4.0 ENVIRONMENTAL IMPACT ANALYSIS

This section discusses the possible environmental effects of the proposed project for the issue areas that were identified as having the potential to experience significant impacts. "Significant effect" is defined by Section 15382 of the *State CEQA Guidelines* as "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. An economic or social change by itself shall not be considered a significant effect on the environment, but may be considered in determining whether the physical change is significant."

The assessment of each issue area begins with a description of the current setting for the issue area being analyzed, followed by an analysis of the project's effect within that issue area. The first subsection of the impact analysis identifies the methodologies used and the "significance thresholds," which are those criteria adopted by the City, other agencies, universally recognized, or developed specifically for this analysis to determine whether potential effects are significant. The next subsection describes each impact of the proposed project, mitigation measures for significant impacts, and the level of significance after mitigation. Each effect under consideration for an issue area is separately listed in bold text, with the discussion of the effect and its significance following. Each bolded impact listing also contains a statement of the significance determination for the environmental impact as follows:

> ***Class I, Significant and Unavoidable:*** *An impact that cannot be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires a Statement of Overriding Considerations to be issued if the project is approved per §15093 of the State CEQA Guidelines.*
>
> ***Class II, Significant but Mitigable:*** *An impact that can be reduced to below the threshold level given reasonably available and feasible mitigation measures. Such an impact requires findings to be made under §15091 of the State CEQA Guidelines.*
>
> ***Class III, Not Significant:*** *An impact that may be adverse, but does not exceed the threshold levels and does not require mitigation measures. However, mitigation measures that could further lessen the environmental effect may be suggested if readily available and easily achievable.*
>
> ***Class IV, No Impact or Beneficial:*** *An effect that would reduce existing environmental problems or hazards or no change in environmental conditions would occur.*

In addition to the impacts listed above, significant positive impacts are also noted in the documentation. Following each environmental effect discussion is a listing of recommended mitigation measures (if required) and the residual effects or level of significance remaining after implementation of the measures. In cases where the mitigation measure for an impact could have a significant environmental impact in another issue area, this impact is discussed as a residual effect. The impact analysis concludes with a discussion of cumulative effects, which evaluates the impacts associated with the proposed project in conjunction with other future development in the area.

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4.1 AESTHETICS

This section evaluates impacts to aesthetic conditions on and around the project site. Impacts to view corridors, scenic resources, the aesthetic character of the site and surrounding area, and light and glare conditions are addressed.

4.1.1 Setting

a. Visual Character of the Project Site and Surrounding Area. The Zone 2 Landslide Moratorium Ordinance Revisions project area encompasses approximately 112 acres north of the intersection of Palos Verdes Drive South and Narcissa Drive within the Portuguese Bend community in the City of Rancho Palos Verdes. This area, located on the hills above the south-central coastline of the City, is within the City's larger (approximately 1,200-acre) Landslide Moratorium Area (LMA). Of the 111 lots within Zone 2, 64 are developed with residences and accessory structures, and 47 are undeveloped parcels or parcels developed with structures other than residences. Of the undeveloped Zone 2 lots, those in the southern and eastern portion of the project area are generally interspersed among the developed parcels, while those in the northern and western portion of the project area are generally in groups along Narcissa Drive, Plumtree Road and Cinnamon Lane, as shown in Figure 2-2, Site Area, in Section 2.0 *Project Description*.

Lots within the Portuguese Bend community are generally ¼-acre to one or more acres in size. Developed lots contain mainly one-story single-family homes constructed in the 1950s and 1960s that generally range from approximately 1,200 square feet to 3,500 square feet in size. Many lots also contain accessory structures including equestrian facilities. Vacant lots within the project area are characterized by highly variable topography ranging from relatively flat to steeply sloping land, vegetated with scrub, grasses, and trees, most of which are pepper, eucalyptus, pine and other ornamental trees and, in some cases, accessory structures and equestrian facilities. Structural development on underdeveloped lots is mostly limited to small, non-habitable structures (e.g., sheds, stables, corrals) for equestrian or horticultural uses. The community is connected through several winding, two-lane private roads maintained by the Portuguese Bend community. The overall visual character and scenic quality of the project area are defined primarily by its varied topography, mature trees and vegetation, and small rock outcroppings. Figure 2-3 (a-c) in Section 2.0 *Project Description* illustrates representative existing visual conditions on several developed and undeveloped lots in the project area.

b. Public and Private Views. Due to the varying topography, intervening vegetation and winding street layout, views of individual lots within the project area are limited from most perspectives. There are no state designated scenic roadways in the vicinity of the project site. Of the nearest public roadways, the City's 1975 General Plan (see Figure 41, Visual Aspects, on Page 189) designates Palos Verdes Drive South, Hawthorne Boulevard and Crest Drive as vehicular view corridors. The project area is generally obscured from views from Palos Verdes Drive South, located one quarter-mile downslope from the southern project boundary, by sloping hills of vegetated open space and single family houses. Public views of portions of the project area are visible from Hawthorne Boulevard, Crest Road and Del Cerro Park, located approximately one half-mile from the northern project boundary, and from the Palos Verdes Loop Trail. Views of the project site from these locations consist primarily of

existing single-family residences amid native and non-native vegetation. Figure 4.1-1 shows existing public views of the project site from these locations.

Lots within the project area are visible from a number of other private properties within the community. These private views are primarily limited to properties adjacent to those that would be affected by the ordinance revisions due to the winding roads, varying topography and mature vegetation. Views of portions of the project area are also visible from the Portuguese Bend Residential Community Trail System. These existing and proposed trails are collector and radial trails of the larger Palos Verdes Trail Loop and Top-of-the-Hill Trail System. This extensive public trails system spans the Palos Verdes peninsula and is outlined in the City's 1993 Conceptual Trails Plan.

c. Light and Glare. Existing lighting in the project area is limited. Primary nighttime lighting sources include the headlights of cars traveling along the communities' private roads, residential outdoor lighting (e.g. porch lights, security lights, landscaping accent lights), and light emanating from the residence interiors within the project area. Some daytime glare is generated by light-colored building materials and windows of existing single-family residences and accessory structures, and by cars traveling or parked along private roads.

Land uses in the vicinity that would be most sensitive to night lighting are the residences located within the project area and residences, public roads and parks on the hillsides above the site to the north. Figure 2-2 in Section 2.0 *Project Description* shows an aerial view of adjacent land uses.

d. Regulatory Setting. The City of Rancho Palos Verdes General Plan and Municipal Zoning Code include a number of goals, policies and regulations intended to protect and enhance the aesthetic resources and visual character of the City. Selected policies and regulations that are applicable to the project's potential visual and aesthetic impacts are discussed below.

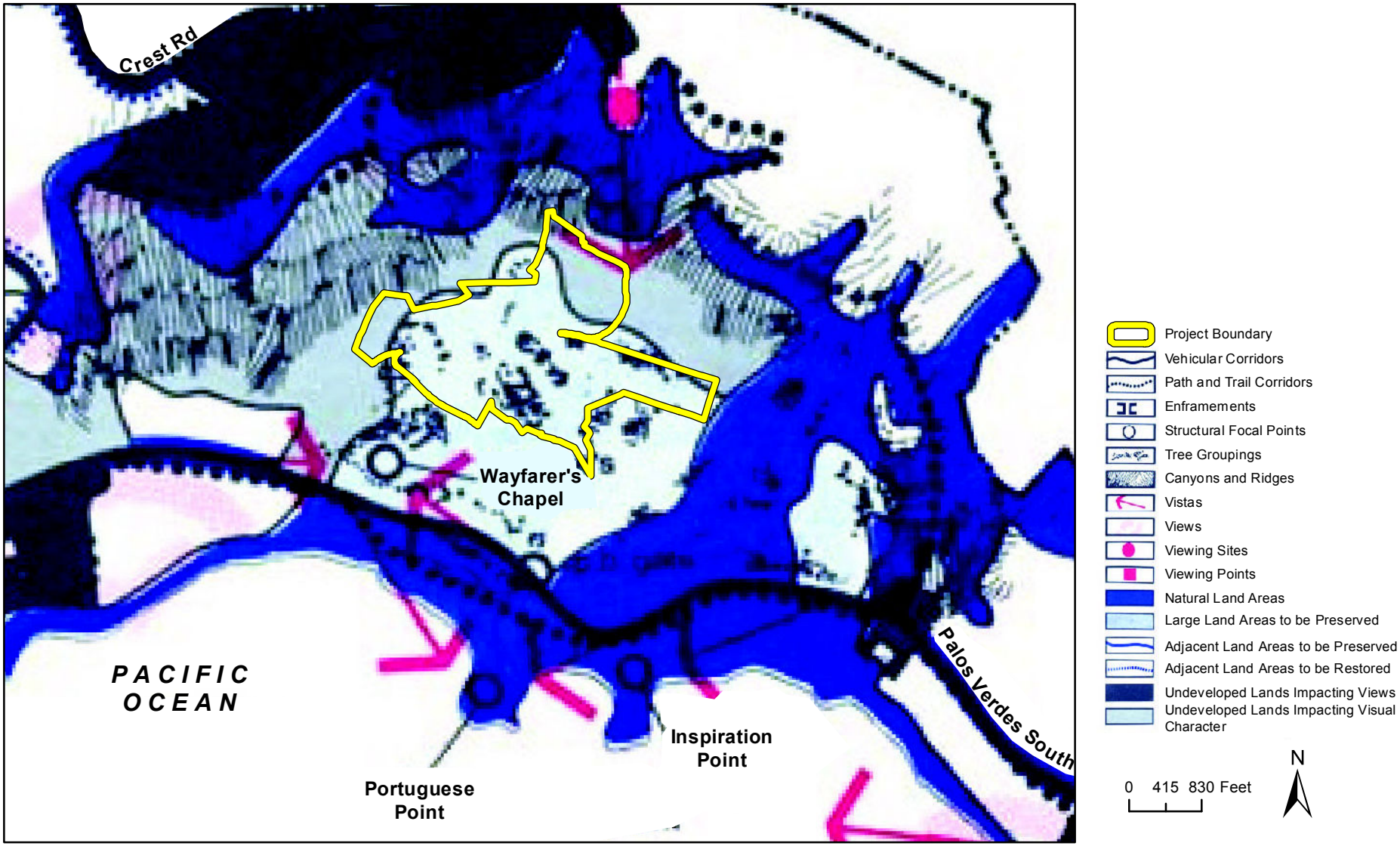
General Plan. The "Visual Aspects of the Plan" section of the City of Rancho Palos Verdes General Plan (1975) generally describes visual and aesthetic resources in the City and sets forth policies calling for the "preservation, restoration, and enhancement of significant visual aspects related to Rancho Palos Verdes" (General Plan Page 188). The Visual Aspects map (General Plan Figure 41) identifies the project area as containing portions of "Natural Land Areas" and "Undeveloped Areas Affecting Visual Character and Views." Natural Areas are defined as "[m]ajor natural areas which will be preserved and viewed from corridors…These natural features provide viewers with a feeling for the rural atmosphere in the City." Undeveloped Areas are defined as "areas to be urbanized which impact the visual character of the corridor… or corridor-related views." Vistas are indicated on the Visual Aspects map toward the Pacific Ocean from areas north and upslope of the project area. The City's General Plan also identifies several significant tree groupings within the project area as well as the major canyons and ridges along the northern boundary of the project area as "natural focal points of interest" within Rancho Palos Verdes. These features from the Visual Aspects map are shown on Figure 4.1-2.

Photo 1 - View toward the project area looking south and downslope from public viewpoints to the north.

Photo 2 - View toward the project area looking south and downslope from public viewpoints to the north.

Public Views of the Project Area

Figure 4.1-1



Basemap Source: Rancho Palos Verdes General Plan.

General Plan "Visual Aspects"
for the Project Area

Figure 4.1-2

The following selected policies related to aesthetics and visual resources may be considered applicable to the project area:

> ***Policy 2.*** *Enhance views and vistas where appropriate through various visual accents.*
>
> ***Policy 3.*** *Preserve and enhance existing positive visual elements, while restoring those which are lacking in their present visual quality.*
>
> ***Policy 7.*** *Require developers, as developments are proposed within areas which impact the visual character of a corridor, to address treatments to be incorporated into their projects, which enhance a corridor's imagery.*
>
> ***Policy 8.*** *Require developments within areas which will impact corridor-related views to fully analyze project impacts in relation to corridors in order to mitigate their impact.*
>
> ***Policy 9.*** *Require developments which lie between natural areas to be maintained and viewing corridors to show how they intend to mitigate view disruption.*
>
> ***Policy 10.*** *Develop a program for the restoration of existing areas, which negatively impact view corridors through the urban design element (e.g., landscaping and under grounding).*

Rancho Palos Verdes Municipal Code. Among other provisions of the Municipal Code related to land development, the project would be required to adhere to zoning regulations that restrict the allowed height, setback, lot coverage, and grading limits of structural development within the Residential (one and two acres zoning) District, including the following from Municipal Code Section 17.02.030:

> *A. Building Height. Maximum building height of 16 feet for residences and 12 feet for detached accessory structures. Height variation permits for structures not exceeding twenty-six feet may be granted for uphill or downhill sloping lots.*
>
> *B. Setbacks for Sloping Lots. Minimum front setbacks of 20 feet, minimum rear setbacks of 15 feet, minimum street-side setbacks of 10 feet, and minimum interior side setbacks of five feet, with setbacks along private street rights-of-way measured from the easement line rather than the property line.*
>
> *C. Lot Coverage. Maximum 25% (RS-1) or 40% (RS-2) net lot coverage.*
>
> *D. Grading and Fill. Less than 1,000 cubic yards of grading (cut and fill combined) per lot, with no more than 50 cubic yards of imported fill per lot.*

Section 17.56.030 of the City of Rancho Palos Verdes Municipal Code provides standards for outdoor lighting:

> *No outdoor lighting shall hereafter be installed or used in the single-family residential (RS) or multiple-family residential (RM) zones, except in accordance with the provisions of this section.*

A. No outdoor lighting shall be permitted where the light source is directed toward or results in direct illumination of a parcel of property or properties other than that upon which such light source is physically located. Individual, non-reflector, incandescent light bulbs, not exceeding one hundred fifty watts each, or an aggregate of one thousand watts for each lot or parcel shall be permitted. On lots exceeding fifteen thousand square feet, an additional one hundred watts in the aggregate shall be permitted for each one thousand five hundred square feet of area or major fraction thereof, by which the lot or parcel exceeds fifteen thousand square feet; provided, that in no event shall the aggregate exceed two thousand watts. Wattage for non-incandescent lighting shall be calculated using the multiplier values described in Section 17.56.040(A) of this chapter.

B. No outdoor lighting shall be permitted where the light source or fixture, if located on a building, above the line of the eaves, or if located on a standard or pole, more than ten feet above grade.

C. Notwithstanding the requirements of this section, outdoor lighting may be installed and used in a manner not permitted by this section upon the issuance of a conditional use permit pursuant to Chapter 17.60 (Conditional Use Permits).

Section 17.54 of the City of Rancho Palos Verdes Municipal Code provides standards for undergrounding of utilities, screening of mechanical equipment, and trash receptacle enclosures. The purpose of the regulations are to ensure "that, in conjunction with new developments, all utility service lines are placed underground and that certain areas and types of equipment are screened from public view. The provisions of this chapter are deemed necessary for the protection of property values and the general welfare."

The General Plan Safety Element and Municipal Code Section 8.08.010 also provide guidelines for fire protection, and indicate that the City of Rancho Palos Verdes adheres to the standards set forth in the County of Los Angeles Fire Code and Uniform Building Codes. These codes outline construction and design provisions, as well as fuel modification plan requirements that could affect visual resources and would apply to any new development that could result from the proposed ordinance revisions.

4.1.2 Impact Analysis

a. Methodology and Significance Thresholds. Different viewers react to views and aesthetic conditions differently. Consequently, the assessment of aesthetic impacts is inherently subjective in nature. This evaluation measures the existing visual resource against the proposed actions, analyzing the nature of the anticipated change.

An aesthetic impact is considered significant if the project would:

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

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

Although this analysis considers potential impacts to both public and private views, it should be noted that changes to private views generally are not considered significant unless a substantial number of private views are affected. Public views are those that can be seen from vantage points that are publicly accessible, such as public streets, freeways, parks, and vista points. These views are generally available to a greater number of persons than are private views. Private views are those that can be seen from vantage points located on private property and private roads.

b. Project Impacts and Mitigation Measures

Impact AES-1 The project area is located within a scenic public viewshed of the Pacific Ocean and the Palos Verdes hillsides and coastline. Individual lots and some private roads within the project area also have views of the ocean, hillsides and open space. However, because the lots where development could be facilitated by the proposed ordinance revisions are located within a private community consisting of highly variable topography and substantial tree cover, the potential development of up to 47 new single-family residences would not have a substantial adverse effect on a scenic vista. This is a Class III *less than significant* impact.

The proposed Zone 2 Landslide Moratorium Ordinance revisions would apply to a project area located within the Portuguese Bend community, an area near the scenic Rancho Palos Verdes coast. There are no public views from within the project area because the roads serving the area are private roads accessible only by residents and their guests through locked gates. Limited public views of the project area are available from public roads and parks to the north and from the public trails along the hillsides to the north and east of the site. Private views of and through the site are available from existing residences and roads within the community, as well as from individual residential properties to the north of the site on the hillsides overlooking the coast. Figures 2-2 and 2-3 in Section 2.0 *Project Description* and Figure 4.1-1 above show existing conditions at the project site and views of and through the site.

Public Views. As noted above under *Setting*, the primary public viewpoints offering views of the project area are from Hawthorne Boulevard, Del Cerro Park, and the hillside trails to the north of the Portuguese Bend community. Representative views as seen from Hawthorne Boulevard and Del Cerro Park are shown on Figure 4.1-1. Driving east or west along Hawthorne Boulevard, all or part of the project area is often obscured by variable topography or vegetation; however, views of the Pacific Ocean and Rancho Palos Verdes coastline are more fully visible over the site and vegetation. When the site is visible, it appears as individual structures interspersed with areas of open spaces of scattered vegetation, and the coastal bluffs and ocean beyond, as illustrated in Figure 2-2 in Section 2.0 *Project Description* and Figure 4.1-1. Scenic features available from the north include the ocean, the sky, mature vegetation, and the hillsides sloping down towards the coastline. On clear days and depending

on the view angle, the Malibu coastline to the northwest or Santa Catalina Island to the south may also be visible in the farther distance.

The potential development of 47 single-family residences with Zone 2 could slightly alter the foreground view of the project area from the public roads, parks and surrounding trails to the north. However, as indicated by observations from points along Hawthorne Boulevard north of the site, the proposed project area is substantially lower in elevation. Due to this varying topography and down sloping elevation, development that could result from the proposed ordinance revisions would not block any scenic views, including views of the ocean, coastline, islands, and hillsides currently available from these public viewpoints. This would be further ensured by residential zoning height limitations set forth in Municipal Code Section 17.02.030 applying to any development that may be approved following the proposed ordinance revisions. The project area itself as seen from the public viewpoints listed above would change incrementally with removal of vegetation and new construction on individual lots throughout Zone 2. However, the visual character would remain generally the same, as the existing land use pattern of medium to large-lot residential development, as well as the existing topography and overall vegetation pattern, would be maintained. Thus, view impacts from these vantage points would be less than significant.

Private Views. As noted above, the primary private viewpoints offering views through the project site are the residences and roads directly adjacent to the 47 individual undeveloped and underdeveloped lots within the project area. These residences have a varying degree of views of and through the affected lots, depending on the specific topography of the properties and the height and density of vegetation on and adjacent to the lots.

Similar to the diversity of specific views from these homes, project implementation would affect their existing views in a range of ways and degrees. For several of these residences, portions of ocean and hillside views could be partially obstructed by development on adjacent properties. However, it is unlikely that these private views would be fully obstructed by development resulting from the proposed ordinance revisions. Full or partial views of the hillsides, coastline, or ocean would remain for the majority of existing lots, so that a substantial adverse effect on a scenic vista would not occur.

There are two important considerations to factor into the determination of the level of impacts to private views from development resulting from the proposed ordinance revisions. First, each residence developed within the project area will be required to adhere to architectural standards developed by the Portuguese Bend Community Association and the lot coverage, and height and grading limits allowed for areas zoned RS-1 and RS-1 per Municipal Code Section 17.02.030. Additionally, the design and size of new development that could be facilitated by the proposed ordinance revisions would be required to maintain consistency with the existing neighborhood character pursuant to the Section 17.02.030 (see Mitigation Measure AES-2 below in Impact AES-3), which requires that new residences "shall be compatible with the character of the immediate neighborhood." In accordance with these standards, future Zone 2 development resulting from the proposed ordinance revisions is expected to consist of:

- Single-story, ranch-style residences with attached or detached three-car garages, with minimum living area of 1,500 square feet and maximum living area of 4,000 square feet or 15% of gross lot area, whichever is less;

- Less than 1,000 cubic yards of grading (cut and fill combined) per lot, with no more than 50 cubic yards of imported fill per lot;
- Maximum 25% (RS-1) or 40% (RS-2) net lot coverage;
- Maximum building height of 16 feet for residences and 12 feet for detached accessory structures;
- Minimum front setbacks of 20 feet, minimum rear setbacks of 15 feet, minimum street-side setbacks of 10 feet, and minimum interior side setbacks of five feet, with setbacks along private street rights-of-way measured from the easement line rather than the property line; and,
- No subdivision of existing lots within Zone 2.

Second, in CEQA analysis impacts to private views are not typically considered significant unless the number of properties significantly affected is relatively high. As noted by the California Court of Appeal in *Ocean View Homeowners Assn., Inc. v. Montecito Water District (*116 Cal. App. 4th 396), "[t]hat a project affects only a few private views may be a factor in determining whether the impact is significant." Due to the varying topography, intervening vegetation, and existing single-family residences, private scenic views from within the project area are limited and visual changes will be isolated. Further, the 16 foot height limit is intended to be consistent with the height of existing structures within the surrounding area. Therefore, although the City acknowledges that some homeowners may experience adverse interference with a portion of their private views, the impact is not significant for purposes of the CEQA analysis.

Mitigation Measures**.** None required.

Significance After Mitigation**.** Impacts to scenic vistas would be less than significant without mitigation.

Impact AES-2 Parcels within Zone 2 contain vegetation of varying types and densities, and the development of residences on up to 47 undeveloped and underdeveloped private lots within the project area would likely result in the removal of mature trees and vegetation. As tree groupings within the project area have been identified as scenic resources in the General Plan, impacts would be Class II, *significant but mitigable*.

The proposed Landslide Moratorium Ordinance revisions would apply to 47 of the 111 Zone 2 lots located within the Portuguese Bend community of the City of Rancho Palos Verdes. As stated above, there are no public views from within the project area. Nor are there existing views of the project area from a designated state scenic highway. Public viewsheds of the site are limited to public roads and parks to the north, and from the public trails along the hillsides to the north and east of the site. Private views of the site are available from existing residences and roads within the community, as well as from residential properties on the hillsides to the north of the site.

Scenic Resources. As illustrated in the aerial view provided as Figure 2-2 in Section 2.0 *Project Description*, individual lots within the 112-acre project area contain vegetation of varying types and densities. Both native and non-native trees and vegetation exist on the vast majority

of the 64 developed parcels. Existing vegetation on the 47 undeveloped lots range from sparsely vegetated with non-native grasses to densely vegetated with mature tree stands.

As indicated in Section 4.3 *Cultural Resources*, there are no registered historic buildings identified within the project area. While there are small existing rock outcroppings on hillside slopes located throughout the area, the project site contains no other scenic resources, such as prominent rock outcroppings, that could be substantially damaged with the development of 47 residences on undeveloped Zone 2 lots. Additionally, there are no designated or proposed state scenic highways in close proximity to the project area.

Development of up to 47 residences may necessitate the removal or alteration of existing mature trees and vegetation for the purposes of construction and fire protection through fuel modification. As noted above under Setting, tree groupings within the project area are identified as scenic resources in the General Plan. Tree removal associated with potential development that could be facilitated by the proposed ordinance revisions within or adjacent to the identified tree groupings would be a potentially significant impact to scenic resources.

Mitigation Measures**.** The following measure would reduce impacts to scenic resources to a less than significant level.

AES-2 As part of approvals for development on the individual subject lots, the City shall require that future development on the affected lots avoid removal of or substantial damage to existing trees to the extent feasible. Where tree removal or substantial damage cannot be feasibly avoided during development, tree replacement shall be required using a ratio, stock, species and monitoring requirements sufficient to ensure a minimum 1:1 replacement five or more years after removal. When selecting replacement tree species, consideration should be given to species that, as they grow to full stature, would be less likely to result in obstruction of views for adjacent properties.

Significance After Mitigation. Implementation of the above mitigation measure would reduce impacts to a less than significant level.

Impact AES-3 **The potential development of additional residences within the Zone 2 project area would introduce new structures and new landscaping and hardscape on up to 47 open and mostly undeveloped sites throughout the Portuguese Bend community. This would incrementally increase the density of development throughout the 112-acre project area. Although the general land use pattern and scale and type of development would be maintained, impacts to the existing visual character and quality of the project area and its surroundings would be Class II, *significant but mitigable*.**

The existing visual character of the 112-acre project site is defined by the existing single-family residences, vegetation and open spaces amidst highly variable topography. Lots within the Portuguese Bend community are generally ¼ acre to 1 or more acres in size. Developed lots

contain mainly one-story single-family houses constructed in the 1950s and 1960s that range from approximately 1,200 square feet to 3,500 square feet. Undeveloped vacant lots within the project area are characterized by highly variable topography ranging from relatively flat to steeply sloping land, and are vegetated with scrub, grasses, and mature trees of varying densities. Due to its sloping vegetated hillsides, open spaces, bucolic feel and varied scales and styles of residential development, the visual character of the project area is of high quality. Existing conditions are shown in Figure 2-3 (a-c) in Section 2.0 *Project Description* and Figure 4.1-1.

The proposed Landslide Moratorium Ordinance revisions would result in the alteration of the visual character of the individual undeveloped lots and the project area as a whole by permitting individual property owners to apply for individual entitlements to develop their lots. This would increase the density of development within the 112-acre project area from 64 single-family residences and associated accessory structures to up to 111 single-family residences and associated accessory structures. New residences facilitated by the ordinance revisions would be located on up to 47 lots dispersed through the project area, with the greatest change to visual character affecting areas in the northern and western portion of the project where affected lots are more generally concentrated in groups. These groups are mostly located along the western extent of Narcissa Drive; the east side of Plumtree Road; and the northern extent of Cinnamon Lane, as shown on Figure 2-2 in Section 2.0 *Project Description*. In addition to the new structural development, the project would introduce formal landscaping, hardscaping, and fuel modification to parcels within the project area, which are currently vegetated with grasses, trees and brush. This is a potentially significant impact.

Mitigation Measures**.** The following mitigation measure is designed to ensure that new residences would be consistent with the surrounding neighborhood by adhering to the residential building standards set forth by the Portuguese Bend Community Association and Municipal Code Section 17.02.030, in addition to the code's requirement that new residences "shall be compatible with the character of the immediate neighborhood."

AES-3 **Compatibility Analysis.** All new residences shall be subject to neighborhood compatibility analysis under the provisions of Section 17.02.030.B (Neighborhood Compatibility) of the Rancho Palos Verdes Municipal Code.

Significance After Mitigation**.** Impacts to the existing visual character would be reduced to a less than significant with incorporation of Mitigation Measure AES-2 as all single-family residences built would be expected to be consistent with existing neighborhood character. With adherence to Mitigation Measure AES-2, the development of 47 undeveloped lots with single-family residences would not significantly degrade the visual character of the 112-acre project area because although it would incrementally intensify development, the existing character of the neighborhood would be generally maintained. In general, the overall visual experience of the project area would not be substantially altered from its current semi-rural residential setting.

Impact AES-4 **The proposed ordinance revisions would result in new sources of light and glare within the project area due to introduction of**

up to 47 new residences and associated lighting. Some of the new light and glare would be visible from public and private viewpoints. This would be a Class II, *significant but mitigable.*

Development resulting from the proposed ordinance revisions would introduce new sources of glare in the form of additional cars on neighborhood roads or light-colored building materials and hardscape. In general, although glare would be increased, it would be similar to that already generated by existing residences and private roads, and due to the existing limited view corridors and varying topography, it would not be significant.

The proposed project would facilitate new lighting on up to 47 of the currently undeveloped and unlit lots within the project area. This lighting would be in the form of outdoor fixtures illuminating private driveways and yards, as well as lighting from within new buildings. The new lighting would be expected to be generally similar to lighting associated with existing residences adjacent to our in proximity to the affected lots, but would incrementally increase the lighting throughout much of Zone 2. This is a potentially significant impact.

Mitigation Measures**.** The following mitigation measure would ensure that new residences adhere to the municipal code requirements related to exterior illumination.

AES-4 **Exterior Illumination.** Exterior illumination for new residences shall be subject to the provisions of Section 17.56.030 (Outdoor Lighting for Residential Uses) of the Rancho Palos Verdes Municipal Code. Key standards that must be adhered to include the following:

- *No outdoor lighting shall be permitted where the light source is directed toward or results in direct illumination of a parcel of property or properties other than that upon which such light source is physically located. Individual, nonreflector, incandescent light bulbs, not exceeding one hundred fifty watts each, or an aggregate of one thousand watts for each lot or parcel shall be permitted. On lots exceeding fifteen thousand square feet, an additional one hundred watts in the aggregate shall be permitted for each one thousand five hundred square feet of area or major fraction thereof, by which the lot or parcel exceeds fifteen thousand square feet; provided, that in no event shall the aggregate exceed two thousand watts. As used herein, the term "watts" is irrespective of the voltage.*
- *No outdoor lighting shall be permitted where the light source or fixture, if located on a building, above the line of the eaves, or if located on a standard or pole, more than ten feet above grade.*

Significance After Mitigation**.** Adherence to the code requirements listed above in Mitigation Measure AES-4 would reduce the impacts of lighting from new residential development to less than significant levels.

c. Cumulative Impacts. In general, the proposed ordinance revisions combined with other pending projects in Rancho Palos Verdes could contribute toward creating a more built-out, developed city. However, no projects on the cumulative projects list (see Table 3-1 in

Section 3.0 *Environmental Setting*) are near enough to the proposed project area to directly contribute to a cumulative visual impact in a common viewshed. The proposed ordinance revisions would not facilitate subdivision of existing lots, so the development pattern would maintain the existing RS-consistent lot density. While the addition of 47 new residences would contribute to the overall buildout of the Portuguese Bend community, the cumulative impacts to scenic views, resources and visual character are considered less than significant with the mitigation measures identified (mitigation measures AES-2 and AES-3). Cumulative impacts related to light and glare would also be less than significant with incorporation of Mitigation Measure AES-4 which would ensure that exterior illumination on new residences adheres to the existing municipal code requirements.

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4.2 AIR QUALITY

This section analyzes the proposed ordinance revisions' temporary and long-term impacts to local and regional air quality. Greenhouse gas emissions are discussed in Section 4.6, *Greenhouse Gas Emissions*.

4.2.1 Setting

a. Climate and Meteorology. The semi-permanent high pressure system west of the Pacific coast strongly influences California's weather. The Mediterranean climate of the region and the coastal influence produce moderate temperatures year round, with rainfall concentrated in the winter months. The sea breeze, which is the predominant wind, is a primary factor in creating this climate and typically flows from the west-southwest in a day-night cycle with speeds generally ranging from 5 to 15 miles per hour. The sea breeze maintains the cool temperatures and clean air circulation and generally prevents warmer inland temperatures and air pollution from permeating into the peninsula, except under certain seasonal conditions such as the offshore Santa Ana winds (City of Rancho Palos General Plan, 1975).

Two types of temperature inversions (warmer air on top of colder air) are created in the area: subsidence and radiational (surface). The subsidence inversion is a regional effect created by the Pacific high in which air is heated as it is compressed when it flows from the high pressure area to the low pressure areas inland. This type of inversion generally forms at about 1,000 to 2,000 feet and can occur throughout the year, but is most evident during the summer months. Surface inversions are formed by the more rapid cooling of air near the ground during the night, especially during winter. This type of inversion is typically lower and is generally accompanied by stable air. Both types of inversions limit the dispersal of air pollutants within the regional airshed, with the more stable the air (low wind speeds, uniform temperatures), the lower the amount of pollutant dispersion. The primary air pollutant of concern during the subsidence inversions is ozone, while the greatest pollutant problems during winter inversions are carbon monoxide and nitrogen oxides.

b. Air Pollution Regulation. Federal and state standards have been established for six criteria pollutants, including ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulates less than 10 and 2.5 microns in diameter (PM_{10} and $PM_{2.5}$), and lead (Pb). California has also set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Table 4.2-1 lists the current federal and state standards for criteria pollutants.

Rancho Palos Verdes is located within the South Coast Air Basin (Basin), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SCAQMD is required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." The Basin, in which the project area is located, is a non-attainment area for both the federal and state standards for ozone and PM_{10}. The Basin is in attainment for the state and

federal standards for nitrogen dioxide, and for carbon monoxide. Characteristics of ozone, carbon monoxide, nitrogen dioxide, and suspended particulates are described below.

Table 4.2-1
Current Federal and State Ambient Air Quality Standards

Pollutant	Federal Standard	California Standard
Ozone	0.075 ppm (8-hr avg)	0.09 ppm (1-hr avg) 0.07 ppm (8-hr avg)
Carbon Monoxide	9.0 ppm (8-hr avg) 35.0 ppm (1-hr avg)	9.0 ppm (8-hr avg) 20.0 ppm (1-hr avg)
Nitrogen Dioxide	0.053 ppm (annual avg)	0.18 ppm (1-hr avg) 0.030 ppm (annual avg)
Sulfur Dioxide	0.5 ppm (3-hr avg) 0.075 ppm (1-hr avg)	0.04 ppm (24-hr avg) 0.25 ppm (1-hr avg)
Lead	1.5 $\mu g/m^3$ (calendar quarter)	1.5 $\mu g/m^3$ (30-day avg)
Particulate Matter (PM_{10})	150 $\mu g/m^3$ (24-hr avg)	20 $\mu g/m^3$ (annual avg) 50 $\mu g/m^3$ (24-hr avg)
Particulate Matter ($PM_{2.5}$)	15 $\mu g/m^3$ (annual avg) 35 $\mu g/m^3$ (24-hr avg)	12 $\mu g/m^3$ (annual avg)

ppm= parts per million
$\mu g/m^3$ = micrograms per cubic meter
Source: California Air Resources Board, http://www.arb.ca.gov/research/aaqs/aaqs2.pdf, September 2010.

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between nitrogen oxides (NO_x) and reactive organic gases (ROG). NO_x is formed during the combustion of fuels, while reactive organic gases are formed during combustion and evaporation of organic solvents. Because ozone requires sunlight to form, it mostly occurs in substantial concentrations between the months of April and October. Ozone is a pungent, colorless toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in lung functions. Groups most sensitive to ozone include children, the elderly, persons with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide. CO is a local pollutant that is found in high concentrations only near a source of carbon monoxide. The major source of CO, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. CO's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, CO reduces the amount of oxygen in the blood, causing heart difficulty in people with chronic diseases, reduced lung capacity and impaired mental abilities.

Nitrogen Dioxide. NO_2 is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is nitric oxide (NO), but NO reacts rapidly to form NO_2, creating the mixture of NO and NO_2 commonly called NO_x. Nitrogen dioxide is an acute irritant. A relationship between NO_2 and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur.

NO_2 absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM_{10} and acid rain.

Suspended Particulates. Atmospheric particulate matter is comprised of finely divided solids and liquids such as dust, soot, aerosols, fumes, and mists. The particulates that are of particular concern are PM_{10} (which measures no more than 10 microns in diameter) and $PM_{2.5}$, (a fine particulate measuring no more than 2.5 microns in diameter). The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and $PM_{2.5}$ can be different. Major man-made sources of PM_{10} are agricultural operations, industrial processes, combustion of fossil fuels, construction, demolition operations, and entrainment of road dust into the atmosphere. Natural sources include wind blown dust, wildfire smoke, and sea spray salt. The finer, $PM_{2.5}$ particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. $PM_{2.5}$ is more likely to penetrate deeply into the lungs and poses a serious health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there, which can cause permanent lung damage. These materials can damage health by interfering with the body's mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

c. Current Air Quality. The air quality monitoring station located nearest to the project area is the North Long Beach Monitoring Station, approximately 13 miles northeast of the project site. Ambient air quality obtained from this station characterizes the air quality representative of the ambient air quality in the project area.

Table 4.2-2 on the following page indicates the number of days that each of the standards has been exceeded at the closest monitoring station. As shown, the ozone concentration exceeded state standard one time in 2007, and did not exceed the state standard in 2008 and 2009. The PM_{10} concentration exceeded the federal standards once in 2007 and did not exceed federal standards in 2008 or 2009. The $PM_{2.5}$ concentration exceeded federal standards on 12 days in 2007, 8 days in 2008, and 6 days in 2009. No exceedances of either the state or federal standards for NO_2 or CO have occurred at the North Long Beach Monitoring Station in the last three years.

d. Air Quality Management. Under state law, the SCAQMD is required to prepare a plan for air quality improvement for pollutants for which the District is in non-compliance. The SCAQMD updates the plan every three years. Each iteration of the SCAQMD's Air Quality Management Plan (AQMP) is an update of the previous plan and has a 20-year horizon. The plan was last updated in 2007. The 2007 AQMP incorporates new scientific data and notable regulatory actions that have occurred since adoption of the 2003 AQMP. The SCAQMD adopted the 2007 AQMP on June 1, 2007. It was updated March 4, 2011 to include revisions to $PM_{2.5}$ and Ozone State Implementation Plan for the Basin. The 2007 AQMP incorporates the revisions made in 2011.

Table 4.2-2
Ambient Air Quality Data

Pollutant	2007	2008	2009
Ozone, ppm - Worst Hour	0.099	0.093	0.089
Number of days of State exceedances (>0.09 ppm)	1	0	0
Number of days of Federal exceedances (>0.12 ppm)	0	0	0
Carbon Monoxide, ppm - Worst 8 Hours	2.59	2.49	2.17
Number of days of State/Federal exceedances (>9.0 ppm)	0	0	0
Nitrogen Dioxide, ppm - Worst Hour	0.107	0.125	0.111
Number of days of State exceedances (>0.25 ppm)	0	0	0
Particulate Matter <10 microns, $\mu g/m^3$ Worst 24 Hours [1]	232	62	62
Number of samples of State exceedances (>50 $\mu g/m^3$)	6	1	3
Number of samples of Federal exceedances (>150 $\mu g/m^3$)	1	0	0
Particulate Matter <2.5 microns, $\mu g/m^3$ Worst 24 Hours[1]	82.8	57.2	63
Number of samples of Federal exceedances (>35 $\mu g/m^3$)	12	8	6

North Long Beach Monitoring Station
Source: CARB, 2007, 2008, 2009 Annual Air Quality Data Summaries available at http://www.arb.ca.gov

The 2007 AQMP was prepared to ensure continued progress towards clean air and comply with state and federal requirements. This AQMP builds upon the approaches taken in the 2003 AQMP for the South Coast Air Basin for the attainment of the federal ozone air quality standard. This AQMP highlights the significant amount of reductions needed and the urgent need to identify additional strategies, especially in the area of mobile sources, to meet all federal criteria pollutant standards within the timeframes allowed under the Clean Air Act. New standards allow for a longer compliance schedule for federal fine particulates and 8-hour ozone but with more stringent PM_{10} and 1-hour ozone standards. The 2007 AQMP proposes attainment demonstration of the federal $PM_{2.5}$ standards through a more focused control of sulfur oxides (SOx), directly-emitted $PM_{2.5}$, and nitrogen oxides (NOx) supplemented with volatile organic compounds (VOC) by 2015. The 8-hour ozone control strategy builds upon the $PM_{2.5}$ strategy, augmented with additional NOx and VOC reductions to meet the standard by 2024 assuming a bump-up is obtained. Further, the 2007 AQMP aims to reduce mobile source emissions by discussing measures that would address the remaining air quality standard exceedances in the region. The 2007 AQMP is incorporated by reference and available to download at http://www.aqmd.gov/aqmp/07aqmp/index.html.

e. Sensitive Receptors in the Project Area. Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14; the elderly over 65;

persons engaged in strenuous work or exercise; and acutely ill and chronically ill persons, especially those with cardio-respiratory diseases. The majority of sensitive receptor locations are therefore residences, schools, and hospitals. Sensitive receptors in the project area are single family residences adjacent to those lots that would be potentially be developed under the proposed project, and the Portuguese Bend Riding Club, a private recreational facility. Although the distances to neighboring residences vary from lot to lot, for the purposes of this EIR analysis, using a conservative estimate it is assumed that sensitive receptors would be approximately 50 feet from the location of grading and construction activities at any of the 47 undeveloped and underdeveloped lots in Zone 2.

4.2.2 Impact Analysis

a. Methodology and Significance Thresholds. This air quality analysis conforms to the methodologies recommended in the SCAQMD's *CEQA Air Quality Handbook* (1993). The handbook includes thresholds for emissions associated with both construction and operation of proposed projects.

The regional construction emissions associated with development that could be facilitated by the proposed ordinance revisions were calculated using the CalEEMOD computer model developed for the SCAQMD by estimating the types and number of pieces of equipment that would be used onsite during each of the construction phases. These construction emissions are analyzed using the regional thresholds established by the SCAQMD and published in the *CEQA Air Quality Handbook*. The construction activities associated with development would generate diesel emissions and dust. Construction equipment that would generate criteria air pollutants includes excavators, graders, dump trucks, and loaders. Some of this equipment would be used during demolition and grading activities as well as when structures are constructed. Emission sources during construction also include export truck trips off-site to remove debris and delivery truck trips during the demolition phase. It is assumed that all of the construction equipment used would be diesel-powered.

Operational emissions associated with onsite development were estimated using the CalEEMOD computer model developed for the SCAQMD and the information provided in the traffic study prepared by LLG Engineers (April 2011). Operational emissions would be comprised of mobile source emissions, energy emissions, and area source emissions. Mobile source emissions are generated by the increase in motor vehicle trips to and from the project site associated with operation of onsite development. Emissions attributed to energy use include electricity and natural gas consumption for space and water heating. Area source emissions are generated by landscape maintenance equipment, consumer products and architectural coating. To determine whether a regional air quality impact would occur, the increase in emissions would be compared with the SCAQMD's recommended regional thresholds for operational emissions.

Regional Thresholds. To determine whether a proposed project would have a significant impact to air quality, Appendix G of the *CEQA Guidelines* questions whether a project would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors);
d) Expose sensitive receptors to substantial pollutant concentrations; or
e) Create objectionable odors affecting a substantial number of people.

As discussed in the Initial Study prepared for the proposed project (see Appendix A), onsite development would not generate objectionable odors that would affect a substantial number of people. No industrial, agricultural or other uses typically associated with objectionable odors are proposed. Therefore, it is unlikely that the proposed project would generate objectionable odors affecting a substantial number of people. Therefore, the threshold related to objectionable odors is not discussed below.

The SCAQMD has developed specific numeric thresholds that apply to projects within the SCAB. The SCAQMD currently recommends that impacts associated with projects with construction-related mass daily emissions that exceed any of the following emissions thresholds should be considered significant:

- *75 pounds per day of ROG*
- *100 pounds per day of NO_x*
- *550 pounds per day of CO*
- *150 pounds per day of SO_x*
- *150 pounds per day of PM_{10}*
- *55 pounds per day of $PM_{2.5}$*

Table 4.2-3 on the following page lists the operational significance thresholds recommended by the SCAQMD. The SCAQMD also recommends that any operational emissions from individual projects that exceed these thresholds be considered cumulatively considerable. These thresholds apply to individual development projects only; they do not apply to the combined emissions generated by a set of cumulative development projects.

Localized Significance Thresholds. In addition to the above thresholds, the SCAQMD has developed Localized Significance Thresholds (LSTs) in response to the Governing Board's Environmental Justice Enhancement Initiative (1-4), which was prepared to update the *CEQA Air Quality Handbook*. LSTs were devised in response to concern regarding exposure of individuals to criteria pollutants in local communities. LSTs represent the maximum emissions from a project that will not cause or contribute to an air quality exceedance of the most stringent applicable federal or state ambient air quality standard at the nearest sensitive receptor, taking into consideration ambient concentrations in each source receptor area (SRA), project size, distance to the sensitive receptor, etc. However, LSTs only apply to emissions within a fixed stationary location, including idling emissions during both project construction and operation. LSTs have been developed for NO_x, CO, PM_{10} and $PM_{2.5}$. LSTs are not applicable to mobile sources such as cars on a roadway (Final Localized Significance Threshold Methodology, SCAQMD, June 2003). As such, LSTs for operational emissions do not apply to onsite

Table 4.2-3
SCAQMD Operational Air Quality Significance Thresholds

Mass Daily Thresholds	
Pollutant	**Operation Thresholds**
NO_x	55 lbs/day
ROC	55 lbs/day
PM_{10}	150 lbs/day
$PM_{2.5}$	55 lbs/day
SO_x	150 lbs/day
CO	550 lbs/day
Lead	3 lbs/day
Toxic Air Contaminants (TACs) and Odor Thresholds	
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
Ambient Air Quality for Criteria Pollutants [a]	
NO_2 1-hour average annual average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)
PM_{10} 24-hour average annual geometric average annual arithmetic mean	10.4 μg/m^3 (recommended for construction) [b] & 2.5 μg/m^3 (operation) 1.0 μg/m^3 20 μg/m^3
PM2.5 24-hour average	10.4 μg/m^3 (recommended for construction) [b] & 2.5 μg/m^3 (operation)
Sulfate 24-hour average	1 ug/m^3
CO 1-hour average 8-hour average	SCAQMD is in attainment; project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)

Source: SCAQMD, CEQA Handbook (SCAQMD, 1993), http://www.aqmd.gov/ceqa/hdbk.html accessed March 12, 2007

[a] *Ambient air quality thresholds for criteria pollutants based on SCAQMD Rule 1303, unless otherwise stated.*

[b] *Ambient air quality threshold based on SCAQMD Rule 403.*

KEY: Lbs/day = pounds per day; ppm = parts per million; ug/m^3 = microgram per cubic meter; ≥ greater than or equal to

development as the majority of emissions would be generated by cars on the roadways. LSTs for construction are shown in Table 4.2-4.

Table 4.2-4
SCAQMD LSTs for Construction

Pollutant	Allowable emissions as a function of receptor distance in feet from a five acre site (lbs/day)				
	82 Feet	164 Feet	328 Feet	656 Feet	1,640 Feet
Gradual conversion of NO_x to NO_2	197	189	202	222	277
CO	1,796	1,984	2,608	4,119	9,852
PM_{10}	15	46	60	88	171
$PM_{2.5}$	8	11	19	35	96

Source: http://www.aqmd.gov/CEQA/handbook/LST/appC.pdf, accessed online April 2011.

LSTs have been developed for emissions within areas up to five acres in size, with air pollutant modeling recommended for activity within larger areas. The SCAQMD provides lookup tables for project sites that measure one, two, or five acres. The project area is located in Source Receptor Area 3 (SRA-3). For the purposes of this EIR, it is assumed that construction activity for multiple projects occurring simultaneously in Zone 2 would not disturb more than a combined 5-acre area at any one given time. According to the SCAQMD's publication *Final Localized Significant (LST) Thresholds Methodology*, the use of LSTs is voluntary, to be implemented at the discretion of local agencies.

b. Project Impacts and Mitigation Measures.

Impact AQ-1 **Onsite construction activity would generate air pollutant emissions that would not exceed SCAQMD construction thresholds for ROC, NO_x, CO, PM_{10} and $PM_{2.5}$. However, construction-related emissions would exceed SCAQMD LSTs for PM_{10} and $PM_{2.5}$. With implementation of mitigation, temporary construction impacts would be Class II, *significant but mitigable*.**

Construction emissions estimates were generated for onsite development using CalEEMod software. The model considers six construction phases: 1) demolition; 2) site preparation; 3) grading; 4) building construction; 5) paving; and 6) architectural coating. For the purposes of this analysis it was assumed that total grading would be approximately 47,000 cubic yards (approximately 1,000 cubic yards per lot) and the maximum amount of imported soil would be approximately 2,350 cubic yards (or 50 cubic yards per lot). CalEEMod default scheduling for construction phases were used and it was assumed that all 47 lots would be developed by the year 2015, i.e. over a span of approximately four years. This is a conservative scenario assumption, since individual lots would be developed independently and thus construction

schedules would likely occur over a longer period. Construction equipment would include tractors, loaders, backhoes, dozers, and saws (See Appendix B for the construction equipment mixes). Table 4.2-5 shows estimated daily emissions during demolition (Phase I), site preparation (Phase II), grading (Phase III), building construction (Phase IV), paving (Phase V), and architectural coating (Phase VI).

Table 4.2-5
Estimated Unmitigated Construction Maximum Daily Air Pollutant Emissions (lbs/day)

	Emissions (lbs/day)				
	ROG	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Phase I Demolition	9.46	75.31	45.5	4.18	3.82
Phase II Site Preparation	10.56	84.85	49.35	22.63	14.22
Phase III Grading	8.54	70.7	39.09	16.68	6.70
Phase IV Building Construction	5.84	38.42	25.79	2.89	2.60
Phase V Paving	4.98	30.18	21.53	2.78	2.56
Phase VI Architectural Coating	27.14	2.59	2.1	0.27	0.22
Maximum lbs/day [e]	**27.14**	**84.85**	**49.35**	**22.63**	**14.22**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**
Local Significance Thresholds [f] (LSTs)	*n/a*	*197*	*1,796*	*15*	*8*
Threshold Exceeded?	**n/a**	**No**	**No**	**Yes**	**Yes**

Source: SCAQMD LST Spreadsheet for a 5-acre site and CalEEMod; see Appendix B for calculations. .
[e] Maximum daily emissions based on highest in either construction year 1, 2 ,3 or 4.
[f] LSTs are for a five-acre project in SRA-3 within a distance of 82 feet from the site boundary

ROG would be emitted primarily during the architectural coating phase, which would last approximately two months. NOx would be emitted primarily during the site preparation phase, which would last approximately one month. Particulate matter emissions would be emitted primarily during the site preparation phase and during the grading phase. As shown in Table 4.2-5, emissions of ROG, NO_x, CO, PM_{10} and $PM_{2.5}$ would be below the SCAQMD construction thresholds.

The LST thresholds only apply to those emissions generated by onsite construction activities, such as emissions from onsite grading, and do not apply to offsite mobile emissions. The LST thresholds for sensitive receptors 82 feet (25 meters) from the project site were used to illustrate the closest receptors, which are the existing single family residences neighboring the various lots in Zone 2. As indicated in Table 4.2-5, emissions generated by temporary construction activities would be below LST thresholds for ROG, NO_x and CO during all construction phases. Emissions generated by temporary construction activities would be above LST thresholds for PM_{10} and $PM_{2.5}$. Therefore, impacts related to construction emissions would be significant. Emissions of particulate matter would occur primarily during grading activities.

Mitigation Measures. As described above, this EIR analysis assumes that all 47 lots would be developed by the year 2015. This is a conservative scenario assumption since individual lots would be developed independently and thus construction schedules would likely occur over a longer period. Nevertheless, air pollutant emissions generated during the site preparation phase of construction in this conservative scenario would exceed the LST for PM_{10}, and would exceed the LST for $PM_{2.5}$. City code Section 17.56.020 requires that "All grading, landscaping and construction activities shall exercise effective dust control techniques, either through screening and/or watering. It is unlawful to cause or allow airborne dust or particles to leave a property and settle on, or otherwise impact in any way, surrounding properties." The following mitigation measures, which is consistent with City code Section 17.56.020, is required to reduce particulate matter emissions associated with site preparation and grading activities. These measures are also consistent with SCAQMD Rule 403, which identifies measures to reduce fugitive dust.

AQ-1(a) **Fugitive Dust Control Measures.** The following shall be implemented during construction to minimize fugitive dust emissions:

- *Soil with 5% or greater silt content that is stockpiled for more than two days must be covered and treated with soil binders to prevent dust generation.*
- *Trucks transporting material must be tarped from the point of origin or must maintain at least two feet of freeboard.*
- *Soil stabilizers must be applied to unpaved roads to prevent excess amounts of dust.*
- *All material excavated or graded must be treated with soil binders preferably in the morning, midday and after work is done for the day.*
- *Ground cover must be replaced in disturbed areas as quickly as possible.*
- *All clearing, grading, earth moving, or excavation activities must cease during periods of high winds (i.e., greater than 20 mph averaged over one hour) so as to prevent excessive amounts of dust.*
- *The contractor must provide adequate loading/unloading areas that limit track-out onto adjacent roadways through the utilization of wheel washing, rumble plates, or another method achieving the same intent.*
- *All material transported off-site must be securely covered to prevent excessive amounts of dust.*
- *Face masks must be used by all employees involved in grading or excavation operations during dry periods to reduce inhalation of dust which may contain the fungus which causes San Joaquin Valley Fever.*
- *All residential units located within 500 feet of the construction site must be sent a notice regarding the construction schedule of the proposed project. A sign legible at a distance of 50 feet must also be posted in a prominent and visible location at the construction site, and must be maintained throughout the construction process. All notices and the signs must indicate the dates and duration of construction activities, as well as provide a telephone number where residents can inquire about the construction process and register complaints.*

- *Visible dust beyond the property line emanating from the project must be prevented to the maximum extent feasible.*
- *These control techniques must be indicated in project specifications. Compliance with the measure shall be subject to periodic site inspections by the City.*

AQ-1(b) **Construction Vehicles.** Trucks and other construction vehicles shall not park, queue and/or idle at the project sites or in the adjoining public or private rights-of-way before 7:00 am, Monday through Saturday, in accordance with the permitted hours of construction state in Section 17.56.020.B of the Rancho Palos Verdes Municipal Code.

Significance After Mitigation. Implementation of mitigation measures AQ-1(a) and AQ-1(b) would reduce particulate matter emissions during the site preparation and grading phase. Table 4.2-6 shows the estimated mitigated maximum emissions during the construction phase with implementation of mitigation measure AQ-1(a) and AQ-1(b).

Table 4.2-6
Estimated Mitigated Construction Maximum
Daily Air Pollutant Emissions (lbs/day)

	Emissions (lbs/day)				
	ROG	**NOx**	**CO**	**PM_{10}**	**$PM_{2.5}$**
Phase I Demolition	9.46	75.31	45.5	4.18	3.82
Phase II Site Preparation	10.56	84.85	49.35	11.22	7.97
Phase III Grading	8.54	70.7	39.09	12.05	4.62
Phase IV Building Construction	5.84	38.42	25.79	2.89	2.60
Phase V Paving	4.98	30.18	21.53	2.78	2.56
Phase VI Architectural Coating	27.14	2.59	2.1	0.27	0.22
Maximum lbs/day [e]	**27.14**	**84.85**	**49.35**	**12.05**	**7.97**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*55*
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**
Local Significance Thresholds [f] (LSTs)	*n/a*	*197*	*1,796*	*15*	*8*
Threshold Exceeded?	**n/a**	**No**	**No**	**No**	**No**

Source: SCAQMD LST Spreadsheet for a 5-acre site and CalEEMod; see Appendix B for calculations. .
[e] Maximum daily emissions based on highest in either construction year 1, 2 ,3 or 4.
[f] LSTs are for a five-acre project in SRA-3 within a distance of 82 feet from the site boundary

As shown in Table 4.2-6, PM_{10} and $PM_{2.5}$ emissions would be successfully mitigated below their respective LSTs. It should be noted that although the model indicates $PM_{2.5}$ emissions that are only .03 below the LST threshold for that pollutant, a determination of less than significant is considered reliable due to the conservative assumptions used in the modeling (e.g. buildout of

all 47 lots within four years of ordinance adoption). Therefore, with mitigation, impacts would be less than significant.

Impact AQ-2 Operation of new residences that could be built as a result of the proposed ordinance revisions would generate air pollutant emissions. However, emissions would not exceed SCAQMD operational significance thresholds for ROG, NO_X, CO, PM_{10} and $PM_{2.5}$. Therefore, operational air quality impacts would be Class III, *less than significant*.

Long-term emissions associated with onsite development, as presented in Table 4.2-7, would include those emissions associated with vehicle trips (mobile emissions), natural gas and electricity use (energy use), and landscape maintenance equipment, consumer products and architectural coating (area emissions) associated with onsite development.

Table 4.2-7
Operational Emissions Associated with Onsite Development
(lbs/day)

Emission Source	ROG	NO_x	CO	PM_{10}	$PM_{2.5}$
Mobile	9.26	0.28	19.56	2.51	2.51
Energy	0.06	0.50	0.21	0.04	0.04
Area	2.65	6.53	26.34	5.53	0.49
Total Emissions	**11.97**	**7.31**	**46.11**	**8.08**	**3.04**
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*55*
Threshold Exceeded?	***No***	***No***	***No***	***No***	***No***

Source: URBEMIS 2007 calculations. See Appendix B for calculations.

The CalEEMod model was used to calculate emissions associated with potential development based on the land uses that would be allowed and the number of trips generated by the new development. Trip generation rates were taken from the EIR traffic study prepared by LLG (see Appendix G). As shown in Table 4.2-7, operational emissions would not exceed any SCAQMD threshold. Therefore, impacts would be less than significant.

Mitigation Measures. Operational emissions associated with each of the alternatives would not exceed SCAQMD thresholds. No mitigation measures are necessary.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact AQ-3 Traffic that could be generated by new residences constructed as a result of adoption of the proposed ordinance revisions, together with cumulative traffic growth in the area, would not create carbon monoxide concentrations exceeding state or federal standards. Localized air quality impacts would therefore be Class III, *less than significant.*

The SCAQMD defines typical sensitive receptors as residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes. As stated above in the Setting, sensitive receptors in Zone 2 would include residents that live adjacent to the 47 undeveloped or underdeveloped lots in Zone 2. When evaluating potential air quality impacts to sensitive receptors, the SCAQMD is primarily concerned with high localized concentrations of CO. Motor vehicles, and traffic-congested roadways and intersections are the primary source of high localized CO concentrations. Localized areas where ambient concentrations exceed federal and/or State standards for CO are termed CO "hotspots." CO emissions are a function of vehicle idling time, meteorological conditions, and traffic flow. Under certain extreme meteorological conditions, CO concentrations near a congested roadway or intersection may reach unhealthful levels (i.e., adversely affecting residents, school children, hospital patients, the elderly, etc.).

The Basin is in attainment of State and federal CO standards and has been for several years. Exhaust standards, cleaner burning fuels, and motor vehicle inspection and maintenance programs have all contributed to the reduced per-vehicle CO emissions. At the North Long Beach monitoring station, the maximum 8-hour CO level recorded since 2007 was 2.59 parts per million (ppm), 72% lower than the 9 ppm state and federal 8-hour standard.

Although CO is not expected to be a major air quality concern in Rancho Palos Verdes over the planning horizon, elevated CO levels can occur at or near intersections that experience severe traffic congestion. A project's localized air quality impact is considered significant if the additional CO emissions resulting from the project create a "hotspot" where the California 1-hour standards of 20.0 ppm or the 8-hour standard of 9 ppm is exceeded. This typically occurs at severely congested intersections. Screening for possible elevated CO levels should be conducted for severely congested intersections that experience levels of service (LOS) E or F with project traffic where a significant project traffic impact may occur. The SCAQMD recommends a quantified assessment of CO hotspots when a project increases the volume to capacity ratio (also called the intersection capacity utilization) by 0.02 (2%) for any intersection with an existing LOS D or worse.

As shown in Table 4.10-3, three of the seven intersections analyzed in the Traffic Study prepared by LLG (April 2011) including the Via Rivera/Hawthorne Boulevard intersection, Tramonto Drive-Seahill Drive/Palos Verdes Drive South intersection and the Forrestal Drive/Palos Verdes Drive south intersection currently operate at LOS D or E. However, as shown in Table 4.10-8, the change in volume to capacity ratio as a result of the project would be less than 0.02 at each of these intersections. Since the change in volume to capacity ratio as a result of the proposed project would not increase by 0.02 at any of the intersections that currently operate at LOS D or worse, CO hotspot impacts would be less than significant.

Mitigation Measures. Impacts would be less than significant; therefore, no mitigation measures are required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

Impact AQ-4 Adoption of the proposed ordinance revisions would have the potential to generate population growth, but such growth would be within the population projections upon which the Air Quality Management Plan (AQMP) are based. Therefore, impacts associated with AQMP consistency for the project would be Class III, *less than significant*.

A significant impact to air quality would occur if the proposed project would conflict with or obstruct implementation of the AQMP for the South Coast Air Basin. Although any development project would represent an incremental adverse impact on air quality in the basin, of primary concern is that project-related impacts have been properly anticipated in the regional air quality planning process and reduced whenever feasible.

According to the SCAQMD Handbook, the purpose of the consistency finding is to determine whether a project is inconsistent with the assumptions and objectives of the regional air quality plans, and thus whether it would interfere with the region's ability to comply with Federal and State air quality standards. If a project is inconsistent, local governments need to consider project modifications or inclusion of mitigation to eliminate the inconsistency. Consistency with the AQMP implies that a project is consistent with the goals, objectives and assumptions in the respective plan to achieve the Federal and State air quality standards.

Per the SCAQMD Handbook, there are two main indicators of a project's consistency with the AQMP:

- *Whether the project would increase the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and*

- *Whether the project would exceed the AQMP's assumptions for 2011 or yearly increments, based on the year of project buildout and phase.*

As indicated under Impact AQ-2, emissions associated with operation of up to 47 new residences would not exceed SCAQMD thresholds; therefore, the project satisfies the first criteria for consistency with the AQMP. In addition, implementation of the proposed project would not result in the formation of CO hotspots from the increase of LOS at study intersections (see Impact AQ-3).

A project may also be inconsistent with the AQMP if it would generate population, housing or employment growth exceeding the forecasts used in the development of the AQMP. The 2007 AQMP, the most recent AQMP adopted by the SCAQMD, incorporates in part local city general plans and SCAG's Regional Transportation Plan socioeconomic forecast projections of regional population, housing and employment growth.

According to the SCAG growth forecasts, the City of Rancho Palos Verdes will have a population of 43,251 in 2020. Development of 47 dwelling units on the project site could cause a direct increase in the City's population. Using the California State Department of Finance average household size for Rancho Palos Verdes of 2.75 persons, the 47 dwelling units would generate an average resident population of 130 persons (47 units x 2.75 persons/unit). The current City population is approximately 42,893, according to the most recent (January 1, 2010) California Department of Finance estimate. Therefore, the proposed project would result in a total population of approximately 43,023 persons (42,893 + 130). This increase in population would be within the City's projected 2020 population of 43,251. Since the project would be consistent with the City's SCAG population growth forecasts, the project would be consistent with the AQMP. Impacts would be less than significant.

Mitigation Measures. No mitigation measures are required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. SCAQMD's approach to determining cumulative air quality impacts for criteria air pollutants is to first determine whether or not the proposed project would result in a significant project-level impact to regional air quality based on SCAQMD significance thresholds. If the project does not exceed SCAQMD thresholds, then the lead agency needs to consider the additive effects of related projects only if the proposed project is part of an ongoing regulatory program or is contemplated in a Program EIR, and the related projects are located within an approximately one mile of the proposed project site. If there are related projects within the vicinity (one-mile radius) of the proposed project site, that are part of an ongoing regulatory program or are contemplated in a Program EIR, then the additive effect of the related projects should be considered.

As the proposed project is not part of an ongoing regulatory program, the SCAQMD recommends that project-specific air quality impacts be used to determine the potential cumulative impacts to regional air quality. As discussed under Impact AQ-2, the proposed project would result in an increase in daily operational emissions; however, emissions would not exceed the SCAQMD thresholds. As discussed under Impact AQ-3, project-generated traffic, together with other cumulative traffic in the area, would incrementally increase CO levels in the site vicinity. However, CO levels would not exceed state and federal standards.

Implementation of the proposed project would not result in an addition of criteria pollutants during operation of the project that would contribute to cumulative impacts in conjunction with related projects in the region. Because the proposed project would not generate emissions that exceed the SCAQMD's operational thresholds and the project is consistent with the AQMP, operation of the project would not make a cumulatively considerable contribution with regard to criteria pollutants. Therefore, the project's contribution to cumulative regional long term air quality impacts would not be cumulatively considerable.

As discussed under Impact AQ-1, construction-generated emissions would not exceed SCAQMD significance thresholds for ROC, NOx, CO, PM_{10} and $PM_{2.5}$. Construction-related emissions would exceed SCAQMD LSTs for PM_{10} and $PM_{2.5}$. Nevertheless, with

implementation of mitigation measures AQ-1(a) and AQ-1(b), temporary construction impacts would be reduced to a less than significant level. Therefore, the project's contribution to temporary cumulative regional air quality impacts would not be cumulatively considerable.

4.3 BIOLOGICAL RESOURCES

This section analyzes the potential impacts to biological resources from the proposed Zone 2 Landslide Moratorium Ordinance revisions, which could facilitate the future development of up to 47 new single family residences on undeveloped lots within the Portuguese Bend community. Both direct impacts associated with site development and indirect impacts to off-site biological resources are addressed. The following analysis is based on a Habitat Assessment performed by Rincon Consultants (January 2011; see attached Appendix C).

4.3.1 Setting

a. Site Setting. The project area is the 112-acre Zone 2 area located in the Portuguese Bend community within the City of Rancho Palos Verdes, County of Los Angeles, California. The project site is separated from residential areas of the City to the northeast and northwest by City-owned open space in the Palos Verdes Nature Preserve (PVNP), which was formed under the California Natural Community Conservation Planning (NCCP) Act of 1991. The PVNP contains several different properties (termed "reserves") with that to the northeast of the project area being the Portuguese Bend Reserve, while that to the northwest is the Filiorum Reserve (formerly known as the "Upper Filiorum"). To the south, southeast, and east of the project area are developed and undeveloped residential lots in the Portuguese Bend community, as well as the undevelopable "Neutral Lands" designated in the Rancho Palos Verdes NCCP Subarea Plan. The project area consists of 111 lots, 64 of which are developed and 47 are undeveloped.

A biological resources survey was conducted on May 4, 2010, to characterize the existing habitat conditions within the project boundary plus an additional 100-foot wide area at the perimeter. The reconnaissance-level survey included a rapid assessment of all vegetative habitat types to define relatively large, ecologically cohesive regions. Since access to individual lots was not provided, specific lot-by-lot searches for special status plant and animal species were not conducted. The field reconnaissance was performed via binocular survey from the roadside of the individual lots. Open space areas and the outside perimeter of lots were walked where access was available.

The survey effort was to be focused on those areas where undisturbed habitat types (i.e., coastal sage scrub and grassland) were thought to be present based on aerial photography. However, the survey effort indicated that almost all of the study area had been highly disturbed by various activities. Therefore, the survey concentrated on those areas containing irregular topography (i.e., slumps, swales, and outcrops), changes or transitions in vegetative cover, and exposed rock outcrops because these represented the most suitable habitat for the target list of special-status species that were the focus of this investigation. General information gathered during the field reconnaissance included composition, habitat, site quality, dominant plant species, disturbance history, and anthropogenic impacts.

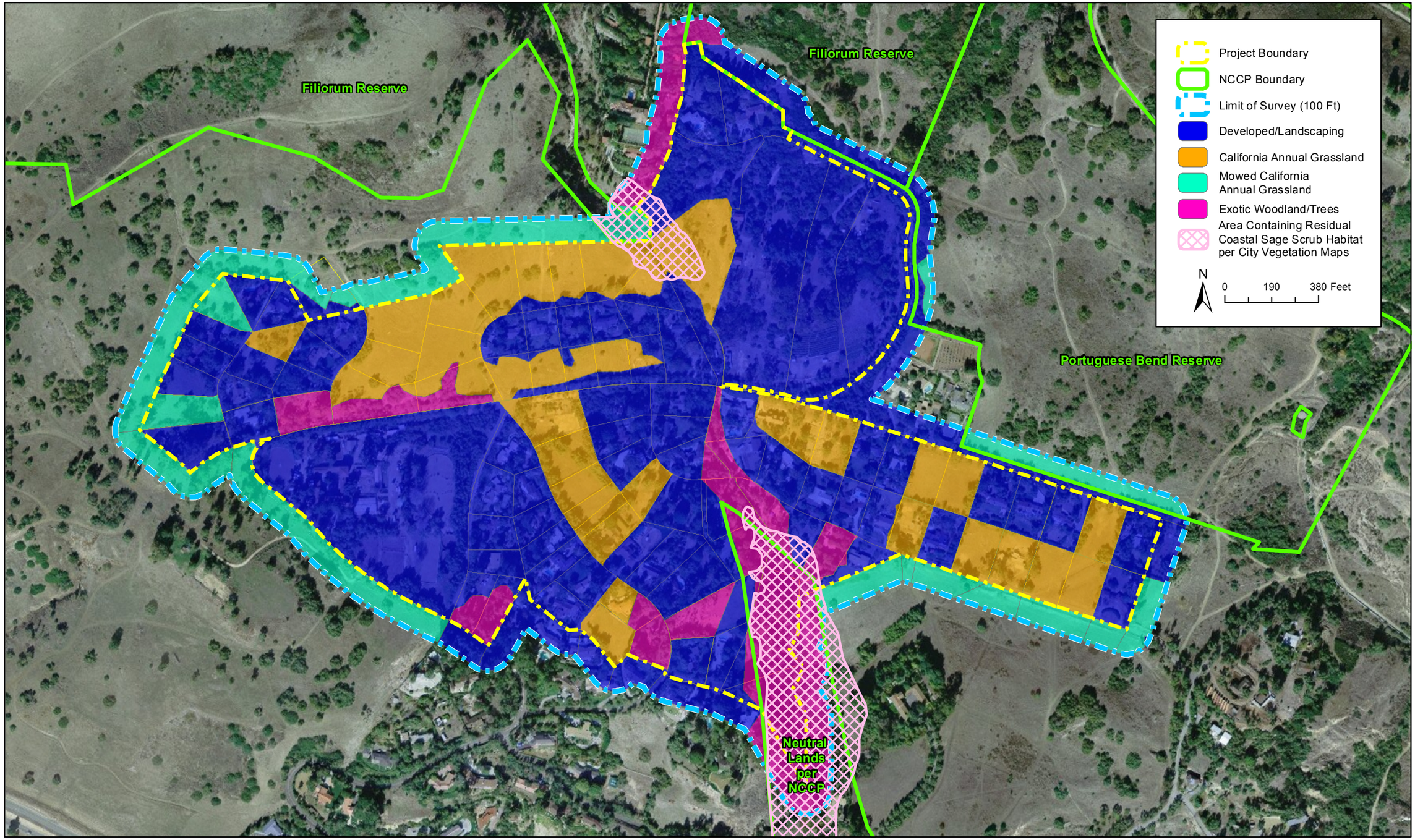
Assessment of the vegetative habitat types provides a method to define habitat quality and integrity for plant and animal distributions and the possible suitability for presence of special-status species. An aerial photograph with APN property boundaries was used during the field surveys to assist in accurately mapping the extent of habitats encountered.

The habitats within the project boundary at the time of the survey included vacant individual residential lots and contained a high level of disturbance, landscaping, and other human interaction. Aerial photography examined prior to the survey suggested the presence of coastal sage scrub-dominated plant communities along the perimeter of the project **b**oundary. Furthermore, review of the maps prepared for the City's NCCP Subarea Plan (dated approximately 2004) indicated the presence of host plants for Palos Verdes Blue Butterfly and coastal sage scrub adjacent to the northwestern portion of the site within the Filiorum Reserve, and coastal sage scrub along Altamira Canyon. However, during the survey it was found that the perimeter of almost all of the study area had been recently mowed or 'weed-wacked' to approximately 10 inches in height, presumably for fire clearance. Binocular survey of the habitats outside the 100-foot-wide buffer area observed patchy and highly disturbed coastal sage scrub habitat with limited distribution of California sage (*Artemisia californica*), California brittlebush (*Encelia californica*), blue elderberry (*Sambucus nigra* ssp. *canadensis*) and toyon (*Heteromeles arbutifolia*) surrounded by non-native annual herbs and grasses. The encelia-dominated coastal sage scrub mapped along Altamira Canyon at the northern project boundary was no longer intact, with the area grazed and mostly comprised of annual grassland with scattered native shrubs. A General Habitat Map is provided in Figure 4.3-1. This figure includes areas previously mapped as containing coastal sage scrub and remnant stands that may still be present, or could regrow in future years prior to development of individual lots.

b. Vegetation. Assessment of the existing habitats visible by the field reconnaissance is best described by the following two habitat types.

California annual grassland series/Ruderal/Disturbed Vegetation/Disturbed Areas. This habitat series includes a collection of species-specific stands strongly dominated by annual or short-lived plants composed of many non-native and native annual species. The series is found at elevations ranging from 0 – 3900 feet. Biotic factors (precipitation, temperature, canopy cover and topography) can vary the composition within a relatively small area (under 5 acres). While this is primarily defined as grassland, many annual herbaceous plants are commonly found within this habitat, with overall community height less than 3 feet. The comparable anthropogenic-ruderal community includes plants and plant communities that thrive in disturbed areas commonly associated with waste areas, roadsides, agriculture, farming or similarly disturbed by human activity. Ruderal communities are dominated by non-native grasses or herbs originating from nearby cultivation, horticultural escapes or other outside sources (soil movement, animal disturbance).

The *2006 Initial Management And Monitoring Report For The Rancho Palos Verdes Draft Natural Community Conservation Plan And Habitat Conservation Plan* (Dudek, 2007) describes this habitat as either Disturbed Areas or Disturbed Vegetation, and refers to plant associations on lands where the vegetation has been significantly altered. Disturbed Vegetation refers to habitats that occur on highly disturbed sites in urbanized areas (along roadsides, footpaths and previously graded areas) that support weedy broadleaf and grass species. Disturbed Areas refers to areas where vegetation has been significantly altered by frequent disking or mowing specifically associated with fire protection and little to no vegetation cover remains. These habitats support typically non-native weedy broadleaf species, including Russian thistle (*Salsola tragus*), mustards (*Brassica* sps.), and annual non-native grasses.



Generalized Habitat Map
Figure 4.3-1

The dominant species found within this habitat include tocalote (*Centaurea melitensis*), wild oats (*Avena fatua*), horehound (*Marrubium vulgare*), mustards (*Brassica nigra, Brassica campestris, Hirschfeldia incana*), fennel (*Foeniculum vulgare*) and bromes (*Bromus diandrus, B. hordeaceus, B. madritensis* ssp. *rubens*). Around the perimeter of the Portuguese Bend community, this habitat had been mowed in a 100 foot swath, presumably for prescribed fire clearance.

Exotic Woodland. This habitat includes non-native trees and shrubs along the Altamira Canyon drainage that bisects the Portuguese Bend community. Some of these introduced species are invasive and have dispersed into the adjacent grassland and native habitats. Within the survey area, this habitat abuts many of the developed properties and associated roadways. The dominant species found within this habitat include many non-native landscape trees, including multiple gum trees (*Eucalyptus* sps.), pepper trees (*Schinus molle*), acacia (*Acacia* sps.), myoporum (*Myoporum laetum*), pines (*Pinus* sps.) and olive trees (*Olea europaea*). Some small remnant stands of coastal sage scrub vegetation are present in this habitat type along Altamira Canyon.

c. Wildlife. The following species were observed at the time of the survey: coyote (*Canis latrans*), California ground squirrel (*Spermophilus beecheyi*), Audubon's cottontail (*Sylvilagus audubonii*), western fence lizard (*Sceloporus occidentalis*), American crow (*Corvus brachyrhynchos*), red-tailed hawk (*Bufeo jamaicensis*), and mourning dove (*Zenaida macroura*). In addition to domesticated species such as dogs, cats, and horses, an extensive population (approximately 80 individuals) of Indian peacocks (*Pavo cristatus*) were observed scattered around the Portuguese Bend community.

d. Wildlife Corridors. The project area is adjoined to the northeast and northwest by the Portuguese Bend and Filiorum Reserves of the PVNP, creating a contiguous section of regionally important habitat areas and natural vegetation. While these contiguous habitat areas are an important corridor for all wildlife, the Portuguese Bend Reserve and Filiorum Reserve also include designated California Gnatcatcher Critical Habitat. Altamira Canyon may also serve as a link for wildlife to pass through the study area; however, such movement is limited by existing residential land uses that are close to the drainage and the dominance of exotic woodlands within the drainage.

e. Special Status Species. A list of special-status species evaluated in this survey was developed based on a review of the California Natural Diversity Database (CNDDB) RareFind3 (March 2010), species listed as part of the NCCP program, previous studies of the region, as well as Rincon staff knowledge of the area. Table 1 of the Habitat Assessment in Appendix C provides the California Native Plant Society List Definitions and Table 2 provides the CNPS List Threat Code Extensions. The CNDDB Element Ranking system (Table 3 of the Habitat Assessment) provides a numeric global and state-ranking system for all special-status species tracked by the CNDDB. The global rank (G-rank) is a reflection of the overall condition of an element (species or natural community) throughout its global range. The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

Listed species are those that are formally listed as endangered or threatened by the federal government (e.g. U.S. Fish and Wildlife Service [USFWS]), pursuant to the Federal Endangered Species Act (FESA) or as endangered, threatened, or rare (for plants only) by the State of

California (i.e. California Fish and Game Commission), pursuant to the California Endangered Species Act (CESA) or the California Native Plant Protection Act. During the listing process for federal species, "critical habitat" may also be designated. Additional species are considered rare (but not formally listed) by various resource agencies, organizations with biological interests/expertise (e.g. Audubon Society, California Native Plant Society [CNPS], The Wildlife Society), and the scientific community. As part of the City's NCCP process, several taxa are included as "covered species" and are considered locally rare.

Special Status Plants. Due to the highly disturbed and landscaped nature within the project boundary and the recently mowed condition of the 100 foot buffer area at the time of the May 2010 field reconnaissance, none of the eleven (11) special status plants are considered to be likely to be found within the survey area. Special status plants could potentially occur within the patchy coastal sage scrub outside the survey area but none were observed during the reconnaissance survey. Additionally, no rare plants were found near the vicinity of the Portuguese Bend community during previous botanical surveys conducted for the Draft NCCP/HCP (Dudek, April 2007). No critical habitat for listed threatened or endangered plants occurs within the survey area (U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal. Table 4.3-1 lists the special status plant species and their regulatory status, habitat and ecological requirements.

Special Status Wildlife. Due to the highly disturbed and landscaped nature within the project boundary and the recently mowed condition of the 100 foot buffer area, none of the twelve (12) special status wildlife species are likely to be found within the survey area except on a rare, transient basis. Special status wildlife could potentially occur within the patchy coastal sage scrub outside the survey area, but no suitable habitat for these species, including larval and adult host plants, were observed within the study area boundaries. Table 4.3-2 provides the listed wildlife species and their regulatory status, habitat and ecological requirements.

Coastal California Gnatcatcher. Coastal California gnatcatcher (CAGN) is listed as a federally threatened species (USFWS 1993) and a CDFG Species of Special Concern. Coastal California gnatcatcher is the northernmost of three subspecies currently recognized for the species. It is restricted to arid, lowland areas and has a range from southwestern California to northwestern Baja California. Within the U.S., the current range of the coastal California gnatcatcher is generally within San Diego, Orange, Los Angeles, eastern Ventura and western Riverside counties. It is a permanent resident of coastal sage scrub-dominated plant communities generally below 2,000 feet, and while strongly associated with coastal sage scrub, it will also use chaparral, grassland, and riparian plant communities where they occur adjacent to or intermixed with sage scrub. While it is found in coastal sage scrub, not all areas classified as coastal sage scrub are occupied. The breeding season of the CAGN extends from about February 15 through August 31, with the peak of nesting activity occurring from mid-March through mid-May. CAGN normally requires at least five to ten acres of coastal sage scrub for nesting and foraging, but CAGN have been observed breeding in small patches of suitable sage scrub surrounded by urban development, with the smallest being 0.5 acres. Despite the patchiness of CAGN distribution, the density of CAGN was highest in high-quality habitat and decreased as habitat quality decreased. Potential population size within the United States may range from 5,000 – 10,000 pairs.

Table 4.3-1
Habitat Requirements for Special Status Plants with the Potential for Occurrence

Common Name	Scientific Name	Status* Fed/State Listing/State Rank/CNPS/	Habitat Requirements and Potential for Occurrence
Aphanisma	***Aphanisma blitoides***	--/--/S1.1/1B.2/RPV	Sandy soil near the coast in coastal bluff scrub and coastal sage scrub at elevations between 10 to 200 feet. Small annual herb blooming April to May. *No potential for occurrence, habitat lacking.*
South coast saltscale	***Atriplex pacifica***	--/--/S2.2/1B.2/RPV	Coastal bluffs, coastal sage scrub and alkali playas from 0 – 450 feet. Prefers sandy openings between shrubs in xeric and mildly disturbed locales. Small, wiry, prostrate annual herb blooming March – October. *No potential for occurrence, habitat lacking.*
Parish's brittlescale	***Atriplex parishii***	--/--/S1.1/1B.1/	Shadscale scrub, alkali sink, freshwater wetlands, and wetland-riparian. Alkaline or clay soils below 1000 feet. Blooms June – October. *No potential for occurrence, habitat lacking.*
Davidson's saltscale	***Atriplex serenana* var. *davidsonii***	--/--/S2?/1B.2/	Coastal bluff scrub, Coastal scrub with alkaline soils at elevations between 30 – 650 feet. Blooms April – October. *No potential for occurrence, habitat lacking.*
Southern tarplant	***Centromadia parryi* ssp. *australis***	--/--/S2.1/1B.1/RPV	Salt marsh margins, mesic valley and foothill grasslands, vernal pools and alkaline areas below 1,400 feet. Blooms May – November. *No potential to occur on site, habitat lacking.*
Catalina crossosoma	***Crossosoma californicum***	--/--/S3.2/1B.2/RPV	Dry, rocky slopes and canyons in coastal sage scrub below 1,600 feet. Deciduous shrub blooming that can reach 16 feet, blooms February - May. *No potential to occur on site, habitat lacking.*
Island green dudleya	***Dudleya virens* ssp. *insularis***	--/--/S2.2/1B.2/RPV	Steep slopes in chaparral, coastal bluff scrub and coastal sage scrub below 1,300 feet. Bright green perennial succulent with basal rosette from caudex, blooms April - June. *No potential to occur on site, habitat lacking.*
Santa Catalina Island desert-thorn	***Lycium brevipes* var. *hassei***	--/--/S1.1/1B.1/RPV	Coastal bluff slopes in coastal bluff scrub and coastal sage scrub at elevations below 1,000 feet. Deciduous shrub that can reach 13 feet high, blooms June. *No potential to occur on site, habitat lacking.*
Lyon's pentachaeta	***Pentachaeta lyonii***	FE/SE/S2 /1B.1/RPV	Openings in chaparral and valley/foothill grasslands near the coast at elevations below 500 feet. Diminutive annual herb that blooms March - April. Normally found in soils derived from volcanic rocks. *No potential to occur on site, habitat lacking.*
Brand's star phacelia	***Phacelia stellaris***	FC/--/S1/1b.1/--	Coastal dunes and coastal scrub at elevations below 400 meters. Annual herb that blooms March – June. *No potential to occur on site, habitat lacking.*
Woolly seablite	***Suaeda taxifolia***	--/--/S2S3/4.2/RPV	Coastal bluffs and margins of salt marshes at elevations below 50 feet. Perennial herb that blooms May – October. *No potential to occur on site, habitat lacking.*

Source: DFG CNDDB Special Vascular Plants, Bryophytes, and Lichens List, April 2010; CNDDB 5-mile search radius, April 2010

FE = Federally Endangered; FT = Federally Threatened;
FC = Federal Candidate; FSC = Federal Species of Concern;
SE = State Endangered; SR = State Rare; RPV = listed in Rancho Palos Verdes Subarea Plan as sensitive.

S1=<6 Eos (viable element occurrences) or <1,000 individuals or <2,000 acres
S2=6-20 Eos or 1,000-3,000 individuals or 2,000-10,000 acres
S3=21-80 Eos or 3,000-10,000 individuals or 10,000-50,000 acres

Table 4.3-2
Special Status Wildlife Species with the Potential for Occurrence

Common Name	Scientific Name	Status	Habitat Requirements and Potential for Occurrence
sandy beach tiger beetle	***Cicindela hirticollis gravida***	--/--/S1/--	Inhabits areas adjacent to non-brackish water along the coast, primarily within sand dunes. *No potential for occurrence, habitat lacking.*
coastal cactus wren	***Campylorhynchus brunnelcapillus***	--/--/S3/SSC/NCCP (San Diego & Orange Counties only)	Inhabits coast sage scrub habitat dominated by patches of tall *Opuntia* cactus. Only the sub-populations in Orange and San Diego Counties are considered special status (Shuford & Gardali, 2008). *Suitable nesting habitat not within study area, rarely a cactus wren may use landscaping shrubs on a transient basis.*
Western beach tiger beetle	***Cicindela latesignata latesignata***	--/--/S1/--	Mudflats and beaches. *No potential to occur on site, habitat lacking.*
monarch butterfly	***Danaus plexippus***	--/--/S3/--	Overwinters and roosts in wind-protected trees in close proximity to host milkweed plants (*Asclepius* sp.) and nectar food sources. Because this animal is abundant on a national basis, resource concerns are related to aggregate winter roosts. *While Monarchs occur in the study area, no winter aggregate areas are known to be present.*
El Segundo blue butterfly	***Euphilotes battoides allyni***	FE/--/S1/Xerces-CI/RPV	Remnant coastal dune habitats, with coast buckwheat as the larval food source. *No potential to occur on site, habitat and host plants absent.*
Mohave tui chub	***Gila bicolor mohavensis***	FE/FP/SE/S1/--	Found in lacustrine environments with deep pools and slow moving water. *No potential to occur on site, habitat lacking.*
Palos Verdes blue butterfly	***Glaucophsyche lygdamus palosverdesensis***	--/--/S1/RPV	Restricted to open coastal sage scrub habitats supporting preferred larval food source (milk vetch or deerweed). *Not expected to occur within study area; no host plants observed in visible survey area.*
San Diego desert woodrat	***Neotoma lepida intermedia***	--/--/S3?/SSC/	Prefers coastal scrub habitat. Constructs houses with twigs usually in rock outcrops, rocky cliffs and slopes. *Limited potential to occur in study area along drainages, habitat generally lacking.*
pocketed free-tailed bat	***Nyctinomops femorosaccus***	--/--/S3/SSC/	Prefers rock crevices in cliffs for roosting. Feeds on wide variety of flying insects. *Unlikely to roost in area as no rock crevices/cliffs present*.
Pacific pocket mouse	***Perognathus longimembris pacificus***	FE/S1/SSC/RPV	Coastal strand, sand dunes, ruderal vegetation on river alluvium, and open coastal sage scrub on marine terraces. *Not expected to be present given the altered landscape; suitable habitat generally lacking.*
Coastal California gnatcatcher	***Polioptila californica californica***	FT/SSC/RPV/NCCP	Coastal and inland sage scrub primarily below 2,000 feet. *Suitable habitat lacking within study area; occasional transient bird may occur in landscaping shrubs, along drainages, and in residual sage scrub stands.*
El Segundo flower-loving fly	***Rhaphiomidas terminatus terminatus***	--/--/S1/--	Confined to the El Segundo sand dunes ecosystem and portions of the Los Angeles River sandy alluvial plain. *No potential to occur on site, habitat lacking.*
California brackish water snail	***Tryonia imitator***	--/--/S1/--	Inhabits coastal lagoons, estuaries and salt marshes. Found only in permanently submerged areas. *No potential to occur on site, habitat lacking.*

Source: DFG CNDDB Special Animals list, July 2009; CNDDB 5-mile search radius, April 2010

FE = Federally Endangered; FT = Federally Threatened;
FC = Federal Candidate; FP= Federally Protected, Department of Fish and Game; FSC = Federal Species of Concern;
SE = State Endangered; SR = State Rare; SSC=Species of Special Concern, Department of Fish and Game; Xerces Society-CI=Critically Imperiled;
RPV = listed in Rancho Palos Verdes Subarea Plan as sensitive.
S1=<6 Eos (viable element occurrences) or <1,000 individuals or <2,000 acres
S2=6-20 Eos or 1,000-3,000 individuals or 2,000-10,000 acres
S3=21-80 Eos or 3,000-10,000 individuals or 10,000-50,000 acres

The survey area contains no intact coastal sage scrub habitat, with only some scattered stands of this vegetation type apparently left along Altamira Canyon. Because coastal California gnatcatchers are present within the adjacent PVNP, with known presence in the Filiorum Reserve to the north of the study area (URS, July 2004), an occasional transient bird may be found on rare occasions within the study area, but no breeding or long term residency is likely or expected given the lack of suitable habitat. No protocol level studies are recommended for the study area as it does not contain the Primary Constituent Elements (PCEs) for the coastal California gnatcatcher, namely coastal sage scrub habitat or non-sage scrub habitat near to coastal sage scrub that could provide space for dispersal, foraging, and nesting.

Palos Verdes Blue Butterfly. Palos Verdes blue butterflies are small thumbnail-sized butterflies that were federally listed as endangered by the U.S. Fish and Wildlife Service in 1980. On March 6, 2010, federally endangered Palos Verdes blue butterflies were released into eight acres of restored coastal sage scrub habitat at Deane Dana Friendship Community Regional Park and Nature Center (Friendship Park) located in San Pedro, approximately three miles southeast of the Portuguese Bend community. The Palos Verde blue had been historically recorded at Friendship Park in 1981, but not observed for several decades. Future Palos Verdes blue butterfly recovery efforts are planned to include continued rearing of butterflies in captivity for release back into the wild and additional habitat restoration and management efforts.

The USFWS is currently working with the City of Rancho Palos Verdes (USFWS, March 6, 2010) on a Habitat Conservation Plan (HCP) that would be coordinated with the existing NCCP. Per Mattoni 1995, suitable habitat that includes the food plant *Astragalus trichopodus lonchus* and common deerweed *(Lotus scoparius)* is present within the NCCP areas to the north of the Portuguese Bend community. URS (July 2004) reported historic sightings to the west of the study area (west of Narcissa Drive) and to the northeast (northeast of Vanderlip Road), but not within the study area. The proposed NCCP/NCP areas would be likely receptor sites for additional captive raised butterflies.

Within the survey area, suitable habitat for the Palos Verdes blue butterfly is generally lacking because of the long term disturbance of the properties and management for fire prevention. None of the known host plants, either as vegetation, blooms or seed pods, were observed during the survey. Based on the above and the lack of known populations in this area over the last 30 years, areas within the project boundary and 100 foot wide buffer are not expected to support the Palos Verdes blue butterfly.

El Segundo Blue Butterfly. The El Segundo blue butterfly is restricted to remnant coastal dune habitat in southern California. During monitoring conducted for the Draft NCCP (Dudek, 2007) it was documented along and at the base of the cliff bluffs approximately 1.8 miles west of the study area. Its host plant is *Eriogonum parvifolium* and the larvae feed only on this flower and its seeds; adults use this plant as a major nectar source. No *Eriogonum parvifolium* were observed during the habitat assessment, and past regular maintenance of the study makes it highly unlikely that this plant is present. No El Segundo blue butterflies would be expected in this area.

Monarch butterfly. The monarch butterfly over-winters in southern California usually in tree groves or windbreaks near available water and nectar sources. This species commonly

uses eucalyptus (*Eucalyptus* sp.), cypress (*Cupressus* sp.) and Monterey pine (*Pinus radiata*) for roosting. While the Monarch butterfly is relatively abundant throughout the North American continent, along the west coast the availability of winter roost sites where the butterflies aggregate by the thousands of individuals is considered a potential concern. The monarch butterfly's preferred food source is milkweed (*Asclepias* sp.), although adults may also feed off nectar from coyote bush (*Baccharis pilularis*) and mule fat (*Baccharis salicifolia*). Monarch butterflies are commonly found in small numbers within landscaped gardens and would be expected to occur within the study area and throughout the City of Rancho Palos Verdes.

Within the survey area suitable habitat for winter roost sites was present throughout, most centralized along the lower reach of Altamira Canyon within eucalyptus groves. Although roost sites were present, none of the preferred food source, milkweed, was observed during the survey. Further, neither the CNDDB nor the Xerces Society (2010) report any large winter aggregations in this area.

"Coastal" Cactus Wren. Cactus wren is resident in arid and semiarid regions from southern California, southern Nevada, extreme southwestern Utah, central Arizona, central New Mexico, and central and southern Texas south to into Mexico and Baja California. The species is considered "common" over most of its range. Based on current taxonomic classifications of this species, the *California Bird Species of Special Concern* indicates that only the San Diego cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) is considered a CDFG species of special concern (see also *Special Animals,* CDFG July 2009). However, Cooper Ecological Monitoring, Inc. (2010) has stated that this taxonomic change is not accepted by all ornithologists and the geographic isolation of the local cactus wren qualifies it as a "sensitive species." Only one cactus wren territory was estimated to be within the Portuguese Bend Reserve during the 2010 surveys, located approximately 3,000 feet east of the project site. The project area lacks the cactus stands typically used by this species and its presence is not expected within the project area.

San Diego Desert Woodrat. This woodrat is a CDFG Species of Special Concern that occurs in scrub areas with moderate to dense canopies. San Diego desert woodrat is a small mammal whose range extends from San Luis Obispo County in the north to San Diego County in the south. Two species of woodrat, big-eared (dusky-footed) woodrat (*Neotoma macrotis*) and San Diego desert woodrat (*Neotoma lepida intermedia*[1]) have ranges that overlap within the region. San Diego desert woodrat feeds on fruits, seeds and bark and is known to feed on cholla and buckwheat. Desert woodrats build elaborate dens with several chambers for nesting and food, as well as several entrances. Nests are usually made at the base of perennial vegetation with sticks, rocks, and other plant parts. They are often associated with large cactus patches, and within coastal sage scrub communities it is almost invariably associated with prickly pear cactus. It also is found in rocky outcroppings on hillsides in coastal scrub. Its nearest known location is within the coastal scrub community located approximately 0.5 miles to the south of the study area. Given the lack of prickly pear cactus and coastal sage scrub plants within the study area, and the proximity of residences that likely have cats which are efficient predators of this species, it is unlikely that this animal maintains a substantial population within the study area. If present within the study area, San Diego desert woodrat

[1] *Recently reclassified as Neotoma bryanti intermedia.*

are most likely limited to the area along Altamira Canyon within the "Neutral Lands" category of the NCCP (see Figure 2).

f. Sensitive Communities and Critical Habitat. A search of the USFWS Critical Habitat Portal yielded one Critical Habitat designation in the project vicinity, that for the California gnatcatcher (CAGN). The 2007 habitat mapping overlies a portion of the study area as illustrated in Figure 2, primarily in the northwest portion of the study area and the "Neutral Lands" in the southern portion. Critical habitat mapping is intended to contain those lands essential for the conservation of a species, but any such land within the mapped boundary must also contain the known physical or biological features (Primary Constituent Elements or PCEs) within the geographical area that are essential to the species conservation. For CAGN, the PCEs are 1) dynamic and successional sage scrub habitats and 2) non-sage scrub communities like chaparral, grassland, riparian areas, near to suitable sage scrub habitats. Within the project area and 100 foot wide buffer area, neither coastal sage scrub habitat or key plant species associated with this habitat were found. Due to fire clearance requirements, it is expected that that 100 foot wide buffer area will continue to be highly disturbed and high quality coastal sage scrub habitat preferred by the CAGN will not be allowed to establish. The maintained grasslands of portions of the site are not considered to provide an important PCE under Item 2 above given the distance to quality coastal sage scrub habitat and the regular disturbance. It should also be noted that the designation of critical habitat does not place a regulatory burden on the private landowner; it only provides that federal agencies are to ensure that actions they fund, authorize, or carry out do not destroy or adversely modify critical habitat.

Special-Status Communities. In addition to sensitive plant species, Rincon's review of the California Natural Diversity Database (CNDDB, RareFind3, June 2006; database current as of May 2010) yielded one sensitive habitat within a five-mile radius of the project site; Southern Coastal Bluff Scrub. Presence or absence of this habitat area was determined using the vegetation classification systems described by Sawyer et al.'s *A Manual of California Vegetation* (2009) and by the CDFG's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986) and surveying the project site for species associated with this sensitive habitat.

Southern Coastal Bluff Scrub is a low, sometimes prostrate scrub and is widespread along the southern California coastline as a very narrow band, often not extending more than about 100 feet inland. Plants usually cling to nearly vertical rock faces just above the surf. Dominant plants associated with this habitat include California sagebrush (*Astemisia californica*), California buckwheat (*Eriogonum fasciculatum*), coast cholla (*Cylindropuntia prolifera*), and coast prickly pear (*Opuntia littoralis*). Dominant associated plants, vertical rock faces, and proximity to the surf which define this community type are lacking within the project area and buffer area.

Palos Verdes Nature Preserve (PVNP). The Palos Verdes Peninsula Land Conservancy (PVPLC) serves as the management agency for the Palos Verdes Nature Preserve, previously referred to as the Portuguese Bend Nature Preserve, for the City of Rancho Palos Verdes. The Preserve was formed under a Natural Community Conservation Plan (NCCP) Subarea Plan to "maximize benefits to wildlife and vegetation communities while accommodating appropriate economic development within the City of Rancho Palos Verdes and region pursuant to the requirements of the NCCP Act and Section 10(a) of the ESA" (URS, July 2004). As a primary

component of the NCCP, a Preserve design was proposed to conserve regionally important habitat areas and provide habitat linkages to benefit sensitive plants and wildlife. PVPLC manages the Preserve under an operating agreement with the City.

The Portuguese Bend and Filiorum Reserves are located to the northeast and northwest of the Portuguese Bend community, respectively (see Figure 4.3-1). The Portuguese Bend Reserve does not directly adjoin the project site, but is on the other side of Narcissa Drive from the project site. The Filiorum Reserve adjoins three of the lots within the project site in the northern portion of the site along Altamira Canyon, but is otherwise separated from the project site by an open space lot on the northwest and roadway on the northeast. The following further discusses these nearby reserves.

Portuguese Bend Reserve. The Portuguese Bend Reserve is a 399-acre area that was preserved in 2005. It consists of rolling hills, steep canyons and rock outcrops, with significant habitat and spectacular views of the Pacific Ocean and Santa Catalina Island. Located below and to the east of Del Cerro Park, it includes the areas known as the lemonade-berry parcel, eagle's nest, the badlands, the active landslide and the dirt extension of Crenshaw Boulevard. This area has numerous important trails and geologic features such as Ailor cliff and the pillow lava outcrop. Multiple sightings of the CAGN were recorded during 2010 surveys (Cooper Ecological Monitoring, Inc., August 2010).

Filiorum Reserve. The Filiorum Reserve is a 208-acre area that was added to the NCCP on December 31, 2009, and renamed from "Upper Filiorum" to "Filiorum Reserve" on May 15, 2012. This parcel connects the Three Sisters and Portuguese Bend Reserves and is a mix of steep hills and bowl-like, flatter areas covered in grasses and coastal sage scrub. It is known to contain a population of CAGN and host plants for the Palos Verdes Blue Butterfly. The City adopted a trails plan for this area on May 15, 2012.

g. Regulatory Setting.

Rancho Palos Verdes General Plan. The goal of the City of Rancho Palos Verdes' General Plan is to conserve, protect, and enhance its natural resources, beauty, and open space for the benefit and enjoyment of its residents and the residents of the entire region. All future development is to recognize the sensitivity of the natural environmental and be accomplished in such a manner as to maximize the protection of it.

Rancho Palos Verdes Municipal Code. The City's Municipal Code provides another layer of environmental protection to lands located within the city limits. Title 17, Chapter 40, Section 040 of the City's Municipal Code provides the regulations for the Natural Overlay Control District (OC-1), which includes those areas of the General Plan within Resource Management (RM)-5 (Old Landslide Area), RM-6 (Hydrologic Factors), RM-7 (Marine Resource), RM-8 (Wildlife Habitat), and RM-9 (Natural Vegetation). Similar designations within the Coastal Specific Plan are also within this overlay district. According to the City's General Plan Natural Environment Element, Altamira Canyon is located within Resource Management (RM) District 6 – Hydrologic Factors, which is included within OC-1. Within this district it is the City's policy to prohibit activities which create excessive silt, pollutant runoff, increase canyon wall erosion, or potential for landslide. Performance criteria relevant to biological resources include restrictions against altering the course, carrying capacity or

gradient of the drainage; developing uses within 50 feet of the edge of the drainage; clearing or thinning more than 20% of the vegetation within the district; and use of herbicides.

Neutral Lands. This category was developed under the NCCP Subarea Plan (URS, July 2004) to include those open space lands that would contribute to the Palos Verdes Nature Preserve function as they cannot be developed because of extreme slopes, open space hazard zoning, or designation as homeowner's association open space. If agreements between the Preserve and landowners of the Neutral Lands are possible, such areas could be managed as part of the Preserve. In some instances, these lands are not prohibited from development, but it is recognized that development constraints already exist pursuant to the City's Municipal Code. Extreme slopes have a greater than 35% grade and occur in undeveloped canyons, such as Altamira Canyon. Open space hazard lands have unstable geologic conditions or other physical constraints requiring a detailed geotechnical investigation prior to removal from the open space hazard designation. Altamira Canyon in the southern portion of the study area is within the Neutral Lands category (see Figure 2) as it is within the RM-6 designation and controlled by the OC-1 regulations as discussed above.

Jurisdictional Drainages and Wetlands. Disturbed riparian habitat and drainage features located within the project boundary and 100 foot wide buffer may contain drainages or wetlands that are under the jurisdiction of the CDFG and/or the US Army Corps of Engineers. Altamira Canyon is an ephemeral drainage channel that originates at Crest Drive and ends at the Pacific Ocean, trending northwest to southeast and bisecting the study area. The northern reach of the drainage within the study area bisects landscaped private property and non-native California annual grassland habitat within undeveloped/underdeveloped lots. The drainage crosses under Narcissa Drive via a storm drain and continues southeast through a steep-banked channel categorized as "Neutral Lands" within the NCCP. Vegetation along this lower drainage feature is dominated by exotic woodland habitat. The drainage channel has hydrological features such as ordinary high water mark or bed, bank, and channel, but lacks any native riparian habitat. The riparian habitat associated with the drainage throughout the project site is dominated by landscape shrubs and trees, primarily pepper trees, pines and eucalyptus, with an understory of non-native annuals and herbaceous perennials, exotic shrubs, and coastal sage scrub patches.

Based upon the reconnaissance survey, the drainage feature located within the project boundary may be subject to USACE (US Army Corps of Engineer), Los Angeles RWQCB (Regional Water Quality Control Board) and/or CDFG (California Department of Fish and Game) jurisdiction. It should be noted that the regulatory agencies make the final jurisdictional determination.

4.3.2 Impact Analysis

a. Methodology and Significance Thresholds. This impact analysis is based on the following: a review of previous biological studies available for the general area; a field survey of the general study area (which did not allow for detailed investigation of each lot); available literature regarding the existing biological resources within the project area; and, aerial photography.

The California Environmental Quality Act (CEQA), Chapter 1, Section 21001 (c) states that it is the policy of the State of California to "prevent the elimination of fish and wildlife species due to man's activities, ensure that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities." Environmental impacts relative to biological resources may be assessed using impact significance criteria encompassing CEQA guidelines and federal, state and local plans, regulations, and ordinances.

The State CEQA Guidelines Appendix G provides the following general statements to determine if significant impacts to biological resources could occur if a project action would:

a) *Have a substantial adverse effect (i.e. significantly reduce species population, reduce species habitat, restrict reproductive capacity), either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, regulations, or by CDFG or USFWS;*
b) *Have a substantial adverse effect (i.e. direct/indirect reduction) on any riparian habitat or other sensitive natural community identified in local or regional plans, policies regulations, or by the CDFG or USFWS;*
c) *Have a substantial adverse effect (i.e. direct/indirect reduction) on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to, marsh vernal pool, coastal, etc.) through direct removal, filling, or hydrological interruption, or other means;*
d) *Interfere substantially (i.e. direct/indirect reduction) with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;*
e) *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and*
f) *Conflict with the provisions of an adopted Habitat Preservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.*

b. Project Impacts and Mitigation Measures.

Impact BIO-1 Special Status Species. Potential development that would be facilitated by the proposed ordinance revisions would not significantly affect special status species due to the lack of suitable habitat, level and frequency of existing human disturbance onsite, and existing regulations under the Natural Overlay Control District (OC-1) that would restrict construction to areas not likely occupied by the San Diego desert woodrat. While the increased human presence is considered adverse, it would not be substantially different or increased over existing conditions, and no significant effect is anticipated. Therefore, impacts to Special Status Species would be Class III, *less than significant*.

As discussed above, special status plant species are not expected to occur on a regular basis within the 47 lots or the adjacent maintained fuel management buffer because of past alteration of vegetation and the general lack of suitable habitat. In addition, the continued fuel management practices with or without the proposed project would virtually eliminate the ability of any sensitive plants to re-establish within these areas.

Most of the special status animals potentially in the area are not expected to be present on the potential development sites because of the lack of habitat. Mobile special status wildlife, such as coastal California gnatcatcher, could rarely occur within the landscaping shrubs present in the study area on a transitory basis during dispersal, but are not likely to be resident or present for long periods of time because of the lack of suitable foraging or nesting habitat. Given the level and frequency of human disturbance onsite and the lack of suitable coastal sage scrub habitat, future development of the individual lots is not expected to have a direct effect on coastal California gnatcatcher individuals. As noted in Table 4.3-2 above, no suitable habitat for listed butterflies is present within the study area.

San Diego desert woodrat is the only special status animal anticipated to potentially occur within the site, possibly within the two lots in the south part of the study area along Altamira Canyon and within the RM-6 designated area. The drainage is steeply incised, with non-native ruderal areas located on the potentially developable upland areas. If developed, construction would not be expected to directly impact any woodrats that may be present as existing regulations under OC-1 would restrict construction to areas not likely occupied by woodrats.

Additional residences in the area would introduce a higher density of human disturbances, including light, noise, and domestic animals, into the vicinity of this special status species, as well as others. However, these elements are already present given the existing residential land uses within the study area and to the north and south. A potential problematic effect, the domestic cat, is already present. Available literature on the size of domestic cat home ranges and the extent to which they enter into adjacent natural areas varies considerably, with estimated home ranges in the 0.5 – 5 acre range and the ability to range 250 – 600 feet from their core residence. It should be noted that feral cats, as compared to domestic cats, can have core home range sizes that exceed 400 acres and have an average movement distance of 5 miles (Guttilla and Stapp, 2010). Any woodrats that may be present at the site are already subject to predation pressures from these human associated animals. However, while small mammals are the most likely prey of domestic cats ranging from residences, their impact on small mammal populations in adjacent reserves is minor. This is in substantial difference to the effect of feral and farm-based rural cats. Therefore, while the increased human presence is considered adverse, it is not substantially different than existing conditions, and no significant effect is anticipated. Impacts to special status species would be less than significant.

Mitigation Measures. None required.

Significance After Mitigation. Impacts to special status species would be less than significant without mitigation.

Impact BIO-2 Sensitive Plant Communities. Development of some of the undeveloped lots in Zone 2 has the potential to significantly impact existing or regrown Coastal Sage Scrub habitat, either through the direct removal of habitat during construction or as a result of Fire Department-mandated fuel modification on and/or off site (i.e., in the Reserves) after construction of new residences. In that event, effects to this sensitive plant

community would be considered potentially significant and impacts would be Class II, *significant but mitigable*.

The project site does not contain any sensitive plant communities because previously mapped coastal sage scrub areas have been reduced to isolated stands. No riparian habitat is associated with the primary drainage, with much of the cover in this area comprised of non-native woodlands. The area adjacent to the Filiorum Reserve has already been cleared sufficiently to maintain adequate distance between the undeveloped lots and sensitive coastal sage scrub vegetation. Therefore, based on current conditions, the proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service. However, over time and depending on future fuel management activities, coastal sage scrub vegetation could become re-established in various areas within Zone 2 or in adjacent properties. As shown in Figure 4.3-1, some isolated patches of former coastal sage scrub (CSS) habitat may still be present within Altamira Canyon, which traverses several developed and undeveloped lots in Zone 2. In addition, several of the undeveloped lots in Zone 2 abut the City-owned Portuguese Bend Reserve, though fuel management of this Reserve already occurs and would continue under the NCCP Subarea Plan. Nonetheless, it is possible that the development of some of the undeveloped lots in Zone 2 might have significant impacts upon existing or regrowth CSS habitat, either through the direct removal of habitat during construction or as a result of Fire Department-mandated fuel modification on- and/or off-site (i.e., in the Reserve) after construction of new residences is complete. In that event, effects to this sensitive plant community would be considered potentially significant.

Mitigation Measures. The following mitigation measure is recommended to reduce impacts to possible stands of CSS vegetation and to maintain consistency with the NCCP Subarea Plan and local ordinances.

BIO-2 **Biological Survey.** For lots that are identified as containing sensitive habitat on the City's most-recent vegetation maps and/or that abut any portion of the current or proposed future boundary of the Palos Verdes Nature Preserve, each applicant shall be required to prepare a biological survey as a part of a complete application for the development of the lot. Said survey shall identify the presence or absence of sensitive plant and animal species identified in the City's adopted NCCP on the subject property, and shall quantify the direct and indirect impacts of the construction of the residence upon such species, including off-site habitat impacts as a result of Fire Department-mandated fuel modification. The applicant and/or any successors in interest to the subject property shall be required to mitigate such habitat loss through the payment of a mitigation fee to the City's Habitat Restoration Fund.

Significance After Mitigation. Implementation of the above mitigation measure would reduce impacts to a less than significant level.

Impact BIO-3 Wetland Habitat and Jurisdictional Drainages. Construction activities within eight lots adjacent to Altamira Canyon could potentially affect jurisdictional drainage areas. This impact is considered Class II, *significant but mitigable*.

Altamira Canyon divides the study area into east and west portions. This drainage was surveyed during the field reconnaissance from available access points, and within those limited areas it did not contain any riparian or wetland habitat. Review of readily available aerial photographs does not indicate the presence of extensive riparian habitat or possible wetland areas. However, the drainage would be subject to the jurisdiction of the CDFG under Section 1600 et. seq. of the Fish and Game Code and possibly contains "waters of the US" subject to the jurisdictional control of the US Army Corps of Engineers. This drainage passes through or is adjacent to eight lots within which construction activities could potentially affect jurisdictional areas. The extent to which jurisdictional areas may be altered is unknown as no specific building plans are under consideration. At the time individual lot construction is proposed, the potential for intrusion into jurisdictional areas will need to be assessed and the actual amount of possible fill or other disturbance within jurisdictional drainages determined. Regulatory policies by the jurisdictional agencies require mitigation for permanent loss of riparian habitat, wetlands, and waters of the US, and may also require mitigation for temporary losses. Because development of these lots may affect jurisdictional areas, this impact is considered potentially significant.

Mitigation Measures. The following mitigation measures are recommended to provide for habitat restoration and ensure that regulatory permits have been appropriately obtained prior to work within jurisdictional areas.

BIO-3(a) **Agency Coordination.** The City shall review each application for construction and determine if proposed development is within the drainage channel within Altamira Canyon. If so, the applicant shall be required to obtain permits, agreements, and/or water quality certifications or correspondence indicating that none are necessary from applicable state and federal agencies regarding compliance with state and federal laws governing work within jurisdictional waters. Such agencies would include the California Department of Fish and Game, the United States Army Corps of Engineers, and the Los Angeles Regional Water Quality Control Board. The applicant shall provide such permits and/or agreements prior to the granting of a building or grading permit.

BIO-3(b) **Habitat Restoration.** In the event an application for construction would result in the loss of riparian or wetland vegetation, the applicant shall restore such habitat at a minimum ratio of 1:1 for temporary loss and 3:1 for permanent loss. Such restoration can occur either on site or within disturbed areas of the Palos Verdes Nature Preserve as determined and approved by the City.

Significance After Mitigation. Implementation of the above mitigation measures would reduce impacts to a less than significant level.

Impact BIO-4 Wildlife Movement. No significant impacts are anticipated with respect to night lighting and noise given the existing residential use of the area. Although the regionally important habitat area (RIHA) is protected by the policies of the Natural Overlay District (OC-1), tree removal associated with development facilitated by the proposed project could affect birds including the California gnatcatcher. Impacts to nesting birds as a result of tree removal would be Class II, *significant but mitigable*.

Future development of the lots that would be allowed under the proposed ordinance revisions is likely to include landscape and other improvements that may remove existing trees within the various lots. While these trees are mostly non-native pepper, eucalyptus, pine, acacia, and olive trees, they may nonetheless support birds that are protected by the Migratory Bird Treaty Act (MBTA) and the Fish and Game Code of California (3503, 3503.5, 3511, 3513 and 3800). These regulations protect almost all native nesting birds, not just special-status birds. A significant impact could occur as a result of harm to the reproductive success of species protected by the MBTA and the Fish and Game Code of California if any bird species are nesting in the existing trees at the time of tree removal. The impact to nesting birds as a result of tree removal would be potentially significant unless mitigation is incorporated.

Exterior night lighting and the noise associated with residential uses could potentially disrupt normal behavior and breeding for some wildlife species. However, such noise and light effects already exist in the area, and the increased density of residences would not be expected to substantially decrease the populations of common wildlife in the area. The introduction of additional landscape vegetation to these sites would potentially increase the local population levels of urban tolerant wildlife, primarily bird species such as Anna's hummingbird, western mockingbird, and California towhee. No significant impact is anticipated with respect to night lighting and noise given the existing residential use of the area. Please see Impact BIO-6 with respect to consistency of construction noise and activity with respect to the Best Management Practices guidelines of Section 6.2.2.2 of the NCCP.

The southern portion of Altamira Canyon within the project boundary that is designated RM-6 was also identified by the NCCP (URS, 2004) as a regionally important habitat area (RIHA) as it was mapped as containing coastal sage scrub along its steep slopes. A review of readily available photographs indicates that the vegetation in this area has apparently changed with the intrusion of additional non-native trees and other elements, and the coastal scrub vegetation appears reduced. The steep canyon slope is not optimal for California gnatcatcher, which prefers slopes of less than 40%, and given the lack of suitable vegetation further north within the canyon, it is unlikely that it is used as a significant transit route that provides connectivity for the local California gnatcatcher population. That function is largely served by the adjacent preserve areas (for instance Filiorum and Portuguese Bend Reserves). As this area is protected by the policies of the natural overlay district (OC-1), the proposed project would not be expected to cause a significant effect on possible California gnatcatcher movement.

Mitigation Measures. The following measure shall be implemented to reduce impacts related to nesting birds to a less than significant level.

BIO-4 **Nesting Bird Surveys and Avoidance**. The City shall require that tree pruning and removal is conducted outside of the bird breeding season (generally February 1 through August 31). If vegetation clearing (including tree pruning and removal) or other project construction is to be initiated during the bird breeding season, pre-construction nesting bird surveys shall be conducted by a qualified biologist. To avoid the destruction of active nests and to protect the reproductive success of birds protected by MBTA and the Fish and Game Code of California, nesting bird surveys shall be performed twice per week during the three weeks prior to the scheduled felling of the trees on the site. The surveys shall be conducted by a qualified biologist approved by the Community Development Director. If any active non-raptor bird nests are found, the tree(s) or vegetation shall not be cut down and a suitable buffer area (varying from 25-300 feet) depending on the particular species found is established from the nest, and that area is avoided until the nest becomes inactive (vacated). If any active raptor bird nests are found, a suitable buffer area (typically 250-500 feet from the nest) depending upon the species, the proposed work activity, and existing disturbances associated with land uses outside of the site, shall be determined and demarcated by the biologist with bright orange construction fencing, flagging, construction lathe, or other means to mark the boundary. All construction personnel shall be notified as to the existence of the buffer zone and to avoid entering the buffer zone during the nesting season. No ground disturbing activities shall occur within this buffer until the City-approved biologist has confirmed that breeding/nesting is completed and the young have fledged the nest. Nesting birds surveys are not required for construction activities occurring from September 1 to January 31.

Significance After Mitigation. Implementation of the above mitigation measure would reduce impacts to nesting birds to a less than significant level.

Impact BIO-5 **Local Policies and Ordinances. The proposed ordinance revisions would not conflict with local policies or ordinances protecting biological resources. Impacts would be Class III, *less than significant*.**

The City of Rancho Palos Verdes has not adopted a tree preservation ordinance. However, the City has established the Natural Overlay Control District (OC-1) to "Maintain and enhance land and water areas necessary for the survival of valuable land and marine-based wildlife and vegetation", and to "Enhance watershed management, control storm drainage and erosion, and control the water quality of both urban runoff and natural water bodies within the City" (Rancho Palos Verdes Municipal Code Section 17.40.040). As noted above, OC-1 has specific performance criteria and regulations that limit the potential for development within areas of important resources and any development. Any development that would result from the proposed project would need to conform to OC-1. While the project would provide for

increased residential development within the Portuguese Bend community, the consistency of individual lot developments will need to be determined at such time that a lot is proposed for development. As such, the proposed project would conform to this local policy and indirect impacts would be less than significant.

The City has a Coastal Sage Scrub (CCS) Conservation and Management Ordinance, which is codified as Chapter 17.41 of the Rancho Palos Verdes Municipal Code. However, this ordinance only applies to parcels over two (2) acres in size that contain CSS habitat. Only one of the undeveloped lots in Zone 2 exceeds this size threshold and contains CSS habitat. Any ordinance-required conservation actions would be determined at such time that this lot is proposed for development. As such, any conflicts of the proposed project with local policies or ordinances protecting biological resources are expected to be less than significant.

Mitigation Measures. None required.

Significance After Mitigation. Impacts would be less than significant.

Impact BIO-6 Conflict with Adopted Habitat Preservation Plan or Natural Communities Conservation Plan. Potential development under the proposed ordinance revisions would have the potential to conflict with guidelines of the NCCP. Therefore, impacts would be Class II, *significant but mitigable*.

As discussed above in the *Regulatory Setting*, the Rancho Palos Verdes City Council conceptually approved the Citywide Natural Communities Conservation Planning (NCCP) Subarea Plan in 2004. The plan identifies Biological Resource Areas and establishes the Palos Verdes Nature Preserve primarily for habitat preservation purposes. The Rancho Palos Verdes NCCP provides for conservation and protection of the habitat of the Palos Verdes blue butterfly and other special-status species, while permitting impacts from development to potential habitat for the covered species, including coastal sage scrub habitat. The City is currently working with CDFG to update, finalize, and authorize the NCCP. Several issues of compatibility of the Zone 2 proposed development with the NCCP are addressed below.

Fuel Modification. As stated in the NCCP Final EIR (URS, 2004), the existing distribution of native vegetation within the Subarea Plan area is highly fragmented and edge-affected by existing development. Fuel management activities outside of the Zone 2 property lines has already substantially altered the biological communities adjacent to the residential lots that could potentially be developed. The northwest portion of the study area contains the majority of the undeveloped/underdeveloped lots, and these lot boundaries are generally more than 200 feet from the boundary of the Filiorum Reserve. An exception is that three lots along Altamira Canyon adjoin the Filiorum Reserve property boundary along an approximate 450 foot linear boundary. The field reconnaissance indicated that this portion of the Reserve has already been subjected to fuel management activities that have reduced the habitat to a non-native grassland. Since no fuel management activities beyond that which has already occurred is expected for the individual lots, no additional impacts to the Reserve area are expected. It should be noted that the Portuguese Bend Reserve has been and will continue to be subjected to fuel management activities along the north edge of Narcissa Drive. For existing private development, the L.A. County Fire Department and L.A. County Department of Agricultural

Commissioner have reviewed the existing private development that abuts the Preserve and have determined the amount of brush clearance needed within the Preserve to provide the code required fuel modification zone for the protection of existing structures outside the Preserve. Development of residential structures in this eastern portion of the project site will not alter that existing practice.

Section 6.2.3 of the City-approved NCCP addresses Fire and Brush Management. It requires a brush management zone of a minimum of 50 feet from houses, buildings, or other structures with provision of up to 100 feet. In addition, brush management for new development is to occur outside Reserves. As discussed above, this level of brush management can be accommodated within the proposed project without affecting any additional Reserve lands.

Development Adjacent Reserves. Site specific project design issues are discussed in Section 6.2.2 of the current NCCP Subarea Plan. Issues associated with development relate to access and staging areas, fuel modification zones (discussed above), introduction of non-native species, night lighting, stormwater and urban runoff, increased noise levels, and access into Reserve lands. Each site to be developed in the proposed project (Zone 2) will need to be required to stay outside of the Reserve areas. Based on the location of the potentially developable lots and Reserve lands, no grading, access or staging areas are expected to affect Reserve lands. Nonetheless, construction activities on those lots that abut the Reserves could have an impact on wildlife and vegetation; therefore, the use of the Best Management Practices recommended under Section 6.2.2.2 are required to maintain consistency with the NCCP.

A Predator Control Plan (PCP) was developed as part of the *2006 Initial Management and Monitoring Report* (Dudek, 2007). It noted that brown-headed cowbirds were observed in the Portuguese Bend Reserve area and another reserve further to the southeast. The PCP recommended that a cowbird trapping program be implemented within the Portuguese Bend Reserve during the second year of the plan to reduce the potential for cowbirds to parasitize nests of native birds. One trap would be sufficient to cover this area. The status of this cowbird trapping program is unknown.

Brown-headed cowbirds are typically associated with land uses that have abundant grass seed, such as equestrian facilities, barns with livestock, and golf courses. Many of the residential lots currently within the study area have horses and other livestock, and an equestrian facility is located in the west portion of the project site. The proposed project would not alter the ability of lot owners to house livestock on their lots, and would not change the extent to which such facilities could occur within the site under existing conditions. If the owners of the lots choose to have large animals, additional waste grain food sources for the brown-headed cowbird could develop, but the potential for cowbird to occur is already present. ~~Development of the lots would not change the current presence of brown-headed cowbirds in the area, although it has the potential to increase the population of cowbirds in the local vicinity.~~ Per the Palos Verdes Peninsula Land Conservancy (see Comment Letter No. 7), recent surveys have not detected cowbirds. Nonetheless, ~~C~~cowbird management is likely to be an ongoing management issue for the Palos Verdes Nature Preserve because of existing land uses' ~~that~~ ability to support cowbird populations. In the event that cowbirds ~~populations increase~~ appear in the area in the future, the single trap recommended in the 2007 PCP for the Reserve to control populations in the area of known coastal California gnatcatcher nesting is anticipated to be sufficient.

As previously stated, buildout of the residential lots could increase the number of domestic animals in the local area that could affect local wildlife. The PCP indicates that the extent of damage to NCCP focus species from feral animals is currently unknown, with additional data to be gathered to determine if a feral animal trapping program is necessary. Based on the study conducted by Kays and DeWan (2004), 80% of observed domestic cat hunts occurred in a garden/yard or within the first 33 feet of the adjacent forest preserve. Radio-tracked domestic cats rarely entered the forest preserve during their study, with scent station recordings indicating that the domestic cats rarely ventured more than 130 feet into the preserve. A caveat of this finding was that the preserve was sufficiently large to sustain predators known to kill cats (coyotes and fishers), and these were domestic cats. Feral cats are known to range more widely into natural habitats, especially in the absence of such predators. Both the Filiorum and Portuguese Bend Reserves adjoin residential land uses on their northern sides, and the project site already contains residences that support domestic cats. The possible increase in the number of residences as proposed by the project is not likely to cause a substantial increase in the number of domestic animal problems within these Reserves given the existing conditions.

As discussed under Impact BIO-4 above, increased exterior night lighting and the noise associated with residential uses could potentially disrupt normal behavior and breeding for some wildlife species. However, such noise and light effects already exist in the area, and the increased density of residences would not be expected to substantially decrease the populations of common wildlife in the area. In addition, Section 17.56.030 of the City's Municipal Code specifically restricts exterior lighting in residential zones (such as the proposed project), generally that "no outdoor lighting shall be permitted where the light source is directed toward or results in direct illumination of a parcel of property or properties other than that upon which such light source is physically located." No substantial conflict with the Reserves related to noise and lighting effects are anticipated.

Conformance with stormwater and urban runoff with the Natural Overlay Control District (OC-1) is a standard requirement of the City's planning process and approvals on the individual lots at such time that they are proposed for development would maintain consistency with the NCCP Subarea Plan.

Section 6.2.4 of the City-adopted NCCP Subarea Plan provides for locating any new fences within Reserves so as not to impede wildlife movement, and also recommends that signage be established for access control and education at the periphery of the Reserves. As noted above, the proposed Zone 2 development does not directly adjoin Reserve land, except for three lots along Altamira Canyon that adjoin the Filiorum Reserve property boundary along an approximate 450 foot linear boundary. As part of the review process for these lots at such time that they are proposed for development, they would be reviewed for compliance with access features and fencing, including controls on access into the Reserve lands. Therefore, the project is considered to conform to the Subarea Plan requirements.

Habitat Protection. The Rancho Palos Verdes Coastal Sage Scrub Conservation Ordinance (Section 17.41 of the Municipal Code) was enacted to specifically preserve lands that contain coastal sage scrub habitat and to implement resource protection per Section 5.8.2 of the City –adopted NCCP (2004). Compliance with this ordinance would be required for the individual lots at such time that they are proposed for development. It is noted that very little vegetation within Zone 2 can be described as "coastal sage scrub" given past and current fuel

modification practices. Therefore, the proposed project is considered to be in conformance with the habitat protection features of the NCCP Subarea Plan.

Existing City ordinances, the standard City permit approval process, the adopted 2004 NCCP Subarea Plan, and future adoption of an Implementing Agreement for the NCCP would serve to minimize the potential for conflicts of future proposed development within the Zone 2 area from conflicting with the Draft NCCP/HCP. Therefore, this effect is considered to be less than significant under CEQA regulations.

Mitigation Measures. The following applicable measures are recommended to enhance the value of the adjacent Reserves, to limit private access into Reserve lands, and to maintain consistency with the requirement that no fuel management for new development be allowed within the Reserves.

BIO-6(a) **Structure Location**. To avoid the need for continued fuel management within the Filiorum Reserve, the City shall require that all structures for those lots abutting the Filiorum Reserve property boundary are located at least 100 feet from that boundary.

BIO-6(b) **Perimeter Fences**. As part of approvals for development on the individual subject lots, the City shall require that lots adjoining the Filiorum Reserve are fenced sufficient to prevent the ready egress of domestic animals into the Reserve. In addition, no gates or other means of ingress into the Reserve shall be permitted.

BIO-6(c) **Construction Best Management Practices.** The following measures shall be required for those lots that abut Reserve lands as part of construction monitoring for the site:

- Contractors shall be educated regarding the off-site Reserve and the need to keep equipment and personnel within the project site prior to the initiation of construction.
- Temporary construction fencing shall be placed at the planned limits of disturbance adjacent to the Reserve.
- Construction should be scheduled to avoid the bird nesting season (see Mitigation Measure BIO-4 above).
- Construction grading adjacent to drainages shall be scheduled for the dry season whenever feasible.

BIO-6(d) **Construction Staging and Stockpiling Areas.** Grading and building plans submitted for City review and approval for those lots abutting Reserve lands shall identify areas for construction staging, fueling and stockpiling if needed. These areas shall be located as far as practical from Reserve lands, and not closer than 50 feet from the PVNP boundary.

Significance After Mitigation. Less than significant.

c. Cumulative Impacts. The following were considered in the assessment of cumulative impacts to biological resources:

- *The cumulative contribution of other approved and proposed projects to fragmentation of open space in the project vicinity;*
- *The loss of sensitive habitats and species;*
- *Contribution of the project to urban expansion into natural areas; and*
- *Isolation of open space within the vicinity by the proposed project and future projects.*

Cumulative development in the City would continue to disturb areas with the potential for sensitive biological resources. Each development proposal is reviewed by the City and undergoes environmental review when it is deemed appropriate. Significant impacts to biological resources are minimized through this development review process, which requires mitigation to reduce significant impacts to the greatest extent feasible and below significance thresholds in most cases. The biological impacts associated with the proposed project have been mitigated to levels of insignificance. The impacts of the proposed project would be localized in nature and would not substantially contribute to any cumulative impacts to regional biological resources. It should also be noted that the adopted NCCP is a comprehensive, long-term habitat conservation plan. The NCCP addresses the potential impacts of urban growth, natural habitat loss and species endangerment, and its implementation is designed to mitigate for the potential loss of sensitive species and their habitat due to the direct, indirect, and cumulative impacts of development of both private and public lands within the planning area.

4.4 CULTURAL RESOURCES

This section analyzes potential impacts to archaeological, paleontological, and historical resources. The discussion is primarily based on the findings of a Cultural Resources Records Search Summary performed by Historical, Environmental, Archaeological, Research Team (H.E.A.R.T.) (H.E.A.R.T., April 2010) and supplemented by a paleontological study conducted by Rincon Consultants (January 2011). The records search was conducted at the South Central Coastal Information Center (SCCIC) at California State University Fullerton, and included a historical map database search with the Geography Department at California State University Northridge, and a consultation with the Native American Heritage Commission. The paleontological resources study consists of a records review of California Geological Survey maps. To ensure the protection of known cultural resources sites identified in the study, the cultural resources report is available for review by qualified personnel at the City's Community Development Department offices.

4.4.1 Setting

a. Archaeological Overview. The overall Los Angeles region has been occupied for over 20,000 years, based on investigations in the Ballona Creek area of the Los Angeles Basin, the La Brea Tar Pits, and Malaga Cove. Chronologies for southern California indicate a generalized hunting and gathering economy in existence at a very early time.

The Millingstone Period dates to over 6000 years ago, and suggests a generalized plant collecting economy, supplemented by hunting and fishing. Regional interaction appears limited when compared with later periods. Around 3,500 years ago, there was an apparent economic shift to more reliance on hunting, as well as an increased exploitation of the acorn. This represents a subtle transition from the prior period where hard seed processing appeared to be more predominant. Sites attributed to this period appear to have been occupied by small groups.

The Intermediate Period dates from 1,000 B.C.-A.D. 1,000. Sites from this time indicate an increased reliance on coastal resources with continued reliance on hunting and collecting. In addition, the advent of the bow and arrow, the appearance of more bone tools, and increased reliance on the mortar and pestle are typical during this time.

The Late Period that begins around A.D. 750-1,000 is characterized by increasing economic and social complexity. Villages tended to be larger, with a more varied assemblage, and there appears to be an increase in smaller satellite sites, established to support the main village, and reflecting seasonal use of a particular area. There seems to be more intensive exploitation of localized resources, and social contacts and economic influences appear to be accelerated through trade and social interaction. There is an increase in the number of sites in the area, which some researchers believe is the result of a population increase. The Late Period is characterized as a time when there are more specialized sites in terms of their location and function, and an amplification of all aspects of the cultural system.

At the time of European contact, the project area was inhabited by the Shoshonean-speaking Gabrielino, as ascribed due to their association with Mission San Gabriel, which was founded in

1771. The Gabrielino are considered one of the most distinctive tribes in all of California, occupying a large area which was bordered on the west by Topanga and Malibu, the San Fernando Valley, the greater Los Angeles basin, the coastal strip down to Aliso Creek south of San Juan Capistrano, and the islands of Catalina, San Clemente, and San Nicolas. They are credited with an extensive and elaborate material culture, their expert craftsmanship in quarrying and manufacturing soapstone, and constructing the plank canoe. Information about the Gabrielino comes from a number of sources. including Kroeber (1925), Boscana (1933), Johnston (1962), Blackburn (1963), Reid (1968), Bean and Smith (1978) and Hill (1985).

b. Historic Overview. The following general information was summarized from Fink (1987). The project area was part of a major land grant received by a Spanish soldier named Juan Jose Dominguez who died in 1809. The 75,000 acre grant was entitled in 1784 and included the entire Rancho Palos Verdes Peninsula. For over 35 years the rancho land supported several thousand heads of cattle and a flourishing hacienda. In 1827, Don Dolores Sepulveda received the Rancho de los Palos Verdes land grant, translated from Spanish to mean range of green trees. Through misfortune and mishaps from 1862 to 1882, stewardship of much of his land passed from the Sepulveda family through various mortgage holders to Jotham Bixby of Rancho Los Cerritos. When his property could no longer be used for only cattle grazing, Bixby leased the land to Japanese farmers for cultivating grains and vegetables. At the close of the 19th Century, the Palos Verdes Peninsula was used by sheepherders. For the most part the mesas and terraces lacked trees, fences, roads and structures. During the early 1900s, the mesa was used for cattle ranching and farming. Japanese families farmed the southern slopes, cultivating beans, peas and tomatoes, while the northern slopes were planted in barley for hay and grain.

By 1913, a consortium of New York investors (Harry P. Davidson of J. P. Morgan and Company; Benjamin Strong, president of the Bankers' Trust Company of New York; and Frank Trumbull, chairman of the board of the Chesapeake and Ohio Railroad) owned most of the Bixby land. Initially, these investors intended to divide the land into large estates. The founding father of the Peninsula, Frank Vanderlip, was one of these investors. Over the next decade, interest in the Peninsula would wane until Vanderlip allied himself with real estate promoter E. G. Lewis. In 1922, a real estate developer named H.G. Lewis acquired the Palos Verdes Project, which would constitute the future City of Palos Verdes Estates and part of the Miraleste area of the current day City of Rancho Palos Verdes, through exercising an option to acquire the Property from Mr. Vanderlip. The community was called Palos Verdes Estates and had decreased in development area from the original 16,000 acres to 3,225 acres. Vanderlip held onto 13,000 acres in the southern portion of the peninsula for future development.

Vanderlip planned to develop the area above Point Vicente lighthouse as an Italian hillside village. Marble was imported from Italy for the first building in 1928, but the project was never completed. Vanderlip constructed his first residence on the Peninsula in 1916 in the Portuguese Bend area, the "Old Ranch Cottage," now known as the "Cottage." Other buildings were added in the 1920s including a small guest house and garage called "La Casetta" and a larger guesthouse in 1924, known as the "Villetta," now known as "Villa Narcissa." Behind the Villetta, a stairway of 268 steps, lined by cypress trees, soared to a lookout point where a white marble temple was built. Several recreational facilities, however, were constructed early in the development of the Palos Verdes Project.

Six street entrances were planned for the Palos Verdes peninsula, three from the east and three from the north. The main broad street, Granvia La Costa (Palos Verdes Drive), considered a parkway with a landscaped center strip, was designed for the unrealized Pacific Electric Railway to run down its center. The Palos Verdes Golf Club was opened in 1924, and the Palos Verdes Swim Club was opened in 1930. Stables for horseback riding were also constructed in Palos Verdes Estates. The Swim Club was renamed the Roessler Pool, in honor of Fred Roessler, mayor of Palos Verdes Estates for 25 years and who was instrumental in the formation of the city of Palos Verdes Estates in 1939. The original Swim Club utilized recirculated ocean water. The Great Depression, which began in 1929, had an extremely debilitating effect on the Palos Verdes Project. Many lot owners defaulted on their property taxes, and the Palos Verdes Homeowners Association, which maintained the Project, was in deep financial straits. In 1932 the trustee turned over to the residents the responsibility of the Homes Association; only one third of the owners of building sites failed to pay their annual assessments.

With the death of Frank Vanderlip in 1937, control of the Palos Verdes Corporation, which owned the balance of the original Vanderlip property holdings other than what was incorporated in the Palos Verdes Project, was passed to Vanderlip's son. During December, 1939, the voters decided to form a city of the sixth class to have taxing authority. Control of the Palos Verdes Corporation passed in 1943 to Harry Benedict, a friend and business associate of Frank Vanderlip. In 1945, Kevin Vanderlip took control of the Corporation. During World War II Japanese farmers and their families who had lived on the Peninsula since 1910 were sent to internment camps. Defensive positions were established at the Haggarty Estate in Malaga Cove. Battery installations were installed at the current location of the Rancho Palos Verdes City Hall (also known as the Civic Center or Upper Point Vicente), as well as at Rocky Point in Lunada Bay in 1943 that included two 16-inch guns. Barracks and support buildings were also constructed in Lunada Bay. An underground observation point was also constructed at Punta Place overlooking Bluff Cove and the South Bay. Rancho Palos Verdes was incorporated on September 7th, 1973.

The subject lots within the 112-acre project area were created in the 1940s. Dating from the 1950s, the majority of the lots have been developed with residential, equestrian and horticultural use. The largest developed lot in Zone 2 is occupied by the Portuguese Bend Riding Club, a nonconforming commercial stable that was established prior to the City's incorporation in 1973.

c. Records Search Results. A record search performed by archaeologist Wayne Bonner of the South Central Coastal Information Center on April 15, 2010 indicated that no previously recorded prehistoric or historic archaeological sites or historic properties exist within the project area. Table 4.5-1 and the bulleted list following the table describe previously recorded prehistoric archaeological resources in proximity to the project site.

Table 4.4-1
Previously Recorded Prehistoric Archaeological Resources in Proximity to the Project Site

Reference	Description
Within a 1000 foot Radius of the Project Site	
CA-LAN-303/ CA-LAN-1019	Recorded by Jay Evans in 1969 and updated by William Hayden in 1995 to be the same site recorded by Martin D.Rosen in 1979. The site contained shellfish, groundstone, charm stone, grooved stones, pestles, flaked tools, chert scrapers, steatite beads, vessels, pendants and bifacial blades. Much of the site has been subject to unauthorized excavation by residents and high school students.
CA-LAN-821	Recorded by Susan Hector and Martin Dean Rosen in 1975 as a light shellfish scatter with no lithic material observed. The site was updated by Joe Simon in 1995 to include the remains of Monterey chert primary flakes.
Within a ½-Mile Radius of the Project Site	
CA-LAn-1735	Possible Quarry Site
CA-LAn-2061	Possible Quarry Site
CA-LAN-103	Small Cave with midden soil and artifacts (destroyed)
CA-LAN-2000	Shell scatter
19-10099	Two chert flakes
CA-LAN-140	Recorded in the early 1900s by N.C. Nelson as a shell refuse located in a partly plowed field near a high bluff. During construction for a parking lot, multiple burials and grave goods were unearthed.
CA-LAN-822	Recorded by S. Hector and M.D. Rosen in 1975 as a lithic and shellfish scatter situated on the bluff.
CA-LAN-884	Recorded by E. Gary Stickel in 1978 as containing shellfish, groundstone, and debitage
CA-LAN-1249	Recorded in 1985 by T.K. McAule as a shell midden eroding out of roadcut face.
CA-LAN-1250	Recorded in 1985 by T.K. McAuley as a shell and lithic scatter
CA-LAN-1251	Recorded by Rechtman and Hickey in 1987 as a dense shell midden with groundstone, chipped stone and tools
CA-LAN-2485	Recorded by David S. Whitley in 1997 as a lithic scatter with habitation debris
CA-LAN-2486	Recorded by David S. Whitley in 1997 as a lithic scatter with habitation debris

Source: H.E.A.R.T., 2010

- Within a half-mile radius, four historic cultural resources have been identified: **19-180589**: Long Point Defense Facility - Observation Post **19-180590**: Long Point Defense Facility - Battery 240; **19-180591**: Long Point Defense Facility - 1936 Monument; and, **19-180592**: Long Point Defense Facility - Nike Air Defense Site
- Ten prior cultural resource studies have been performed: Anon 1995, 1997; Chakurian 2003; Foster 1989; Hayden & Macko 1995a,b; Maki, 1995, 2001; McCauley 1985; McKenna 2001.
- Two of these investigations encompassed 100% of the project area (Anon 1995; Hayden & Macko 1995 a, b; Maki 2001.), with negative results.
- Two National Register of Historic Places have been identified (1979-2005 and supplements to date) within a half-mile radius: The Harry Benedict Estate located at One Peppertree Drive (NR#86002796), and; the **Wayfarers Chapel**, located at 5755 Palos Verdes Dr S, also known as "The Glass Church" was designed by Lloyd Wright (son of Frank Lloyd Wright) in the late 1940s and was built between 1949 and 1951. Additions were built in later years, including a tower and a visitor center (NR# 05000210).
- The California Historic Resources Inventory (HRI) lists one property within a half-mile radius: The Harry Benedict Estate located at One Peppertree Drive.
- No California Register of Historic Resources exists (1992, with supplemental information to date).
- No California Historical Landmarks are listed (1995, with supplemental information to date).
- No California Points of Historical Interest are noted (1992, with supplemental information to date).
- No State Historic Resources Commission issues are presented (1980-present. Minutes from quarterly meeting).
- The Native American Heritage Commission (NAHC) was contacted by letter on April 18, 2010 for any information regarding Native American concerns for the project area. No response was received to date.

The following historic maps were consulted:

- Township-Range Plat Survey of the United States Geological Service (1852-1890)
- Map of Private Grants and Public Lands Adjacent to Los Angeles and San Diego- Clinton Day (1869)
- Map of the County of Los Angeles, California - Stevenson/Rowan (1881-1888)
- Map of the Reservoir Lands in the County of Los Angeles - Seebold (1891)
- Santa Ana, California 15-minute USGS topographic map (surveyed in 1894) (1901)
- Rueger's Map of Greater Los Angeles (1902)
- Topographic Map of the Los Angeles Aqueduct and Adjacent Territory (1908)
- Map of Los Angeles County – Blunt (1911)

- Percival's Map of Los Angeles and Vicinity – Thompson (1924)
- Los Angeles and Vicinity Showing Old Adobes and Historic Sites – Giffen (1936)
- Palos Verdes, California 15-minute USGS topographic map (1944)
- Redondo Beach 7.5-minute USGS topographic map (1953)

d. Paleontological Overview. The surface exposures within the project vicinity are mapped as Quaternary Landslides (Saucedo, G. J, et al. 2003), and include the Ancient Portuguese Bend Landslide, the Active Portuguese Bend Landslide, the Abalone Cove Landslide, and the Klondike Landslide. These landslides are all considered to be large, destructive landslides classified as historically active with complex movement and depositional patterns. The overall average thickness of the combined landslides is approximately 130 feet thick and covering over 260 acres. These slides overlay the underlying tuffaceous lithofacies of the Altamira Shale (Haydon 2007) with a low potential of paleontological resources.

4.4.2 Impact Analysis

a. Methodology and Significance Thresholds. This assessment is based on the information gathered and analyzed in the cultural resources study (H.E.A.R.T., 2010). The study consists of an archival records search. As described in the *Setting*, a records search was conducted at SCCIC located on the CSU Fullerton campus.

Cultural resource impacts are considered significant if the proposed project would:

- *Cause a substantial adverse change in the significance of a historic or archaeological resources, as defined in Section 15064.5 of the CEQA Guidelines*
- *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature*
- *Disturb any human remains, including those interred outside of formal cemeteries*

For purposes of this analysis, cultural (archaeological and paleontological) resources include the following:

- *A resource listed, or determined to be eligible by the State Historical Resources Commission for listing, in the California Register of Historical Resources*
- *A resource included in a local register of historical resources or identified as significant in an historical resource survey*
- *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*

A resource is considered archeologically significant if it:

- *It contains information needed to answer important scientific research questions,*
- *Has a special and particular quality such as being the oldest or best available example of its type*

- *Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage*
- *Is associated with the lives of persons important in California's past*
- *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*
- *Has yielded, or may be likely to yield, information important in prehistory or history*

As discussed in the project Initial Study (Appendix A to this EIR), impacts related to historic resources would be less than significant. Therefore, the impact discussion below focuses on archaeological and paleontological resources, and disturbance of human remains.

b. Project Impacts and Mitigation Measures.

Impact CR-1 **Potential development that the proposed ordinance revisions could facilitate on the undeveloped lots, which could include up to 1,000 cubic yards of grading per lot, has the potential to disturb as-yet undetected areas of prehistoric archaeological significance. This is considered a Class II, *significant but mitigable*, impact.**

No previously recorded prehistoric or historic archaeological sites or historic properties were identified within the project area during the cultural resources records search performed for the project. However, several sites of archaeological significance have been identified within ½-mile of the property. The likelihood of finding intact significant cultural resources is low due to historic grading and development on many properties, as well as grading limitations put in place by the Portuguese Bend Community Association and the City's zoning regulations. Nevertheless, construction activity for the residential units that could be allowed under the proposed revisions to the Landslide Moratorium Ordinance would involve earthwork such as grading and trenching, which has the potential to unearth yet-to-be discovered archaeological resources. Therefore, although no significant archaeological resources are expressly known to occur on-site, potential impacts to as-yet undetected archaeological resource impacts are considered significant.

Mitigation Measures. The following measure would mitigate potentially significant impacts relating to the possible discovery of archaeological resources during construction activity such as site grading and trenching.

CR-1 **Archaeological Monitoring**. Prior to the commencement of grading, the applicant shall retain a qualified archeologist to monitor grading and excavation. In the event undetected buried cultural resources are encountered during grading and excavation, work shall be halted or diverted from the resource area and the archeologist shall evaluate the remains and propose appropriate mitigation measures.

Significance After Mitigation. With implementation of the above measure, potential impacts relating to grading within individual lots of the project site to as-yet unknown archaeological resources would be reduced to a less than significant level.

Impact CR-2 **Grading for development that could be facilitated by the proposed ordinance revisions has low potential to disturb any paleontological resources. Impacts to paleontological resources would be Class III, *less than significant*.**

As discussed above under *Setting*, the surface exposures within the project vicinity are mapped as large, destructive landslides classified as historically active with complex movement and depositional patterns. The overall average thickness of the combined landslides is approximately 130 feet thick and covering over 260 acres. These slides overlay the underlying tuffaceous lithofacies of the Altamira Shale (Haydon 2007) with a low potential of paleontological resources. Due to the substantial depth from surface to the marine Altimira Shale, and the low potential for fossils at depth, no paleontological resources are expected to occur within the project boundary either at surface or at a depth commonly associated with construction activities. Therefore, project implementation would not affect any paleontological resources.

Mitigation Measures. None required.

Significance After Mitigation. Impacts to paleontological resources would be less than significant without mitigation.

Impact CR-3 **Grading for development that could be facilitated by the proposed ordinance revisions has the potential to disturb human remains, including those interred outside of formal cemeteries. With adherence to existing regulations that address discovery of human remains during grading and construction, impacts would be Class III, *less than significant*.**

No previously recorded burial sites were identified within the project area during the cultural resources records search performed for the project. Although the likelihood of finding any human remains is low due to historic grading and development on many properties, construction activity for the residential units that could be allowed under the proposed revisions to the Landslide Moratorium Ordinance would involve earthwork such as grading and trenching, which has the potential to unearth yet-to-be discovered human remains. Therefore, potential impacts to as-yet undetected human remains are considered significant. However, in accordance with California Health and Safety Code Section 7050.5, all construction or excavation must be stopped in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery until the County coroner or medical examiner can determine whether the remains are those of a Native American. Section 7052 of the Health and Safety Code states that disturbance of Native American cemeteries is a felony.

Mitigation Measures. None required.

Significance After Mitigation. With required adherence to existing regulations, potential impacts relating to grading within individual lots of the project site to as-yet unknown human remains would be less than significant.

c. Cumulative Impacts. Cumulative development in the City would continue to disturb areas with the potential to contain as-yet undiscovered cultural resources, including archaeological resources and paleontological resources. Each development proposal is reviewed by the City, and undergoes environmental review when it is determined that potential for significant impacts exist. In the event that significant resources are discovered, impacts to such resources would be mitigated on a case-by-case basis. Thus, cultural resource impacts associated with future cumulative development in the City are expected to be less than significant.

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4.5 GEOLOGY

The following analysis is partially based on the literature review and geotechnical investigation of the project area conducted by LGC Valley, Inc., dated March 29, 2011, and the Rancho Palos Verdes General Plan Natural Environment Element. The geotechnical review conducted by LGC Valley, Inc. is contained in its entirety in Appendix D. The Rancho Palos Verdes General Plan is available for review at the Community Development Department at the Rancho Palos Verdes City Hall, 30940 Hawthorne Boulevard, in Rancho Palos Verdes.

4.5.1 Setting

a. Regional Geology. As described in the Rancho Palos Verdes General Plan Natural Environment Element, the Palos Verdes Peninsula is underlain by a sequence of middle Miocene and younger bedded sedimentary rocks that are draped anticlinally over a core of Mesozoic schist "basement rocks." Both the schist and sedimentary rocks have been intruded by irregular masses of basaltic volcanic rocks. A series of marine terrace benches developed across the rocks of the Peninsula during late Pleistocene and Holocene geologic time (the last few hundred thousand years) and both sandy marine terrace deposits and overlying deposits of landward origin occupy these benches. The landscape in parts of the region has been significantly modified by the movement of massive landslides during the time interval between formation of the oldest terraces and the present (Rancho Palos Verdes General Plan, 1975). The peninsula has been uplifted by movement on two sub-parallel bounding faults, the Palos Verdes fault on the northeast and the San Pedro fault offshore on the southwest.

The faulting and seismicity of Southern California is dominated by the compressionary regime associated with the "Big Bend" of the San Andreas Fault Zone. The San Andreas Fault Zone separates two of the major tectonic plates that comprise the Earth's crust. The Pacific Plate lies west of the San Andreas Fault Zone. The North American Plate lies east of the San Andreas Fault Zone. The relative movement between the two plates is the driving force of fault ruptures in the region. The San Andreas Fault generally trends northwest-southeast. However, north of the Transverse Ranges Province, the fault trends in an east-west direction (the Big Bend), causing the fault's right-lateral strike-slip movement to produce north-south compression between the two plates. This compression has produced rapid uplift of many of the mountain ranges in Southern California. North-south compression in southern California has been estimated to be 5 to 20 millimeters per year (SCEC, 1995).

b. Project Area Geology. The proposed ordinance revisions would apply to the approximately 112-acre Zone 2 Landslide Moratorium Ordinance area, located north of the intersection of Palos Verdes Drive South and Narcissa Drive in the Portuguese Bend area of the Palos Verdes Peninsula. This area, located on the hills above the south-central coastline of the City, is within the City's larger (approximately 1,200-acre) Landslide Moratorium Area (LMA).

The project area is located on Middle Miocene to Early Pliocene Monterey formation, which constitutes the exposed bedrock over most of the Palos Verdes Peninsula. The Altamira Shale Member of the Monterey formation is the lowest of three distinct phases of the Monterey formation in the area and is the source of the Ancient Portuguese Bend Landslide (APBL), and all subsequent landslides within the APBL including the Recent Portuguese Bend Landslide

(PBL) and the Abalone Cove Landslide (ACL). The Altamira Shale is further subdivided into three distinct lithofacies, or zones of distinct deposition and thus rock types. These are the Portuguese Tuff, the Cherty Lithofacies and the Phosphatic Lithofacies. Of these three, the Portuguese Tuff is the most prominent and encountered unit in the area, and is typically used as a reference point in discussing stratigraphy. Because of its thickness, estimated between 50 feet and 75 feet, and its composition (an altered ash tuff to bentonite clay), it is also commonly considered to have the greatest potential to affect the slope stability of the local area (LGC Valley, Inc, 2011).

Geologic Units. The main geologic units in Zone 2 and the surrounding area are the Monterey formation and ancient and recent landslide deposits. Surficial units of marine and non-marine terrace soils, along with alluvium, colluvium and fill mantle the thicker deposits of landslide and bedrock (LGC Valley, Inc., 2011). Each of these materials is discussed below.

Artificial Fill. Local areas of artificial fill are found throughout the Zone 2 area. Fill soil thickness is variable from a few inches to ten feet or more in response to the filling of low points, swales or grabens from ancient landsliding events in order to create roads and/or pads. According to the March 2011 Geotechnical Study prepared by LGC Valley, Inc., it is possible that some of the minor cracking observed within roadways, trenches and within lots in the Zone 2 area are due to settlement of poorly compacted fill soils.

Colluvium. Colluvium is located at the ground surface in areas unaffected by grading activities and is the in-situ development of soil from the underlying materials. The colluvium or topsoil is composed of dark brown to black silty clay and clayey silt and is prone to shrinkage and cracking when drying. The colluvium is thicker in low areas such as swales and thinner on steep hillsides. The colluvium has an average thickness of approximately three feet for gently dipping surfaces in the project area (LGC Valley, Inc., 2011).

Alluvium. Alluvium is the down slope migration of particles by moving water that is typically confined within the elongated troughs of streams and canyons. Alluvium may be fine to coarse-grained and even consist of cobbles and boulders. Alluvium is generally confined to the active stream channels that cut across the southern flank of the peninsula and are interpreted at approximately ten feet or less in thickness in the adjacent Altamira and Portuguese Canyons. Thinner deposits are interpreted within the short streams that feed into these primary canyons.

Landslides. Landslides have occurred throughout the peninsula, but none are more prominent than those of the approximately 900-acre Ancient Portuguese Bend Landslide complex and surrounding areas. In general, these landslides are the result of inclined bedding to the south that becomes unsupported due to erosion from beach waves and intrusion from water runoff. As landslides fall into the beach zone due to loss of support from erosion, the material up-slope from these areas loses support and becomes susceptible to landsliding as well. Further instability comes from the now fractured nature of the landslide material, which allows more water to infiltrate into the landslide mass, adding weight, creating buoyancy and further decreasing clay strength, while erosion from beach processes at the toe restrict the landslide masses from natural buttressing. The overall effect is a series of landslides that "shingle" up slope nearly to the crest of the anticline that forms the backbone of the peninsula.

According to the LGC Valley, Inc. Geotechnical Study (2011), the initial landsliding that occupies the bulk of the area observed today occurred approximately 120,000 years ago with possibly initial movements as early as 500,000 years ago. Landslides in the South Shore occured approximately 16,200 years ago, and historical landsliding of the Portuguese Bend Landslide (PBL) and Abalone Cove Landslide (ACL) indicate that mass movements still occur in the area today. Thus, it is reasonable to conclude that landsliding occurs nearly continuously, at least in geologic terms, throughout the APBL complex and that landsliding will continue into the future.

Overall, the various landslides are interpreted or known to be founded on the weak bentonite clay beds that comprise within the Altamira Shale (LGC Valley, Inc., 2011). All landslides appear to fail in a down slope direction toward the ocean. Because of numerous land movements, head scarps and grabens of varying length, height and arc occur throughout the APBL area. Over time, erosion wore down these initially sharp angled features into subdued hills and depressions. Coupled with the formation of terraces over time, the APBL has a gently rolling, hilly appearance except in the areas of recent landsliding.

The Ancient Portuguese Bend Landslide (APBL) moved as a translational-type landslide along a pre-existing weak layer(s) composed of bentonite clay that is inclined toward the ocean (LGC Valley, Inc., 2011). Some geologic reviewers interpret that the APBL initially moved as a single sheet, in part because of the lateral continuity of the entire landslide complex, and then broke into smaller landslides shortly thereafter. Others hypothesize that landsliding occurred in several relatively smaller stages that then migrated up-slope as a series of landslides as successive parcels of land became unsupported from the down-slope failures.

Recent historical movement and groundwater data such as that identified in the Abalone Cove Landslide (ACL) and recent Portuguese Bend Landslide (PBL), among others, generally supports this later interpretation as these slides occurred along seaward dipping strata, that appears to have begun within the beach zone with very high water levels high up-slope. Reports that leech fields, seepage pits and cesspools were in common practice for residences atop the APBL indicate primary sources for groundwater build-up which would be a primary catalyst for movement (LGC Valley, Inc., 2011).

Though both of these slides generally moved "at once," surface monument data as well as historical data indicate that the first and greater movement occurred at the toe of the slide and then decreased up-slope such that the slides "shingle" up-slope with the toe area showing a greater "rubble" appearance than those areas higher up (LGC Valley, Inc., 2011). Thus, the material near the toe of the landslide has a distinctly different and chaotic structure with very low strength as compared to the landslide debris higher uphill, which is more intact and has a greater inherent strength.

As indicated above, the movement of lower land masses subsequently decreases support of the land higher up creating distinct zones within each landslide that are progressively less broken and therefore stronger up slope. The larger uphill masses provide significant support to up-slope property because it remains fairly intact.

Abalone Cove Landslide. The Abalone Cove Landslide (ACL) is the re-activation of part of the APBL complex and abuts Zone 2 immediately to the south. Movement of the ACL initiated in 1974 and continued significant movement until 1985 encompassing a total of approximately 85 acres (LGC Valley, Inc., 2011).

Beginning in 1994, a series of survey monuments were installed across the ACL and Zone 2. The monuments were set up to be reviewed through Global Positioning Satellite networks (GPS) and recordings have been collected through 2006. The data from these monuments indicates small amounts of movement have occurred up to the most recent known readings in 2006. Interpretations vary as to causation of the movement, ranging from slope creep, stress relaxation of the landslide from the primary movement that occurred between 1974 and 1985, continued creep movement along the basal rupture surface of the landslide, effects from high rainfall, damage or disturbance to monuments, to possible error in data points or some combination thereof (LGC Valley, Inc., 2011).

From 1994 to 2006, movement of the ACL indicated the magnitude of displacement at the toe of the ACL to be approximately 1.9 feet, the mid-portion 0.8 feet, and the head area approximately 0.6 feet (LGC Valley, Inc., 2011). This movement roughly correlates to a yearly slip of 1.9 inches, 0.8 inches and 0.6 inches, respectively, though the movement is not steady on a year-to-year basis. Instead, the data appears to indicate that movement occurs in pulses typically regulated by rainfall. This movement is not considered to be a hazard to life and limb as long as the abatement activities (groundwater dewatering and monitoring) within the ACL continue. Monuments within Zone 2 indicate average movement of approximately 0.3 inches per year or three inches every 10 year period.

Because the ACL area contained numerous home sites and the boundaries were unclear at the time of initial and even continued landsliding, a Landslide Moratorium Ordinance was adopted in 1978. This ordinance was adopted in part because it was uncertain if the slide could be controlled or prevented from spreading into areas beyond the area characterized by visible surface cracks.

Shortly after the adoption of the Landslide Moratorium Ordinance, a geotechnical investigation of the ACL was sponsored by the City. The subsequent report by Robert Stone and Associates (1979) provided recommendations for removal of groundwater and noted the lack of youthful landslides uphill (Zone 2) of the ACL. The report indicated that there were only two naturally occurring processes capable of destabilizing the slides uphill from the active ACL. One was loss of support on the downhill side as a result of movement of the ACL, and the other was a rise in the water table. From these conclusions, the report recommended against further development in Zone 2 until slide movement was stopped within the ACL, the water table was lowered, and surface drainage was improved.

Within Zone 2, pumping wells have lowered the groundwater table, drainage has been improved, and the movement on the adjacent ACL has slowed substantially. With the exception of differences of opinion with regard to why or even if there is true land movement in ACL and Zone 2, it appears that these conditions have generally been met, and that the uncertainty with regard to landslide control has been abated.

Portuguese Bend Landslide. The 260-acre active Portuguese Bend Landslide (PBL) has been moving continuously since re-activation in 1956. Like the ACL, the PBL is a portion of the much larger APBL complex; however, its rate of movement is estimated at approximately three feet per year versus the 0.6 to 1.9 inch per year rate for the ACL (LGC Valley, Inc., 2011).

The landslide displaced Palos Verdes Drive South, eliminated the extension of Crenshaw Boulevard, damaged a pier just east of Inspiration Point, and affected approximately 160 homes, of which about 134 were destroyed. The remaining home owners moved to nearby areas that were more stable or adapted to account for ground movements through methods such as continuous use of hydraulic jacks and timbers to keep their foundations level.

Excavation shafts explored by geologists into the PBL located the basal rupture surface on a sheared bentonite clay bed located about 30 to 40 feet above the Portuguese Tuff. The western margin of the PBL moves over inactive landslide debris of the APBL while the eastern portion moves over in-place bedrock (LGC Valley, Inc., 2011).

Similar to the ACL, the PBL is composed of rubble within the toe areas and numerous large blocks up-slope that move at different rates. Like the ACL, the seaward portion of the slide mass moves at a faster rate than those parcels further away from the coast and all parcels accelerate after periods of high rainfall. The rate of movement of the landslide reached 1.5 inches per day after seasons of high rainfall. Only through continued redistribution of landslide mass in three distinct pulses between 1986 and 1995 did the movement reduced to 0.05 inches per day. However, lapses in maintenance, increased infiltration of water into the landslide, weight at the head of the slide due to other landslides and additional weight due to alluvial build-up led to additional failures (LGC Valley, Inc., 2011).

Over several decades, numerous attempts to stabilize the landslide have failed. These include the installation of 23 steel-reinforced concrete caissons; earth re-distribution across the landslide; the installation of dewatering wells, attempts to control beach erosion through the installation of gabions, drainage improvements, and the sealing of fissures.

Groundwater. The current source of groundwater is primarily rainfall. However, supplemental water may also result from infiltration from adjacent canyons, up-slope areas and pipes broken due to landsliding.

Groundwater was concluded to be the most likely agent responsible for the slide movement of the 80-acre Abalone Cove Landslide (ACL) (LGC Valley, Inc., 2011). The ACL landslide is the re-activation of part of the APBL complex and is relevant for the Zone 2 area because it abuts Zone 2 immediately to the south. Movement of the ACL initiated in 1974 and continued significant movement until 1985, encompassing a total of approximately 85 acres.

A dewatering system was installed in the ACL and was effective in lowering the groundwater table and slowing the rate of land movement. Correlations between groundwater pumping and a decline in the rate of movement of the slide began immediately after the start of dewatering. Subsequent wells appear to have further reduced movement to negligible amounts.

Early in the development of the Portuguese Bend area septic systems, leach lines and cesspools installed as part of residential development on the APBL contributed high volumes of water directly into the landslide and were likely catalysts for inception of movement.

In their report for the City of Rancho Palos Verdes, Robert Stone & Associates (RSA, 1979) clearly described three ways in which groundwater negatively affects a landslide mass. First, the water increases the plasticity of clay gouge along the slide surface and allows it to deform more freely with less frictional resistance. Once saturation occurs along a slide surface, the further accumulation of water decreases stability through the action of water pressure. The buoyancy effect of water reduces the weight of solid material pushing down on the slide surface; thus reducing frictional resistance to sliding. At the same time, fluid pressure acting in the direction of slide movement provides an additional driving force similar to water behind a dam. For the ACL, RSA (1979) concluded that evaluation of the driving force produced by the groundwater head indicates it is the controlling factor causing the slide movement.

Currently, groundwater is interpreted as the controlling factor in initiating slide movement. It is also the only factor that can be reasonably manipulated to minimize slide movement for all areas within the Ancient Portuguese Bend Landslide (APBL) complex.

c. Seismic Hazards. The project area is located within the Peninsular Ranges Geomorphic Province, a seismically active area of Southern California. The Peninsular Ranges are characterized by northwest-trending blocks of mountain ridges and thick sequences of sediment-floored valleys cut longitudinally by young northwest trending fault zones and local low angle thrust faults. Numerous active faults occur within this region, and the nearby Palos Verdes, Newport-Inglewood and Santa Monica faults are the most significant faults from a seismic hazards perspective.

The project area is located outside an Alquist-Priolo Earthquake Fault Zone as defined by the Alquist-Priolo Special Studies Zone Act of 1972 (now the Alquist-Priolo Earthquake Fault Zoning Act), which regulates development near active faults (LGC Valley, Inc., 2011). Thus the potential for ground rupture to the project area from an active fault is low.

However, the project area is expected to experience strong ground shaking from both near and distant earthquake sources. The type and magnitude of the seismic shaking hazard are dependent on the distance from the causative fault and the intensity and magnitude of the seismic event. Primary seismic hazards can be divided into two general categories: hazards due to ground rupture and hazards associated with ground shaking.

Potential for Ground Rupture. In general terms, an earthquake is caused when strain energy in rocks is suddenly released by movement along a plane of weakness. In some cases, fault movement propagates upward through the subsurface materials and causes displacement at the ground surface as a result of differential movement. Surface rupture usually occurs along traces of known or potentially active faults, although many historic events have occurred on faults not previously known to be active.

The California Geologic Survey (CGS) establishes criteria for determining faults as active, potentially active or inactive. Active faults are those that show evidence of surface

displacement within the last 11,000 years (Holocene age). Potentially active faults are those that demonstrate displacement within the past 1.6 million years (Quaternary age). Faults showing no evidence of displacement within the last 1.6 million years are considered inactive for most structures, except for critical or certain life structures. In 1972, the Alquist-Priolo Special Studies Zone Act (now known as the Alquist-Priolo Earthquake Fault Zoning Act, 1994) was passed into law, to prohibit the location of most structures for human occupancy across the traces of active faults and to thereby mitigate the hazard of fault rupture. The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to delineate Earthquake Fault Zones along known active faults in California, and provides policies for cities and counties to regulate developments within Earthquake Fault Zones.

Ground rupture caused by movement along a fault could result in catastrophic structural damage to buildings constructed along the fault trace. Consequently, the State of California via the Alquist-Priolo Special Studies Zone Act prohibited the construction of occupied "habitable" structures within the designated active fault zone. The term "structure for human occupancy" is defined as any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year. Unless proven otherwise, an area within 50 feet of an active fault is presumed to be underlain by active branches of the fault. Local government agencies may identify additional faults, in addition to those faults identified by the State, for which minimum construction setback requirements must be maintained.

Several active and potentially active faults are located in the region. These include the Elysian Park fold and thrust belt, the Torrance-Wilmington fold and thrust belt, the Newport-Inglewood fault and the Santa Monica fault among others. The Palos Verdes Fault is located approximately four miles from the project area and is considered to have the most substantial effect on the site from a probabilistic design standpoint. In addition, other large faults in the Southern California area have the potential to affect the site. These include the San Andreas Fault, San Gabriel Fault and other undefined large blind thrust faults. However, based on the geotechnical report prepared by LGC Valley, Inc., no known active or potentially active faults underlie the project area. Therefore, the potential for surface ground rupture at the project area is low.

Potential for Ground Shaking. The energy released during an earthquake propagates from its rupture surface in the form of seismic waves. The resulting strong ground motion from the seismic wave propagation can cause significant damage to structures. At any location, the intensity of the ground motion is a function of the distance to the fault rupture, the local soil/bedrock conditions, and the earthquake magnitude. Intensity is usually greater in areas underlain by unconsolidated material than in areas underlain by more competent rock. Earthquakes are characterized by a moment magnitude, which is a quantitative measure of the strength of the earthquake based on strain energy released during the event. The magnitude is independent of the site, but is dependent on several factors, including the type of fault, rock-type, and stored energy. Moderate to severe ground shaking would be experienced in the project area if a large magnitude earthquake occurs on one of the nearby faults.

Ground shaking is primarily a function of the distance between a site and the seismic source, the type of materials underlying the site and the motion of fault displacement. The 1994

Northridge earthquake showed how peculiarities in basin effects could play a significant role in ground accelerations at particular areas. For instance, ground accelerations exceeding 1.0 g were recorded at areas far from the epicenter of the Northridge earthquake.

The number or frequency of large magnitude earthquakes that may occur during the life of the project cannot be predicted. However, it is probable the project area will experience at least one major earthquake during the next 50 years.

d. Secondary Seismic Hazards from Ground Shaking. Potential hazards resulting from the secondary effects of ground shaking include: liquefaction, lateral spreading, seismic settlement, and earthquake induced landslides. Secondary hazards are discussed below.

Liquefaction. Soil liquefaction results from the temporary buildup of excess pore pressures, which can result in a condition of near zero effective stress and temporary loss of strength. Several factors influence a soil's potential for liquefaction during an earthquake, including magnitude and proximity of the earthquake; duration of shaking; soil types; grain size distribution; clay fraction content; soil density; particle angularity; effective overburden; location of the groundwater table; cyclic loading; and soil stress history. Saturated, loose to medium dense, near surface cohesionless soils exhibit the highest liquefaction potential, while dry, dense, cohesionless soils and cohesive soils exhibit low to negligible liquefaction potential. With increasing overburden, density and increasing clay-content, the likelihood of liquefaction decreases. Liquefaction often occurs in earthquake prone areas underlain by young alluvium where the groundwater table is higher than 50 feet below ground surface.

Based on a review of the Seismic Hazard Zone Maps (CGS, 1999a, 1999b) for the Redondo Beach and San Pedro Quadrangles, the project area is not located within a Seismic Hazards Zone for Liquefaction. Previous geotechnical studies indicate the project area is underlain by ancient landslide deposits consisting generally of the Altamira Shale with lesser deposits of various surficial soils. The shale is not considered susceptible to liquefaction; however, the thin surficial soils may be susceptible. Based on the general distribution and interpreted thicknesses of surficial soils in the subject area, liquefaction potential within the project area is anticipated to be very low to nil.

Lateral Spreading. Lateral spreading, closely related to liquefaction, occurs when level or nearly level soil masses slide laterally on a liquefied layer and gravitational and inertial forces cause the layer and the overlying non-liquefied material to move toward a free face. The magnitude of lateral spreading movement depends on the magnitude of the seismic event, distance between the site and the seismic event, thickness of the liquefied layer, ground slope, fines content, average particle size of the materials comprising the liquefied layer, and the standard penetration rates of the materials. Because the site is hilly and the potential for liquefaction is very low to nil, the potential for lateral spreading on the project area is also considered very low to nil.

Seismic Settlement. Seismic settlement occurs when cohesionless materials (sands) densify as a result of ground shaking. Uniform settlement beneath a given structure would cause minimal damage; however, because of variations in distribution, density, and confining conditions of the soils, seismic settlement is generally non-uniform and can cause serious

structural damage. Dry and partially saturated soils as well as saturated granular soils are subject to seismic settlement.

The project area is underlain by ancient landslide material composed of Altamira Shale and locally thin surficial deposits such as non-marine terrace soils and colluvium or alluvium. Based on a review of LME applications and soils reports for the first 16 undeveloped lots completed to date, the foundations for the undeveloped lots will be founded into newly placed fill over landslide soils or directly into the landslide material. Based on those studies, the underlying landslide material would not be prone to settlements. Due to the minimal thickness of proposed engineered fill beneath foundations, the potential for seismically-induced settlement is very low.

Ground Lurching. Lurching occurs when certain soils have been observed to move in a wave-like manner in response to intense seismic ground shaking, thereby forming ridges or cracks on the ground surface. Areas underlain by thick accumulations of slopewash and alluvium are more susceptible than bedrock to ground lurching. Under strong seismic ground motion, lurching can be expected within loose, cohesionless soils, or in clay-rich soils with high moisture content. Generally, only lightly loaded structures such as pavement, fences, pipelines, and walkways are damaged by ground lurching; more heavily loaded structures appear to resist such deformation. Because deposits of loose terrace sands and slopewash were not indicated in geotechnical reports for proposed residential locations, ground lurching is not expected to occur.

Earthquake Induced Landslides and Rock Topple. Landslides occur when slopes become unstable and masses of earth material move down slope. Landslides are generally rapid events, often triggered during periods of rainfall or by earthquakes. Mudslides and slumps are typically more shallow types of landslides that affect the upper soil horizons, and are not bedrock features. Mudslides and slumps commonly occur during or soon after periods of rainfall, and rock fall and rock avalanches are common during large earthquakes.

The size of a seismically-induced landslide can vary from minor rock falls to large hillside slumps and avalanches. The underlying geology including bedrock bedding planes, degree of water saturation of a material, steepness of a slope and general strength of the soil all contribute to the stability of a hillside. Basal erosion caused by water or human-induced modifications to the natural contour of a hill, including grading, have the potential to aid in destabilizing a hillside during an earthquake.

The stability of a soil is influenced by many factors, including grain size, moisture content, organic matter content, degree of slope, and soil type. Unstable soils can produce landslides, debris flows, and rock falls. All of these phenomena are manifestations of gravity driven flows of earth materials due to slope instability. Hill slopes naturally have a tendency to fail. Unless engineered properly, development in hillside areas tends to increase the potential for slope failures. Slope modifications by grading, changes in infiltration of surface water, and undercutting slopes can create unstable hill slopes, resulting in landslides or debris flows. Rock falls occur in virtually all types of rocks and especially on slopes steeper than 40 degrees where the rocks are weakly cemented, intensely fractured, or weathered. It should be noted that the addition of homes on the project area would not alter the potential for seismic slope failure.

Rock fall landslides are commonly triggered by seismically-induced ground shaking. Rock topple involves the rotation of columns or blocks of rock about some fixed base, and rock topple can occur when these blocks of rock are subject to earthquake forces. Generally, vertical or near vertical slopes are most subject to this process, however slopes with a gradient greater than 3:1 (horizontal to vertical) are more susceptible to rock topple than slopes of lower angle. A ground acceleration of at least 0.10 g in steep terrain is necessary to induce earthquake-related rock falls, although exceeding this value does not guarantee that rock falls will occur (Wilson and Keefer, 1985). Steep terrain does occur north and west of Zone 2 and based on the local rock types, terrain, and ground accelerations indicated in the LGC Valley report (2011) which exceed those indicated by Wilson and Keefer (1985), these areas may be subject to rock topple and rock fall during a seismic event.

As defined by the California Geological Survey, the project area is located within a Seismic Hazard Zone for earthquake induced landslides. The project area is located within a Seismic Hazard Zone. The project area is within the boundaries of the Ancient Portuguese Bend Landslide, and the area is upslope of the well investigated, studied and mapped ACL and PBL landslides. Depending on the intensity of seismic shaking, seismically-induced landsliding could occur in the project area if ground shaking is very high. The probability of seismically-induced landslides is considered moderate (LGC Valley, Inc., 2011).

e. Geotechnical Hazards.

Expansive Soils. Expansive soils swell or heave with increases in moisture content and shrink with decreases in moisture content and clays are most susceptible to expansion. Foundations for structures constructed on expansive soils require special design considerations (CBC, 2008). Within the Zone 2 area, the upper area soils consist of fill, colluvium, and landslide material that contain expansive soils. Laboratory testing performed as a part of individual lot investigations indicated the expansion potential is medium to high (LGC Valley, Inc., 2011).

Hydroconsolidation. Hydroconsolidation occurs when soil layers collapse (settle) when water is added under loads. Natural deposits susceptible to hydroconsolidation are typically aeolian, alluvial, or colluvial materials, with high apparent strength when dry. The dry strength of the materials may be attributed to the clay and silt constituents in the soil and the presence of cementing agents (i.e., salts). Capillary tension may tend to act to bond soil grains. Once these soils are subjected to excessive moisture and foundation loads, the constituency, including soluble salts or bonding agents, is weakened or dissolved, capillary tensions are reduced and collapse occurs, resulting in settlement. The site is predominantly underlain by dense bedrock-derived landslide deposits, and surficial soils are relatively thin and anticipated to be removed prior to construction of single-family homes; therefore, the potential for hydroconsolidation is considered very low.

Subsidence and Settlement. Subsidence is the sinking of the ground surface caused by the compression of soil layers. This may be caused by groundwater, oil or gas withdrawal, oxidation of organics, or the placement of additional fill over compressible layers.

Layers susceptible to compression settlement can be exacerbated by increased loading, such as from the construction of onsite buildings or the placement of additional fill over compressible

layers. Settlement can also result solely within improperly placed artificial fill and structures built on soils or bedrock materials with differential settlement rates. Settlement can be mitigated prior to development through the removal and recompaction of loose soils, and proper placement of engineered fill during site grading.

Slope Stability. Slope stability refers to the relative stability of a slope in terms of driving forces versus resisting forces. If the driving forces are greater than the resisting forces, the slope will move or fail in the down slope direction. If the resisting forces are greater than the driving forces, the slope will not move but remain in a state of stability. If the forces are equal, the slope is on the verge of failure.

The standard of practice within Southern California is to achieve a factor of safety in which the resisting forces are 1.5 times greater than the driving forces (factor of safety of 1.5). The purpose of achieving a factor of safety of 1.5 is to account for those portions of the data set that are inconsistent or poorly understood. In this way, a "safety factor" is applied to the slope being reviewed.

Generally speaking, a factor of safety of 1.5 is the condition to achieve for development projects with slopes that may affect the sites. However, professional judgment and review, geotechnical analysis, and a recent judicial decision regarding the project area have resulted in a consensus that the site has an uncertain factor of safety (LGC Valley, 2011).

Gross Slope Stability. The geotechnical report prepared by LGC Valley, Inc. included a review of geotechnical studies, investigations, and reviews of the APBL, PBL, and ACL by numerous geotechnical professionals who determined the factor of safety of the ancient and active landslides within the project area based on their data set and methods of analysis. Because of the abundance and diversity of data along with variable interpretation of the data, there are varying opinions regarding the overall stability within Zone 2. These opinions range from the area being at unity, i.e. factor of safety at or just below 1.0, (GeoKinetics, 2007), a factor of safety that is probably greater than 1.0 and less than 1.5 (Cotton Shires, 2001) to a factor of safety of greater than 1.5 (Leighton, 2001 and 2006).

The primary factors used in determining a factor of safety for a site are: the profile of the ground surface; the geologic structure of the underlying bedrock or soils; the groundwater table; and the strength of the soil column, plus the method of analysis. Secondary factors are also considered. For the project area these include: previous earthwork and redistribution of land mass; erosion along the beach zone and a reduction in support to up-slope areas; and control of run-off and potential infiltration of water into the slide mass through ground fractures and other avenues.

Based on the review by LGC Valley, Inc., there is a general agreement in the topography of the area, groundwater levels used in the slope stability analyses, the strength of the various soil units, the general location of the various rupture surfaces and the overall structure of site bedrock at depth. There is also general consensus that erosion along the beach zone contributes to instability, that instability generally decreases away from the beach zone and that control of groundwater is fundamental for minimizing long term instability. Further, there is additional agreement between the various reviewers that any future development that may

occur in the geologic hazard area should be bound by a set of conditions that range from becoming a part of the community abatement district to the control of run-off from roofs.

Thus based on LGC Valley's work, the item most in contention did not include the fundamental parameters into which a slope stability analysis is considered. Rather it was the method of analysis that created the greatest disparities between various geotechnical firms and reviewers. These methods are complex and premised in a deep understanding of soil behavior and the complex interactions that occur between rock, soil, water, discontinuities (known, and predicted) and gravity. Thus there are various ways of interpreting and combining the geologic data, to obtain a range of conclusions regarding site stability, from site failure (factor of safety less than 1.0) to stable (factor of safety of 1.0 or greater). Based on their review and geotechnical expertise, LGC Valley, Inc. concluded that site slope stability is likely somewhere higher than 1.0, but less than 1.5.

LGC Valley, Inc. also concluded that the development of the 47 undeveloped lots within Zone 2 will not have a negative effect on the overall stability of the ancient or active landslides or the remainder of Zone 2, provided the development of the lots are designed within the guidelines of the conditions of approval and in accordance with the city of Palos Verdes and the latest adopted building codes, and provided additional measures with respect to control of groundwater, reduction in infiltration of water and limiting of earth grading are taken into consideration during development.

Surficial Slope Stability. Surficial failures consist of a variety of failures ranging from shallow slumps to debris flows. Generally, debris flows are a mixture of water-saturated soil that moves down slope, while slumps do not mix much but move as a more intact piece of soil. Surficial landslide failures form when generally loose masses of poorly consolidated soil or weathered bedrock become saturated and then become unstable due to the increase in pore pressure along the soil/rock interface, the increase in weight to the soil from water and a decrease in the soil's strength, which reduces the soil's ability to resist the driving forces. Typically, these events occur during or shortly after periods of long duration and/or high intensity rainfall. Surficial slope stability may be a potential hazard to some of the proposed home sites within the project area.

f. Regulatory Setting

Public Resources Code, Section 2621. The Alquist-Priolo Act of 1972 (now the Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code 2621, Division 2, Chapter 7.5) established criteria and policies to assist cities, counties, and State agencies in the exercise of their responsibility to prohibit the location of developments and structures for human occupancy across the trace of active faults, as defined by the State Mining and Geology Board. Under the Act, the State Geologist is required to delineate active faults ("special study zones") in California and the State Mining and Geology Board provides regulations to guide cities and counties in their implementation of the law. The Act also requires that, prior to approval of a project, a geologic study be conducted to define and delineate any hazards from surface rupture. Unless proven otherwise, the area within 50-feet of an active fault is presumed to be underlain by active branches of the fault. As discussed above, the project area is not located in an Alquist-Priolo Earthquake Fault Zone.

Other State Regulatory Requirements. State Government Code requires cities and counties to adopt and enforce the Uniform Building Code (UBC). The City has adopted the California Building Code (CBC), 2010 Edition (Part 2 of Title 24 of the California Code of Regulations), including Chapter 1 and Appendices F, I and J, which incorporates and amends the International Building Code, 2006 Edition, Volumes 1 and 2, published by the International Code Council, as the Building Code of the City of Rancho Palos Verdes. The project area would be subject to Public Resources Code Section 2699, which directs cities to take into account the information provided in available seismic hazard maps when it adopts or revises the safety element of any land-use planning or permitting ordinances. The Department of Conservation, Division of Mines and Geology, Special Publication 117a sets forth guidelines under the Geologic Hazards Mapping Act for evaluating and mitigating seismic hazards. Recommendations for mitigating landslide hazards are included in this publication and may be used in the project area, as necessary.

Rancho Palos Verdes General Plan. The City of Rancho Palos Verdes General Plan contains several policies and guidelines applicable to the proposed project.

The Palos Verdes General Plan (1975) includes the following policies for public health/safety related to the natural environment:

1. *Permit development within the Sea Cliff Erosion Area (RM1), only if demonstrated through detailed geologic analysis, that the design and setbacks are adequate to insure public safety and to maintain physical, biologic, and scenic resources. Due to the sensitive nature of RM 1, this area is included as an integral part of a Specific Plan District and should be more fully defined.*
2. *Allow only low intensity activities within Resource Management Districts of extreme slopes (RM 2).*
3. *Require any development within the Resource Management Districts of high slopes (RM 3) and old landslide area (RM 5) to perform at least one, and preferably two, independent engineering studies concerning the geotechnical, soils, and other stability factors (including seismic considerations) affecting the site.*
4. *Allow no further development involving any human occupancy within the active landslide area (RM 4)*
5. *Develop and enforce a grading ordinance with detailed controls and performance standards to insure both engineering standards and the appropriate topographic treatment of slopes based upon recognized site planning and landscape architecture standards.*
7. *Prohibit activities that create excessive silt, pollutant runoff, increase canyon wall erosion, or potential for landslide, within Resource Management Districts containing Hydrologic Factors (RM 6).*

The Rancho Palos Verdes General Plan (1975) includes the following policy for infrastructure:

5. *Require that all flood control/natural water source interfaces and systems be treated so that erosion will be held to a minimum.*

Landslide Moratorium Ordinance. The project area is within the 1,200-acre Landslide Moratorium Area (LMA), established in 1978 in response to potential unstable soil conditions

and active landslide movement (Chapter 15.20 of the Rancho Palos Verdes Municipal Code). In general, properties within the LMA that are currently developed with residential structures are permitted to make limited improvements if the City grants a Landslide Moratorium Exception (LME). New construction is not permitted on properties within the LMA that are not currently developed with residential structures unless a Moratorium Exclusion (ME) is granted, effectively removing the properties from the LMA. As discussed in Section 2.0 *Project Description*, the proposed project would amend this chapter of the Municipal Code.

Rancho Palos Verdes Municipal Code. The California Building Code (2010 Edition) was adopted by the City as the Building Code of the City of Rancho Palos Verdes (see Section 15.04.010 of the Municipal Code - Building Code adopted of the City's Municipal Code).

Section 15.20.050 of the City of Rancho Palos Verdes Municipal Code establishes mitigation measures required for projects that are exceptions to the City's landslide moratorium regulations, including the following:

A. If lot drainage deficiencies are identified by the director of public works, all such deficiencies shall be corrected by the applicant.

B. If the project involves additional plumbing fixtures, or additions of habitable space which exceed two hundred square feet, or could be used as a new bedroom, bathroom, laundry room or kitchen, and if the lot or parcel is not served by a sanitary sewer system, septic systems shall be replaced with approved holding tank systems in which to dispose of on-site waste water. The capacity of the required holding tank system shall be subject to the review and approval of the city's building official. For the purposes of this subsection, the addition of a sink to an existing bathroom, kitchen or laundry room shall not be construed to be an additional plumbing fixture. For those projects which involve additions of less than two hundred square feet in total area and which are not to be used as a new bedroom, bathroom, laundry room or kitchen, the applicant shall submit for recordation a covenant specifically agreeing that the addition of the habitable space will not be used for those purposes. Such covenant shall be submitted to the director for recordation prior to the issuance of a building permit. For lots or parcels which are to be served by a sanitary sewer system on or after the effective date of the ordinance codified in this section (July 6, 2000), additional plumbing fixtures may be permitted and the requirement for a holding tank may be waived, provided that the lot or parcel is to be connected to the sanitary sewer system. If a sanitary sewer system is approved and/or under construction but is not yet operational at the time that a project requiring a landslide moratorium exception permit is approved, the requirement for a holding tank may be waived, provided that the lot or parcel is required to be connected to the sanitary sewer system pursuant to Section 15.20.110 of this chapter, or by an agreement or condition of project approval.

C. Roof runoff from all buildings and structures on the site shall be contained and directed to the streets or an approved drainage course.

D. If required by the city geotechnical staff, the applicant shall submit a soils report, and/or a geotechnical report, for the review and approval of the city geotechnical staff.

E. If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to support and participate in existing or

future sewer and/or storm drain assessment districts and any other geological and geotechnical hazard abatement measures required by the city. Such covenant shall be submitted to the director prior to the issuance of a building permit.

F. *If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to an irrevocable offer to dedicate to the city a sewer and storm drain easement on the subject property, as well as any other easement required by the city to mitigate landslide conditions. Such covenant shall be submitted to the director prior to the issuance of a building permit.*

G. *A hold harmless agreement satisfactory to the city attorney promising to defend, indemnify and hold the city harmless from any claims or damages resulting from the requested project. Such agreement shall be submitted to the director prior to the issuance of a building permit.*

H. *The applicant shall submit for recordation a covenant agreeing to construct the project strictly in accordance with the approved plans; and agreeing to prohibit further projects on the subject site without first filing an application with the director pursuant to the terms of this chapter. Such covenant shall be submitted to the director for recordation prior to the issuance of a building permit.*

I. *All landscaping irrigation systems shall be part of a water management system approved by the director of public works. Irrigation for landscaping shall be permitted only as necessary to maintain the yard and garden.*

J. *If the lot or parcel is served by a sanitary sewer system, the sewer lateral that serves the applicant's property shall be inspected to verify that there are no cracks, breaks or leaks and, if such deficiencies are present, the sewer lateral shall be repaired or reconstructed to eliminate them, prior to the issuance of a building permit for the project that is being approved pursuant to the issuance of the moratorium exception permit.*

K. *All other necessary permits and approvals required pursuant to this code or any other applicable statute, law or ordinance shall be obtained.*

4.5.2 Environmental Impact Analysis

a. Methodology and Thresholds of Significance. This evaluation is based on the geotechnical evaluation of the site that was conducted by LGC Valley, Inc. This document is available in its entirety in Appendix D.

It should be noted that the proposed project's impacts in the following issue areas was found to be less than significant in the Initial Study (see Appendix A):

- *Rupture of a known earthquake fault*
- *Seismic-related ground failure, including liquefaction*
- *Soils incapable of adequately supporting the use of septic tanks*

Because these issues were found to be less than significant in the Initial Study, further discussion of these issues in the EIR is not warranted. Therefore, this EIR analysis focuses on potential impacts related to:

- *Strong seismic ground shaking*
- *Landslides*

- *Soil erosion or the loss of topsoil*
- *The potential to be located on a geologic unit or soil that is unstable as a result of the project, and potentially result in lateral spreading, subsidence, liquefaction, or collapse*
- *The potential to be located on expansive soils, creating substantial risks to life or property*

The proposed project's impact is considered potentially significant if it would expose people or structures to major geologic hazards. Therefore, impacts are considered significant if the proposed project would be exposed to a high potential for such seismic hazards as ground shaking, landslides, seismic-related ground failure, seismically-induced landslides, and soil hazards such as expansive soils, based on regional or site-specific conditions.

b. Project Impacts and Mitigation Measures.

Impact GEO-1 Seismically-induced ground shaking could result in the exposure of people and structures that could be introduced to the area as a result of the proposed ordinance revisions to adverse effects. However, mandatory compliance with applicable CBC requirements would reduce impacts to a Class III, *less than significant*, level.

Given the highly seismic character of the Southern California region and the project site's proximity to known active and potentially active faults, severe ground shaking is anticipated during the life of the new residences that could be built under the proposed ordinance revisions. As discussed in *setting* above, several active and potentially active faults are located in the region. These include the Elysian Park fold and thrust belt and the Torrance-Wilmington fold and thrust belt, the Newport-Inglewood fault and the Santa Monica fault, among others. The Palos Verdes Fault is located approximately four miles from the project area and is considered to have the most substantial effect on the site from a probabilistic design standpoint. No known active or potentially active faults underlie the project area. However, earthquakes along any of the faults in the region could potentially damage buildings and pose risks to human health and safety. Any new construction of habitable structures that could be facilitated by the proposed ordinance revisions would be required to comply with the California Building Code (CBC) standards. CBC standards require that structures are built to resist forces generated by ground shaking during an earthquake. With mandatory compliance with CBC standards, impacts from ground shaking would be less than significant.

Mitigation Measures. Impacts would be less than significant without mitigation.

Significance after Mitigation. Impacts would be less than significant.

Impact GEO-2 Construction on individual lots in Zone 2 facilitated by the proposed ordinance revisions could cause or accelerate erosion, such that slope failure could occur. Operation of the project, which would allow for 47 single-family homes to be developed in the project area, could potentially cause or accelerate downstream erosion. However, with

implementation of Mitigation Measure HWQ-1 and Mitigation Measure HWQ-4 identified in Section 4.8, *Hydrology and Water Quality*, impacts would be Class II, *significant but mitigable.*

During construction of individual residences, topsoil would be exposed and potentially removed from individual properties. The exposure or removal of topsoil could cause accelerated erosion on the project site. Construction impacts would be potentially significant.

Over the longer term, adverse surface drainage could potentially occur in portions of the project area, which may be caused by increased impervious surfaces on individual lots, modified runoff patterns, or inadequate drainage facilities. Adverse surface drainage could cause or accelerate erosion, which could undermine proposed structures and lead to surficial slope failures on either manufactured or natural slopes. Therefore, impacts associated with soil erosion are potentially significant.

In addition, any increase in runoff from the subject lots could increase drainage into Altamira Canyon. Altamira Canyon, a natural drainage course that traverses the Zone 2 area, currently experiences erosion due to runoff from the existing areas that are tributary to the canyon. A number of factors currently contribute to erosion in Altamira Canyon, including the steep gradient of the canyon, storm and operational runoff from existing developments within the watershed, and the types of soil within the streambed.

Development of the subject lots would result in an increase in impervious area, and consequently, an increase in runoff rates and volume. The increase in impervious area would result in a change in the water balance within the project area. While the total rainfall for any given storm will remain constant, there would be an increase in runoff and a corresponding reduction in infiltration within the project area. As discussed in Section 4.8 *Hydrology and Water Quality*, potential buildout of the 47 subject lots under the proposed ordinance revisions would result in an approximately 6% increase in impervious area within the watershed. This would equate to an approximately 0.8% increase in impervious area of the total watershed. The resulting increase in runoff rates from development would range from 0.6% to 2.0% (2, 5, 10, 50-year, and capital storm events) and 2.8% through 5.3% in total runoff volume. Thus, based upon the total runoff quantities and the proposed project's relatively small contribution to the drainage into Altamira Canyon that is a factor in the ongoing erosion, impacts due to the project would be less than significant with the mitigation identified below. These measures would minimize increases in the quantity, duration, and frequency of runoff through the use of detention facilities and the application of low impact development principles in the development of the lots. By releasing the runoff from the lots in a controlled manner, Altamira Canyon would experience little or no measurable incremental increase in erosion directly attributable to the 47 lots.

It should be noted that, because Altamira Canyon currently experiences erosion and will continue to experience erosion with or without adoption of the proposed ordinance revisions, the City has explored other measures to address the existing erosion but they have been rejected as infeasible, too costly, or an undue burden to be placed on remaining lots to be developed. These include streambed restoration / stabilization concepts and diversion drains. The former

include lining the streambed with concrete or riprap, or installing drop structures and point and/or toe stabilizers to reduce the grade of the streambed to a stable grade. These were determined to be infeasible due to the damage to habitat that would result as well as cost. Construction of a diversion drain or ditches has also been considered, however a significant quantity of new pipeline would be required. This would require substantial excavation in streets as well as construction through some of the existing lots. In addition, the resulting benefit would be negligible because it would only divert the small contribution of the remaining lots that would become developable, and would not address the main cause of the erosion: the existing runoff currently outletting into Altamira Canyon from the entire watershed.

Mitigation Measures. Mitigation Measure HWQ-1, as identified in Section 4.8, *Hydrology and Water Quality*, would be required to reduce erosion during construction to a less than significant level. In addition, pursuant to Mitigation Measure HWQ-4 in Section 4.8, *Hydrology and Water Quality*, each of the individual developers would be required to comply with the following, pursuant to the review and approval by the City Building Official:

- *Illustrate that point flow on each of the properties is either normalized, attenuated adequately, or will reach an acceptable conveyance such as a storm drain, channel, or natural drainage course. All runoff shall be directed to an acceptable conveyance and shall not be allowed to drain to localized sumps or catchment areas with no outlet.*
- *Maintain existing drainage patterns and outlet at historical outlet points*
- *Minimize changes to the character of the runoff at property lines. Changes in character include concentration of flow outletting onto adjacent properties or increasing the frequency or duration of runoff outletting onto adjacent properties*
- *Reduce increases in runoff by utilizing appropriate and applicable low impact development principles*
- *Provide onsite detention facilities or conveyance to acceptable off-lot conveyance devices*
- *Minimize "Dry Weather" runoff which could add to the total infiltration from the project*

With implementation of Mitigation Measure HWQ-4, impacts related to erosion from increased impervious surfaces or potential to change runoff patterns would be less than significant.

Significance After Mitigation. Impacts would be less than significant with implementation of measures HWQ-1 and HWQ-4 in Section 4.8, *Hydrology and Water Quality*.

Impact GEO-3 The project area is located on a geologic unit that could be unstable or could potentially become unstable as a result of development facilitated by the proposed ordinance revisions. With implementation of mitigation measures GEO-3(a) and GEO-3(b), impacts would be Class II, *significant but mitigable.*

The project area and surrounding areas are within the boundaries of the Ancient Portuguese Bend Landslide, and the site is upslope of the well investigated, studied and mapped Abalone Cove and Portuguese Bend landslides. In addition, as discussed in the *Setting*, the project site is within an identified earthquake-induced landslide area. The underlying bedrock bedding planes, groundwater level, steepness of slope, and shear strengths of the soils all influence the

stability of the hillsides in the project area. Lateral erosion caused by natural or human-induced modifications to the contour of a hill, which includes grading, have the potential to destabilize a hillside. As discussed in *Setting*, based on a review of relevant studies and geotechnical reports, LGC Valley, Inc. determined that the slope stability in the project area is likely higher than 1.0, but lower than 1.5. As discussed in *Setting*, the standard of practice within Southern California is to achieve a factor of safety in which the resisting forces are 1.5 times greater than the driving forces (factor of safety of 1.5). Therefore, slopes in the project area could potentially be unstable and impacts are potentially significant.

Grading for residences and accessory structures would be required to adhere to grading practices as outlined within the County of Los Angeles and City of Rancho Palos Verdes Grading Ordinances in order to address issues specific to each lot's surficial slope stability. Due to the unique circumstances in the project area, impacts related to large deep-seated landslides would be potentially significant and further mitigation in terms of ground water control is warranted.

As discussed in Section 4.8, *Hydrology and Water Quality*, portions of the additional runoff that would be added to the existing drainage system for the project area would be directed to Altamira Canyon. Groundwater recharge is a landslide concern because an increase in infiltration could affect the stability of existing landslides in the project vicinity. Adding water to the landslide material adds weight, creates buoyancy, and further decreases clay strength on the existing slopes, which could lead to slope failure. However, the portions of Altamira Canyon that would contain the drainage from the project area are generally steep, and as such do not contribute substantially to groundwater recharge as water moves quickly over the land surface, minimizing infiltration. Therefore, the incremental increase in surface water from the project area would not substantially increase infiltration in Altamira Canyon or related effects on landslide potential (LGC Valley, Inc., 2011). (As adding impervious surfaces on the project site would decrease infiltration on the subject lots, that aspect of the potential new development would not contribute to groundwater-related landslide concerns.)

Mitigation Measures. Mitigation measures GEO-3(a) and GEO-3(b) would be required to address impacts related to soil instability and landslides. ~~Among other standards, Mitigation Measure GEO-3 would require control of groundwater and reduction in infiltration of water.~~ Compliance with Mitigation Measure GEO-3(a) and GEO-3(b) would reduce impacts to a less than significant level.

GEO-3(a) **Geotechnical Recommendations.** Prior to issuance of any Grading Permit or Building Permit, individual project applicants shall comply with all recommendations contained within the Geotechnical Study prepared by LGC Valley, Inc., dated March 29, 2011, including the following, which shall be reflected in the geotechnical/soils reports for individual projects:

- *Conform to the City of Rancho Palos Verdes Landslide Moratorium Ordinance (Rancho Palos Verdes Municipal Code Chapter 15.20).*
- *Less than 1,000 cubic yards of grading (cut and fill combined) per lot, with no more than 50 cubic yards of imported fill per lot.*

- *The property owners shall agree to participate in the Abalone Cove Landslide Abatement District and/or other recognized or approved districts whose purpose is to maintain the land in a geologically stable condition. No proposed building activity may cause lessening of stability in the zone.*
- *Prior to issuance of a building permit, a geotechnical report shall be submitted to and approved by the City's geotechnical reviewers indicating what, if any, lot-local and immediately adjacent geologic hazards must be addressed and/or corrected prior to, or during construction. Said report shall specify foundation designs based on field and laboratory studies.*
- *Post-construction lot infiltration and runoff rates and volume shall be made equal to pre-construction conditions through use of appropriate low impact development principles such as, but not limited to, detaining peak flows and use of cisterns, bio-retention areas, green roofs and permeable hardscape.*
- *All houses shall connect to a public sanitary sewer system. Any necessary easements shall be provided.*
- ~~*Storm drainage improvements to reduce lot infiltration of run-off shall be designed and approved by the City prior to issuance of building permits.*~~
- *All lot drainage deficiencies, if any, identified by the Director of Public Works ~~City staff~~ shall be corrected. ~~The design of pools, ponds and sumps shall be subject to City review and approval.~~*
- *Runoff from all buildings and paved areas not infiltrated or retained/detained on site to match existing conditions shall be collected and directed to the street or to an approved drainage course as approved by the ~~City Engineer~~Director of Public Works.*
- *All other relevant building code requirements shall be met.*

GEO-3(b) **Covenant.** Individual project applicants shall submit for recordation a covenant agreeing to construct the project strictly in accordance with the approved plans and agreeing to prohibit further projects on the subject site without first filing an application with the Director pursuant to the terms of Chapter 15.20 of the Rancho Palos Verdes Municipal Code. Such covenant shall be submitted to the Director for recordation prior to the issuance of a building permit.

Significance After Mitigation. Impacts would be reduced to below a level of significance under CEQA with implementation of mitigation measure GEO-3(a) and GEO-3(b) and compliance with applicable requirements of the most recent CBC. With these requirements, development of the 47 undeveloped lots within Zone 2 would not be expected to have a negative effect on the overall stability of the ancient or active landslides or the remainder of Zone 2.

Impact GEO-4 **The project area is in a Seismic Hazard Zone for earthquake-induced landslides. Therefore, project area development**

would inherently be subject to risks associated with seismically-induced landslides. However, with implementation of mitigation measures GEO-3(a) and GEO-3(b) requiring that potential new construction on each lot be designed in compliance with site-specific geotechnical recommendations, impacts would be Class II, *significant but mitigable.*

The project site is located within a Seismic Hazard Zone for earthquake-induced landslides. Seismic Hazard Zones are regulatory zones identified by the State of California that encompass areas prone to liquefaction and earthquake-induced landslides. In Seismic Hazard Zone areas, the state has determined that weak soil and/or rock may be present beneath the site. If present, these weak materials can fail during an earthquake and, unless proper precautions are taken during grading and construction, can cause damage to structures.

Landslides occur when slopes become unstable and masses of earth material move down slope. Landslides are generally rapid events, often triggered during periods of rainfall or by earthquakes. The size of a landslide can vary from minor slope scars to hundreds of acres of hillside land movement. The underlying bedrock bedding planes, groundwater level, steepness of a slope, and shear strengths of the soils all contribute to the stability of a hillside. The Palos Verdes Fault is located approximately four miles from the site and is considered to have the most substantial effect on the project area from a probabilistic design standpoint.

The potential for seismically-induced landsliding would not change with the addition of the 47 residences that would be accommodated in the project area. The 47 subject lots are primarily in areas of gentle slopes, whereas the seismic hazard concern is for the more steeply inclined areas. Grading quantities would be limited by the proposed ordinance revisions and any loose soils that are replaced with compacted fill could actually improve conditions. Nonetheless, depending on the intensity of seismic shaking, seismically-induced landsliding could occur in the project area during a seismic event, a potentially significant impact.

Mitigation Measures. Mitigation measures GEO-3(a) and GEO-3(b) above would be required to reduce impacts to a less than significant level. In particular, Mitigation Measure GEO-3(a) would require each applicant to submit a geotechnical report for review and approval by the City's geotechnical reviewers indicating any geologic hazards that need to be addressed and/or corrected prior to construction. In addition, Mitigation Measure GEO-3(b) would require each individual project applicant to record a covenant agreeing to construct the project strictly in accordance with the approved plans. Because each individual single-family residential site would be required to prepare a geotechnical report and would be required to construct the project strictly according to approved plans, potential seismically-induced landsliding effects would be addressed on a site-specific basis.

Significance After Mitigation. Impacts would be reduced to below a level of significance under CEQA with incorporation of mitigation measures GEO-3(a) and GEO-3(b). However, as discussed in the geotechnical study (LGC Valley, Inc., 2011), the project area will continue to have the potential for instability due to the presence of the Abalone Cove and Portuguese Bend

landslides. Therefore, as is the case in any landslide prone area, development within the project area is subject to inherent risks associated with seismically-induced landslides.

Impact GEO-5 The project area is not susceptible to liquefaction, ground lurching, lateral spreading or seismic settlement. Impacts would be Class III, *less than significant*.

As discussed in *Setting*, the project area is underlain by ancient landslide material composed of Altamira Shale and locally thin surficial deposits such as non-marine terrace soils and colluvium or alluvium. The Seismic Hazard Zone maps for the Redondo Beach and San Pedro quadrangles show that the project area is not within a liquefaction zone. Liquefaction potential in the project area is very low (LGC Valley, Inc., 2011). Because the project area is not susceptible to liquefaction, the potential for lateral spreading is low.

Areas underlain by thick accumulations of slope wash and alluvium are more susceptible than bedrock to ground lurching. Under strong seismic ground motion, lurching can be expected within loose, cohesionless soils, or in clay-rich soils with high moisture content. Generally, only lightly loaded structures such as pavement, fences, pipelines, and walkways are damaged by ground lurching; more heavily loaded structures appear to resist such deformation. Because deposits of loose terrace sands and slope wash are not present in the project area, the potential for ground lurching is nil.

Based on a review of LME applications and soils reports for the first 16 undeveloped lots in the project area completed to date, the underlying landslide material on the project site would not be prone to settlement. Due to the minimal thickness of proposed engineered fill beneath foundations, the potential for settlement is low.

Design of the proposed structures in accordance with the provisions of the most recent CBC would minimize the potential effects of ground shaking. Therefore, adverse effects associated with liquefaction, ground lurching, lateral spreading and/or seismic settlement during a ground shaking event would not be expected. Impacts would be less than significant.

Mitigation Measures. Mitigation is not required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact GEO-6 Soils within the project area are moderately to highly expansive. With implementation of mitigation measures GEO-3(a) and GEO-3(b), impacts related to expansive soils would be Class II, *significant but mitigable*.

As discussed in *Setting*, expansive soils swell or heave with increases in moisture content and shrink with decreases in moisture content. Clays are most susceptible to expansion. Foundations for structures constructed on expansive soils require special design considerations (CBC, 2010). Within the Zone 2 area, the upper site soils consist of fill, colluvium, and landslide material that contain expansive soils. Laboratory testing performed as a part of individual lot

investigations indicate that expansion potential is medium to high (LGC Valley, Inc., 2011). Expansive soils could result in significant distress in the form of cracking and/or differential uplift of concrete footings and floor slabs when soils become wet. Therefore, impacts related to expansive soils would be potentially significant. Structures on the project site would be required to comply with the most recent California Building Code, which would reduce the potential for expansive soil effects. Nonetheless, impacts related to expansive soils would be potentially significant.

Mitigation Measures. Implementation of mitigation measures GEO-3(a) and GEO-3(b) would be required to reduce impacts related to expansive soils. Mitigation Measure GEO-3(a), as described above, requires that the project conform to the City of Rancho Palos Verdes Landslide Moratorium Ordinance, grade less than 1,000 cubic yards per lot, participate in ACLAD and/or other recognized or approved districts whose purpose is to maintain the land in a geologically stable condition, and submit a geotechnical report to the City's geotechnical reviewers prior to construction. Further, Mitigation Measure GEO-3(b) would ensure that these geotechnical report recommendations are actually implemented into the project by requiring individual project applicants to record a covenant agreeing to construct the project strictly in accordance with the approved plans. With implementation of the recommendations contained in the geotechnical report as required by Mitigation Measure GEO-3(a) and by constructing the project strictly according to approved plans as required by Mitigation Measure GEO-3(b), impacts related to expansive soils would be reduced to a less than significant level.

Significance After Mitigation. Impacts would be less than significant with implementation of mitigation measures GEO-3(a) and GEO-3(b).

c. Cumulative Impacts. Cumulative development in the City and surrounding areas would include approximately 90,000 square feet of commercial/retail, 50,000 square feet of office, 2,000 residential units, and 190,000 square feet of institutional uses, as shown in Table 3-1 in Section 3.0, *Environmental Setting*. Proposed development, in conjunction with other cumulative projects proposed in the City of Rancho Palos Verdes and surrounding areas, would expose people and property to seismically related hazards that are present throughout the region. Planned and pending projects would be subject to various geologic hazards that are site-specific in nature, but would not create additive effects that are cumulative in nature. Impacts related to slope stability, destabilization of hillsides due to excavation, landsliding, seismically induced ground shaking, liquefaction, soil settlement and expansive soils would be similar to what is described for the project and would be addressed on a project-by-project basis through compliance with existing building codes and any site-specific mitigation measures for individual projects. Compliance with applicable code requirements and the recommendations of site-specific geotechnical evaluations on a case-by-case basis would reduce cumulative impacts relating to geologic hazards to a less than significant level.

Regarding erosion in Altamira Canyon, as discussed above, based upon the total runoff quantities and the proposed project's relatively small contribution to the drainage that is a factor in the ongoing erosion the project's contribution as mitigated would not be cumulatively considerable.

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4.6 GREENHOUSE GAS EMISSIONS

This section discusses global climate change, its causes and the contribution of human activities, as well as a summary of existing greenhouse gas emissions. The section describes the criteria for determining the significance of climate change impacts, and analyzes the proposed Amendments' impacts related to global climate change and greenhouse gas emissions.

4.6.1 Setting

a. Climate Change and Greenhouse Gases. Global climate change is the observed increase in the average temperature of the Earth's atmosphere and oceans along with other significant changes in climate (such as wind patterns, precipitation, and storms) over an extended period of time. The term "global climate change" is often used interchangeably with the term "global warming," but "global climate change" is preferred to "global warming" because it helps convey that there are other changes in addition to rising temperatures. The baseline, against which these changes are measured, originates in historical records identifying temperature changes that have occurred in the past, such as during previous ice ages. The global climate is continuously changing, as evidenced by repeated episodes of substantial warming and cooling documented in the geologic record. The rate of change has typically been incremental, with warming or cooling trends occurring over the course of thousands of years. The past 10,000 years have been marked by a period of incremental warming, as glaciers have steadily retreated across the globe. However, scientists have observed acceleration in the rate of warming during the past 150 years. Per the United Nations Intergovernmental Panel on Climate Change (IPCC, 2007), the understanding of anthropogenic warming and cooling influences on climate has led to a high confidence (90% or greater chance) that the global average net effect of human activities since 1750 has been one of warming. The prevailing scientific opinion on climate change is that most of the observed increase in global average temperatures, since the mid-20th century, is likely due to the observed increase in anthropogenic GHG concentrations (IPCC, 2007).

Gases that absorb and re-emit infrared radiation in the atmosphere are called greenhouse gases (GHGs). GHGs are present in the atmosphere naturally, are released by natural sources, or are formed from secondary reactions taking place in the atmosphere. The gases that are widely seen as the principal contributors to human-induced global climate change carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), flourinated gases such as hydroflourocarbons (HFCs) and perflourocarbons (PFCs), and sulfur hexaflouride (SF_6). Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

GHGs are emitted by both natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely by-products of fossil fuel combustion, whereas CH_4 results from off-gassing associated with agricultural practices and landfills. Man-made GHGs, many of which have greater heat-absorption potential than CO_2, include fluorinated gases and sulfur hexafluoride (SF_6) (California Environmental Protection Agency [CalEPA], 2006). Different types of GHGs have varying global warming potential (GWP). The GWP of a GHG is the potential of a gas or aerosol to trap heat in the atmosphere over a specified timescale (generally, 100 years). Because GHGs absorb different amounts of heat, a common reference gas (CO_2) is used to relate the amount of heat absorbed to the

amount of the gas emissions, referred to as "carbon dioxide equivalent" (CDE or CO_2E), and is the amount of a GHG emitted multiplied by its GWP. Carbon dioxide has a GWP of one. By contrast, methane (CH_4) has a GWP of 21, meaning its global warming effect is 21 times greater than CO_2 on a molecule per molecule basis.

The accumulation of GHG in the atmosphere regulates the earth's temperature. Without the natural heat trapping effect of GHG, Earth's surface would be about 34° C cooler (CalEPA, 2006). However, it is believed that emissions from human activities, particularly the consumption of fossil fuels for electricity production and transportation, have elevated the concentration of these gases in the atmosphere beyond the level of naturally occurring concentrations. The following discusses the primary GHGs of concern.

Carbon Dioxide. The global carbon cycle is made up of large carbon flows and reservoirs. Billions of tons of carbon in the form of CO_2 are absorbed by oceans and living biomass (i.e., sinks) and are emitted to the atmosphere annually through natural processes (i.e., sources). When in equilibrium, carbon fluxes among these various reservoirs are roughly balanced (U.S. Environmental Protection Agency [USEPA], April 2008). CO_2 was the first GHG demonstrated to be increasing in atmospheric concentration, with the first conclusive measurements being made in the last half of the 20th Century. Concentrations of CO_2 in the atmosphere have risen approximately 35% since the industrial revolution. Per the IPCC (2007), the global atmospheric concentration of CO_2 has increased from a pre-industrial value of about 280 parts per million (ppm) to 379 ppm in 2005. The atmospheric concentration of CO_2 in 2005 exceeds the natural range over the last 650,000 years (180 to 300 ppm) as determined from ice cores. The average annual CO_2 concentration growth rate was larger during the last 10 years (1995–2005 average: 1.9 ppm per year) than it has been since the beginning of continuous direct atmospheric measurements (1960–2005 average: 1.4 ppm per year), although there is year-to-year variability in growth rates. Currently, CO_2 represents an estimated 82.7% of total GHG emissions (Department of Energy [DOE] Energy Information Administration [EIA], December 2008). The largest source of CO_2, and of overall GHG emissions, is fossil fuel combustion.

Methane. CH_4 is an effective absorber of radiation, though its atmospheric concentration is less than that of CO_2 and its lifetime in the atmosphere is limited to 10 to 12 years. It has a GWP approximately 21 times that of CO_2 (refer to *Greenhouse Gas Inventory* below for a discussion of GWP). Over the last 250 years, the concentration of CH_4 in the atmosphere has increased by 148% (IPCC, 2007), although emissions have declined from 1990 levels. Anthropogenic sources of CH_4 include enteric fermentation associated with domestic livestock, landfills, natural gas and petroleum systems, agricultural activities, coal mining, wastewater treatment, stationary and mobile combustion, and certain industrial processes (USEPA, April 2008).

Nitrous Oxide. Concentrations of N_2O began to rise at the beginning of the industrial revolution. N_2O is produced by microbial processes in soil and water, including those reactions that occur in fertilizers that contain nitrogen. Use of these fertilizers has increased over the last century. Agricultural soil management and mobile source fossil fuel combustion are the major sources of N_2O emissions. N_2O's GWP is approximately 310 times that of CO_2.

Fluorinated Gases (HFCS, PFCS and SF_6). Fluorinated gases, such as hydrofluorocarbons (HFCs), perflurocarbons (PFCs), and sulfurhexafluoride (SF_6), are powerful GHGs that are emitted

from a variety of industrial processes. Fluorinated gases are used as substitutes for ozone-depleting substances such as chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs), and halons, which have been regulated since the mid-1980s because of their ozone-destroying potential and are phased out under the Montreal Protocol (1987) and Clean Air Act Amendments of 1990. Electrical transmission and distribution systems account for most SF_6 emissions, while PFC emissions result from semiconductor manufacturing and as a by-product of primary aluminum production. Fluorinated gases are typically emitted in smaller quantities than CO_2, CH_4, and N_2O, but these compounds have much higher GWPs. SF_6 is the most potent GHG that the IPCC has evaluated.

b. Greenhouse Gas Inventory. Worldwide anthropogenic emissions of GHG were approximately 40,000 million metric tons (MMT) CDE in 2004, including ongoing emissions from industrial and agricultural sources, but excluding emissions from land use changes (i.e., deforestation, biomass decay) (IPCC, 2007). CO_2 emissions from fossil fuel use accounts for 56.6% of the total emissions of 49,000 million metric tons CDE (includes land use changes) and all CO_2 emissions are 76.7% of the total. CH_4 emissions account for 14.3% of GHG and N_2O emissions for 7.9% (IPCC, 2007).

Total U.S. GHG emissions were 7,282 million metric tons CDE in 2007 (DOE EIA, December 2008), or about 14% of worldwide GHG emissions. U.S. emissions rose by 16.7% from 1990 to 2007. The residential and commercial end-use sectors accounted for 17% and 15%, respectively, of CO_2 emissions from fossil fuel combustion in 2007 (DOE EIA, December 2008). Both sectors rely heavily on electricity for meeting energy demands, with 72% and 79%, respectively, of their emissions attributable to electricity consumption for lighting, heating, cooling, and operating appliances. The remaining emissions were due to the consumption of natural gas and petroleum for heating and cooking.

Based upon the California Air Resources Board (ARB) *California Greenhouse Gas Inventory for 2000-2008* (http://www.arb.ca.gov/cc/inventory/data/data.htm), California produced 478 MMT CDE in 2008. The major source of GHG in California is transportation, contributing 37% of the state's total GHG emissions. Electricity generation is the second largest source, contributing 24% of the state's GHG emissions (California Energy Commission [CEC], June 2010). California emissions are due in part to its large size and large population compared to other States. By contrast, California had the fourth lowest CO_2 emissions per capita from fossil fuel combustion in the country in 2004, due in part to the success of its energy-efficiency and renewable energy programs and commitments that have lowered the state's GHG emissions rate of growth by more than half of what it would have been otherwise (CEC, 2006). Another factor that reduces California's per capita fuel use and GHG emissions, as compared to other states, is its relatively mild climate. ARB staff has projected statewide unregulated GHG emissions for the year 2020, which represent the emissions that would be expected to occur in the absence of any GHG reduction actions, will be 596 MMT CDE (ARB, 2007).

c. Effects of Global Climate Change. Globally, climate change has the potential to affect numerous environmental resources through potential impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG emissions at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36°F) per

decade is projected and there are identifiable signs that global warming could be taking place, including substantial ice loss in the Arctic (IPCC, 2007).

According to the CEC's Draft Climate Action Team Biennial Report, potential impacts in California of global warming may include loss in snow pack, sea level rise, more extreme heat days per year, more high ozone days, more large forest fires, and more drought years (CEC, March 2009). Below is a summary of some of the potential effects reported by an array of studies that could be experienced in California as a result of climate change.

Air Quality. Higher temperatures, which are conducive to air pollution formation, could worsen air quality in California. Climate change may increase the concentration of ground-level ozone, but the magnitude of the effect, and therefore its indirect effects, are uncertain. If higher temperatures are accompanied by drier conditions, the potential for large wildfires could increase, which, in turn, would further worsen air quality. However, if higher temperatures are accompanied by wetter, rather than drier conditions, the rains would tend to temporarily clear the air of particulate pollution and reduce the incidence of large wildfires, thereby ameliorating the pollution associated with wildfires. Additionally, severe heat accompanied by drier conditions and poor air quality could increase the number of heat-related deaths, illnesses, and asthma attacks throughout the state (CEC, March 2009).

Water Supply. Uncertainty remains with respect to the overall impact of global climate change on future water supplies in California. Studies have found that, "considerable uncertainty about precise impacts of climate change on California hydrology and water resources will remain, until we have more precise and consistent information about how precipitation patterns, timing, and intensity will change" (California Department of Water Resources [DWR], 2006). For example, some studies identify little change in total annual precipitation in projections for California (California Climate Change Center [CCCC], 2006). Other studies show significantly more precipitation (DWR, 2006). Even assuming that climate change leads to long-term increases in precipitation, analysis of the impact of climate change is further complicated by the fact that no studies have identified or quantified the runoff impacts that such an increase in precipitation would have in particular watersheds (CCCC, 2006). Also, little is known about how groundwater recharge and water quality will be affected (Ibid.). Higher rainfall could lead to greater groundwater recharge, although reductions in spring runoff and higher evapotranspiration could reduce the amount of water available for recharge (Ibid.).

The California Department of Water Resources (DWR) (2006) report on climate change and effects on the State Water Project (SWP), the Central Valley Project, and the Sacramento-San Joaquin Delta concludes that "[c]limate change will likely have a significant effect on California's future water resources… [and] future water demand." DWR also reports that "much uncertainty about future water demand [remains], especially [for] those aspects of future demand that will be directly affected by climate change and warming. While climate change is expected to continue through at least the end of this century, the magnitude and, in some cases, the nature of future changes is uncertain" (DWR, 2006).
This uncertainty serves to complicate the analysis of future water demand, especially where the relationship between climate change and its potential effect on water demand is not well understood (DWR, 2006). DWR adds that "[i]t is unlikely that this level of uncertainty will

diminish significantly in the foreseeable future." Still, changes in water supply are expected to occur, and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky, 2003; DWR, 2006; Cayan, 2006, Cayan, D., et al, 2006).

Hydrology. As discussed above, climate changes could potentially affect: the amount of snowfall, rainfall, and snow pack; the intensity and frequency of storms; flood hydrographs (flash floods, rain or snow events, coincidental high tide and high runoff events); sea level rise and coastal flooding; coastal erosion; and the potential for salt water intrusion. Sea level rise may be a product of climate change through two main processes: expansion of sea water as the oceans warm and melting of ice over land. A rise in sea levels could result in coastal flooding and erosion and could jeopardize California's water supply. Increased storm intensity and frequency could affect the ability of flood-control facilities, including levees, to handle storm events.

Agriculture. California has a $30 billion agricultural industry that produces half of the country's fruits and vegetables. Higher CO_2 levels can stimulate plant production and increase plant water-use efficiency. However, if temperatures rise and drier conditions prevail, water demand could increase; crop-yield could be threatened by a less reliable water supply; and greater ozone pollution could render plants more susceptible to pest and disease outbreaks. In addition, temperature increases could change the time of year certain crops, such as wine grapes, bloom or ripen, and thereby affect their quality (CCCC, 2006).

Ecosystems and Wildlife. Climate change and the potential resulting changes in weather patterns could have ecological effects on a global and local scale. Increasing concentrations of GHGs are likely to accelerate the rate of climate change. Scientists expect that the average global surface temperature could rise as discussed previously: 1.0-4.6°F (0.6-2.5°C) in the next 50 years, and 2.2-10°F (1.4-5.8°C) in the next century, with substantial regional variation. Soil moisture is likely to decline in many regions, and intense rainstorms are likely to become more frequent. Sea level could rise as much as two feet along most of the U.S. coast. Rising temperatures could have four major impacts on plants and animals: (1) timing of ecological events; (2) geographic range; (3) species' composition within communities; and (4) ecosystem processes, such as carbon cycling and storage (IPCC, 2007; Parmesan, 2004; Parmesan, C. and H. Galbraith, 2004).

While the above-mentioned potential impacts identify the possible effects of climate change at a global and potentially statewide level, in general scientific modeling tools are currently unable to predict what impacts would occur locally.

d. Regulatory Setting. The following regulations address both climate change and GHG emissions.

International and Federal Regulations. The United States is, and has been, a participant in the United Nations Framework Convention on Climate Change (UNFCCC) since it was produced by the United Nations in 1992. The objective of the treaty is "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." This is generally understood to be

achieved by stabilizing global greenhouse gas concentrations between 350 and 400 ppm, in order to limit the global average temperature increases between 2 and 2.4°C above pre-industrial levels (IPCC 2007). The UNFCC itself does not set limits on greenhouse gas emissions for individual countries or enforcement mechanisms. Instead, the treaty provides for updates, called "protocols," that would identify mandatory emissions limits.

Five years later, the UNFCC brought nations together again to draft the *Kyoto Protocol* (1997). The Protocol established commitments for industrialized nations to reduce their collective emissions of six greenhouse gases (carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons) to 5.2% below 1990 levels by 2012. The United States is a signatory of the Protocol, but Congress has not ratified the it and the United States has not bound itself to the Protocol's commitments (UNFCCC, 2007).

The United States is currently using a voluntary and incentive-based approach toward emissions reductions in lieu of the Kyoto Protocol's mandatory framework. The Climate Change Technology Program (CCTP) is a multi-agency research and development coordination effort (led by the Secretaries of Energy and Commerce) that is charged with carrying out the President's National Climate Change Technology Initiative (USEPA, December 2007; http://www.epa.gov/climatechange/policy/cctp.html).

The U.S. Supreme Court in *Massachusetts v. EPA* (April 2, 2007) held that the EPA can consider regulating motor-vehicle GHG emissions. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. This will be done through coordination of the GHG emission limits and the NHTSA Corporate Average Fuel Economy (CAFE) standards. On May 7, 2010, the final combined EPA and NHTSA standards that comprise the first phase of this national program were promulgated regarding passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The CAFE standards require these vehicles to meet an estimated combined average emissions level of 250 grams of carbon dioxide per mile, equivalent to 35.5 miles per gallon (MPG) if the automobile industry were to meet this carbon dioxide level solely through fuel economy improvements. New emission limits and CAFE standards for light-duty vehicles for the 2017-2025 model years are currently (September 30, 2010) under development. In October 2010, the agencies each proposed complementary GHG and CAFE standards under their respective authorities covering medium and heavy-duty trucks for the model years 2014-2018.

The EPA in May 2010 finalized the GHG Tailoring Rule that specifies that beginning in 2011, projects that will increase GHG emissions substantially will require an air permit. Typical facilities that would be covered under this rule include power plants, industrial boilers, and oil refineries, which as a group are responsible for 70 percent of the GHGs from stationary sources. The applicability criteria to determine which sources are subject to permitting is being "tailored" to apply to GHGs, which are emitted at a much greater quantity than the more typical regulated air pollutants, and also have different consequences than the criteria pollutants. New sources as well as existing sources not already subject to Title V that emit, or have the potential to emit, at least 100,000 tons per year (tpy) CO_2e will become subject to the Prevention of Significant Deterioration (PSD) and Title V requirements. In addition, sources

that emit or have the potential to emit at least 100,000 tpy CO_2e and that undertake a modification that increases net emissions of GHGs by at least 75,000 tpy CO_2e will also be subject to PSD requirements.

California Regulations. Assembly Bill (AB) 1493 (2002), referred to as Pavley I, requires ARB to develop and adopt regulations to achieve "the maximum feasible and cost-effective reduction of GHG emissions from motor vehicles." On June 30, 2009, EPA granted the waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year.

In 2005, Governor Schwarzenegger issued Executive Order S-3-05, establishing statewide GHG emissions reduction targets. Executive Order (EO) S-3-05 provides that by 2010, emissions shall be reduced to 2000 levels; by 2020, emissions shall be reduced to 1990 levels; and by 2050, emissions shall be reduced to 80% of 1990 levels (CalEPA, 2006). In response to EO S-3-05, CalEPA created the Climate Action Team (CAT), which in March 2006, published the Climate Action Team Report (the "2006 CAT Report") (CalEPA, 2006). The 2006 CAT Report identified a recommended list of strategies that the state could pursue to reduce GHG emissions. These are strategies that could be implemented by various state agencies to ensure that the emission reduction targets in EO S-3-05 are met and can be met with existing authority of the state agencies. The strategies include the reduction of passenger and light duty truck emissions, the reduction of idling times for diesel trucks, an overhaul of shipping technology/ infrastructure, increased use of alternative fuels, increased recycling, and landfill methane capture, etc.

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," signed into law in 2006. AB 32 codifies the Statewide goal of reducing GHG emissions to 1990 levels by 2020 (essentially a 25% reduction below 2005 emission levels; the same requirement as under S-3-05), and requires ARB to prepare a Scoping Plan that outlines the main State strategies for reducing GHGs to meet the 2020 deadline. In addition, AB 32 requires ARB to adopt regulations to require reporting and verification of statewide GHG emissions.

After completing a comprehensive review and update process, the ARB approved a 1990 statewide GHG level and 2020 limit of 427 MMT CDE. The Scoping Plan was approved by ARB on December 11, 2008, and includes measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. The Scoping Plan includes a range of GHG reduction actions that may include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms.

Executive Order S-01-07 was enacted on January 18, 2007. The order mandates that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California to reduce the carbon intensity of California's transportation fuels by at least 10% by 2020.

Senate Bill (SB) 97, signed in August 2007, acknowledges that climate change is an environmental issue that requires analysis in CEQA documents. In December 2009, the California Resources Agency (Resources Agency) adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions or the effects of GHG emissions.

The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts.

SB 375, signed in August 2008, enhances the State's ability to reach AB 32 goals by directing ARB to develop regional greenhouse gas emission reduction targets to be achieved from vehicles for 2020 and 2035. SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPO) to prepare a "sustainable communities strategy" (SCS) that contains a growth strategy to meet these emission targets for inclusion in the Regional Transportation Plan (RTP). On September 23, 2010 ARB adopted final regional targets for reducing greenhouse gas emissions in 2020 and 2035.

ARB Resolution 07-54 establishes 25,000 metric tons of GHG emissions as the threshold for identifying the largest stationary emission sources in California for purposes of requiring the annual reporting of emissions. This threshold is just over 0.005% of California's total inventory of GHG emissions for 2004.

For more information on the Senate and Assembly bills, Executive Orders, and reports discussed above, and to view reports and research referenced above, please refer to the following websites: www.climatechange.ca.gov and http://www.arb.ca.gov/cc/cc.htm.

Local Regulations and CEQA Requirements. Pursuant to the requirements of SB 97, the Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions and analysis of the effects of GHG emissions. The adopted CEQA Guidelines provide regulatory guidance on the analysis and mitigation of GHG emissions in CEQA documents, while giving lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHGs and climate change impacts. To date, the Bay Area Air Quality Management District (BAAQMD), the South Coast Air Quality Management District (SCAQMD), and the San Joaquin Air Pollution Control District (SJVAPCD) have adopted significance thresholds for GHGs. The SCAQMD threshold, which was adopted in December 2008, considers emissions of over 10,000 metric tons CDE/year to be significant. However, the SCAQMD's threshold applies only to stationary sources and is expressly intended to apply only when the SCAQMD is the CEQA lead agency. Although not yet adopted, the SCAQMD has a recommended quantitative threshold for all land use types of 3,000 metric tons CDE/year (SCAQMD, "Proposed Tier 3 Quantitative Thresholds – Option 1", September 2010). Note that no air district has the power to establish definitive thresholds that will completely relieve a lead agency of the obligation to determine significance on a case-by-case basis for a specific project.

4.6.2 Impact Analysis

a. Methodology and Significance Thresholds. The State CEQA Guidelines are used in evaluating the cumulative significance of GHG emissions from the proposed project. As described by CEQA Guidelines Section 15064.4, a lead agency shall have discretion to determine, in the context of a particular project, whether to:

> *(1) Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision*

> *with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or*
>
> *(2) Rely on a qualitative analysis or performance based standards.*

Further, a lead agency should consider the following factors, among others, when assessing the significance of impacts from greenhouse gas emissions on the environment:

> *(1) The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;*
>
> *(2) Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*
>
> *(3) The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such requirements must be adopted by the relevant public agency through a public review process and must reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.*

Although this EIR is a programmatic EIR and the proposed landslide moratorium ordinance revisions would not involve any specific development proposals or change any land use designations, this section provides a quantitative analysis to estimate GHG emissions.

The vast majority of individual projects do not generate sufficient GHG emissions to create a project-specific impact through a direct influence to global climate change; therefore, the issue of climate change typically involves an analysis of whether a project's contribution towards an impact is cumulatively considerable. "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (CEQA Guidelines, Section 15355).

For future projects, the significance of GHG emissions may be evaluated based on locally adopted quantitative thresholds, or consistency with a regional GHG reduction plan (such as a Climate Action Plan). However, because the SCAQMD has not yet adopted GHG emissions thresholds that apply to land use projects where the SCAQMD is not the lead agency and no GHG emissions reduction plan or GHG emissions thresholds have been adopted in Rancho Palos Verdes, the proposed project is evaluated based on the SCAQMD's recommended/preferred option threshold for all land use types including residential of 3,000 metric tons CO_2e per year (SCAQMD, "Proposed Tier 3 Quantitative Thresholds – Option 1", September 2010). It is important to note that the City has not recommended that threshold for any other purpose at this time, but that numeric threshold is recommended for this analysis.

Although this EIR is a programmatic EIR, the development potential associated with the proposed revisions to the Landslide Moratorium Ordinance would have a significant impact

related to GHG emissions if the GHG emissions would result in more than 3,000 metric tons of carbon dioxide equivalent (CDE) units per year. In addition, in order to determine whether or not the proposed project's GHG emissions are "cumulatively considerable," this analysis determines the project's consistency with applicable greenhouse gas emissions reductions strategies.

Study Methodology. This analysis is based on the methodologies recommended by the California Air Pollution Control Officers Association [CAPCOA] (January 2008) *CEQA and Climate Change* white paper. The analysis focuses on CO_2, N_2O, and CH_4 as these are the GHG emissions that onsite development would generate in the largest quantities. Fluorinated gases, such as HFCs, PFCs, and SF_6, were also considered for the analysis. However, because the development potential would only involve residential development, the quantity of fluorinated gases would not be significant since fluorinated gases are primarily associated with industrial processes. Calculations were based on the methodologies discussed in the CAPCOA white paper (January 2008) and included the use of the California Climate Action Registry General Reporting Protocol (January 2009).

Construction Emissions. Although construction activity is addressed in this analysis, CAPCOA does not discuss whether any of the suggested threshold approaches (as discussed below in *GHG Cumulative Significance*) adequately address impacts from temporary construction activity. As stated in the *CEQA and Climate Change* white paper, "more study is needed to make this assessment or to develop separate thresholds for construction activity" (CAPCOA, 2008). Nevertheless, the SCAQMD has recommended amortizing construction-related emissions over a 30-year period in conjunction with the proposed project's operational emissions.

Construction of the 47 lots would generate temporary GHG emissions primarily due to the operation of construction equipment and truck trips. As discussed in Section 4.2, *Air Quality*, for the purposes of this analysis it was assumed that total grading would be approximately 47,000 cubic yards (approximately 1,000 cubic yards per lot) and the maximum amount of imported soil would be approximately 2,350 cubic yards (or 50 cubic yards per lot). Site preparation and grading typically generates the greatest amount of emissions due to the use of grading equipment and soil hauling. For construction analysis, it was assumed that all 47 lots would be developed by the year 2015. This is a conservative/worst case scenario assumption since individual lots would be developed independently and thus construction schedules would likely occur over many years. Emissions associated with the construction period were estimated using the California Emissions Estimator Model (CalEEMod) computer model, based on the projected maximum amount of equipment that would be used onsite at one time. Complete CalEEMod results and assumptions can be viewed in Appendix B.

Indirect Emissions. Operational emissions from energy use (electricity and natural gas use) for the 47 residences was estimated using the CalEEMod model (see Appendix B for calculations). The default values on which the CalEEMod model are based include the California Energy Commission (CEC) sponsored California Commercial End Use Survey (CEUS) and Residential Appliance Saturation Survey (RASS) studies. The CalEEMod model provides operational emissions of CO_2, N_2O and CH_4. This methodology is considered reasonable and reliable for use, as it has been subjected to peer review by numerous public and private stakeholders, and in particular by the CEC. It is also recommended by CAPCOA (January 2008).

Emissions associated with area sources including consumer products, landscape maintenance, hearth, and architectural coating were calculated in the CalEEMod model and utilize standard emission rates from CARB, USEPA, and district supplied emission factor values (CalEEMod User Guide, 2011).

Emissions from waste generation were also calculated in the CalEEMod model and are based on the IPCC's methods for quantifying GHG emissions from solid waste using the degradable organic content of waste (CalEEMod User Guide, 2011). Waste disposal rates by land use and overall composition of municipal solid waste in California was primarily based on data provided by the California Department of Resources Recycling and Recovery (CalRecycle).

Emissions from water and wastewater usage calculated in the CalEEMod model were based on the default electricity intensity is from the CEC's 2006 Refining Estimates of Water-Related Energy Use in California using the average values for Northern and Southern California.

Direct Emissions from Mobile Combustion. Emissions of CO_2 and CH_4 from transportation sources for the proposed project were quantified using the CalEEMod computer model. Because the CalEEMod model does not calculate N_2O emissions from mobile sources, N_2O emissions were quantified using the California Climate Action Registry General Reporting Protocol (January 2009) direct emissions factors for mobile combustion (see Appendix for calculations). Total daily trips for the 47 single family residences was based on the standard Institute of Transportation Engineers (ITE) rate for single family residences and was calculated and extrapolated to derive total annual mileage in CalEEMod. Emission rates for N_2O emissions were based on the vehicle mix output generated by CalEEMod and the emission factors found in the California Climate Action Registry General Reporting Protocol.

One of the limitations to a quantitative analysis is that emission models, such as CalEEMod, evaluate aggregate emissions and do not demonstrate, with respect to a global impact, what proportion of these emissions are "new" emissions, specifically attributable to the project in question. For most projects, the main contribution of GHG emissions is from motor vehicles and the total vehicle miles traveled (VMT), but the quantity of these emissions appropriately characterized as "new" is uncertain. Traffic associated with a project may be relocated trips from other locales, and consequently, may result in either higher or lower net VMT. For the proposed project analyzed in this report, it is likely that some of the GHG emissions associated with traffic and energy demand would be truly "new" emissions. However, it is also likely that some of the emissions represent diversion of emissions from other locations. Thus, although GHG emissions are associated with onsite development, it is not possible to discern how much diversion is occurring or what fraction of those emissions represents global increases. In the absence of information regarding the different types of trips, the VMT estimate generated by CalEEMod is used as a conservative, "worst-case" estimate.

b. Project Impacts and Mitigation Measures.

Impact GHG-1 **Development that could be facilitated by the proposed ordinance revisions would generate additional GHG emissions beyond existing conditions. However, GHG emissions generated by full development potential within Zone 2 would not exceed relevant significance thresholds. Further, the proposed project would be generally consistent with the Climate Action Team GHG reduction strategies, the 2008 Attorney General Greenhouse Gas Reduction Measures and the CAPCOA GHG Model Policies Guide. Impacts would be Class III, *less than significant.***

As stated above, GHG emissions for potential buildout of the project area under the proposed ordinance revisions were calculated using the SCAQMD's CalEEMod computer model based on the development potential that would be accommodated as a result of the proposed revisions to the Landslide Moratorium Ordinance. The following summarizes the project's overall GHG emissions (see Appendix B for full CalEEMod worksheets).

Construction Emissions. For the purpose of this analysis, construction activity is conservatively assumed to occur over a period of approximately four years. Based on the CalEEMod model results, construction activity for the project would generate an estimated 753 metric tons of carbon dioxide equivalent (CDE) units (as shown in Table 1) during the first year of construction, which is the year with the highest amount of GHG emissions since this year incudes site preparation and grading phases. As described above under Study Methodology, although construction emissions are temporary in nature, in order to account for their contribution over the lifetime of the project the SCAQMD recommends amortization of construction emissions over a 30-year period and then addition of the construction emissions to the operational emissions (SCAQMD, 2008). Following the SCAQMD's recommended methodology to amortize emissions over a 30-year period (the assumed life of the project), construction of the proposed project would generate an estimated 25 metric tons of CDE per year.

Table 4.6-1
Estimated Construction Emissions of Greenhouse Gases

Emission Source	Annual Emissions	
	Emissions (metric tons)	Carbon Dioxide Equivalent (CDE)
Carbon Dioxide (CO_2)[1]	751.62	751.6 metric tons
Methane (CH_4)[1]	0.08	1.7 metric tons
Nitrous Oxide (N_2O)[1]	0.0	0.0 metric tons
	Total	**753.3 metric tons**
	Amortized over 30 years	**25.11 metric tons per year**

[1] *See Appendix B for calculations and for GHG emission factor assumptions.*

Operational Indirect and Stationary Direct Emissions.

Area Source Emissions. The CalEEMod model was used to calculate direct sources of air emissions located at the project site. This includes hearths, consumer product use, and landscape maintenance equipment. Because the project would involve residential units which do not typically have large rates of emissions associated with consumer products, emissions from the proposed project associated with consumer products would be negligible (0 metric tons per year). As shown in Table 4.6-2, the area sources would generate approximately 36 metric tons CDE per year.

Table 4.6-2
Estimated Area Source Greenhouse Gas Emissions

Emission Source	Annual Emissions (Carbon Dioxide Equivalent (CDE)
Hearth	34.31 metric tons
Landscaping	1.19 metric tons
Total	**35.5 metric tons**

Source: See Appendix B for calculations and for GHG emission factor assumptions.

Energy Use. Operation of the potential new residences would consume both electricity and natural gas (see Appendix B for calculations). The generation of electricity through combustion of fossil fuels typically yields CO_2, and to a smaller extent, N_2O and CH_4. As discussed above, annual electricity and natural gas emissions can be calculated using default values from the CEC sponsored CEUS and RASS studies which are built into the CalEEMod model.

As shown in Table 4.6-3, electricity consumption associated with the project would generate approximately 206 metric tons CDE per year. Natural gas use would generate approximately 131 metric tons CDE per year. Thus, overall energy use at the project site would generate approximately 337 metric tons CDE per year.

Table 4.6-3
Estimated Annual Energy-Related Greenhouse Gas Emissions

Emission Source	Annual Emissions (Carbon Dioxide Equivalent (CDE)
Electricity [1]	89 metric tons
Natural Gas[1]	107 metric tons
Total	**196 metric tons**

[1] *See Appendix B for calculations and for GHG emission factor assumptions.*

Solid Waste Emissions. It is anticipated that the potential new residences would generate approximately 55 tons of solid waste per year according to the CalEEMod output. As shown in Table 4.6-4, based on this estimate, this aspect of the project would generate approximately 25 metric tons of CDE per year.

Table 4.6-4
Estimated Annual Solid Waste Greenhouse Gas Emissions

Emission Source	Annual Emissions (Carbon Dioxide Equivalent (CDE)
Solid Waste	**25 metric tons**

Sources: See Appendix B for calculations and for GHG emission factor assumptions.

Water Use Emissions. It is anticipated that the project would use approximately 5,000,000 gallons of water per year. Based on the amount of electricity generated in order to supply this amount of water, as shown in Table 4.6-5, this aspect of the project would generate approximately 21 metric tons of CDE per year.

Table 4.6-5
Estimated Greenhouse Gas Emissions from Water Use

Emission Source	Annual Emissions (Carbon Dioxide Equivalent (CDE)
Water Use	**20.66 metric tons**

Sources: See Appendix B for calculations and for GHG emission factor assumptions.

Transportation Emissions. Mobile source GHG emissions were estimated using the ITE rate for average daily trips single family residences consistent with the project's traffic study prepared by LLG (March 2011) and by the total vehicle miles traveled (VMT) estimated in CalEEMod. Based on the CalEEMod model estimate, potential development would generate approximately 1,491,574 annual VMT.

Table 5 shows the estimated mobile emissions of GHGs for the project based on the estimated annual VMT. As noted above, the CalEEMod model does not calculate N_2O emissions related to mobile sources. As such, N_2O emissions were calculated based on the project's VMT using calculation methods provided by the California Climate Action Registry General Reporting Protocol (January 2009). As shown in Table 4.6-6 below, the project would result in approximately 763 metric tons of CDE units associated with mobile emissions.

Table 4.6-6
Estimated Annual Mobile Emissions of Greenhouse Gases

Emission Source	Annual Emissions (Carbon Dioxide Equivalent (CDE)
Mobile Emissions (CO_2 & CH_4) [1]	732.58 metric tons
Mobile Emissions (N_2O) [2]	30 metric tons
Total	**763 metric tons**

[1] See Appendix for calculations in CalEEMod Model output.
[2] See Appendix for calculations according to California Climate Action Registry General Reporting Protocol, Reporting Entity-Wide Greenhouse Gas Emissions, Version 3.1,January 2009, page 30-35.

Combined Construction, Stationary and Mobile Source Emissions. Table 4.6-7 combines the construction, operational and mobile GHG emissions associated with onsite development for the proposed project. Construction emissions associated with construction activity (approximately 753 metric tons CDE) are amortized over 30 years (the anticipated life of the project).

For the proposed project, the combined annual emissions would total approximately 808 metric tons per year in CDE units. This total represents roughly 0.00016% of California's total 2004 emissions of 492 million metric tons. These emission projections indicate that the majority of the project's GHG emissions are associated with vehicular travel (55%). However, as noted above, mobile emissions are in part a redirection of existing travel to other locations, and so are already a part of the total California GHG emissions.

Table 4.6-7
Combined Annual Emissions of Greenhouse Gases

Emission Source	Annual Emissions
Construction	25 metric tons CDE
Operational	
Area	36 metric tons CDE
Energy	196 metric tons CDE
Solid Waste	25 metric tons CDE
Water	21 metric tons CDE
Mobile	763 metric tons CDE
Total	**1,060 metric tons CDE**

Sources: See Appendix B for calculations and for GHG emission factor assumptions.

As noted above, neither the SCAQMD or the City of Rancho Palos Verdes have adopted formal GHG emissions thresholds that apply to land use projects and no GHG emissions reduction

plan have been adopted in Rancho Palos Verdes. Therefore, the proposed project is evaluated based on the SCAQMD's recommended/preferred option threshold for all land use types of 3,000 metric tons CO_2e per year (SCAQMD, "Proposed Tier 3 Quantitative Thresholds – Option 1", September 2010).

Based on the development potential within Zone 2 that would result from revisions to the Landslide Moratorium Ordinance, total GHG emissions would be approximately 1,060 metric tons CDE per year. Although development facilitated by proposed project would generate additional GHG emissions beyond existing conditions, because the total amount of GHG emissions would be lower than the threshold of 3,000 metric tons per year, impacts from GHG emissions would be less than significant.

The proposed Amendments would also be generally consistent with applicable regulations or plans addressing greenhouse gas reductions. As indicated above, the CAT published the Climate Action Team Report to Governor Schwarzenegger and the Legislature (the "2006 CAT Report") in March 2006. The CAT Report identifies a recommended list of strategies that the State could pursue to reduce climate change greenhouse gas emissions. The CAT strategies are recommended to reduce GHG emissions at a statewide level to meet the goals of the Executive Order S-3-05. These are strategies that could be implemented by various State agencies to ensure that the Governor's targets are met and can be met with existing authority of the State agencies. In addition, in 2008 the California Attorney General published The California Environmental Quality Act Addressing Global Warming Impacts at the Local Agency Level (Office of the California Attorney General, Global Warming Measures Updated May 21, 2008). This document provides information that may be helpful to local agencies in carrying out their duties under CEQA as they relate to global warming. Included in this document are various measures that may reduce the global warming related impacts of a project. Tables 4.6-8 and 4.6-9 illustrate that the proposed project would be consistent with the GHG reduction strategies set forth by the 2006 CAT Report as well as the 2008 Attorney General's Greenhouse Gas Reduction Measures.

Table 4.6-8
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	***Project Consistency***
California Air Resources Board	
Vehicle Climate Change Standards AB 1493 (Pavley) required the state to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by the ARB in September 2004.	**Consistent** The vehicles that travel to and from the project site on public roadways would be in compliance with ARB vehicle standards that are in effect at the time of vehicle purchase.
Diesel Anti-Idling The ARB adopted a measure to limit diesel-fueled commercial motor vehicle idling in July 2004.	**Consistent** Current State law restricts diesel truck idling to five minutes or less. Although unlikely since this project would involve single family residences, diesel trucks operating from and making deliveries to the project site are subject to this state-wide law. Construction vehicles are also subject to this

Table 4.6-8
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	*Project Consistency*
	regulation.
Hydrofluorocarbon Reduction 1) Ban retail sale of HFC in small cans. 2) Require that only low GWP refrigerants be used in new vehicular systems. 3) Adopt specifications for new commercial refrigeration. 4) Add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs. 5) Enforce federal ban on releasing HFCs.	**Consistent** This strategy applies to consumer products. All applicable products would be required to comply with the regulations that are in effect at the time of manufacture.
Alternative Fuels: Biodiesel Blends ARB would develop regulations to require the use of 1 to 4% biodiesel displacement of California diesel fuel.	**Consistent** The diesel vehicles such as construction vehicles that travel to and from the project site on public roadways could utilize this fuel once it is commercially available.
Alternative Fuels: Ethanol Increased use of E-85 fuel.	**Consistent** Residents at the project site could choose to purchase flex-fuel vehicles and utilize this fuel once it is commercially available regionally and locally.
Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy duty vehicles and an education program for the heavy duty vehicle sector.	**Consistent** The heavy-duty vehicles for construction activities that travel to and from the project site on public roadways would be subject to all applicable ARB efficiency standards that are in effect at the time of vehicle manufacture.
Achieve 50% Statewide Recycling Goal Achieving the State's 50% waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48% has been achieved on a statewide basis. Therefore, a 2% additional reduction is needed.	**Consistent** The City's Source Reduction and Recycling Element (SRRE) is the solid waste reduction planning document, and establishes goals and policies for the City regarding source reduction, recycling and composting and environmentally safe solid waste management alternatives to land disposal. The SRRE also helps the City in maintaining the 50% diversion rate requirement specified by AB 939. As of 2002 (the last verified date by the CIWMB), the City was recycling approximately 51% of its solid waste, thereby complying with the standards established by AB 939 It is anticipated that the proposed project would participate in the City's waste diversion programs and would similarly divert at least 51% of its solid waste.
Zero Waste – High Recycling Efforts to exceed the 50% goal would allow for additional reductions in climate change emissions.	**Consistent** As of 2002 (the last verified date by the CIWMB), the City was recycling 51% of its solid waste, thereby complying with the standards established by AB 939. It is anticipated that the proposed project would participate in the City's waste diversion programs and would similarly divert at least 51% of its solid waste. The project would also be subject to all applicable State and City requirements for solid waste reduction as they change in the future.

Table 4.6-8
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	*Project Consistency*
Department of Forestry	
Urban Forestry A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	**Consistent** Landscaping for new residences would likely result in additional planted trees throughout the project site and would primarily consist of native plant species. In addition, Mitigation Measure AES-1 requires replacement planting for trees removed for new development allowed under the proposed ordinance revisions.
Department of Water Resources	
Water Use Efficiency Approximately 19% of all electricity, 30% of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	**Consistent** New residences would be required to comply with Municipal Code Chapter 15.34 - Water Efficient Landscaping. In addition, individual residences would be equipped with low-flow plumbing fixtures, further reducing water use.
Energy Commission (CEC)	
Building Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	**Consistent** The proposed project would need to comply with the standards of Title 24 that are in effect at the time of development.
Appliance Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	**Consistent** Under State law, appliances that are purchased for the project - both pre- and post-development – would be consistent with energy efficiency standards that are in effect at the time of manufacture.
Fuel-Efficient Replacement Tires & Inflation Programs State legislation established a statewide program to encourage the production and use of more efficient tires.	**Consistent** Residents and visitors of the project site could purchase tires for their vehicles that comply with state programs for increased fuel efficiency.
Municipal Utility Energy Efficiency Programs/Demand Response Includes energy efficiency programs, renewable portfolio standard, combined heat and power, and transitioning away from carbon-intensive generation.	*Not applicable*, but project development would not preclude the implementation of this strategy by municipal utility providers. It should also be noted that the individual owners of lots may participate in the City's Voluntary Green Building Construction Program. The program allows those who wish to construct "green buildings" to work with a recognized organization in order to receive "green building" certification. This approach allows green building "experts" to work with interested applicants to achieve their green building objectives.
Municipal Utility Renewable Portfolio Standard	

Table 4.6-8
Project Consistency with Applicable Climate Action Team
Greenhouse Gas Emission Reduction Strategies

Strategy	***Project Consistency***
California's Renewable Portfolio Standard (RPS), established in 2002, requires that all load serving entities achieve a goal of 20% of retail electricity sales from renewable energy sources by 2017, within certain cost constraints.	*Not applicable*, but the project would not preclude the implementation of this strategy by Southern California Edison.
Municipal Utility Combined Heat and Power Cost effective reduction from fossil fuel consumption in the commercial and industrial sector through the application of on-site power production to meet both heat and electricity loads.	*Not applicable* since this strategy addresses incentives that could be provided by utility providers such as Southern California Edison and The Gas Company.
Alternative Fuels: Non-Petroleum Fuels Increasing the use of non-petroleum fuels in California's transportation sector, as recommended as recommended in the CEC's 2003 and 2005 Integrated Energy Policy Reports.	**Consistent** Residents and visitors of the project site could purchase alternative fuel vehicles and utilize these fuels once they are commercially available regionally and locally.
Green Buildings Initiative Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20% by the year 2015, as compared with 2003 levels. The Executive Order and related action plan spell out specific actions state agencies are to take with state-owned and -leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20% target.	**Consistent** As discussed previously, the project would be required to be constructed in compliance with the standards of Title 24 that are in effect at the time of development. The 2008 Title 24 standards are approximately 15% more efficient than those of the 2005 standards. In addition, all potential residential buildings would be required to adhere to the CAL Green Building Code which would include reducing energy use beyond Title 24 standards. It should also be noted that individual owners of lots may participate in the City's Voluntary Green Building Construction Program. The program allows those who wish to construct "green buildings" to work with a recognized organization in order to receive "green building" certification. This approach allows green building "experts" to work with interested applicants to achieve their green building objectives.
Business, Transportation and Housing	
Smart Land Use and Intelligent Transportation Systems (ITS) Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors. ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services. The Governor is finalizing a comprehensive 10-year strategic growth plan with the intent of developing ways to promote, through state investments, incentives and technical assistance, land use, and technology	**Consistent** The project site is located within an existing residential neighborhood/community increasing the density of the area along an existing transit corridor in Rancho Palos Verdes.

Table 4.6-8
Project Consistency with Applicable Climate Action Team Greenhouse Gas Emission Reduction Strategies

Strategy	*Project Consistency*
strategies that provide for a prosperous economy, social equity and a quality environment. Smart land use, demand management, ITS, and value pricing are critical elements in this plan for improving mobility and transportation efficiency. Specific strategies include: promoting jobs/housing proximity and transit-oriented development; encouraging high density residential/commercial development along transit/rail corridor; valuing and congestion pricing; implementing intelligent transportation systems, traveler information/traffic control, incident management; accelerating the development of broadband infrastructure; and comprehensive, integrated, multimodal/intermodal transportation planning.	
Public Utilities Commission (PUC)	
Accelerated Renewable Portfolio Standard The Governor has set a goal of achieving 33% renewable in the State's resource mix by 2020. The joint PUC/Energy Commission September 2005 Energy Action Plan II (EAP II) adopts the 33% goal.	*Not applicable*, but project development would not preclude the implementation of this strategy by energy providers.
California Solar Initiative The solar initiative includes installation of 1 million solar roofs or an equivalent 3,000 MW by 2017 on homes and businesses, increased use of solar thermal systems to offset the increasing demand for natural gas, use of advanced metering in solar applications, and creation of a funding source that can provide rebates over 10 years through a declining incentive schedule.	**Consistent** Although no solar roofs are proposed at this time, individual lot owners would be able to install solar roofs at their residence.

Table 4.6-9
Project Consistency with Applicable Attorney General Greenhouse Gas Reduction Measures

Strategy	*Project Consistency*
Transportation-Related Emissions	
Diesel Anti-Idling Set specific limits on idling time for commercial vehicles, including delivery vehicles.	**Consistent** Currently, the California Air Resources Board's (CARB) Airborne Toxic Control Measure (ATCM) to Limit Diesel-Fueled Commercial Motor Vehicle Idling restricts diesel truck idling to five minutes or less. Diesel trucks operating from and making deliveries to the project site are subject to this state-wide law. Construction vehicles are also subject to this regulation.
Transportation Emissions Reduction Provide shuttle service to public transportation.	**Consistent** Shuttle service to public transportation would be unnecessary as the project site is located near several bus lines, and is located within walking distance (approximately

Table 4.6-9
Project Consistency with Applicable Attorney General
Greenhouse Gas Reduction Measures

Strategy	*Project Consistency*
	0.5 mile - 1 mile) to the Gold and Orange Routes served by the Palos Verdes Transit Authority.
Solid Waste and Energy Emissions	
Solid Waste Reduction Strategy Project construction shall require reuse and recycling of construction and demolition waste.	**Consistent** The City's Source Reduction and Recycling Element (SRRE) is the solid waste reduction planning document, and establishes goals and policies for the City regarding source reduction, recycling and composting and environmentally safe solid waste management alternatives to land disposal. Project construction would be required to adhere to the goals and policies contained in the SRRE.
Water Use Efficiency Require measures that reduce the amount of water sent to the sewer system – see examples in CAT standard above. (Reduction in water volume sent to the sewer system means less water has to be treated and pumped to the end user, thereby saving energy.	**Consistent** As described above, the project would be anticipated to incorporate landscaping that would be designed to require minimal irrigation and to reflect the native vegetation of the surrounding area, thereby reducing water use. In addition, individual residences would be equipped with ultra-low-flow plumbing fixtures, further reducing water use at the project site.
Land Use Measures, Smart Growth Strategies and Carbon Offsets	
Smart Land Use and Intelligent Transportation Systems Require pedestrian-only streets and plazas within the project site and destinations that may be reached conveniently by public transportation, walking or bicycling.	**Consistent** The project site is located within walking distance (approximately 0.5 miles to 1 mile) to public transportation such as the Gold and Orange Routes served by the Palos Verdes Transit Authority.

Although the proposed revisions to the Landslide Moratorium Ordinance do not include specific development projects, development facilitated by the revisions within Zone 2 would result in an incremental increase in GHG emissions. However, as indicated above in Table 4.6-7, the increase of GHG emissions would be approximately 1,060 metric tons CDE per year which is below the recommended threshold of 3,000 metric tons CDE per year. In addition, as indicated in Tables 4.6-8 and 4.6-9, the proposed project would be consistent with CAT strategies and the 2008 Attorney General Greenhouse Gas Reduction Measures. Therefore, the proposed Amendments would be consistent with the objectives of AB 32, SB 97, and SB 375, and their contribution to cumulative GHG emissions and climate change would not be significant.

Mitigation Measures. As specified above, the proposed project would result in less than 3,000 metric tons CDE per year and would be consistent with the 2006 CAT Report as well as the 2008 Attorney General's Greenhouse Gas Reduction Measures; therefore, no mitigation is necessary.

Significance after Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. As indicated above in Impact GHG-1, GHG emissions associated with the proposed project would be less than significant. Analyses of greenhouse gases are cumulative in nature as they affect the accumulation of greenhouse gases in the atmosphere. Since there is no cumulative impact, and give the relatively small contribution to cumulative GHG emissions associated with the proposed project, there are no project level impacts as well.

4.7 FIRE PROTECTION

This section describes existing fire hazards near the proposed project area and potential impacts associated with those fire hazards relative to existing and proposed structures. Potential impacts related to emergency access are discussed in Section 4.10 *Transportation and Circulation*.

4.7.1 Setting

a. Project Area Setting. The Zone 2 Landslide Moratorium Ordinance Revisions project area is located on the hills above the south-central coastline of the City, is within the City's larger (approximately 1,200-acre) Landslide Moratorium Area (LMA). Of the 111 lots within Zone 2, 64 are developed with residences and accessory structures, and 47 are undeveloped or underdeveloped parcels. Lots within Zone 2 are generally ¼ acre to one or more acres in size. Developed lots contain mainly one-story single-family homes and many also contain accessory structures including equestrian facilities. Vacant lots within the project area are characterized by highly variable topography and are vegetated with scrub, grasses, mature trees and, in some cases, accessory structures and equestrian facilities. The project area is encompassed by vegetated open space to the north, east, and west which makes up the Portuguese Bend and Upper Filiorum Natural Communities Conservation Planning (NCCP) subareas of the Rancho Palos Verdes Nature Preserve, and has limited existing residential uses to the south.

b. Fire Hazards. The majority of the Zone 2 project area consists of developed and undeveloped parcels on variably sloping land vegetated with grasses and trees. The County of Los Angeles Fire Department has designated the site as a very high fire hazard area (Fire Hazard Severity Zone Map, 2007). The County's fire hazard map was developed by the Forestry Division based on an evaluation of fuels, topography, dwelling density, weather, infrastructure, building materials, brush clearance, and fire history, and serves to determine increased insurance rates and building requirements. Weather is the single most important component affecting wildfire. In particular, specific weather events can occur that drastically alter the normally temperate Rancho Palos Verdes coastal plain climate to create catastrophic wildfire conditions. The winds that create extreme wildfire conditions in the Southern California region are known as the "Santa Ana" winds.

c. Fire Protection. The Los Angeles County Fire Department (LACFD) Batallion 14 provides fire prevention, fire suppression, and life safety services to the City of Rancho Palos Verdes. LACFD Battalion 14 has 8 fire stations throughout Rancho Palos Verdes and surrounding area, staffed 24 hours a day, 365 days a year. The nearest fire station (#53) is located at 6124 Palos Verdes Drive South, approximately one-half mile northwest of the Portuguese Bend community access point at Narcissa Drive. Station #53 is staffed by one captain, one engineer, and one firefighter. Station #53 equipment includes one pumper fire truck (Captain Demeyer, Personal Communication, April 26, 2011). Access to Portuguese Bend is provided solely from Palos Verdes Drive South, which connects to the private community via Narcissa Drive and Peppertree Drive from the south. In case of an emergency, the fire station uses a remote control or key to open the locked gates at both private community entrances.

d. Regulatory Setting. The City of Rancho Palos Verdes General Plan and Municipal Zoning Code include a number of goals, policies and regulations intended to maintain and

augment fire protection within the City. Selected policies and regulations that are applicable to the project's potential fire hazard impacts are discussed below.

General Plan. The Safety Element of the City of Rancho Palos Verdes General Plan (1975) generally describes the wildfire hazard history, potential, risk factors, and emergency services in the City and sets forth policies and recommendations by which to increase safety and reduce hazards. The following selected policies related to safety and fire protection may be considered applicable to the project area.

Policy 2. *Adopt and enforce building codes, ordinances, and regulations using best practices which contain design and construction standards based upon appropriate levels of risk and hazard.*

Policy 4. *Cooperate with the fire protection agency and water company to ensure adequate water flow capabilities throughout all areas of the City.*

Policy 6. *Develop stringent site design and maintenance criteria for areas of high fire hazard potential.*

Policy 9. *Ensure that services are provided to deal adequately with health and sanitation problems.*

Municipal Code. Rancho Palos Verdes Municipal Code Section 8.08.010 adopts the Los Angeles County Fire Code, Title 32, as the Fire Code of the City of Rancho Palos Verdes. The County maintains fire safety requirements, development standards and regulations, and standard fees, for new development. Building standards for fire hazards, including roof coverings, construction materials, structural components, and clearing of brush and vegetative growth, are administered by the LACFD and the City's Building and Safety Division.

For areas located within the Very High Fire Hazard Severity Zone (VHFHSZ), County Fire Code Sections 325.2.1.2, 328.10, 1117.2.1 and 4908.1 require completion and approval of a land development plan and fuel modification plan. Appendices B and C of the Fire Code specify that for single-family dwellings located on a lot of one acre or more in a VHFHSZ, the fire-flow must be 1,000 gallons per minute for a duration of two hours and hydrants must be spaced not more than 600 feet apart. Additionally, the City's Building and Safety Division mandates wildfire protection building construction requirements intended to mitigate wildfire exposure in an urban interface area.

The LACFD Fuel Modification Unit provides guidelines the VHFHSZ in order to create a defensible space for effective fire protection in newly constructed and/or remodeled homes. Fuel modification zones in the project area are strategically placed strips of land where combustible native or ornamental vegetation has been modified or replaced with drought-tolerant, low-fuel-volume plants, creating a buffer to areas of natural vegetation surrounding the perimeter of a single-family dwelling. A fuel modification plan identifies specific zones within a property which are subject to fuel modification. Plans vary in complexity and fuel modification distances are estimated based on the fire history, the amount and type of vegetation, the arrangement of the fuels, topography, local weather patterns, and construction, design and placement of structures. The plan must also include an irrigation plan, a landscape plan, zone delineation for setbacks, irrigation, and thinning, and the identification of responsible parties for the plan's installation and maintenance.

Joint Natural Hazards Mitigation Plan. The 2004 City of Rancho Palos Verdes Joint Natural Hazards Mitigation Plan seeks to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from natural hazards, such as wildfires. The mitigation plan provides a list of activities that may assist the City in reducing risk and preventing loss from future natural hazard events. City mitigation measures applicable to the project area include:

WF #3-1. *Encourage development and dissemination of information relating to the fire hazard to help educate and assist builders & homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.*

WF #3-2. *Increase communication, coordination & collaboration between wildland/urban interface property owners, local planners and fire prevention crews & officials to address risks, existing mitigation measures, and federal assistance programs.*

WF #3-3. *Encourage implementation of wildfire mitigation activities in a manner consistent with the goals of promoting sustainable ecological management & community stability.*

4.7.2 Impact Analysis

a. Methodology and Significance Thresholds.

The County of Los Angeles does not include specific significance thresholds for impacts to fire hazards and fire protection services. Development within the project area must provide adequate emergency access, fire hydrants and fire flow in accordance with Los Angeles County Fire Code. In addition, a fuel modification plan providing adequate defensible space requires review and approval prior to issuance of a building permit. Significance criteria for this section have been taken from the Initial Study (Zone 2 Landslide Moratorium Ordinance Revisions, 2010) which is based on the *State CEQA Guidelines.* For the purpose of this analysis, a significant impact would occur if implementation of the proposed ordinance revisions would:

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

Potential impacts related to emergency access are discussed in Section 4.10, *Transportation and Circulation*.

b. Project Impacts and Mitigation Measures.

Impact FIRE-1 The project area is located in a Very High Fire Hazard Severity Zone and is adjacent to the Portuguese Bend and Upper Filiorum subareas of the Rancho Palos Verdes Nature Preserve on the north, east and west. New residences constructed as a result of adoption of the proposed ordinance

revisions could expose people or structures to risks associated with wildland fires. Impacts would be Class II, *significant but mitigable*.

The project area is located adjacent to the Portuguese Bend and Upper Filiorum NCCP subareas, which are primarily vegetated with grasses, scrub, and mature trees. This vegetated open space abuts developed and undeveloped lots within Zone 2 to the north, east and west. As such, residences developed within the project area would be exposed to increased fire hazards risk. In addition, the introduction of additional structures and residences could increase the potential for fires due to human carelessness, appliance malfunctions, faulty wiring or cinders from fireplaces. Inadequate emergency access, fire hydrant spacing and fire flow rates could also pose significant fire hazard risks. However, each new residence must submit a land development plan and receive approval from the LACFD Land Development Unit, demonstrating compliance with the Los Angeles County Fire Code requirements on specified flow rates, fire hydrant spacing and emergency access within a Very High Fire Hazard Severity Zone.

Prior to any development in the Very High Fire Hazard Severity Zone, property owners would also be required to submit a fuel modification plan to the LACFD Forestry Division. This fuel modification plan must be reviewed and approved for defensible space, reasonable fire safety, and compliance with Sections 325.2.1, 325.2.2, 325.10, and 503.2.1 of the Los Angeles County Fire Code, the Fire Departments Fuel Modification Guidelines, and California Code of Regulations Title 14, Division 1.5, Chapter 7, subchapter 2. While the risk of wildfire hazard in the project area would remain, with the required development and implementation of proper fuel modification plans, in addition to required adherence to all Los Angeles County building codes concerning fire safety, impacts would be less than significant but mitigable.

Mitigation Measures. The following mitigation measures are intended to reduce impacts related to fire hazards to a less than significant level.

FIRE-1 (a) **Fuel-Load Vegetation Management.** Each applicant shall be required to prepare a fuel modification plan pursuant to the requirements of LACFD. The LACFD shall review and approve the plan prior issuance of a building or grading permit. The fuel modification plan shall at a minimum include the following:

- *Vegetation clearance requirements around all new structures within a minimum 100 foot buffer, or greater, as determined by LACFD;*
- *A landscaping plan using plants recommended for the Rancho Palos Verdes area and selected from the desirable plant list for setback, irrigated, or thinning zone; and*
- *A regularly scheduled brush clearance of vegetation on and adjacent to all applicable access roads, power lines, and structures.*

FIRE-1(b) **Fire Protection Requirements.** New, single-family residences and related accessory structures shall be designed to incorporate all fire protection requirements of the City's most recently adopted Building Code, to the satisfaction of the Building Official.

Significance After Mitigation. Upon implementation of mitigation measures FIRE-1(a) and FIRE-1(b), impacts related to fire hazards would be less than significant.

c. Cumulative Impacts. Cumulative projects in the Rancho Palos Verdes area, as listed in Table 3-1 in Section 3.0 *Environmental Setting*, would incrementally increase the potential for exposure to fire hazards depending on the precise location of such development. The proposed development would incrementally contribute to this cumulative effect. However, all new development would be subject to existing regulations relative to fire hazards. Impacts associated with individual developments would be addressed on a case-by-case basis as needed, in part by the application of development standards or mitigation measures for development in high fire hazards to reduce such risks if determined necessary. With implementation of the project-specific mitigation measures listed above the project's contribution to fire hazard impacts would not be cumulatively considerable. In addition, as discussed in Section 4.3, *Biological Resources*, it is possible that the development of some of the undeveloped lots in Zone 2 might result in impacts on existing or regrowth coastal sage scrub (CSS) habitat as a result of Fire Department-mandated fuel modification on- and/or off-site (i.e., in the Reserve) after construction of new residences is complete. However, with the inclusion of the mitigation measures identified in Section 4.3, impacts would be less than significant. Mitigation Measure BIO-2 would be required to reduce impacts to possible stands of CSS vegetation to a less than significant level. As further discussed in Section 4.3, *Biological Resources*, with implementation of mitigation measures (including Mitigation Measure BIO-2) the impacts of the proposed project would be localized in nature and would not substantially contribute to any cumulative impacts to regional biological resources.

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4.8 HYDROLOGY and WATER QUALITY

This section analyzes the proposed ordinance revisions' potential to adversely affect hydrology and water quality. This analysis is partially based on a Conceptual Drainage and SUSMP (Water Quality) Report prepared by Hunsaker and Associates, LA Inc., dated May 6, 2011. The report is included as Appendix E of this EIR.

4.8.1 Setting

a. Hydrology and Storm Drain System. The project area is located on the Palos Verdes Peninsula. Since the Rancho Palos Verdes Peninsula is a single hill formation, a central ridge disperses drainage in a number of small watershed systems. However, no major watershed systems are completely confined within the boundaries of Rancho Palos Verdes. All surface waters originate from precipitation that falls on the peninsula (Rancho Palos Verdes General Plan, 1975). The drainage pattern flows in several directions as a result of the central ridge. The majority of the runoff flows directly south into the Pacific Ocean. The remaining runoff flows east through San Pedro, north through Rolling Hills and Rolling Hills Estates, or west through Palos Verdes Estates. All runoff, however, eventually flows into the Pacific Ocean.

The project area is part of an approximately 855-acre watershed that includes developed and undeveloped land. Offsite areas to the north of the project area include existing Tracts 27789, 31617 and 31714, as well as natural hillside and canyon open space areas. Altamira Canyon is the main natural drainage course that drains the project area and offsite tributary areas. Altamira Canyon has experienced and continues to experience erosion that is partially due to runoff from the existing on and off site developments. Figure 4.8-1 shows the drainage pattern in the project area.

The existing drainage system in the project area was designed for the 111 lots within the 112-acre Portuguese Bend area (the Zone 2 area), including the 47 lots that could be developed as part of the project. Based upon observations by the residents and a review of the overall drainage system, the existing drainage system is inadequate to convey runoff from the existing developed lots. However, since~~Since~~ the existing drainage system was designed for the entire Portuguese Bend development, including the 47 undeveloped lots, ~~each lot is assumed to have a proportional share of the existing drainage capacity provided for the Portuguese Bend development. In other words, regardless of when the lots are constructed,~~ each lot is allowed to drain into the existing drainage system ~~based upon the size of the lot~~.

In the vicinity of the project area, runoff is conveyed within existing drainage courses, storm drains, and culverts that traverse the site. The project area is divided roughly by Cinnamon Lane into two major drainage areas. The area east of Cinnamon Lane drains a total of approximately 637 acres, of which approximately 82 acres are located in the Zone 2 area. Drainage in the easterly watershed is conveyed by Altamira Canyon southwesterly to Narcissa Drive. The area west of Cinnamon Lane drains a total of 115 acres, of which approximately 42 acres are located in the Zone 2 area. Drainage in the westerly watershed is conveyed by a combination of an existing subsurface storm drain system and surface flow in a southeasterly direction along Figtree Road to the cul-de-sac at the end of Figtree Road. The storm drain continues southeasterly through private lots to a junction with Altamira Canyon (the easterly

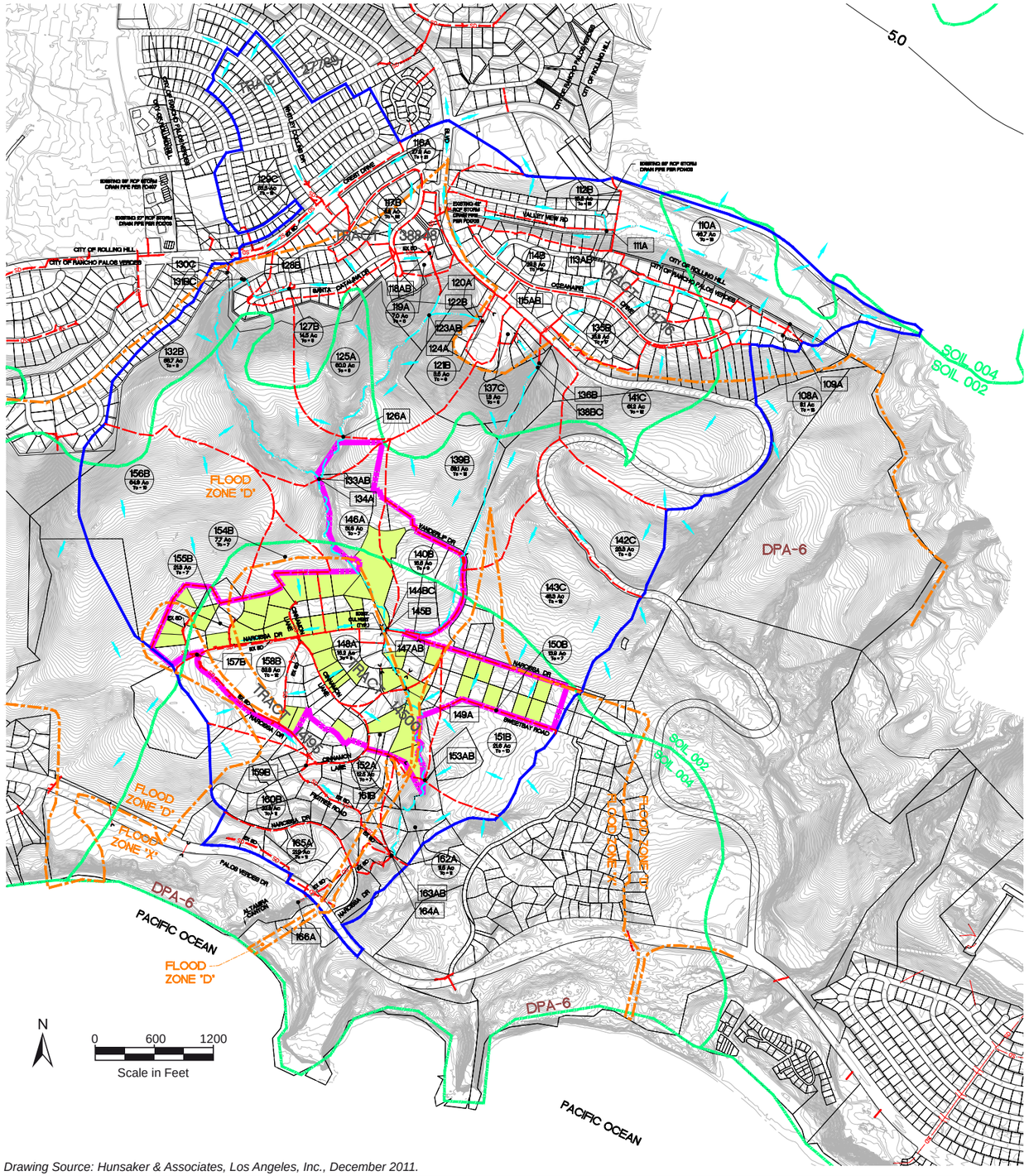
watershed) approximately 400 feet north of Narcissa Drive. From the junction, the storm drain drains southwesterly across Narsissa Drive and Palos Verdes Drive South and outlets into the lower reaches of Altamira Canyon. Altamira Canyon drains directly into the Pacific Ocean from Palos Verdes Drive South.

b. Flood Hazard Zones. The Flood Insurance Rate Map (FIRM) issued by the Federal Emergency Management Agency (FEMA) for Zone 2 and the surrounding area (Map ID 06037C2026F) indicates that the site and surrounding area are contained within Zone X and Zone D. Zone X designates an area with a minimal risk of flooding (not within the 100-year flood zone) and Zone D designates an area with areas in which flood hazards are undetermined, but possible. The flood hazard zones are shown in Figure 4.8-1. As shown on Figure 4.8-1, 10 of the 47 lots that could be developed as a result of the project are partially or completely located within the Zone D designation.

c. Water Quality (Federal, State, and local regulations). Direct discharges of pollutants into waters of the United States are not allowed, except in accordance with the National Pollutant Discharge Elimination System (NPDES) program established in Section 402 of the Clean Water Act (CWA). The major purpose of the NPDES program is to protect human health and the environment by protecting the quality of water. California's primary statute governing water quality and water pollution is the Porter-Cologne Water Quality Control Act of 1970 (Porter-Cologne Act). The Porter-Cologne Act grants the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) broad powers to protect water quality and is the primary vehicle for implementation of California's responsibility under the federal CWA. The Porter- Cologne Act grants the SWRCB and RWQCBs the authority and responsibility to adopt plans and policies, to regulate discharges to surface and groundwater, to regulate waste disposal sites, and to require clean up of discharges of hazardous materials and other pollutants.

The protection of water quality in the watercourses within Rancho Palos Verdes is under the jurisdiction of the Los Angeles RWQCB (SWRCB District 4). The RWQCB establishes requirements prescribing discharge limits and establishes water quality objectives through the "Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges Within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach" for which the City of Rancho Palos Verdes is a co-permittee (Order No. 01-182), NPDES Permit No. CAS004001, dated December 13, 2001 and amended most recently in April 2011, issued by the California Regional Water Quality Control Board – Los Angeles Region, which also serves as a NPDES permit under the Federal Clean Water Act. As a co-permittee, the City is required to implement procedures with respect to the entry of non-storm water discharges into the municipal storm water system. The Rancho Palos Verdes Municipal Code (Chapter 13.10) addresses specific storm water pollution requirements for new developments in accordance with the NPDES Permit.

The NPDES permit specifies that all new development and redevelopment projects that fall under specific priority project categories must complete a Standard Urban Storm Water Mitigation Plan (SUSMP) (March 2000). These categories of development are considered "priority" because the RWQCB determined that they have the greatest potential to degrade water quality. If applicable, structural or treatment control BMPs for a project (including, as



Drawing Source: Hunsaker & Associates, Los Angeles, Inc., December 2011.

HYDROLOGIC SUMMARY TABLE

SUB AREA	NODE	AREA (Ac)	Sub-total Area (Ac)	% IMPERVIOUSNESS (Existing Condition)	% IMPERVIOUSNESS (Proposed Condition)	SOIL TYPE	ISOHYET	50-YR TC (min)	QB (cfs) (Pre-development)	Capital (cfs) (Pre-development)	QB (cfs) (Post-development)	Capital (cfs) (Post-development)	DEBRIS (CY)
108A		8.1		21	21	002	4.9	13		18.9		18.9	
	109A												
110A		46.7		2	2	002	4.9	18		91.3		91.3	
	111A												
112B		16.2		21	21	004	4.9	18		28.1		28.1	
	113AB												
114B		23.8		42	42	004	4.9	18		43.6		43.6	
	115AB												
116A		27.9		21	21	004	4.9	21		44.2		44.2	
117B		8.8		42	42	004	4.9	22		14.1		14.1	
	118AB												
119A		7.0		21	21	004	4.9	6		21.2		21.2	
	120A												
121B		3.5		21	21	004	4.9	6		10.6		10.6	
	122B												
	123AB		**142.0**							**170.0**		**170.0**	
	124A												
125A		60.0		1	1	004	4.9	9	156.8	252.4	156.8	252.4	4500.0
	126A												
127B		14.5		42	42	004	4.9	9		37.0		37.0	
	128B												
129C		53.3		42	42	004	4.9	13		112.4		112.4	
	130C												
	131BC		**67.8**							**147.5**		**147.5**	
132B		68.7		1	1	002	4.9	9	200.0	321.9	200.0	321.9	5152.5
	133AB		**338.5**						**598.8**	**737.7**	**598.8**	**737.7**	
	134A												
135B		15.8		42	42	004	4.9	17		29.0		29.0	
	136B												
137C		1.3		21	21	004	4.9	5		4.4		4.4	
	138BC		**17.1**							**32.7**		**32.7**	
139B		59.1		2	2	004	4.9	12	132.8	213.8	132.8	213.8	4432.5
140B		16.5		38	40	002	4.9	9					
141C		61.2		1	1	002	4.9	12	154.4	248.6	154.4	248.6	4590.0
142C		23.3		1	1	002	4.9	5	91.6	147.4	91.6	147.4	1747.5
143C		48.3		5	5	002	4.9	12	121.8	196.1	121.8	196.1	3622.5
	144BC		**225.5**						**499.2**	**723.9**	**499.2**	**723.9**	
	145B												
146A		31.6		13	23	002	4.9	7					
	147AB		**595.6**						**1076.0**	**1464.0**	**1076.3**	**1464.4**	
148A		16.2		22	40	004	4.9	8					
	149A												
150B		13.9		26	40	004	4.9	7					
151B		21.6		2	2	005	4.9	10	53.9	84.5	53.9	84.5	1587.6
152A		12.5		18	40	004	4.9	7					
	153AB		**659.8**						**1102.7**	**1483.7**	**1165.7**	**1568.4**	
154B		7.7		2	2	004	4.9	7	22.8	36.7	51.9	47.9	566.0
155B		21.3		13	40	005	4.9	7					
156B		64.9		2	2	002	4.9	10	180.6	283.2	180.6	283.2	4770.2
	157B												
158B		33.8		16	20	004	4.9	12					
	159B												
160B		33.8		36	36	004	4.9	11					
	161B												
162A		11.5		2	2	004	4.9	11	27.1	43.7	27.1	43.7	862.5
	163AB		932.8						1541.5	**2025.2**	1585.9	**2083.5**	
	164A												
165A		21.9		42	42	004	4.9	11					
	166A		854.6						1577.2	**2092.5**	1586.3	**2128.4**	

LEGEND:

- 150B / 35.5 Ac / Tc = 18 — SUBAREA NODE, ACREAGE, TIME OF CONCENTRATION
- 153A — CONFLUENCE NODE
- VACANT OR DEVELOPED WITH STRUCTURES OTHER THAN RESIDENCES; POTENTIALLY DEVELOPABLE UNDER PROPOSED ORDINANCE REVISIONS
- DPA-6 — DEBRIS POTENTIAL AREA (DPA)
- SOIL 004 / SOIL 002 — SOIL CLASSIFICATION BOUNDARY
- FLOOD ZONE AREA
- 5.0 — ISOHYET
- CITY BOUNDARY
- PROJECT BOUNDARY
- WATERSHED BOUNDARY
- FLOW PATH
- SD — SD — EXISTING CULVERT, EXISTING STORM DRAIN
- SUBAREA BOUNDARY
- MAIN CHANNEL

DRAINAGE DESIGN CRITERIA:

1. 50-YR, 24-HR ISOHYET: 4.9
2. SOIL TYPES: 2 & 4
3. DESIGN STORMS: 50-YR, 24-HR
4. PERCENT IMPERVIOUS VALUES:
   EXISTING RESIDENTIAL – 42%
   ONSITE UNDEVELOPED LOTS – 2%
   OFFSITE VACANT AREA – 1%
   PROPOSED RESIDENTIAL – 40%
5. DPA = 6, 48,000 CY PER SQ MI
6. BULK FACTOR = 1.61

Drainage Plan

Figure 4.8-1

applicable, post-construction treatment control BMPs) set forth in project plans would be required to meet the design standards set forth in the SUSMP and the current Municipal NPDES Permit. (As the proposed project involves ordinance revisions that could facilitate up to 47 new residences on existing lots, individual construction projects built pursuant to the ordinance would not be subject to the SUSMP, as would be the case, for example, for a 47-lot subdivision.) While the current Los Angeles County MS4 permit does not specifically require addressing hydromodification effects and Low Impact Development (LID) principles, an interim clarification letter sent in 2006 to the County of Los Angeles and its co-permittees specifically discussed shortcomings in the current MS4 Permit that required attention. The County of Los Angeles and City of Los Angeles have since adopted ordinances or policies that specifically address LID and hydromodification requirements. The County's Low Impact Development Ordinance adopted in January 2009 requires that impacts due to development be treated at the source.

d. City of Rancho Palos Verdes Requirements. In accordance with Rancho Palos Verdes Municipal Code Chapter 13.10.050, owners and occupants of property within the city must comply with the following requirement:

> *B. Use of Water. Runoff of water used for irrigation purposes shall be minimized to the maximum extent practicable. Runoff of water from the permitted washing down of paved areas shall be minimized to the maximum extent practicable. Sweeping and collection of debris is encouraged for trash disposal.*

Section 15.20.050 of the City of Rancho Palos Verdes Municipal Code establishes measures required for projects that are exceptions to the City's landslide moratorium regulations, including the following:

> *A. If lot drainage deficiencies are identified by the director of public works, all such deficiencies shall be corrected by the applicant.*
>
> *B. If the project involves additional plumbing fixtures, or additions of habitable space which exceed two hundred square feet, or could be used as a new bedroom, bathroom, laundry room or kitchen, and if the lot or parcel is not served by a sanitary sewer system, septic systems shall be replaced with approved holding tank systems in which to dispose of on-site waste water. The capacity of the required holding tank system shall be subject to the review and approval of the city's building official. For the purposes of this subsection, the addition of a sink to an existing bathroom, kitchen or laundry room shall not be construed to be an additional plumbing fixture. For those projects which involve additions of less than two hundred square feet in total area and which are not to be used as a new bedroom, bathroom, laundry room or kitchen, the applicant shall submit for recordation a covenant specifically agreeing that the addition of the habitable space will not be used for those purposes. Such covenant shall be submitted to the director for recordation prior to the issuance of a building permit. For lots or parcels which are to be served by a sanitary sewer system on or after the effective date of the ordinance codified in this section (July 6, 2000), additional plumbing fixtures may be permitted and the requirement for a holding tank may be waived, provided that the lot or parcel is to be connected to the sanitary sewer system. If a sanitary sewer system is approved and/or under construction but is not yet operational at the time that a project requiring a landslide moratorium*

exception permit is approved, the requirement for a holding tank may be waived, provided that the lot or parcel is required to be connected to the sanitary sewer system pursuant to Section 15.20.110 of this chapter, or by an agreement or condition of project approval.

C. *Roof runoff from all buildings and structures on the site shall be contained and directed to the streets or an approved drainage course.*

D. *If required by the city geotechnical staff, the applicant shall submit a soils report, and/or a geotechnical report, for the review and approval of the city geotechnical staff.*

E. *If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to support and participate in existing or future sewer and/or storm drain assessment districts and any other geological and geotechnical hazard abatement measures required by the city. Such covenant shall be submitted to the director prior to the issuance of a building permit.*

F. *If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to an irrevocable offer to dedicate to the city a sewer and storm drain easement on the subject property, as well as any other easement required by the city to mitigate landslide conditions. Such covenant shall be submitted to the director prior to the issuance of a building permit.*

G. *A hold harmless agreement satisfactory to the city attorney promising to defend, indemnify and hold the city harmless from any claims or damages resulting from the requested project. Such agreement shall be submitted to the director prior to the issuance of a building permit.*

H. *The applicant shall submit for recordation a covenant agreeing to construct the project strictly in accordance with the approved plans; and agreeing to prohibit further projects on the subject site without first filing an application with the director pursuant to the terms of this chapter. Such covenant shall be submitted to the director for recordation prior to the issuance of a building permit.*

I. *All landscaping irrigation systems shall be part of a water management system approved by the director of public works. Irrigation for landscaping shall be permitted only as necessary to maintain the yard and garden.*

J. *If the lot or parcel is served by a sanitary sewer system, the sewer lateral that serves the applicant's property shall be inspected to verify that there are no cracks, breaks or leaks and, if such deficiencies are present, the sewer lateral shall be repaired or reconstructed to eliminate them, prior to the issuance of a building permit for the project that is being approved pursuant to the issuance of the moratorium exception permit.*

K. *All other necessary permits and approvals required pursuant to this code or any other applicable statute, law or ordinance shall be obtained.*

The Palos Verdes General Plan (1975) includes the following policies related to drainage and water quality:

7. *Prohibit activities that create excessive silt, pollutant runoff, increase canyon wall erosion, or potential for landslide, within Resource Management Districts containing Hydrologic Factors (RM 6).*

11. *Stringently regulate irrigation, natural drainage, and other water-related considerations, in both new development and existing uses affecting existing or potential slide areas.*

15. *Require a master landscape plan for any proposed development showing the retention/enhancement of natural vegetation proposed, new complementing vegetation, and all efforts involving retention/enhancement/protection of hydrologic factors, vegetation and wildlife factors.*

The Palos Verdes General Plan (1975) includes the following policy for infrastructure:

5. *Require that all flood control/natural water source interfaces and systems be treated so that erosion will be held to a minimum.*

4.8.2 Impact Analysis

a. Methodology and Significance Thresholds. As discussed in the Initial Study prepared for the proposed project (Appendix A), the project area sits inland of steep coastal bluffs above the Pacific Ocean at an average elevation of approximately 350 feet above sea level. In addition, according to the Department of Conservation Tsunami Inundation Map for the Redondo Beach (South) Quadrangle, the project area is located outside a tsunami inundation area (DOC, March 2009). Therefore, as discussed in the Initial Study, impacts related to flooding as a result of the failure of a levee or dam and inundation by seiche, tsunami, or mudflow would be less than significant.

Impacts would be considered potentially significant if the proposed project would:

- *Violate any water quality standards or waste discharge requirements*
- *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering or the local groundwater table level*
- *Substantially alter the existing drainage pattern of the area such that substantial erosion or siltation occurs*
- *Substantially alter the existing drainage pattern or substantially increase the rate or amount of surface runoff in a manner which results in flooding*
- *Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff*
- *Otherwise substantially degrade water quality*
- *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map*
- *Place within a 100-year flood hazard area structures which would impede or redirect flood flows*
- *Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam*
- *Expose people or structures to a significant risk of loss, injury, or death as a result of*

inundation by seiche, tsunami, or mudflow

The Initial Study determined that the proposed project could result in potentially significant impacts related to all of these impact categories except for the last two related to levee or dam failure or inundation by seiche, tsunami, or mudflow. These two topics are therefore not discussed further in this section.

Two hydrologic methods were used for the drainage analysis contained within the Hydrologic Study prepared by Hunsaker and Associates, 2011. The methods include the Rational Method and the Modified Rational Method, which are included in the 2006 Los Angeles County Hydrology Manual. A 24-hour storm analysis based upon the Los Angeles County Rational and Modified Rational Method of Hydrology was used for clear, burned, and burned and bulked conditions for the watershed. The amount of impervious surfaces in the project area was determined from the Land Use and Imperviousness Table provided in the Los Angeles County Hydrology Manual, 2006.

b. Project Impacts and Mitigation Measures.

Impact HWQ-1 During construction of the proposed project, the soil surface would be subject to erosion and the downstream watershed, including the Pacific Ocean, could be subject to temporary sedimentation and discharges of various pollutants. However, with implementation of Mitigation Measure HWQ-1, impacts relating to the potential for discharge of various pollutants, including sediment, would be Class II, *significant but mitigable*.

Adoption of the proposed ordinance revisions would result in the possible future development of up to 47 new residences on existing legal lots in Zone 2. Each of the 47 lots would be graded to accommodate single-family residential structures. As discussed in Section 2.0, *Project Description*, grading on each of the lots would be limited to less than 1,000 cubic yards (cut and fill combined), with no more than 50 cubic yards of imported fill per lot.

Excavation and grading could result in erosion of soils and sedimentation, which could cause temporary impacts to surface water quality and therefore violate water quality standards or contribute additional sources of polluted runoff. Project development would likely require temporary onsite storage of excavated soils (stockpiling). During grading and soil storage, there is the potential for soil migration offsite via wind entrainment and/or water erosion. Therefore, impacts would be potentially significant.

Mitigation Measures. The following mitigation measure would be required to reduce impacts related to water quality during construction activities to a less than significant level.

HWQ-1 Construction pollution, sediment and erosion control. Prior to issuance of any Grading Permit or Building Permit, each applicant shall prepare a Construction Erosion Control and Water Quality Plan for the review and approval of the Building Official. The applicant shall be responsible for continuous and effective

implementation of the plan during construction of each residence. The plan shall include Best Management Practices that may include, but not be limited to, the following:

- *Erosion Control. Eroded sediments from areas disturbed by construction and from stockpiles of soil shall be retained on site to minimize sediment transport from the site to streets, drainage facilities or adjacent properties via runoff, vehicle tracking or wind. Utilize erosion control techniques, such as soil stabilizers, covering soil during construction, wind blocking devices, cease grading during high winds, use of soil binders (watering graded soils should be avoided), filtration devices, and stabilizing ingress/egress points. Reduce fugitive dust to the maximum extent practicable.*
- *Erosion from slopes and channels shall be controlled by implementing an effective combination of BMPs (as approved in Regional Board Resolution No. 99-03), such as the limiting of grading schedule during the wet season; inspecting graded areas during rain events; planting and maintenance of vegetation on slopes; and covering erosion susceptible slopes.*
- *Pollutant Detainment Methods. Protect downstream drainages from escaping pollutants by capturing materials carried in runoff and preventing transport from the site. Examples of detainment methods that retard movement of water and separate sediment and other contaminants are silt fences, hay bales, sand bags, berms, silt and debris basins.*
- *Construction Materials Control. Construction related materials, wastes, spills or residues shall be retained on site to minimize transport from the site to streets, drainage facilities or adjoining properties by wind or runoff. Runoff from equipment and vehicle washing shall be contained at construction sites unless treated to remove sediment and pollutants. Non-Stormwater runoff from equipment and vehicle washing and any other activity shall be contained at the project site.*
- *Recycling/Disposal. Maintain a clean site. This includes proper recycling of construction-related materials and equipment fluids.*
- *Cleanup and dispose of small construction wastes (i.e., dry concrete) appropriately.*

Significance After Mitigation. Impacts related to the quality of runoff during construction, water quality standards, and degradation of water quality during construction would be less than significant with implementation of Mitigation Measure HWQ-1.

Impact HWQ-2 Development that would be facilitated by the proposed ordinance revisions would incrementally increase the amount of impermeable surfaces in the project area, and potential new development would also generate various urban pollutants such as oil, herbicides and pesticides, which could adversely affect surface water quality. With implementation

of Mitigation Measure HWQ-2, impacts related to surface water quality would be Class II, *significant but mitigable*.

The proposed project would allow for development of up to 47 new single-family homes in the Portuguese Bend area. This new development would increase the number of vehicles and the amount of pesticides used in the project area compared to existing conditions. Impermeable surfaces such as driveways would accumulate deposits of oil, grease, and other vehicle fluids and hydrocarbons. In addition, maintenance of new landscaping could introduce chemical inputs such as pesticides and herbicides. During storms, these deposits would be washed into and through the drainage systems and to the Pacific Ocean. The addition of fertilizers, pesticides and other chemicals to new landscaping has the potential to include higher than natural concentrations of trace metals, biodegradable wastes (which affect dissolved oxygen levels), and excessive major nutrients such as nitrogen and phosphorus.

Urban runoff can have a variety of deleterious effects. Oil and grease contain a number of hydrocarbon compounds, some of which are toxic to aquatic organisms at low concentrations. Heavy metals such as lead, cadmium, and copper are the most common metals found in urban storm water runoff. These metals can be toxic to aquatic organisms, and have the potential to contaminate drinking water supplies. Nutrients from fertilizers, including nitrogen and phosphorous, can result in excessive or accelerated growth of vegetation or algae, resulting in oxygen depletion and additional impaired uses of water. Therefore, the increased impervious surface area, vehicular activity and use of pesticides for landscaping onsite, could increase the amount of pollutants in onsite runoff, which could adversely affect the water quality of receiving waters including the Pacific Ocean.

As discussed above, the project would involve revisions to a landslide moratorium ordinance, which would allow for potential development of 47 individual single-family residences in the project area. The 47 residences and associated hardscaping could potentially increase the impervious surface area on each of the individual lots by up to approximately 38%. The development that could potentially result from the project as well as the increase in impervious surfacing in the project area would incrementally increase the amount of pollutants that could be contained in runoff from the area. Therefore, impacts would be potentially significant.

Mitigation Measures. As discussed above under *Setting*, in accordance with Rancho Palos Verdes Municipal Code Chapter 13.10.050, owners and occupants of property within the city are required to minimize the runoff of water used for irrigation purposes to the maximum extent practicable. Runoff of water from washing down paved areas is required to be minimized to the maximum extent practicable. Sweeping and collection of debris is encouraged for trash disposal. In addition, with implementation of Mitigation Measure HWQ-2 listed below which would require adherence to the Municipal Code requirements related to the NPDES permit, runoff from the individual residences that could be developed as a result of the project would not have a substantial effect on water quality.

HWQ-2 **NPDES Review.** Any development proposal located within, adjacent to or draining into a designated Environmentally Sensitive Area (ESA) and involving the creation of two thousand five hundred square feet or more (≥ 2,500 SF) of impervious surface shall

require the review and approval by the City's National Pollutant Discharge Elimination System (NPDES) consultant prior to building permit issuance.

Significance After Mitigation. Impacts related to the quality of runoff, water quality standards, and degradation of water quality after construction would be less than significant with implementation of Mitigation Measure HWQ-2.

Impact HWQ-3 Potential buildout under the proposed ordinance revisions would incrementally increase the amount of impermeable surface within the project area, which ~~would~~ could affect the location and amount of infiltration. ~~Based~~ However, with adherence to existing regulations related to drainage design and with implementation of mitigation measures GEO-3 (a and b) and HWQ-4, ~~on the hydrologic and geologic conditions in the project area,~~ impacts related to groundwater recharge would be Class ~~III~~, ~~*less than*~~ *significant but mitigable*.

The proposed project would allow for the construction of single-family homes on up to 47 of the 111 existing lots in the Zone 2 area. The remaining sixty-four lots are developed primarily with single-family residences and associated accessory structures and landscaping. The addition of new single-family residences, hardscaping and parking areas would incrementally increase the overall amount of impermeable surface area onsite. Impermeable surface area could increase by up to approximately 38% on individual lots as they are built out. The resulting increase in runoff from individual lots if drainage is not properly controlled ~~is projected to~~could potentially range between 9.8% and 15.1% over existing conditions (Hunsaker and Associates, 2011). However, as described below, any new development would maintain, and would not exacerbate, the existing runoff and infiltration conditions~~Therefore, groundwater recharge on individual lots would likely be incrementally reduced compared to existing conditions~~.

As discussed in Section 4.5 *Geology*, infiltration is a concern in the project area because an increase in infiltration could affect the stability of existing landslides in the project vicinity. Adding water to the landslide material adds weight, creates buoyancy, and further decreases clay strength on the existing slopes, which could lead to slope failure. However, as discussed below under Impact HWQ-4, runoff rates, runoff volumes, and infiltration would remain generally the same as under existing conditions with buildout of the 47 subject properties pursuant to the proposed ordinance revisions and with adherence to Mitigation Measure HWQ-4.

~~Due to the low permeability of the existing soils (clays) and steepness of the natural canyons, an increase in infiltration as a result of the project as a whole is likely to be low. For a given storm event, the total infiltration from the added flow due to the increase in impervious surface area would not exceed existing conditions (Hunsaker and Associates, 2011). Portions of the additional runoff that would be added to the existing drainage system for the project area would be directed to Altamira Canyon. However, the portions of Altamira Canyon that would contain the drainage from the project area are generally steep, and as such do not contribute substantially to groundwater recharge as water moves quickly over the land surface,~~

~~minimizing infiltration. Therefore, the incremental increase in surface water from the project area would not substantially increase infiltration in Altamira Canyon or related effects on landslide potential.~~

~~A decrease in infiltration could affect groundwater recharge in the area. However, as discussed above, infiltration is not desirable in the project area. Therefore impacts related to a reduction in groundwater recharge would be less than significant.~~

Mitigation Measures. Impacts would be less than significant, therefore mitigation beyond measures GEO-3 (a and b) and HWQ-4 is not required.

Significance After Mitigation. Impacts would be less than significant with implementation of Mitigation Measures GEO-3 (a and b) and HWQ-4~~out mitigation~~.

Impact HWQ-4 **Potential buildout under the proposed ordinance revisions would incrementally increase the amount of onsite impermeable surface area, which ~~may~~ could have the potential to increase storm water flows and create localized flooding. However, with implementation of Mitigation Measure GEO-3 (a and b) and Mitigation Measure HWQ-4, buildout under the ordinance revisions would result in a flow rate generally similar to existing conditions. Therefore, impacts related to storm water runoff would be Class II, *significant but mitigable*.**

As described above, the proposed ordinance revisions would allow for the construction of single-family homes on 47 of the lots in the project area. The addition of single-family structures, hardscaping, and driveways/parking areas would incrementally increase the overall amount of impermeable surface area in the project area. An increase in impervious surfaces ~~would~~ could increase the peak flow rate compared to existing conditions. This has the potential to create flooding and drainage problems, ~~if~~ as the existing drainage system is inadequate to handle existing runoff rates~~additional flow~~.

The existing drainage system in the project area was designed for all 111 lots in the 112-acre Zone 2 area. The system is a private system originally permitted by the County. Reference plans and design calculations were not available for confirmation of the capacity of the existing drains. A detailed hydrologic and hydraulic analysis of the existing drainage system, including culverts, streets, and open drainage courses was not prepared as a part of this analysis. However, testimony and video provided by residents indicates that some culverts and roads are inadequate to convey existing runoff. ~~Therefore, a combination of the natural and constructed drainage conveyances have the capacity to convey the runoff from the project area (Hunsaker and Associates, LA Inc., 2011)~~. The increase in peak runoff rates as a result of cumulative development of the 47 lots for the design storm events (10, 25, 50-year, and Capital Storm) ranges from 0.5% to 1% for the entire watershed and 2.9% to 4.5% for the project area (Zone 2), as shown in Table 4.8-1 and Table 4.8-2 respectively.

Table 4.8-1
Cumulative Watershed Drainage Runoff Summary

Year		Pre-development	Post-development	Delta	% change
SUSMP	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	37.4	40.1	2.70	6.7%
	q (cfs/ac)	0.044	0.047	0.003	6.7%
	Vol (ac-ft)	12.0	12.9	0.90	7.0%
	vol (ac-ft/ac)	0.014	0.015	0.001	7.0%
2-year	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	276.7	282.5	5.78	2.0%
	q (cfs/ac)	0.324	0.331	0.007	2.0%
	Vol (ac-ft)	53.4	55.4	2.00	3.6%
	vol (ac-ft/ac)	0.062	0.065	0.002	3.6%
2-year (Burn)	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	312.0	317.3	5.3	1.7%
	q (cfs/ac)	0.365	0.371	0.006	1.7%
	Vol (ac-ft)	65.2	68.2	3.0	4.4%
	vol (ac-ft/ac)	0.076	0.080	0.004	4.4%
5-year	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	579.62	587.37	7.75	1.3%
	q (cfs/ac)	0.678	0.687	0.009	1.3%
	Vol (ac-ft)	91.44	96.56	5.12	5.3%
	vol (ac-ft/ac)	0.107	0.113	0.006	5.3%
10-year	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	876.86	885.38	8.52	1.0%
	q (cfs/ac)	1.026	1.036	0.010	1.0%
	Vol (ac-ft)	121.6	126.68	5.08	4.0%
	vol (ac-ft/ac)	0.142	0.148	0.006	4.0%
25-year	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	1230.7	1237.3	6.63	0.5%
	q (cfs/ac)	1.440	1.448	0.008	0.5%
	Vol (ac-ft)	164.78	170.7	5.92	3.5%
	vol (ac-ft/ac)	0.193	0.200	0.007	3.5%
50-year	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	1505.4	1515.53	10.13	0.7%
	q (cfs/ac)	1.761	1.773	0.012	0.7%
	Vol (ac-ft)	197.98	204.58	6.60	3.2%
	vol (ac-ft/ac)	0.232	0.239	0.008	3.2%

Table 4.8-1
Cumulative Watershed Drainage Runoff Summary

Year		Pre-development	Post-development	Delta	% change
Capital	Area (ac)	854.7	854.7	0.00	0.0%
	Q (cfs)	2116.30	2128.40	12.10	0.6%
	q (cfs/ac)	2.476	2.490	0.014	0.6%
	Flow Vol (ac-ft)	228.3	234.91	6.61	2.8%
	Debris Vol (ac-ft)	20.3	20.3	0.00	0.0%
	total Vol (ac-ft)	230.8	237.4	6.62	2.8%
	vol (ac-ft/ac)	0.270	0.278	0.008	2.8%

Source: Hunsaker and Associates, LA Inc., 2011
Note: Volume (Vol) Acre (ac)
Acre-feet (ac-ft) Cubic feet per second (cfs)

Table 4.8-2
Project Area (Zone 2) Drainage Runoff Summary

Year		Pre-development	Post-development	Delta	% change
SUSMP	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	9.7	12.0	2.30	19.2%
	q (cfs/ac)	0.067	0.082	0.016	19.2%
	Vol (ac-ft)	3.1	3.8	0.70	18.4%
	vol (ac-ft/ac)	0.021	0.026	0.005	18.4%
2-year	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	62.4	70.8	8.40	11.9%
	q (cfs/ac)	0.428	0.486	0.058	11.9%
	Vol (ac-ft)	9.7	12.7	3.00	23.6%
	vol (ac-ft/ac)	0.067	0.087	0.02	23.6%
5-year	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	129.3	138.9	9.60	6.9%
	q (cfs/ac)	0.887	0.953	0.066	6.9%
	Vol (ac-ft)	16.3	21.4	5.10	23.8%
	vol (ac-ft/ac)	0.112	0.147	0.03	23.8%
10-year	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	187.9	196.7	8.80	4.5%
	q (cfs/ac)	1.289	1.349	0.060	4.5%
	Vol (ac-ft)	21.2	26.2	5.00	19.1%
	vol (ac-ft/ac)	0.145	0.180	0.03	19.1%

Table 4.8-2
Project Area (Zone 2) Drainage Runoff Summary

25-year	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	263.2	271.1	7.87	2.9%
	q (cfs/ac)	1.805	1.859	0.054	2.9%
	Vol (ac-ft)	27.8	33.9	6.10	18.0%
	vol (ac-ft/ac)	0.191	0.233	0.04	18.0%
50-year	Area (ac)	145.8	145.8	0.00	0.0%
	Q (cfs)	314.3	324.45	10.15	3.1%
	q (cfs/ac)	2.156	2.225	0.070	3.1%
	Vol (ac-ft)	35.9	39.8	3.90	9.8%
	vol (ac-ft/ac)	0.246	0.273	0.03	9.8%

Source: Hunsaker and Associates, LA Inc., 2011
Note: Volume (Vol) Acre (ac)
Acre-feet (ac-ft) Cubic feet per second (cfs)

Localized flood effects may occur on an individual lot basis (Hunsaker and Associates, LA Inc., 2011). The hydrologic analysis conducted by Hunsaker and Associates determined that increases in runoff from an individual lot would range from approximately 9.8% to 15.1%, as shown in Table 4.8-3.

Table 4.8-3
Median Lot Drainage Runoff Summary

Year		Pre-development	Post-development	Delta	% change
SUSMP	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	0.02	0.06	0.04	64.8%
	q (cfs/ac)	0.03	0.08	0.053	64.8%
	Vol (ac-ft)	0.01	0.02	0.01	62.3%
	vol (ac-ft/ac)	0.01	0.03	0.016	62.3%
2-year	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	0.22	0.36	0.14	40.1%
	q (cfs/ac)	0.29	0.49	0.195	40.1%
	Vol (ac-ft)	0.01	0.06	0.05	79.9%
	vol (ac-ft/ac)	0.02	0.09	0.07	79.9%
5-year	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	0.54	0.70	0.16	23.4%
	q (cfs/ac)	0.73	0.95	0.223	23.4%
	Vol (ac-ft)	0.02	0.11	0.09	80.6%
	vol (ac-ft/ac)	0.03	0.15	0.12	80.6%

Table 4.8-3
Median Lot Drainage Runoff Summary

10-year	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	0.85	1.00	0.15	15.1%
	q (cfs/ac)	1.14	1.35	0.204	15.1%
	Vol (ac-ft)	0.05	0.13	0.09	64.6%
	vol (ac-ft/ac)	0.06	0.18	0.12	64.6%
25-year	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	1.24	1.38	0.14	9.8%
	q (cfs/ac)	1.68	1.86	0.183	9.8%
	Vol (ac-ft)	0.07	0.17	0.10	60.9%
	vol (ac-ft/ac)	0.09	0.23	0.14	60.9%
50-year	Area (ac)	0.74	0.74	0.00	0.0%
	Q (cfs)	1.47	1.65	0.17	10.6%
	q (cfs/ac)	1.99	2.23	0.235	10.6%
	Vol (ac-ft)	0.14	0.20	0.07	33.1%
	vol (ac-ft/ac)	0.18	0.27	0.09	33.1%

Source: Hunsaker and Associates, LA Inc., 2011
Note: Volume (Vol) Acre (ac)
Acre-feet (ac-ft) Cubic feet per second (cfs)

The hydrologic analysis conducted as part of the Drainage Report (Appendix E) determined that the post-development runoff rates would result in an increase in runoff from the existing lots into the existing culverts, roads, and natural watercourses. The Capital storm is determined by applying burned and bulked factors in 50-year storm. Vacant lots within Zone 2 area are adjacent to existing developed lots, therefore those vacant lots do not experience the full burn effect as natural area and no capital storm is determined. For the proposed project, the SUSMP 0.75 inch 24-hour storm event criteria were used to determine if runoff volume or flow should be treated (Hunsaker and Associates, 2011).

The Modified Rational Method was used to determine the peak flow rate and the peak volume for the project compared to existing conditions, utilizing the Los Angeles County Time of Concentration calculator (based upon the Rational Method) . Water quality treatment flow rates and volumes were calculated with the Los Angeles County Time of Concentration calculator developed for the SUSMP analysis (using a rainfall of 0.75 inches). It was assumed that the amount of impervious surfacing on the 47 lots that could potentially be developed would increase by 38% compared to existing conditions on the vacant lots (Hunsaker and Associates, 2011). The increase in peak flow rate and volume would potentially increase storm water flows and create flooding.

The analysis performed for this project was prepared at a programmatic level to determine the overall hydrological impact of the proposed project. Each of the individual property owners would need to prepare a detailed hydrologic analysis to demonstrate compliance with the mitigation measures listed below. The mitigation measures address individual site

development impacts due to flooding and erosion. Although the project area currently experiences flooding and erosion, resolving existing conditions is not a part of the mitigation required for the proposed project's impacts. While it may be desirable to resolve the site flooding and erosion in Altamira Canyon and other natural drainage courses, it is an existing condition affecting the larger area that would be addressed separately from these proposed ordinance revisions.

As discussed in the *Setting*, Section 15.20.050 of the City of Rancho Palos Verdes Municipal Code establishes requirements for projects that are exceptions to the City's landslide moratorium regulations. The following measures apply to drainage effects within the project area:

- *If lot drainage deficiencies are identified by the director of public works, all such deficiencies shall be corrected by the applicant.*
- *Roof runoff from all buildings and structures on the site shall be contained and directed to the streets or an approved drainage course.*
- *If required by the city geotechnical staff, the applicant shall submit a soils report, and/or a geotechnical report, for the review and approval of the city geotechnical staff.*
- *All landscaping irrigation systems shall be part of a water management system approved by the director of public works. Irrigation for landscaping shall be permitted only as necessary to maintain the yard and garden.*

Nonetheless, impacts would be potentially significant.

Mitigation Measures. As discussed in Section 4.5, *Geology*, Mitigation Measure GEO-3 (a and b) would be required. Mitigation Measure GEO-3 (a and b) would require that storm drainage improvements that address drainage deficiencies and avoid increases in ~~to reduce lot~~ infiltration of ~~run-off~~stormwater be ~~are~~ designed to the satisfaction of the Director of Public Works~~and approved by the City~~ prior to issuance of building permits on the individual subject lots~~; all lot drainage deficiencies, if any, identified by City staff are corrected; and that runoff from all buildings and paved areas is collected and directed to the street or to an approved drainage course as approved by the City Engineer~~. In addition, Mitigation Measure HWQ-4 would be required to reduce impacts related to flooding to a less than significant level.

HWQ-4 **Flooding.** Prior to issuance of any grading permit or building permit, the applicant for any individual construction project shall comply with the following, pursuant to the review and approval by the ~~City~~ Director of Public Works~~Building Official~~:

- *A detailed Hydrology Study and Drainage Plan shall be prepared by a Licensed Civil Engineer for review and approval by the City. The study shall address impacts to the proposed building site, as well as upstream and downstream properties. The analysis shall include the SUSMP 2-year, 5-year, 10-year, 25-year, 50-year, and Capital Storms to determine impacts. The analysis will follow the methodology outlined in the Los Angeles County Hydrology and Sedimentation Manual (latest edition), the Los Angeles County Low Impact Development Manual, and Los*

Angeles County Stormwater Best Management Practices Design and Maintenance Manual for preparation of the design calculations. Improvements will be based upon the policies and codes of the City. The drainage plan shall demonstrate that:

- *Post-construction lot infiltration and runoff rates and volume shall be made equal to pre-construction conditions through use of appropriate low impact development principles such as, but not limited to, detaining peak flows and use of cisterns, bio-retention areas, green roofs and permeable hardscape.*
- *Illustrate that point (concentrated) flow on each of the properties is either normalized, attenuated adequately, or will reach an acceptable conveyance such as a storm drain, channel, roadway or natural drainage course. All runoff shall be directed to an acceptable conveyance and shall not be allowed to drain to localized sumps or catchment areas with no outlet.*
- *Avoid changes to the character of the runoff at property lines. Changes in character include obstructing or diverting existing runoff entering the site, changing the depth and frequency of flooding, concentration of flow outletting onto adjacent properties or streets, and increasing the frequency or duration of runoff outletting onto adjacent properties or streets.*
- *Minimize "Dry Weather" infiltration which could add to the total infiltration from the project.*

- ~~*Illustrate that point (concentrated) flow on each of the properties is either normalized, attenuated adequately, or will reach an acceptable conveyance such as a storm drain, channel, or natural drainage course. All runoff shall be directed to an acceptable conveyance and shall not be allowed to drain to localized sumps or catchment areas with no outlet.*~~
- ~~*Maintain existing drainage patterns and outlet at historical outlet points*~~
- ~~*Minimize changes to the character of the runoff at property lines. Changes in character include concentration of flow outletting onto adjacent properties or increasing the frequency or duration of runoff outletting onto adjacent properties*~~
- ~~*Reduce increases in runoff by utilizing appropriate and applicable low impact development principles*~~
- ~~*Provide onsite detention facilities or conveyance to acceptable off-lot conveyance devices*~~
- ~~*Minimize "Dry Weather" runoff which could add to the total infiltration from the project*~~

Significance After Mitigation. Impacts related to alteration of drainage patterns, the potential for the proposed project to result in flooding, and the capacity of storm water drainage systems would be less than significant with implementation of Mitigation Measure HWQ-4.

Impact HWQ-5 Adoption of the proposed ordinance revisions would allow for the construction of up to 47 single-family homes within

the project area. Several of the single-family homes could be constructed in an area in which there is a potential for flood hazards to exist. However, with implementation of Mitigation Measure HWQ-5, flooding impacts would be Class II, *significant but mitigable*.

The FIRM issued by FEMA for Zone 2 and the surrounding area (Map ID 06037C2026F) indicates that the site and surrounding area are contained within Zone X and Zone D. Zone X designates an area with a minimal risk of flooding (not within the 100-year flood zone) and Zone D designates an area in which flood hazards are undetermined, but possible. Ten of the 47 lots that could be developed as a result of the project are partially or completely located within the Zone D designation, as shown in Figure 4.8-1. Therefore, flooding could occur, which could cause damage to structures and could be hazardous to humans during a storm event. Impacts are potentially significant.

Mitigation Measures. Mitigation Measure HWQ-5 would be required to reduce impacts to a less than significant level.

HWQ-5 Standards of Construction in a Flood Zone D Area. Prior to issuance of any grading permit or building permit, the applicant for any construction project located in an area designated as Zone D by FEMA shall comply with the following, pursuant to Section 15.42.120 of the City of Rancho Palos Verdes Municipal Code. Plans shall be reviewed and approved accordingly by the City Building Official:

- *All new construction shall be designed to be adequately anchored to prevent flotation, collapse or lateral movement of the structure resulting from hydrodynamic and hydrostatic loads, including the effects of buoyancy*
- *All new construction shall be constructed with materials and utility equipment resistant to flood damage*
- *All new construction shall be constructed using methods and practices that minimize flood damage*
- *All new construction shall be constructed with electrical, heating, ventilation, plumbing and air conditioning equipment and other service facilities that are designed and/or located so as to prevent water from entering or accumulating within the components during conditions of flooding*

Significance After Mitigation. Impacts would be less than significant with implementation of Mitigation Measure HWQ-5.

c. Cumulative Impacts. Cumulative development in the City and surrounding areas would include approximately 90,000 square feet of commercial/retail, 50,000 square feet of office, 2,000 residential units, and 190,000 square feet of institutional uses, as shown in Table 3-1 in Section 3.0, *Environmental Setting*. Planned and pending development in the general vicinity could increase impermeable surface area, thereby potentially increasing peak flood flows and

overall runoff volumes. However, with implementation of mitigation measures similar to the proposed project, the post development peak discharges will not substantially increase peak flood flows or increase flooding. Consequently, the project would not contribute materially to any potential cumulative increases in peak runoff or associated flooding impacts.

With respect to surface water quality, construction activity associated with cumulative development would temporarily increase sedimentation due to grading and construction activities. In addition, new development would increase the generation of urban pollutants that may adversely affect water quality in the long term. However, like the proposed project, all future development would be subject to implementation of appropriate Best Management Practices in accordance with City, State and Federal requirements. Furthermore, all qualifying projects are subject to the requirements of the NPDES Permit as required by Mitigation Measure HWQ-2, which is specifically designed to develop, achieve, and implement a timely, comprehensive, and cost-effective storm water pollution control program. Thus, implementation of applicable requirements on development in the area would reduce cumulative impacts to a less than significant level. As discussed above, with implementation of mitigation measures, the project's contribution to increased pollutant loads in area surface water would be reduced to a less than significant level and thus would not be cumulatively considerable.

4.9 NOISE

This section evaluates the proposed project's potential impact to existing local noise conditions. Both temporary construction noise and long-term noise generated by operation of the proposed project are evaluated.

4.7.1 Setting

a. Overview of Sound Measurement. Noise level (or volume) is generally measured in decibels (dB) using the A-weighted sound pressure level (dBA). The A-weighting scale is an adjustment to the actual sound power levels to be consistent with that of human hearing response, which is most sensitive to frequencies around 4,000 Hertz (about the highest note on a piano) and less sensitive to low frequencies (below 100 Hertz).

The sound pressure level is measured on a logarithmic scale with the 0 dB level based on the lowest detectable sound pressure level that people can perceive (an audible sound that is not zero sound pressure level). Based on the logarithmic scale, a doubling of sound energy is equivalent to an increase of 3 dB, and a sound that is 10 dB less than the ambient sound level has no effect on ambient noise. Because of the nature of the human ear, a sound must be about 10 dB greater than the reference sound to be judged as twice as loud. In general, a 3 dB change in community noise levels is noticeable, while 1-2 dB changes generally are not perceived. Quiet suburban areas typically have noise levels in the range of 40-50 dBA, while those along arterial streets are in the 50-60+ dBA range. Normal conversational levels are in the 60-65 dBA range, and ambient noise levels greater than 65 dBA can interrupt conversations.

Noise levels typically attenuate (or drop off) at a rate of 6 dB per doubling of distance from point sources such as industrial machinery. Noise from lightly traveled roads typically attenuates at a rate of about 4.5 dB per doubling of distance. Noise from heavily traveled roads typically attenuates at about 3 dB per doubling of distance.

In addition to the actual instantaneous measurement of sound levels, the duration of sound is important since sounds that occur over a long period of time are more likely to be an annoyance or cause direct physical damage or environmental stress. One of the most frequently used noise metrics that considers both duration and sound power level is the equivalent noise level (Leq). The Leq is defined as the single steady A-weighted level that is equivalent to the same amount of energy as that contained in the actual fluctuating levels over a period of time (essentially, the average noise level). Typically, Leq is summed over a one-hour period.

The time period in which noise occurs is also important since noise that occurs at night tends to be more disturbing than that which occurs during the daytime. Two commonly used noise metrics – the Day-Night average level (Ldn) and the Community Noise Equivalent Level (CNEL) - recognize this fact by weighting hourly Leqs over a 24-hour period. The Ldn is a 24-hour average noise level that adds 10 dB to actual nighttime (10:00 PM to 7:00 AM) noise levels to account for the greater sensitivity to noise during that time period. The CNEL is identical to the Ldn, except it also adds a 5 dB penalty for noise occurring during the evening (7:00 PM to 10:00 PM).

b. Sensitive Receptors. Noise sensitive receptors are land uses that are considered more sensitive to noise than others. Residences, hospitals, schools, guest lodging, and libraries are most sensitive to noise intrusion and therefore have more stringent noise exposure targets than manufacturing or industrial uses that are not subject to effects such as sleep disturbance. Sensitive receptors in the project area would be single family residences adjacent to those lots that would potentially be developed under the proposed project. Although the distances to neighboring residences vary from lot to lot, for the purposes of this EIR analysis, it is assumed that sensitive receptors would be approximately 50 feet from any of the 47 undeveloped and underdeveloped lots in Zone 2.

c. Fundamentals of Environmental Groundborne Vibration. Vibration is sound radiated through the ground. The rumbling sound caused by the vibration of room surfaces is called groundborne noise. The ground motion caused by vibration is measured as particle velocity in inches per second and, in the U.S., is referenced as vibration decibels (VdB).

The background vibration velocity level in residential and educational areas is usually around 50 VdB. The vibration velocity level threshold of perception for humans is approximately 65 VdB. A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Most perceptible indoor vibration is caused by sources within buildings, such as operation of mechanical equipment, movement of people, or the slamming of doors. Typical outdoor sources of perceptible groundborne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If a roadway is smooth, the groundborne vibration from traffic is rarely perceptible. The range of interest is from approximately 50 VdB, which is the typical background vibration velocity level, to 100 VdB, which is the general threshold where minor damage can occur in fragile buildings.

The general human response to different levels of groundborne vibration velocity levels is described in Table 4.9-1.

Table 4.9-1
Human Response to Different Levels of Groundborne Vibration

Vibration Velocity Level	Human Reaction
65 VdB	Approximate threshold of perception for many people.
75 VdB	Approximate dividing line between barely perceptible and distinctly perceptible. Many people find that transportation-related vibration at this level is unacceptable.
85 VdB	Vibration acceptable only if there are an infrequent number of events per day.

Source: Federal Railroad Administration, 1998.

d. Regulatory Setting. The City of Rancho Palos Verdes General Plan Sensory Environment Element (1975) contains a Noise section that provides a description of existing

noise levels and sources. The Noise section includes a Noise Level Contour and several policies on noise and acceptable noise levels. The project site is not within the 60 dBA arterial roadway noise contour or the 45 dBA recreational facility contour shown on Figure 40 of the Sensory Environment Element. Although the City has not adopted a Noise Ordinance, to implement the City's noise policies, the City's Municipal Code contains a number of separate provisions that regulate or limit noise production in the City. Table 4.9-2 identifies the section and noise topic included in the City' Municipal Code.

Table 4.9-2
City of Rancho Palos Verdes
Existing Noise Regulations

Code Section	Topic
6.04.060	Prohibition on persistent animal noises that disturb the peace.
8.20.120	Noise Controls applicable to solid waste collection
9.24	Unruly Parties and Gathering; recovery of law enforcement expenses
10.04.040	Limitation on Off-road vehicle operation that disturbs the peace
17.08.030 C.	Home occupation standards prohibiting activities injurious to neighboring properties for reasons of noise
17.12.030 F.	Limitation on commercial uses regarding deliveries, trash pick-up, parking lot trash sweepers, operation of machinery or mechanical equipment can exceed sixty-five (65) dBA, as measured from the closest property line shall only be allowed on commercial properties which abut a residential district, between the hours of seven a.m. and seven p.m., Monday through Sunday.
17.48.030 E.3. b	65 DB limitation on mechanical equipment at closest property line
17.56.020	Restricts the hours of operation for construction equipment to between the hours 7 a.m. and 7 p.m. Monday through Saturday. No work is allowed to occur on Sunday. A Special Construction Permit could be obtained to allow work on Federal holidays and Sundays during the permitted hours stated above.
17.60.050	Conditional Use Permit Standards and conditions to protect against noise impacts
17.62.060	Special Use Permit Standards and conditions to protect against noise impacts
17.60.040 G. 4.	Grading Permits – conditions of approval to address noise impacts of grading activities

Source: Rancho Palos Verdes Municipal Code

For the most part existing noise regulations have no numerical standards, but restrict unnecessary or excessive noise within the City limits. As recommended by the General Plan Noise Element, the maximum "normally acceptable" noise level for single family residential areas is 60 dBA CNEL (See Table 4.9-3), and the maximum "normally acceptable" noise level for churches (such as Wayfarer's Chapel) is 70 dBA CNEL. A "normally acceptable" noise level means that the specified land use would be compatible based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.

e. Existing Noise Conditions and Sources. The most common sources of noise in the project vicinity are transportation-related, such as automobiles, trucks, and motorcycles. Motor vehicle noise is of concern because it is characterized by a high number of individual events, which often create a sustained noise level, and because of its proximity to areas sensitive to noise exposure. The primary source of roadway noise near the project site is traffic on roads on

and around the project site, including Palos Verdes Drive South, which is located south of the project site. Weekday afternoon 20-minute noise measurements were taken using an ANSI Type II integrating sound level meter on March 17, 2011. Results of the noise monitoring are shown in Table 4.9-4. Complete noise monitoring data can be found in Appendix F.

Table 4.9-3
Land Use Compatibility for Noise Environments

Land Use Category	Community Noise Exposure Level			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50-60	55-70	70-75	75-85
Residential – Multiple Family	50-65	60-70	70-75	75-85
Transient Lodging – Motel, Hotels	50-65	60-70	70-80	80-85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50-70	60-70	70-80	80-85
Auditoriums, Concert Halls, Amphitheaters	NA	50-70	NA	65-85
Sports Arenas, Outdoor Spectator Sports	NA	50-75	NA	70-85
Playgrounds, Neighborhood Parks	50-70	NA	67.5-75	72.5-85
Golf Courses, Riding Stable, Water Recreation, Cemeteries	50-75	NA	70-80	80-85
Office Buildings, Business Commercial and Professional	50-70	67.5-77.5	75-85	NA
Industrial, Manufacturing, Utilities, Agriculture	50-75	70-80	75-85	NA

Source: State of California Governor's Office of Planning and Research, General Plan Guidelines,2003

Notes: NA - Not Applicable
Normally Acceptable – Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements
Conditionally Acceptable – New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
Normally Unacceptable – New construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
Clearly Unacceptable – New construction or development should generally not be undertaken.

Table 4.9-4
Existing Noise Monitoring Results

Measurement Identification Number	Measurement Location	Primary Noise Source	Approximate Distance to Primary Noise Source	Leq (dBA)	Nearest Sensitive Receptor
1	Narcissa Drive east of Vanderlip Drive	Traffic on Narcissa Drive	15 feet from center line	51	Single-family residence
2	Cinnamon Lane between Narcissa Drive and Thyme Place	Traffic on Cinnamon Lane	15 feet from center line	50	Single-family residence
3	Narcissa Drive between Plumtree Road and Cinammon Lane	Traffic on Narcissa Drive	15 feet from center line	43	Single-family residence
4	Palos Verdes Drive South between Peppertree Lane and Cherry Hill Lane (outside of project area)	Traffic on Palos Verdes Drive South	30 feet from center line	69	Single-family residence
5	Palos Verdes Drive South between Narcissa Drive and Barkentine Road (outside of project area)	Traffic on Palos Verdes Drive South	48 feet from center line	72	Single-family residence

Source: Field measurements using ANSI Type II Integrating sound level meter.
See Appendix F for noise monitoring data sheets

4.7.2 Impact Analysis

a. Methodology and Significance Thresholds. Noise levels associated with existing and future traffic along area roadways would constitute the main operational noise source associated with the proposed project. Other operational noise associated with the project would be typical of residential neighborhoods, of which the project site is already a part, and would be governed by the existing regulations listed in section 4.7.1d of this EIR. Roadway noise levels were calculated using standard noise modeling equations adapted from the Federal Highway Administration Traffic Noise Model (TNM) Lookup Table software (version 2.0) noise prediction model (noise modeling data sheets can be viewed in Appendix F). The model calculations are based on traffic data from the traffic study completed for the proposed project (see Appendix G). Cumulative conditions consider pending development within the City as indicated in Section 3.0, *Environmental Setting*, Table 3-1.

For traffic-related noise, impacts are considered significant if project-generated traffic results in exposure of sensitive receptors to unacceptable noise levels based on the May 2006 Transit Noise and Vibration Impact Assessment guidelines created by the Federal Transit Administration (FTA). Table 4.9-5 shows the FTA recommendations for identifying significant changes in noise. These thresholds apply to both the noise generated by the project alone and cumulative noise increases. If sensitive receptors would be exposed to traffic noise increases exceeding the criteria below, impacts would be considered significant.

Table 4.9-5
Significance of Changes in Operational Roadway Noise Exposure

Ldn or Leq in dBA	
Existing Noise Exposure	**Allowable Noise Exposure Increase**
45-50	7
50-55	5
55-60	3
60-65	2
65-70	1
75+	0

Source: Federal Transit Administration (FTA), May 2006

Construction Activities – Short Term

Construction noise was estimated based on noise level estimates from the Federal Highway Administration (FHWA) Construction Noise Handbook (Updated May 2010). Although the City does not have established quantitative thresholds for construction noise, for this analysis, a significant noise impact would occur if construction noise would exceed typical speech interference levels. Noise peaks generated by construction equipment could result in speech interference in nearby residences if the noise level in the interior of the building exceeds 50 dBA. A typical building can reduce noise levels by 20 dBA with windows closed. Assuming a 20 dBA reduction with windows closed, an exterior noise level of 70 dBA (Leq) at receptors would maintain an acceptable interior noise environment of 50 dBA. Additionally, construction generated by the project would also result in significant impacts if it occurred outside of the hours identified in the City's Municipal Code (17.56.020), which are 7:00 a.m. to 7:00 p.m., Monday through Saturday, unless a Special Construction Permit is obtained from the Community Development Director.

Groundborne Noise and Vibration

The City of Rancho Palos Verdes has not adopted specific thresholds for groundborne vibration impacts. Therefore, this analysis uses the Federal Railway Administration's vibration impact thresholds for sensitive buildings to determine whether groundborne vibration would be "excessive." A vibration velocity level of 75 VdB is the approximate dividing line between barely perceptible and distinctly perceptible levels for many people. Therefore, the Federal Railway Administration recommends an 80 VdB threshold at residences and buildings where people normally sleep (e.g., nearby residences) and 83 VdB at institutional buildings (e.g., Wayfarer's Chapel, which is the closest institutional building to the Zone 2 area). These thresholds apply to conditions where there are an infrequent number of events per day.[1]

[1] "Infrequent events" is defined by the Federal Railroad Administration as being fewer than 70 vibration events per day.

b. Project Impacts and Mitigation Measures.

Impact N-1 Short-term project construction would intermittently generate high noise levels on and adjacent to the site. This would be a Class II, *significant but mitigable* impact.

Nearby noise-sensitive land uses in the vicinity of the project area include single-family residences located approximately 50 feet from any of the 47 undeveloped and underdeveloped lots in Zone 2. Noise impacts are a function of the type of activity being undertaken and the distance to the receptor location. As indicated in Section 2.0, *Project Description*, the proposed project would involve ordinance revisions that would allow for the potential construction of single family homes on 47 undeveloped or underdeveloped lots. Construction of the project would require grading and building phases that have the potential to affect nearby receptors.

Table 4.9-6 shows typical noise levels associated with activities during various phases of construction at a distance of 50 feet from the noise source. Typical construction noise levels range from about 78 to 85 dB. The grading/excavation phase of project construction tends to be the shortest in duration and create the highest construction noise levels because of the operation of heavy equipment, although it should be noted that only a limited amount of equipment can operate near a given location at a particular time. Equipment typically used during this stage includes heavy-duty trucks, backhoes, bulldozers, excavators, front-end loaders, and scrapers. Operating cycles for these types of construction equipment may involve one or two minutes of full-power operation followed by three to four minutes at lower power settings. Other primary sources of noise would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). Construction of residences would typically be the longest phase of construction and involve smaller equipment due to the nature of the work. Work associated with building may include heavy trucks, air compressors, generators, and hand-held mechanical tools.

Construction noise generally attenuates by about 6 dB per doubling of distance. The nearest receptors to the project site would be adjacent single-family residences. Although the distances to neighboring residences vary from lot to lot, for the purposes of this EIR analysis, it is assumed that sensitive receptors would be located approximately 50 feet from any of the 47 undeveloped and underdeveloped lots in Zone 2. Therefore, the maximum noise level at the nearby residences during clearing and excavation activities would be approximately 85 dBA, as shown in Table 4.9-6. This is above the 70 dBA speech interference threshold used for this analysis. This is a potentially significant impact.

Table 4.9-6
Typical Noise Levels at Construction Sites

Construction Phase	Type of Equipment	Average Noise Level at 50 Feet
Clearing	Rubber tired dozers Tractors/Loaders/Backhoes Water Trucks	84 dBA
Excavation	Graders Compactors Rubber tired dozers Tractors/Loaders/Backhoes Water Trucks	85 dBA
Foundation/Conditioning	Graders Rubber tired dozers Tractors/Loaders/Backhoes Water Trucks	85 dBA
Laying Subbase, Paving	Cement and Mortar Mixers Pavers Rollers Tractors/Loaders/Backhoes	81 dBA
Finishing and Cleanup	Forklifts Tractors/Loaders/Backhoes	84 dBA

Source: FHWA Highway Construction Noise Handbook, 2010.

Mitigation Measures. The following mitigation measure is intended to limit construction noise by limiting the schedule of construction activities as required by the Rancho Palos Verdes Municipal Code.

N-1 **Construction Schedule**. Permitted hours and days of construction activity are 7:00 a.m. to 7:00 p.m., Monday through Saturday, with no construction activity permitted on Sundays or on the legal holidays specified in Section 17.96.920 of the Rancho Palos Verdes Municipal Code without a special construction permit.

Significance After Mitigation. Construction noise impacts would be reduced with implementation of Mitigation Measure N-1 which would ensure compliance with Section 17.56.020 of the City's Municipal Code, which allows construction, grading, or landscaping activities, or the operation of heavy equipment, only between the hours of 7:00 a.m. and 7:00 p.m., Monday through Saturday, and prohibits them any other time and on legal holidays and Sundays. This would restrict construction noise to daytime hours when ambient noise levels are higher and people are typically at work. Compliance with this mitigation measure would reduce construction noise impacts of the proposed project to a less than significant level.

Impact N-2 Construction facilitated by the proposed ordinance revisions could generate intermittent levels of groundborne vibration affecting residences and other buildings near the project site. However, these impacts are temporary in nature and would not exceed existing thresholds. Therefore, impacts would be *less than significant*.

Construction activities that would occur at any of the 47 undeveloped and underdeveloped lots in Zone 2 that make up the project site have the potential to generate low levels of groundborne vibration. Table 4.9-7 identifies various vibration velocity levels for the types of construction equipment that would operate at the project site during construction activities.

Based on the information presented in Table 4.9-7, vibration levels could reach approximately 69 VdB at nearby existing residences which, for the purposes of this EIR, are assumed to be at least 100 feet away from the project site. This would be less than the groundborne velocity threshold level of 80 vibration decibels (VdB) established by the Federal Railway Administration for noise-sensitive buildings and residences where people normally sleep, and the 83 VdB threshold for institutional uses such as Wayfarer's Chapel. In addition, construction activities and their associated vibration levels would be limited to daytime hours between 7:00 AM to 7:00 PM Monday through Saturday in accordance with the City's Municipal Code Section 17.56.020. The proposed project is required to comply with these regulations. Therefore, construction activities would not occur during recognized sleep hours for residences. As such, impacts to the residential uses near the project site would be less than significant.

Table 4.9-7
Vibration Source Levels for Construction Equipment

Equipment	Approximate VdB				
	25 Feet	50 Feet	60 Feet	75 Feet	100 Feet
Large Bulldozer	87	78	76	73	69
Loaded Trucks	86	77	4	71	68
Jackhammer	79	70	67	65	61
Small Bulldozer	58	48	46	43	39

Source: Harris Miller Miller & Hanson, Inc., Transit Noise and Vibration Assessment, April 1995 (Prepared for USDOT Federal Transit Administration.

Mitigation Measures. Impacts would be less than significant without mitigation.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact N-3 Traffic generated by the potential development of up to 47 new residences in Zone 2 would incrementally increase noise levels on area roadways. However, the increase in noise would not exceed significance thresholds and would therefore be Class III, *less than significant*.

Potential buildout under the proposed ordinance revisions would increase the number of vehicle trips to and from the site, which would incrementally increase traffic noise on area roadways and at neighboring uses. The street network in the project vicinity has many residential receptors. Because they represent the busiest traffic conditions, estimated PM peak hour traffic values from the Traffic Study (see Appendix G) were used to model the change in noise levels resulting from increased traffic for both the existing and future conditions. Table 4.9-8 shows the increase in roadway generated noise at sensitive receptors along the studied roadways.

Table 4.9-8
Project Contribution to Roadway Noise Levels

Street Segment	Existing	Existing Plus Project	Project Increase Compared to Existing Traffic (dB)	Future	Future Plus Project	Project Increase Compared to Future Traffic (dB)
Narcissa Drive east of Vanderlip Drive	46.2	**48.7**	**+2.5**	48.7	48.8	**+0.1**
Cinnamon Lane between Narcissa Drive and Thyme Place	46.2	**48.7**	**+2.5**	48.7	48.8	**+0.1**
Narcissa Drive between Plumtree Road and Cinammon Lane	46.2	**48.7**	**+2.5**	48.7	48.8	**+0.1**
Palos Verdes Drive South between Peppertree Lane and Cherry Hill Lane	64.1	**64.2**	**+0.1**	65.5	65.5	**+0.0**
Palos Verdes Drive South between Narcissa Drive and Barkentine Road	64.1	**64.2**	**+0.1**	65.5	65.5	**+0.0**

Source: See Appendix F for Federal Highway Administration's Traffic Noise Model 2.5 noise Lookup Table modeling data sheets

As indicated in Table 4.9-8, the highest noise level increase at residential receptors within 100 feet of local streets within the project area for both the existing and future scenarios would be 2.5 dB. This is within the allowable noise exposure increase of 7 dB shown in Table 4.9-5 for areas with an existing noise exposure of 45-50 dBA. The highest noise level increase at residential receptors within 100 feet of Palos Verdes Drive for both existing and future scenarios would be 0.1 dB. This is within the allowable noise exposure increase of 2 dB shown in Table

4.9-5 for areas with an existing noise exposure of 60-65 dBA. Therefore, impacts related to project-generated traffic noise would be less than significant in relation to the sensitive receptors that are the focus of this noise impact analysis.

Mitigation Measures. Mitigation is not required since significant impacts have not been identified.

Significance After Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. The proposed project and related projects in the area, as identified in Table 3-1 in Section 3.0, *Environmental Setting*, would generate temporary noise during construction that would exceed the 70 dBA speech interference threshold used for this analysis. As discussed in Impact N-1, these impacts would be reduced to a less than significant level with implementation of Mitigation Measure N-1 which would require construction activities to adhere to regulations of the City of Rancho Palos Verdes governing allowed hours of construction. No projects on the cumulative projects list (see Table 3-1 in Section 3.0 *Environmental Setting*) are close enough to the proposed project site to contribute to a cumulative construction noise impact.

Traffic noise impacts associated with cumulative development within the City would incrementally increase noise levels along roadways and could potentially subject sensitive receptors to noise exceeding City standards. Cumulative development has the potential to increase roadway generated noise throughout the City. However, the analysis under Impact N-3 includes the future cumulative development scenario, which would not result in noise levels exceeding thresholds. Therefore, cumulative traffic-related noise impacts would not be significant.

Cumulative development would result in stationary (non-traffic) operational noise increases in the project vicinity. However, based on the fact that land uses proposed under the project would be consistent with the single family residential character of their surroundings, and the fact that these uses are already regulated by the Rancho Palos Verdes Municipal Code, impacts from the proposed project's operational noise would be less than significant. Additionally, based on the fact that noise dissipates as it travels away from its source, noise impacts from onsite activities and other stationary sources would be limited to the project site and vicinity. Thus, cumulative operational (non-traffic) noise impacts from related projects, in conjunction with project-specific noise impacts, would not have the potential to result in cumulatively considerable adverse effects.

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4.10 TRAFFIC AND CIRCULATION

The following analysis is partially based on the Traffic Impact Study for the Zone 2 Landslide Moratorium – Portuguese Bend Project, prepared by Linscott, Law and Greenspan, (LLG) Engineers and dated April 12, 2011 and supplemental analysis performed by LLG in August 2012. The full study and the supplemental analysis is contained in Appendix G of the EIR.

4.10.1 Setting

a. Existing Street System. Access to the existing Portuguese Bend community of Rancho Palos Verdes is provided via Narcissa Drive and Peppertree Drive. All streets in the Portuguese Bend community are private, and the community itself is gated. The gates restricting access to the community on Narcissa Drive and Peppertree Drive are set back approximately 190 and 90 feet from Palos Verdes Drive South, respectively. The following lane configurations are provided at the existing access locations for the community:

- Narcissa Drive/Palos Verdes Drive South
  - Eastbound Approach: One left-turn lane and one shared through/right-turn lane
  - Westbound Approach: One left-turn lane, one through lane and one right-turn lane
  - Southbound Approach: One shared left-turn/through lane and one right-turn lane

- Peppertree Drive/Palos Verdes Drive South
  - Eastbound Approach: One left-turn lane and one through lane
  - Westbound Approach: One through lane and one right-turn lane
  - Southbound Approach: One left-turn lane and one right-turn lane

The streets in the vicinity of the project area are divided into several functional classifications. Each type of street provides for a general level of traffic movement through the City. There are four categories in the roadway hierarchy, ranging from freeways with the highest capacity to two-lane undivided roadways with the lowest capacity. Freeways are limited-access and high-speed travel ways that carry regional through-traffic. Access is provided by interchanges with typical spacing of one mile or greater. Arterial roadways carry the majority of traffic entering and traveling through the City and are generally developed as commercial corridors. Arterials are generally designed with two to six travel lanes and their major intersections are signalized. This roadway type is divided into two categories: principal and minor arterials. Principal arterials are typically four-or-more lane roadways that serve both local and regional through-traffic. Minor arterials are typically two-to-four lane streets that service local and commute traffic. Collector roadways are intended to provide for the movement of traffic between arterials and neighborhoods. Collector roadways are typically designed with two through travel lanes that may accommodate on-street parking. Local roadways distribute traffic within a neighborhood, or similar adjacent neighborhoods, and are not intended for use as a through-street or a link between higher capacity facilities such as collector or arterial roadways. Local streets are fronted by residential uses and do not typically serve commercial uses.

The following roadways are located within the project vicinity and are described in detail in the Traffic Impact Study:

- *Palos Verdes Drive South (arterial)*
- *Barkentine Road (local street)*
- *Forrestal Drive (local street)*
- *Hawthorne Boulevard (arterial)*
- *Narcissa Drive (private roadway)*
- *Palos Verdes Drive East (arterial)*
- *Peppertree Drive (private roadway)*
- *Seahill Drive (local street)*
- *Tramonto Drive(local street)*
- *Via Rivera(local street)*

b. Existing Traffic Volumes and Level of Service. Consistent with City of Rancho Palos Verdes guidelines for traffic impact analyses, traffic conditions in the vicinity of the project area were analyzed using intersection capacity-based methodology known as the "Intersection Capacity Utilization Methodology," which is referred to hereinafter as the ICU Methodology.

The efficiency of traffic operations at a location is measured in terms of Level of Service (LOS). Level of service is a description of traffic performance at intersections. The level of service concept is a measure of average operating conditions at intersections during an hour. It is based on volume-to-capacity (V/C) ratio. Levels range from A to F with A representing excellent (free-flow) conditions and F representing extreme congestion. The ICU methodology compares the level of traffic during the peak hours at an intersection (volume) to the amount of traffic that the intersection is able to carry (capacity). Intersections with vehicular volumes that are at or near capacity (V/C≈ 1.0) experience greater congestion and longer vehicle delays.

Analysis of unsignalized intersections is conducted differently from signalized intersections due to different operating characteristics. Stop-controlled intersections are analyzed using the delay-based Highway Capacity Manual (HCM) method of determining level of service, which measures average vehicle delay to affected vehicles.

Table 4.10-1 describes the LOS concept and the operating conditions for signalized intersections and Table 4.10-2 describes the LOS concept and operating conditions for stop-controlled intersections.

A total of seven intersections were chosen for the project's traffic impact analysis. All of the seven study intersections selected for analysis are controlled by stop signs with the stop signs facing the minor street approaches. The study analyzed the following seven intersections:

1. Via Rivera/Hawthorne Boulevard
2. Seahill Drive-Tramando Drive/Palos Verdes Drive South
3. Barkentine Road/Palos Verdes Drive South
4. Narcissa Drive/Palos Verdes Drive South
5. Peppertree Drive/Palos Verdes Drive South
6. Forrestal Drive/Palos Verdes Drive South
7. Palos Verdes Drive East / Palos Verdes Drive South

The intersection of Palos Verdes Drive West/Hawthorne Boulevard/Via Vicente was not selected for analysis as no operational deficiencies are known to exist and based on recent analyses the project would not contribute significantly to the critical movements of the intersection.

Table 4.10-1
Level of Service Definitions for Signalized Intersections (ICU Methodology)

Level of Service (LOS)	Interpretation	Volume to Capacity Ratio
A	Excellent operation - free-flow	0.000 - 0.600
B	Very good operation - stable flow, little or no delays	0.601 - 0.700
C	Good operation - slight delays	0.701 - 0.800
D	Fair operation – noticeable delays, queuing observed	0.801 - 0.900
E	Poor operation - long delays, near or at capacity	0.901 - 1.000
F	Forced flow – congestion	Over 1.000

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, Washington D.C., 1985 and Interim Materials on Highway Capacity, NCHRP Circular 212, 1982

Table 4.10-2
Level of Service Criteria for Unsignalized Intersections (HCM Methodology)

Level of Service (LOS)	Highway Capacity Manual Delay Value (sec/veh)	Level of Service Description
A	≤ 10.0	Little or no delay
B	> 10.0 and ≤ 15.0	Short traffic delays
C	> 15.0 and ≤ 25.0	Average traffic delays
D	> 25.0 and ≤ 35.0	Long traffic delays
E	> 35.0 and ≤ 50.0	Very long traffic delays
F	> 50.0	Severe congestion

Existing manual counts of vehicular turning movements were conducted in May 2010 at six of the seven existing study intersections and in March 2011 for the remaining study intersection (i.e., Intersection No. 1, Hawthorne Boulevard/Via Rivera) during the weekday morning (AM) and afternoon (PM) commuter periods to determine the peak hour traffic volumes. The manual counts were conducted by traffic count subconsultants at the study intersections from 7:00 to 9:00 AM to determine the weekday AM peak commuter hour, and from 4:00 to 6:00 PM to determine the weekday PM peak commuter hour. Traffic volumes at the seven study

intersections show the weekday morning and afternoon peak periods typically associated with peak hours in the metropolitan area.

The existing weekday AM and PM peak hour LOS at the seven study intersections are summarized in Table 4.10-3. The existing traffic volumes at the study intersections during the weekday AM and PM peak hours are shown in Figures 4.10-1 and 4.10-2, respectively.

Table 4.10-3
Existing Intersection Levels of Service Summary

Key Intersection	Time Period	Control Type	Delay (sec/veh)	V/C Ratio	LOS
1. Via Rivera/Hawthorne Boulevard	AM PM	Two-Way Stop	38.6 29.4	0.572 0.342	E D
2. Seahill Drive-Tramonto Drive/Palos Verdes Drive South	AM PM	Two-Way Stop	27.6 23.6	0.396 0.274	D C
3. Barkentine Road/Palos Verdes Drive South	AM PM	Two-Way Stop	18.9 18.7	0.091 0.067	C C
4. Narcissa Drive/Palos Verdes Drive South	AM PM	Two-Way Stop	17.8 16.1	0.085 0.069	C C
5. Peppertree Drive/Palos Verdes Drive South	AM PM	Two-Way Stop	20.0 18.4	0.068 0.069	C C
6. Forrestal Drive/Palos Verdes Drive South	AM PM	Two-Way Stop	31.3 26.6	0.315 0.251	D D
7. Palos Verdes Drive East / Palos Verdes Drive South	AM PM	Two-Way Stop	17.0 16.3	0.271 0.175	C C

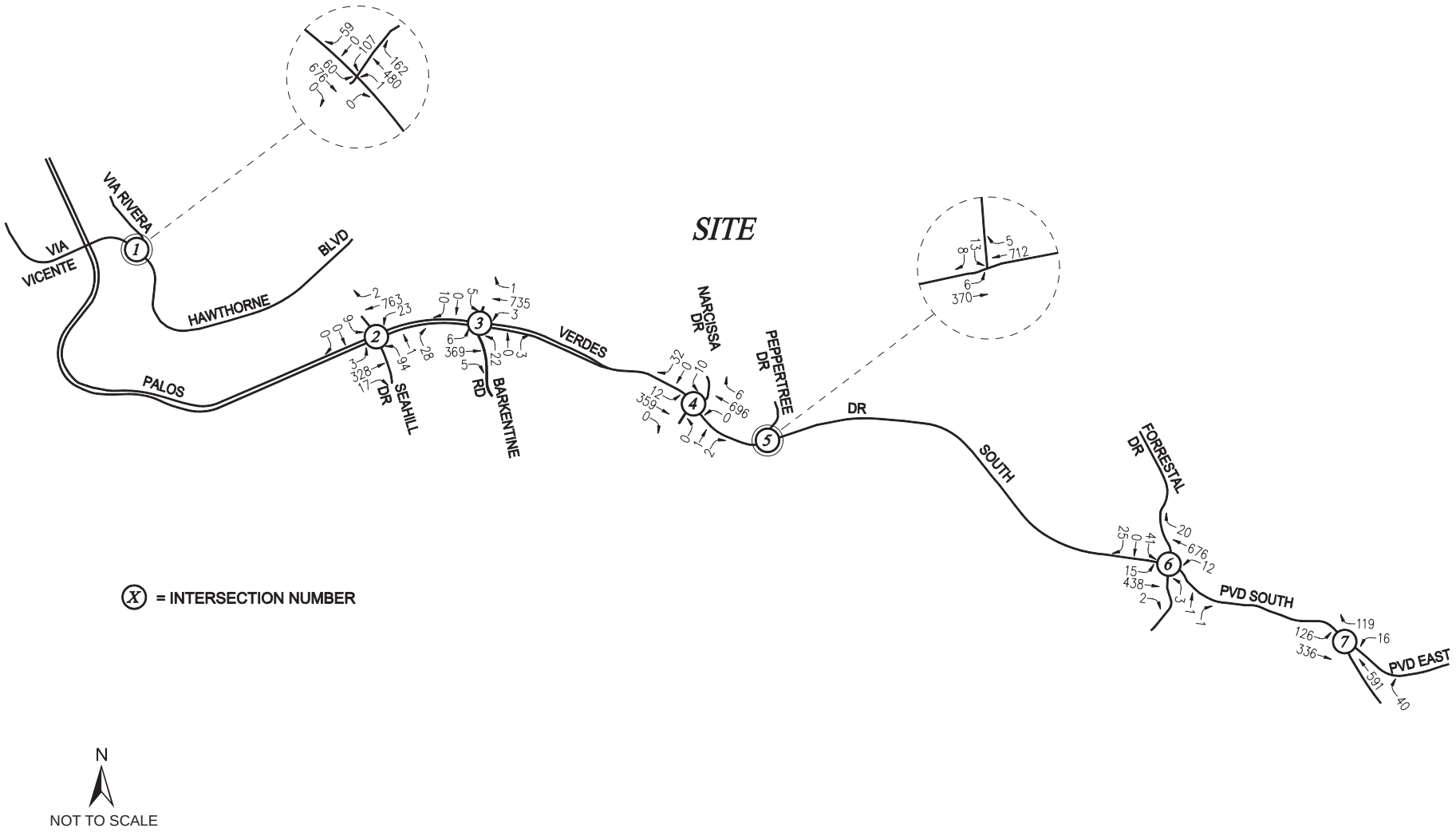
Source: Linscott, Law and Greenspan, 2011

In addition to studying intersections within the project vicinity, the Traffic Impact Study also analyzed the roadway level of service for the following two street segments:

1. Palos Verdes Drive South east of Seacove Drive (between Seacove Drive and the Wayfarer Chapel driveway)
2. Palos Verdes Drive South east of Cherry Hill Lane (between Cherry Hill Lane and Schooner Drive)

Automatic 24-hour machine traffic counts were conducted at the above locations during a mid-week day (i.e., Tuesday, Wednesday, or Thursday) in May 2010. The average weekday AM and PM peak hour volumes were then calculated based on the automatic 24-hour machine traffic counts.

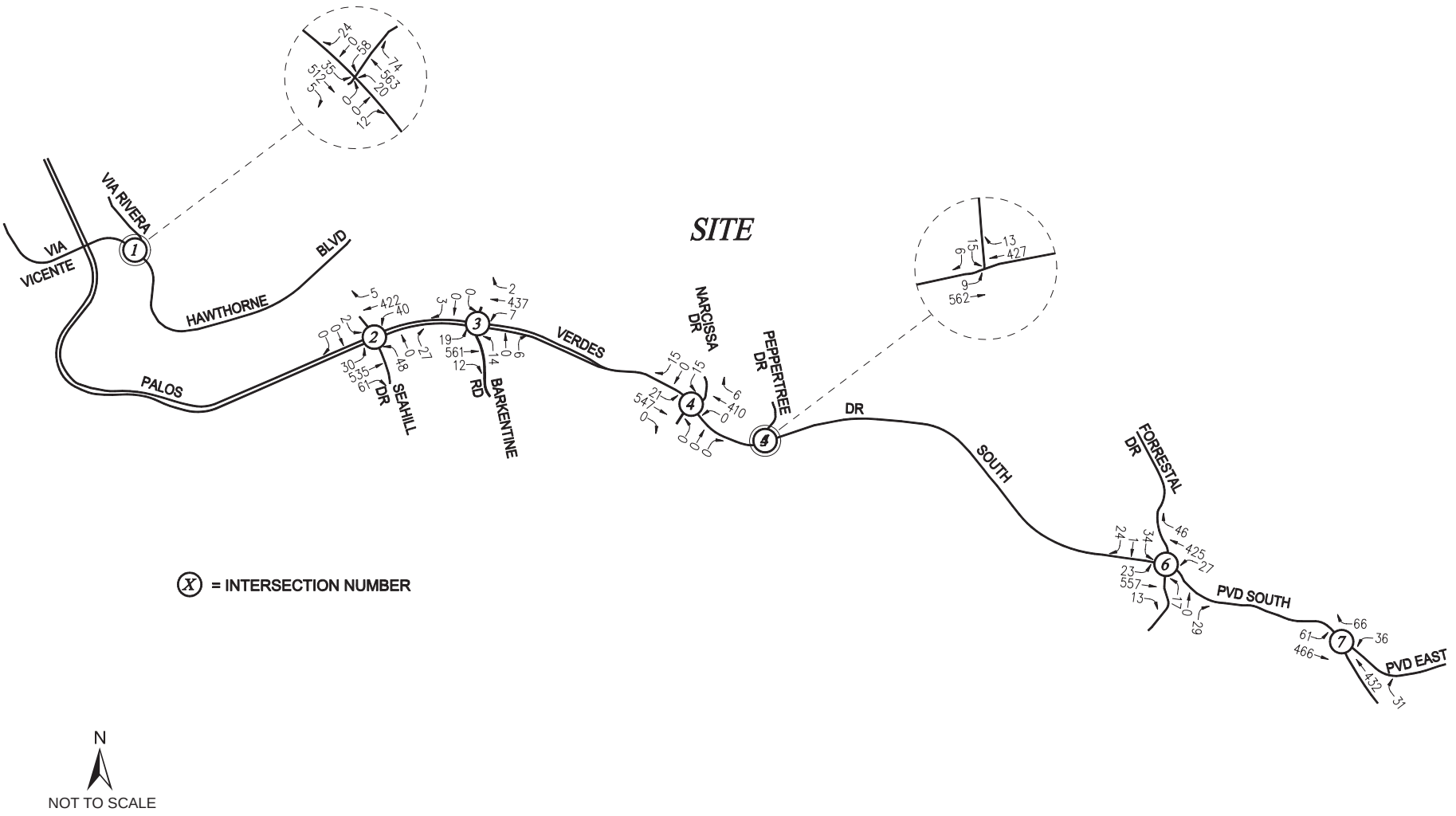
The significance of the potential impacts of traffic generated by buildout under the proposed ordinance revisions ("project") at the study street segments was identified using the two-lane roadway criteria set forth in the *County of Los Angeles Traffic Impact Analysis Report Guidelines* document. According to the County's published traffic impact study guidelines, a transportation impact on a roadway is deemed significant based on a percentage increase in passenger cars per hour (PCPH) by the project. Table 4.10-4 shows the existing traffic conditions on the two analyzed street segments. As shown in the Table both street segments currently operate at LOS A.



Existing Traffic Volumes - AM Peak Hour

Source: Linscott, Law & Greenspon, Engineers, March 2011.

Figure 4.10-1



Existing Traffic Volumes - PM Peak Hour

Figure 4.10-2

Source: Linscott, Law & Greenspon, Engineers, March 2011.

Table 4.10-4
Existing Roadway Traffic Conditions

Roadway Segment	Time Period	Directional Split			Total Capacity (PCPH)	Peak Hour Vol	V/C	LOS
1. Palos Verdes Drive South east of Seacove Drive (between Seacove Drive and Wayfarer Chapel driveway)	AM	70	/	30	2,500	1,122	0.449	A
	PM	60	/	40	2,650	1,023	0.386	A
2. Palos Verdes Drive South east of Cherry Hill Lane (between Cherry Hill Lane and Schooner Drive)	AM	70	/	30	2,500	1,125	0.450	A
	PM	60	/	40	2,650	972	0.367	A

Source: Linscott, Law and Greenspan, 2011.

d. Existing Public Bus Transit Service. Public bus transit service within the Zone 2 project study area is currently provided by the Los Angeles County Metropolitan Transportation Authority, Palos Verdes Peninsula Transit Authority, and the City of Los Angeles Department of Transportation. A summary of the existing transit service, including the transit route, destinations and peak hour headways is presented in Table 4.10-5.

Table 4.10-5
Existing Transit Near Project Site

Route	Destinations	Roadways Near site	No. of Buses During Peak Hour		
			Direction	AM	PM
Metro 344	Rancho Palos Verdes to Harbor Gateway (via Torrance)	Palos Verdes Drive West, Palos Verdes Drive South, Hawthorne Boulevard	NB SB	3 4	3 3
LADOT Commuter Express 448	Downtown Los Angeles to Rancho Palos Verdes (via Lomita, Harbor City, Wilmington, Century Freeway)	Hawthorne Boulevard	NB SB	1 0	0 3
PVPTA Blue Line	Rancho Palos Verdes	Palos Verdes Drive West, Hawthorne Boulevard	EB WB	1 2	1 1
PVPTA Gold Line	Rolling Hills to Rancho Palos Verdes	Palos Verdes Drive West, Palos Verdes Drive South	EB WB	2 2	1 1
PVPTA Orange Line	Rolling Hills to Rancho Palos Verdes	Palos Verdes Drive West, Palos Verdes Drive South	EB WB	0 2	1 0
PVPTA 226	Palos Verdes Estates	Palos Verdes Drive West	NB SB	0 2	1 0

Source: Linscott, Law and Greenspan, 2011.

e. Regulatory Setting

State Highway Analysis**.** The purpose of the Caltrans *Guide for the Preparation of Traffic Impact Studies (State of California Department of Transportation, December 2002)* is to provide a safe and efficient State transportation system, provide consistency and uniformity in the identification of traffic impacts generated by local land use proposals, and consistency and equity in the identification of measures to mitigate the traffic impacts generated by land use proposals. The Caltrans traffic studies guide identifies review of substantial individual projects, which might impact the CMP State Highway transportation system.

County of Los Angeles Congestion Management Program**.** The purpose of the Congestion Management Program (CMP) is to develop a coordinated approach to managing and decreasing traffic congestion by linking the various transportation, land use and air quality planning programs throughout the County. The program is consistent with the Southern California Association of Governments (SCAG) Regional Transportation Plan (RTP) and SCAG's Regional Transportation Improvement Program. The CMP program requires review of substantial individual projects, which might on their own impact the CMP transportation system.

City of Rancho Palos Verdes General Plan**.** The Urban Environment Element of the General Plan provides goals and policies for circulation, noise, visual aspects and public services and infrastructure. The Element describes the City's existing transportation system and future conditions related to transportation, as a result of growth in traffic. The Urban Environment Element policies that are relevant to the proposed project include the following:

- *Design public access into residential areas to control non-local traffic.*
- *Require that all new developments to establish walkway, bikeway and equestrian systems, where appropriate.*
- *Require adequate off-street parking for all existing and future development.*

City of Rancho Palos Verdes Zoning Code. According to the RPV Zoning Map, the Portuguese Bend area is located within the Single Family Residential District, including both RS-1 (one-acre minimum lot size) and RS-2 (20,000 square-foot minimum lot size) zoned lots. The following general standards (Code Section 17.02.030, *Development Standards*) relevant to traffic and circulation apply to the Single Family Residential District:

E. Parking/Driveway Standards.

1. *A minimum of two enclosed parking spaces shall be provided and maintained in a garage, and a minimum of two unenclosed parking spaces shall be provided and maintained as a driveway, on the property of each single-family dwelling unit containing less than five thousand square feet of habitable space, as determined by the director.*

2. *A minimum of three enclosed parking spaces shall be provided and maintained in a garage, and a minimum of three unenclosed parking spaces shall be provided and maintained as a driveway, on the property of each single-family dwelling unit containing five thousand square feet or more of habitable space, as determined by the director.*

3. *A garage with a direct access driveway from the street of access shall not be located less than twenty feet from the front or street-side property line, whichever is the street of access.*

4. *In addition to the parking requirements for the primary single-family residence on a property, parking for city-approved second units shall be provided in accordance with Chapter 17.10 (Second Unit Development Standards).*

5. *An enclosed parking space shall have an unobstructed ground space of no less than nine feet in width by twenty feet in depth, with a minimum of seven feet of vertical clearance over the space. An unenclosed parking space shall have an unobstructed ground space of no less than nine feet in width by twenty feet in depth.*

6. *The following minimum driveway widths and turning radii shall be provided for all driveways leading from the street of access to a garage or other parking area on a residential parcel:*

    a. *A driveway shall be a minimum width of ten feet; and*

    b. *A paved twenty-five-foot turning radius shall be provided between the garage or other parking area and the street of access for driveways which have an average slope of ten percent or more, and which are fifty feet or more in length.*

7. *Driveways shall take into account the driveway standards required by the department of public works for driveway entrances located in the public right-of-way.*

8. *A driveway that is located adjacent to a side property line shall provide a minimum eighteen-inch-wide landscaped area between the side property line and the adjacent driveway, unless such buffer would reduce the minimum width of the driveway to less than ten feet, in which case the width of the landscape buffer may be narrowed or eliminated at the discretion of the director.*

9. *All driveways shall be built and maintained in accordance with the specifications of the Los Angeles County fire department. If there is any inconsistency between the standards imposed by this chapter and the standards imposed by the Los Angeles County fire department, the stricter shall apply.*

10. *Unless otherwise expressly permitted elsewhere in this title, enclosed tandem parking spaces may only be used for parking spaces in excess of the minimum requirements of subsections (1) and (2) of this section, provided that each space meets the minimum dimensions specified in subsection (5) of this section.*

4.8.2 Impact Analysis

a. Methodology and Significance Thresholds. As part of the traffic study prepared for the project by Linscott, Law and Greenspan, existing manual counts of vehicular turning movements were conducted in May 2010 at six of the seven existing study intersections and in March 2011 for the remaining study intersection (i.e., Intersection No. 1, Hawthorne

Boulevard/Via Rivera) during the weekday morning (AM) and afternoon (PM) commuter periods to determine the peak hour traffic volumes. The manual counts were conducted by traffic count subconsultants at the study intersections from 7:00 to 9:00 AM to determine the weekday AM peak commuter hour, and from 4:00 to 6:00 PM to determine the weekday PM peak commuter hour.

The following traffic scenarios were analyzed in the traffic study:

1. ***Existing Conditions*** *– The analysis of existing AM and PM weekday peak hour traffic conditions provides a basis for the assessment of future traffic conditions. The existing conditions analysis includes a description of key area streets and highways, traffic volumes, and current intersection and roadway operating conditions.*

2. ***Existing with Project Conditions—*** *This scenario identifies the incremental impacts of the proposed project on the existing AM and PM weekday peak hour traffic conditions by adding the traffic expected to be generated by the project to the existing traffic forecasts.*

3. ***Year 2020 Future Pre-project Conditions*** *– This scenario projects the future traffic growth and intersection operating conditions that could be expected from regional growth and known related projects in the vicinity of the project site. These analyses provide the future baseline conditions against which project specific impacts are evaluated.*

4. ***Year 2020 Future with Project Conditions*** *– This analysis identifies the incremental impacts of the proposed project on future traffic operating conditions by adding the traffic expected to be generated by the project conditions to the year 2020 pre-project traffic forecasts.*

Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Traffic volumes to be generated by the proposed project were forecast for the weekday AM and PM peak hours, and over a 24-hour period. The resource typically used by traffic engineers (including the City of Rancho Palos Verdes) to forecast trip generation for development projects is the Institute of Transportation Engineers' (ITE) Trip Generation manual. ITE Land Use Code 210 (Single-Family Detached Housing) trip generation average rates were used to forecast traffic volumes for the proposed project.

Intersection Methodology. Existing AM and PM peak hour operating conditions for the 7 key study intersections were evaluated using the Intersection Capacity Utilization (ICU) methodology for signalized intersections and the methodology outlined in Chapter 17 of the *Highway Capacity Manual 2000* (HCM2000) for unsignalized intersections.

Intersection Capacity Utilization Method of Analysis. City of Rancho Palos Verdes and Los Angeles County Congestion Management Program (CMP) requirements, existing weekday AM and PM peak hours operating conditions for signalized study intersections be evaluated using the Intersection Capacity Utilization (ICU) method. The ICU methodology is intended for signalized intersection analyses and estimates the volume-to-capacity (V/C) relationship for

an intersection based on the individual V/C ratios for key conflicting traffic movements. The ICU analysis methodology describes the operation of a signalized intersection using a range of LOS from LOS A (free-flow conditions) to LOS F (severely congested conditions), based on corresponding Volume/Capacity (V/C) ratios. It is important to note that none of the study area intersections are currently signalized.

The ICU numerical value represents the percent signal (green) time, and thus capacity, required by existing and/or future traffic. The ICU value translates to a LOS estimate, which is a relative measure of an intersection's performance. The six qualitative categories of Level of Service have been defined along with the corresponding ICU value range and are shown in Table 4.10-6. Pursuant to Los Angeles County CMP requirements, the ICU calculations use a lane capacity of 1,600 vehicles per hour (vph) for left-turn, through, and right-turn lanes, and a dual left-turn capacity of 2,880 vph. Additionally, a clearance adjustment factor of 0.10 was added to each LOS calculation to account for time devoted to the yellow and all-red intervals.

Table 4.10-6
Level of Service Criteria for Signalized Intersections (ICU Methodology)

Level of Service (LOS)	Intersection Capacity Utilization Value (V/C)	Level of Service Description
A	≤ 0.600	EXCELLENT. No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601 – 0.700	VERY GOOD. An occasional approach phase is fully utilized; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701 – 0.800	GOOD. Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801 – 0.900	FAIR. Delays may be substantial during portions of the rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901 – 1.000	POOR. Represents the most vehicles intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	> 1.000	FAILURE. Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Potentially very long delays with continuously increasing queue lengths.

Highway Capacity Manual Method of Analysis (Unsignalized Intersections). The HCM2000 unsignalized methodology for stop-controlled intersections was utilized for the analysis of the unsignalized intersections. This methodology estimates the average control delay for each of the subject movements and determines the level of service for each constrained movement. Average control delay for any particular movement is a function of the capacity of the approach and the degree of saturation. The overall average control delay is measured in seconds per vehicle, and the level of service is then calculated for the entire intersection for a four-way stop controlled intersection. For a two-way stop controlled intersection, it should be noted that although the HCM2000 provides a procedure to calculate a value to reflect the intersection average control delay, it does not define a level of service for the intersection as a whole. Rather, the control delay and level of service for the most constrained

approach are calculated and are reported for the two-way stop controlled intersections. The six qualitative categories of Level of Service have been defined along with the corresponding HCM control delay value range, as shown in Table 4.10-2. The LOS of an unsignalized intersection ranges LOS A (free-flow conditions) to F (severely congested conditions), based on delay experienced per vehicle.

Intersection Operation. The significance of the potential project generated traffic impacts at any signalized intersection is identified using criteria set forth in the Los Angeles County Department of Public Works' *Traffic Impact Analysis Report Guidelines, 1997* which is the standard practice for the City of Rancho Palos Verdes. According to the County's published guidelines, an impact is considered significant if the project-related increase in the v/c ratio equals or exceeds the thresholds presented in Table 4.10-7.

Table 4.10-7
Signalized Intersection Impact Threshold Criteria

Pre-Project ICU	Level of Service	Project Related Increase in ICU
≥ 0.71 - 0.80	C	equal to or greater than 0.04
≥ 0.81 - 0.90	D	equal to or greater than 0.02
≥ 0.91 or more	E/F	equal to or greater than 0.01

Source: Traffic Impact Analysis Report Guidelines, Los Angeles County Department of Public Works, 1997

The City of Rancho Palos Verdes has established the following thresholds of significance for unsignalized intersections:

- *A significant impact would occur at an unsignalized intersection when the addition of project-generated trips causes the peak hour level of service of the intersection to change from acceptable operation (LOS D or better) to deficient operation (LOS E or F); or*
- *A significant impact would occur at an unsignalized intersection if the peak hour level of service of the intersection is LOS E or F and the addition of project-generated trips changes the delay by 2.0 seconds or more.*

Street Segment Analysis. The following two roadway street segments were analyzed:

1. *Palos Verdes Drive South east of Seacove Drive (between Seacove Drive and Wayfarers Chapel driveway)*
2. *Palos Verdes Drive South east of Cherry Hill Lane (between Cherry Hill Lane and Schooner Drive)*

Automatic 24-hour machine traffic counts were conducted at the above locations during a mid-week day (i.e., Tuesday, Wednesday, or Thursday) in May 2010. The average weekday AM and PM peak hour volumes were then calculated based on the automatic 24-hour machine traffic counts. Copies of the 24-hour machine counts are contained in Appendix A of the traffic report.

Potential project-generated traffic at the analyzed street segments was identified using the two-lane roadway criteria set forth in the *County of Los Angeles Traffic Impact Analysis Report Guidelines* document, which is standard practice for the City of Rancho Palos Verdes . According to the County's published traffic impact study guidelines, a transportation impact on a roadway is deemed significant based on a percentage increase in passenger cars per hour (PCPH) by the project as shown in Table 4.10-8.

Future Traffic Volume and Distribution.

Horizon year (Year 2020), background traffic growth estimates have been calculated by using an ambient traffic growth factor. The ambient traffic growth factor is intended to include unknown related projects in the study area, as well as account for typical growth in traffic volumes due to the development of projects outside the study area. The future growth in traffic

Table 4.10-8
Street Segment Impact Threshold Criteria

Two-lane Roadways				
Directional Split	Total Capacity (PCPH)	Percent Increase in Passenger Cars Per Hour (PCPH) by Project		
		Pre-project LOS		
		C	D	E/F
50/50	2,800	4	2	1
60/40	2,650	4	2	1
70/30	2,500	4	2	1
80/20	2,300	4	2	1
90/10	2,100	4	2	1
100/0	2,000	4	2	1

Source: Linscott, Law and Greenspan, 2011

volumes has been calculated at 0.6 percent (0.6%) per year. The ambient growth factor was based on review of the background traffic growth estimates for the Palos Verdes area published in the 2010 Congestion Management Program for Los Angeles County, which indicate that existing traffic volumes would be expected to increase at an annual rate of approximately 0.51 percent (0.51% per year) between years 2010 and 2020. However, in order to provide a conservative analysis, the higher ambient growth factor of 0.60 percent (0.60% per year) contained in the 2004 Congestion Management Program for Los Angeles County was utilized in this analysis. Application of the ambient traffic growth factor to existing traffic volumes results in a 6.0 percent (6.0%) increase in existing traffic volumes to horizon Year 2020.

In order to make a realistic estimate of future on-street conditions prior to adoption of and potential development under the Zone 2 Landslide Moratorium Ordinance Revisions project, the status of other known development projects (related projects) in the area has been researched at the City of Rancho Palos Verdes, City of Rolling Hills

Estates, and City of Los Angeles. With this information, the potential impact of the proposed project can be evaluated within the context of the cumulative impact of all ongoing development. Based on current research, 34 related projects are located in the project vicinity that have either been built, but not yet fully occupied, or are being processed for approval. These 34 related projects have been included as part of the cumulative background setting in Year 2020.

Traffic volumes expected to be generated by the related projects were calculated using rates provided in the ITE Trip Generation manual. The related projects' respective traffic generation for the weekday AM and PM peak hours, as well as on a daily basis for a typical weekday, is summarized in Table 4.10-9.

Table 4.10-9
Year 2020 Future Pre-Project Conditions Summary

#	Key Intersection	Time Period	Future Background Year 2020		
			Delay	V/C	LOS
1	Via Rivera/Hawthorne Boulevard	AM PM	122.8 89.5	0.916 0.698	F F
2	Seahill Drive-Tramonto Drive/Palos Verdes Drive South	AM PM	39.8 43.8	0.577 0.479	E E
3	Barkentine Road/Palos Verdes Drive South	AM PM	24.9 27.6	0.133 0.115	C D
4	Narcissa Drive/Palos Verdes Drive South	AM PM	23.1 23.2	0.111 0.121	C C
5	Peppertree Drive/Palos Verdes Drive South	AM PM	26.7 27.7	0.105 0.122	D D
6	Forrestal Drive/Palos Verdes Drive South	AM PM	65.8 75.6	0.574 0.597	F F
7	Palos Verdes Drive East / Palos Verdes Drive South	AM PM	8.5 6.7	0.366 0.507	A A

Source: Linscott, Law and Greenspan, 2012.

Project Traffic Projections. In order to estimate the traffic impact characteristics of the proposed project, a multi-step process was utilized. The first step is trip generation, which estimates the total arriving and departing traffic volumes on a peak hour and daily basis. The traffic generation potential is forecast by applying the appropriate vehicle trip generation equations or rates to the project development tabulation.

The second step of the forecasting process is trip distribution, which identifies the origins and destinations of inbound and outbound project traffic volumes. These origins and destinations are typically based on demographics and existing/anticipated travel patterns in the study area. The third step is traffic assignment, which involves the allocation of project traffic to study area streets and intersections. Traffic assignment allocates specific volume forecasts to individual roadway links and intersection turning movements throughout the study area.

Project Trip Generation. Traffic generation is expressed in vehicle trip ends, defined as one-way vehicular movements, either entering or exiting the generating land use. Traffic volumes to be generated by the proposed project were forecast for the weekday AM and PM peak hours. As shown on Table 4.10-10, the proposed project is expected to generate 450 new

daily trips including approximately 35 vehicle trips (9 inbound trips and 26 outbound trips) during the weekday AM peak hour. During the weekday PM peak hour, the proposed project is expected to generate 47 vehicle trips (30 inbound trips and 17 outbound trips).

Project Traffic Distribution. The directional traffic distribution pattern for the proposed project is presented in Figure 4.10-3. Project traffic volumes both entering and exiting the site have been distributed and assigned to the adjacent street system based on the following considerations:

- *The site's proximity to major traffic corridors (i.e., Palos Verdes Drive South),*
- *Expected localized traffic flow patterns based on adjacent roadway channelization and presence of traffic signals,*
- *Existing intersection traffic volumes,*
- *Ingress/egress availability at the project site, and*
- *Input from City staff*

The traffic volume assignments reflect the traffic distribution characteristics shown in Figure 4.10-3 and the project traffic generation forecasts presented in Table 4.10-10.

Table 4.10-10
Project Trip Generation Summary

Land Use	Size	Net New Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
			IN	OUT	TOTAL	IN	OUT	TOTAL
Single Family Housing	47 units	450	9	26	35	30	17	47

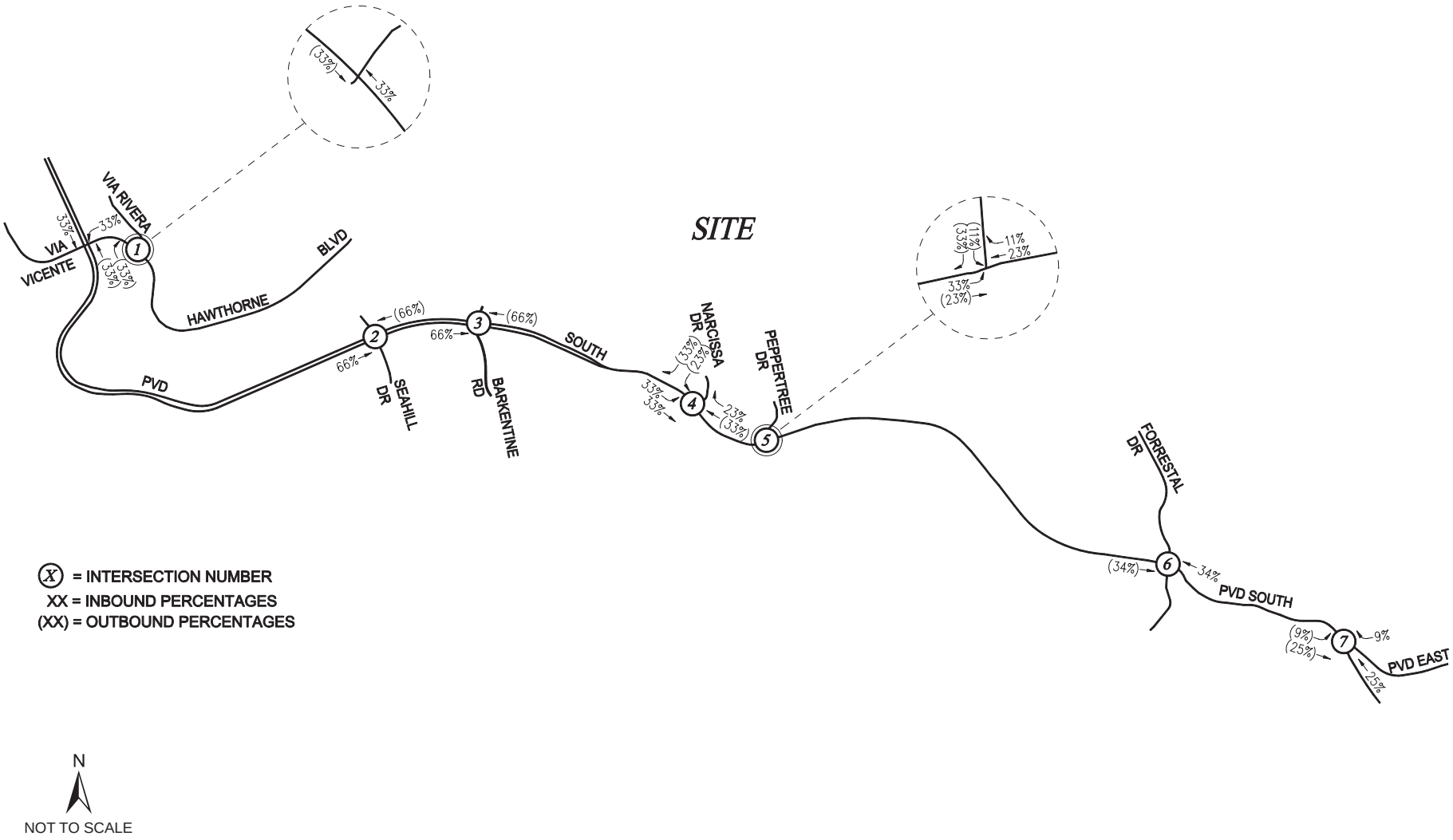
Source: Linscott, Law and Greenspan, 2011
ITE Land Use Code 210 (Single-Family Detached Housing) trip generation average rates.

Congestion Management Plan (CMP) Traffic Impact Criteria. The Congestion Management Program (CMP) is a state-mandated program that was enacted by the State Legislature with the passage of Proposition 111 in 1990. The program is intended to address the impact of local growth on the regional transportation system.

As required by the *2010 Congestion Management Program for Los Angeles County*, a Traffic Impact Assessment (TIA) has been prepared to determine the potential impacts on designated monitoring locations on the CMP highway system. The analysis has been prepared in accordance with procedures outlined in the *2010 Congestion Management Program for Los Angeles County*, County of Los Angeles Metropolitan Transportation Authority, October 2010.

Impacts related to traffic and circulation would be considered significant if the project would:

> *Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but not limited to:*
>
> - *Intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit*
> - *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*



Project Traffic Distribution Pattern

Source: Linscott, Law & Greenspon, Engineers, March 2011.

Figure 4.10-3

- *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*
- *Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible use (e.g., farm equipment)*
- *Result in inadequate emergency access*
- *Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)*

As discussed in the Initial Study (Appendix A), the project, by its nature as single family residences, would not result in a change in air traffic patterns by increasing traffic levels or a change in location that results in substantial safety risks. Therefore, as discussed in the Initial Study, no impact to air traffic patterns would occur. Therefore, the following discussion will focus on traffic on the street system, level of service standards established by the county congestion management agency, hazards due to design feature, emergency access, and alternative transportation.

b. Project Impacts and Mitigation Measures.

Impact T-1 **The potential increase in vehicles traveling on the surrounding roadway network from buildout under the proposed ordinance revisions would not result in significant impacts at any of the study area intersections under existing plus project conditions. However, the increase in vehicle trips under cumulative conditions would result in significant impacts at three of the study area intersections. Mitigation Measure T-1(a) would reduce impacts to a less than significant level at the intersection of Hawthorne Boulevard/Via Rivera. However, mitigation measures T-1 b through c were found to be infeasible and would not reduce cumulative impacts to a less than significant level at Forrestal Drive/Palos Verdes Drive South and Seahill Drive-Tramonto Drive/Palos Verdes Drive South. Impacts at these two intersections would therefore be Class I, *significant and unavoidable*.**

Table 4.10-11 shows the change in V/C or Delay from existing conditions (see Table 4.10-3) to existing plus project scenario. As shown in the table, the additional traffic as a result of the proposed project would not result in significant impacts at any of the seven study area intersections.

Table 4.10-12 shows the change in V/C or Delay from the Year 2020 Future Pre-project Conditions scenario (see Table 4.10-11) to the Year 2020 Future with Project scenario.

Table 4.10-11
Existing Plus Project Intersection Impacts

#	Intersection	Time Period	Delay	Significant Impact?
1	Via Rivera/Hawthorne Boulevard	AM PM	1.0 0.9	NO NO
2	Seahill Drive-Tramonto Drive/Palos Verdes Drive South	AM PM	0.9 1.1	NO NO
3	Barkentine Road/Palos Verdes Drive South	AM PM	0.4 0.7	NO NO
4	Narcissa Drive/Palos Verdes Drive South	AM PM	1.4 0.5	NO NO
5	Peppertree Drive/Palos Verdes Drive South	AM PM	-0.8 -0.6	NO NO
6	Forrestal Drive/Palos Verdes Drive South	AM PM	0.7 0.8	NO NO
7	Palos Verdes Drive East / Palos Verdes Drive South	AM PM	0.1 0.2	NO NO

Source: Linscott, Law and Greenspan, 2011.

Table 4.10-12
Year 2020 Future With Project Scenario Intersections

#	Key Intersection	Time Period	Change in V/C or Delay	Significant Impact?
1	Via Rivera/Hawthorne Boulevard	AM PM	4.3 4.6	YES YES
2	Seahill Drive-Tramonto Drive/Palos Verdes Drive South	AM PM	1.9 3.0	NO YES
3	Barkentine Road/Palos Verdes Drive South	AM PM	0.6 1.1	NO NO
4	Narcissa Drive/Palos Verdes Drive South	AM PM	2.6 1.1	NO NO
5	Peppertree Drive/Palos Verdes Drive South	AM PM	-1.1 -1.0	NO NO
6	Forrestal Drive/Palos Verdes Drive South	AM PM	2.4 3.7	YES YES
7	Palos Verdes Drive East / Palos Verdes Drive South	AM PM	0.4 0.9	NO NO

Source: Linscott, Law and Greenspan, 2011

As shown in Table 4.10-12, under cumulative conditions in 2020, the proposed project would result in significant impacts at the following three intersections:

- Hawthorne Boulevard/Via Rivera
- Seahill Drive-Tramonto Drive/Palos Verdes Drive South
- Forrestal Drive/Palos Verdes Drive South

Although no intersections would exceed thresholds under the existing plus project scenario, because three intersections would exceed thresholds in the Year 2020 Future With Project scenario as identified in Table 4.10-12, impacts would be potentially significant.

Mitigation Measures. As discussed above, the proposed project would result in potentially significant cumulative impacts at three intersections during future year (2020). Mitigation measures T-1(a-c) were designed to reduce cumulative impacts at the intersections that would be adversely affected by traffic generated by the project, including Hawthorne Boulevard/Via Rivera, Forrestal Drive/Palos Verdes Drive South, and Seahill Drive-Tramonto Drive/Palos Verdes Drive South.

T-1(a) **Hawthorne Boulevard/Via Rivera**. The individual project applicants shall provide a proportionate fair share contribution to the City to restripe the southbound approach of Via Rivera to provide two lanes (a 10-foot wide single left-turn lane and a 12-foot wide optional through-right combination lane) and/or a traffic signal shall be installed at the intersection of Hawthorne Boulevard and Via Rivera in order to improve overall operations and assignment of motorist right-of-way.

T-1(b) **Seahill Drive-Tramonto Drive/Palos Verdes Drive South.** The individual project applicants shall provide a proportionate fair-share contribution towards the modification of the intersection to provide an acceleration lane to better facilitate the northbound left-turn movement (from Seahill Drive) onto westbound Palos Verdes Drive South. *(Note that the City can only require a fair share payment; therefore, implementation of the improvements required in this Mitigation Measure cannot be guaranteed. Impacts at this intersection would be significant and unavoidable. Please see discussion under Significance After Mitigation below for further explanation.)*

T-1(c) **Forrestal Drive/Palos Verdes Drive South.** A traffic signal shall be installed at this intersection in order to improve overall operations and assignment of motorist right-of-way. *(Note that impacts at this intersection have been assumed to be significant and unavoidable. Please see discussion under Significance After Mitigation below for further explanation.)*

Significance After Mitigation. Mitigation measures T-1(a-c) were designed to reduce cumulative impacts. As shown in Table 4.10-13, Mitigation Measure T-1(a) would reduce the potentially significant project-related impact to the intersection of Hawthorne Boulevard/Via Rivera to a less than significant level. However, mitigation measures T-1(b-c) were found to be infeasible. Therefore, as shown in Table 4.10-13, impacts to two intersections would be significant and unavoidable. These intersections include:

- Seahill Drive-Tramonto Drive/Palos Verdes Drive South – PM Peak Hour (Cumulative Impact)
- Forrestal Drive/Palos Verdes Drive South – AM and PM Peak Hours (Project and Cumulative Impact)

Table 4.10-13
Year 2020 Future Background Projects Plus Mitigated Project Intersection LOS

Key Intersection		Time Period	Project Change in V/C or Delay	Significant Impact	Project w/Mitigation Change in V/C or Delay	Significant Impact?
1	Hawthorne Boulevard/ Via Rivera[1]	AM	4.3	**YES**	-39.8	NO
		PM	4.6	**YES**	-9.8	NO
2	Seahill Drive-Tramonto Drive/Palos Verdes Drive South	AM	1.9	**NO**	-20.1	**NO**
		PM	3.0	**YES**	-22.6	**YES**
6	Forrestal Drive/Palos Verdes Drive South	AM	2.4	**YES**	0.139	**YES**
		PM	3.7	**YES**	0.090	**YES**

Source: Linscott, Law and Greenspan, 2010.
[1] The mitigation measure for this intersection consists of restriping the southbound approach of Via Rivera to provide a single left-turn land and an optional through-right combination lane

Each intersection's level of significance after mitigation is discussed below:

- **Hawthorne Boulevard/Via Rivera**. Restriping the southbound approach of Via Rivera to provide two lanes would reduce intersection delay, which would improve operations to 83.0 seconds of delay (LOS F) from 127.1 seconds of delay (LOS F) during the AM peak hour. During the PM peak hour, the improvement is expected to improve operations to 79.7 seconds of delay (LOS F) from 94.1 seconds of delay (LOS F). While this restriping measure does improve overall intersection operations as a whole by reducing the overall southbound approach delay, it should be noted that the southbound left-turn movement delay during the AM and PM peak hours is 113.5 seconds (LOS F) and 107.9 seconds (LOS F), respectively.

- **Seahill Drive-Tramonto Drive/Palos Verdes Drive South.** The mitigation measure that would fully mitigate the project-related impact at this intersection (Mitigation Measure T-1(b)) would require the applicant to provide a proportionate fair-share contribution towards the modification of the intersection to provide an acceleration lane to better facilitate the northbound left-turn movement (from Seahill Drive) onto westbound Palos

Verdes Drive South. However, since the fair share contribution to this mitigation measure would not allow the City to fully implement the measure absent of other funding resources, the mitigation was conservatively deemed infeasible and no feasible mitigation measures were identified that would mitigate project-related impacts at this location. As shown in Table 4.10-13, impacts would be significant and unavoidable.

- **Forrestal Drive/Palos Verdes Drive South.** The mitigation measure that would fully mitigate the project-related impact at this intersection (Mitigation Measure T-1(c)) would require a traffic signal to be installed at this intersection. Although installation of the signal may be technically feasible, there may be other policy reasons for finding the traffic signal inappropriate and infeasible at this time. If the City were to approve signalization of the intersection, the impact would be reduced to less than significant. If, however, the City determines that signalization is not feasible, no other feasible mitigation measures were identified that would mitigate project-related impacts at this location. Therefore, assuming that the City does not authorize signalization of the intersection, as shown in Table 4.10-13, the project's impact at this intersection would be significant and unavoidable.

Impact T-2 The proposed project would increase traffic levels along roadways in the vicinity of the project site. However, the projected increases are below City-adopted thresholds at both studied street segments. Therefore, impacts to these two street segments would be Class III, *less than significant*.

Neighborhood traffic impacts were evaluated in the traffic study on the following two street segments:

1. *Palos Verdes Drive South east of Seacove Drive (between Seacove Drive and Wayfarers Chapel driveway)*
2. *Palos Verdes Drive South east of Cherry Hill Lane (between Cherry Hill Lane and Schooner Drive)*

The significance of the potential impacts of project generated traffic at the analyzed street segments was identified using the two-lane roadway criteria set forth in the *County of Los Angeles Traffic Impact Analysis Report Guidelines* document. According to the County's published traffic impact study guidelines, a transportation impact on a roadway is deemed significant based on a percentage increase in passenger cars per hour (PCPH).

The forecast traffic conditions at the analyzed street segments for existing, year 2020 future pre-project (i.e., existing traffic volumes, ambient traffic growth and related projects traffic volumes) and Year 2020 future with project analysis scenarios are summarized in Table 4.10-14. The

average AM and PM peak hour volumes were utilized to evaluate existing conditions on the roadway. A 0.6 % annual ambient growth rate through the year 2020 as well as related projects traffic volumes were conservatively added to the existing weekday AM and PM peak hour volumes in order to estimate the future pre-project traffic volumes. As shown in Table 4.10-14, the proposed project AM and PM day trips would incrementally affect traffic volumes on the analyzed street segments. However, application of the County's two-lane roadway threshold criteria for street segment analysis indicates that the proposed project is not anticipated to significantly impact the analyzed street segments. Therefore, impacts would be less than significant without mitigation.

Table 4.10-14
Roadway Segments Impacts

#	Roadway Segment	Time Period	Existing Traffic Conditions		Year 2020 Traffic Conditions w/ Future Background Projects		Year 2020 With Project Traffic Conditions			
			V/C	LOS	V/C	LOS	V/C	LOS	Percent Increase	Significant Impact?
1	Palos Verdes Drive South east of Seacove Drive (between Seacove Drive and Wayfarers Chapel driveway)	AM PM	0.449 0.386	A A	0.592 0.569	A A	0.601 0.581	B A	1.6% 2.1%	No No
2	Palos Verdes Drive South east of Cherry Hill Lane (between Cherry Hill Lane and Schooner Drive)	AM PM	0.450 0.367	A A	0.588 0.541	A A	0.593 0.547	A A	0.8% 1.1%	No No

Source: Linscott, Law and Greenspan, 2011.

Mitigation Measures. As impacts would be less than significant, mitigation is not required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact T-3 **Based on Los Angeles County Congestion Management Program (CMP) criteria, impacts to CMP identified freeway monitoring segments and arterial intersections as a result of buildout under the proposed project would be Class III, *less than significant*.**

The 2004 Congestion Management Program (CMP) is a state-mandated program that was enacted by the State Legislature with the passage of Proposition 111 in 1990. The program is intended to address the impact of local growth on the regional transportation system.

Freeway monitoring locations. The CMP Traffic Impact Assessment (TIA) guidelines require that a traffic impact assessment must be prepared if the proposed project adds 150 or more trips (in either direction) during either the AM or PM weekday peak periods. The proposed project would not add 150 or more trips (in either direction) during either the AM or PM weekday peak hours to the CMP freeway monitoring location. Therefore, no further review of potential impacts to CMP freeway monitoring locations is required.

Intersection monitoring locations. The following CMP intersection monitoring locations have been identified in the project vicinity:

CMP Station	Intersection
Int. No. 58	Pacific Coast Highway at Western Avenue
Int. No. 84	Western Avenue at 9th Street
Int. No. 128	Western Avenue at Toscanini Drive
Int. No. 151	Pacific Coast Highway at Crenshaw Boulevard
Int. No. 152	Pacific Coast Highway at Hawthorne Boulevard
Int. No. 153	Pacific Coast Highway at Palos Verdes Boulevard

The CMP TIA guidelines require that intersection monitoring locations must be examined if the proposed project would add 50 or more trips during either the AM or PM weekday peak periods. The proposed project would not add 50 or more trips during the AM or PM peak hours at the CMP monitoring intersection. As such, no further review of potential impacts to intersection monitoring locations that are part of the CMP highway system is required.

Transit Service. As required by the *2010 Congestion Management Program for Los Angeles County*, a review has been made of the CMP transit service. Existing transit service is provided in the vicinity of the proposed project. The project trip generation, as shown in Table 5-2, was adjusted by values set forth in the CMP (i.e., person trips equal 1.4 times vehicle trips, and transit trips equal 3.5 percent of the total person trips) to estimate transit trip generation. Pursuant to the CMP guidelines, the proposed project is forecast to generate demand for two (2) transit trip during the weekday AM peak hour, two (2) transit trips during the weekday PM peak hour, and 22 daily transit trips during the weekday. The calculations are as follows:

- Weekday AM Peak Hour = 35 × 1.4 × 0.035 = 2 Transit Trips
- Weekday PM Peak Hour = 47 × 1.4 × 0.035 = 2 Transit Trips
- Weekday Daily Trips = 450 × 1.4 × 0.035 = 22 Transit Trips

Seven bus transit lines and routes are provided adjacent to or in close proximity to the project site, with two of these transit lines and routes directly serving the Portuguese Bend community. A total of four different bus transit providers provide service within the study area. These seven transit lines provide service for an average (i.e., an average of the directional number of buses during the peak hours) of approximately 20 buses during the AM peak hour and roughly 17 buses during the PM peak hour. Therefore, based on the above calculated peak hour transit trips, this would correspond to less than one transit rider per bus. Given the low number of

generated transit trips per bus, impacts on existing or future transit services in the project area would not be significant.

Mitigation Measures. Mitigation is not required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact T-4 Access to the project site during construction activity and during the operational phase of the project would be provided via Narcissa Drive and Peppertree Drive. Although there would be an increase of traffic during construction activity, construction traffic would not result in any significant impacts. In addition, emergency access during both construction and operational phases would be adequate to serve the Portuguese Bend community. Therefore, impacts relating to site access and circulation would be Class III, *less than significant.*

The Traffic Study provided by LLG Engineers contains two separate memorandums regarding construction traffic and emergency access and evacuation (see Appendix G for "Emergency Evacuation Review" Memo and "Construction Impact Analysis" Memo). The following summarizes the analysis contained in Appendix G regarding these issues.

Vehicular access to the project site during construction, during the operational phase of the project and during an emergency evacuation would be provided via the existing access gates at Narcissa Drive and Peppertree Drive. All streets in the Portuguese Bend community are private, and the community itself is gated. The gates restricting access to the community on Narcissa Drive and Peppertree Drive are set back approximately 190 and 90 feet from Palos Verdes Drive South, respectively. The lane configurations, as described above in the *Setting*, would remain the same as currently exists. The following discussion is based on supplemental analyses prepared by LLG Engineers and included with the Traffic Impact Study in EIR Appendix G.

Construction Traffic. During peak building construction activities (using the highly conservative assumption that all 47 lots would be under construction concurrently), construction worker vehicles and trucks would generate up to approximately 852 vehicle trips per day (426 inbound trips and 426 outbound trips). The inbound and outbound construction worker trips are anticipated to occur primarily outside of the AM and PM commuter peak hours. Haul trucks and delivery trucks would access the site via Palos Verdes Drive South, Peppertree Drive and Narcissa Drive. A total of eight material delivery trucks per hour are anticipated to be generated to/from the project site during peak construction activities. With two gateways on Palos Verdes Drive South (i.e., at Narcissa Drive and Peppertree Drive), this would result in no more than four vehicles at each of the gateway study intersections during either the AM or PM peak hour. As noted in the Traffic Impact Study contained in Appendix G, these intersections are projected to operate at LOS D as a result of the proposed project and as shown above in tables 4.10-12 and 4.10-13 above this temporary increase would not result in any significant impacts based on the City's significance criteria. In addition, this temporary

level of trip generation would not exceed the CMP threshold of 50 or more vehicle trips during either the AM or PM peak hours.

Emergency Access. A total of approximately 165 homes are planned within the Portuguese Bend community, including 111 homes in the project area (i.e., which includes the 47 additional single family homes analyzed as part of the proposed project as well as 64 developed lots within the project area) based on review of available aerial photography records/files. Field observations were conducted by LLG Engineers in order to verify existing signage, traffic control and pavement widths associated with the private roadways within the Portuguese Bend area (see Appendix G for Emergency Access and Evacuation Evaluation Memo). Narcissa Drive has a pavement width of roughly 23 feet north of the existing gate (north of Palos Verdes Drive South) and the pavement width generally varies between 22 feet and 24 feet in width along its length. Peppertree Drive has a pavement width of roughly 22 feet north of the existing gate (north of Palos Verdes Drive South) and the pavement width generally varies between 22 feet and 24 feet in width along its length. The roadways are of sufficient width to allow large vehicles (i.e., fire engine type trucks) to access the Portuguese Bend area. It should also be noted that the majority of the roadways are not fully improved (e.g., with formal curb and gutter); thus, the above widths and measurements reflect the edge of pavement widths. However, additional (i.e., unimproved) width is available along many portions of the roadways.

Evacuation from a wildfire is the primary consideration for public safety during such an emergency. The law enforcement agencies' primary responsibility during a wildland fire is to assist in evacuation of an area. Residents are expected to follow the evacuation routes as communicated and directed by Los Angeles County fire personnel via local roads and onto either Narcissa Drive or Peppertree Drive to exit the area via Palos Verdes Drive South.

A study documenting the number of existing residential units and potential future residential units for the Portuguese Bend area that would utilize either Narcissa Drive or Peppertree Drive to evacuate has been prepared as part of the Traffic Study (see Appendix G). Given an overall gateway distribution of 56 percent via Narcissa Drive and 44 percent via Peppertree Drive associated with the future potential homes (i.e., 26 via Narcissa Drive and 21 via Peppertree Drive), the total number of existing and future homes expected to evacuate via Narcissa Drive totals 86 homes (i.e., 60 existing and up to 26 future homes) and via Peppertree Drive totals 79 homes (i.e., 58 existing and up to 21 future homes). Based on this, during an emergency evacuation approximately 172 vehicles are forecast to exit via Narcissa Drive and 158 vehicles are forecast to exit via Peppertree Drive. The study estimated that the clearing time to evacuate the vehicles traveling south on Narcissa Drive would be approximately 1.1 minutes and the time to evacuate the vehicles traveling south on Peppertree Drive would be approximately 1.1 minutes. This estimated clearing time is within an acceptable range for evacuation purposes (LLG Memo contained in Appendix G).

The study also included an evaluation of the number of access points (exit roads). For a total number of households of between 51 and 300 homes, the minimum number of exit roads is two and the maximum number of households per exit totals 150 homes. Since the Portuguese Bend community has been constructed with two exit roads and a total of 86 and 79 total households are forecast to exit the Narcissa Drive and Peppertree Drive gateways, respectively, the design of the roadway system with respect to number of exit roadways and number of households per

exit is concluded to be adequate for emergency evacuation purposes. Thus, these access points are considered to be adequate for the proposed project. Impacts would not be significant. (It should be noted, however, that based on the field observations conducted along the private roadways, the LLG analysis (see Appendix G) recommends that the City consider posting these access roads with "No Parking – Fire Lane" signs to further improve capacity.) However, the roadway are private streets, thus the association may consider this recommendation.

Construction Traffic Implications During an Evacuation. Accounting for the addition of the construction worker and construction truck trip generation/vehicles (while subtracting the future resident vehicles from the evacuation analysis), the evacuation clearance times discussed above (1.1 minutes for both Narcissa Drive and Peppertree Drive) would increase to 1.4 minutes for Narcissa Drive and 1.3 minutes for Peppertree Drive, respectively. It should also be noted that the provisions for resident evacuation would also apply to construction-related vehicles and personnel. Therefore, it can be concluded that these clearance times would increase by approximately 0.3 minutes (18 seconds) and 0.2 minutes (12 seconds) for the Narcissa Drive and Peppertree Drive access points, respectively. Although clearance times would increase during construction by 18 seconds and 12 seconds, respectively, the times are still within an acceptable range for evacuation purposes. Impacts would not be significant.

Mitigation Measures. Mitigation is not required.

Significance After Mitigation. Impacts would be less than significant without mitigation.

Impact T-5 Development facilitated by the proposed project would not conflict with adopted policies, plans, or programs supporting alternative transportation. Impacts relating to alternative transportation would be *less than significant*.

The proposed Landslide Moratorium Ordinance revisions would facilitate development of up to 47 new residences within the Zone 2 project area. As described in Impact T-3, seven bus transit lines and routes are provided adjacent to or in close proximity to the project site, with two of these transit lines and routes directly serving the Portuguese Bend community. A total of three different bus transit providers provide service within the study area. These seven transit lines provide service for an average (i.e., an average of the directional number of buses during the peak hours) of approximately 20 buses during the AM peak hour and roughly 17 buses during the PM peak hour.

The Portuguese Bend community is a private/gated residential community. The proposed project would allow the owners of existing vacant or underutilized lots to build residential units. As such, no new development types or patterns within Portuguese Bend are proposed. Thus the project would be consistent with the existing pattern of development and would not conflict with policies relating to alternative transportation modes. Impacts relating to alternative transportation would not be significant.

Mitigation Measures. Impacts would be less than significant; therefore, no mitigation is necessary.

Significance after Mitigation. Impacts would be less than significant without mitigation.

c. Cumulative Impacts. The analysis under Impact T-1 considers cumulative growth through the year 2020. As noted under that discussion, cumulative growth would result in cumulative impacts at three of the seven study intersections which are forecast to operate at adverse levels of service (LOS E or worse during either the AM or PM peak hours under Year 2020 Future with Project conditions). Although mitigation measures T-1(a-c) are intended to reduce impacts at these three intersections, two of the mitigation measures (T-1(b-c) have been deemed infeasible. As such cumulative impacts at these two intersections are considered significant and cumulatively considerable.

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4.11 UTILITIES AND SERVICE SYSTEMS

This section analyzes the proposed project's potential impacts to the City's wastewater conveyance infrastructure system. Storm drain infrastructure issues are discussed in Section 4.6, *Hydrology and Water Quality*.

4.11.1 Setting

a. Project Area Setting. The City of Rancho Palos Verdes sanitary sewer services are provided by the County Sanitation Districts of Los Angeles County. Due to landslide hazards in the Portuguese Bend area of the Palos Verdes Peninsula, which were exacerbated by leachate that drains underground from residential septic systems, the Abalone Cove Landslide Abatement District was established in 1980, with the City's Redevelopment Agency responsible for the funding and installation of a sanitary sewer system to serve this area. To help stabilize this landslide area the Abalone Cove Sewer System was installed in 2001. The Abalone Cove Sewer Conveyance System is the only system in the City that is owned, operated and maintained by the City, with the remainder of the City continuing to be served by the County Sanitation Districts of Los Angeles County (CSDLAC). The City collects fees from the property owners through the Abalone Cover Sewer Fee for the operation, maintenance and improvements to the system. Any new lots that connect to the existing system would be required to pay fees if not already doing so.

The Abalone Cove Sewer System consists of 44 grinder pumps, 130 manholes, one diversion structure, approximately 19,000 linear feet of gravity pipeline, 19,615 feet of low pressure pipeline, 2,505 linear feet of force main, and four lift stations. Wastewater from the Abalone Cove Sewer System is conveyed to a pump station, where it is connected to a trunk sewer network maintained by the CSDLAC. The flow would enter the Districts' Joint Outfall J Unit IG Trunk Sewer, located in Palos Verdes Drive South just west of Seacove Drive. This 21-inch diameter trunk sewer has a design capacity of 4.5 million gallons per day (mgd) and conveyed a peak flow of 2.5 mgd when last measured in 2010. Wastewater is conveyed via this trunk sewer network to the CSDLAC Joint Water Pollution Control Plant (JWPCP) located in the City of Carson. The JWPCP has a capacity of 400 million gallons per day and currently average daily flows are approximately 265.4~~380~~ million gallons per day (~~Ken Rademacher, JWPCP Plant Manager, pers. comm. 5/6/11~~Adriana Raza, CSDLAC Facilities Planning Department, letter of November 20, 2012).

The Abalone Cove Sewer System was designed to serve the 111 single individual lots in the project area. Currently 64 lots are developed with single family residences, and 47 lots are undeveloped. Currently, only 64 of the 111 lots in the Abalone Cove Sewer System service area are connected to the sewer wastewater conveyance system. The remaining 47 undeveloped lots are within the service area but are not connected to the conveyance system. As shown below in Table 4.11-1, the 64 single family residences generate approximately 16,640 gallons of wastewater per day. As part of the update to the City's Sewer System Master Plan, it was

indicated[1] that the Abalone Cove Sewer System has adequate capacity to serve the 47 undeveloped lots.

Table 4.11-1
Current Wastewater Generation

Land Use	Water Use Factor ERU[1] (GDP[2])	Wastewater (GPD)
64 Single Family Residences	260/dwelling	16,640
Total Wastewater Generation		**16,640**

Source: City of Rancho Palos Verdes, Annual Report – Abalone Cove Sewer Maintenance Fee – FY 2009-10
[1]ERU = Equivalent Residential Unit
[2]GPD = gallons per day

Wastewater Regulatory Setting. The City's sewer system is subject to Section 201 of the Federal Clean Water Act (CWA). According to the CWA, the City must adopt a facilities plan in accordance with the United States Environmental Protection Agency (USEPA) Rules and Regulations, 40 CFR, Section 35.917. Section 201 specifies the following:

> *Facilities planning will demonstrate the need for facilities and, by a systematic evaluation of feasible alternatives, will also demonstrate that the proposed measures represent the most cost-effective means of meeting established effluent and water quality goals while recognizing environmental and social considerations.*

The City prepared a Sewer System Master Plan (SSMP) in 2004, and was subsequently updated in 2009 to comply with the Regional Water Quality Board requirements. The SSMP includes capacity analysis, maintenance schedules, and capital improvement plans.

Conveyance. The Los Angeles Regional Water Quality Control Board enforces Section 122.41(m) of part 40 of the Code of Federal Regulations (CFR), which prohibits the bypassing of water treatment facilities and sanitary sewer overflows.

In addition to the CFR, the sewer conveyance system is subject to regulation by the South Coast Air Quality Management District, which responds to claims regarding odors.

4.11.2 Impact Analysis

a. Methodology and Significance Thresholds.

Appendix G of the CEQA Guidelines. Based on Appendix G of the *CEQA Guidelines*, the proposed project could have a potentially significant impact to utilities and service systems if it were to result in one or more of the following:

- *Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?*

[1] City of Rancho Palos Verdes Public Works Department, *City of Rancho Palos Verdes Sewer System Master Plan*, 2009.

- *Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*
- *Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?*
- *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?*
- *Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*
- *Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?*
- *Comply with federal, state, and local statutes and regulations related to solid waste?*

As discussed in the Initial Study (Appendix A), the project would not result in significant impacts related to water supply, landfill capacity or solid waste regulations (the fourth, sixth and seventh bullets above). As noted above, impacts related to drainage facilities are discussed in Section 4.8, *Hydrology and Water Quality*. Therefore, the following discussion will focus on wastewater facilities and infrastructure.

The environmental impacts of the proposed project with respect to wastewater are determined based on the potential increase in wastewater generation from buildout under the proposed ordinance revisions and the capacity of existing and proposed wastewater treatment facility and infrastructure. The existing sewer capacity and wastewater generation is compared to the proposed project's potential wastewater generation, including improvements associated with the onsite development. Wastewater generation is estimated based on water demand rates from the City of Rancho Palos Verdes Annual Report – Abalone Cove Sewer Maintenance Fee – FY 2009-10.

b. Project Impacts and Mitigation Measures.

Impact U-1 Wastewater conveyance and treatment systems are adequate to serve the potential for up to 47 new residences to be built in the project area. However, individual new residences that could be constructed under the proposed ordinance revisions would require the extension of wastewater conveyance facilities. This impact would be Class II, *significant but mitigable*.

As previously discussed, wastewater from the Abalone Cove Sewer System is conveyed via a trunk sewer network to the CSDLAC Joint Water Pollution Control Plant (JWPCP) located in the City of Carson. This wastewater treatment plant provides both primary and secondary treatment for approximately 3.5 million people throughout Los Angeles County. The JWPCP has a capacity of 400 million gallons per day and currently average daily flows are approximately 380 million gallons per day (Ken Rademacher, JWPCP Plant Manager, pers. comm. 5/6/11). Thus the plant has a remaining daily capacity of approximately 120 million gallons per day. As shown below in Table 4.11-2, full buildout under the proposed ordinance revisions would generate approximately 12,220 gallons of wastewater per day. This increase would be well within the existing unused capacity of the JWPCP.

Table 4.11-2
Wastewater Treatment

Current Wastewater Treatment	Proposed Project Wastewater Generation	Increased Wastewater Treatment %
300,000,000 GPD[1]	12,220 GPD	0.000047%

Source: Sanitation Districts of Los Angeles County, 2011
[1]GPD = gallons per day

In May 2006, the State Water Resources Control Board adopted Statewide General Waste Discharge Requirements (GWDR) for publicly owned sanitary sewer systems. The GWDR requires that agencies that own or operate a sanitary sewer system comprised of one mile or more to develop and implement a Sewer System Management Plan (SSMP) that documents a comprehensive program for sewer system operation, maintenance and repair. In compliance with this requirement, the City of Rancho Palos Verdes Public Works Department prepared the City of Rancho Palos Verdes Sewer System Master Plan, which was adopted in 2009.

The SSMP included an inventory and evaluation of the Abalone Cove Sewer System. The SSMP identified that the Abalone Cove Sewer System was designed to provide sanitary service to the 111 individual lots in the service area, 64 of which are developed with single family residences and 47 which are vacant (proposed project). The SSMP indicates that there is sufficient capacity in the in the Abalone Cove Sewer System to provide service for 111 lots[2], including the 47 undeveloped lots. Currently, the previously identified wastewater conveyance facilities provide service to the 64 developed lots but not to the 47 undeveloped lots. Without the extension of the Abalone Cover Sewer System conveyance infrastructure to the 47 undeveloped lots, the proposed project would have a potentially significant impact without mitigation. The design, approval and construction of such facilities would be dependent upon the timing of development of the 47 undeveloped lots. As proposals for development of the 47 are submitted to the City of approval, each developer would be required to comply with the City requirements to provide adequate connections for the onsite development. Adherence to City requirements and mitigation measures U-1 through U-~~5~~ 4 would ensure impacts to wastewater conveyance would not be significant.

Mitigation Measures. The following measures would ensure that impacts related to the need for individual sewer connections would be less than significant.

~~**U-1 Holding Tank System.** If the director of Public Works determines that the sanitary sewer system cannot accommodate a new connection at the time of building permit issuance, the project shall be connected to a City approved holding tank system until such time as the sanitary sewer system can accommodate the project. In such cases, once the sanitary sewer system becomes available to serve the project, as determined by the Director of Public Works, the holding tank system shall be removed, and the project shall be connected to the sanitary sewer system.~~

[2] City of Rancho Palos Verdes Public Works Department, *City of Rancho Palos Verdes Sewer System Master Plan*, *Appendix K*, 2009

U-~~2~~1 **Additional Plumbing**. If the project involves additional plumbing fixtures, or additions of habitable space which exceed 200 square feet, or could be used as a new bedroom, bathroom, laundry room or kitchen, and if the lot or parcel is not served by a sanitary sewer system, septic systems shall be replaced with approved holding tank systems in which to dispose of on-site waste water. The capacity of the required holding tank system shall be subject to the review and approval of the City's Building Official. For the purposes of this mitigation measure, the addition of a sink to an existing bathroom, kitchen or laundry room shall not be construed to be an additional plumbing fixture. For those projects which involve additions of less than 200 hundred square feet in total area and which are not to be used as a new bedroom, bathroom, laundry room or kitchen, the applicant shall submit for recordation a covenant specifically agreeing that the addition of the habitable space will not be used for those purposes. Such covenant shall be submitted to the Director for recordation prior to the issuance of a building permit. For lots or parcels which are to be served by a sanitary sewer system on or after July 6, 2000, additional plumbing fixtures may be permitted and the requirement for a holding tank may be waived, provided that the lot or parcel is to be connected to the sanitary sewer system. If a sanitary sewer system is approved and/or under construction but is not yet operational at the time that a project requiring a landslide moratorium exception permit is approved, the requirement for a holding tank may be waived, provided that the lot or parcel is required to be connected to the sanitary sewer system pursuant to Section 15.20.110 of the Rancho Palos Verdes Municipal Code, or by an agreement or condition of project approval.

U-~~3~~2 **Participation in Future Sewer and/or Storm Drain Assessment District**. If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to support and participate in existing or future sewer and/or storm drain assessment districts and any other geological and geotechnical hazard abatement measures required by the City. Such covenant shall be submitted to the Director prior to the issuance of a building permit.

U-~~4~~3 **Sewer and Storm Drain Easement**. If the lot or parcel is not served by a sanitary sewer system, the applicant shall submit for recordation a covenant agreeing to an irrevocable offer to dedicate to the City a sewer and storm drain easement on the subject property, as well as any other easement required by the City to mitigate landslide conditions. Such convenant shall be submitted to the Director prior to the issuance of a building permit.

U-~~5~~4 **Inspection of Sewer Lateral**. If the lot or parcel is served by a sanitary sewer system, the sewer lateral that served the applicant's property shall be inspected to verifty that there are no cracks, breaks or leaks and, if such deficiencies are present, the sewer lateral shall be repaired or

reconstructed to eliminate them, prior to the issuance of a building permit for the project that is being approved pursuant to the issuance of a moratorium exception permit.

Significance After Mitigation. Onsite development impacts to the wastewater conveyance infrastructure would be less than significant with implementation of specified mitigation measures.

c. Cumulative Impacts. Cumulative projects in the Rancho Palos Verdes area, as listed in Table 3-1 in Section 3.0 *Environmental Setting*, would incrementally increase wastewater generation in the City of Rancho Palos Verdes. The proposed development would incrementally contribute to this cumulative effect. However, all new development would be subject to existing regulations to relative to wastewater generation. Impacts associated with individual developments would be addressed on a case-by-case basis as needed. With implementation of the project-specific mitigation measures listed above the project's contribution to wastewater impacts would not be cumulatively considerable.