

4.8 HYDROLOGY AND WATER QUALITY

This section identifies potential impacts to drainage and watershed resources that would result from the proposed project. A watershed is a region, usually defined by ridgelines, which drains into a specified body of water. Watershed-related impacts are those associated with grading and drainage, erosion and water quality that may arise as a result of construction and occupancy of facilities. The Port Master Plan Final Program EIR (2004) and Hydrology Report (Sherwood Design Engineers [Sherwood] 2014) are incorporated by reference into the analysis below. The Final Program EIR is available for review at the Harbor District office and the Hydrology Report is located in Appendix F of this EIR.

4.8.1 Existing Conditions

4.8.1.1 Regional Drainage Pattern

The primary surface drainage feature affecting San Luis Bay and the Avila Beach area is San Luis Obispo Creek, which drains areas north of the City of San Luis Obispo. The San Luis Obispo Creek estuary is located about two miles west of the Harbor Terrace planning area. Historically, flow within much of San Luis Obispo Creek has been absent primarily during the late summer months (July through October) of low rainfall years. High flows within the creek occur primarily during and immediately following significant storm events. The City of San Luis Obispo constructed a Wastewater Reclamation Facility in the 1940s near the southern city boundary, and began direct discharge to the creek in the late 1960s. This 5.0 to 5.5 cubic feet per second (cfs) supplemental discharge flow has altered natural stream flow of San Luis Obispo Creek resulting in a perennial stream. Data from the County Engineering Department shows creek flow to range from 6.2 cfs in September to 124.9 cfs in March (CMCA 2014, Fugro West 1995 incorporated by reference).

Stream flow volumes associated with flooding are generally discussed in terms of recurrence interval, which defines the frequency at which a given size flow is likely to occur. Therefore, a 100-year flood is the flow volume that is statistically expected to occur on the average of once every 100 years. The 100-year flood plain, as calculated using HEC-2 cross-sectional modeling accepted by FEMA, is generally used as a threshold to assess flood hazard for planning and insurance purposes. The 100- and 500-year floodplains of lower San Luis Obispo Creek is shown in Figure 4.8-1.

The Flood Insurance Study (FIS) conducted by FEMA for San Luis Obispo County notes that runoff from all the streams in the County is very small, with appreciable flows occurring only during and immediately after precipitation. However, during large storms, streamflow increases rapidly, and floodwaters can contain high amounts of debris, causing major flood damage. The last flooding event causing major flood damage in Avila Beach occurred in the spring of 1995.

The drainage basin immediately north of the Port that contribute runoff to San Luis Bay includes hillside areas of approximately 530 acres. Existing peak flows for this drainage area is estimated to be approximately 520 cfs. Figure 4.8-2 shows watershed boundaries affecting the project site.

Both Pecho Creek and Sea Canyon Watersheds affect the Harbor District area. Sea Canyon feeds San Luis Creek. The portion of the Pecho Creek watershed that drains toward the project site consists mostly of moderately steep to steep slopes with gradients between 15% and 45%. These slopes are covered by annual grasses, brush, and oak trees. Slopes are drained primarily by sheet flow. The Diablo Canyon Road channel, a well-defined earth channel is a primary, natural channel connecting several smaller secondary channels. The downstream

portion of this primary channel is partially improved with concrete lining. Additional downstream improvements include a 500-foot long, 5-foot diameter culvert that outfalls into San Luis Bay. Because there has been a history of overtopping at this culvert, there is potential for erosion damage at Diablo Canyon Road, Avila Beach Drive, and the San Luis Bay pipe outlet.

Soil coverage for much of the area involves a shallow well-drained layer of brown clay loam with an underlying layer of grayish brown clay loam and fractured sandstone. These soils have a moderately slow permeability; as such, water holding capacity is low or very low. Surface runoff for these soils and slope conditions is rapid and there is high potential for erosion and surface slides.

4.8.1.2 Coastal Hazards

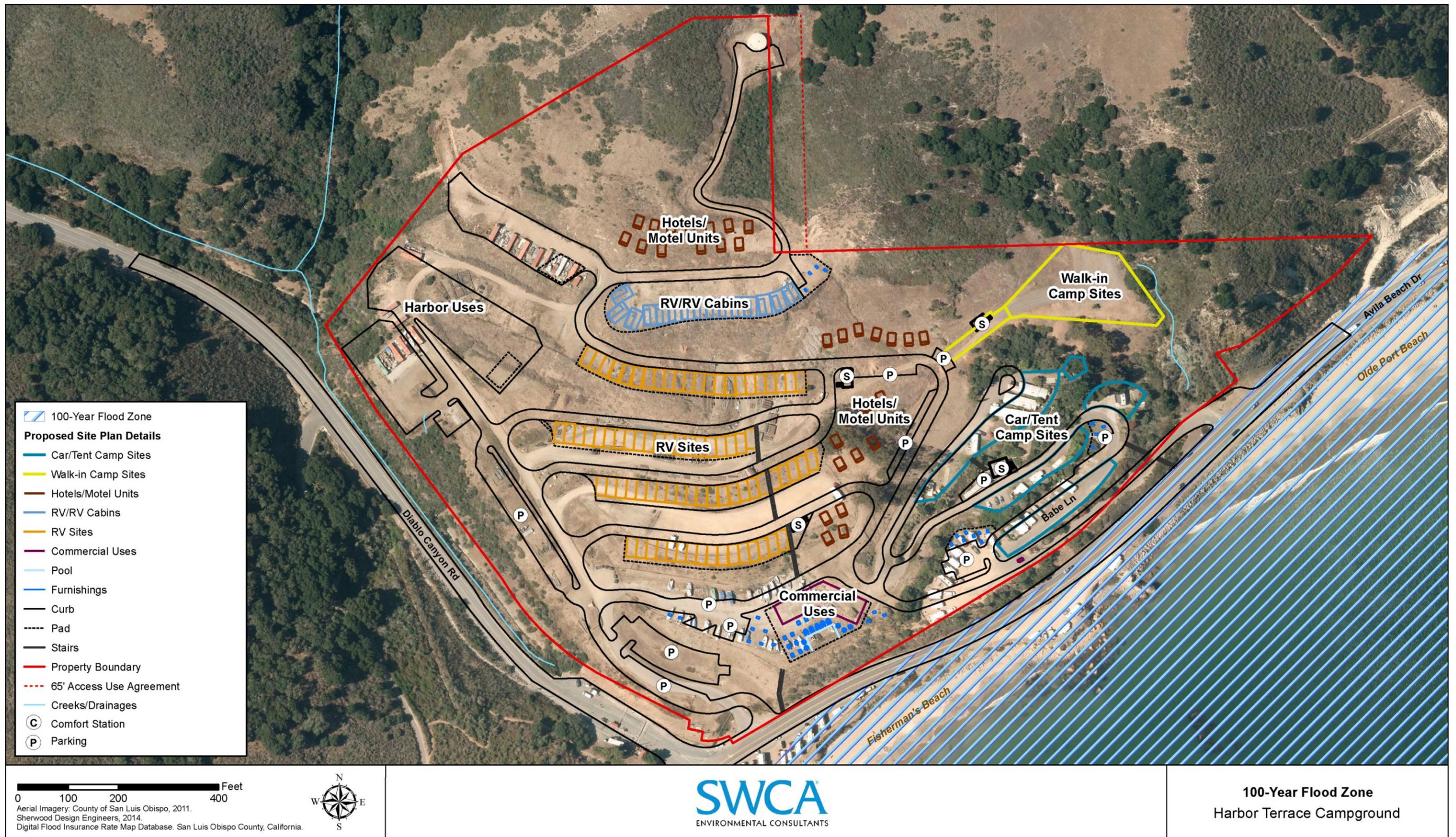
Port San Luis and the coastline surrounding San Luis Bay are protected from predominant northwesterly swells by a 2,300-foot long breakwater; however, little protection is provided for southerly swells (County of San Luis Obispo 2013). Protective riprap has been constructed adjacent to Avila Beach Drive to protect the roadway from storm waves. Historic storms have resulted in damage due to coastal flooding, and the region is classified with a “moderate risk” (County of San Luis Obispo 2013).

4.8.1.3 Stormwater Runoff

The existing site consists of a terraced hillside that is sparsely vegetated with coastal scrub and trees. The paved access road that leads up the hill branches off into multiple paved zones that are used for storage of containers and other harbor related materials. A water tank is located in the upper northern portion of the site that serves potable water access points across the site. There is also a paved road, Babe Lane, on the east portion of the site. Along Babe Lane there are mobile homes and concrete pads for RV parking.

The defining characteristic of this site is the steep slope of the hillside. The slopes of the hillside range from 10 to 66% and the existing roadway is at a 9% grade in places. The west two-thirds of the site is composed mainly of fill that has been placed over many years with smaller zones of Monterey Formation and Franciscan Mélange soils. The eastern portion of the site is in a potential landslide area, named Landslide Area 1 in the Geotechnical report. Based on findings from the Geologic and Geotechnical Hazards Study (Earth Systems Pacific 2014), the soils within the project limits are mostly fill and are not well suited for infiltration. Additionally, the areas near the 8 landslide areas could pose a hazard given heavy rains or oversaturation from infiltration. Based on these geologic conditions, infiltration across the site must be limited, and areas of concentrated flow need to be discharged such that it does not inundate the surrounding native soil. Additional information regarding geologic conditions is provided in Section 4.5 Geology and Soils.

Figure 4.8-1. 100-year Flood Zone



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The existing site drainage is broken up into five watersheds (refer to Figure 4.8-2). Watershed 1 encompasses the west side of the site from bottom to top and is 19.3 acres. Watershed 1 drains down to Avila Beach Drive and discharges through the existing outfall into San Luis Obispo Bay. Watershed 2 spans the middle of the site from top to bottom and is 10.6 acres. This watershed drains down to Avila Beach Drive and into the swale on the north side of the road where it flows east. Watershed 3 is located in the southeast corner of the site and is 3.9 acres. This watershed drains to Avila Beach Drive and meets up with the flow from Watershed 2. Watersheds 2 and 3 continue in the swale until discharging into a catch basin after Babe Lane. Watersheds 4 and 5 do not influence any portions of the site containing either existing or proposed development, and so have not been included in this report. Between Watersheds 1, 2, and 3 there are 2.4 acres of impervious area. All watersheds, except Watershed 1, discharge into a roadside swale. All discharges eventually outfall to the bay. The peak discharges and flows for the 2, 10, 25, and 100-year storms are shown in Table 4.8-1 below.

Table 4.8-1. Existing Site Peak Discharges

Watershed/ Outlet	2-Yr Discharge 2-Yr, 24-hr = 3.3-in		10-Yr Discharge		25-Yr Discharge		100-Yr Discharge	
	Volume (af*)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)
1	2.4	11.3	4.1	22.3	5.6	29.1	7.1	39.2
2	1.3	6.2	2.2	12.3	3.1	16.1	3.9	21.6
3	0.5	3.5	0.9	6.6	1.2	8.4	1.5	11.1
Total	4.2	21	7.2	41.2	9.9	53.6	12.5	71.9

Note: All rainfall data from San Luis Obispo D graphs, rainfalls for lower drainage areas, and includes a full 24-hour storm event. The method used for total volume and flow calculations is SCS TR-20.

*af = acre feet

Source: Sherwood 2014

4.8.1.4 Surface Water Quality

Surface water quality has been monitored in San Luis Obispo Creek by the City of San Luis Obispo at several locations. The creek has been monitored for water temperature, dissolved oxygen (DO), pH, turbidity, biochemical oxygen demand (BOD), and other constituents. San Luis Obispo Creek is on the 2010 Clean Water Act Section 303(d) list of impaired waters for pathogens. Urban stormwater runoff and agricultural runoff are identified as the primary source of pathogens, including fecal coliform (RWQCB 2013b).

Improved drainage systems within the project area include the downstream portion of the Diablo Canyon Road channel. This channel is partially improved with a concrete lining. Additional downstream improvements include a 500-foot long, 5-foot diameter culvert that outfalls into San Luis Bay.

Erosion is a natural process that occurs over time by either wind or water moving over soils. The natural erosion process is an important factor in building up fertile valley soils and beach sand along the coastline. However, soil erosion can become a problem when human activities accelerate the rate at which soils are being displaced. Non-point sources of erosion, such as impervious surfaces, unsound farming practices, over-grazing, construction activities, and road construction (particularly unpaved roads) can all accelerate the rate at which soils are removed from hillsides. Point sources such as industrial wastewater discharges, mining activities, wastewater treatment plants, commercial and residential land uses, and agricultural operations can affect erosion rates through increased stormwater velocity, disturbance of natural drainage patterns, and water discharges. Soil erosion can leave silt-choked streams, gullied hillsides, and damaged farmland.

Nonpoint sources of erosion and sedimentation can also degrade water quality by contributing excessive levels of organic nutrients and inorganic chemicals. These introduced materials can muddy water, and rob light and oxygen from plants and animals.

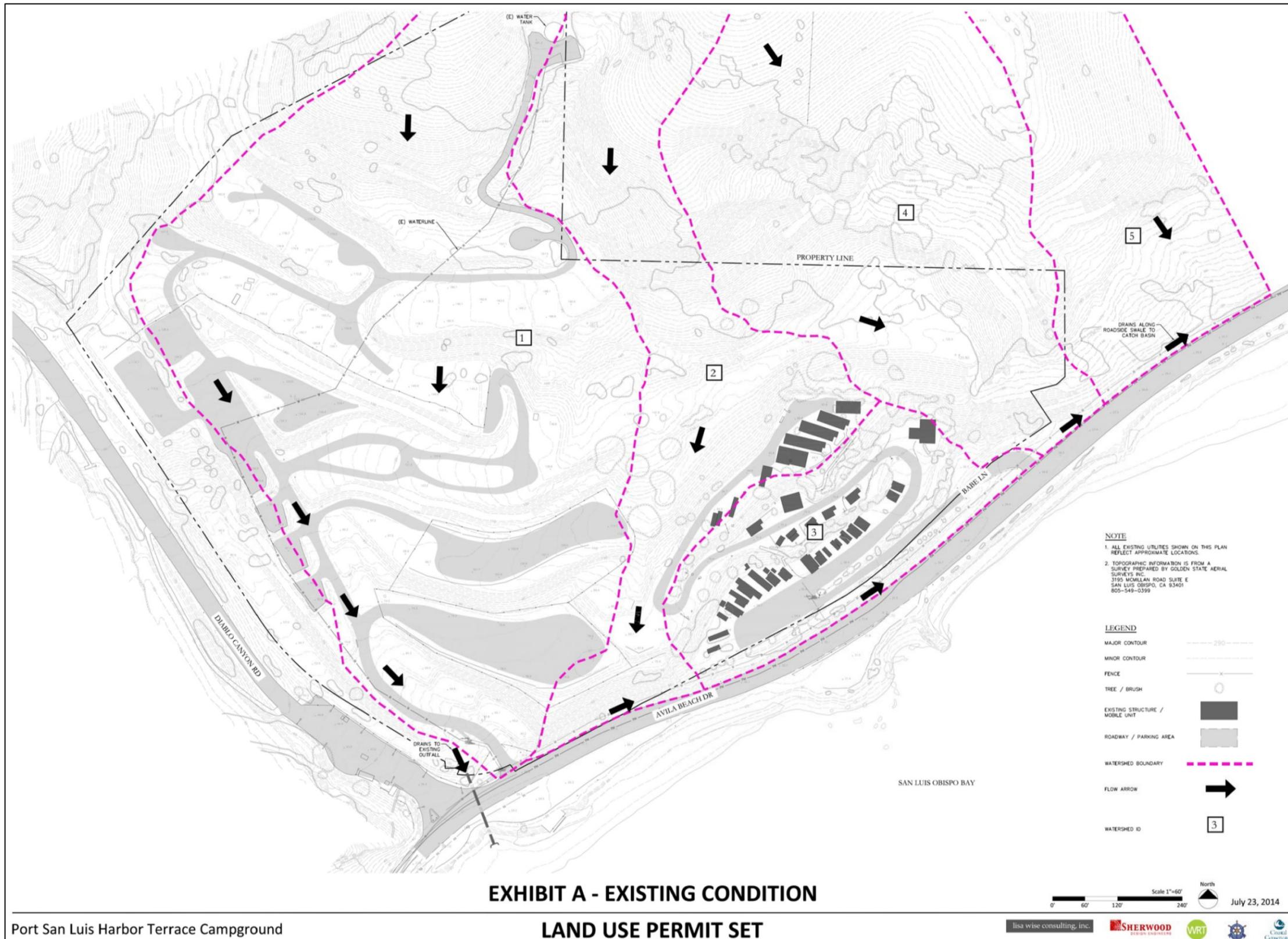
4.8.1.5 Flood Hazard

Based on review of FEMA data, the project site is not located within a flood zone. A Special Flood Hazard Area subject to 1% annual flood (100-year flood zone) is located adjacent to the project site, at elevation 24, which covers Avila Beach Drive. Recent flooding within the Port area occurred in early 2014, and resulted in flooding within the Port parking area west of the project site, and on Avila Beach Drive.

4.8.1.6 Sea Level Rise

The County of San Luis Obispo Hazard Mitigation Plan (County of San Luis Obispo 2013) identifies 3.3 to 4.6 feet of sea level rise by the year 2100. Draft Sea Level Rise Policy Guidance prepared by the CCC (CCC 2013) identifies sea level rise of 1.38 to 5.48 feet by the year 2100. For the purposes of this analysis, the highest level of potential sea level rise is identified. Sea level rise will cause flooding and inundation of coastal areas, including beaches, coastal bluffs, development, and roadways. Additional effects include increased coastal erosion, changes in sediment supply and movement, and salt water intrusion in groundwater basins and aquifers. These effects may have a significant impact on the coastal economy and could put important coastal resources and coastal development at risk, including ports, marine terminals, commercial fishing infrastructure, public access, recreation, wetlands and other coastal habitats, water quality, biological productivity in coastal waters, coastal agriculture, and archeological and paleontological resources.

Figure 4.8-2. Existing Watersheds



Port San Luis Harbor Terrace Campground

LAND USE PERMIT SET



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4.8.2 Regulatory Setting

4.8.2.1 Federal Policies and Regulations

Federal Policies and Regulations

The Clean Water Act controls the discharge of toxic material into surface water bodies. Under this act, states are required to identify water segments impaired by pollutants and develop control strategy/management plans to reduce pollution and meet certain water quality standards.

Regulatory protection for water resources throughout the United States is under the jurisdiction of the USACE. Section 404 of the Clean Water Act prohibits the discharge of dredged or fill material into “waters of the U.S.” without formal consent from the USACE. Waters of the U.S. include marine waters, tidal areas, stream channels, and associated wetlands. Wetlands include freshwater marshes, vernal pools, freshwater seeps, and riparian areas. Under §404, activities in waters of the U.S. may be subject to either an individual permit or a general permit, or may be exempt from regulatory requirements. Some activities have been given blanket authorization under the provisions of a general permit through the Nationwide Permit system. Individual Permits require the applicant to prepare and submit an alternatives analysis of the project.

Section 401 of the Clean Water Act and its provisions ensure that federally permitted activities comply with the federal Clean Water Act and state water quality laws. Section 401 is implemented through a review process conducted by the RWQCB, and is usually triggered by the §404 permitting process. Specifically, the RWQCB certifies via §401 that the proposed project complies with applicable effluent limitations, water quality standards, and other conditions of California law. If the RWQCB denies certification, the lead federal agency must deny the federal permit application.

State Policies and Regulations

The establishment and enforcement of water quality standards for the discharge into and maintenance of water throughout California is managed by the SWRCB and its RWQCBs. The SWRCB enforces the federal Clean Water Act on behalf of the US EPA. Most of the quantitative objectives are based on the CCR, Title 22 – State Drinking Water Standards. Other considerations include the Porter-Cologne Water Quality Control Act and the RWQCB’s Non-degradation Policy. San Luis Obispo County lies entirely within Region 3, the Central Coast RWQCB. The RWQCB is the primary State agency ensuring that the quality of potable water supplies is protected from harmful effects by man.

The California Department of Health Services (DHS) is responsible for overseeing the quality of water once it is in storage and distribution systems. DHS oversees the self-monitoring and reporting program implemented by all water purveyors, performs inspections, and assists with financing water system improvements for the purpose of providing safer and more reliable service.

Section 10910 of the California Water Code requires the County to identify the agency or entity responsible for providing water service to the area and to request that the agency determine whether the project was included within the current Urban Water Management Plan maintained by that water agency.

Section 13260(a) of the California Water Code requires that any person discharging waste or proposing to discharge waste within any region, other than to a community sewer system, that

could affect the quality of the waters of the State, file a Waste Discharge Report (WDR). All WDRs must implement the applicable water quality control plan (Basin Plan) for the Region affected by the discharge. Therefore, WDRs require the project to comply with all applicable Basin Plan provisions, including any prohibitions and water quality objectives, governing the discharge. The siting, design, construction, operation, maintenance, and monitoring of all small domestic systems must comply with all of the applicable provisions of the RWQCB's Basin Plan. The project shall not discharge waste in excess of the maximum design and disposal capacity of the small domestic system. The discharger must comply with any more stringent standards in the Basin Plan. In the event of a conflict between the provisions of RWQCB Order No. 97-10-DWQ and the Basin Plan, the more stringent provision prevails.

The Port is operating under a number of NPDES permits issued by the RWQCB in accordance with the Federal Water Quality Control Act. Potentially significant sources of water pollution are regulated to insure water quality standards in streams and other surface watercourses are maintained.

The Porter-Cologne Water Quality Control Act provides the authority and method for the State of California to implement its water management program. The act establishes waste discharge requirements for both point and non-point source discharges affecting surface water and groundwater.

CDFW is responsible for conserving, protecting, and managing California's fish, wildlife, and native plant resources. California law requires any person, agency, or public utility proposing a project that may impact a river, stream, or lake to notify the CDFW before beginning the project. If the CDFW determines that the project may adversely affect existing fish and wildlife resources, a Lake or Streambed Alteration Agreement is required. This Agreement lists the CDFW conditions of approval for the proposed project, and serves as an agreement between applicants and the CDFW.

4.8.2.2 Local Policies and Regulations

Chapter 23.05 of the County's CZLUO contains site development standards for the county, including drainage, grading, erosion, and sedimentation control. Furthermore, mitigation consistent with ordinance requirements will be recommended to ensure implementation. Sections that are applicable to drainage, grading, erosion, and sedimentation are outlined below.

Section 22.05.020 states that the County's standards for grading and excavation are intended to minimize hazards to life and property, protect against erosion and the sedimentation of water courses, and to protect the safety, use, and stability of public rights of way and drainage channels. Grading must follow the standards provided in the Uniform Building Code and the following standards:

- Areas of cut and fill are to be limited to the minimal amount necessary.
- Grading for a building site is prohibited on slopes of 30% or greater (unless a Variance is granted).
- Contours are to be blended with the natural terrain.
- Grading may not alter watercourses except as permitted through the CDFW and various watercourse protection methods shall be followed.

- Areas where natural vegetation has been removed must be replanted by various approved methods.
- Grading shall not occur within 100 feet of any Environmentally Sensitive Habitat except where a setback adjustment has been granted and specific findings can be met.

Section 23.05.040 of the CZLUO states that standards for the control of drainage and drainage facilities are designed to minimize harmful effects of stormwater runoff and resulting inundation and erosion on proposed projects, and to protect neighboring and downstream properties from drainage problems resulting from new development. Erosion and sedimentation control to protect damaging effects on-site and on adjoining properties is discussed in §23.05.036 of the CZLUO. A sedimentation and erosion control plan would be required, and shall include temporary and final measures including:

- Slope surface stabilization including temporary mulching or other stabilization measures to protect exposed areas of high erosion potential during construction and interceptors and diversions at the top of slopes to redirect runoff.
- Erosion and sedimentation control devices such as absorbing structures or devices to reduce the velocity of runoff.
- Final erosion control measures including mechanical or vegetative measures.

The County has developed a Post Construction Requirements Handbook (dated March 2014) with the required standards for post-construction storm water management in new construction and redevelopment. Due to the location of the site in the county, construction must meet performance requirements 1 and 2. The requirements are described under Impacts and Mitigation Measures below, including an assessment how the project would meet these standards.

Interim LID Guidelines is a project sponsored by municipalities in San Luis Obispo County and the Central Coast RWQCB to help reduce onsite stormwater runoff. The guidelines and regulations act as a transition into new rules that will be developed as a part of a joint effort to develop new hydromodification control criteria. The new rules, titled Post-Construction Stormwater Management Requirements for Development Projects in the Central Coast Region (RWQCB Central Coast Region 2013a), were adopted on July 12, 2013.

In addition to the environmental benefits, LID may provide aesthetic benefits and, in some cases, an economic benefit as well. The interim guidelines categorize projects into three performance requirement tiers based on the square footage of increased impervious surfaces created by the project. Projects with a potential to result in polluted stormwater discharge (e.g., automotive Repair shops, gasoline stations, residential hillside development, restaurants, 5,000-square-foot parking lots), and residential tentative subdivisions with a potential for five or more units are designated as Tier 3 projects, and are required to incorporate at least two LID measures that retain or reduce runoff and meet any additional agency requirements. The RWQCB Requirements designate three Performance Requirement Tiers and Requirement Number 3 (Runoff Retention) applies to detached single-family homes resulting in 15,000 square feet or greater net impervious area in specified Watershed Management Zones (including the proposed project site). LID measures are required in addition to a Stormwater Control Plan.

San Luis Bay Coastal Area Plan

San Luis Bay Coastal Area Plan standards applicable to the project include:

Aquatic and Terrestrial Habitats

Goal: Responsibly managed and protected resources in and surrounding San Luis Obispo Bay (State-granted Tidelands).

3. **Runoff Controls.** Require implementation of effective runoff control strategies and pollution prevention activities by incorporating the most current best management practices for all new development.

Hazards

1. **Natural Hazards.** New development within areas subject to natural hazards from geologic or flood conditions (including beach erosion) shall be located and designed to minimize risks to human life and property. All new development shall assure stability and structural integrity, and neither create nor contribute significantly to erosion and geologic instability. Along the shoreline new development (with the exception of coastal-dependent uses or public recreation facilities) shall be designed so that shoreline protective devices (such as seawalls, cliff retaining walls, revetments, breakwaters, groins) that would substantially alter landforms or natural shoreline processes, will not be needed for the life of the structure. Construction of permanent structures on the beach shall be prohibited except for facilities necessary for public health and safety such as lifeguard towers.

Harbor Terrace

- c. To protect and enhance sensitive biological resources and habitat areas, including water quality, on and adjacent to the Harbor Terrace site, the following measures shall include, but are not limited to:
 7. Grading for approved development shall be designed and implemented to minimize sedimentation impacts on adjacent surface water bodies including coastal streams and San Luis Bay. Construction activities such as grading and clearing shall be scheduled to avoid the rainy season.
 8. Minimize impervious surfaces and install post development BMP's to capture, infiltrate, and/or treat storm water runoff. The objective of drainage improvements shall be to avoid any increase in the quantity and intensity of storm water runoff exiting the site. Post construction BMP's shall be designed with adequate capacity to accommodate, at a minimum, the 85th percentile 24-hour runoff event.
 9. If drainage facilities are proposed to flow into the stream/drainage channel adjacent to Diablo Canyon Road, the stream channel shall be restored to provide both flow capacity and natural habitat.

10. *Filtering all drainage from parking facilities by using vegetated swales or oil/water separators to limit oil/grease pollution and the intensity of flow commonly associated with parking lots.*

11. *Use all BMP's possible to limit water quality impacts and eliminate to the greatest degree feasible the need for additional culverts and ocean/beach disposal points.*

Port Master Plan and Port Master Plan Final Program EIR

The Port Master Plan Final Program EIR included the following mitigation measures, which are applicable to the proposed project:

D-1 *Measures to be considered for the mitigation of potential drainage, erosion, seepage and water quality impacts associated with new development include, but are not limited to:*

- *The incorporation of on-site runoff collection systems which includes energy dissipation, berms, temporary settling basins, and/or a silt/hydrocarbon separator for the collection and removal of hazardous materials and sediments.*
- *The incorporation of on-site drainage systems to collect runoff from all impervious onsite services, including parking spaces, roads and buildings.*
- *The incorporation of offsite retention basins with appropriate water quality controls.*
- *Surface runoff should be collected by curbs, gutters and drainage swales and conveyed to an appropriate point of disposal. Discharges of greater than five feet per second should be released through an energy dissipator or outlet.*
- *The incorporation of sub-surface drains to intercept seepage and convey it to an acceptable point of disposal.*
- *Watering any construction sites at least twice per day during construction, or more frequently if determined necessary by the Harbor District.*
- *Re-vegetating portions of sites exclusive of paved areas as soon as reasonable following grading.*
- *Incorporating rain gutters and downspouts for buildings with adequate splash guard protection.*
- *Grading surfaces adjacent to buildings so that runoff is conveyed away from foundations and onto paved surfaces or underground collection pipes.*

D-2 *Prior to the commencement of new construction activities, a General Construction Activity Storm Water Permit from the Regional Water Quality Control Board (RWQCB) shall be obtained. As part of this permit, a storm water pollution prevention plan shall be prepared specifying Best Management Practices (BMPs) for erosion control and stormwater pollutant discharge control during any construction activities. For all project components, grading and drainage plans shall incorporate BMPs for erosion control and*

stormwater pollutant discharge control. This may also serve to reduce non-project-related sediment loads further downstream.

- D-3** *All newly constructed impervious surfaces, including parking spaces, streets and roads, and storage lots, shall drain to an underground storm drainage system or improved channel. Surface runoff will be collected by curbs, gutters and drainage swales to storm drain pipe inlets. Runoff will be kept underground until it is released to a graded or improved natural channel. Discharges greater than five feet per second will be released through an energy dissipator structure at the drainage system outlet.*
- D-4** *New roadside shoulders beyond the edge of pavement shall only be used for minor road embankment runoff and emergency overflows from underground pipe systems. Additional drainage swales, inlets and channels will be provided on grading plans in order to handle sheet flows that would otherwise be directed across roads.*
- D-5** *The following grading procedures shall be included in order to minimize the potential for drainage and erosion problems on slope banks:*
- *Locate terrace drain ditches at the top of fill slopes greater than a gradient of 4 horizontal to 1 vertical. Allow only surface runoff which is incidental over the face of a fill slope.*
 - *Include terrace drains and velocity dissipators on existing and proposed slopes greater than 35 feet in height.*
 - *Install wicks, subdrains or other improvements, as necessary, to insure that groundwater seepage does not occur on man-made slopes.*
- D-6** *All areas disturbed by grading activities shall be seeded with native or naturalized grasses to reduce dust emissions and erosion.*
- D-7** *New storm drain inlets and pipe systems shall be added along the edge of the bluff to prevent flows from being released onto unprotected slopes.*
- D-8** *A site-specific erosion control and temporary revegetation plan shall be developed for all new grading. This plan shall include erosion control devices to be installed prior to the beginning of the rainy season (October 15).*
- D-9** *Prior to grading operations, application for a construction Storm Water Discharge General Permit shall be submitted to the Regional Water Quality Control Board. This permit request will be accompanied by an indication of construction site erosion control practices, soil tracking control methods and practices, and moisture control of surfaces for dust control.*
- D-10** *An erosion and sedimentation control plan as required by the National Pollution Discharge Elimination System permit shall be prepared for all new construction. This permit request will comply with all the drainage protection measures and procedures of the on-site Storm Water Pollution Prevention Plan (SWPPP).*
- D-11** *A Revegetation Plan shall be prepared for all newly graded areas. The goal of this plan is to (1) ensure that sediment is not eroded and transported off-site; and (2) upon*

completion of construction, to re-establish vegetation compatible with surrounding native plantings

D-12 *Additional rock dissipator protection shall be provided at new culvert outlets along Avila Beach Drive and at the existing 5 foot diameter culvert for the Diablo Canyon Road channel.*

D-13 *Additional rock protection along the shoreline (Avila Beach Drive) will be added to provide protection of the new and existing slopes during high surf conditions.*

D-14 *Prior to approval of new grading plans or grading permits, the applicant shall show the following note on grading and drainage plans:*

No construction work will be permitted in any flowing channel and no graded material or debris will be placed within existing storm drain channels. All work within seasonally dry streambeds shall be in accordance with permits issued by the County of San Luis Obispo and the Regional Water Quality Control Board.

4.8.3 Thresholds of Significance

Consistent with CEQA Guidelines Appendix G, the County states that a significant water resource impact would occur if the project would:

- a. Violate any water quality standards;
- b. Discharge into surface waters or otherwise alter surface water quality (e.g., turbidity, temperature, dissolved oxygen, etc.);
- c. Change the quality of groundwater (e.g., saltwater intrusion, nitrogen-loading, etc.);
- d. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide additional sources of polluted runoff;
- e. Change rates of soil absorption, or amount or direction of surface runoff;
- f. Change the drainage patterns where substantial on or off-site sedimentation/erosion or flooding may occur;
- g. Involve activities within the 100-year flood zone;
- h. Change the quantity or movement of available surface or ground water;
- i. Adversely affect community water service provider; or,
- j. Expose people to a risk of loss, injury, or death involving flooding (e.g., dam failure, etc.), or inundation by seiche, tsunami or mudflow.

4.8.4 Impact Assessment and Methodology

An impact to water quality would occur if the proposed project results in the discharge of pollutants into ground or surface waters. Impacts to the movement of water may occur if the project would affect stormwater runoff, including existing drainage infrastructure, resulting in

flooding, erosion, and sedimentation. Potential impacts are assessed based on site topography, the proposed layout and elevations of potential project components, the erodibility of soils, existing drainage patterns, and the regulatory framework applicable to the project. The proposed project design and preliminary grading and drainage plans incorporate applicable hydrological standards, and consider other site conditions and geologic hazards.

4.8.5 Project Specific Impacts and Mitigation Measures

The proposed project includes a main commercial building at the base of the site, 32 hotel/motel units spread across four zones of the site, and comfort stations providing restroom and sink access, along with dog washing stations. Additionally, there are five paved RV parking areas located on terraces going up the hillside of the site and a harbor storage area in the northwest corner of the site. There are also vehicle parking lots at the base of the site and along roadways providing access to the various areas. In total these impervious areas comprise 9.5 acres of the 32 acre site. The remainder of the site is pervious area, of which some of the east portion of the site will be used for walk-in and car camping. Car camping will occur on Babe Lane. Hotel/motel units are located throughout the site and will be placed to accommodate minimal grading. The harbor storage requires an expansive paved area to accommodate equipment and boat access. The areas between the terraces will be graded to accommodate the steepness of the site and the northern portion of the site will remain undisturbed.

The proposed site is broken up into 20 sub-watersheds (refer to Figure 4.8-2). These sub-watersheds, with the exception of Watershed D, are between 0.5 and 3.0 acres and have similar methods of stormwater collection, treatment, and discharge. Watershed D includes area outside the property boundary up to the ridgeline and is approximately 15 acres with approximately 2 acres of impervious area. The runoff from the pervious area of Watershed D drains directly into the piped network, while the runoff from the impervious area is treated through swales and into raingardens within the watershed, before being discharged into the pipe network. The typical treatment methodology used on this site has been to direct the stormwater in a roadside bio-swale and to route the runoff to a lined rain garden for treatment and discharge to the stormwater pipe network and outfall. This method of stormwater routing is being implemented to limit infiltration on site during storm events, where the soil can become saturated, and allows the site to conform to the San Luis Bay Coastal Area Plan which prohibits detention basins and other devices that can cause oversaturation of the underlying soils.

Due to the steepness of the proposed grades, the swales have slopes up to 12%. In order to mitigate flow velocity, and erosion of the bio-swales, check dams shall be built every 20 to 30 linear feet, depending on the slope. Additionally, in order to create level treatment areas, retaining walls, approximately six feet or lower have been provided at many of the raingardens.

Using this methodology, combined with the existing and proposed site conditions, runoff coefficients and Time of Concentration (T_c) were developed for each sub-catchment area. The impervious area across the site has increased, which reduces infiltration. Thus the quantity of water leaving the site has increased, however the flow velocity has been maintained, increasing the time of concentration as the water travels through the site, and improving the quality by routing the flows through a treatment train. In the Geologic/Geo-Technical Hazards Study (Earth Systems Pacific 2014) it is recommended not to increase infiltration of water near the landslide areas. Although the water remains on site for a longer period of time in the proposed conditions, there is less infiltration overall and no low points for inadvertent water collection and soil saturation.

The main discharge point of the site is the piped outfall that discharges into the bay through existing outlets. The project proposes no new drainage outlets. Water will also be discharged off the site via a bio-swale that parallels Avila Beach Drive from where the water will sheet across Avila Beach Drive. This will receive flow from all new development, which includes all of the sub-catchments, except N and R. Sub-catchments N and R, and will discharge into the roadside swale. The peak discharges and flow rates for the 2-, 10-, 25-, and 100-year storms are shown in Table 4.8-3 below. This table also shows a comparison of pre to post-development discharge volumes and flow rates for the site as a whole.

Table 4.8-2. Proposed Project Peak Discharges

Outlet	2-Yr Discharge 2-Yr, 24-hr = 3.3-in		10-Yr Discharge		25-Yr Discharge		100-Yr Discharge	
	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)	Volume (af)	Peak Flow (cfs)
Piped Outfall	4.9	19.08	8.0	38.7	10.8	48.7	13.4	56.9
Roadside Swale	0.3	1.7	0.4	3.15	0.6	3.94	0.7	5.18
Total Proposed	5.2	20.78	8.4	41.85	11.4	52.64	14.1	62.08
Total Existing	4.2	21	7.2	41.2	9.9	53.6	12.5	71.9
<i>Change in Runoff</i>	<i>+ 1.0</i>	<i>- 0.22</i>	<i>+ 1.2</i>	<i>+ 0.65</i>	<i>+ 1.5</i>	<i>- 0.96</i>	<i>+ 1.6</i>	<i>- 9.82</i>

Note: All rainfall data from San Luis Obispo D graphs, rainfalls for lower drainage areas, and includes a full 24-hour storm event. The method used for total volume and flow calculations is SCS TR-20.

Source: Sherwood 2014

The project has designed its storm water treatment to incorporate Low Impact Development measures around the site in order to meet minimum requirements—Performance Requirement (PR) 1. The project ~~will~~ requires a technical feasibility exemption from PR2. Page 3-15 of the new regulations stipulates, “No liners or other barriers interfering with infiltration, except for situations where lateral infiltration is not technically feasible”. The project proposes to line rain gardens with clay in order to comply with landslide and slope stability recommendations identified in the Geologic/Geotechnical Hazards Report (Earth Systems Pacific 2014). The developer shall work with the Port San Luis Harbor District to consider achieving additional performance requirements, PR3 (Runoff Retention) and PR4 (Peak Management), to the maximum extent practical. As noted previously, there are geological and geotechnical safety constraints on this site that directly conflict with the hydrological goals and the county’s preferred methods for meeting the Performance Requirements. Runoff retention typically requires rain water capture and infiltration or re-use for toilet flushing or irrigation use. Due to the prohibition of infiltration on site, a below ground cistern or similar storage device would need to be used to hold water for re-use. For consecutive storm events, which would overload a

cistern, discharge from the site via the piped network would be required. In order to meet the requirements of PR4 the post-construction runoff volume must not be greater than the pre-construction volume for the 10-year storm. Currently that volume is calculated to be 1.1 acre-feet, so that volume would need to be retained either at grade or below grade and released slowly, into the stormwater pipe network, over a 4 hour period. This could also be achieved with a large enough cistern. Any below ground structures used for water storage would need to be constructed within the limits set by the geotechnical report for earthquake safety.

The County Public Works Department reviewed the Port San Luis Harbor Terrace Stormwater Technical Feasibility Exemption Request and Stormwater Control Plan, and determined that the preliminary Stormwater Control Plan appears acceptable, and the technical exemption for Performance Standard 2 was approved (Tim Tomlinson 2014).

Violate Water Quality Standards

The analysis of consistency with water quality standards is based on the Performance Requirements identified in the Post Construction Requirements Handbook (County of San Luis Obispo 2014).

Performance Requirement 1 – Low Impact Development

The intent of PR1 is to mimic predevelopment hydrology to the extent feasible using LID principles. The overall design strategies that PR1 recommends using are to limit disturbance of creeks and natural drainage features; to minimize compaction of highly permeable soils; to limit clearing and grading of native vegetation; and to minimize impervious surfaces by concentrating improvements on the least sensitive portions of the site. The site design measures listed in PR1, of which at least one must be used, are listed below:

- Roof runoff directed into cisterns or rain barrels.
- Roof runoff directed into vegetated areas.
- Runoff from sidewalks, walkways, or patios directed onto vegetated areas.
- Runoff from driveways and/or uncovered parking lots onto vegetated areas.
- Construct bike lanes, driveways, uncovered parking lots, or other paved areas with a permeable surface.

Regarding the Design Strategies, there are no creeks or significant natural drainage features on the site, and any small existing swales and minor ditches disturbed by construction will be fully restored and stabilized. Extensive regrading will be required to implement the proposed plan on the steep site, and the resulting cut and fill slopes will have to be compacted as directed by the project's geotechnical engineer. All areas that do not require disturbance, though, will be protected from unnecessary compaction. Similarly, the site's existing sparse vegetation cover will be retained wherever possible, but it is expected this will primarily be outside the limits of construction. The creation of new impervious surfaces will be limited to the extent feasible, but the proposed camping and vehicle storage uses of the site will require hard surfaced parking areas and all weather roadways. These uses are similar to the site's existing condition, although there will be an increase in total impervious cover. It is noted that permeable pavements were considered for the site, but were ruled out in accordance with the Geologic - Geotechnical Hazards Study (Earth Systems Pacific 2014). Another portion of PR1 is the control of storm water. The site has been designed to fully comply with this requirement by sloping all impervious surfaces towards vegetated treatment areas in the form of swales and rain gardens, prior to being discharged from the site via a stormwater pipe system. Additionally the roof runoff

of the large buildings on site should be directed to nearby rain gardens to meet the design requirements of Performance Requirement 1.

Performance Requirement 2 – Water Quality Treatment

The purpose of this requirement is to reduce pollutant loads and concentrations in site generated stormwater runoff using physical, biological, and chemical removal processes. Regulated projects, including the proposed project, have three options, listed in preference order, to treat runoff.

- LID treatment systems involve harvesting and use, infiltration, or evapotranspiration storm water control measures to collectively retain storm water runoff equal to the volume of runoff generated by the 85th percentile 24-hour storm event.
- Biofiltration treatment systems remove pollutants through the use of natural systems, such as swales or filter strips. Must demonstrate that the swale can treat site runoff of 0.2 inches per hour over a 24-hour period or 2 times the 85th percentile storm without causing scour, erosion, or channeling.
- Non-Retention based treatment systems – “end of pipe” treatment approaches must treat the volume generated by the 85th percentile 24-hour storm event. This is the least preferred option and there must be good reasoning to go this route.

The storm water quality portion of the site design is directed by PR2, which has the purpose of reducing pollutant loads and concentrations in storm water generated on site. As noted above, a technical exemption from this standard ~~will be required~~ was approved by County Public Works in order to mitigate for potential landslide and slope stability hazards by lining rain gardens with clay to prevent over-saturation of underlying soils. The intent of this requirement would be met in the design by implementing a combination of LID treatment systems, in the form of bio-swales and rain gardens. The bio-retention swales function as water transport, filtering, and settling devices. They perform these three functions by first collecting flow from the impervious areas across the site. Then, by having a combination of soil and rock media to filter out contaminants. And lastly, by staggering flow at checkdams to increase transport time and allow settling to occur. The raingardens are the main source of stormwater treatment on the site. They receive flows from the swales and provide a combination of filtering and flow staggering. Once runoff enters a raingarden, it will be filtered through an 18" deep vegetative soil layer that filters out and traps contaminants. The runoff will then be collected by subdrains within an underlying layer of crushed rock, for discharge to the project's storm drain system. This discharge is required because the site's steep slopes may be destabilized by concentrated infiltration of runoff underneath the project's many proposed rain gardens. Since the raingardens are built with an impermeable base, during larger storms that the underdrain is not sized for, the raingarden will fill and discharge into an overflow pipe that is connected to the piped stormwater system.

To meet the treatment requirements set by PR2 the bio-retention filtration system needs to be capable of treating site runoff given a 0.2 inches per hour rainfall intensity loading rate and assumes an infiltration rate of 5 inches per hour, thus requiring a treatment area equal to 4% of the impervious area in each watershed area. In order to implement these systems the impervious areas of the site are sloped so that runoff is directed to the bio-retention swales and transported to the rain gardens. This two phased system will remove a large percentage of the contaminants. As seen in Table 4.8-4 below, which breaks down treatment calculations per

watershed, the area of rain garden treatment that will be provided meets the minimum 4% requirement.

Table 4.8-3. Rain Garden Sizing Summary

Watershed	Impervious Area (square feet)	Treatment Area Required (square feet)	Treatment Area Provided (square feet)
A1			440
A2	22,900	916	580
B	49,072	1,963	2,058
C1			480
C2	27,800	1,112	860
D	86,700	3,468	3,747
E	23,100	924	2,190
F	69,396	2,776	2,897
G	27,200	1,088	1,423
H	17,200	688	751
I	22,400	896	2,883
J	0	0	0
K	9,400	376	2,298
L	27,800	1,112	1,174
M	7,100	284	1,530
N	21,800	872	960
O	0	0	0
P	0	0	0
Q	0	0	0
R	0	0	0
Total Area	411,868	16,475	24,271

Source: Sherwood 2014

Performance Requirement 3 – Runoff Retention

The purpose of this requirement is to retain the beneficial uses of a project's receiving waters. To meet this requirement a volume of water determined by a formula set in the San Luis Obispo Post Construction Requirement Handbook must be retained on site. Although the project is

exempt from this requirement, criteria to conform and limiting site constraints were addressed in the hydrology report (Sherwood 2014).

Performance Requirement 4 – Peak Management

The purpose of this requirement is to retain the beneficial uses of a project's receiving waters. The requirement is to manage peak flow storm water runoff. The project designer will need to demonstrate that post-development peak flows discharged from the site do not exceed pre-project peak flows for the 2- through 10-year storm events in the storm water control plan. Though the project is exempt from this requirement, methods to meet the retention quantities are addressed in the hydrology report (Sherwood 2014).

Based on the proposed design of the project, which incorporates existing standards and regulations identified by the County and RWQCB, including preparation and implementation of construction and operational erosion and sedimentation control, SWPPP preparation and implementation, and management and filtration of stormwater, potential impacts would be less than significant.

Discharge into Surface Waters or Alter Water Quality

Based on the extensive amount of grading and excavation required during construction of the project, there is a potential for significant erosion and sedimentation to occur, resulting in a potentially significant impact. Compliance with existing County and RWQCB regulations, including preparation of a SWPPP, will be required.

In the long-term, as described above, the proposed project incorporates the use of LID strategies including sloping all impervious surfaces and runoff from structure roofs towards vegetated swales and rain gardens prior to being discharged from the site via a stormwater pipe system. The bio-retention swales function as water transport, filtering, and settling devices. During larger storms, the raingarden will fill and discharge into an overflow pipe that is connected to the piped stormwater system.

Therefore, potential impacts to surface waters and water quality would be less than significant.

Change the Quality of Groundwater

Construction and implementation of the project would not result in adverse effects to groundwater. Water supply for the proposed project would be provided by CSA 12.

Create or Contribute Runoff Water Exceeding Capacity of Drainage Systems

Based on the hydrological analysis conducted for the project (Sherwood 2014), which is described in detail above and included in Appendix F of this EIR, the proposed project would not create or contribute runoff water exceeding the capacity of existing drainage systems.

Change Rate/Amount of Soil Absorption or Surface Runoff

Based on the hydrological analysis conducted for the project (Sherwood 2014), which is described in detail above and included in Appendix F of this EIR, and incorporation of design measures identified in the study consistent with County standards, the proposed project would not change the rate or amount of surface runoff. Soil absorption would be reduced; however, stormwater runoff currently discharges into the ocean and does not contribute to groundwater resources for the area. In addition, percolation of stormwater is identified as a potential hazard

due to underlying geologic conditions, and measures are proposed to reduce the potential for a hazard. Therefore, the project would not result in a significant impact.

Result in Substantial Sedimentation, Erosion, or Flooding

As noted above, during construction the project has the potential to result in substantial sedimentation and erosion. Compliance with existing regulations imposed by the County and RWQCB are required. The proposed project would not contribute to localized or regional flooding, due to its location on the coastline. In the event of a 100-year storm or greater, stormwater would flow from the project site into the Pacific Ocean, following filtration through the proposed onsite drainage system.

Involve Activities in the 100-year Flood Zone

Based on review of FEMA flood insurance rate maps, the project site is not located within a 100-year flood zone; however, a Special Flood Hazard Area subject to 1% annual flood (100-year flood zone) is located adjacent to the project site, at elevation 24, which covers Avila Beach Drive. During a major storm event, coastal flooding may extend to the base of the project site on the roadway, and may inhibit access. In these instances, temporary evacuation of the project site may be implemented by the Harbor District. Therefore, potential impacts would be less than significant.

Change Quantity/Movement of Surface or Groundwater

The proposed project would obtain water from the Lopez Lake Reservoir, via CSA 12. Based on estimated water demand (refer to EIR Section 4.8), the proposed demand is within the existing agreement between the Harbor District and CSA 12, and would not change the quantity or movement of groundwater. The proposed project does not include any modifications to existing drainages on or near the project site, and would not affect flow within these drainages.

Adversely Affect Community Water Service Provider

The proposed project would obtain water from CSA 12, which has adequate water supply to serve the project. The Harbor District has an existing agreement with CSA 12 for water use, which would include the proposed project. The project would not affect nearby Avila Beach CSA.

Risk Exposure to Flooding or Inundation

As noted above, the 100-year flood zone extends across Avila Beach Drive. Based on estimates of sea level rise, and assuming 5.48 feet of sea level rise by the year 2100, coastal flooding in the future may reach the 30-foot elevation (base sea level) during a storm event. Increased wave action and storm surge may increase this level. Affected areas of the project site may include the access roads and lower parking areas. Exacerbated coastal erosion may compromise the commercial structure, swimming pool, and lower campsites. In the future, modifications to the site may be required to adapt to climate change and sea level rise, and may include removal of structures or features. Based on the lower elevations of the Port and community of Avila Beach, the effects would occur along the Avila coastline, and regional adaptation measures would be required for the region. In order to plan for and further mitigate potential future effects resulting from sea level rise, the following mitigation is recommended:

HYD/mm-1 Prior to occupancy of the proposed project, the Harbor District or their designee shall develop a Sea Level Rise Adaptation Plan including, but not limited to, the

Harbor District's (or their designee's) ongoing documentation of high tide elevation levels and coastal storms, the future removal of structures and features as a result of sea level rise and associated coastal hazards including erosion and slope stability, and indicators that the lower facility amenities may be compromised by sea level rise (i.e., wave action overtops and floods Avila Beach Drive and erodes the road cut adjacent to the project site). The initial plan, and subsequent revisions based on actual conditions, shall be submitted to the County of San Luis Obispo Environmental Coordinator for review and approval.

The site may also be affected by a tsunami event, which would also be exacerbated by sea level rise. In the short-term, the upper elevations of the project site would be protected from elevated sea level during a tsunami event, and would provide a safe haven. Emergency evacuation would occur via Avila Beach Drive or Diablo Canyon Road, depending on the advance notice and implementation of County and Harbor District evacuation orders. Based on compliance with existing emergency response plans, potential impacts would be less than significant.

4.8.6 Cumulative Impacts

The cumulative impact scenario includes build-out under the Port Master Plan. The Port Master Plan Final Program EIR, which included an assessment of the development of Harbor Terrace, identified potentially significant but mitigable impacts that would occur as a result of build-out of the Master Plan. Potential impacts include increased impervious surfaces, erosion potential, and stormwater runoff (less than significant with mitigation), discharge of hazardous materials into the ocean (less than significant with mitigation), increased potential for erosion during construction (less than significant with mitigation), and potential for release of hazardous materials into San Luis Bay (less than significant with mitigation). Projects located outside of the Harbor District that may affect hydrological resources in the region include the Avila Tank Farm remediation, general plan amendment, and development project. Analysis of the Avila Tank Farm project is anticipated to include an evaluation of water supply and hydrological effects, and compliance with existing regulations would be required. Discretionary projects in the Avila Urban Area and San Luis Bay Estates are required to comply with local and state stormwater regulations and the County Code.

Analysis of the proposed project included a site-specific hydrology study, and incorporation of measures and standards identified in County policy documents to address stormwater runoff rates and quality. Based on the design of the project, and compliance with existing regulations, the project would not result in a cumulatively considerable impact to water resources.

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