3.1.4 Hydrology/Water Quality

This section describes existing hydrologic and water quality conditions within the Project site and vicinity, identifies regulatory requirements and industry standards associated with hydrologic and water quality issues, and evaluates potential impacts and mitigation measures related to implementation of the Proposed Project.

The 1981 and 1983 EIRs identified flood control impacts as significant but mitigable and impacts to water quality as less than significant.

The 1981 EIR noted that: (1) during construction, exposed ground surfaces potentially would lead to increased erosion and increased siltation in downstream areas; (2) approximately one-third of the site would be impervious post development, and (3) the project would contribute to an overall cumulative effect of increased pollutants in runoff. Mitigation within the 1981 EIR included erosion control measures and runoff baffling devices to serve as mini-siltation basins.

Within the 1983 EIR, a number of facilities were identified as being located within the 100-year floodplain for the San Luis Rey River and/or Horse Ranch Creek, including several proposed structures and portions of Pankey Road, Pala Mesa Drive and local access roads. Similar to the 1981 EIR, the 1983 EIR concluded that development of the project would create imperious surfaces that would result in increased runoff and peak flows in downstream watercourses. Due to the small nature of the increase, however, these impacts were identified as less than significant. Mitigation identified for impacts associated with flooding included elevating all building pads and roadways above the 100-year floodplain and precluding development within the floodway. As stated in the 1983 document, water quality would be impacted by runoff from primarily pesticides and fertilizers associated with agricultural use of the property, as well as petroleum products and detergents associated with urban land uses. The property also would be subject to erosion and increased sedimentation. Water quality impacts were not assessed as significant in the 1983 EIR.

Since certification of the 1981 and 1983 EIRs, the specific proposed uses and layout of the site have changed, as has the regulatory framework. The San Diego RWQCB Water Quality Control Plan for the San Diego Basin (1994) has been prepared and updated annually as appropriate. NPDES requirements for municipal, construction and groundwater effects are new since 1983. In addition, pursuant to the NPDES Municipal Permit requirements, the County now addresses storm water management under new sources such as the Standard Urban Storm Water Mitigation Plan (SUSMP; most recently updated in September 2012). New ordinances related to storm water management and water quality control are in effect, as well as associated design practices. These changed conditions have resulted in the need for new evaluation of these issues specific to the current Proposed Project, as discussed below.

A number of technical studies related to hydrology and water quality have been prepared for the Proposed Project, including the following: (1) Preliminary CEQA Hydrology/On-site Drainage Study (Hydrology Study, PDC 2013a); (2) Preliminary Major Storm Water Management Plan (SWMP, PDC 2013b); (3) Horse Ranch Creek Floodplain Study (PDC 2013c); (4) San Luis Rey River Floodplain Study (Chang Consultants [Chang] 2013a); (5) Preliminary Hydromodification

Management Study (PHMS, PDC 2013d); and (6) Hydromodification Screening for Campus Park West (Chang 2013b). These studies are summarized below along with other applicable data, with the complete reports included in Appendices L (Hydrology Study, PHMS and Hydromodification Screening), M (SWMP), N (Horse Ranch Creek Floodplain Study), and O (San Luis Rey River Floodplain Study) of this EIR.

3.1.4.1 *Existing Conditions*

Watershed and Drainage Characteristics

The Project site is located within the San Luis Rey Hydrologic Unit (HU), one of 11 major drainage areas identified in the San Diego RWQCB *Water Quality Control Plan for the San Diego Basin* (Basin Plan, 1994 as amended). The San Luis Rey HU is a generally rectangular-shaped area encompassing approximately 565 square miles, and extends from near the San Diego/Riverside county line and Volcan Mountain along the eastern boundary of the San Diego Basin to the City of Oceanside on the coast (Figure 3.1.4-1, Project Location within Local Hydrologic Designations). The San Luis Rey HU is divided into a number of hydrologic areas and subareas based on local drainage characteristics, with the Project site located within the Lower San Luis Hydrologic Area (HA) and the Bonsall Hydrologic Subarea (HSA). Drainage within the San Luis Rey HU is predominantly through the San Luis Rey River and associated tributaries, with the river located adjacent to the southernmost portion of the Project site. The San Luis Rey River continues generally west and south from the site vicinity, and enters the Pacific Ocean in the city of Oceanside approximately 16 miles to the southwest (with related on- and off-site drainage patterns outlined below). Average annual precipitation in the Project site vicinity (Fallbrook) is approximately 13.2 inches, with much of this (approximately 83 percent) occurring during the period of November through March (weather.com, last reviewed April 2013).

The Project site is primarily undeveloped, with on-site land use consisting of previously disturbed and undisturbed vacant land, minor agricultural activities (orchards), and facilities associated with a radio-controlled model airplane club (e.g., parking areas and take-off/landing strips). Existing drainage facilities located within the Project site and adjacent areas include five culverts extending beneath I-15, two bridge crossings of Horse Ranch Creek along Pankey Road (including one each on the north and south sides of SR-76), a bridge crossing of Horse Ranch Creek along SR-76, and a culvert extending beneath SR-76 from a natural on-site sump area (with additional discussion provided below). Downstream drainage facilities include several bridge crossings along the San Luis Rey River at roadways including I-15, Old Highway 395, SR-76, and I-5.

Surface drainage within the Project site and related watershed areas flows generally west to east, and occurs as both confined (point) and unconfined (sheet) flow. The entire Project site is tributary to the San Luis Rey River, either directly or via Horse Ranch Creek, which is adjacent to portions of the site. Specifically, Horse Ranch Creek flows generally south along the eastern site boundary north of SR-76, and crosses under both Pankey Road (North Pankey Bridge) and SR-76 via existing bridge structures. South of SR-76, drainage in the creek continues generally south along the western Project site boundary, flows beneath an existing bridge structure in Pankey Road (South Pankey Bridge), and enters the San Luis Rey River near the southernmost

portion of the Project site. Existing site drainage is divided generally into four watershed areas (or systems) in the Project Hydrology Study, designated as Systems 100E through 400E (with 100E through 300E located entirely north of SR-76, and 400E located entirely south of SR-76). The four Project drainage systems are summarized below, and are depicted on Exhibits A-1 and A-2 of the Project Hydrology Study (PDC 2013a in Appendix L).

System 100E

System 100E includes approximately 275 acres, and is located primarily in off-site areas west of I-15. Off-site drainage in this watershed flows into the northern portion of the site (north of Pala Mesa Drive) through a number of the existing culverts extending beneath I-15. Flows in System 100E within the site (including drainage from the described off-site areas) moves generally east through several small natural drainages, which discharge into Horse Ranch Creek along the eastern site boundary upstream (north) of an existing bridge on Pankey Road (North Pankey Bridge). Existing peak 100-year storm flow[1] from System 100E is approximately 370.2 cubic feet per second (cfs).

System 200E

This area includes approximately 40.3 acres located in the southeastern portion of the site (north of SR-76). This area drains generally southeast through the site via a number of small drainage courses, and enters Horse Ranch Creek downstream (south) of the North Pankey Bridge, but north of SR-76. Existing peak 100-year storm flow from System 200E is approximately 48.6 cfs.

System 300E

System 300E encompasses approximately 95.5 acres, including on-site areas in the southwestern portion of the site (north of SR-76) and off-site areas west of I-15. Off-site drainage in this watershed flows into the southwestern portion of the site via a number of the existing culverts extending beneath I-15. Within the site, drainage in this watershed flows generally east-southeast, and enters a natural sump area in the southwestern corner of the property, just north of SR-76. Based on analyses conducted as part of the Project Hydrology Study and a previous investigation associated with the adjacent SR-76 corridor (URS 2007), this sump has adequate capacity to retain flows from smaller storm events, and has a single outlet consisting of a 72-inch diameter culvert that extends under SR-76. During larger storm events, flows from the on-site sump discharge through the noted culvert and flow east-southeast for approximately 150 feet before entering Horse Ranch Creek. Existing peak 100-year storm flow from System 300E is approximately 151.3 cfs.

System 400E

This system includes approximately 11.9 acres located south of SR-76. Runoff within this area consists entirely of overland (sheet) flow that drains directly into nearby portions of Horse Ranch Creek and the San Luis Rey River. A portion of this runoff enters a concrete channel that discharges into Horse Ranch Creek south of the SR-76 bridge, with this channel constructed in

[1] A 100-year storm is defined as an event with a one percent chance of occurring in any given year.

association with recent improvements to SR-76. Existing peak 100-year storm flow from System 400E is approximately 24.5 cfs.

Flood Hazards

The Federal Emergency Management Agency (FEMA) has mapped flood hazards on the Project site and vicinity. The northern portion of the Project site (north of SR-76) is designated as Zone X, or areas determined to be outside the 500-year (and 100-year) floodplain (FEMA 2012a and 2012b). Portions of the site located south of SR-76 (including areas proposed for commercial use) are within the identified 100-year FEMA floodplain boundary associated with the San Luis Rey River.

In addition to the described FEMA mapping, pre-development 100-year floodplains have been mapped along local segments of Horse Ranch Creek and the San Luis Rey River in the floodplain analyses conducted for the Proposed Project (refer to PDC 2013c and Chang Consultants 2013a in Appendices N and O). These floodplain studies involved preparation of Hydrologic Engineering Center-River Analysis System (HEC-RAS) models for the noted areas, with the following conclusions (refer to Figure 3.1.4-2, Existing Conditions Floodplain Map): (1) the mapped 100-year floodplain along Horse Ranch Creek encroaches into portions of the Project site both north and south of SR-76, including areas proposed for development; and (2) the mapped 100-year floodplain along the San Luis Rey River encroaches into the project site south of SR-76, including areas proposed for development.

Groundwater

While no known information regarding active or abandoned groundwater wells is available for the Project site, groundwater was observed on site at depths of between 13 and 18 feet below the surface in all four exploratory borings conducted as part of the 2012 Geotechnical Investigation (Appendix I). This investigation also notes that observed groundwater depths generally decrease to the north, with previous geotechnical investigations encountering groundwater as shallow as three feet below the surface of alluvial deposits in the northern portion of the Project site (Leighton 2012).

Shallow groundwater was also reported at several nearby locations during geotechnical and hazardous material investigations of the adjacent Campus Park property, including areas near the San Luis Rey River and Horse Ranch Creek (GeoSoils 2002; Shepardson 2007, 2006, 2005 and 2003). Observed groundwater in these areas was present at depths ranging between approximately 1.5 and 12 feet below the surface in alluvium, and 28 to 56 feet below surface grade in bedrock deposits. A number of abandoned wells located along nearby sections of the San Luis Rey River were reportedly used for irrigation of agricultural operations conducted on the Campus Park site between the 1940s and early 1980s (Pankey 2005). In addition, several abandoned wells are present on off-site properties to the north and northeast (including the Campus Park property), with these wells also associated with previous agricultural operations and/or domestic use. Production rates for historic use of the described wells along the San Luis Rey River were estimated at up to 1,000 gallons per minute (gpm, Pankey 2005), although no

associated documentation is known to be available (and no known production data are available for any of the other noted off-site wells).

Water Quality

On-site and Vicinity Water Quality

Surface water within the Project site consists of intermittent flows from storm events and runoff from agricultural or landscape irrigation. No known surface water quality data are available for the Project site, with storm and irrigation flows typically subject to variations in water quality due to local conditions such as runoff rates/amounts and land use. A summary of typical pollutants sources and loadings for various land use types is provided in Table 3.1.4-1, Summary of Typical Pollutant Sources for Urban Storm Water Runoff, and Table 3.1.4-2, Typical Loadings for Selected Pollutants in Runoff from Various Land Uses.

Known water quality data for off-site areas in the immediate Project site vicinity are limited to two samples collected in 2002 and 2009 at the adjacent Campus Park property to the northeast (GeoSoils 2009, 2002). Both samples were taken from an outlet pipe originating in an adjacent mixed use (avocado/citrus) orchard. The 2002 sample was tested for pollutants including agricultural pesticide residue, total petroleum hydrocarbons (gas and diesel), pH, organic lead, and nitrates, while the 2009 sample was tested for nitrates only. The results of the 2002 test indicated that observed levels of organophosphorus pesticides, chlorinated pesticides/herbicides, petroleum hydrocarbons, and lead were all below detection limits, with an observed pH of 6.7, or neutral (GeoSoils 2002). The observed nitrate level from the 2002 sample was 43 mg/l, while the nitrate level from the 2009 sample was 9.5 mg/l. Both of these sample results are below the Basin Plan nitrate standard identified in the referenced GeoSoils reports. The Maximum Pollutants Level relative to drinking water standards for nitrate is 10 mg/l, with the described outlet pipe not known (or proposed) to be used as a potable water source. While flows from the off-site outlet on the Campus Park property are not directly tributary to the Project site, they ultimately drain to either Horse Ranch Creek or the San Luis Rey River, both of which are adjacent to (and receive runoff from) the Project site.

Based on the nature and generally low to moderate intensity of existing development within the Project site and upstream areas, as well as the described off-site sampling data, local surface water quality is expected to be generally moderate. This anticipated condition is qualified somewhat by the presence of local agricultural operations, which are considered the likely source of nitrate levels observed in the off-site surface water samples.

No documented data on groundwater quality within the Project site and immediate vicinity are known to be available. The previously noted off-site wells along the San Luis Rey River reportedly exhibited total dissolved solids (TDS) levels of approximately 400 to 500 mg/l during the 1960s. In addition, one of the described off-site wells located on the adjacent Campus Park property was reportedly drilled in the 1970s but never used for irrigation due to “high TDS levels” (Pankey 2005).

Off-site Water Quality

Receiving waters associated with the Project site include Horse Ranch Creek, the San Luis Rey River and the Pacific Ocean. Existing water quality data for these areas include quantitative and qualitative monitoring and/or testing results, biological assessment (bioassessment) studies, and 303(d) impaired water evaluations conducted by the State Water Resources Control Board (SWRCB) and RWQCB. An overview of monitoring and reporting data from a number of representative sources is provided below, followed by a summary evaluation of overall water quality conditions within the Project site and related watersheds.

Surface Water Quality Monitoring Data

Historic and current water quality monitoring has been/is being conducted within the San Luis Rey River watershed in association with local, regional and statewide water agency programs; as well as requirements under the federal CWA, NPDES, and the associated Municipal Storm Water Permit (refer to the discussion of Regulatory Framework below for additional information).

Wet weather monitoring at the San Luis Rey River Yuma site (located approximately 10 miles downstream of the Project site) was conducted between 1993 and 1998 for numerous physical, chemical and biological parameters. These tests documented that applicable water quality objectives were regularly exceeded for fecal coliform, semi-volatile compounds, and total petroleum hydrocarbons; frequently exceeded for metals (including copper and zinc), nitrogen, and total suspended solids (TSS); and occasionally exceeded for biochemical oxygen demand (BOD) and chemical oxygen demand (COD, MEC Analytical Systems, Inc. [MEC] 2001). Wet weather monitoring has been conducted at the San Luis Rey River mass loading station (MLS, located approximately 15 miles downstream of the project site) between 2001 and 2009, and in 2010/2011 (with no monitoring conducted in 2009/2010 or 2011/2012). Additional wet weather monitoring along the San Luis Rey River was conducted at two temporary watershed assessment stations in 2010/2011 (TWAS-1 and TWAS -2, located approximately 4.5 and 9.3 miles downstream of the project site, respectively). Monitoring efforts at the MLS and TWAS sites involved a similar suite of pollutants as noted above, along with additional parameters such as chemical pesticides/herbicides and toxicity to select aquatic organisms (and no monitoring conducted at these sites in 2011/2012). The resulting data indicate that applicable water quality objectives were exceeded most recently at a high or medium frequency for TDS, fecal coliform, pH, TSS, turbidity, toxicity, total phosphorus and pesticides (diazinon and malathion); and were exceeded at a low frequency for pollutants including nutrients (Weston Solutions, Inc. [Weston] 2013, 2012, 2011, 2010).

Jurisdictional dry weather sampling was conducted most recently in 2011 at a number of locations both up- and downstream of the Project site. These efforts documented that water quality objectives were most commonly exceeded for nitrate, turbidity and MBAS (methylene blue active substances, including surfactants from sources such as detergents); and less commonly for pollutants including conductivity, ammonia, and enterococcus and total coliform bacteria (Weston 2013).

Bioassessment studies have been conducted at two downstream locations as part of the NPDES Municipal Storm Water Permit requirements between 2001 and 2011 (with only one site tested in 2001). Bioassessment testing involves evaluation of the taxonomic richness and diversity of benthic macroinvertebrate (BMI) communities, with all tested sites ranked for the condition of BMI communities. Test results for all samples at the noted locations exhibited poor or very poor ratings, reflecting (at least in part) generally poor local water quality conditions (Weston 2012, 2011, 2010, 2008, 2007 and 2005; MEC 2005, 2004 and 2003).

Sampling was conducted in 2004 at two sites along the San Luis Rey River under the California Surface Water Ambient Monitoring Program (SWAMP). The two noted sites include one location each up- and downstream of the Proposed Project, with the upstream sample exceeding turbidity standards and the downstream sample exceeding standards for sulfate and manganese (Weston 2008).

The City of Oceanside conducted water quality monitoring between November 1993 and July 2001 at three locations along the San Luis Rey River, including the SR-76 crossing and the previously described Yuma and MLS sites. Data from these efforts identified "[p]arameters that exhibited consistently high concentrations…" including bacterial indicators, TDS, chloride, magnesium, iron, and manganese (City of Oceanside 2003).

Ambient bay and lagoon monitoring was conducted for a number of coastal waters between 2002 and 2005, including the San Luis Rey River Estuary. The intent of this program was to document conditions including sediment chemistry, toxicity and ecological community structure, as well as to provide indications of the overall status of marine life and determine priorities for additional investigations and remedial actions. Samples from the San Luis Rey River Estuary exhibited generally high individual and overall (i.e., relative to other sampled embayments) quality rankings for sediment chemistry and toxicity, and low to moderate rankings for benthic community structure (Weston 2007).

Groundwater Quality Monitoring Data

Available information on groundwater quality includes historic and/or recent data for the Mission and Bonsall HSA Groundwater Basins, as well as the San Luis Rey River Valley Basin. The Bonsall HSA Basin encompasses the project site and proximal downstream areas (and coincides with the Bonsall HSA boundary depicted on Figure 3.1.4-1), while the Mission HSA Basin includes areas further downstream within the San Luis Rey River HU. An evaluation of potential groundwater storage capabilities conducted for the SDCWA identified TDS ranges of 1,000 to 3,100 mg/l in the Mission HSA Basin, and 600 to 3,100 mg/l for the Bonsall HSA Basin (Woodward-Clyde Consultants 1990). These levels represent generally moderate to poor water quality conditions, although local variation was present. More recent data for the Mission HSA Basin also indicate generally moderate to poor groundwater quality conditions, as characterized by typical TDS levels of 1,200 to 1,600 mg/l (SDCWA 1997). The described groundwater quality conditions are likely associated, at least in part, with extensive agricultural use in the associated watersheds.

Historic groundwater quality in the southwestern portion of the San Luis Rey Valley Basin was described as exhibiting magnesium, sulfate, chloride, nitrate, iron and TDS levels that were unsuitable for domestic use, as well as chloride and TDS levels unsuitable for irrigation (California Department of Water Resources [DWR] 2003). An additional assessment of groundwater quality conducted for the San Luis Rey Valley Basin identified a TDS range of 530 to 7,060 mg/l (with an average of 1,258 mg/l), and documented a number of incidents where water quality objectives (or maximum pollutants levels [MCLs]) were exceeded for pollutants including nitrates and pesticides (SWRCB 2003). The described data indicate generally moderate to poor quality within the southwestern potion of the San Luis Rey Valley Basin, with these conditions associated with factors including urban/agricultural development and seawater intrusion in coastal areas.

Section 303(d) Impaired Water Bodies and Total Maximum Daily Loads

The SWRCB and RWQCBs produce bi-annual qualitative assessments of statewide and regional water quality conditions. These assessments are focused on CWA Section 303(d) impaired water listings and scheduling for assignment of total maximum daily load (TMDL) requirements. States are required to identify and document any and all polluted surface water bodies, with the resulting documentation referred to as the *Clean Water Act Section 303(d) List of Water Quality Limited Segments*, or more commonly the 303(d) list. This list of water bodies identifies the associated pollutants and TMDLs, along with pollutant sources and projected TMDL implementation schedules/status. A TMDL establishes the maximum amount of an impairing substance or stressor that a water body can assimilate and still meet water quality standards, and allocates that load among pollution contributors. TMDLs are quantitative tools for implementing state water quality standards, based on the relationship between pollution sources and water quality conditions. The most current (2010) approved 303(d) list identifies the following impaired waters in downstream watersheds (SWRCB 2012):

- The lower portion of the San Luis Rey River (west of I-15) is listed as impaired for chloride, enterococcus and fecal coliform bacteria, phosphorus, total nitrogen, toxicity and TDS. Potential sources for chloride, bacterial, phosphorus, nitrogen and toxicity impairments include urban runoff/storm sewers, and unknown point and non-point runoff. Potential sources identified for TDS impairment include agricultural runoff, surface mining, golf course activities, industrial point runoff/wastewater, flow regulation/modification, natural sources, urban runoff/storm sewers, and point and non-point runoff of unknown origin. The proposed TMDL completion date for chloride and TDS is identified as 2019, with a TMDL completion date for all other listed pollutants of 2021.
- The upper portion of the San Luis Rey River (east of I-15) is listed as impaired for total nitrogen. Potential sources include unknown non-point runoff, with an associated TMDL completion date of 2021.
- The Pacific Ocean shoreline at the San Luis Rey River mouth is listed for enterococcus and fecal coliform bacteria, with potential pollutants sources including urban runoff/storm sewers and unknown point/non-point runoff. An associated TMDL was adopted by the RWQCB on February 10, 2010, under Order No. R9-2010-0001.

Water Quality Summary

Based on the above information, surface water quality within the Project site and immediate vicinity is assumed to be generally moderate. This conclusion is based on the described data sources, as well as the fact that associated upstream watersheds include primarily low to moderate density development. Monitoring data indicate generally poor water quality conditions in downstream portions of the San Luis Rey River and associated coastal waters, with some variation among individual pollutants. These conditions are associated with the higher level of urban development and associated pollutant generation, as well as the ongoing implementation of water quality control measures. Specifically, the 2010/2011 Urban Runoff Monitoring Report associated with NPDES requirements documents the following long-terms trends at the San Luis Rey MLS: (1) concentrations of bacterial indicators, dissolved phosphorus, ammonia, pH and turbidity are increasing; and (2) concentrations of TDS, total hardness and conductivity are decreasing (Weston 2013, 2012).

Based on the available historic and recent data described above, groundwater quality within the project site and downstream portions of the Bonsall, Mission, and San Luis Rey Valley basins is characterized as generally moderate to poor.

Regulatory Framework

The Proposed Project is subject to a number of regulatory requirements associated with federal, state and local guidelines, as summarized below.

National Pollutant Discharge Elimination System Requirements

The Proposed Project is subject to applicable elements of the CWA, including the NPDES. Specific NPDES requirements associated with the Proposed Project include conformance with the General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit, NPDES No. CAS000002, SWRCB Order 2009-0009-DWQ), General Permit for Discharges from Groundwater Extraction and Similar Discharges to Surface Waters within the San Diego Region Except for San Diego Bay (Groundwater Permit; RWQCB Order No. R9-2008-0002, NPDES No. CAG919002), NPDES Municipal Storm Water Permit (Municipal Permit, NPDES CAS 0108758, RWQCB Order No. 2007-0001), and related County standards as outlined below.

General Construction Activity Storm Water Permit

Conformance with the Construction General Permit is required prior to development of applicable sites exceeding one acre, with this permit issued by the SWRCB under an agreement with the USEPA. Specific conformance requirements include implementing a Storm Water Pollution Prevention Plan (SWPPP), an associated Construction Site Monitoring Program (CSMP), employee training, and minimum best management practices (BMPs), as well as a Rain Event Action Plan (REAP) for applicable projects (e.g., those in Risk Categories 2 or 3, as outlined below). Under the Construction General Permit, project sites are designated as Risk Level 1 through 3 based on site-specific criteria (e.g., sediment and receiving water risk), with

Risk Level 3 sites requiring the most stringent controls. Based on the site-specific risk level designation, the SWPPP and related plans/efforts identify detailed measures to prevent and control the off-site discharge of pollutants in storm water runoff. Depending on the risk level, these may include mandatory technology-based action levels, effluent limitations, and advanced treatment systems (ATS). Specific pollution control measures require the use of best available technology economically achievable (BAT) and/or best conventional pollutant control technology (BCT) levels of treatment, with these requirements implemented through applicable BMPs. While site-specific measures vary with conditions such as risk level, proposed grading, and slope/soil characteristics, detailed guidance for construction-related BMPs is provided in the permit and related County standards (as outlined below), as well as additional sources including the *EPA National Menu of Best Management Practices for Storm Water Phase II – Construction* (USEPA 2012), and *Storm Water Best Management Practices Handbooks* (California Stormwater Quality Association [CASQA] 2009). Specific requirements for the Proposed Project under this permit would be determined during SWPPP development, after completion of Project plans and application submittal to the SWRCB.

General Groundwater Extraction Waste Discharge Permit

The Project would need to apply for coverage under the General Groundwater Extraction Waste Discharge Permit only if construction would discharge extracted groundwater into the receiving water. Conformance with the noted Groundwater Permit is generally applicable to all groundwater discharge regardless of volume, with certain exceptions as noted in the permit text. Specific requirements for permit conformance include: (1) implementing an appropriate sampling and analysis/monitoring program; (2) providing at least 30 days notification to the appropriate local agency prior to discharging to a municipal storm drain system; (3) conforming with applicable water quality standards, including (but not limited to) the Basin Plan, CWA, and State Porter-Cologne Water Quality Control Act; and (4) submittal of applicable monitoring reports.

Municipal Storm Water Permit

This permit identifies waste discharge requirements for urban runoff related to applicable new development, redevelopment, and existing development sites under the jurisdiction of co-permittees (e.g., the County of San Diego). The intent of these requirements is to protect environmentally sensitive areas and provide conformance with pertinent water quality standards, including the CWA and the RWQCB Basin Plan. Identified requirements involve using a number of planning, design, operation, treatment and enforcement measures to reduce pollutant discharges from individual development projects (and the municipal storm drain system as a whole) to the maximum extent practicable (MEP). Specifically, these measures include: (1) using jurisdictional planning efforts (such as discretionary general plan approvals) to provide water quality protection; (2) requiring coordination between individual jurisdictions to provide watershed-based water quality protection; (3) implementing applicable low impact development (LID), site design, source control, priority project, and/or volume- or flow-based (as defined in the permit text) treatment control BMPs to avoid, reduce and/or mitigate effects including

increased erosion and sedimentation, hydromodification[2] and the discharge of pollutants in urban runoff; and (4) using appropriate monitoring, reporting and enforcement efforts to ensure proper implementation, documentation and (as appropriate) modification of permit requirements. The Municipal Permit also requires co-permittees to fund and implement urban runoff management plans (URMPs) to reduce runoff and pollutants discharges to the MEP. The URMPs were conducted on a jurisdictional basis for the first two years, and were expanded to include a watershed-based approach for subsequent efforts. The watershed-based approach is being implemented for the Project site and applicable downstream watersheds through the current San Luis Rey River Watershed URMP (City of Oceanside 2008).

Pursuant to the described Municipal Permit requirements, the County (along with other applicable co-permittees) participated in developing the SUSMP (approved by the RWQCB on June 12, 2002) to address storm water quality issues, and adopted related storm water standards and ordinances as described below under County Requirements. An updated Countywide Model SUSMP was adopted by the co-permittees on February 9, 2010. The County adopted a local (County-specific) SUSMP on February 10, 2003 (per Municipal Permit requirements), with the most recent update of this document adopted in September 2012 to reflect current requirements including the revised 2007 Municipal Permit.

It should also be noted that an update to the current Municipal Permit is pending, and is anticipated to be adopted by the RWQCB sometime in 2013. The updated permit would be more regional in scope, encompassing applicable portions of San Diego, Riverside and Orange counties now covered by separate municipal permits. The new Municipal Permit, while still in draft form as of this writing, may also involve additional and/or modified requirements related to efforts including monitoring/assessment and reporting, use of LID BMPs, hydromodification and runoff management, discharge prohibitions, effluent and receiving water limitations, action levels, and related remedial efforts.

Basin Plan Requirements

The RWQCB Basin Plan establishes a number of beneficial uses and water quality objectives for surface and groundwater resources. Beneficial uses are generally defined in the Basin Plan as "the uses of water necessary for the survival or well being of man, plus plants and wildlife." Identified existing and potential beneficial uses for the Project site and applicable downstream areas of the Mission and Bonsall HSAs (including coastal waters) include: agricultural supply (AGR); industrial service supply (IND); contact and non-contact water recreation (REC 1 and REC 2); biological habitats of special significance (BIOL); warm freshwater habitat (WARM); wildlife habitat (WILD); rare, threatened or endangered species (RARE); marine habitat (MAR); and migration of aquatic organisms MIGR). Identified beneficial uses for groundwater in the Lower San Luis HA include municipal and domestic supply (MUN), AGR and IND. Water quality objectives identified in the Basin Plan are based on established beneficial uses, and are defined as "the limits or levels of water quality constituents or characteristics which are

[2] Hydromodification is defined in the Municipal Permit as the change in natural watershed hydrologic processes and runoff characteristics (infiltration and overland flow) caused by urbanization or other land use changes that result in increased stream flows, sediment transport, and morphological changes in the channels receiving the runoff.

established for the reasonable protection of beneficial uses." Water quality objectives identified for surface and groundwater resources in the Lower San Luis HA and the Bonsall HSA are summarized in Table 3.1.4-3, Surface and Groundwater Quality Objectives for the Lower San Luis HA and the Bonsall HSA.

County of San Diego Requirements

Pursuant to the described NPDES Permit requirements, the County has adopted and/or updated the following related standards: (1) the Watershed Protection, Storm Water Management and Discharge Control Ordinance (Storm Water Ordinance, No. 10096); (2) the associated Storm Water Standards Manual (Storm Water Manual, 2003a) and LID[3] Handbook (2007g); (3) the previously described County SUSMP; (4) the County Jurisdictional URMP (JURMP, 2010d); and (5) the County Grading Ordinance (No. 10179). These sources provide, among other things, direction for applicants to determine if and how they are subject to County and related Municipal Storm Water Permit standards, and identify requirements for the inclusion of permanent LID and site design, source control and/or LID/treatment control BMPs to provide regulatory conformance for applicable projects. The County Storm Water Ordinance/Storm Water Manual also requires construction-related BMPs to address issues including erosion and sedimentation. The County may, at its discretion, require the submittal and approval of a SWPPP to address construction-related storm water issues prior to site development (with such requirements in addition to the NPDES SWPPP criteria described above).

The San Diego County Hydrology Manual (County 2003b) provides uniform procedures for analyzing flood and storm water conditions in the County. Specific elements of these procedures include methods to estimate storm flow peaks, volumes and time distributions. These data are used in the design of storm water management facilities to ensure appropriate dimensions and capacity (typically 100-year storm flow volumes), pursuant to applicable requirements in the San Diego County Drainage Design Manual (County 2005b).

The County Guidelines for Determining Significance – Hydrology (County 2007h), provide direction for evaluating environmental effects to and from hydrologic conditions and hazards. Specifically, these guidelines address potential adverse effects to hydrologic resources, life and property (pursuant to applicable CEQA standards) from issues including drainage alteration, increased water surface elevations, increased runoff velocities and peak flow rates, and flooding. The Hydrology Guidelines identify significance guidelines for the noted issues, as well as related regulatory standards, typical adverse effects, standard mitigation/design considerations, and reporting requirements.

The County Guidelines for Determining Significance, Surface Water Quality (County 2007i), provide direction for evaluating environmental effects related to water quality issues, pursuant to related CEQA standards. The Water Quality Guidelines give an overview of hydrologic resources, local watershed conditions, related regulatory standards and typical adverse effects, and provide guidance for identifying significance guidelines and standard mitigation/design considerations.

[3] The LID process is intended to mimic predevelopment hydrologic conditions by using design practices and techniques to effectively capture, filter, store, evaporate, detain and infiltrate runoff close to its source.

3.1.4.2 *Analysis of Project Effects and Determination as to Significance*

The discussion of potential impacts provided below is applicable to both Project development scenarios (**Scenarios 1** and **2**). Similarly, because of the consistency of hydrology/water quality issues relative to the Project area, the discussion of on-site impacts is also directly applicable to proposed off-site road and utility development unless otherwise noted.

Drainage Alteration

Guideline for the Determination of Significance

A significant impact related to drainage alteration would occur if the Proposed Project would:

1. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off site.

Guideline Source

Guideline No. 1 is from Section 4.0 of the County Guidelines for Determining Significance – Hydrology (County 2007b).

Analysis

As described in Section 3.1.4.1, surface flows within the portion of the Project site and associated off-site watersheds located north of SR-76 drain generally west to east. The majority of this flow moves through the site and enters Horse Ranch Creek along the eastern property boundary. Flows associated with smaller storm events in the southwestern portion of the site (and related off-site areas) are retained in an existing on-site sump; while flows in this area from larger events are discharged to Horse Ranch Creek through an existing outlet structure. Flows in Horse Ranch Creek drain generally to the south and enter the San Luis Rey River near the southernmost site boundary. The portion of the Project site located south of SR-76 drains directly into either Horse Ranch Creek to the west, or the San Luis Rey River to the south. The San Luis Rey River continues generally west from the Project site area and enters the Pacific Ocean in the City of Oceanside. Project implementation would result in some modification of the described on-site drainage patterns and directions through proposed grading and construction. These modifications would not substantially alter the overall described on- and off-site drainage patterns, however, with the Project Hydrology Study concluding that "The Project's drainage patterns mimic the existing conditions…Existing drainage patterns will be maintained." Specifically, the Project design would encompass a number of appropriately designed and located drainage facilities to retain the overall existing drainage features, including the use of similar outlet points for flows discharged from the site. Based on the described conditions, Project-related impacts to drainage alteration would be **less than significant**, including associated erosion and siltation effects (with additional information on potential erosion concerns provided below under the discussion of water quality).

Runoff Rates/Amounts and Related Drainage System and/or Flood Hazards

Guideline for the Determination of Significance

A significant impact related to runoff, drainage systems and related flooding would occur if the Proposed Project would:

2. Result in increased velocities and peak flow rates exiting the Project site that would cause flooding downstream or exceed the storm water drainage system capacity serving the site.

Guideline Source

Guideline No. 2 is from Section 4.0 of the County Guidelines for Determining Significance – Hydrology (County 2007b).

Analysis

Implementation of the Proposed Project would result in the construction of impervious surfaces including pavement and structures, with such areas increasing both the rate and amount of runoff within the site by reducing infiltration capacity and concentrating flows. Proposed on-site storm drain facilities include a series of graded pads, public/private streets, gutters, curb inlets and catch basins, all of which would be tied to an underground storm drain system of pipelines and related structures. The proposed storm drain system would accommodate peak 100-year storm flows and be designed so that off-site flows from the west do not comingle with on-site flows (except for minor drainage from the northernmost Caltrans storm drain tributary to the site). This design is intended to allow applicable portions of on-site flows (in addition to those from the noted Caltrans facility) to be treated prior to off-site discharge, per applicable regulatory requirements (as outlined below under the discussion of water quality). The Project Hydrology Study (Appendix L) includes an assessment of pre- and post-development runoff rates and amounts within and from the site, including analyses of Project-related effects to existing/proposed storm drain systems, off-site flows, and related downstream flooding hazards. Calculated post-development flows from the Project site are summarized below for the proposed drainage systems, along with the previously described existing flows (refer to Figure 2 of the Project Hydrology Study in Appendix L for a depiction of post-development drainage system boundaries). In addition, a number of minor modifications to existing off-site drainage structures are proposed in association with off-site project roadway facilities, with these modifications discussed separately below.

System 1000P/100P

This system includes proposed flows from both on-site (1000P) and off-site (100P) areas, and corresponds to existing System 100E described in Section 3.1.4.1. The combined peak 100-year flow in System 1000P/100P is calculated at 358.9 cfs, which represents a net reduction of 11.3 cfs from the existing flow of 370.2 cfs in System 100E. This reduction results from changes in the time of concentration (TOC) associated with the two respective hydrographs. The TOC is generally defined as the time required for water to travel from the hydraulically most distant

point in a watershed to the outlet. Based on the fact that the Proposed Project would result in a net reduction of peak 100-year flows in System 1000P/100P, no associated detention is proposed. The Project design includes the use of appropriate energy dissipation facilities (e.g., riprap aprons) at the two proposed discharge locations in this system to address the Project-related increase in flow velocity.

System 2000P

This system includes proposed flows from on-site development areas that drain southeast to Horse Ranch Creek, and corresponds to existing System 200E described in Section 3.1.4.1. The calculated peak 100-year flow in System 2000P is 280.1 cfs, which represents a net increase of 231.5 cfs from the existing flow of 48.6 cfs in System 200E. The Project Hydrology Study concludes that detention for 100-year peak flows in this system would not be warranted, based on the following considerations (with additional discussion provided in Sections 3.5 and 3.6 of the Project Hydrology Study in Appendix L): (1) the Project site is located at the downstream end of the Horse Ranch Creek watershed, with the peak flow entering the creek from the Project to occur prior to the peak flow in the overall creek watershed (and therefore resulting in only a minimal increase of overall peak flows in Horse Ranch Creek); and (2) based on the timing of peak flow conditions described in item 1, detention (i.e., delayed discharge) of peak flow from the Project site would actually increase the overall peak flow in Horse Ranch Creek. The Project design also includes the use of appropriate energy dissipation facilities at the three proposed discharge locations in this system to address the Project-related increase in flow velocity.

System 3000P/300P

This system includes proposed flows from both on-site (3000P) and off-site (300P) areas, and corresponds to existing System 300E described in Section 3.1.4.1. The combined peak 100-year flow in System 3000P/300P is calculated at 159.2 cfs, which represents a net increase of 7.9 cfs from the existing flow of 151.3 cfs in System 300E. The Project Hydrology Study concludes that detention for peak 100-year flow in this system would not be warranted for similar reasons as noted above for System 2000P, as well as the fact that Project-related grading would reduce the overall area draining to the on-site sump in this system (refer to Section 3.1.4.1). Accordingly, post-development flows would not exceed the capacity of the 72-inch outlet pipe from this sump. The Project design also includes the use of appropriate energy dissipation facilities at this proposed discharge point to address the Project-related increase in flow velocity.

System 4000P

This system includes proposed flows from on-site development in areas located south of SR-76, and corresponds to existing System 400E described in Section 3.1.4.1. The calculated peak 100-year flow in System 2000P is 67.5 cfs, which represents a net increase of 43 cfs from the existing flow of 24.5 cfs in System 400E. The Project Hydrology Study concludes that detention for peak 100-year flow in this system would not be warranted, for similar reasons as described above for System 2000P. Post-development flows from this system would be discharged directly into Horse Ranch Creek via an outlet pipe located south of the SR-76 Bridge. This would entail an increase in flow concentration relative to the existing system runoff, which sheet flows

directly into Horse Ranch Creek and the San Luis Rey River. The Project Hydrology Study concludes that this is not a major concern, however, due to the minor amount of this flow relative to flows in Horse Ranch Creek, as well as the fact that flows are discharged directly into the creek (i.e., without having to flow through any adjacent properties). The Project design also includes the use of appropriate energy dissipation facilities at this proposed discharge point to address the Project-related increase in flow velocity. Under **Scenario 2** for the Project, the calculated peak 100-year flow in System 2000P would be 76.6 cfs, or a net increase of 52.1 cfs over the existing flow in System 400E. For similar reasons as noted above for **Scenario 1**, however, the Project Hydrology Study concludes that detention for peak 100-year flow in this system under **Scenario 2** would not be warranted (and that appropriate energy dissipation facilities would be provided).

Off-site Drainage Modifications

Proposed off-site facilities involve roadway modifications including widening Old Highway 395 near the Pala Mesa Drive intersection, widening SR-76, and realigning the Shearer Crossing/Pankey Road intersection. The existing drainage patterns and associated facilities in these areas would be preserved to the maximum extent practicable, although some minor modifications may be required, including: (1) widening near Old Highway 395 would likely require adjustments to inlets and other collection points due to the revised curb locations, although existing drainage conditions would not change substantially; and (2) the SR-76 improvements would require minor revisions to associated drainage facilities (overside drains) to accommodate the new edge of pavement locations and collect associated runoff from the elevated roadway.

Summary of Drainage Alteration Impacts

As noted above, Project drainage facilities (including the proposed North Pankey Bridge and improvements associated with off-site roadway modifications) would accommodate peak 100-year storm flows, and the capacity of the existing 72-inch culvert under SR-76 would not be exceeded by Project implementation. The Project Hydrology Study also notes that "[h]ydraulic modeling for the Project's proposed widening of the…Caltrans SR-76 Horse Ranch Creek Bridge indicates that peak existing condition flows exceed the bridge capacity." Based on this condition and the fact that the Proposed Project would result in only a minor increase (0.08 percent) to peak flows in the creek, detention was determined not to be warranted for any of the proposed drainage systems as previously described. It should also be noted, however, that the Project would incorporate four on-site hydromodification/water quality basins as described below in this section. These facilities, while not designed as detention basins for peak 100-year flows (or factored into the associated modeling for Horse Ranch Creek), would provide substantial detention capacity for smaller storm events, with the result that peak 100-year storm flow at the downstream SR-76 bridge crossing would be at or below the existing level (PDC 2013c).

Based on the above discussions, the Project Hydrology Study concludes that the overall peak 100-year flow from the Project site (and applicable off-site areas) into Horse Ranch Creek would represent an increase of approximately 0.08 percent over existing peak flow levels (i.e., without

consideration of the hydromodification/water quality basins, as noted above), and would not adversely increase downstream flooding hazards or the capacity of downstream storm drain systems/facilities. As a result of these considerations and the fact that the on- and off-site drainage system would be designed to accommodate peak 100-year storm flows, potential Project-related impacts associated with increased flow peak flow rates and amounts, associated downstream flooding hazards, and the capacity of existing or planned storm drain systems would be **less than significant.**

Hydromodification

Guidelines for the Determination of Significance

A significant impact related to hydromodification would occur if the Proposed Project would:

3. Exceed applicable hydromodification requirements or conflict with the County's Final Hydromodification Management Plan (HMP; County 2011).

Guideline Sources

Guideline No. 3 is derived from hydromodification requirements included in the previously described RWQCB NPDES Municipal Permit and related County standards.

Analysis

Pursuant to requirements under the NPDES Municipal Permit (as outlined in Section 3.1.4.1 of this subchapter), the County prepared an HMP for Priority Development Projects (PDPs), with the final (adopted) HMP dated March 2011. Specifically, the HMP requires that all PDPs must either demonstrate that the project is exempt from HMP requirements based on the identified criteria, or provide compliance with the hydromodification mitigation requirements outlined in the HMP.

The stated purpose of the HMP is "…to manage increases in runoff discharge rates and durations from all PDPs, where such increased rates and durations are likely to cause increased erosion of channel beds and banks, sediment pollutant generation, or other impacts to beneficial uses and stream habitat due to increased erosive force". In general terms, hydromodification consists of the erosive impacts caused by cumulative changes in the quantity and duration of storm water flows resulting from the increase in impervious surfaces associated with development. Specifically, an increase in impervious areas typically generates related increases in both the rate and amount of storm water runoff compared to pre-development conditions. Flow thresholds associated with hydromodification mitigation requirements are typically expressed in terms of less intense storms (e.g., 2- to 10-year storm events) which, due to the increased of impervious area in associated watersheds, can potentially result in more accelerated cumulative long-term erosion than one larger storm event (such as a 100-year storm). As a result, hydromodification management techniques are aimed at reducing the duration and quantity of storm flows from the smaller and more frequent storm events.

The Proposed Project is a PDP and must therefore comply with the HMP mitigation requirements. Accordingly, a Hydromodification Screening and a PHMS were prepared for the Project to evaluate the HMP compliance efforts incorporated into the Project design (Chang 2013b and PDC 2013d in Appendix L). Flow duration control is the most common form of hydromodification management, and is intended to mitigate associated effects prior to downstream discharge. Flow duration control typically involves the use of facilities such as infiltration basins, bioretention areas, detention basins or cisterns to regulate and/or reduce flows and help reduce associated impacts to downstream receiving waters. Based on analysis in the PHMS, the following observations and conclusions regarding hydromodification effects and related HMP requirements were identified for the Proposed Project:

- The two proposed development areas south of SR-76 (PAs 4 and 5) are exempt from HMP requirements, due to the fact that the proposed outfall location discharges to an exempt water body. That is, based on Table 6-1 of the HMP, direct discharges to the San Luis Rey River near the Project site are exempt, as this portion of the river is identified as an "exempt river reach" due to considerations including watershed area, 100-year flow rates, and existing upstream flow regulation (County 2011b).

- There are eight proposed outfall (or discharge) points within (or from) the portion of the Project site located north of SR-76, with two of these exempt from HMP requirements, including outfalls B and G as depicted on Exhibit B of the PHMS (PDC 2013d in Appendix L). Specifically, Outfall B discharges "run-on" flows originating in off-site areas to the west, with these flows conveyed through the Project site without the addition of any Project-related flows. Outfall G consists of an existing 72-inch pipeline that conveys to the south (under SR-76) that are derived primarily from a natural sump area (refer to PHMS Exhibit B and the discussion of Drainage System 300E above in Section 3.1.4.1). While this outfall also includes flows from Proposed Project development areas, these Project-related flows pass through an additional outfall (Outfall F) before reaching Outfall G, and are therefore already addressed as part of the HMP requirements for Outfall F (as described below).

- The remaining six outfall points north of SR-76 (Outfalls A, C through F and H) were evaluated under HMP requirements in the PHMS. Outfalls D and E were combined for purposes of the PHMS, as both discharge to Horse Ranch Creek at approximately the same location and the hydromodification basin at Outfall E would compensate for providing no attenuation at Outfall D (that is, the minor amount of net increase in impervious surface at Outfall D would be adequately addressed in the basin upstream of Outfall E such that the combined discharge would be in compliance with the hydromodification requirements). Similarly, Outfalls F and H were combined as they ultimately discharge to the same point, and Outfall H discharges to a hardened channel that flows into Horse Ranch Creek (refer to PHMS Exhibit B). Accordingly, there are four discharge points addressed for HMP compliance in the PHMS, including Outfalls A, C, D/E and F/H, with these four locations referred to as point of compliance (POC) sites. It should also be noted that all applicable project discharge would be subject to appropriate water quality treatment, as described below in this section.

- The four POCs described above were assessed using the San Diego Hydrology Model, (SDHM2012), with appropriate soil type, slope, land cover, drainage and rainfall data. Based on this modeling, four detention basins were identified for the noted POCs and included in the Proposed Project design, with these facilities to provide appropriate flow control management and ensure conformance with applicable HMP requirements (refer to Figure 1-25, Conceptual Drainage Plan).

A number of conservative assumptions were incorporated into the Project SDHM model, including the detention basin volumes and the fact that zero infiltration into native soils is factored into the related calculations (with local soils generally characterized as exhibiting "moderate infiltration rates"). The identified detention basins are also proposed to be used as water quality treatment BMPs, as outlined below in this section. Based on this proposed use and potential future changes in the Project design, the identified nature, extent and location of the four detention basins could be modified accordingly. Specifically, the current site plan identifies the four basins as graded, open facilities. If the Project design is subsequently modified to, for example, include additional uses in the basin areas, the design of these facilities could be changed to provide underground vaults or tanks. Regardless of such potential future Project design changes, the four basins (or equivalent facilities) would be required to provide adequate detention capacity, as identified in the Project PHMS, to ensure compliance with associated requirements in the HMP. Based on the described conclusions and considerations, the Project design incorporates appropriate detention facilities to provide compliance with applicable requirements under the HMP, and would avoid or reduce potential effects related to hydromodification to a **less than significant** level.

<u>Floodplains, Floodwater Surface Water Elevations, and Related Flood Hazards</u>

Guidelines for the Determination of Significance

A significant impact related to floodplains, floodwater surface elevations, and related flood hazards would occur if the Proposed Project would:

4. Place housing, habitable structures, or unanchored impediments to flow in a 100-year floodplain area or other special flood hazard area, as shown on a FIRM, a County Floodplain Map or County Alluvial Plain Map, which would subsequently endanger health, safety and property due to flooding; or

5. Place structures within a 100-year flood hazard or alter the floodway in a manner that would redirect or impede flow resulting in any of the following:

    a. Alter the Lines of Inundation resulting in the placement of other housing in a 100-year flood hazard; or
    b. Increase the water surface elevation in a watercourse with a watershed equal to or greater than one square mile by one foot or more in height, or increase the water surface elevation of the San Luis Rey River by 2/10 of a foot or more in height.

Guideline Sources

Guideline Nos. 4 and 5 are from Section 4.0 of the County Guidelines for Determining Significance – Hydrology (County 2007b).

Analysis

Flood-related Health, Safety and Property Hazards, and Inundation/Water Surface Elevations

As described in Section 3.1.4.1, floodplain studies were conducted for applicable portions of Horse Ranch Creek (PDC 2013c) and the San Luis Rey River (Chang Consultants 2013a) to delineate existing floodplain boundaries and evaluate associated potential Project-related impacts. The results of these studies, along with FEMA Flood Insurance Rate Map (FIRM) data, are used in the following analyses of potential on- and off-site flood-related hazards.

Horse Ranch Creek. Delineation of the Horse Ranch Creek floodplain identified a number of existing and proposed facilities that are or would be located within the mapped floodplain boundaries (refer to Figure 3.1.4-2). Specifically, existing facilities within the mapped floodplain include the majority of the North Pankey Road Bridge and portions of Pankey Road between the bridge and SR-76. Proposed Project facilities that would be located within the mapped Horse Ranch Creek floodplain include portions of several residential, commercial and mixed used lots, as well as associated access roads, on the north side of SR-76, along with portions of the westernmost commercial lot south of the highway. Based on these conditions, the current Project design includes a number of measures to address associated potential impacts from flood-related health, safety and property hazards. Specifically, this would include replacing the North Pankey Bridge and realigning/raising applicable portions of Pankey Road, as well as raising applicable graded pad elevations such that all proposed roadways, bridges, and graded pads would be located outside of the mapped Horse Ranch Creek 100-year floodplain (Figure 3.1.4-3, Proposed Conditions Floodplain Map). The proposed modifications to the existing mapped 100-year floodplain for Horse Ranch Creek would warrant submittal of a Conditional Letter of Map Revision (CLOMR) to FEMA for review, and subsequent approval of a LOMR. This process would allow revision of the associated FIRM panels to reflect proposed conditions, and would be conducted during (and incorporate) final Project design, with a LOMR to be processed after construction is complete. Based on the described conditions and assumptions, potential impacts to the Proposed Project from 100-year flood-related health, safety and property hazards associated with Horse Ranch Creek would be **less than significant.**

The Horse Ranch Creek Floodplain Study (and subsequent related correspondence) concludes that, north of the North Pankey Road Bridge, Project implementation could potentially result in a maximum rise in surface water elevations of 2.2 feet above existing conditions. Under existing conditions, a large percentage of the flow overtops Pankey Road and only a small percentage flows underneath the existing bridge. Since overtopping is eliminated with the new bridge and new Pankey Road profile, the water surface elevation increases upstream of the bridge because more energy is required to drive the flow through the proposed bridge opening than the existing condition flow (which flows over the roadway). The increase does not violate the above-noted threshold of raising elevations by one foot or more, since that condition only applies to

regulatory floodways and no regulatory floodways exist within Horse Ranch Creek. The water surface elevation increase could potentially generate flood-related (inundation) impacts to off-site areas. The Floodplain Study also notes, however, that three separate flood analyses for Horse Ranch Creek have been conducted for the Campus Park West, Campus Park and Meadowood projects, and that all three used different modeling and bridge design assumptions and resulted in different conclusions. As a result, the projected rise in water surface elevations varies, depending on which analysis/data are used, but all three projects noted increases in water surface elevations and designed the elevations of the proposed improvements accordingly. Based on the described conditions and assumptions, potential impacts from the Proposed Project related to on- and off-site water surface elevations and associated flooding hazards would be **less than significant.**

San Luis Rey River. The Project San Luis Rey River Floodplain Study identified a number of existing and proposed facilities that are or would be located within the associated mapped floodplain boundaries (refer to Figure 3.1.4-2). Specifically, existing facilities within the mapped floodplain include portions of Shearer Crossing. Proposed Project facilities that would be located within the mapped San Luis Rey River floodplain include all or part of the two proposed commercial development areas south of SR-76. Based on these conditions, the San Luis Rey River Floodplain Study provides the following conclusions: (1) the current Project design includes appropriate measures to address associated potential flood-related health, safety and property hazards, including raising applicable roadway structures and graded pad elevations above the mapped San Luis Rey River 100-year floodplain (Figure 3.1.4-3), as well as providing protective measures (such as geosynthetic mats or vegetation) in appropriate areas (i.e., road embankments near Shearer Crossing) to address potential erosion and scour effects; (2) post-development water surface elevations along the San Luis Rey River would be generally the same as existing elevations with only minor increases of between 0.01 and 0.02 foot at cross-sections 673 through 677.8 (upstream of Shearer Crossing) as a result of Project implementation; (3) post-development channel velocities along the San Luis Rey River would be generally the same as existing velocities, with exceptions including a 0.2 foot per second (fps) decrease at cross-section 670 (just upstream of Shearer Crossing), and a 0.1 fps increase at cross-sections 676.7 and 677.2 (which would not affect the proposed project or existing erosion/scour protection at Shearer Crossing); and (4) no adverse impacts related to inundation of associated off-site properties would result for the Proposed Project. The proposed modifications to the existing mapped 100-year floodplain for the San Luis Rey River would also warrant submittal/approval of a CLOMR and would require submittal of a LOMR, as described above for Horse Ranch Creek. Based on the described conditions and conclusions, potential impacts to the Proposed Project and related off-site areas from 100-year flood-related health, safety, property and inundation/water surface elevation hazards associated with the San Luis Rey River would be **less than significant.**

Water Quality

Guidelines for the Determination of Significance

A significant impact related to water quality would occur if the Proposed Project would:

6. Fail to conform to applicable federal, State or local "Clean Water" statutes or associated regulations including, but not limited to, the Federal Water Pollution Control Act (Clean Water Act [CWA]) and related NPDES requirements; California Porter-Cologne Water Quality Control Act and related San Diego Basin Plan; County of San Diego Watershed Protection, Stormwater Management, and Discharge Control Ordinance (Ordinance No. 10096, San Diego Code of Regulatory Ordinances Sections 87 and 67); County of San Diego Storm Water Standards Manual; County of San Diego LID Manual; and County of San Diego SUSMP.

7. Drain to a tributary of an impaired water body listed on the CWA Section 303(d) list, and contribute substantial additional pollutants for which the receiving water body is already impaired.

8. Contribute pollution in excess of that allowed by applicable state or local water quality objectives or cause or contribute to the degradation of beneficial uses.

Guideline Sources

Guideline Nos. 6 through 8 are derived from Section 4.0 of the County Guidelines for Determining Significance – Surface Water Quality (County 2007c).

Analysis

Conformance with Federal, State and Local Water Quality Statues and Associated Regulations

Potential Project-related water quality impacts are associated with both short-term construction activities and long-term operation and maintenance. Project-related activities that could potentially result in direct effects to groundwater quality are limited to the percolation of Project-related surface runoff and associated pollutants (e.g., in proposed detention basins). Accordingly, the following assessment of potential water quality impacts is applicable to both surface and groundwater resources.

Short-term Construction Impacts. Potential water quality impacts related to on- and off-site Project construction include erosion/sedimentation, the use and storage of construction-related hazardous materials (e.g., fuels, etc.), generation of debris from demolition activities, and disposal of extracted groundwater (if required), as described below.

Erosion and Sedimentation. Proposed excavation, grading, and construction activities on the Project site and associated off-site areas (e.g., road improvements) could potentially result in related erosion and off-site sediment transport (sedimentation). Project activities would involve

the removal of surface stabilizing features such as vegetation, excavation of existing compacted materials from cut areas, redeposition of excavated (and/or imported) material as fill in proposed development sites, and potential erosion from disposal of extracted groundwater (if required). Project-related erosion could result in the influx of sediment into downstream receiving waters, with associated water quality effects such as turbidity and transport of other pollutants that tend to adhere to sediment particles.

While graded, excavated and filled areas associated with construction activities would be stabilized through efforts such as compaction and installation of hardscape and landscaping, erosion potential would be higher in the short-term than for existing conditions. Developed areas would be especially susceptible to erosion between the beginning of grading/construction and the installation of pavement or establishment of permanent cover in landscaped areas. Erosion and sedimentation are not considered to be significant long-term concerns for the Proposed Project because developed areas would be stabilized through installation of hardscape or landscaping. The Project also would incorporate long-term water quality controls pursuant to County and NPDES guidelines, including (among other efforts) measures that would avoid or reduce off-site sediment transport. This would include efforts such as the use of detention/water quality basins, media filters, hydrodynamic separators, energy dissipators, irrigation controls, and drainage facility maintenance (i.e., to remove accumulated sediment).

The short-term water quality effects from Project-related erosion and sedimentation could potentially affect downstream waters and associated wildlife habitats, with such impacts considered potentially significant. Short-term (construction) erosion and sedimentation impacts would be addressed through conformance with the NPDES Construction General Permit and associated County standards, as described above in Section 3.1.4.1 under Regulatory Framework. This would include implementing an authorized NPDES/County SWPPP for proposed construction, including (but not limited to) erosion and sedimentation BMPs. The Project SWMP identifies a number of preliminary construction BMPs, including measures related to erosion/sedimentation (Appendix M). While specific BMPs would be determined during the SWPPP process based on site characteristics (soils, slopes, etc.), they would include standard industry measures and guidelines from the NPDES Construction Permit and County Stormwater Ordinance/Stormwater Standards Manual, as well as the SWMP and additional sources identified in Section 3.1.4.1 under Regulatory Framework. A summary of anticipated erosion and sedimentation BMPs that would be applicable to the Proposed Project are provided in Table 3.1.4-4, Potential Measures to Avoid or Minimize Impacts Related to Erosion and Sedimentation. Based on the implementation of these and/or other appropriate erosion and sediment control BMPs as part of (and in conformance with) the Project SWPPP and related requirements, associated erosion/sedimentation impacts would be **less than significant**. Erosion and sedimentation controls implemented for the Proposed Project would be further defined during the NPDES/County SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures listed in Table 3.1.4-4.

Construction-related Hazardous Materials. Project construction would involve the use and/or storage of hazardous materials such as fuels, lubricants, solvents, concrete, paint, and portable septic system wastes. The accidental discharge of such materials during Project construction could potentially result in significant impacts if such materials reach downstream receiving

waters, particularly materials such as petroleum compounds that are potentially toxic to aquatic species in low concentrations. Implementation of a SWPPP would be required under NPDES and (potentially) County guidelines, and would include detailed measures to avoid or mitigate potential impacts related to the use and potential discharge of construction-related hazardous materials. The Project SWMP identifies a number of preliminary construction BMPs, including measures related to the proper use and storage of hazardous materials (Appendix M). While detailed BMPs would be determined as part of the NPDES/SWPPP process based on Project-specific parameters, they are likely to include the standard industry measures and guidelines from the NPDES Construction General Permit and County Stormwater Ordinance/Stormwater Standards Manual, as well as the SWMP and additional sources identified in Section 3.1.4.1 under Regulatory Framework. A summary of anticipated construction-related hazardous material BMPs that would be applicable to the Proposed Project is provided in Table 3.1.4-5, Potential Measures to Avoid or Minimize Impacts Related to the Use and Storage of Construction-related Hazardous Materials. Based on the implementation of these and/or other appropriate hazardous material BMPs as part of (and in conformance with) the Project SWPPP and related requirements, associated impacts would be **less than significant**. Construction-related hazardous materials controls implemented for the Project would be further defined during the NPDES/County SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures in Table 3.1.4-5.

Demolition-related Debris Generation. The Proposed Project would involve the demolition of existing on-site facilities including structures and pavement. These activities would generate variable amounts of construction debris, potentially including concrete, asphalt, glass, metal, drywall, paint, insulation, fabric and wood. Demolition activities could also potentially generate particulates, as well as pollutants related to hazardous materials including lead-based paint and asbestos insulation. The introduction of demolition-related particulates or hazardous material pollutants into the local storm drain system could potentially result in significant downstream water quality impacts.

Project construction would be subject to a number of regulatory controls related to demolition, including NPDES/SWPPP requirements and hazardous materials controls described in Section 3.1.3, Hazards and Hazardous Wastes, of this subchapter. The Project SWPPP would include measures to address potential effects associated with pollutant generation from demolition activities, with detailed requirements to be determined as part of the SWPPP process. A number of standard BMPs that would likely be applicable to Project demolition efforts are provided in Table 3.1.4-6, Potential Measures to Avoid or Minimize Impacts Related to the Generation of Debris during Demolition Activities. Demolition-related activities involving hazardous materials would conform to the associated regulatory requirements described in Section 3.1.3 of this EIR. Such conformance would include applicable measures to regulate sampling and monitoring procedures; contain/abate contaminated materials during construction; provide protective gear for workers handling contaminated materials; ensure acceptable exposure levels; and provide for safe and appropriate handling, transport and disposal of hazardous materials generated during Project construction.

Based on implementation of appropriate BMPs as part of (and in conformance with) an NPDES/County SWPPP, as well as conformance with applicable hazardous material regulations,

potential water quality impacts from Project-related generation of demolition debris would be **less than significant**. Project controls for demolition-related debris generation would be further defined during the NPDES permitting and SWPPP process, with the resulting BMPs taking priority over the more general types of standard industry measures listed in Table 3.1.4-6.

Disposal of Extracted Groundwater. Shallow groundwater is expected to be encountered during Project-related excavation and construction. Disposal of groundwater extracted during construction activities into local drainages and/or storm drain facilities could potentially generate significant water quality impacts through erosion/sedimentation, or the possible occurrence of pollutants in local groundwater aquifers. Project construction would require conformance with applicable NPDES Groundwater Permit criteria prior to disposal of extracted groundwater (as outlined under Regulatory Framework). While specific BMPs to address potential water quality concerns from disposal of extracted groundwater would be determined based on site-specific parameters, they would likely include standard measures from the Groundwater Permit, with typical requirements outlined below.

- Use erosion and sediment controls similar to those described in Table 3.1.4-4 for applicable areas/conditions (e.g., disposal of extracted groundwater on slopes or graded areas).
- Test extracted groundwater for appropriate contaminants prior to discharge.
- Treat extracted groundwater prior to discharge, if required, to provide conformance with applicable discharge criteria (e.g., through methods such as filtration, aeration, adsorption, disinfection, and/or conveyance to a municipal wastewater treatment plant).

Based on the required conformance with NPDES Groundwater Permit standards and the implementation of related BMPs, water quality impacts from Project-related disposal of extracted groundwater would be **less than significant**.

Based on the temporary nature of potential dewatering activities associated with Project construction, related potential impacts to local groundwater resources such as aquifer drawdown or depletion would be **less than significant**.

Long-term Operation and Maintenance Impacts. The Project SWMP (Appendix M) identifies pollutants of concern and appropriate control measures related to development of the Proposed Project, based on procedures identified in the County Stormwater Ordinance/Manual, SUSMP and LID Manual, as well as the related NPDES Municipal Permit. The Proposed Project is identified as a PDP due to the inclusion of proposed development categories such as residential and commercial properties, parking areas, and roadways. Anticipated and potential pollutants associated with the Proposed Project include sediment, nutrients, heavy metals, organic compounds, trash and debris, oxygen demanding substances, oil and grease, bacteria and viruses, and pesticides (refer to Table 7 of the SWMP in Appendix M). Based on the condition of the downstream receiving waters (refer to Section 3.1.4.1), the primary target pollutants for the Proposed Project are nutrients, bacteria and viruses, and heavy metals. Secondary pollutants of concern for the Project include sediment, organic compounds, oxygen demanding substances, trash and debris, oil and grease, and pesticides. Urban pollutants accumulate in areas such as streets, parking areas, and drainage facilities, and are picked up in runoff during storm events.

Runoff within the Project site would increase as a result of constructing impervious surfaces, with a corresponding increase in pollutant loading potential. Based on these conditions, long-term Project operation could result in the on- and off-site transport of urban pollutants and associated significant effects such as increased turbidity, oxygen depletion and toxicity to attendant species in downstream receiving waters.

The Proposed Project would conform to applicable County and NPDES storm water standards, with such conformance to include the use of appropriate post-construction LID and site design, source control and LID/treatment control BMPs. Specific proposed BMPs are identified in the Project SWMP (Appendix M), with these measures summarized below and followed by a discussion of associated monitoring and maintenance activities.

LID Site Design BMPs. LID and site design BMPs are intended to avoid, minimize and/or control post-development runoff, erosion potential and pollutants generation to the MEP by mimicking the natural hydrologic regime. The LID process employs design practices and techniques to effectively capture, filter, store, evaporate, detain and infiltrate runoff close to its source. Specific LID and site design BMPs identified in the Project SWMP are summarized below, with additional discussion provided in Appendix M. All of the proposed LID and site design BMPs would help reduce long-term urban pollutant generation by minimizing runoff rates and amounts, retaining permeable areas, increasing on-site filtering and infiltration, and reducing erosion/sedimentation potential.

- Conserve Natural Areas, Soils and Vegetation. This measure would include efforts such as preserving well draining (Type A and B) soils, significant trees, critical areas (e.g., floodplains and steeper slopes), and areas near drainages wherever feasible to provide natural buffer zones.

- Minimize Disturbance to Natural Drainages. Specific efforts would include providing appropriate set-backs from drainages for development envelopes, and restricting construction equipment access in planned green/open space areas.

- Minimize and Disconnect Impervious Surfaces. This measure would involve using clustered lot designs and providing landscaping in applicable paved areas such as parking lots.

- Minimize Soil Compaction. Individual efforts to minimize soil compaction would include restricting construction equipment access in planned green/open space areas, and scarifying soils that are compacted during construction.

- Parking Lot Design. This measure would include efforts such as providing permeable and/or pitched pavements, and use of curb cuts to drain applicable areas to landscaping where feasible.

- Driveway, Sidewalk and Bike Path Design. This measure would involve using permeable and/or pitched pavement to infiltrate and/or drain impervious surfaces to landscaping where feasible.

- Building Design. Specific measures would include providing cisterns/rain barrels and use of downspouts to increase infiltration and direct drainage into vegetated areas where feasible.

- Landscaping Design. Individual landscaping design efforts would include using appropriate soil amendments, reusing native soils, installing "smart" irrigation systems (e.g., appropriate water schedules and rain/pressure-sensitive shutoff devices), and installing appropriate landscaping, including street trees.

Source Control BMPs. Source control BMPs are intended to avoid or minimize the introduction of pollutants into storm drains and natural drainages to the MEP by reducing on-site pollutant generation and off-site pollutant transport. Specific source control BMPs identified in the Project SWMP are summarized below, with additional discussion provided in the Project SWMP (Appendix M). All of the proposed source control BMPs would help improve long-term water quality within and downstream from the Project site by avoiding or minimizing pollutant generation and exposure to storm flows at the source.

- Install "no dumping" stencils/tiles and/or signs with prohibitive language (per current County guidelines) at applicable locations such as drainages, storm drain inlets, catch basins and public access points to discourage illegal dumping.

- If applicable (i.e., if such facilities are included as part of the proposed development), design outdoor material storage areas, food service facilities, water features, loading docks, maintenance bays, vehicle/equipment wash areas, outdoor processing areas, and non-retail fueling areas to reduce pollutant discharge through the following types of methods: (1) providing appropriate storage facilities for hazardous materials (e.g., cabinets, sheds or similar structures that prevent runoff contact and discharge to storm drains); (2) providing appropriate on-site pretreatment or directing flows from applicable areas (e.g., vehicle/equipment maintenance or fueling sites) to the sanitary sewer; (3) installing impermeable floors, covers and secondary containment structures such as berms, dikes or curbs in appropriate areas (e.g., loading docks and fueling/maintenance areas); (4) using pavement grades, containment structures or other appropriate methods to prevent run-on.

- Design trash storage areas to reduce pollutant discharge through methods such as paving with impervious surfaces, precluding run-on, installing screens or walls to prevent trash dispersal, providing attached lids and/or roofs for trash containers to prevent direct precipitation contact, and providing appropriate on-site pretreatment prior to discharge of associated runoff to the sanitary sewer.

- Implement regular street sweeping in areas such as plazas, sidewalks and parking lots, and preclude debris and washwater containing cleaning agents/degreasers from entering the storm drain system (e.g., through discharge to the sanitary sewer).

- Design site landscaping to maximize the use of appropriate native and/or drought-tolerant varieties, and use efficient irrigation systems as described above for Site Design and LID BMPs.

- Direct drainage from private roadways into water quality basins (as described below under LID/Treatment Control BMPs).

- Design driveways to include shared access, flared lanes (i.e., a single lane at the street), wheelstrips (i.e., pavement only under tires), and/or drainage to landscaped areas prior to entering the storm drain system where feasible.

- Incorporate landscaping into parking area drainage systems wherever applicable.

- Revegetate/stabilize manufactured or disturbed slopes as soon as feasible, and use appropriate drainage structures to preclude concentrated flows on slopes.

- Provide pet waste disposal bags and related educational materials at trail heads, open space corridors or other applicable locations to encourage clean-up efforts.

- Minimize applications of chemical pesticides, herbicides, fertilizers; use licensed professionals for application of such chemicals in common landscaped areas; and restrict the rates and times of fertilizer applications to minimize potential discharge in irrigation or precipitation runoff.

- Implement an educational program for home and business owners/tenants to prevent illegal or inadvertent pollutant discharge, including the distribution of materials regarding dry-clean methods, protection of storm drain inlets, prevention/proper disposal of pet wastes, proper handling/disposal of solid and hazardous wastes, water conservation, swimming pool chemical use/maintenance, integrated pest management (IPM) methods, employee training, secondary containment, minimizing hazardous material use, proper clean-up procedures, street and parking lot sweeping, and proper collection/disposal of wash water.

LID and Treatment Control BMPs. Treatment control (or structural) BMPs are designed to remove pollutants from urban runoff for a design storm event to the MEP through means such as filtering, treatment, or infiltration. Treatment control and/or LID BMPs are required to address the identified priority pollutants of concern, and treatment control BMPs must provide medium or high levels of removal efficiency for these pollutants (per applicable regulatory requirements). Specific LID and treatment control BMPs identified in the Project SWMP include extended/dry detention basins with grass/vegetated linings (water quality basins), and storm drain inlet high-rate media filter inserts (Bioclean Round Grate Inlet Skimmer Box [GISB] media filters with curb inlet filters, or equivalent). Water quality basins would be used to treat runoff from most of the site prior to discharge, with four individual basins proposed in the Project area north of SR-76 (refer to Figure 1-25 of this EIR and Attachment B of the Project SWMP in Appendix M). Water quality basins exhibit a high removal efficiency for coarse sediment/ trash and pollutants that tend to associate with fine particles during treatment (sediment, nutrients,

heavy metals, organic compounds, oxygen demanding substances, pathogens, oil and grease, and pesticides); and a low removal efficiency for pollutants that tend to be dissolved during treatment (nutrients). To compensate for the low nutrient removal efficiency, the Project will also incorporate additional efforts including the use of native landscaping to reduce fertilizer use, and restricting the rates and times of fertilizer applications to minimize nutrient discharge in irrigation or precipitation runoff.

Media filter inserts would be used to treat Project runoff from applicable areas not covered by the described water quality basins. Specifically, this includes areas around the proposed intersection of SR-76 and Pankey Road, with a series of six curb inlets proposed to direct associated flows to the associated filters prior to discharge into the Project storm drain system (refer to Attachment C of the Project SWMP In Appendix M). Potential pollutants from the described area include sediment, heavy metals, organic compounds, trash and debris, and oil and grease, with media filters exhibiting a high level of removal efficiency for all of these pollutants. The Project SWMP identifies the noted Bioclean Round GISB Media Filters as a potential media filter for the Proposed Project, with Bioclean filters approved by the County as a BMP filtration device.

Additionally, one or more treatment BMPs would be required in the commercial development areas located south of SR-76. As identified in the *Menu of Additional Potential BMPs* provided in the Project SWMP, additional treatment BMPs in the commercial areas could potentially include media filters, biofilters, vegetated swales, bioretention facilities, wet ponds/constructed wetlands, and/or infiltration devices, all of which would provide a medium or high level of removal efficiency for the target pollutants (refer to Table 11 of the SWMP in Appendix M). The specific types and locations of these additional BMPs would be determined after completion of preliminary site design for the noted commercial development areas to determine the most appropriate and effective BMP type(s). If the two commercial lots are developed together or in partnership, one regional BMP could potentially be used to treat both pads. Otherwise, each pad would be designed so that associated drainage would be appropriately treated prior to discharge into the public storm drain system.

The proposed LID/treatment control BMPs would help to improve long-term water quality within and downstream of the Project site by treating/removing pollutants from urban runoff prior to downstream discharge. Detailed discussion of proposed LID/treatment control BMP design, locations, sizing, and performance criteria is provided in the Project SWMP (Appendix M).

Post-construction BMP Monitoring/Maintenance Schedules and Responsibilities. Identified BMPs include physical facilities such as no dumping signs/tiles, water quality basins, and media filters that require ongoing monitoring and maintenance. Water quality basins are identified as Second Category BMPs, while the proposed media filters are Fourth Category BMPs (due to their proposed location within a pubic road ROW). Accordingly, monitoring and maintenance efforts for the water quality basins would be implemented by the Project owner(s) through entering into a written BMP Maintenance Agreement with the County. Specific elements of this agreement would include requiring that the basin areas be limited to the proposed use, granting an access easement to the County, and ensuring adequate funding through means such as a cash deposit, letter of credit, or other means acceptable to the County. Monitoring and maintenance

for the Fourth Category media filters would be conducted by the County, although the property owner(s) would be responsible for the related funding (as well as funding for implementation and maintenance of all other proposed BMPs). Specific monitoring and maintenance efforts associated with proposed BMP facilities and programs include monitoring and reporting to document that programs/activities are being implemented as designed, inspection and maintenance of physical facilities, and making necessary modifications to ensure that intended BMP functions and regulatory requirements are being met. Additional discussion of specific monitoring and maintenance requirements is provided in Attachment F of the Project SWMP in Appendix M.

Based on implementation of proposed LID and site design, source control, and LID/treatment control BMPs in conformance with County storm water standards and the related NPDES Municipal Storm Water Permit (along with related monitoring/maintenance efforts), long-term Project-related water quality impacts would be **less than significant**.

Drainage to 303(d) List Impaired Waters or Tributaries

As described in Section 3.1.4.1, the project site is tributary to 303(d) listed waters including the San Luis Rey River and the Pacific Ocean at the mouth of the San Luis Rey River. Based on Guideline No. 7 under Water Quality and the identified list of anticipated and potential pollutants from the Proposed Project, associated potential impacts to 303(d) listed waters would be related to pollutants including nutrients (e.g., for TDS, phosphorus and chloride impairment), petroleum hydrocarbons (e.g., for toxicity) and bacteria (for bacterial indicator impairment). Pursuant to the discussion of short- and long-term water quality issues provided above under the analysis of regulatory conformance, the Proposed Project would incorporate treatment BMPs that provide medium or high avoidance/removal efficiencies for all applicable pollutants, as well as additional measures to minimize the use and/or potential discharge of pollutants including nutrients and bacteria. Specifically, these additional measures would involve efforts such as: (1) providing educational materials and waste disposal bags in appropriate locations (e.g., trail heads) to minimize the discharge of bacterial pollutants (i.e., from pet wastes); and (2) using native landscaping to reduce fertilizer (nutrient) use, and restricting the rates and times of fertilizer applications to minimize nutrient discharge in irrigation or precipitation runoff. Based on the use of these and other appropriate measures in conformance with applicable County and NPDES regulatory requirements, potential Project-related impacts associated with drainage to 303(d) listed waters or tributaries would be **less than significant**.

Protection of Water Quality Objectives and Beneficial Uses

A summary of applicable San Diego Basin Plan water quality objectives and related beneficial uses is provided in Section 3.1.4.1, under the discussion of Regulatory Framework (refer also to Table 3.1.4-3). Pursuant to the discussion of short- and long-term water quality issues provided above under the analysis of regulatory conformance, the Proposed Project would incorporate a number of BMPs and related efforts to ensure conformance with the CWA, NPDES, California Porter-Cologne Water Quality Control Act, San Diego Basin Plan, and pertinent County water quality requirements. Based on this conformance, the Proposed Project would not generate

pollutants that exceed surface water quality objectives or cause or contribute to the degradation of associated beneficial uses, and related potential impacts would be **less than significant**.

3.1.4.3 *Cumulative Impact Analysis*

As described in the preceding analysis, implementation of the Proposed Project would require conformance with a number of regulatory requirements related to hydrology and water quality, including applicable elements of the CWA, NPDES, County storm water standards, California Porter-Cologne Water Quality Control Act, and RWQCB Basin Plan. Based on such conformance (including the design measures described in Chapter 7.0 of this EIR), all identified Project-level hydrology and water quality impacts from the Proposed Project would be avoided or reduced below a level of significance.

The described regulatory requirements constitute a regional effort to implement hydrology and water quality protections through a watershed-based program designed to meet applicable criteria such as Basin Plan Beneficial Uses and Water Quality Objectives. To this end, these standards require the implementation of efforts to reduce runoff and contaminant discharges to the MEP, with the NPDES Municipal Permit identifying the goal of "[p]romoting attainment of water quality objectives necessary to support designated beneficial uses." The County has implemented all of these requirements in the form of the SUSMP, Stormwater Ordinance/Manual and URMPs, as well as applicable education, planning, and enforcement procedures. Based on the described regional/watershed based approach required for hydrology and water quality issues in existing regulatory standards, and the fact that conformance with these requirements would be required for all identified projects within the cumulative projects area (including the Proposed Project), cumulative hydrology/water quality impacts related to Project implementation would be **less than significant**.

3.1.4.4 *Significance of Impacts*

Identified potential hydrology/water quality impacts associated with the Proposed Project would be less than significant prior to mitigation, based on the implementation of identified proposed design measures and conformance with applicable regulatory requirements.

3.1.4.5 *Conclusion*

Based on the discussions provided above, potential Project-specific and cumulative hydrology and water quality impacts associated with implementation of the Proposed Project would be effectively avoided or reduced below identified significance guidelines through implementation of recommendations provided in the Project Hydrology Study, PHMS, SWMP, Horse Ranch Creek Floodplain Study, and San Luis Rey River Floodplain Study, as well as conformance with established regulatory requirements. Accordingly, no mitigation measures are required or proposed.

Table 3.1.4-1
SUMMARY OF TYPICAL POLLUTANT SOURCES FOR URBAN STORM WATER RUNOFF

Pollutants	Pollutant Sources
Sediment and Trash/Debris	Streets, landscaping, driveways, parking areas, rooftops, construction activities, atmospheric deposition, drainage channel erosion
Pesticides and Herbicides	Landscaping, roadsides, utility right-of-ways, soil wash-off
Organic Compounds	Landscaping, streets, parking areas, animal wastes, recreation areas
Oxygen Demanding Substances	Landscaping, animal wastes, leaky sanitary sewer lines, recreation areas
Heavy Metals	Automobiles, bridges, atmospheric deposition, industrial areas, soil erosion, corroding metal surfaces, combustion processes
Oil and Grease/Hydrocarbons	Roads, driveways, parking lots, vehicle maintenance areas, gas stations, illicit dumping to storm drains
Bacteria and Viruses	Landscaping, roads, leaky sanitary sewer lines, sanitary sewer cross-connections, animal wastes, recreation areas
Nutrients (Nitrogen and Phosphorus)	Rooftops, landscaping, atmospheric deposition, automobile exhaust, soil erosion, animal wastes, detergents, recreation areas

Source: USEPA 1999

Table 3.1.4-2
TYPICAL LOADINGS FOR SELECTED POLLUTANTS IN RUNOFF FROM VARIOUS LAND USES (lbs/acre/year)

Land Use	TSS	TP	TKN	NH_3 - N	NO_2 + NO_3 - N	BOD	COD	Pb	Zn	Cu
Commercial	1000	1.5	6.7	1.9	3.1	62	420	2.7	2.1	0.4
Parking Lot	400	0.7	5.1	2	2.9	47	270	0.8	0.8	0.04
HDR	420	1	4.2	0.8	2	27	170	0.8	0.7	0.03
MDR	190	0.5	2.5	0.5	1.4	13	72	0.2	0.2	0.14
LDR	10	0.04	0.03	0.02	0.1	N/A	N/A	0.01	0.04	0.01
Freeway	880	0.9	7.9	1.5	4.2	N/A	N/A	4.5	2.1	0.37
Industrial	860	1.3	3.8	0.2	1.3	N/A	N/A	2.4	7.3	0.5
Park	3	0.03	1.5	N/A	0.3	N/A	2	0	N/A	N/A
Construction	6000	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Grains/Hay	400	0.8	N/A	N/A	N/A	20	150	N/A	N/A	N/A
Citrus/Vegetables	400	1.5	N/A	N/A	N/A	30	200	N/A	N/A	N/A

HDR = High Density Residential; MDR = Medium Density Residential; LDR = Low Density Residential
N/A = Not available; insufficient data to characterize
Abbreviations: TSS = Total Suspended Solids; TP = Total Phosphorus; TKN = Total Kjeldahl Nitrogen; NH_3 – N = Ammonia – Nitrogen; NO_2 + NO_3 – N = Nitrite + Nitrate - Nitrogen; BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; Pb = Lead; Zn = Zinc; Cu = Copper
Sources: USEPA 1999; RWQCB 1988

Table 3.1.4-3
SURFACE AND GROUNDWATER QUALITY OBJECTIVES FOR THE LOWER SAN LUIS HYDROLOGIC AREA AND THE BONSALL HYDROLOGIC SUBAREA[1]

SURFACE WATER												
Lower San Luis Hydrologic Area												
Constituent (mg/l or as noted)												
TDS	**Cl**	**SO_4**	**% Na**	**N&P**	**Fe**	**Mn**	**MBAS**	**B**	**Odor**	**Turb NTU**	**Color Units**	**F**
500	250	250	60	--[2]	0.3	0.05	0.5	0.75	None	20	20	1.0
GROUNDWATER												
Bonsall Hydrologic Subarea												
Constituent (mg/l or as noted)												
TDS	**Cl**	**SO_4**	**% Na**	**NO_3**	**Fe**	**Mn**	**MBAS**	**B**	**Odor**	**Turb NTU**	**Color Units**	**F**
1,500	500	500	60	45	0.85	0.15	0.5	0.75	None	5	15	1.0

[1] Concentrations not to be exceeded more than 10% of the time during any one-year period; refer to Figure 3.1.4-1 for local hydrologic designation locations.
[2] Shall be maintained at levels below those that stimulate algae and emergent plant growth.
Abbreviations: TDS = Total Dissolved Solids; Cl = Chlorides; SO_4 = Sulfate; Na = Sodium; N&P = Nitrogen and Phosphorus; NO_3 = Nitrate; Fe = Iron; Mn = Manganese; MBAS = Methylene Blue Activated Substances (e.g., commercial detergent); B = Boron; Turb = Turbidity (measured in Nephelometric Turbidity Units [NTU]); F = Fluoride.
Source: RWQCB 1994, as amended

Table 3.1.4-4
POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO EROSION AND SEDIMENTATION

- Comply with seasonal grading restrictions during the rainy season (October 1 to April 30) for applicable locations/conditions.
- Prepare and implement a CSMP to ensure appropriate monitoring, testing, BMP effectiveness, and conformance with applicable discharge requirements.
- Prepare and implement a REAP, if applicable (i.e., depending on risk level), to ensure that active construction areas/activities have adequate erosion and sediment controls in place within 48 hours of the onset of any likely precipitation event (i.e., 50 percent or greater probability of producing precipitation, per National Oceanic and Atmospheric Administration projections).
- Preserve existing vegetation wherever feasible, and use phased grading schedules to limit the area subject to erosion at any given time.
- Properly manage storm water and non-storm water flows to minimize runoff.
- Use erosion control/stabilizing measures such as geotextiles, mulching, mats, plastic sheets/tarps, fiber rolls, soil binders, compost blankets, soil roughening, and/or temporary hydroseeding (or other plantings) established prior to October 1 in appropriate areas (e.g., disturbed areas and graded slopes).
- Use sediment controls to protect the construction site perimeter and prevent off-site sediment transport, including measures such as temporary inlet filters, silt fence, fiber rolls, silt dikes, biofilter bags, gravel bag berms, compost bags/berms, temporary sediment basins, check dams, street sweeping/vacuuming, ATS (if applicable based on risk assessment), energy dissipators, stabilized construction access points/sediment stockpiles, and properly fitted covers for sediment transport vehicles.

Table 3.1.4-4 (cont.) **POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO EROSION AND SEDIMENTATION**
• Store BMP materials in applicable on-site areas to provide "standby" capacity adequate to provide complete protection of exposed areas and prevent off-site sediment transport. • Provide full erosion control for disturbed areas not scheduled for additional activity for 14 or more consecutive calendar days. • Provide appropriate training for the personnel responsible for BMP installation and maintenance. • Use solid waste management efforts such as proper containment and disposal of construction debris. • Comply with local dust control requirements, potentially including measures such as regular watering, use of chemical palliatives, limiting construction vehicle/equipment speeds, and restricting/precluding construction operations during periods of high wind speeds. • Install permanent landscaping, with emphasis on native and/or drought-tolerant varieties, as soon as feasible after construction. • Implement appropriate monitoring and maintenance efforts (e.g., prior to and after storm events) to ensure proper BMP function and efficiency. • Implement sampling/analysis, monitoring/reporting and post-construction management programs per NPDES and/or County requirements. • Implement additional BMPs as necessary to ensure adequate erosion and sediment control (e.g., enhanced treatment and more detailed monitoring/reporting).

Table 3.1.4-5 **POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE USE AND STORAGE OF CONSTRUCTION-RELATED HAZARDOUS MATERIALS**
• Minimize the amount of hazardous materials used and stored on site, and restrict storage/use locations to areas at least 50 feet from storm drains and surface waters. • Use raised (e.g., on pallets), covered, and/or enclosed storage facilities for all hazardous materials. • Maintain accurate and up-to-date written inventories and labels for all stored hazardous materials. • Use berms, ditches, and/or impervious liners (or other applicable methods) in material storage and vehicle/equipment maintenance and fueling areas to provide a containment volume of 1.5 times the volume of stored/used materials and prevent discharge in the event of a spill. • Place warning signs in areas of hazardous material use or storage and along drainages and storm drains (or other appropriate locations) to avoid inadvertent hazardous material disposal. • Properly maintain all construction equipment and vehicles. • Restrict paving operations during wet weather, use appropriate sediment control devices/methods downstream of paving activities, and properly contain and dispose of wastes and/or slurry from sources including concrete, dry wall and paint, by using properly designed and contained washout areas. • Provide training for applicable employees in the proper use, handling and disposal of hazardous materials, as well as appropriate action to take in the event of a spill.

Table 3.1.4-5 (cont.) **POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE USE AND STORAGE OF CONSTRUCTION-RELATED HAZARDOUS MATERIALS**
• Store absorbent and clean-up materials in readily accessible on-site locations. • Properly locate, maintain and contain portable wastewater facilities. • Regularly (at least weekly) monitor and maintain hazardous material use/storage facilities and operations to ensure proper working order. • Implement solid waste management efforts such as proper containment and disposal of construction debris, and restrict construction debris storage areas to appropriate locations at least 50 feet from storm drain inlets and water courses. • Employ a licensed waste disposal operator to regularly (at least weekly) remove and dispose of construction debris at an authorized off-site location. • Use recycled or less hazardous materials wherever feasible. • Post regulatory agency telephone numbers and a summary guide of clean-up procedures in a conspicuous on-site location. • Regularly (at least weekly) monitor and maintain hazardous material use/storage facilities and operations to ensure proper working order. • Implement additional BMPs as necessary (and in conformance with applicable requirements) to ensure adequate hazardous material control.

Table 3.1.4-6 **POTENTIAL MEASURES TO AVOID OR MINIMIZE IMPACTS RELATED TO THE GENERATION OF DEBRIS DURING DEMOLITION ACTIVITIES**
• Recycle appropriate (i.e., non-hazardous) construction debris for on- or off-site use whenever feasible. • Use dust-control measures such as watering to reduce particulate generation for pertinent locations/activities (e.g., concrete removal). • Use appropriate erosion prevention and sediment control measures downstream of all demolition activities. • Conform with applicable requirements related to the removal, handling, transport and disposal of hazardous materials generated during demolition, including efforts such as implementing appropriate sampling and monitoring procedures; proper containment of contaminated materials during construction; providing protective gear for workers handling contaminated materials; ensuring acceptable exposure levels; and ensuring safe and appropriate handling, transport and disposal of hazardous materials generated during Project construction.

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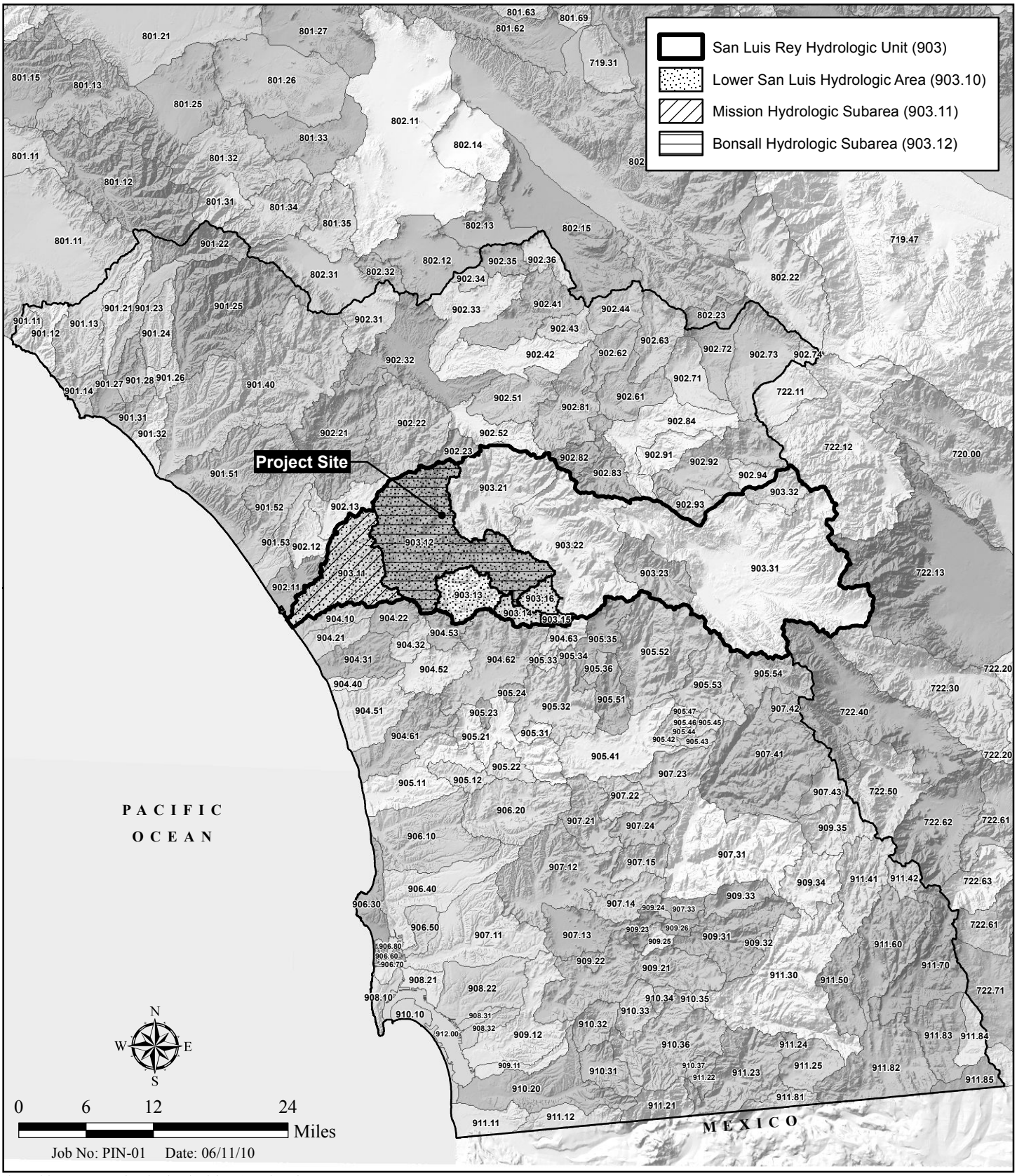

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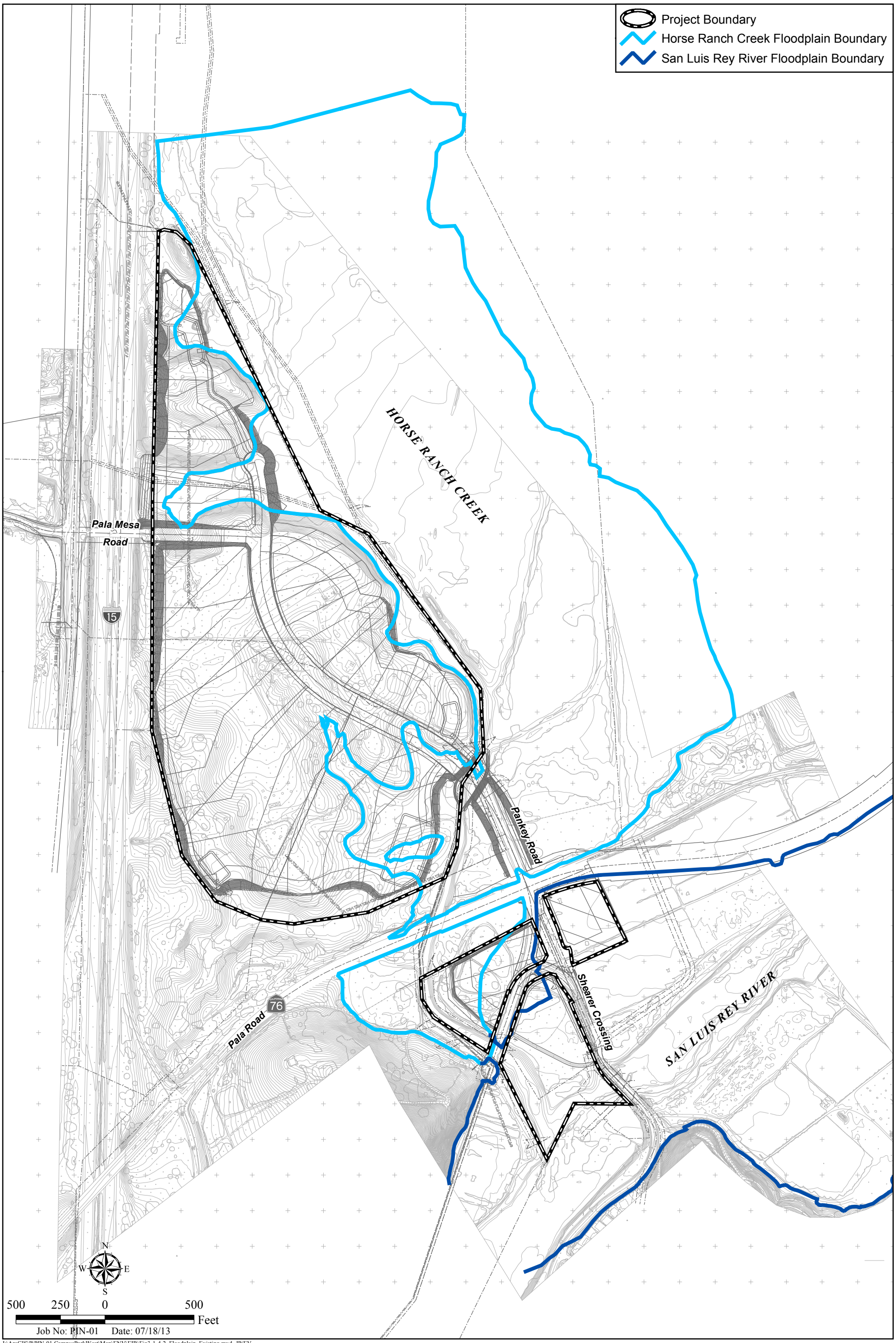
Project Location within Local Hydrologic Designations

CAMPUS PARK WEST

HELIX Environmental Planning

Figure 3.1.4-1



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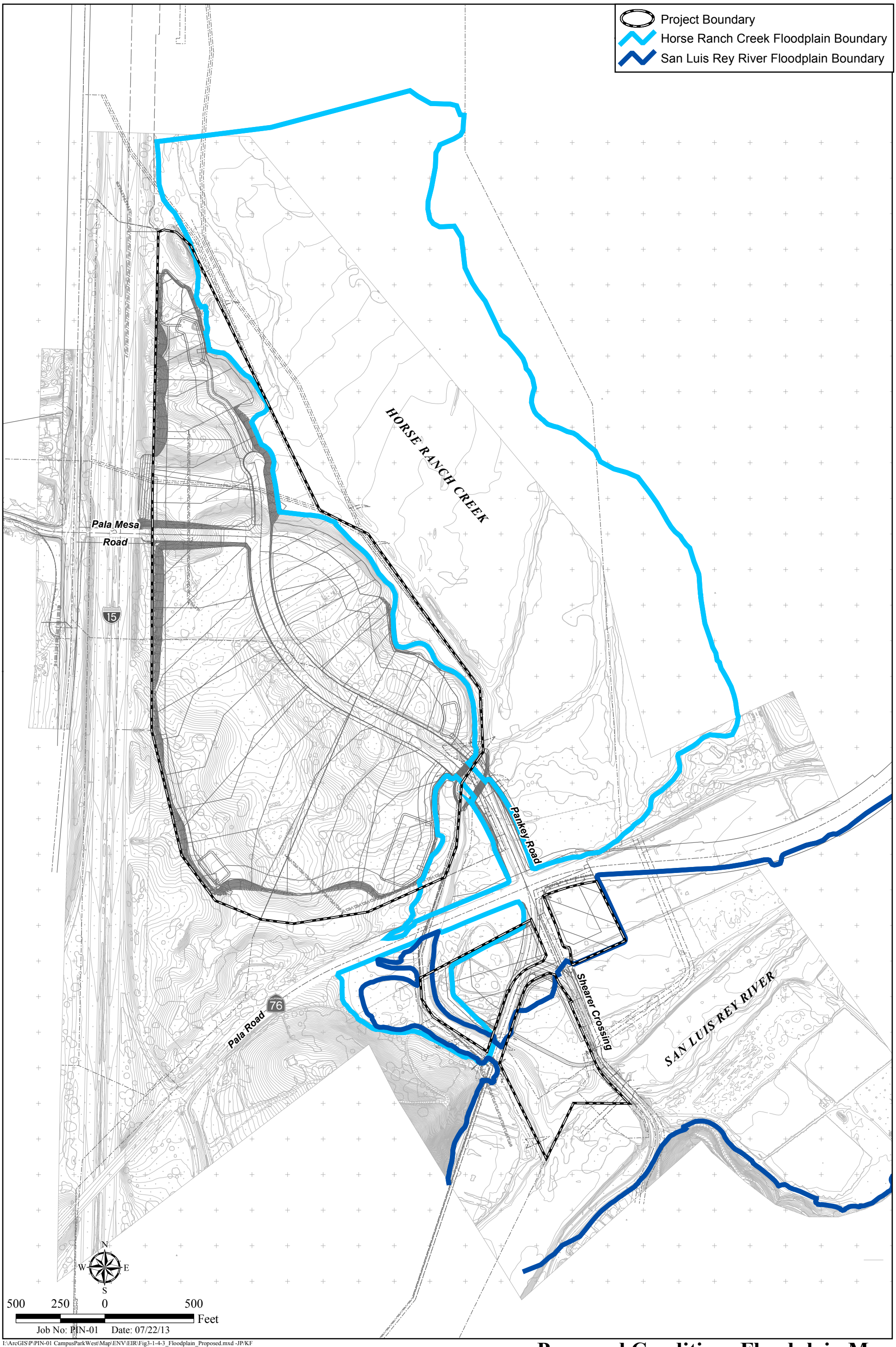
Existing Conditions Floodplain Map

CAMPUS PARK WEST

HELIX Environmental Planning

Figure 3.1.4-2



I:\ArcGIS\P\PIN-01 CampusParkWest\Map\ENV\EIR\Fig3-1-4-3_Floodplain_Proposed.mxd -JP/KF

Proposed Conditions Floodplain Map

CAMPUS PARK WEST

HELIX Environmental Planning

Figure 3.1.4-3