

3.2 Hydrology/Water Quality

Technical studies used for the following analysis include a CEQA-Level Hydrology Report (Chang Consultants [Chang] 2015), Limited Groundwater Investigations prepared by AECOM (2012) and Earth Tech (2004), a Well Drilling Letter Report (Earth Tech 2007), and the Otay Hills Reclamation Plan (EnviroMINE 2019b). These studies are summarized in this section along with other applicable data, with the Hydrology Report (Chang 2015) and most recent Limited Groundwater Investigation (AECOM 2012) included in Appendix D of this EIR.

3.2.1 Regulatory Framework

The Proposed Project is subject to a number of hydrology and water quality regulatory requirements associated with Federal, State, and local guidelines, as summarized below. Additional discussion of these requirements is provided in the assessment of Project-related impacts, as appropriate.

3.2.1.1 *International Boundary and Water Commission Storm Water Runoff and Quality Criteria*

The International Boundary and Water Commission (IBWC) is a bi-national entity that oversees projects along the U.S./Mexico international border that may result in impacts involving political, economic, environmental, or infrastructure issues. The IBWC jurisdiction extends 60 feet north from the international border, with the agency's goals including the provision of solutions for issues such as hydrology, water quality and flood control. While none of the Proposed Project facilities are located within the noted 60-foot zone, treated and detained runoff from the Project impact footprint would be discharged into watersheds that eventually enter IBWC jurisdiction. With respect to hydrology and water quality, IBWC guidelines mandate that new development projects in applicable border regions (including the Project site vicinity): (1) do not result in cross-border runoff that exceeds pre-development levels; and (2) prevent pollution and meet applicable environmental laws, regulations, and other pertinent requirements. For the Proposed Project, conformance with these requirements would entail designing the storm drain system to ensure that there is no net increase in post-development flows from the Project site, as well as conforming with appropriate elements of the Federal CWA and related water quality standards as outlined below.

3.2.1.2 *Clean Water Act/National Pollutant Discharge Elimination System Requirements*

The Proposed Project and alternatives are subject to appropriate elements of the Federal CWA, including the NPDES. Specific NPDES requirements associated with Project implementation include conformance with the General Industrial Activity Storm Water Permit (Industrial Permit; NPDES No. CAS000001, SWRCB Order 97-03-DWQ), as summarized below.

Industrial Permit

The Industrial Permit is intended to regulate storm water “[a]ssociated with industrial activity...that discharges...liquids or materials other than storm water...either directly or indirectly to waters of the United States.” The current Industrial Permit was adopted by the SWRCB in April 2014 and became effective on July 1, 2015. The basic requirements for

conformance with the Industrial Permit include: (1) submission of a properly completed NOI prior to operation; (2) identification and elimination of unauthorized non-storm water discharges; (3) development and implementation of a storm water pollution prevention plan (SWPPP), including minimum required and (as applicable) advanced best management practices (BMPs) to reduce or prevent industrial pollutants in storm water discharges pursuant to applicable best available technology economically achievable (BAT, for toxic and non-conventional pollutants), and best conventional pollutant control technology (BCT, for conventional pollutants) levels of treatment; (4) appropriate training for monitoring and reporting staff; (5) conformance with identified numeric action levels and related response actions; and (6) monitoring/reporting of storm water discharges to determine the effectiveness of the Project SWPPP (including specific monitoring to target applicable constituents and 303[d] impaired waters, and sampling/analysis for appropriate projects). While site-specific measures to avoid/control contaminant discharge to storm water would be determined during the NPDES/SWPPP process and would vary with site-specific conditions (such as excavation parameters, slope/soil characteristics and operations), detailed guidance for BMPs is provided in the Industrial Permit and related sources such as the County Storm Water Standards outlined below, and the California Stormwater Quality Association (CASQA) *Construction Storm Water Best Management Practices Handbooks* (CASQA 2009).

3.2.1.3 SMARA Standards

All mineral extraction operations under State jurisdiction are required by SMARA to implement a reclamation plan approved by the Lead Agency, as outlined under the discussion of Regulatory Framework in Section 3.2.1 of this EIR. Applicable requirements related to hydrology and water quality under SMARA include the preparation of a reclamation plan and associated erosion and sediment control measures. The application of these standards to Project implementation is described as appropriate in Subchapter 4.2, *Hydrology/Water Quality*.

3.2.1.4 Basin Plan Requirements

The RWQCB Water Quality Control Plan for the San Diego Basin (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 receiving waters located downstream of the Project impact footprint (including the Tijuana River and unnamed intermittent streams) 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); and rare, threatened, or endangered species (RARE). Identified existing beneficial uses for applicable coastal waters (including the Tijuana Estuary and the Pacific Ocean) include IND; navigation (NAV); REC-1; REC-2; commercial and sport fishing (COMM); BIOL; estuarine habitat (EST); WILD; RARE; marine habitat (MAR); aquaculture (AQUA); migration of aquatic organisms (MIGR); spawning, reproduction, and/or early development (SPWN); and shellfish harvesting (SHELL). Identified existing and potential beneficial uses for groundwater in the San Ysidro and Water Tanks HSAs 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

established for the reasonable protection of beneficial uses.” Water quality objectives include both narrative requirements (which can encompass qualitative and quantitative standards) and specific numeric objectives for identified contaminants and waters. Numeric water quality objectives have not been established for surface waters in the Tijuana Valley Hydrologic Area (HA) or the Water Tanks Hydrologic Subarea (HSA), with these areas subject to narrative objectives as identified in the Basin Plan. Specifically, narrative objectives for these areas include quantitative requirements for contaminants such as ammonia, coliform, and chloride, as well as qualitative standards for additional contaminants, degradation of waters, and associated biological communities. Numeric objectives for surface water quality in the San Ysidro HSA and groundwater quality in the Tijuana Valley HA are summarized in Table 3.2-3, *Surface and Groundwater Quality Objectives for the Tijuana Valley Hydrologic Area and the San Ysidro Hydrologic Subarea*.

3.2.1.5 County of San Diego Requirements

The San Diego County Hydrology Manual (County 2003) 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 2005).

The County Guidelines for Determining the Significance of Hydrology issues (County 2007c) 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 2007d), 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.

The County Guidelines for Determining Significance – Groundwater Resources (County 2007g), provide direction for evaluating environmental effects related to groundwater supplies (e.g., aquifer volumes/yields, local water table levels, and well production) and quality, pursuant to related CEQA standards. The Groundwater Resource Guidelines give an overview of groundwater resources, hydrogeologic principles, aquifer/well characteristics, associated water quality concerns, regulatory standards, and typical adverse effects, and provide guidance for identifying significance guidelines and standard mitigation/design considerations.

3.2.2 Environmental Setting

3.2.2.1 Watershed and Drainage Characteristics

The Proposed Project site encompasses approximately 410 acres, including a 105-acre impact area and approximately 305 acres that would be dedicated to open space as MSCP Hardline Preserve within the OHCA (refer to Figure 1-2). Because the preserve area would not be impacted by Project implementation, the following analysis is focused primarily on impacts to the watershed associated with the 105-acre impact footprint.

The Project impact footprint is located within the Tijuana Hydrologic Unit (HU), one of 11 such drainage areas designated in the 1994 (as amended) RWQCB Basin Plan. The Tijuana HU is a generally rectangular shaped area of approximately 470 square miles and extends between the Laguna Mountains (near Little Laguna Lake) and the U.S.-Mexico international border on the east, and the City of Imperial Beach and the border along the coast (Figure 3.2-1, *Project Location within Local Hydrologic Designations*). The Tijuana HU is divided into a number of HAs and HSAs based on local drainage characteristics. The Project impact footprint and vicinity are located within the Water Tanks HSA of the Tijuana Valley HA. Drainage within the Tijuana HU is through the Tijuana River and associated tributaries, with the approximately 15-square mile Water Tanks HSA drained primarily by a number of canyons flowing west and/or south (e.g., Spring, Moody, and Wruck Canyons). Annual precipitation in the Tijuana HU ranges from approximately 11 inches along the coast to over 25 inches in the Laguna Mountains (RWQCB 1994). The Project site vicinity (zip code 92154) averages approximately 10 inches of rainfall per year, with over 84 percent occurring between November and March (MelissaData.com 2014).

Surface drainage in the Project impact footprint and immediate vicinity occurs as both non-point runoff (sheet flow) and within a number of small, unnamed, ephemeral canyon drainages flowing primarily west and south. The principal drainage courses within and adjacent to the Project impact footprint consist of five unnamed ephemeral washes, including three flowing generally east to west within the northwestern and central portions of the impact footprint, and two flowing generally south-southwest in the southern area (with the southern drainages converging into a single wash just south of the site, refer to the Existing Condition Map of the Hydrology Report in Appendix D1). The three east-west drainages exit the impact footprint along the western boundary, with the northwestern-most of these drainages entering a natural watercourse that flows generally southwest from the site. The other two east-west drainages flow into a storm drain associated with an adjacent (off-site) batch plant development, which conveys runoff to the southwest. Flows from these three west-flowing sources continue south/southwest for approximately one mile to the international border with Mexico. The southern drainage courses exit the impact footprint along the southern boundary, converge just south of the site, and continue south-southwest to the international border via a single natural drainage course. After moving south of the border, flows from the Project impact footprint (and other portions of the associated watershed) enter the Tijuana River through related tributaries, and continue generally west for approximately seven miles before reentering the U.S. just west of I-5. The Tijuana River continues west from this point for approximately five miles before flowing into the Pacific Ocean via the Tijuana Estuary.

The Project impact footprint is predominantly undeveloped, with existing on-site land uses including surface and subsurface utility lines and a number of unpaved roads and trails (refer to

Figure 1-3). No known drainage facilities are present within the impact footprint, with drainage improvements in the immediate downstream area limited to the storm drain facilities along the western boundary as described above. Existing drainage facilities in areas further downstream including crossing structures for the Tijuana River and associated tributaries at a number of roadways. The Project Hydrology Report (Appendix D1) provides existing 100-year storm flows from the five described outlet points (i.e., locations where point storm flows leave the impact footprint) based on the County Hydrology Manual rational method procedure (June 2003). Specifically, this procedure involves the delineation of applicable drainage basins and use of appropriate criteria from the referenced County Hydrology Manual such as hydrologic soils groups, runoff coefficients, and flow lengths/elevations. Based on this analysis, the Project Hydrology Report identifies a combined existing 100-year storm flow of 819 cubic feet per second (cfs) from the Project impact footprint (which encompasses flows from both on- and off-site sources), including the following flows at the noted outlet locations: (1) 559 cfs at the northwestern-most drainage outlet (Discharge Point A); (2) 28 cfs from the second discharge point in the northwestern site area (Discharge Point B); (3) 94 cfs at the central outlet (Discharge Point C, with flows from Points B and C discharging to the adjacent off-site storm drain facilities as noted); and (4) a combined flow of 138 cfs from the two southern outlets (Discharge Points D and E, refer to Chang 2015 in Appendix D1 for basin descriptions and drainage calculations).

3.2.2.2 Flood Hazards

The Project impact footprint and vicinity have been mapped for flood hazards by the Federal Emergency Management Agency (FEMA). The entire impact footprint and adjacent areas are designated as Zone X, or areas determined to be outside the 500-year (and, therefore, the 100-year) floodplain. The closest mapped 100-year floodplain is located approximately one mile west of the site along Johnson Canyon Creek (FEMA 2012a, 2012b, 2012c).

3.2.2.3 Groundwater

No regional groundwater basins are mapped within the Project impact footprint and immediate vicinity, with the closest major aquifer, the Lower Tijuana River Basin, located approximately seven miles to the west at its closest point (California Department of Water Resources [DWR] 2003; San Diego County Water Authority [SDCWA] 1997). This basin is described as including approximately 80,000 acre-feet¹ of storage capacity within a 5.6-square mile area, with an average depth to groundwater of approximately 80 feet below surface grade (DWR 2003, SDCWA 1997). Historical data in more proximal areas document the presence of groundwater at depths of between 350 and 485 feet at locations approximately two miles west of the Project impact footprint (DWR 1986).

As described in Subchapter 3.1, *Geological Resources*, groundwater was not observed within the impact footprint or Project site during geotechnical investigation, which included core drilling at three locations to depths of approximately 190 feet below the surface. In addition, limited groundwater investigations of the Project impact footprint were conducted in 2011 and 2004 (AECOM 2012, Earth Tech 2004), and a well was drilled near the northern impact footprint

¹ An acre-foot is the volume of water required to cover an area of one acre to a depth of one foot and equals approximately 326,000 gallons.

boundary to a depth of 1,013 feet in August/September 2005 (Earth Tech 2007). This well intersected a groundwater aquifer in fractured volcanic rock at depths of between approximately 335 and 600 feet, with an associated yield of approximately 0.5 gallon per minute (Earth Tech 2007). Based on these data and additional analysis, the 2011 Groundwater Investigation estimates that the static water level is approximately 300 feet below the ground surface at the well site and assumes that the general direction of groundwater movement in the Project area is east to west (AECOM 2012).

3.2.2.4 Water Quality

Surface water in the Project impact footprint and immediate vicinity consists predominantly of ephemeral flows from storm events. No known surface water quality data are available for the Project impact footprint and vicinity, with storm flows subject to variations in water quality due to local conditions such as runoff volume/velocity and land use. Summaries of typical contaminant sources and loadings for various land use types are shown in Tables 3.2-1, *Summary of Typical Contaminant Sources for Urban Storm Water Runoff*, and 3.2-2, *Typical Loadings for Selected Contaminants in Runoff from Various Land Uses*. Based on the nature and low intensity of existing development in the Project impact footprint and upstream watershed areas, local surface water quality is expected to be generally good.

Historic and current surface water quality monitoring has been/is being conducted within the Tijuana River watershed in association with local/regional water agency programs and requirements under Federal CWA/NPDES, the related Municipal Storm Water Permit, and SWRCB requirements. Specific data incorporated into the following assessment include wet/dry season monitoring and bioassessment studies conducted pursuant to the NPDES Municipal Storm Water Permit; State Surface Water Ambient Monitoring Program (SWAMP) studies for the Tijuana HU; and qualitative biannual water quality assessments conducted by the SWRCB, as outlined below.

NPDES Wet/Dry Season and Bioassessment Monitoring

Wet season monitoring at the Tijuana River mass loading station (MLS), located at the Hollister Street Bridge (approximately 10.2 miles downstream of the Project impact footprint), covered three storm events each for the 2001/2002 through 2006/2007 storm seasons, one event for the 2008/2009 season, two storm events in the 2009/2010 season, and three storm events for the 2011/2012 storm season (24 total events, with no monitoring conducted at the MLS during the 2007/2008 or 2010/2011 seasons, or since 2012). These monitoring events involved numerous physical, chemical, and bacterial constituents of concern (COCs), with the following summary results for the most current (2011/2012 season) monitoring: (1) regulatory standards were exceeded at a high frequency (more than 50 percent) for constituents including biochemical oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), turbidity, pesticides (diazinon, bifenthrin and permethrin), fecal coliform bacteria, dissolved and total phosphorus, and toxicity to aquatic test organisms (*Ceriodaphnia dubia*, a water flea, and *Hyalella azteca*, a small shrimp-like amphipod crustacean); (2) regulatory standards were exceeded at a moderate frequency (between 25 and 50 percent) for nitrite (as N), and methylene blue activated substances (MBAS, e.g., commercial detergents); and (3) regulatory standards were exceeded at a

low frequency (less than 25 percent) for total dissolved solids (TDS; Weston Solutions, Inc. [Weston] 2013).

Wet weather sampling was also conducted at two temporary watershed assessment stations (TWASs) within the Tijuana HU in 2009/2010, including two storm events at TWAS-2 (located along the Tijuana River at Dairy Mart Road, approximately 10 miles downstream of the Project impact footprint). No monitoring has been conducted at TWAS-2 subsequent to 2009/2010, with the other TWAS (TWAS-1) located a substantial distance upstream. The following summary results were provided from the noted monitoring at TWAS-2 in 2009/2010; (1) regulatory standards were exceeded at a high frequency for BOD, TSS, turbidity, fecal coliform bacteria, total phosphorus, bifenthrin, and toxicity to aquatic test organisms (*C. dubia*); (2) regulatory standards were exceeded at a moderate frequency for oil and grease, COD, MBAS, dissolved phosphorus, permethrin, and toxicity to aquatic test organisms (*H. azteca*); and (3) regulatory standards were exceeded at a low frequency for TDS (Weston 2011).

Dry weather sampling has also been conducted since 2002/2003 at several sites located downstream of the Project impact footprint. This program is focused on collecting dry season samples from storm drain facilities, rather than streams or receiving waters, to identify urban pollutants and sources. Data from the most recent (2011) dry weather sampling events documented that water quality objectives were most commonly exceeded for COCs including turbidity, MBAS, and ammonia (Weston 2013).

Bioassessment monitoring involves evaluation of criteria including the taxonomic richness (i.e., number of taxonomic groups) and diversity (i.e., species diversity within taxonomic groups) of benthic macroinvertebrate communities. Bioassessment monitoring has been conducted at several up- and downstream sites along the Tijuana River, including the previously described MLS and TWAS-2 locations. Test results for these sites during the 2009/2010 through 2011/2012 seasons indicate poor or very poor Index of Biotic Integrity (IBI) rankings at the MLS and TWAS-2 sites, with these rankings based on numerical scores assigned to factors such as species composition and richness (and derived in part from water quality conditions) and used to determine the health of aquatic communities (Weston 2013, 2012, 2011).

Based on the described monitoring data, the 2011/2012 Tijuana River Watershed Urban Runoff Management Plan (WURMP) Annual Report (conducted pursuant to applicable NPDES requirements) identifies the following as priority wet and dry season constituents for the Lower Tijuana HA: (1) medium or high priority wet season constituents including BOD, COD, TSS, turbidity, nutrients (total and dissolved phosphorus), diazinon, bifenthrin, permethrin, nitrate as N, and MBAS; and (2) medium or high priority dry season constituents including ammonia, turbidity, MBAS, TSS, TDS, nutrients, and fecal coliform bacteria, (County, et al. 2013).

Water Quality Improvement Plan for the Tijuana River Watershed Management Area

Pursuant to requirements in the NPDES Municipal Storm Water Permit, a Water Quality Improvement Plan (WQIP) was prepared for the Tijuana River Watershed Management Area (WMA) and was adopted by the RWQCB in March 2016. The WQIP identifies priority water quality conditions, defines goals to address the identified conditions, and sets forth strategies and timelines to achieve those goals. The highest priority water quality concern for the Tijuana River

WMA is sediment. Strategies that have been implemented to control sediment include dry weather flow reduction in storm drains, improvements to dirt alleyways in the City of Imperial Beach, and increased storm drain system maintenance by the City of San Diego. The goal is to reduce the sediment load (based on total suspended solids) in the Tijuana River WMA by 38 percent by year 2028.

A Monitoring and Assessment Program was established under the WQIP and includes receiving water monitoring, MS4 outfall discharge monitoring, and special studies. Results from the MAP are reported annually to the RWQCB. The most recent report concluded that the 2015-2016 sediment load was lower than the baseline; however, continued monitoring is required to determine if the reduction in sediment load over time will achieve the goals set by the WQIP (City of Imperial Beach et al. 2017).

State Surface Water Ambient Monitoring Program (SWAMP)

Monitoring conducted under the SWAMP periodically rotates among watersheds, with the Tijuana HU most recently monitored in 2005/2006 (SWAMP 2008). While this latest effort does not encompass water quality data from areas within or adjacent to the Project impact footprint, it includes one sampling location along the Tijuana River near Dairy Mart Road (approximately 10 miles downstream), which was evaluated for water chemistry, water and sediment toxicity, and bioassessment conditions. The results (as outlined below) indicate that “Water quality was heavily impacted...” at the Tijuana River site (SWAMP 2008).

Water Chemistry

Water chemistry testing involved conventional water chemistry (e.g., pH, temperature, and dissolved oxygen), inorganics, pesticides/herbicides, polycyclic aromatic hydrocarbons (PAHs; e.g., byproducts of fossil fuel combustion), dissolved metals, and polychlorinated biphenyls (PCBs). The results of the described testing indicated that aquatic and human health standards for water chemistry were exceeded at a high frequency at the noted Tijuana River sampling site, particularly for PAHs.

Water and Sediment Toxicity

Toxicity testing included evaluating effects from both sediment and water samples to indicator species such as algae and amphipods. The results of these efforts indicated that toxicity to tested organisms occurred at a high frequency at the Tijuana River sampling site.

Bioassessment Monitoring

SWAMP bioassessment testing at the described Tijuana River/Dairy Mart Road site was most recently conducted in the spring of 2003, with an associated IBI rating of very poor.

Bi-annual Clean Water Act Assessments

The SWRCB produces bi-annual qualitative assessments of statewide and regional water quality conditions. Since 1998, these assessments have focused on Federal CWA Section 303(d) impaired water listings and priority status for assignment of total maximum daily load (TMDL)

requirements. The Section 303(d) and TMDL assessments involve prioritizing waters on the basis of water quality (i.e., impaired) status and the necessity for assigning quantitative contaminant load restrictions (i.e., TMDLs), with these data submitted to the USEPA for review and approval. The most current (2014/2016) approved assessment identifies the following impaired waters in areas downstream of the Project impact footprint: (1) the lower 6.22 miles of the Tijuana River listed for ammonia as nitrogen, benthic community effects, cadmium, eutrophic conditions, indicator bacteria (i.e., enterococcus and total/fecal coliform bacteria), low dissolved oxygen, pesticides, phosphorus, sedimentation/siltation, selenium, solids, surfactants (i.e., MBAS), synthetic organics, total nitrogen (as N), toxicity, trace elements, and trash; (2) 1,319 acres in the Tijuana Estuary listed for eutrophic conditions, indicator bacteria, lead, low dissolved oxygen, nickel, pesticides, thallium, toxicity, trash, and turbidity; and (3) approximately 0.03 mile of the Pacific ocean shoreline, located at various points between the international border and Seacoast Drive, listed for indicator bacteria. Identified “Expected TMDL Completion Dates” for impaired waters on the 2014/2016 303(d) list range from 2010 to 2027 for all contaminants and locations (SWRCB 2018). Based on a number of public workshops and scoping meetings conducted in 2011 as part of the ongoing Tijuana River/Estuary TMDL process, the RWQCB is currently pursuing a stakeholder collaboration approach, rather than a TMDL, for the trash and sediment listings in the Tijuana River and Estuary. An associated resolution endorsing this approach and outlining related strategies (R9-2012-0030) was adopted by the RWQCB on February 8, 2012 and a Tijuana River Valley Recovery Team (TRVRT) was formed. In 2015, the TRVRT finalized a Five-Year Action Plan which was endorsed by the RWQCB (R9-2015-0035) and outlines a recovery strategy for the lower six miles of the Tijuana River and the Tijuana River Estuary.

Groundwater

Regional groundwater data include reported TDS levels of between 500 and 3,000 milligrams per liter (mg/l), 500 and 2,000 mg/l, and 380 to 3,620 mg/l in the Lower Tijuana River Basin (SDCWA 1997, DWR 2003 and SWRCB 2003, respectively). Historic (1985) information from a number of wells located approximately 2 to 6 miles west of the Project impact footprint generally characterize groundwater quality as poor, based on TDS levels averaging approximately 1,930 mg/l (DWR 1986).

Groundwater quality testing was conducted in 2011 at the previously described well near the northern impact footprint boundary. The results of this testing indicate generally poor overall groundwater quality, as characterized by TDS levels of 2,200 mg/l (refer to AECOM 2012 in Appendix D2 for additional test results).

Water Quality Summary

Based on the above information, existing surface water quality within the Project impact footprint and associated upstream watersheds is assumed to be generally good. This conclusion is based primarily on the undeveloped nature of these areas, with little known data available. Local groundwater quality is considered generally poor, based on testing from an adjacent well, although data are limited to this single location. The quality of surface and groundwater in areas downstream of the Project impact footprint is characterized as generally moderate to poor, based on historic and current monitoring data, as well as impaired water designations identified by the SWRCB.

**Table 3.2-1
SUMMARY OF TYPICAL CONTAMINANT SOURCES
FOR URBAN STORM WATER RUNOFF**

Contaminant	Contaminant Sources
Sediment and Trash/Debris	Streets, landscaping, driveways, parking areas, rooftops, construction activities, atmospheric deposition, drainage channel erosion
Pesticides and Herbicides	Landscaping, roadsides, utility rights-of-way, 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 3.2-2
TYPICAL LOADINGS FOR SELECTED CONTAMINANTS
IN RUNOFF FROM VARIOUS LAND USES
(lbs/acre/year)**

<u>Land Use</u>	TSS	TP	TKN	NH₃ - N	NO₂ + NO₃ - N	BOD	COD	Pb	Zn	Cu
Commercial	1,000	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	6,000	80	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Source: USEPA 1999

Key: lbs/acre/year = pounds per acre per year; HDR = High Density Residential; MDR = Medium Density Residential; LDR = Low Density Residential; N/A = Not available, insufficient data to characterize; TSS = Total Suspended Solids; TP = Total Phosphorus; TKN = Total Kjeldahl Nitrogen; NH₃ - N = Ammonia - Nitrogen; NO₂ + NO₃ - N = Nitrite + Nitrate + Nitrogen; BOD = Biochemical Oxygen Demand; COD = Chemical Oxygen Demand; Pb = Lead; Zn = Zinc; Cu = Copper

Table 3.2-3 SURFACE AND GROUNDWATER QUALITY OBJECTIVES FOR THE TIJUANA VALLEY HYDROLOGIC AREA AND THE SAN YSIDRO HYDROLOGIC SUBAREA¹												
Surface Water: San Ysidro Hydrologic Subarea												
Constituent (mg/l or as noted)												
TDS	Cl	SO₄	% Na	N&P	Fe	Mn	MBAS	B	Odor	Turb (NTU)	Color Units	F
2,100	-- ²	-- ²	-- ²	-- ³	-- ²	-- ²	-- ²	-- ²	None	20	20	-- ²
Groundwater: Tijuana Valley Hydrologic Area												
Constituent (mg/l or as noted)⁴												
TDS	Cl	SO₄	% Na	NO₃	Fe	Mn	MBAS	B	Odor	Turb (NTU)	Color Units	F
2,500 ⁵	550 ⁵	900 ⁵	70	-- ²	-- ²	-- ²	-- ²	2.0 ⁵	None	-- ²	-- ²	-- ²

Source: RWQCB 1994

¹ Concentrations not to be exceeded more than 10 percent of the time during any one-year period.

² Numeric objectives not established, Basin Plan narrative objectives apply.

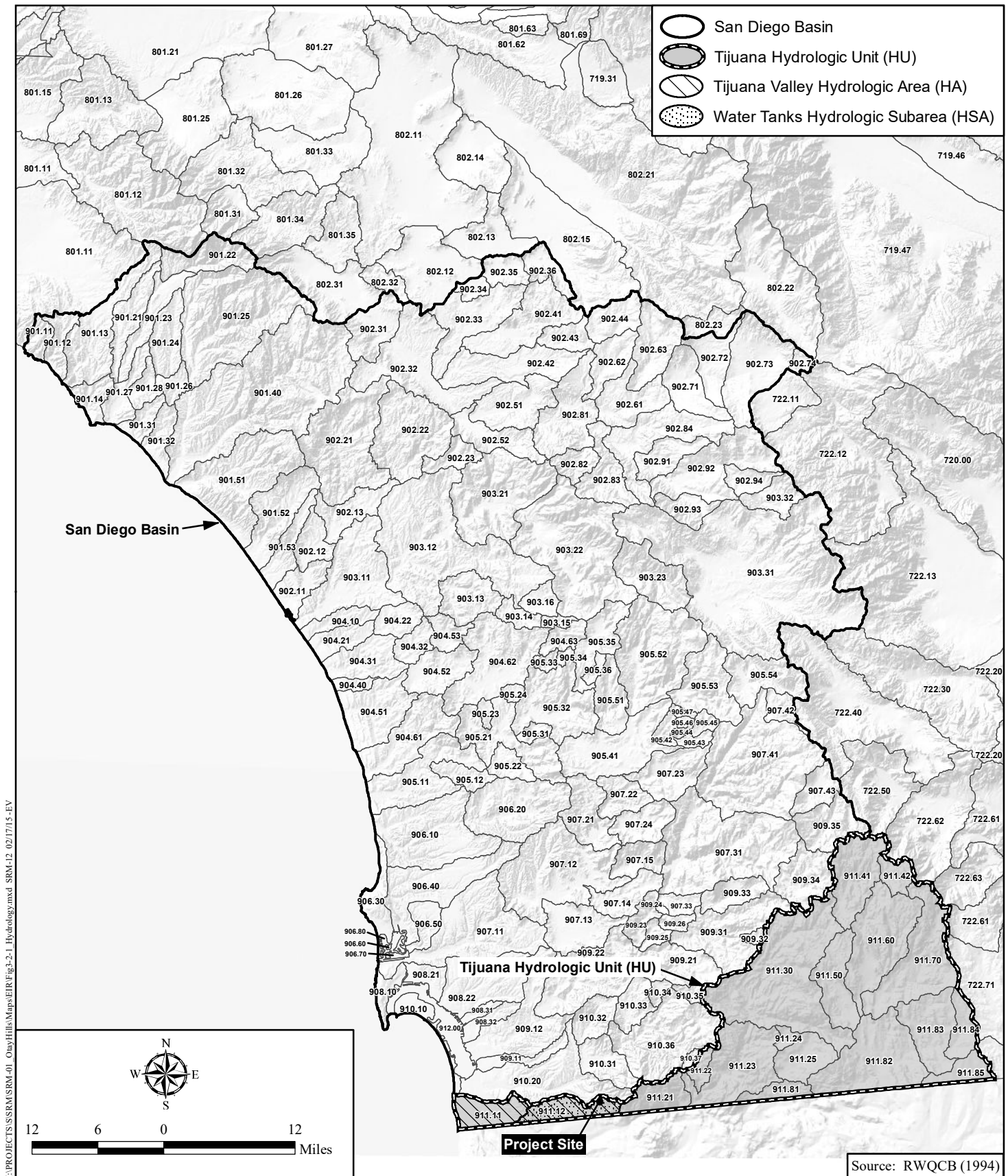
³ Shall be maintained at levels below those which stimulate algae and emergent plant growth.

⁴ Stated objectives do not apply west of Hollister Street.

⁵ Detailed salt balance studies recommended to verify appropriate discharge limits.

Key: TDS = Total Dissolved Solids; Cl = Chlorides; SO₄ = Sulfate; Na = Sodium; N&P = Nitrogen and Phosphorus; NO₃ = 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

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Project Location within Local Hydrologic Designations

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Figure 3.2-1