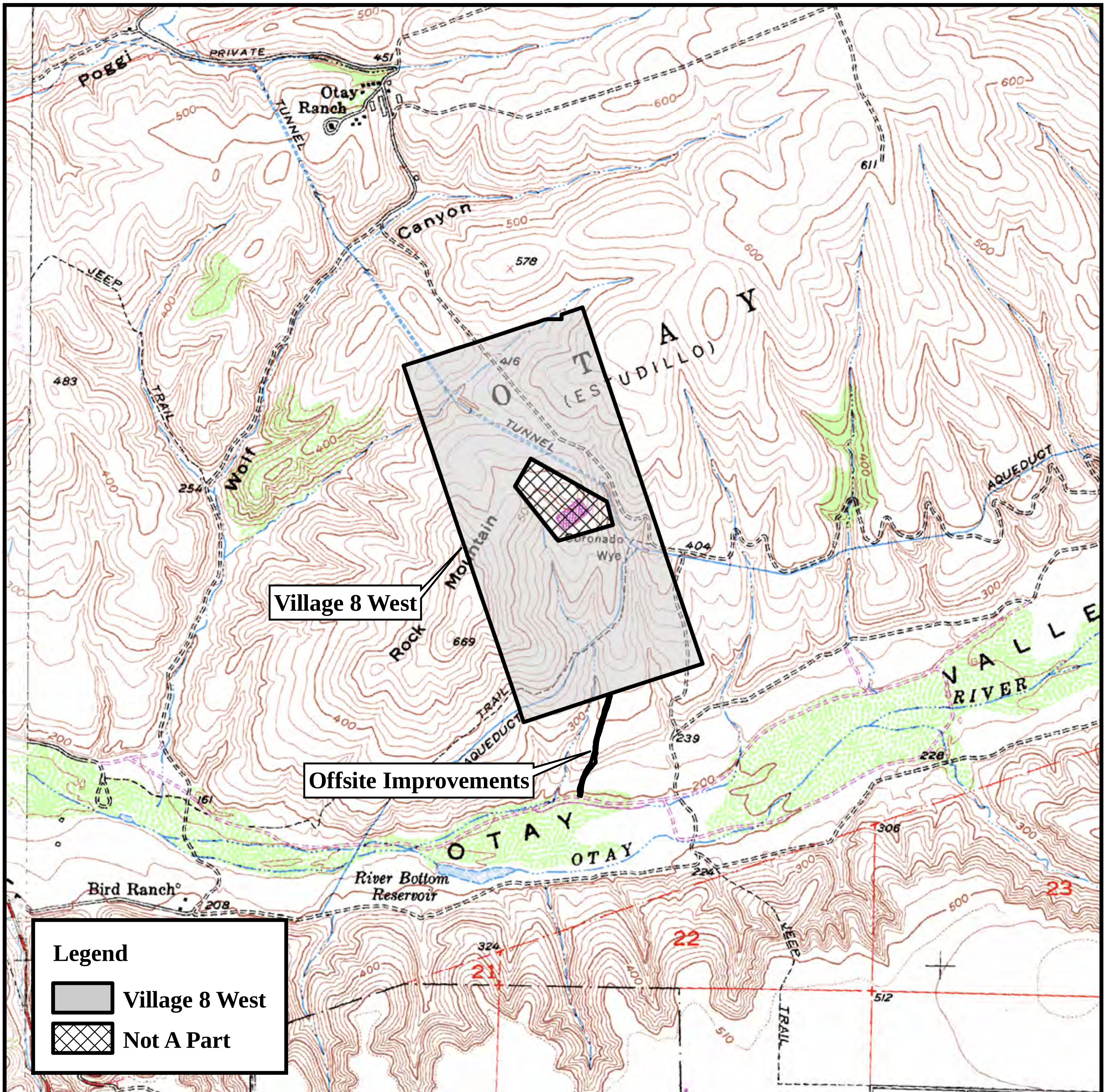
Gallegos & Associates obtained a cultural resource record search from the South Coastal Information Center for the Otay Ranch Village 8 West project. Two previously recorded archaeological sites are located within the storm drain/sewer line project APE. These sites and their relationship to the APE are shown in Figure 3 and described below.



Noah Archaeological Consulting

Regional Project Location

FIGURE 1



Otay Mesa 7.5' USGS Map

Scale 1:24,000

0.5 0.25 0 0.5 1 1.5 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 Feet

1 0.5 0 1 Kilometers

Noah Archaeological Consulting

Project area shown on USGS Map	FIGURE 2

FIGURE 3

PROJECT APE AND PREVIOUSLY RECORDED SITES

(See Confidential Appendix)

CA-SDI-4789

In 1973, Michael Waters recorded CA-SDI-4789 as a temporary camp consisting of flakes, cores, and flake tools. Brian F. Smith submitted a site form update to the SCIC in 1996 showing an expanded site boundary, based on a 1989 field survey (Smith: personal communication 2010).

In 1994, Caltrans contracted with Brian F. Mooney Associates to perform a Phase II study at CA-SDI-4789 to evaluate the significance of the site. The Phase II study consisted on a surface collection and excavation of 22 STPs. The surface collection recovered 461 artifacts, including debitage (n=403), cores (n=28), a utilized flake, a bifacially modified artifact, battered implements (n=3) and ceramics (n=22). A systematic excavation of 20 shovel test pits (STPs) at the junctures of a 50 m interval grid and two judgmentally placed STPs resulted in the recovery of four pieces of debitage and five ceramic sherds from two of the STPs. The researchers concluded that the site was essentially a surface scatter and that the testing and analysis program had exhausted the site's research potential (Schaefer et al. 1994).

CA-SDI-12809

Charlotte McGowen, a professor at Southwestern College, originally identified a small portion of CA-SDI-12809, calling it Cal.F:5:1 (a San Diego State University Anthropology Department designation). McGowen directed a field school at this portion of the site for over a decade. Artifacts recovered by the field school include large quantities of flaked lithics and ground stone, ceramics, clay balls, soapstone arrow-shaft straighteners and a turtle "fetish", shell beads and an ornament, a shell fishhook, glass trade beads, and bone tools. McGowan reported many hearths and a possible "temescal" (sweathouse). Human remains were also recovered from this area of the site (McGowen 1997; Rosen 1989), which is located about 1.3 km east of proposed offsite improvement area.

In 1989, Martin Rosen greatly expanded the boundaries of the site to cover an entire lower bench above the Otay River, an area roughly 2000 m long by 100 meters wide. Rosen described an artifact scatter over the entire bench with densities varying from light to extensive.

In 1996, Brian F. Smith submitted a site form update to the SCIC, based on fieldwork carried out in 1989 (Smith 2010:personal communication). The update provides site dimensions of 2,164 m by 198 m and a map showing the site extending into a drainage channel located a short distance west of Rosen's western site boundary.

Caltrans contracted with Brian F. Mooney Associates to evaluate the significance of SDI-12809 (McDonald et al. 1993). A grid system was laid out across the entire site, and an STP was excavated at every 20 m intersection point within the established grid. In areas where artifact densities were considered moderate or high, additional STPs were excavated at 5- or 10-m intervals to further delineate the boundaries of concentrations. Eight hundred (800) STPs were excavated across the site. In addition, 27 1x1 m units were placed within defined loci (areas of artifact concentration) and in potential SR-125 construction impact zones. Ten distinct areas of artifact and midden deposition were identified and, from these, two major site occupational areas were identified (Locus A, including the Southwestern College field school area, and combined loci H, I, and J). Native American heritage concerns were also apparent, with the possible presence of a sweathouse in Locus A and human remains from several loci. Radiocarbon dates were obtained on charcoal samples and ranged between 260 $\pm$ 80 BP and 560 $\pm$ 120 BP. It has been suggested that the site may be a remnant of the ethnohistoric village of Otay or one of its satellite villages, although archival research did not reveal the location of the village complex. (McDonald et al. 1993).

CA-SDI-12809 was recommended as eligible for inclusion in the National Register of Historic Places (NRHP) under Criterion D (McDonald 1993; Rosen 1995). The research potential associated with the two major occupational areas was cited as justification for the recommendation (McDonald 1993:vii). On May 25, 1995, the Office of Historic Preservation concurred with this recommendation.

Because the site has had a formal determination of eligibility to the NRHP, it automatically is included in the California Register of Historic Resources.

FIELD METHODS

The APE was intensively surveyed on foot by a team consisting of Anna Noah, Nick Doose, and Gabe Kitchen, a Kumeyaay monitor provided by Red Tail Monitoring & Research, Inc. Beginning at the south end of the APE, longitudinal transects spaced at 7- to 8-m intervals were walked to the north end of the APE and back. Artifact locations were mapped using a handheld GPS unit and photographs were taken of each artifact.

Ground visibility ranged from excellent in a recently plowed field, dirt roads, and bare patches to poor, owing to dense low grasses and forbs over much of the lower terrace. The fieldwork took place on February 18, 2010.

SURVEY RESULTS

The survey was positive. Both CA-SDI-4789 and CA-SDI-12809 were relocated. The results for each site are presented below.

CA-SDI-4789

The site area occupies a recently plowed agricultural field in which the ground surface is unobscured. One artifact, a core made from local fine-grained metavolcanic material, was observed (Figure 4).

CA-SDI-12809

A single fine-granted metavolcanic flake was noted on the site outside the APE (Figure 4).

FIGURE 4

TRENCH LOCATION, SURVEY AREA (APE), SITE BOUNDARIES, AND RESULTS OF 1993 STP TEST PROGRAM AT CA-SDI-12809

(See Confidential Appendix)

SIGNIFICANCE OF PROJECT IMPACTS AND RECOMMENDED MITIGATION

CA-SDI-4789

The site area would be directly impacted by construction of the storm drain and sewer line (Figure 4). Previous testing of CA-SDI-4789 resulted in the conclusion that the site's research potential had been exhausted by the testing and artifact analysis. Nevertheless, there remains the possibility that subsurface features, including human remains, could be recovered during construction. Therefore, implementation of mitigation measures as outlined in Section 7.6 of this report would be required.

CA-SDI-12809

The proposed project APE is in an area previously tested by Brian F. Mooney Associates. Figure 4 shows that 6 STPs were excavated within the APE, all with negative results. STPs were excavated at 20 m intersection points on the established grid seen in the figure. The number of artifacts recovered from each STP is shown at the intersection point. As shown in Figure 4, the closest positive STP location is approximately 150 m east of the APE. That STP produced one artifact. Of the two major occupational areas identified through previous testing, the closest is the loci H, I, J group, located a minimum of 325 m east of the APE.

Based on the results of previous testing, there is little likelihood that subsurface deposits occur within the APE. However, because of the possibility that subsurface features and/or human remains could be uncovered during construction, implementation of mitigation measures as outlined in Section 7.6 of this report would be required.

REFERENCES CITED

McDonald, M., C. Serr, and J. Schaefer

1993 Phase II Archaeological Evaluation of CA-SDI-12,809, A Late Prehistoric Habitation Site in the Otay River Valley, San Diego County, California. On file at the South Coastal Information Center, San Diego State University, San Diego.

McGowen, C.

1997 Final Report of the Excavation of Cal. F:5:1 (CA-SDI-12,809). On file at the South Coastal Information Center, San Diego State University, San Diego.

Rosen, M.

1989 Archaeological Site Record for CA-SDI-12,809. On file at the South Coastal Information Center, San Diego State University, San Diego.

1995 Historic Property Survey Report for SR-125. On file at the South Coastal Information Center, San Diego State University, San Diego.

Schaefer, J., D. Saunders, and C. Serr

1994 Phase II Archaeological Evaluation of Prehistoric Sites CA-SDI-4739, CA-SDI-4741/4742, CA-SDI-4743, CA-SDI-4789/4988, CA-SDI-11,367/11,368 and CA-SDI-11,372 in the Otay River Area, San Diego County, California. On file at the South Coastal Information Center, San Diego State University, San Diego.

APPENDIX F2

Paleontological Resources Assessment

TECHNICAL REPORT
PALEONTOLOGICAL RESOURCE ASSESSMENT
OTAY RANCH – PARCEL B – VILLAGE 8 WEST
CITY OF CHULA VISTA
SAN DIEGO COUNTY, CALIFORNIA

Prepared for:

OTAY LAND COMPANY
1903 Wright Place
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Carlsbad, California 92008

Prepared by:

DEPARTMENT OF PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM
P.O. Box 121390
San Diego, California 92112

Thomas A. Deméré, Ph.D., Director
Sarah A. Siren, M.S., Paleontological Field Manager

2 September 2010

TECHNICAL REPORT
PALEONTOLOGICAL RESOURCE ASSESSMENT
OTAY RANCH – PARCEL B – VILLAGE 8 WEST
CITY OF CHULA VISTA
SAN DIEGO COUNTY, CALIFORNIA

INTRODUCTION

Otay Land Company proposes to develop an approximately 300-acre site in the City of Chula Vista, San Diego County, California. The parcel is located at the southern extent of La Media Road, southwest of the intersection between Santa Luna Road and Magdalena Avenue (Figures 1 and 2).

This technical report provides an assessment of issues related to paleontological resources within the project area, including proposed offsite trails and utility corridors. The purpose of this report is to assist Otay Land Company in planning and design efforts for the purposed project as related to paleontological resource issues. Specifically, this report is intended to summarize existing paleontological resource data in the project area and vicinity; assess potential impacts to paleontological resources from development of the project area; and identify mitigation measures to avoid or reduce project-related impacts wherever feasible. Additional discussion of report methodology is provided below. This report was prepared by Sarah A. Siren and Thomas A. Deméré of the Department of PaleoServices, San Diego Natural History Museum (SDNHM), San Diego, California.

As defined here, paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric (i.e., 10,000 years or older) plant and animal life exclusive of humans. Fossil remains such as bones, teeth, shells, leaves, and wood are found in the geologic deposits (rock formations) within which they were originally buried. For the purposes of this report, paleontological resources can be thought of as including not only the actual fossil remains but also the collecting localities and the geologic formations containing those localities.

METHODOLOGY

A review was conducted of relevant published and unpublished and published geologic reports (Kennedy and Tan, 1977; Tan and Kennedy, 2002), published and unpublished paleontological reports (Deméré, 1988; Walsh and Deméré, 1991; Deméré and Walsh, 1993), and museum paleontological locality data (SDNHM, Department of Paleontology). This approach was followed in recognition of the direct relationship between paleontological resources and the geologic formations within which they are found. Knowing the geology of a particular area and the fossil productivity of formations that occur in that area, it is possible to predict where fossils will, or will not, be encountered.

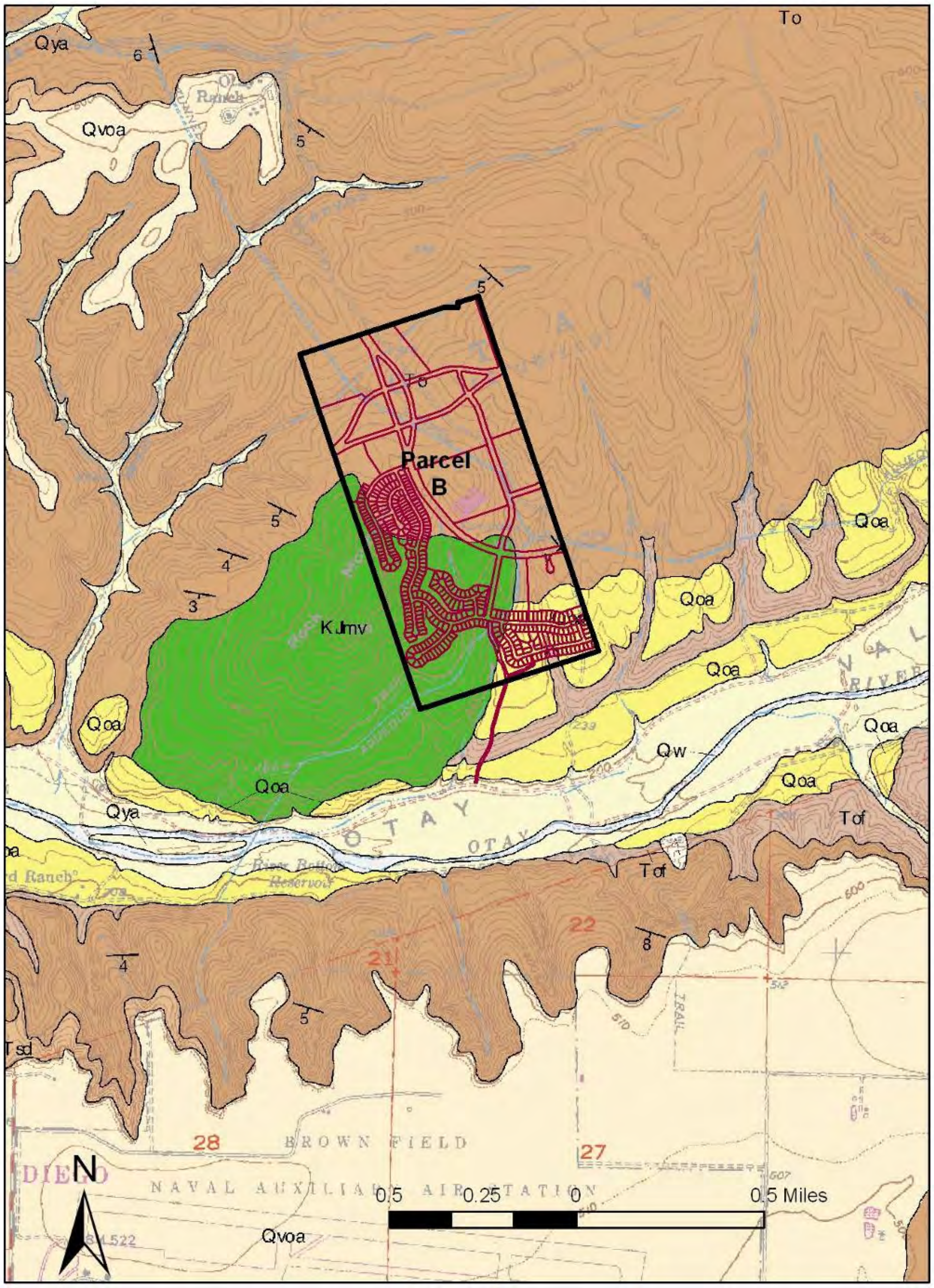

Figure 1. Portion of the geologic map of Tan and Kennedy (2002) showing the Parcel B - Village 8 West project boundaries (black rectangle) and offsite improvements (extending beyond black rectangle in red south of the property boundary). The majority of the project area is underlain by sedimentary rocks of the Oligocene-age Otay Formation (To). Quaternary-age (late to middle Pleistocene) alluvial and terrace deposits (Qoa) occur in the southeast portion of the project site, while Jurassic-Cretaceous-age Santiago Peak Volcanics (KJmv) occur in the southwest portion of the project site. Other rock units identified on the map include: late Holocene active channel and wash deposits (Qw), Holocene alluvial deposits (Qya), middle to early Pleistocene alluvial deposits (Qvoa), Oligocene to Miocene fanglomerate facies of the Otay Formation (Tof). Base map; Otay, CA 7.5' USGS topographic quadrangle; scale 1:24,000.

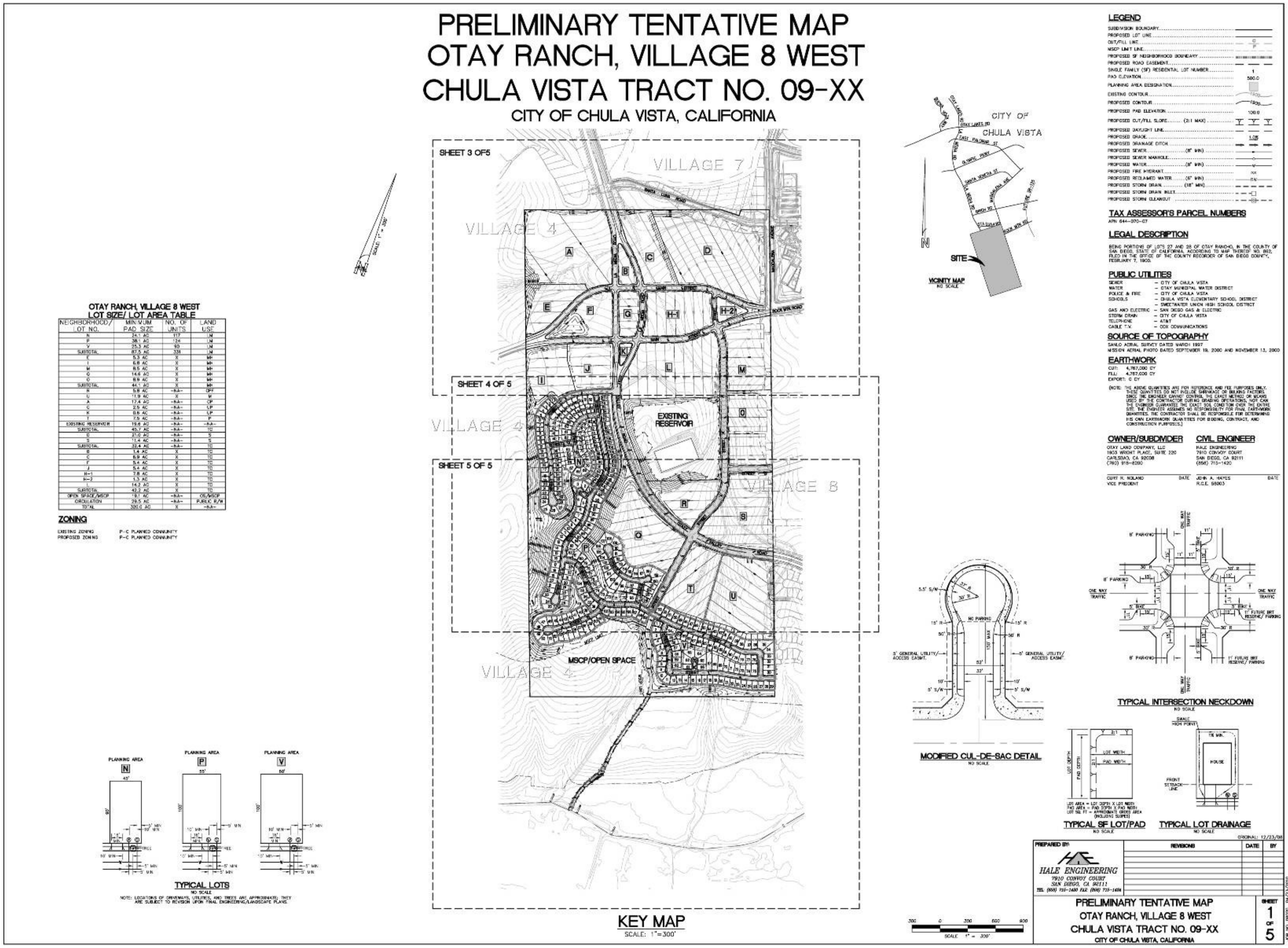

Figure 2. Preliminary tentative map for the proposed project site showing Parcel B - Village 8 West (courtesy of Hale Engineering, 2010).

A pedestrian survey of the project and immediately surrounding areas was conducted on September 23, 2009, by SDNHM personnel to field check the results of the literature and record searches and to determine the paleontological resource sensitivity of the geologic units that will be affected by the proposed development. This work involved inspection of bedrock outcrops for exposed paleontological resources.

EXISTING CONDITIONS

PHYSICAL GEOLOGICAL SETTING

In general, Parcel B - Village 8 West lies within the southern portion of the Peninsular Ranges Geomorphic Province, which is dominated by plutonic igneous rocks of late Mesozoic age (~125 to 90 million years old [Ma]) and pre-batholithic metamorphic rocks of middle Mesozoic age (~200 to 140 Ma). Along the coastal plain of San Diego County these crystalline basement rocks are overlain by younger sedimentary deposits of Cenozoic age (~50 Ma to 10,000 years old) (Walawender, 2000).

The oldest geologic units on site are the Jurassic-Cretaceous-age Santiago Peak Volcanics which are mapped in the southwestern portion of Parcel B - Village 8 West (Kennedy and Tan, 1977; Tan and Kennedy, 2002; Figure 3). This area includes Rock Mountain, a crystalline basement outlier composed of metavolcanic rocks. Rock Mountain has been the site of commercial quarry operations for decades. In the southeastern portion of the project site, poorly consolidated Quaternary-age sedimentary rocks crop out (Kennedy and Tan, 1977; Tan and Kennedy, 2002; Figure 6). These relatively youthful river terrace deposits date back to the Pleistocene Epoch (Ice Age) and rest on much older sedimentary rocks mapped as the Oligocene-age Otay Formation (~29 Ma; Artim and Pickney, 1973; Deméré, 1988; Walsh and Deméré, 1991; Tan and Kennedy, 2002), which underlie the majority of the project site.

Natural outcrops of the Otay Formation are limited because of a pervasive cover of plant material and topsoil. However, artificial exposures along the San Diego Aqueduct right-of-way were observed in the east central portion of the project study area (Figures 4 & 5).

PALEONTOLOGICAL RESOURCE ASSESSMENT

The following section provides a general overview of the types of geologic deposits located within the project area and proposed offsite trails and utility corridors.

Stratigraphic Rock Units

Santiago Peak Volcanics (KJmv)
Description:
The metavolcanic rocks mapped by Tan and Kennedy (2002) as the late Jurassic to early Cretaceous-age Santiago Peak Volcanics are the oldest geological rocks on site. The Santiago Peak Volcanics, located in the southwestern portion of the project site, are mainly composed of

volcanic breccias, with lesser amounts of volcanic tuffs and flows (Tan and Kennedy, 2002). In other parts of the region, slightly-to-moderately metamorphosed marine mudstones and sandstones appear to be interbedded with the volcanic rocks (Fife et al., 1967). Radiometric dates on the volcanic flow-rocks of the Santiago Peak Volcanics have yielded earliest Cretaceous ages, approximately 120-130 Ma (Herzig and Kimbrough, 1991). The Santiago Peak Volcanics were altered during emplacement of the vast volumes of magma generated by early Cretaceous subduction of a large lithospheric plate. These magmas subsequently cooled to form the plutonic ("granitic") rocks of the Peninsular Ranges Batholith, which forms the bulk of the central mountainous region of San Diego County.

Figure 3. Metavolcanic rocks of the Santiago Peak Volcanics, as mapped by Tan and Kennedy (2002), are present in the southwestern portion of Parcel B - Village 8 West. Bedrock bouldery outcrops are visible at the surface (right side of the photo; view south along the southwestern portion of Parcel B - Village 8 West).

Paleontology:
In general, the molten origin of the Santiago Peak Volcanics precludes the possible discovery of fossil remains in these rocks. However, some of the volcanic breccias contain petrified wood, as in Mira Mesa and near Rancho Santa Fe (D'Vincent, 1967). In addition, certain exposures of the metasedimentary portion of this formation have produced important remains of siliceous microfossils (e.g., radiolarians: Jones and Miller 1982) and marine macroinvertebrates including belemnites and clams (Jones and Miller, 1982). There are currently no records of any paleontological collecting sites in these rocks as exposed south of San Clemente Canyon in the City of San Diego. Field inspection of outcrops of the Santiago Peak Volcanics indicated that only metavolcanic rocks occur in the project area.

Site Specific Assessment:
Because the outcrops of the Santiago Peak Volcanics within the study area consist of exposures of metavolcanic rock, this rock unit has been assigned a zero paleontological resource sensitivity.

Otay Formation (To and Tof)
Description:
The sedimentary rocks underlying the majority of the project area have been mapped by Tan and Kennedy (2002) as fluvial and alluvial fan strata of the Oligocene-age Otay Formation. The Otay Formation in this area is correlative with the Arikareean North American Land Mammal Age and has been radiometrically dated at approximately 29 Ma. The formation has been divided into three members by Walsh and Deméré (1991) who recognize a basal angular conglomerate (fanglomerate) member, a middle gritstone member, and an upper sandstone-mudstone member. Typical exposures of the upper member consist of gray-white, medium-grained, tuffaceous sandstone, with interbeds of brown and red-brown claystones and white bentonite layers (Walsh and Deméré, 1991). The middle member consists of interbedded coarse-grained sandstones and angular gravels (gritstone). The lower member is a poorly-sorted, cobble to boulder fanglomerate (Tof of Tan and Kennedy, 2002; Figure 1). In general the formation becomes finer grained from bottom to top with the basal angular conglomerate member grading upward and westward into the gritstone member, which in turn grades upward and westward into the sandstone-mudstone member. Taken together, the Otay Formation may be as much as 400 feet thick, but at any one location the formation is typically less than 120 feet thick.

During the pedestrian survey, good exposures of the Otay Formation, specifically the gritstone member, were observed in the east-central portion of the project site (Figure 3). In this location, the sedimentary rocks are light brown, coarse-grained, poorly-sorted sandstone, characteristic of the middle gritstone member of the Otay Formation (Figure 4). Based on the mapped geological units and the pedestrian survey, it is likely that potentially fossiliferous deposits of the Otay Formation underlie the majority of the project area, as well as portions of the proposed offsite trails and utility corridors (Figure 1).

Paleontology:
Numerous fossil localities have been discovered in the gritstone member of the Otay Formation in the Chula Vista and Otay Mesa areas of southwestern San Diego County. These localities have produced well-preserved remains of a diverse assemblage of terrestrial vertebrates which includes tortoises, lizards, snakes, birds, shrews, rodents, rabbits, dogs, foxes, cat-like nimravids, rhinoceros, camels, mouse-deer, and oreodonts. Based on these fossil discoveries, the Otay Formation is now considered to be the richest source of late Oligocene terrestrial vertebrates in California (Deméré, 1988; Walsh and Deméré, 1991).

Site Specific Assessment:
Because of its paleontological richness, the Otay Formation is assigned a high paleontological resource sensitivity.

Figure 4. Artificial outcrop of the gritstone member of the Otay Formation along the aqueduct alignment in the east central portion of Parcel B - Village 8 West. Overlying the Otay Formation is a foot or more of topsoil and tilled ground surface.

Figure 5. Close-up of outcrop of the gritstone member of the Otay Formation, located in the artificial outcrop shown in Figure 4.

Quaternary alluvial and terrace deposits (Qoa)

Description:

Younger Quaternary alluvial and terrace deposits occur in the southeastern of the project site, as well as portions of the proposed offsite trails and utility corridors (Figure 1). These sediments consist of moderately- to poorly-consolidated deposits of "gravel, sand, silt, and clay" (Tan and Kennedy, 2002) and were deposited by a Pleistocene-age proto-Otay River.

Paleontology:

No fossils are known from the Quaternary alluvial and terrace deposits in the immediate project area. However, significant Pleistocene land mammal fossils have been found in similar deposits throughout coastal San Diego County, including sites in the Sweetwater River Valley (Majors, 1993). It is likely that undisturbed portions of these potentially fossilferous deposits will yield at least some significant Ice Age fossil specimens.

Site Specific Assessment:

Although disturbed at the surface of the project site by agricultural activities, the deeper, undisturbed portions of Quaternary alluvial and terrace deposits are assigned a high paleontological resource sensitivity.

Figure 6. View north from the southeastern portion of Parcel B - Village 8 West of outcrop of poorly consolidated, coarse-grained Quaternary alluvial and terrace deposits.

<u>*Holocene alluvial deposits* (Qya)</u>
Description:
Surface deposits within the project site consist of "unconsolidated to poorly consolidated silt, clay, sand and gravel" and include "modern active sediments along small drainage channels" (Tan and Kennedy, 2002). These deposits are Holocene in age (11,000 years ago to present; Tan and Kennedy, 2002) and are associated with locally derived ephemeral stream drainages.

Paleontology:
The Holocene age of these deposits indicates they are too young to contain true fossil remains or traces. Consequently, they do not represent significant paleontological resources.

Site Specific Assessment:
Holocene alluvial deposits are only mapped in the southern most region of the offsite improvement area, in the Otay River Valley (Figure 1). Based on its post-Pleistocene age, Holocene alluvial deposits are assigned a low paleontological resource sensitivity.

Results of Record Search
Eight previously recorded fossil collecting localities are documented in records housed at SDNHM. All of these localities occur within a half mile or less of Parcel B - Village 8 West (Appendix) and were discovered in sedimentary deposits of the Oligocene-age Otay Formation during paleontological monitoring of construction projects.

The eight localities were all discovered within the Otay Formation, to the north and east of Parcel B - Village 8 West. Two of the eight localities were collected from the fluvial gritstone member of the Otay Formation during excavation for the SR 125 toll road. Fossils recovered from the eight localities mentioned above included *Hypertragulus* sp. (extinct deer-like mammal), *Mesoreodon* sp. and *Sespia californica* (extinct oreodonts), *Hesperocyon* sp. and *Leptocyon* sp. (extinct members of the modern day dog family, Canidae), *Archaeolagus* sp. and *Paleolagus* sp. (extinct rabbit relatives), *Capacikala gradatus* (extinct beaver relative), heliscomyid rodents, squamates (e.g., lizards and snakes), and the very rare discovery of fossilized eggshell found during grading at the Otay Ranch Village 7 project site to the north (SDSNH Localities 5679, 5697-5700, 5703, 5705, and 5946; Deméré, 2006; Korth, 1994; Appendix).

<u>IMPACT ANALYSIS</u>

INTRODUCTION

Direct impacts to paleontological resources occur when earthwork activities, such as mass grading operations or trenching activities associated with the proposed off-site improvements, cut into the geological deposits (formations) within which fossils are buried. These direct impacts have the potential to destroy fossilized remains. Since fossils are the remains of prehistoric animal and plant life, they are considered to be nonrenewable. Such impacts can be significant and, under CEQA guidelines, require mitigation.

Impacts to paleontological resources are typically rated from high to zero depending upon the resource sensitivity of impacted formations.

High significance
Impacts to high sensitivity formations (Otay Formation and Quaternary alluvial and terrace deposits). This includes excavation for proposed offsite improvements (e.g., storm drain and sewer trenching) that will extend beyond the southern project boundary.

Moderate significance
Impacts to moderate sensitivity formations (none within the project site).

Low significance
Impacts to low sensitivity formations (Holocene alluvial deposits). This includes excavation for proposed offsite improvements that will extend beyond the southern project boundary.

Zero significance
Impacts to formations with no fossil potential (Santiago Peak Volcanics).

SITE SPECIFIC IMPACTS

Santiago Peak Volcanics
Preliminary grading plans for the project site indicate that the metavolcanic bedrock of the Santiago Peak Volcanics will be impacted during excavations in the southwestern portion of the project site.

Otay Formation
The majority of the project site is underlain by the highly fossiliferous Otay Formation Preliminary grading plans suggest that this sedimentary rock unit will be impacted by mass grading activities, especially in the northeastern and southeastern portions. In addition, construction of proposed offsite trails and utility corridors south of the project site has the potential to also impact the Otay Formation (including rocks mapped as Tof by Tan and Kennedy, 2002).

Quaternary alluvial and terrace deposits
Potentially fossilferous Quaternary alluvial and terrace deposits occur in the southeastern portion of the project site. Preliminary grading plans suggest that these sedimentary deposits will be impacted by mass grading activities. In addition, construction of proposed offsite trails and utility corridors south of the project site has the potential to also impact the Quaternary alluvial and terrace deposits.

Holocene alluvial deposits
Construction of proposed offsite facilities south of the project site are underlain by modern alluvium.

MITIGATION MEASURES

- Prior to the issuance of grading permits, the Applicant shall provide written confirmation to the City that a qualified paleontologist has been retained to carry out an appropriate mitigation program. (A qualified paleontologist is defined as an individual with an M.S. or Ph.D. in paleontology or geology who is familiar with paleontological procedures and techniques). A pre grade meeting shall be held among the paleontologist and the grading and excavation contractors.

- A paleontological monitor shall be onsite at all times during the original cutting of previously undisturbed sediments of highly sensitive geologic formations (i.e., Otay Formation and Quaternary alluvial and terrace deposits) to inspect cuts for contained fossils. (A paleontological monitor is defined as an individual who has experience in the collection and salvage of fossil materials.) The paleontological monitor shall work under the direction of a qualified paleontologist. The monitor shall be onsite on at least a half-time basis during the original cutting of previously undisturbed sediments of moderately sensitive geologic formations (e.g., unnamed river terrace deposits and the Mission Valley Formation) to inspect cuts for contained fossils. However, neither of these rock units have been mapped within the project site and are therefore not anticipated to be impacted during construction.

  - The monitor shall be onsite on at least a quarter-time basis during the original cutting of previously undisturbed sediments of low sensitivity geologic formations (e.g., Lindavista Formation and Santiago Peak Volcanics [metasedimentary portion only] to inspect cuts for contained fossils. However, these deposits have not been mapped within the project site and are therefore not anticipated to be impacted during construction. The monitor shall periodically (every several weeks) inspect original cuts in deposits with an unknown resource sensitivity (i.e., Quaternary alluvium).

  - In the event that fossils are discovered in unknown, low, or moderately sensitive formations, the Applicant shall increase the per-day field monitoring time. Conversely, if fossils are not discovered, the monitoring, at the discretion of the City's Deputy City Manager/Development Services Director or its designee, shall be reduced. A paleontological monitor is not needed during grading of rocks with no resource sensitivity (i.e., Santiago Peak Volcanics, metavolcanic portion).

- When fossils are discovered, the paleontologist (or paleontological monitor) shall recover them. In most cases, this fossil salvage can be completed in a short period of time. However, some fossil specimens (such as a complete whale skeleton) may require an extended salvage time. In these instances, the paleontologist (or paleontological monitor) shall be allowed to temporarily direct, divert, or halt grading to allow recovery of fossil remains in a timely manner. Because of the potential for the recovery of small fossil remains such as isolated mammal teeth, it may be necessary in certain instances and at the discretion of the paleontological monitor to set up a screen-washing operation on the site.

- Prepared fossils along with copies of all pertinent field notes, photos, and maps shall be deposited in a scientific institution with paleontological collections such as the San Diego Natural History Museum. A final summary report shall be completed. This report shall include discussions of the methods used, stratigraphy exposed, fossils collected, and significance of recovered fossils.

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APPENDIX

NUMBER	---LOCALITY NAME AND GEOGRAPHIC LOCATION---	----------ROCK AND TIME UNITS-ROCK TYPE-FIELD NOTES----------	-----------COLLECTORS-COMPILED BY-ENTERED BY-DONOR-----------
5679	McMillin Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'45"N--116°58'17"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial PJS book 4, pg 17, 18, 22	P.J. Sena 30 Mar 2005 P.J. Sena 23 Aug 2005 K.A. Randall 27 Sep 2005 McMillin Land Development 30 Mar 2005
5697	Otay Ranch Village 7 - Micro Site Chula Vista San Diego Co. CA USA 32°36'53"N--116°58'42"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation sandstone-mudstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial BOR #30, pgs 39-41, PJS #4, pgs 55-60	P.J. Sena, B.O. Riey, C.M. Redman 8 Sep 2005 P.J. Sena 16 Dec 2005 K.A. Randall 20 Jun 2006 The Otay Ranch Company 8 Sep 2005
5698	Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'42"N--116°58'42"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation gritstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial BOR book #29, pgs 128 & 149, book #30 pgs 5 & 41	B.O. Riney 17 Jun 2006 B.O. Riney 8 Jul 2005 K.A. Randall 29 Jun 2006 The Otay Ranch Company 17 Jun 2006
5699	Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'56"N--116°58'44"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation sandstone-mudstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial PJS book # 4, pgs 22, 56-57, BOR book #30, pg 41	B.O. Riney, P.J. Sena 12 Sep 2005 B.O. Riney 8 Jul 2005 K.A. Randall 29 Jun 2006 The Otay Ranch Company 12 Sep 2005
5700	Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'55"N--116°58'42"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation sandstone-mudstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial BOR book #30, pg 41, PJS book 4, pgs 52 & 54	B.O. Riney, P.J. Sena 30 Aug 2005 P.J. Sena 15 Dec 2005 K.A. Randall 29 Jun 2006 The Otay Ranch Company 30 Aug 2005
5703	Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'56"N--116°58'42"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation sandstone-mudstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial PJS book 4, pgs 55 & 58, BOR book 30 pg 41	P.J. Sena 6 Sep 2005 K.A. Randall 1 Jun 2006 K.A. Randall 29 Jun 2006 The Otay Ranch Company 15 Sep 2005
5705	Otay Ranch Village 7 Chula Vista San Diego Co. CA USA 32°36'29"N--116°59' 5"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation sandstone-mudstone member Cenozoic Paleogene late Oligocene early Arikareean sdst-fluvial PJS book #4, pgs 43-45	P.J. Sena 5 Aug 2005 P.J. Sena 15 Dec 2005 K.A. Randall 29 Jun 2006 The Otay Ranch Company 5 Aug 2005
5946	SR 125 Toll Road Chula Visa San Diego Co. CA USA 32°36' 9"N--116°57'48"W Otay Mesa, CA 1:24000 USGS 1955(1971)	Otay Formation gritstone member Cenozoic Paleogene late Oligocene early Arikareean gritstone-fluvial RAC book 38 pg 34	R.A. Cerutti 8 Jun 2005 P.J. Sena 3 Oct 2006 K.A. Randall 18 Jan 2006 Otay River Constructors 8 Jun 2005