3.9 Hydrology, Water Quality, and Water Utilities

This section evaluates the potential hydrologic and water quality impacts that would result from the proposed PWIMP.

3.9.1 Introduction

This evaluation of hydrology and water quality was based on information from the City of Oxnard's 2030 General Plan. Key Terms and concepts include the following:

- **Acre Feet Per Year (AFY).** A quantity measure of water. The amount of water covering an acre of land with one foot of water.
- **Aquifer.** A deposit of rock, such as sandstone, containing water that can be used to supply wells.
- **Drainage.** The control and removal of excess rainfall runoff or groundwater by the use of surface or subsurface features or drains.
- **Drainage Channel.** An open channel such as swale, constructed channel, or natural drainage course that may convey, store, and treat runoff.
- **Groundwater.** Water beneath the surface that can be collected with wells, tunnels, or drainage galleries.
- **NPDES.** National Pollutant Discharge Elimination System, a permitting program administered by the State. The NPDES permit granted to Oxnard establishes standards and requirements for the control of pollutants in stormwater.
- **Service Area.** The area for which a purveyor is responsible for disturbing water supplies.
- **Stormwater Management.** Public policies and activities undertaken to regulate the rate, volume, and quality of runoff.
- **Wastewater.** Sewage (either treated or untreated) from residential, commercial, industrial, and institutional sources.
- **Wastewater Collection System.** The totality of the pipes, pump stations, manholes, and other facilities that convey untreated wastewater from the various sources around the City to the Oxnard Wastewater Treatment Plant.
- **Water Demand.** The volume of water requested by users to satisfy their needs.
- **Watershed.** An area of land that drains water, sediment, and dissolved material to a common outlet.
- **Water Supply.** Water supplied from surface water tanks, direct diversions from a water body (e.g., river, lake, or delta) or groundwater conveyed (e.g., via pipes) for use as a City water source.

3.9.2 Regulatory Context

Hydrology and water quality is subject to various Federal, State and local regulations. A brief overview of these regulations follows.

3.9.2.1 Federal Regulations

A brief overview of the federal regulations follows.

Clean Water Act. The CWA, enacted by the federal government in 1972 and amended in 1987, was designed to restore and maintain the chemical, physical, and biological integrity of the waters of the nation.

- **National Pollution Discharge Elimination System.** Section 301(a) of the CWA requires that point source discharges of pollutants to a water of the United States must be done in conformance with an NPDES permit. NPDES permits establish effluent limitations that incorporate various requirements of the CWA designed to protect water quality. CWA Section 402 authorizes the EPA or states with an approved NPDES program to issue permits. The State of California has an approved NPDES Program. The state NPDES Program is described below. In addition, communities greater than 100,000 in populations are required to apply for a municipal permit under the NPDES program. In Ventura County, the County and numerous co-permittees applied for a joint permit under this program; co-permittees included numerous cities throughout Ventura County, including Oxnard, Camarillo, and Ventura. The Countywide NPDES Municipal Stormwater Permit is also described below.
- **Total Maximum Daily Loads.** Section 303(d) of the CWA requires that states make a list of waters that are not attaining standards after technology-based limits. This is done to maintain a minimum level of pollutant management, using the best available technology, be put into place. States are to develop total maximum daily loads (TMDLs) for waters on this list (and where the EPA administrator deems they are appropriate). A TMDL must account for all sources of the pollutants that caused the water to be listed, including contributions from point sources (federally permitted discharges) and contributions from nonpoint sources. EPA is required to review and approve the list of impaired waters and each TMDL. The Santa Clara and Calleguas Creek watersheds have been listed as being impaired. The State of California is currently in the process of developing TMDLs for these and the other waters that have been listed as being impaired pursuant to Section 303(d) of the CWA, as described below.
- **Underground Injection Control Program.** The Safe Drinking Water Act established the Underground Injection Control (UIC) Program to provide safeguards so that injection wells do not endanger current and future underground sources of drinking water (USDW). The UIC Program defines an injection well as any bored, drilled, or a driven shaft or a dug hole, where the depth is greater than the largest surface dimension that is used to discharge fluids underground. EPA groups underground injection into five classes for regulatory control purposes. Wells used for injection of potable or recycled water into a potable groundwater aquifer would fall under Class V, which includes injection of nonhazardous fluids into or above a USDW. The State of California shares primary enforcement responsibility for the UIC Program with EPA. The UIC Program is authorized by rule, and no permit is necessary.

However, current federal requirements prohibit any injection activity that may endanger underground sources of drinking water (40 CFR Part 144). Therefore, owners and operators of Class V wells are required to provide inventory information (location, legal contact, nature of the injection activity, etc.) to their state UIC authority.

- **National Toxics Rule and California Toxics Rule.** In 1992, pursuant to the CWA, EPA promulgated the National Toxics Rule (NTR) criteria to establish numeric criteria for priority toxic pollutants for California. The NTR established water quality standards for 42 pollutants not covered at that time under California's statewide water quality regulations. As a result of a September 1994 court order that revoked California's statewide water quality control plan for priority pollutants, EPA initiated efforts to promulgate additional numeric water quality criteria for California. In May 2000, EPA issued the California Toxics Rule (CTR), which promulgated numeric criteria for priority pollutants. The CTR documentation (Volume 65, pages 31682–31719 of the *Federal Register* [65 FR 31682–31719], May 18, 2000, along with amendments in February 2001) "carried forward" the previously promulgated standards of the NTR, thereby providing a single document listing California's fully adopted and applicable water quality criteria for 126 priority pollutants.
- **Section 303(D) Impaired Waters List.** Section 303(d) of the CWA requires states to develop lists of water bodies (or sections of water bodies) that do not meet water quality standards after implementation of minimum required levels of treatment by point- source dischargers (i.e., municipalities and industries). The intent of the Section 303(d) list is to identify water bodies that require future development of a Total Maximum Daily Load (TMDL) and associated implementation program to maintain water quality. Section 303(d) requires states to develop a TMDL for each of the listed pollutants and water bodies.
- **Federal Anti-degradation Policy**. Section 303 of the Clean Water Act (CWA) (33 U.S.C. § 1313) requires that states adopt water quality standards for waters of the United States within their applicable jurisdiction. Such water quality standards must include, at a minimum, (1) designated uses for all waterbodies within their jurisdiction, (2) water quality criteria necessary to protect the most sensitive of the uses, and (3) anti-degradation provisions. Anti-degradation policies and implementing procedures must be consistent with the regulations in 40 C.F.R. § 131.12. Anti-degradation is an important tool that states use in meeting the CWA requirement that water quality standards protect public health and welfare, enhance water quality, and meet the objective of the Act to "restore and maintain the chemical, physical and biological integrity" of the nation's waters. The CWA requires that states adopt anti-degradation policies and identify implementation methods to provide three levels of water quality protection to maintain and protect (1) existing water uses and the level of water quality, (2) high quality waters, and (3) outstanding national resource waters.
- **Executive Order 11988: Floodplain Management.** Executive Order 11988 requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. In accomplishing this objective, Executive Order 11988 states that "each agency shall provide leadership and shall take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values

served by flood plains in carrying out its responsibilities."

The Federal Emergency Management Agency (FEMA) oversees floodplains and administers the National Flood Insurance Program (NFIP) adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities that participate in the program. Areas of special flood hazard (those subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The NFIP mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in an increase of more than one foot in flood elevation. In addition, development is not allowed in delineated floodways within the regulatory floodplain.

3.9.2.2 State Regulations

A brief overview of the state regulations follows.

State Water Resources Control Board. EPA has delegated responsibility for implementation of portions of the CWA to the California State Water Resources Control Board (State Board) and nine Regional Water Quality Control Boards (RWQCBs), including water quality planning and control programs such as the NPDES. The Code of Federal Regulations (Title 40, CFR) and EPA guidance documents provide direction for implementation of the CWA. The State Board sets statewide policies and develops regulations for the implementation of water quality control programs mandated by state and federal water quality statutes and regulations. The RWQCBs develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The State Board has adopted several statewide Water Quality Control Plans that are part of the Basin Plans. In addition, both the State and Regional Boards have adopted policies, separate from these plans, that provide detailed direction on the implementation of certain plan provisions. In the event that inconsistencies exist among the various plans and policies, the more stringent provisions apply. Applicable acts, policies, and water quality control plans are as follows:

- **The Porter-Cologne Water Quality Control Act.** The Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulation within California and defines water quality objectives as the limits or levels of water constituents established for the reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout California, while the Central Coast RWQCB (CCRWQCB) conducts planning, permitting, and enforcement activities. The Porter-Cologne Act requires the RWQCB to establish a regional Basin Plan with water quality objectives, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Beneficial uses, together with the corresponding water quality objectives, are defined as standards, per federal regulations. Therefore, the regional Basin Plans form the regulatory references for meeting state and federal requirements for water quality control. Changes in water quality are allowed if the change is consistent with the maximum beneficial use of the State waters, it does not unreasonably affect the present or anticipated beneficial uses, and it does not result in water quality less than that prescribed in the water quality control plans. The Basin Plan regulations also apply to groundwater. The Basin Plan for this location is discussed below in the local regulations subsection. This

Act would apply to the recharge wells because they would have the potential to affect water quality and beneficial uses in the Basin through injection of purified water. Thus, the Project would be required to comply with the Basin Plan water quality objectives established by the LARWQCB to protect the beneficial uses of the groundwater.

- **"Anti-degradation Policy."** In 1968, the SWRCB adopted an anti-degradation policy (policy) aimed at maintaining the high quality of waters in California through the issuance of Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California"). They apply to both surface waters and groundwaters (and thus groundwater replenishment projects), protect both existing and potential beneficial uses of surface water and groundwater, and are incorporated into Regional Water Quality Control Board (RWQCB) Water Quality Control Plans (e.g., Basin Plans).

  The policy requires that existing high water quality be maintained to the maximum extent possible, but allows lowering of water quality if the change is "consistent with maximum benefit to the people of the state, will not unreasonably affect present and anticipated use of such water (including drinking), and will not result in water quality less than prescribed in policies." The policy also stipulates that any discharge to existing high quality waters will be required to "meet waste discharge requirements which will result in the best practicable treatment or control of the discharge to ensure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

  The policy prohibits actions that tend to degrade the quality of surface and groundwater. The RWQCBs oversee this policy (SWRCB, 1968). The anti-degradation policy states that:

  - Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water, and will not result in water quality less than that prescribed in the policies.
  - Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters must meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

  SWRCB has interpreted Resolution No. 68-16 to incorporate the federal anti-degradation policy, which applies if a discharge that began after November 28, 1975 would lower existing surface and groundwater quality. This policy would apply to the treated water to be recharged into the Project wells because this element would be required to comply with the state resolution maintaining the existing water quality.

One of the requirements for a recycled water project is that it must be compatible with State Board Resolution 68-16 and the Recycled Water Policy (see below, under the header 'Recycled Water Policy'). This can be evaluated on a project-specific localized impacts basis or can be evaluated in terms of the utilization of basin-wide groundwater assimilative capacity. Utilization of more than 10% of basin-wide assimilative capacity for compliance with anti-degradation policy has typically required a Salt and Nutrient Management Plan for the basin or a similar level of evaluation (Brown and Caldwell, 2018).

- **Recycled Water Policy**. The Recycled Water Policy was adopted by the SWRCB in February 2009 and was subsequently amended in 2013 to include monitoring for CECs (discussed below) for groundwater replenishment projects. The Recycled Water Policy was a critical step in creating uniformity in how RWQCBs were individually interpreting and implementing the Anti-degradation Policy in Resolution 68-16 for water recycling projects, including groundwater replenishment projects such as the Project. The critical provisions in the Policy related to groundwater replenishment projects are discussed in the following subsections.
    - ***Constituents of Emerging Concern.*** As defined in the SWRCB Recycled Water Policy, CECs are chemicals in personal care products, pharmaceuticals including antibiotics, antimicrobials, agricultural and household chemicals, hormones, food additives, transformation products and inorganic constituents. These chemicals have been detected throughout the nation in trace amounts in surface water, wastewater, recycled water, and groundwater. The Recycled Water Policy includes monitoring requirements for six CECs for subsurface application groundwater replenishment projects using recycled water, four of which are used as health-based indicators and others serving as performance-based indicators. In addition to the Recycled Water Policy, the SWRCB regulations for groundwater replenishment projects with recycled water requires a project sponsor in the project's Engineering Report to recommend CECs for monitoring in the recycled water and potentially in the groundwater. For recharge projects using recycled water that has been treated using RO and an advanced oxidation process (AOP), the monitoring requirements in the Recycled Water Policy only apply to recycled water prior to and after RO/AOP treatment (i.e., no groundwater sampling). None of the CECs currently have regulatory limits. The Recycled Water Policy includes monitoring trigger levels (MTLs) for the four health-based CEC indicators and response actions to be taken by groundwater replenishment project sponsors based on monitoring results compared to the MTLs. The MTLs were based on Drinking Water Equivalent Levels. A Drinking Water Equivalent Level represents the amount of a CEC in drinking water that can be ingested daily over a lifetime without appreciable risk. The following CECs from the Recycled Water Policy are those with health-based indicators, treatment/performance-based indicators, or both as indicated below in parentheses.
        - 17-β-estradiol – steroid hormone (health-based indicator);
        - Caffeine – stimulant (health-based and performance-based indicator);
        - N-nitrosodimethylamine (NDMA) – disinfection byproduct (health-based and performance- based indicator) [Note: NDMA's current California Notification Level (NL) is 0.01µg/L];

   - Triclosan – antimicrobial (health-based indicator); and
   - N, N-diethyl-metatoluamide (DEET) – ingredient in personal care products (performance- based indicator); and Sucralose – food additive (performance-based indicator).

- ***Salt and Nutrient Management Plans.*** In recognition that some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed Basin Plan groundwater objectives, and that some Basin Plans do not have adequate implementation measures to achieve compliance, the Recycled Water Policy includes provisions for managing salts and nutrients on a regional or watershed basis through development of Salt and Nutrient Management Plans (SNMP) rather than imposing requirements on individual recycled water projects (which had been the practice prior to adoption of the Recycled Water Policy). SNMPs were to be developed for every groundwater basin/sub-basin with high salts and nutrients by May 2014 (May 2016 with a RWQCB-approved extension).

- ***Anti-degradation and Assimilative Capacity.*** Assimilative capacity is the ability for groundwater to receive contaminants without detrimental effects to human health or other beneficial uses. It is typically derived by comparing background ambient chemical concentrations in groundwater to the concentrations of the applicable Basin Plan groundwater quality objectives. The difference between the ambient concentration and groundwater quality objective is the available assimilative capacity. The Recycled Water Policy establishes two assimilative capacity thresholds in the absence of an adopted SNMP. A groundwater replenishment project that utilizes less than 10% of the available assimilative capacity in a groundwater basin/sub-basin (or multiple projects utilizing less than 20% of the available assimilative capacity in a groundwater basin/subbasin) are only required to conduct an anti-degradation analysis verifying the use of the assimilative capacity. In the event a project or multiple projects utilize more than the designated fraction of the assimilative capacity (e.g., 10% for a single project or 20% for multiple projects), the project proponent must conduct a RWQCB-deemed acceptable (and more elaborate) anti-degradation analysis.

  The RWQCB has the discretionary authority to allocate assimilative capacity to groundwater replenishment projects. There is a presumed assumption that allocations greater than the Recycled Water Policy thresholds would not be granted without concomitant mitigation or an amendment to the Basin Plan groundwater quality objective to create more assimilative capacity for allocation. Groundwater replenishment projects that utilize advanced treated recycled water will use very little to essentially none of the available assimilative capacity because of the high quality of the water. The Reverse Osmosis (RO) treatment component proposed for the PWIMP provides very high removal percentages for salts and nutrients, eliminating the need to utilize significant basin-wide assimilative capacities. Therefore, the PWIMP carries a low risk of adverse salt and nutrient impacts to groundwater.

- ***Regional Water Quality Control Board Groundwater Requirements.*** The Recycled Water Policy does not limit the authority of a RWQCB to impose more stringent requirements for groundwater replenishment projects to protect designated beneficial uses of groundwater, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation with the California SWRCB DDW. The Recycled Water Policy also does not limit the authority of a RWQCB to impose additional requirements for a proposed groundwater replenishment project that has a substantial adverse effect on the fate and transport of a contaminant plume (for example those caused by industrial contamination or gas stations), or changes the geochemistry of an aquifer thereby causing the dissolution of naturally occurring constituents, such as arsenic, from the geologic formation into groundwater. These provisions require additional assessment of the impacts of a groundwater replenishment project on areas of contamination in a basin and/or if the quality of the water used for replenishment causes constituents, such as naturally occurring arsenic, to become mobile and impact groundwater.

- **Ocean Plan.** On November 16, 2000, the SWRCB adopted and revised a *Water Quality Control Plan for the Ocean Waters of California* (Ocean Plan). The revised plan was approved by the State of California Office of Administrative Law (OAL) on July 9, 2001, and approved by EPA on December 3, 2001. The revised plan contains water quality objectives for coastal waters of California meant to ensure the reasonable protection of beneficial uses and the prevention of nuisance. By complying with these water quality objectives, it is expected that receiving waters are protected for marine aquatic life (including shellfish), water contact recreation, and other human health issues.
- **Policies Related to Groundwater Sources of Drinking Water Policy.** The Sources of Drinking Water Policy (adopted as Resolution 88-63) designates the municipal and domestic supply (MUN) beneficial use for all surface waters and groundwater except for those waters: (1) with total dissolved solids exceeding 3,000 mg/L, (2) with contamination that cannot reasonably be treated for domestic use, (3) where there is insufficient water supply, (4) in systems designed for wastewater collection or conveying or holding agricultural drainage, or (5) regulated as a geothermal energy producing source. Resolution 88-63 addresses only designation of water as drinking water source; it does not establish objectives for constituents that threaten source waters designated as MUN.

RWQCB, Los Angeles Region (4) – Water Quality Control Plan. The Oxnard Plain and Pleasant Valley areas are located within the LARWQCB. The LARWQCB adopted a revised *Water Quality Control Plan for the Los Angeles Region: Basin Plan for Coastal Watersheds of Los Angeles and Ventura Counties* (Basin Plan) on June 13, 1994, and amended this plan on January 27, 1997 by LARWQCB Resolution No. 97-02. This updated and consolidated plan represents the master quality control planning document and regulations of the LARWQCB. The SWRCB and the OAL approved the revised Basin Plan on November 17, 1994, and February 23, 1995, respectively. On May 26, 2000, EPA approved the revised Basin Plan except for the implementation plan for potential municipal and domestic supply (MUN)-designated water bodies, which is not pertinent to this discharge.

The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan: (1) designates beneficial uses for surface and groundwaters, (2) sets beneficial uses for specific surface and groundwaters, (3) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the anti-degradation policy of the state, and (4) describes implementation programs to protect all waters in the region. In addition, the Basin Plain incorporates (by reference) all applicable state and regional board plans and policies and other pertinent water quality policies and regulations.

The Los Angeles Region encompasses all coastal drainages flowing into the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angles County line, as well as the drainages of five offshore islands. In addition, the region includes all coastal waters within 3 miles of the continental and island coastlines. For planning purposes, the Regional Board uses the classification system developed by the California Department of Water Resources, which divides surface waters into hydrologic units, areas, and subareas; and groundwaters into major groundwater basins. The proposed project is located within the Oxnard and Pleasant Valley Subareas of the Oxnard Plain Area of the Santa Clara-Calleguas Hydrologic Unit of the Basin Plan.

Beneficial Uses form the cornerstone of water quality protection under the Basin Plan. Once Beneficial Uses are designated, appropriate water quality objectives can be established that maintain or enhance water quality; and programs can be implemented to ensure the protection of beneficial uses. The designated beneficial uses, together with water quality objectives, form water quality standards mandated under the California Water Code and the CWA. Beneficial uses and water quality objectives are specified for the following water bodies: inland surface waters (rivers, streams, lakes, and inland wetlands); groundwater; wetlands (freshwater, estuarine and saltwater marshes); swamps, mudflats, and riparian areas; and coastal waters (bays, estuaries, lagoons, harbors, beaches, and ocean water).

The Basin Plan provides an implementation plan for enhancing or maintaining water quality. This plan includes WDRs, Water Reclamation Requirements (WRRs), and the NPDES Program as described below. Effluent limits for ocean discharges are based the statewide Water Quality Control Plans that are made part of the Basin Plans, which include the Ocean Plan described above. In addition, as described below, TMDLs are currently being developed but have not yet been finalized for the Santa Clara and Calleguas Creek watersheds, which are listed as being impaired. Once finalized, these TMDLs will be incorporated into the Basin Plan as an amendment and will include implementation provisions.

- **Waste Discharge Requirements.** All wastewater discharges in the region, whether to surface or groundwaters, are subject to the California Water Code (Section 13263) and will require WDRs to be issued by the RWQCB. All reuses of treated wastewaters are subject to WRRs as described below. In addition, WDRs for discharges to surface waters also serve as NPDES permits because EPA has delegated responsibility of implementing this program to the state and regional boards. It is illegal to discharge wastes of any waters of the state and to reuse treated wastewaters without obtaining appropriate WDRs, WRRs, or NPDES permits. Any facility or person who discharges, or proposes to discharge, wastes or makes a material change to the character, location, or volume of waste discharges to waters in the region must describe the quality and nature of the proposed discharge in a report of waste discharge (ROWD) or an NPDES application. Upon review of the ROWD or NPDES application and all other pertinent information (including comments received at a public hears), the regional board will consider the issuance of requirements that incorporate appropriate measures and limitations to protect the public health and water quality. The basis components of the requirements include:

– Discharge limitations (including, if required, effluent and receiving water limits) Standard requirements and provisions outlining the dischargers general discharge requirements and monitoring and report responsibilities

– A monitoring program in which the discharger is required to collocate and analyze samples and submit monitoring reports to the regional board on a prescribed schedule.

– Dischargers are categorized according to their threat to water quality and operational complexity. In addition, discharges to surface waters are categorized as major or minor discharges. NPDES permits are adopted for a 5-year period.

- **Reclamation Requirements.** Projects that reuse treated wastewater and thereby lessen the demand for higher quality fresh waters are subject to WRRs, which are used to regulate groundwater recharge with treated wastewaters in lieu of WDRs. Title 22, California Code of Regulations, Division 4, Chapter 3 describes the applicable reclamation criteria. Requirements from the California DHS are incorporated into WRRs. The state and regional boards recognize the shortage of fresh water in the region and the need to conserve water for beneficial uses. Accordingly, reclaimed wastewaters are considered to be an increasingly important local resource. The RWQCB supports reclamation projects (i.e., those projects that reuse treated wastewaters, thereby offsetting the use of fresh waters) through the WRRs program. Under this program, treated wastewaters are reused for groundwater recharge, recreational impoundments, industrial processing and supply, and landscape irrigation.
- **National Pollution Discharge Elimination System Program.** The CWA authorizes EPA to regulate point source pollutants to the waters of the United States under the NDPES permitting program. California became a "delegated state" for issuing NDES Permits in 1974. As noted above, the state issues NPDES permits as WDRs in accordance with a Memorandum of Agreement (MOA) between EPA and the state board, and as codified in the California Water Code. A standard NPDES permit generally includes the following components: findings, effluent limitations, receiving water limitations, provisions, compliance/task schedules, pretreatment requirements, sludge requirements, and a monitoring program.
- **General WDRs and NPDES Permit for Discharges of Groundwater.** The Basin Plan allows discharges, in some cases, to be regulated under general requirements, which simplifies the permit process for certain types of discharges. These general requirements are issued administratively after an NPDES application has been filed and it has been determined that the discharge meets the conditions specified in the general requirements. A General WDR and NPDES Permit is available for construction dewatering and well test waters, which would be covered by the General NPDES Permit and WDRs for Groundwater Discharges from Construction and Project Dewatering to Surface Waters in Coastal Watersheds of Los Angeles and Ventura Counties.
- **General NPDES Permit for Discharges of Stormwater.** The Basin Plan requires a statewide general NPDES stormwater permit for all construction projects impacting 5 acres

or more, or smaller areas that are part of a larger common plan, including excavation, demolition, grading, and clearing. For construction activities, landowners are required to develop and implement an SWPPP and assess the effectiveness of their pollution prevention measures (control practices). The NPDES permit establishes requirements for the Notice of Intent (NOI) and the schedule for submittal and compliance. In addition, as described above for the Clean Water Act under Federal Standards, the State of California is currently in the process of developing TMDLs for waters that have been listed as being impaired pursuant to Section 303(d) of the CWA. TMDLs are to be established at the level necessary to implement the applicable water quality standards, which require that all sources of pollution and all aspects of a watershed drainage system be reviewed. Section 303(d), 303(e), and their implementing regulations of the CWA, require that approved TMDLs be incorporated into water quality control plans. EPA has established regulations (40 CFR 122) requiring that NPDES permits be revised to be consistent with any approved TMDL. Federal regulation requires that implementation plans be developed along with the TMDLs. The SWRCB has interpreted state law (Porter-Cologne Water Quality Control Act) to require that implementation be addressed when TMDLs are incorporated into Basin Plans (water quality control plans). TMDLs developed by RWQCBs are to be designed as Basin Plan amendments and will include implementation provisions. TMDLs are in development but have not yet been finalized for the Santa Clara and Calleguas Creek watersheds, are listed as being impaired.

RWQCB, Los Angeles Region (4) – Section 401 Certification. Section 401 of the CWA grants each state the right to ensure that the interests of the state are protected on any federally permitted activity occurring in or adjacent to Waters of the State. In California, the RWQCB are the agencies mandated to ensure protection of the waters of the state. Anyone proposing to conduct a project that requires a federal permit or involves dredge or fill activities that may result in a discharge to U.S. surface waters and/or "Waters of the State" are required to obtain a CWA Section 401 Water Quality Certification and/or Waste Discharge Requirements (Dredge/Fill Projects) from the LARWQCB, verifying that the project activities will comply with state water quality standards. The most common federal permit for dredge and fill activities is a CWA Section 404 permit issued by the U.S. Army Corps of Engineers (USACE).

Sustainable Groundwater Management Act. The Sustainable Groundwater Management Act (SGMA) was signed into California State law by Governor Jerry Brown on September 16, 2014 and became effective January 1, 2015. SGMA gives local agencies the authority to customize groundwater sustainability plans to their regional economic and environmental needs and manage groundwater in a sustainable manner to protect groundwater resources. SGMA provides a definition of sustainable groundwater management and has established a framework for local agencies to develop plans and implement sustainable management strategies to manage groundwater resources, prioritizes basins (ranked as high- and medium-priority) with the greatest problems (i.e., the undesirable results as discussed below), and sets a 20-year timeline for implementation.

The DWR and the SWRCB are the lead state agencies responsible for developing regulations and reporting requirements necessary to carry out SGMA. DWR sets basin prioritization, basin boundaries, and develops regulations for groundwater sustainability plans. The SWRCB is responsible for fee schedules, data reporting, probationary designations and interim sustainability plans (DWR, 2016).

SGMA requires the creation of a Groundwater Sustainability Agency for medium- and high-priority groundwater basins in accordance with Water Code §10723 et seq. Each Groundwater Sustainability Agency is to develop and implement a Groundwater Sustainability Plan (GSP) in accordance with Water Code §10727 et seq. The GSP would describe how users of groundwater within the Basin would manage and use groundwater in a manner that can be sustainably maintained during the planning and implementation horizon without causing undesirable results. SGMA defines undesirable results as follows:

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply;
- Significant and unreasonable reduction of groundwater storage;
- Significant and unreasonable seawater intrusion;
- Significant and unreasonable degraded water quality, including the migration of contaminant plumes that impair water supplies;
- Significant and unreasonable land subsidence that substantially interferes with surface land uses; and
- Depletions of interconnected surface water that have significant and unreasonable adverse impacts on beneficial uses of the surface water

The PWIMP would affect groundwater management in the Basin because it would be replenishing the aquifers with purified water and altering pumping distribution among the City's groundwater supply wells. As one of the objectives of the PWIMP is to replenish groundwater and raise groundwater levels, the PWIMP may have a positive contribution to the sustainable management of groundwater.

Department of Drinking Water, Domestic Water Supply System for Potable Use. California's drinking water program was originally created in 1915, when the California State Board of Health established the Bureau of Sanitary Engineering. In 1976, two years after the Safe Drinking Water Act was passed, California adopted its own safe drinking water act (contained in the Health and Safety Code) and adopted implementing regulations (contained in Title 22 California Code of Regulation). The state's act had two main goals: (1) to continue the state's drinking water program, and (2) to be the delegated authority (referred to as the "primacy") by the EPA for enforcement of the federal Safe Drinking Water Act. As required by the federal act, California's program must set drinking water standards that are at least as stringent as the EPA's standards. In addition, each community water system must monitor for a specified list of contaminants, and the findings must be reported to the state.

The DDW regulates public water systems, oversees water recycling projects, permits water treatment devices, supports and promotes water system security, and performs a number of other functions. DDW has adopted enforceable primary and secondary maximum contaminant levels (MCLs). The MCLs are either based on the federal MCLs or as part of DDW's own regulatory process. For example, California has an MCL for perchlorate while there is no federal MCL. The MCLs account for not only chemicals' health risks, but also factors such as their detectability and treatability, as well as costs of treatment. Health and Safety Code Section 116365(a) requires a contaminant's MCL to be established at a level as close to its Public Health

Goal (PHG) as is technologically and economically feasible, placing primary emphasis on the protection of public health. The Office of Environmental Health Hazard Assessment (OEHHA) established PHGs.

They are concentrations of drinking water contaminants that pose no significant health risk if consumed for a lifetime, based on current risk assessment principles, practices, and methods. OEHHA establishes PHGs pursuant to Health and Safety Code Section 116365(c) for contaminants with MCLs, and for those for which MCLs will be adopted.

Public water systems use PHGs to provide information about drinking water contaminants in their annual Consumer Confidence Reports. Certain public water systems must provide a report to their customers about health risks from a contaminant that exceeds its PHG and about the cost of treatment to meet the PHG and hold a public hearing on the report. There are also a variety of chemicals of health concern whose occurrence is too infrequent in conventional drinking water sources to justify the establishment of national standards; these are addressed using advisory levels. The DDW, with the assistance of OEHHA, has established notification levels (NLs) and Response Levels for that purpose. If a chemical concentration is greater than its NL in drinking water, the utility that distributes the water must inform its customers and consumers about the presence of the chemical, and about health concerns associated with exposure to it. If a chemical is present in drinking water that is provided to consumers at concentrations greater than the Response Levels (10 to 100 times greater than the NL depending on the toxicological endpoint of the constituent), DDW recommends that the source be taken out of service.

Final Groundwater Replenishment with Recycled Water Regulations hereafter, referred to as "Groundwater Replenishment Regulations," went into effect June 18, 2014 (SWRCB, 2015). The overarching principles taken into consideration by DDW in developing the Groundwater Replenishment Regulations were:

- Groundwater replenishment projects are replenishing groundwater basins that are used as sources of drinking water

Control of pathogenic microorganisms should be based on a low tolerable risk that was defined as an annual risk of infection[1]from pathogen microorganisms in drinking water of one in 10,000 (10-4). This risk level is the same as that used for the federal Surface Water Treatment Rule for drinking water.

- Compliance with drinking water standards for regulated chemicals.
- Controls for unregulated chemicals.
- No degradation of an existing groundwater basin used as a drinking water source.
- Use of multiple barriers to protect water quality and human health.
- Projects should be designed to identify and respond to a treatment failure. A component of this design acknowledges that groundwater replenishment projects inherently will

[1] There is a difference between infection and disease. Infection, often the first step, occurs when a pathogen enters a body and begins to multiply. Disease occurs when the cells in the body are damaged as a result of the infection and signs and symptoms of an illness appear. Infection necessarily precedes disease, but infection typically only leads to disease in a fraction of cases. Many factors influence the infection-to-disease ratio.

include storage in a groundwater aquifer and include some natural treatment

The key provisions of the Groundwater Replenishment Regulations that apply to subsurface application (e.g., the use of injection or vadose zone wells) that use 100% recycled water for application are summarized in Table 4.9-1.

Table 4.9-1
Summary of Groundwater Replenishment Regulations

Control Mechanism	Requirements
Source Control	Entities that supply recycled water to a groundwater replenishment project must administer a comprehensive source control program to prevent undesirable chemicals from entering wastewater. The source control program must include: (1) an assessment of the fate of DDW and RWQCB- specified contaminants through the wastewater and recycled water treatment systems; (2) provisions for contaminant source investigations and contaminant monitoring that focus on DDW and RWQCB- specified contaminants; (3) an outreach program to industrial, commercial, and residential communities; and (4) an up-to-date inventory of contaminants.
Pathogen Control	To meet the low tolerable risk level (a basic principle of the regulations), pathogen reduction requirements have been established for treatment of recycled water similar to the approach used for drinking regulations. The Groundwater Replenishment Regulations require a project to achieve a 12- log enteric virus reduction, a 10-log *Giardia* cyst reduction, and a 10-log *Cryptosporidium* oocyst reduction using at least 3 treatment barriers. To ensure that a barrier is significant, each barrier must achieve at least 1.0-log reduction. No treatment process can be credited with more than a 6-log reduction. The log reductions must be verified using a procedure approved by DDW. Log reduction refers to the reduction of pathogenic microorganism concentrations on a log-scale (e.g., 3 logs is 99.9% removal). Failure to meet the specified reductions requires notification to DDW and RWQB, investigation, and/or discontinuation of recycled water use until a problem is corrected. Trussell et al. (2013) conducted an extensive review of the proposed pathogen reduction requirements in the Groundwater Replenishment Regulations and concluded that the assumptions used to derive the log reductions were conservative and provide a large factor of safety that likely reduces the actual risk of infection below the 10^{-4} level, particularly for control of the amount of a particular disease present in a community.
Nitrogen Control	To ensure protection of groundwater, the concentration of total nitrogen in recycled water must meet 10 mg/L before or after recharge. Failure to meet this value requires follow-up sampling, notification to DDW and RWQCB, and/or discontinuation of recycled water use until a problem is corrected.
Regulated Chemicals Control	The recycled water must meet drinking water MCLs as specified by the Groundwater Replenishment Regulations. Failure to meet MCLs requires follow-up sampling, notification to DDW and RWQCB, and/or discontinuation of recycled water use until the problem is corrected.
Unregulated Chemicals Control	Monitoring the concentrations and toxicities of thousands of potential organic compounds in any water supply would be an infeasible task. Control of unregulated chemicals for all groundwater replenishment projects using 100% recycled water is accomplished through criteria for full advanced treatment of the recycled water, limits for Total Organic Carbon (TOC) and performance of treatment for CECs. TOC is used as a surrogate for unregulated and unknown organic chemicals. For subsurface application projects (injection and vadose wells), the entire recycled water flow must be treated using RO and AOP. After treatment, the TOC in the recycled water cannot exceed an average of 0.5 mg/L. Specific performance criteria for RO and AOP processes have been included in the Groundwater Replenishment Regulations. Failure to meet the requirements

Table 4.9-1
Summary of Groundwater Replenishment Regulations

Control Mechanism	Requirements
	established for a groundwater replenishment project results in notifications to DDW and RWQCB, response actions, and in some cases cessation of the use of recycled water.
Response Retention Time (RRT)	The intent of the RRT is to provide time to retain recycled water underground to identify any treatment failure so that inadequately treated recycled water does not enter a potable water system. Sufficient time must elapse to allow for: a response that will protect the public from exposure to inadequately treated water; and provide an alternative source of water or remedial treatment at the wellhead if necessary. The RRT is the aggregate period of time between treatment verification samples or measurements; time to make the measurement or analyze the sample; time to evaluate the results; time to make a decision regarding the appropriate response; time to activate the response; and time for the response to work. The minimum RRT is 2 months but must be justified by the groundwater replenishment project sponsor.
Monitoring Program	Comprehensive monitoring programs are established for recycled water and groundwater for regulated and unregulated constituents.
Operation and Optimization Plan	The intent of the plan is to assure that the facilities are operated to achieve compliance with the Groundwater Replenishment Regulations, to achieve optimal reduction of contaminants, and to identify how the project will be operated and monitored.
Boundaries Restricting Locations of Drinking Water Wells	Project sponsors must establish a "zone of controlled well construction," which represents the greatest of the horizontal and vertical distances reflecting the underground retention times required for pathogen control or for the RRT. Drinking water wells cannot be located in this zone. Project sponsors must also create a "secondary boundary" representing a zone of potential controlled well construction that may be beyond the zone of controlled well construction, thereby requiring additional study before a drinking water well is drilled.
Adequate Managerial and Technical Capability	A project sponsor must demonstrate that it possess adequate managerial and technical capability to comply with the regulations.
Engineering Report	The project sponsor must submit an Engineering Report to DDW and RWQCB that indicates how a groundwater replenishment project will comply with all regulations and includes a contingency plan to insure that no untreated or inadequately treated water will be used. The report must be approved by DDW.
Reporting	Annual reports must be submitted to DDW, RWQCB, and groundwater providers downgradient of injection wells; the Engineering Report must be updated every 5 years.
Alternatives	Alternatives to any of the provisions are allowed if: the project sponsor demonstrates that the alternative provides the same level of public health protection; the alternative has been approved by DDW; and an expert panel has reviewed the alternative unless otherwise specified by DDW.
Public Hearing	The project sponsor must hold a public hearing for a groundwater replenishment project after DDW approves the Engineering Report; based on the Engineering Report, the hearing, and public comments, DDW issues a conditional approval letter to the RWQCB for inclusion in the Waste Discharge Requirements and/or Water Reclamation Requirements issued by the RWQCB. Thus, including the hearing for the RWQCB permit, there are two public hearings for a groundwater replenishment project. Should DDW obtain primacy for issuing groundwater replenishment permits, the RWQCB would provide recommendations and conditions for inclusion in the Waste Discharge Requirements and/or Water Reclamation Requirements and the SWRCB would hold the permit hearing.

Statewide NPDES General Permit for Drinking Water System Discharges. Since February 2016, the District has coverage under the Statewide National Pollutant Discharge Elimination System (NPDES) Permit for Drinking Water System Discharges to Waters of the United States (WQ 2014-0194-DWQ General Order No. CAG140001). The SWRCB is responsible for issuance of NPDES permits for discharges from drinking water systems with 1,000 connections or greater that are regulated by the State Board Division of Drinking Water or a local county department of public health. The Order provides regulatory coverage for short-term or seasonal planned and emergency (unplanned) discharges resulting from a water purveyor's essential operations and maintenance activities undertaken to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements for providing reliable delivery of safe drinking water. Such discharges include, but are not limited to, discharges from supply wells, transmission systems, water treatment facilities, water distribution systems, and storage facilities. Planned and emergency discharges are required to be regulated by an NPDES permit if the discharges flow into a water of the U.S. Discharges authorized under the Order are determined to not adversely affect or impact beneficial uses of the receiving waters when properly managed through BMPs. For the purposes of the groundwater resources analysis, the NPDES Statewide General permit applies to planned discharges of groundwater during the drilling, construction, and development of groundwater monitoring and/or recharge wells.

Water Well Standards. Under California Water Code Section 231, enacted in 1949, DWR is responsible for developing standards for the protection of well water quality. Authority for enforcing the standards as they apply to the construction, destruction, and modification of water wells rests with the Santa Cruz County Environmental Health Services. The California Water Code requires contractors that construct or destruct water wells to have a C-57 Water Well Contractor's License, follow DWR well standards, and file a completion report with DWR (Water Code Sections 13750.5 et seq.). The City would obtain the appropriate permits for installation of any new water supply wells and abandonment and destruction of any wells.

Well Completion Reports. DWR is responsible for maintaining a file of well completion reports (DWR Form 188), which must be submitted whenever a driller works on a water well. Well completion reports must be filed with DWR within 60 days from the date of the work. Well completion reports may be used by public agencies conducting groundwater studies, provided that the information is kept confidential and is used only for the purpose of conducting the study (Water Code Sections 13751 and 13752).

Groundwater Rights. In California, water rights involve the right to use water, not the right to own water. While the Water Code implies the existence of groundwater rights, their doctrinal bases and characteristics are essentially the product of the decisions of the courts. There are three types of groundwater rights:

- ***Overlying Rights.*** Subject to certain limitations, property owners above a common aquifer possess a right to the reasonable and beneficial use of a groundwater resource on their own lands overlying the aquifer from which the water is taken. Overlying rights are correlative (related to each other) and overlying users of a common water source are allowed to share the resource on a pro rata basis in times of shortage.
- ***Appropriative Rights.*** Non-overlying uses and public uses, such as municipal uses, are called appropriative uses. Among groundwater appropriators, the "first in time, first in

right" priority system applies. Appropriative users are entitled to use the surplus water available after the overlying user's rights are satisfied.

- ***Prescriptive Rights.*** Prescriptive rights are gained by trespass or unauthorized taking that can yield a title because it was allowed to continue longer than the five-year statute of limitations. Claim of a prescriptive water right to non-surplus water by an appropriator must be supported by many specific conditions, including a showing that the pumpage occurred in an open manner, was continuous and uninterrupted for five years, and was under a claim of right. From a water law standpoint, the City possesses appropriate water rights and as a public agency, it has the right to store recharge and to recapture water in the Groundwater Basin can be summarized by the following general rules:
    - The City has the right to recapture water that has been added to the groundwater supply as a result of recharge;
    - The City has the right to prevent other groundwater producers from extracting the replenished supply, although this could require litigation, and in some cases, adjudication of all rights to the groundwater basin may be necessary to determine rights to the total supply; and
    - The underground storage and recovery of the groundwater basin cannot substantially interfere with the basin's native or natural groundwater supply.
- ***Material Injury.*** Groundwater case law has generally adopted the threshold that "…material injury… turns on the existence of an appreciable diminution in the quantity or quality of water…" A reasonable definition of "appreciable" in the context of this EIR is if the project would render a nearby well incapable of meeting its:
    - Historically measured maximum daily production level;
    - Historically measured dry-season production levels; or
    - Historically measured annual production levels under drought conditions.

3.9.2.3 Local Regulations

California Government Code Section 53091 (d) and (e) provides that facilities for the production, generation, storage, treatment, or transmission of water supplies are exempt from local (i.e. city and county) building and zoning ordinances. Some of the proposed facilities evaluated in this EIR relate to the production, generation, treatment, and transmission of water and are, therefore, legally exempt from local building and zoning ordinances. However, they would not be exempt from the requirements of Local Coastal Programs, if applicable. With that said, the relevant local regulations related to the PWIMP are discussed below.

Coastal Zone Management Act Federal Consistency Review. The federal consistency requirement set forth in Section 307 of the Coastal Zone Management Act (CZMA) requires that activities approved or funded by the federal government (e.g., the federally-funded California Clean Water State Revolving Fund Program) that affect any land or water use or natural resource of a state's coastal zone, must be consistent with the enforceable policies of the state's federally approved coastal management program.

California's federally approved coastal management program consists of the California Coastal Act, the McAteer-Petris Act, and the Suisun Marsh Protection Act. The California Coastal Commission implements the California Coastal Act and the federal consistency provisions of the

CZMA for activities affecting coastal resources outside of San Francisco Bay. Subparts D and F of the federal consistency regulations govern consistency review for activities involving a federal permit and federal funding, respectively. These sections generally require the applicant to provide the subject state agency (e.g., the Coastal Commission) with a brief assessment of potential coastal resources impact and project conformity with the enforceable policies of the management program.

The Coastal Commission considers an application for a coastal development permit to satisfy the Subpart D and F conformity assessment requirements. Typically, the Coastal Commission will provide its response (concurrence, conditional concurrence, or objection) in its staff report for the coastal development permit. In cases where the coastal development permit is issued by a local government with a certified local coastal program (LCP), the Coastal Commission will typically provide its response in a letter, following the permit issuance and the completion of any appeals process.

California Coastal Act. The California Coastal Act (Public Resources Code Section 30000 et seq.) provides for the long- term management of lands within California's coastal zone boundary. The Coastal Act includes specific policies for management of natural resources and public access within the coastal zone. Of primary relevance to groundwater hydrology and water quality are Coastal Act policies concerning protection of the biological productivity and quality of coastal waters. For example, Article 4 of the Act details policies related to the marine environment, such as biological productivity and water quality. Specifically, and relevant to groundwater hydrology and water quality, the Act requires the quality of coastal waters, streams, wetlands, estuaries appropriate to maintain optimum populations of marine organisms and for the protection of human health, to be maintained and, where feasible, restored through, among other means, preventing depletion of groundwater supplies (Cal. Pub. Res. Code §§ 30231).

Fox Canyon Groundwater Management Agency. The FCGMA was created in 1982 to preserve groundwater resources for water users in all areas overlying the Fox Canyon aquifer zone and has jurisdiction over all of the land that overlies the Fox Canyon Aquifer, which encompasses approximately 185 square miles. The Oxnard Plain and Pleasant Valley are included in this area. The FCGMA manages groundwater resources through ordinances and does not own any capital facilities. The first, Ordinance No 1, was adopted in 1983 and required that all well owners with extraction facilities within register their wells with the FCGMA, report annual extractions, and pay an annual groundwater extraction charge. The most significant, Ordinance No 5, addresses groundwater overdraft by requiring reductions in groundwater extractions via scheduled 5 percent reductions beginning in 1990 every 5 years that total 25 percent with the objective of reducing extractions to a "safe yield" level. Ordinance No. 8 (the "Ordinance Code"), adopted in 2002, combines the previous active ordinances (1.3, 3.2, 4.3, and 5.9) to reduce confusion, eliminate redundant text, and to shorten the laws into a more manageable format.

Applicable Ordinance No. 8 is reviewed once every 5 years and, if necessary, amended to ensure that the goals of the FCGMA are met. Ordinance No. 8 covers the following items:

- Registration of wells, reporting extraction, and levying of charges
- Installation and use of metering equipment for groundwater extraction facilities
- Protection of the South, East, and West Las Posas Basins
- Reduction of groundwater extractions to eliminate overdraft of the aquifer system

The following provisions of Ordinance No. 8 will be utilized in implementation of the PWIMP.

- Section 5.3, Adjustments to Extraction Allocations, recognizes that adjustments to "extraction allocation" may be necessary to provide some flexibility while still maintaining the goal of reaching a safe yield condition. The PWIMP will utilize Section 5.3.2.4, Transfer of Allocation, to transfer groundwater that is not pumped, in lieu of recycled water deliveries to agricultural users, to the City and/or UWCD for groundwater extraction for potable supplies. A request for transfer of allocation is required to be submitted jointly by the parties involved, including specific details of the requested transfer. If approved, the adjustment of allocation is effective for the remainder of the calendar year and for all subsequent calendar years until modification by a subsequent FCGMA-approved adjustment.
- Section 5.7, Credits, allows operators to obtain credits that are not considered as extraction allocations or adjustments to extraction allocations. Credits are to be accounted for through the normal reporting and accounting procedure and are carried forward from year to year. Upon request, the FCGMA Board may transfer credits provided there is a net benefit to the aquifer within the FCGMA. The PWIMP will utilize Section 5.7.1.2, Storage Credits, to obtain storage credits for "foreign water" injected or spread and percolated in a FCGMA Board-approved injection/storage facility. The FCGMA will determine the amount of storage credits based upon documentation of expected losses provided by the operator seeking the storage credit. A written application for approval of an injection/storage facilities is required that provides the details of the requested injection/storage program. If approved, an operator will obtain credits as determined by the FCGMA.

County Well Permit. Ventura County Well Ordinance No. 4814 requires that a permit application be filed with the Ventura County Water Resources Division. This ordinance states that the well construction standards of the County are those as listed in the State of California's Department of Water Resources Bulletin No. 74-9, Chapter IV, entitled "Water Well Standards - Ventura County" and Bulletin No. 74-81, Bulletin No. 74-90, Chapter II, entitled "Water Well Standards – State of California." A detailed well log must be submitted to the Water Resources Department within 30 days upon completion of the monitoring wells.

County Watercourse Encroachment Permit. The Ventura County Public Work Agency, Flood Control Department, requires that a Watercourse Encroachment Permit be obtained prior to construction.

Countywide NPDES Municipal Stormwater Permit. Local stormwater permitting requirements by the Ventura County Public Work Agency, Flood Control Department, for construction are covered by the stormwater permitting requirements in the RWQCB Water Quality Control Plan for the Los Angeles Region (Basin Plan), which are described above. In addition, communities greater than 100,000 in population are required to apply for a municipal permit under the NPDES program. In Ventura County, the County and numerous co-permittees applied for a joint permit under this program; co-permittees included numerous cities throughout Ventura County, including Oxnard, Camarillo, and Ventura. The Countywide NPDES Municipal Stormwater Permit was adopted by the RWQCB in 2000, pursuant to Division 7 of the California Water Code. Board Order No. 00-108 represents the permit under NPDES for stormwater discharges and urban runoff within Ventura County.

The Order requires the Ventura County Flood Control District other co-permittees to implement the requirements of NPDES Permit No. CAS004002, including the Monitoring and Reporting Program, Ventura Countywide Stormwater Quality Urban Impact Mitigation Plan (SQUIMP), and Ventura Countywide Stormwater Quality Management Plan (SQMP).

The requirements include programs to ensure that best management practices (BMPs) and other stormwater quality protection measures are incorporated into grading and building permits, and that regulatory and site inspection programs are developed. Individual water quality protection measures, including BMPs, were developed at the County level; and the County and Cities become jointly responsible for ensuring compliance.

The Santa Clara River is the primary surface water feature in the City and the longest free-flowing river in Southern California. The river is also one of the few remaining rivers in the area that remains in a relatively natural state. The total river length is approximately 70 miles, extending from its headwaters at Mount Pinos to the Santa Clara River Estuary adjacent to McGrath State Beach.

The Oxnard Plain groundwater Hydrographic sub-unit includes the Oxnard and Pleasant Valley Hydrographic Sub areas, each of which receives natural recharge from a system of nine groundwater basins along the Santa Clara River Basin. The Oxnard Hydrographic Sub area is located in the southwest corner of the Santa Clara River Basin and consists of the Montalvo, Mound, and Oxnard Plain Basins.

The Oxnard Plain Basin is the most important to the City of Oxnard and is composed of two aquifer systems known as the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). The UAS consists of the Oxnard Aquifer, and the Mugu Aquifer. The LAS is comprised of the Hueneme, Fox Canyon, and Grimes Canyon Aquifers.

Due to its low land profile, the City of Oxnard became a member of the National Flood Insurance Program (NFIP). The City also adopted a Master Plan of Drainage and a Floodplain Management Ordinance (Chapter 35 of the Oxnard City Code) to protect its residents and businesses. The City of Oxnard falls within the Santa Clara River's 1,600 square mile watershed. Flooding in Oxnard caused by rainwater is most likely to occur in the winter months when Ventura County receives most of it precipitation. The majority of Oxnard's rain falls between late January and mid-March. On average, however, rainfall in the Oxnard area increases sharply in early November and does not decrease until mid/late-March. High winds or tides can cause seawater surges resulting in coastal flooding beyond the high tide line. Wave action can directly impact seaside homes and infrastructure. Indirectly, wave action can cause beach and bluff erosion resulting in damage to seaside homes and infrastructure.

Several dams are located at least 35 miles to the east and northeast of Oxnard within Ventura and Los Angeles counties. These include the Santa Felicia Dam at Lake Piru, the Castaic Lake Dam and the Pyramid Lake Dam. The major threat to Oxnard is upstream along the Santa Clara River corridor. Although the potential for a dam failure is considered low, should one or more of these dams fail, the entire city is located within the Dam Inundation Zone, also called Dam Failure Hazard Area. Damage to the city could be in the form of a wall of fast--moving water, mud, and debris. Residential and commercial buildings as well as critical facilities could be impacted by a dam failure.

The City of Oxnard is a participant with other local governments in the Ventura Countywide Stormwater Quality Management Plan. This is a comprehensive regional effort to implement federal and state requirements for reducing water pollution from uncontrolled stormwater runoff. This program defines the Best Management Practices applicable to management of stormwater runoff, and the prevention of dry weather runoff. It also establishes the design requirements for Low Impact Development to minimize the volume of stormwater discharge and pollutant levels that originate from newly developed areas.

Compliance with these principles by construction and land development projects that may affect stormwater quality in the City stormwater drainage system is a requirement of the National Pollutant Discharge Elimination System (NPDES) Permit No. CAS004002, issued by the California Regional Water Quality Control Board, Los Angeles Region in 2010.

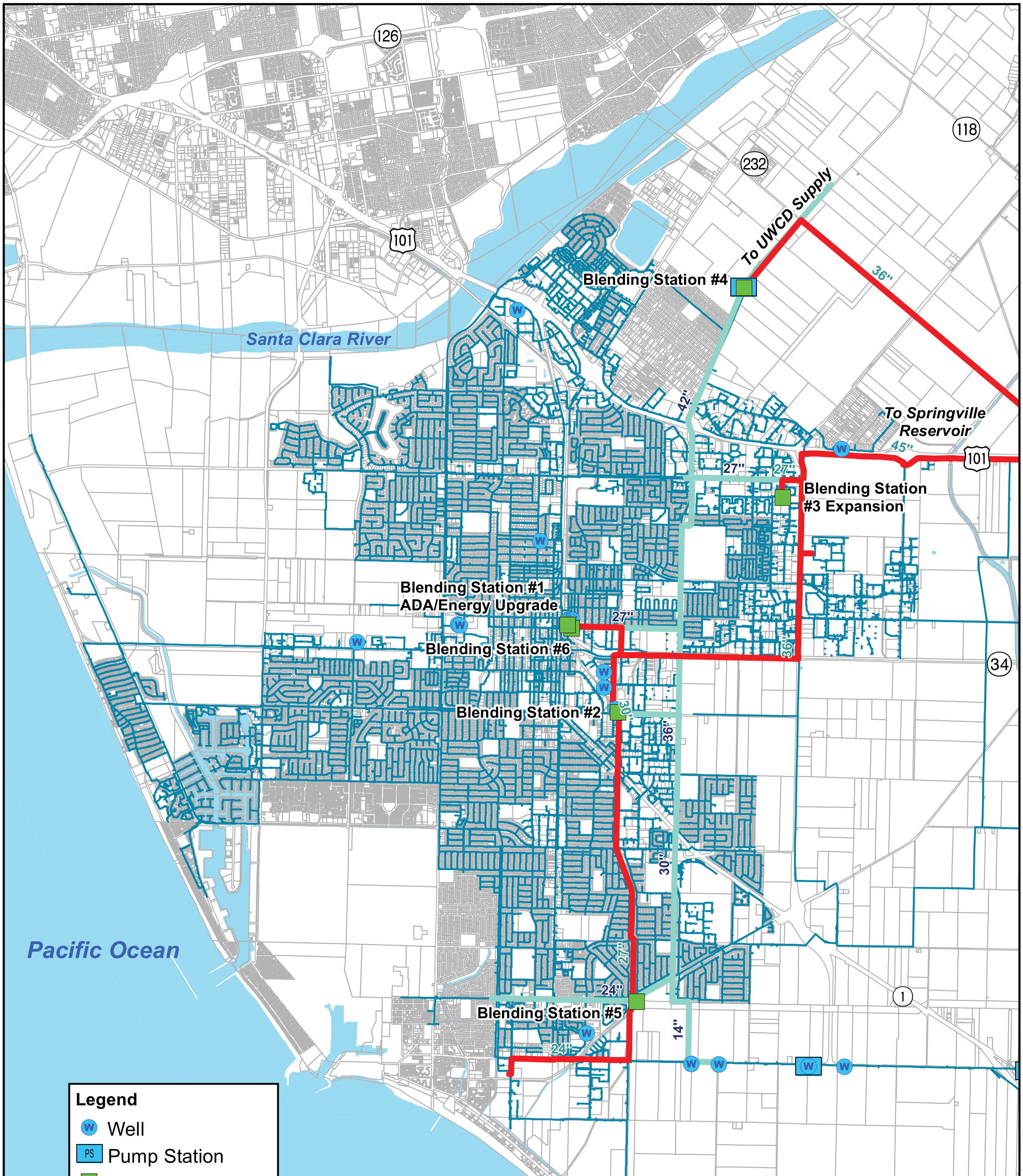
Discussions and background information related to Hydrology and Water Quality are found in two chapters of the 2030 General Plan EIR (Infrastructure and Community Services and Safety and Hazards). The first chapter addresses water quality issues that may be associated with wastewater treatment discharges or other discharges that may involve water pollution, including the management of stormwater discharges. The Safety and Hazards chapter addresses hydrology issues associated with flooding, affecting the 100-year flood plain, and potential development in these areas. For all of the issues within this topic, it was determined that the application of existing statutory and regulatory requirements and compliance with existing City and agency programs would address potential significant impacts.

3.9.3 Environmental Setting

As discussed in Chapter 2 – Project Description, the City owns and operates its own water supply, recycled water supply, wastewater collection and treatment, and stormwater facilities. Each is summarized below.

Existing Water Supply and Distribution Facilities. The City of Oxnard owns and operates its own municipal water supply system and is fortunate to have both local and imported water supplies available. The City's water supply sources consist of a blend of local groundwater produced through the City's own groundwater wells, local groundwater the City purchases from the United Water Conservation District (UWCD), imported surface water purchased from the Calleguas Municipal Water District (CMWD), and recycled water supplies from the City's Advanced Water Purification facility (APWF) from the Oxnard Wastewater Treatment Plant (OWTP) effluent. There are six (6) Blending Stations (BS) throughout the City. Figure 3.9-1 presents the City's water supply and distribution system.

Existing Wastewater Facilities. The City of Oxnard currently provides wastewater collection and treatment services through the Public Works Wastewater Division. The Oxnard Wastewater Treatment Plant (OWTP) services the cities of Oxnard and Port Hueneme, and the U.S. Navy Construction Battalion Station, the Point Mugu Naval Air Station, and some adjacent unincorporated areas. The City owns, operates, and maintains over 300 miles of sewer pipeline and 16 wastewater pumping stations as shown on Figure 3.9-2. Three additional pumping stations owned and operated by other entities also discharge to the City's system. The collection systems convey flow to the OWTP located at the southwest portion of the City. The collection system includes gravity sewers ranging from 6- to 48-inches in diameter. The majority

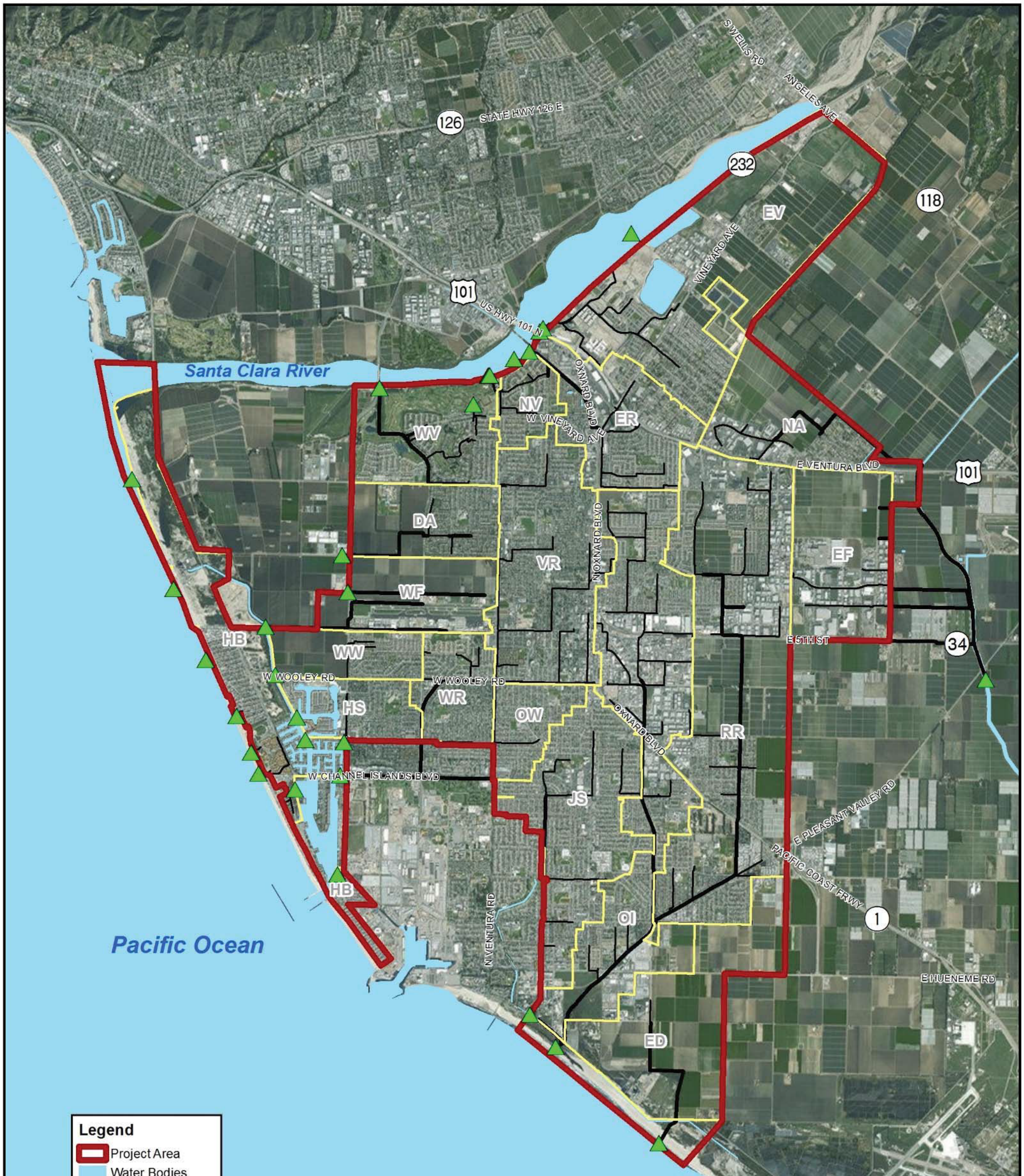


POTABLE WATER DISTRIBUTION SYSTEM

FIGURE 3.9-1

CITY OF OXNARD

ENVIRONMENTAL IMPACT REPORT



EXISTING STORMWATER SYSTEM

FIGURE 3.9-2

CITY OF OXNARD

ENVIRONMENTAL IMPACT REPORT

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of flow in the system is conveyed to the treatment facility through the Ventura Road, Rose Avenue, Redwood, Western, Central, and Eastern trunk sewers.

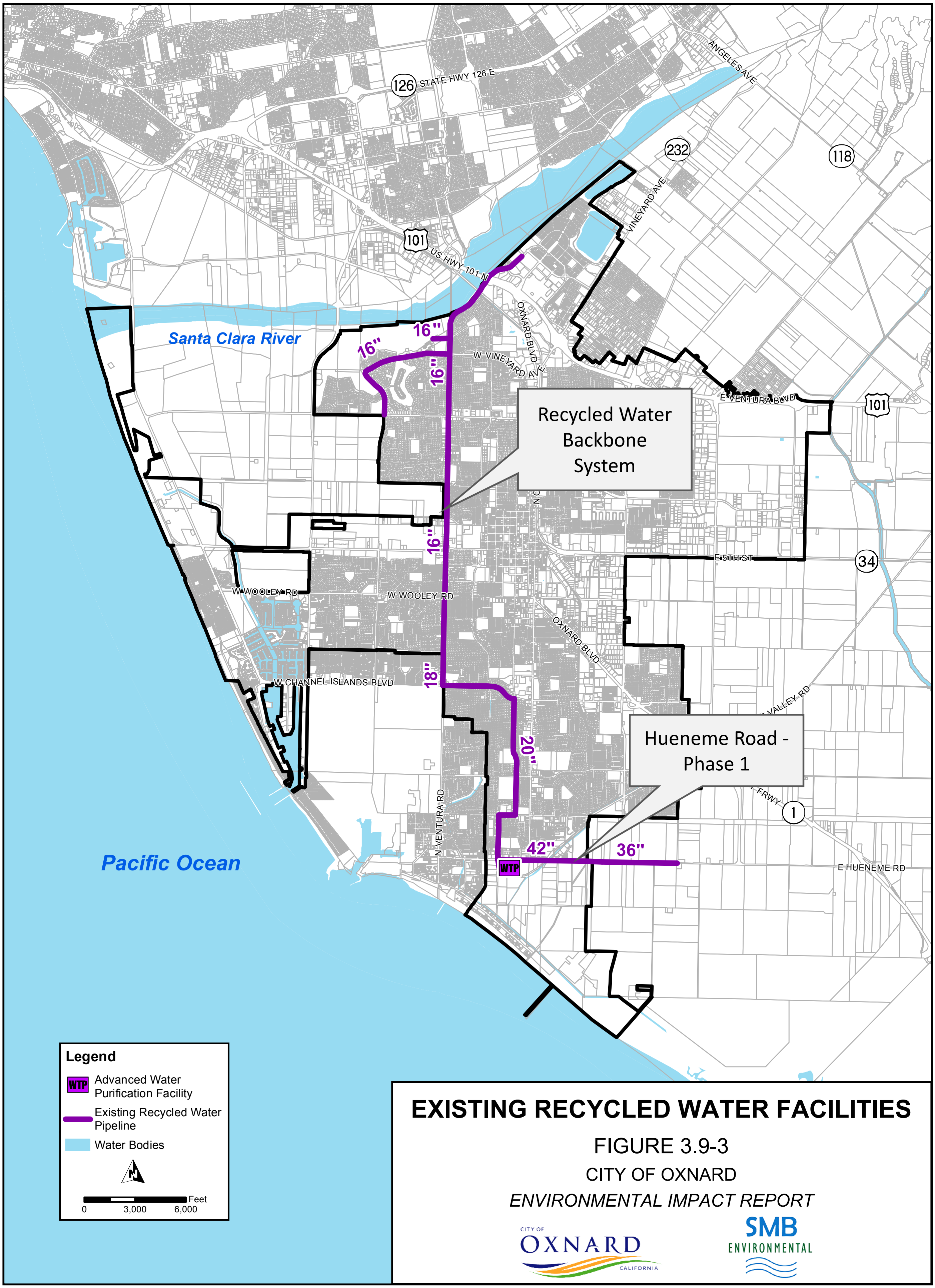
The OWTP has a current design capacity of 39.6 million gallons per day, Average Dry Weather Flow (ADWF) and 75.4 million gallons per day Peak Wet Weather Flow (PWWF). The OWTP has an ocean outfall pipe consisting of three sections. The first section, beginning at the effluent pumping station which consists of 868 feet of 48-inch diameter reinforced concrete pipe. This is followed by 1,600 feet of 30-inch diameter cast iron pipe. There is a 5,200- foot section of 48-inch diameter reinforced concrete pipe of which the terminal 1,016-foot portion is comprised of a diffuser section, designed for rapid dispersion of the effluent to meet ambient ocean water salinity conditions and not to have concentrations settle on the ocean floor. The final section of the pipe limits the actual capacity of the system to 50 million gallons per day and therefore the plant incorporates a flow equalization facility to limit maximum plant outfall capacity to an average of 50 MGD. There are presently some lines in the sewer collection system that is at capacity.

Existing Recycled Water System. Wastewater from the Oxnard Wastewater Treatment Plant (OWTP) provides secondary treated wastewater to the advanced water purification facility (AWPF) for recycled water treatment and distribution. Figure 3.9-3 provides an overview of the existing recycled water facilities. The existing 6.25 mgd facility was constructed to allow for modular expansion of the MF, RO, and UV/AOP treatment trains up to 25 mgd without adding ancillary equipment (i.e., cleaning and support systems). However, it is necessary to assess whether enough OWTP effluent exists to increase the AWPF's capacity. In general, the AWPF's capacity cannot be expanded beyond what the OWTP can supply. The City's AWPF is now in operation, producing high quality water for non-potable reuse. Detailed water quality and performance testing has been completed and is documented in Appendix D. In short, the City's advanced treated recycled water has shown consistent contaminant removal throughout the MF/RO/UVAOP process and meets all health goals, including Maximum Contaminant Levels (MCLs), secondary MCLs, and Notification Levels (NLs). In addition, Constituents of Emerging Concern (CEC) concentrations were either Non-Detect (ND) or below the recommended health levels according to literature sources.

Existing Stormwater Drainage Infrastructure. Oxnard's relatively flat topography has a major bearing on the drainage needs of the area. Elevations in the City range from sea level to 80 feet above sea level. The City is in Ventura County Watershed Protection District (VCWPD) Flood Zone 2. The drainage area includes the City and surrounding area that drains into the City. In addition to natural factors, the type and intensity of land use are significant factors affecting storm runoff. Open areas allow for percolation into soils and minimizes runoff. Developed areas have increased portions of impervious surfaces and generate increased surface runoff.

The City of Oxnard currently uses storm drain facilities maintained by the Public Works Department Operations Division and County of Ventura flood control channels to handle storm water runoff as shown on Figure 3.9-2, above. In addition, it is a common practice for agricultural operations to use private underground tile lines to drain perched water from shallow soil zones. These tile lines empty into city storm drains or natural drainage courses. Funding for storm drain maintenance is provided by the City's general fund.

The PWIMP planning boundary for the drainage area encompasses the urbanized core of the



EXISTING RECYCLED WATER FACILITIES

FIGURE 3.9-3

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City and a portion of the area within the Sphere of Influence, a total of approximately 35 square miles. The plan divides the City into 17 watershed areas each approximately 500 acres or larger in size.

The drainage system of Oxnard discharges to the sea, either directly or indirectly via VCFCD facilities. The City is a co-permittee, along with nine other cities, Ventura County and the Watershed Protection District for the NPDES permit issued by the California Regional Water Quality Control Board. The City is required to comply with the Countywide Storm Water Quality Management Program and the Federal Clean Water Act that regulates discharge of pollutants into waters of the U.S.

The City has three existing flood planning policies. These policies are (1) a storm drain fund fee aimed at new development, (2) a requirement that all new development convey water generated by their project and all upstream water to the nearest adequate storm drain facility, and (3) drainage standards defining the appropriate hydrology method and roughness factors for use in all storm drainage conveyance system designs.

3.9.4 Impact Analyses

This section includes a discussion of the relevant significance criteria, the approach and methodology to the analyses, and any identified impacts and mitigation measures.

3.9.4.1 Significance Criteria

Significance thresholds below are based on Appendix G (Environmental Checklist Form) of the *CEQA Guidelines* and modified from the City's *May 2017 CEQA Guidelines*, which indicates that a potentially significant impact on cultural and tribal resources would occur if the PWIMP would:

- Cause a violation of any adopted water quality standards or waste discharge or treatment requirements;
- Substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted);
- 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 on- or off-site flooding or exceed the capacity of existing or planned stormwater drainage systems;
- Place new structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Impede or redirect flood flows such that it would increase on- or off-site flood potential;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or
- Be exposed to a substantial risk related to inundation by seiche, tsunami, or mudflow.

3.9.4.2 Approach and Methodology

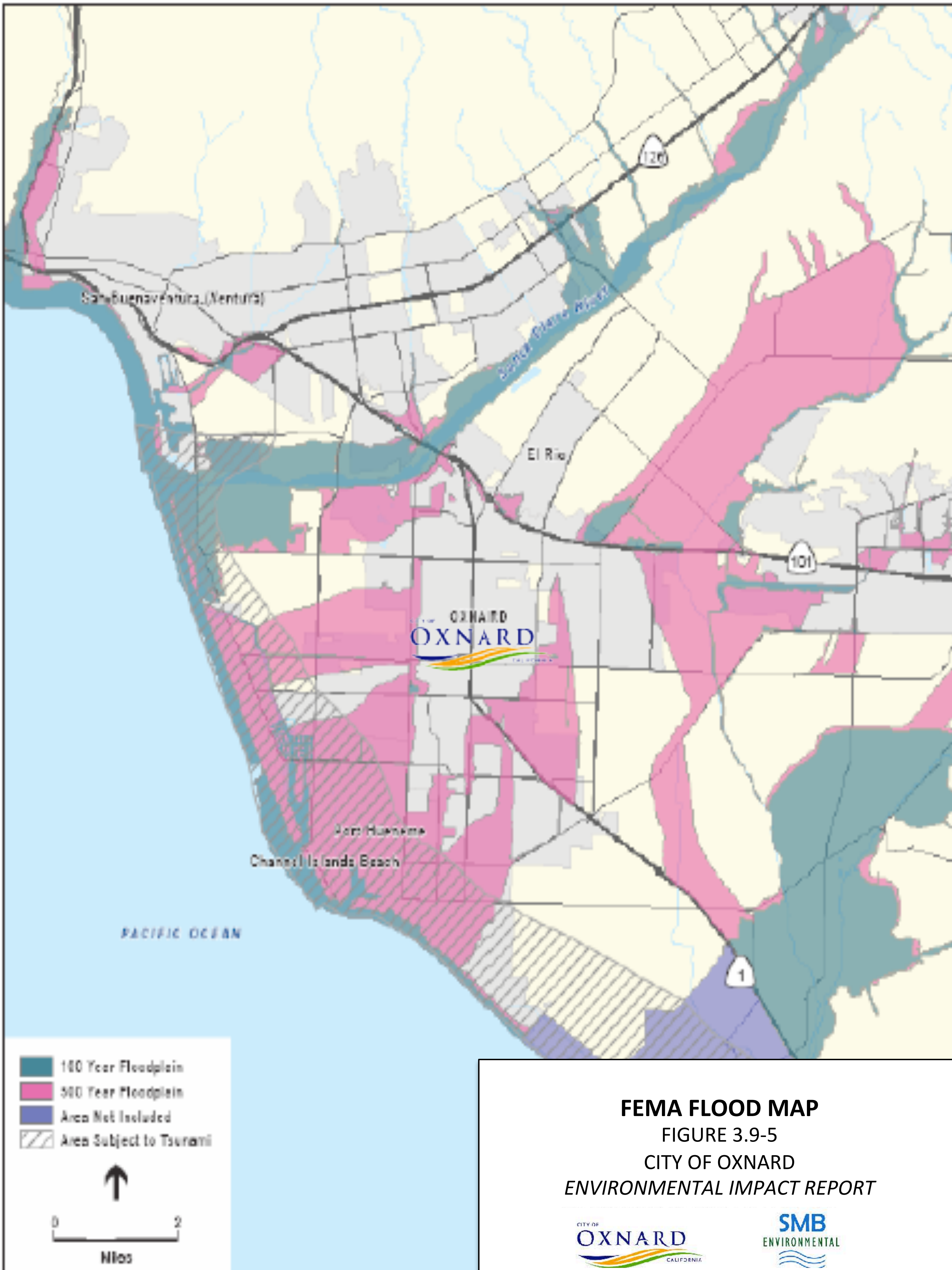
As described in Chapter 2, Project Description, the City's PWIMP is comprised of improvements to the City's Water Supply System, Recycled Water System, Wastewater System, and Stormwater System through build-out of the City's 2030 General Plan. However, the design details, final options, and the timing of construction phases are not precisely known, despite the best estimates provided in the schedules in Chapter 2. Further, it is not practical or prudent to try to provide project-level or detailed quantitative analysis at this time as many of the details are not known and the timing will likely change and/or the requirements for project-level analysis could change and be different in the future. As such, the environmental impact analysis for this section has been prepared at a programmatic level of detail and it addresses the full range of potential environmental effects associated with implementation of the PWIMP, but the analysis is more qualitative and general. Specifically, the analysis focuses on providing a discussion on potential significant impacts and provides broad mitigation measures that can and should be implemented at the project-level. This approach is consistent with the State CEQA Guidelines provisions for a Program EIR, as described in Section 15168, which suggests that the level of detail is dictated by "ripeness"; detailed analysis should be reserved for issues that are ripe for consideration.

According to the City's CEQA Guidelines, the key evaluation of potential water quality impacts will relate to how a project complies with applicable stormwater Best Management Practices (BMPs) and Low Impact Development (LID) principles. Guidance from the Countywide Stormwater Quality Management Program identifies measures and requirements that apply to different kinds of projects (Ventura County Stormwater Quality Management Program 2015). Applicable federal, state, and local standards will typically be described and information demonstrating compliance with standards will be provided.

Compliance with applicable National Pollutant Discharge Elimination System (NPDES) and associated local standards and requirements will normally suffice to reduce water quality impacts to below a level of significance.

Impacts to hydrological and storm drain systems will also consider NPDES and associated local requirements pertaining to limiting increases in surface runoff. Again, compliance with applicable requirements needs to be demonstrated. For smaller infill projects that would not substantially increase impervious surface area, citing of requirements may suffice. For larger projects involving substantial changes in surface runoff and the need for onsite detention/retention, a preliminary hydrological study will normally be needed in support of the CEQA document.

The potential for flooding may be evaluated with relevant FEMA FIRMs. In addition, Figure 3.9-4 shows the approximate extent of the 100-year flood level in the beach and coastal areas, and how that level may change with rising sea level. Projects within the 100-year flood zone typically require flood insurance unless a Letter of Map Revision (LOMR) is approved by FEMA.



FEMA FLOOD MAP

FIGURE 3.9-5

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3.9.4.3 Impacts and Mitigation Measures

Based on the significance criteria and approach and methodology described above, the potential impacts are discussed below.

Impact 3.9-1: Construction and operation of the PWIMP could cause a violation of any adopted water quality standards or waste discharge or treatment requirements. The potential temporary construction and long-term operational impacts are discussed below.

Temporary Construction Impacts

Excavation, grading, and construction activities associated with the PWIMP facilities could violate water quality as those activities would expose and disturb soils, resulting in potential increases in erosion and siltation in the Project area. Construction during the rainy season could result in increases in erosion, station, and water quality issues. Generally, excavation, grading, paving, and other construction activities would expose disturbed and loosened soils to erosion by wind and runoff. Construction activities could therefore result in increased erosion and siltation, including nutrient loading and increasing the total suspended solids concentration. Erosion and siltation from construction have the potential to impact the creeks, drainage crossings, and the ocean, therefore posing a potentially significant impact to water quality. With the incorporation of the following mitigation, any potential impacts to water quality as a result of construction are reduced to less-than-significant levels.

Temporary Construction Mitigation Measures

Mitigation Measure 3.9-1a: Implement Construction Best Management Practices. To reduce potentially significant erosion and siltation, the City and/or its selected contractor(s) shall obtain a Stormwater Pollution Prevention Permit(s) (SWPPP) and implement Best Management Practices and erosion control measures as required by the Los Angeles RWQCB. Best Management Practices to reduce erosion and siltation shall include the following measures: Avoidance of construction activities during inclement weather; limitation of construction access routes and stabilization of access points; stabilization of cleared, excavated areas by providing vegetative buffer strips, providing plastic coverings, and applying ground base on areas to be paved; protection of adjacent properties by installing sediment barriers or filters, or vegetative buffer strips; stabilization and prevention of sediments from surface runoff from discharging into storm drain outlets; use of sediment controls and filtration to remove sediment from water generated by dewatering; and returning all drainage patterns to pre-existing conditions.

Significance after Mitigation: Less than Significant.

Long-Term Operational Impacts

The PWIMP would treat secondary effluent through advanced water purification processes and either inject it into the groundwater basin through IPR/ASR recharge wells for either: 1) indirect potable reuse (IPR); 2) provide it directly for non-potable reuse (NPR) (i.e. irrigation); and/or 3) eventually provide it directly for direct potable reuse (DPR). The potential for each of these options to violate any adopted water quality standards or waste discharge or treatment requirements are discussed below. In addition, the injection of water into the groundwater basin has the potential to cause leaching of soils and constituents within the soils. Further, the expansion of the PWIMP's Reuse Program has the potential to affect the discharges to the ocean and potentially ocean water quality. Each of these are discussed below.

Indirect Potable Recharge

The operation of the PWIMP could involve the injection of up to approximately 18.75 mgd (i.e. 21,000 afy)[2] of treated wastewater into the groundwater basin through the proposed IPR/ASR wells. IPR/ASR wells have the potential to make a significant contribution to the City's water resources needs. However, a significant impact would occur if the injected purified water contained residual chemicals, pathogens, or other contaminants at high enough concentrations leading to degradation of the ambient groundwater quality and violation of groundwater quality standards.

The advanced water purification process removes chemical constituents, pathogens, and CECs from the source water. As further defined in the Regulatory Framework, above, CEC is a broad term that may include a wide range of trace level pollutants that are common to modern wastewater streams, such as; potential endocrine disrupting compounds, pharmaceutically active compounds, and personal care products. The DDW requires that potable reuse projects produce a high-quality water that meets state and federal potable water standards, removes pathogens using multiple barriers of treatment, utilizes RO for removal of total organic carbon and salts, is low in conventional disinfection byproducts (DPBs), and provides for an advanced oxidation process (AOP) that is capable of further reduction of trace level organic pollutants, should they pass through the RO process.

Further, recharging groundwater aquifers with purified water has been implemented successfully in California. For example, the Orange County Water District, currently purifies secondary effluent to near distilled water quality and recharges 100 million gallons per day into their groundwater basin. The State of California supports this type of potable reuse, repeatedly documenting the high-quality water and the protection of public health. Final regulations for groundwater recharge are adopted by the State through the DDW, as discussed in the Regulatory Framework, above, and these regulations are key to the impact assessment of the Project.

California regulations (see Regulatory Context, above) require a comprehensive monitoring program to ensure that the quality of the treated water remains high. The monitoring program requires the operator to test, on a quarterly basis, a minimum of two monitoring wells between the point(s) of recharge/injection and extraction for drinking water. In addition, other real time monitoring systems must be in place to identify failures in the system to avoid recharging the groundwater with non-purified water. Online sensor technology is available that provides water managers with the ability to control the treatment process in real time to ensure the process is working as intended. There are specific monitoring technologies for each process in the Project treatment sequence (MF/UF, RO, and UV-AOP). For example, in some systems, if the required UV dose is not provided for pathogen disinfection, the plant automatically shuts down. Facilities can be designed, engineered, and operated to limit opportunities for failure and ensure proper system operation.

The City's AWPF is now in operation, producing high quality water for non-potable reuse. Detailed water quality and performance testing has been completed and is documented in

[2] Based on the ultimate capacity of the APWF.

Appendix D. In short, the City's advanced treated recycled water has shown consistent contaminant removal throughout the MF/RO/UVAOP process and meets all health goals, including Maximum Contaminant Levels (MCLs), secondary MCLs, and Notification Levels (NLs). In addition, Constituents of Emerging Concern (CEC) concentrations were either Non Detect (ND) or below the recommended health levels according to literature sources.

Based on the proposed water treatment sequence, recharge locations, and estimated residence time, the proposed PWIMP IDP/ASR wells would comply with state groundwater regulations and would adequately treat and remove the chemicals of concern and the CEC's present in the wastewater stream generated by the Oxnard WWTF. Advanced water purification processes would greatly reduce or eliminate the concentrations of trace CEC's or other chemicals of concern to far below limits considered safe for human consumption. As the injection of advanced treated wastewater would be adequately treated, the potential for degradation of the ambient potable groundwater would negligible and would not violate any adopted water quality standards or waste discharge or treatment requirements. This potential impact is considered less than significant.

Direct Non-Potable Reuse

The operation of the PWIMP could also include the application of up to approximately 18.75 mgd (i.e. 21,000 afy) of recycled water for irrigation or other non-potable purposes. The advanced purified water would provide the non-potable users with a much higher quality of water than tertiary treated water and thus this water would have no detection or much lower concentration of constituents of concern including total dissolved solids (TDS). As a result, this would be a beneficial impact over existing tertiary water supplies. Any other impacts would be considered less than significant.

Direct Potable Recharge

The operation of the PWIMP could also include the use of up to approximately 18.75 mgd (i.e. 21,000 afy) of advanced purified water being used for direct potable use. However, this has not yet been approved by the State of California and the DDW. Therefore, and until such time that DPR is approved in the State and for this particular PWIMP Project, the City will continue to use the advanced purified water for direct non-potable reuse and for indirect potable reuse, consistent with federal, state, and local requirements and prior approvals. As a result, any impacts are considered to be less than significant.

Soil Leaching

Managed active recharge of purified water into an aquifer can cause chemical reactions between the purified water and the aquifer material such that mineral dissolution[3], oxidation[4], and/or desorption[5] can occur. These processes can lead to the release of metals (from iron or manganese oxide minerals) or other inorganic constituents (sulfides through oxidation). Changes in water quality caused by these processes can lead to treatment operations issues and could potentially degrade groundwater quality of an aquifer.

Detailed geochemical characterization on the characteristics of aquifer sediments has not yet been

[3] Mineral dissolution is the process by which a rock or mineral completely dissolves in water.
[4] Oxidation refers to any chemical reaction in which a material gives up electrons, as when the material combines with oxygen. Burning is an example of rapid oxidation; rusting is an example of slow oxidation.
[5] Desorption refers to the process where a substance is released from or through a surface; the opposite of absorption.

performed. However, and based on a cursory review, there is potential for some regulated metals (arsenic, cadmium, nickel, and manganese) and other inorganic constituents (fluoride, sulfate) to be released to the aquifer through leaching due to the injection of purified water. If these constituents, especially the regulated metals, were to be released to the groundwater in the groundwater basin in concentrations that exceed California MCLs, it would be considered a significant impact. However, under SWRCB DDW regulations and the state Anti-Degradation Policy, the District would not be permitted to implement the Project and recharge the aquifer with purified water that could induce leaching of metals or other inorganic constituents to the groundwater.

It is possible that the treated water could need conditioning to minimize the potential for leaching of other constituents that may be susceptible to mobilization under low salinity and/or oxidized conditions. Therefore, proper conditioning to prevent geochemical mobilization in excess of MCLs would occur and the Project would conform to the Anti-degradation Policy. As part of this Project and in accordance with the SWRCB DDW regulations and the state Anti-Degradation Policy, adherence to which is mandatory for water recharge projects, the City would conduct the appropriate studies and testing to develop adequate post-treatment stabilization measures that would ensure chemical leaching does not occur to an extent that groundwater quality standards would be violated. Given that the City proposes post-treatment stabilization prior to injection of the purified water and would comply with California's water quality standards, this impact is considered less than significant.

Ocean Water Quality

The PWIMP's Reuse Program operational activities have the potential to affect ocean water quality in terms of the following:

- Change in Flows to Ocean Outfall from Recycled Water Reuse and IPR, NPR, and DPR
- Change in Concentrate Flows to Wastewater Treatment Plant Influent

The PWIMP would treat a portion of the effluent from the existing OWTP to meet regulatory standards for direct non-potable reuse (primarily irrigation) and IPR/DPR. The diversion of secondary effluent for tertiary and advanced water treatment prior to reuse would result in a reduction of flow to the ocean outfall. The magnitude of this reduction would vary seasonally. The recycled water and IPR/DPR reuse program involves the expansion of the existing 6.25 mgd AWPF by an additional 6.25 mgd to 12.5 mgd and then by another 6.25 mgd to a final capacity of 18.75 mgd. In short, this would reduce the flows to the ocean outfall by 12.5 mgd. This reduction, in and of itself, would be considered a less-than-significant impact to potentially a beneficial impact to the ocean receiving waters. Further, changes in discharges to the ocean via the City's existing ocean outfall would only be allowed in accordance with applicable standards and the City's existing Waste Discharge Requirements (WDR), and NPDES permit.

This potential benefit would also be offset (or reduced) by the expansion of the existing 7.5 mgd desalter plant by an additional 7.5 mgd for a total capacity of 15 mgd, which would increase the concentrate loads of salts going to the ocean. Specifically, the net effect would an approximate 15 to 20 percent reduction in flows going to the ocean and an approximate 10 to 15 percent increase in TDS in the ocean effluent. However, these relatively small changes are within the natural variability of the current discharge and are within the permitted outfall capacity. Further the City's existing outfall would not need to be expanded and the diffuser system would disperse the concentrate and it would be come ambient to the ocean salinity, upon discharge. This would be considered a less-than-significant impact the ocean receiving waters. Further, any changes to the discharges to the ocean via the City's existing ocean outfall would only be allowed in accordance with applicable standards and the City's existing Waste Discharge Requirements (WDR), and NPDES permit. Because project discharges would fall within existing WDR requirements, this impact would be less than significant. Therefore, no mitigation measures would be required.

Significance: Less-than-Significant Impact.

Impact 3.9-2: Construction and operation of the PWIMP could substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted). The potential temporary construction and long-term operational impacts are discussed below.

Temporary Construction Impacts

Construction the PWIMP facilities would not deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. Construction of most of the PWIMP facilities would be done primarily within existing roadways and existing disturbed areas. In addition, subsurface excavation would be limited to several feet below surface elevation and would not interfere with the groundwater basin(s) and/or groundwater supplies. The PWIMP involves the construction and operation of six (6) new groundwater wells and ten (10) new IPR/ASR wells.

A significant impact would occur if construction activity associated with the drilling, construction and development of the proposed recharge wells or monitoring wells were to permanently lower groundwater levels, hinder the ability of nearby District and non-District production wells to pump groundwater, or degrade local groundwater quality to such a degree that water supplies in neighboring wells is no longer useable.

Drilling deep, large diameter wells is a common occurrence and is conducted using proven, industry standard methods. Boreholes for proposed recharge wells and monitoring wells would be drilled by a truck-mounted drill rig using one of the standard drilling methods for large diameter deep wells; an example of this would be dual-wall, reverse-circulation rotary.[6] Some drilling projects require large volumes of water during well drilling to reduce friction in the drill casing and to help flush rock fragments and pulverized cuttings generated from drilling out of the borehole. For these operations, clean well drilling water is typically brought onto the site via support trucks or obtained from the municipal supply (e.g. temporary hook-up or hydrant). The water used during drilling is cycled

[6] Dual-wall, reverse-circulation rotary drilling uses a drilling rig with two rotary drives. One drive rotates the outer drilling casing into the subsurface with a hardened drive or cutting shoe, while the other drive rotates an inner drill pipe and cutting bit. In reverse circulation, air or water is pumped under pressure down between the outer drill casing and inner drill pipe, and air, water, and cuttings are returned to the surface in the inner drill pipe. Upon reaching the desired depth, the inner drill string is removed, and the well casing, filter pack, and surface seal is built inside the outer casing, allowing the well to be built while holding the native formation materials back from the borehole. Upon completion, the outer casing is withdrawn, leaving the finished well in place.

through the well boring, flushed or ejected out of the hole, contained on site to settle sediment, and then transported off-site. As drilling water is typically brought on site or is provided by a municipal water purveyor (in the case of the Project, the City), its use has a less-than-significant effect on groundwater resource sources.

After a monitoring or recharge well is constructed, it is developed. Well development is a standard procedure that is typically performed to maximize the well efficiency by removing fine-grained material that would clog the slots in the well screen and pore spaces of the gravel or sand filter pack and the surrounding aquifer formation. Clogging in the screen or filter pack would reduce the flow of water into the well. The procedure is conducted in general accordance with the American Society for Testing and Materials (ASTM) D5521-02: *Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers.* The two steps in a well development program are mechanical development and pumping development.

Mechanical development can require three (3) to five (5) 24-hour days to complete and involves swabbing the inside of the screen and casing and airlifting or bailing out the water. A pump is used to pump and surge water through the well to remove remaining sediment from within the well. Mechanical development pumps can extract water at 200 gallons per minute (gpm) requiring up to 500,000 gallons of water. Monitoring well development uses compressed air and produces much less water (about 50,000 to 100,000 gallons). The pumping development continues until the well is free of sediment and the well water turbidity is low.

Pumping development can require one (1) to four (4) days depending on the depth and size of the well and the conditions of the aquifer formation material. The groundwater volumes extracted during development of a large production or recharge well could range between 500,000 to 1.5 million gallons, depending on the planned rate of extraction from the well; development of monitoring wells would require considerably less water because they are smaller wells.

Continued extraction of water causes the groundwater levels to decline in a circular pattern surrounding the well, forming what is referred to as a cone of depression. The development pumping would maintain the cone of depression until the development pumping ceases and levels recover as groundwater flows back into the aquifer materials.[7] The groundwater level drawdown created from well development is typically minimal and localized around the well due to the extraction rate (approximately 200 gpm over 6-10 days).

Well development is a temporary operation that could depress groundwater levels locally around the well for up to an estimated 24 to 48-hours. However, given the location of the proposed recharge and monitoring well sites, the short-term duration of the well development process is not anticipated or expected to form a cone of depression that would adversely impact the operation of nearby City or non-City, private production wells. Therefore, the changes in water levels caused by well-head development during the construction of the monitoring and recharge wells is considered less than significant.

Construction of the recharge and monitoring wells would require the use of drilling fluids in the drilling process, primarily to help keep the borehole from caving in during drilling. These fluids

[7] The cone of depression expands as pumping continues until the discharge from the well equals the recharge to the aquifer. When this equilibrium is reached, in what is referred to as the steady state conditions, the cone of depression ceases to expand.

are typically water-based and contain small amounts of inert additives. The chemicals in the fluids could degrade the groundwater quality in the aquifer and constitute a significant impact if not used properly and within the manufacturer's guideline and professional standards. Examples of the products currently used throughout the water well drilling industry include liquid polymer emulsion used to stabilize the borehole by preventing reactive shale and clay from swelling and sloughing, or a concentrated detergent containing non-corrosive, non-contaminating, and slowly biodegradable wetting agents, dispersants, and emulsifiers. Sometimes a mud mixture is used that contains the expansive clay bentonite. However, polymers are widely used because they are more easily removed from the well during development. Often surfactants and dispersants are also used during well development. These and all drilling fluids that are added during drilling and development are removed through the downhole fluid circulation and well development. As the fluids are typically confined to the interior part of the borehole or may migrate a minimal distance from the well boring, there is a low potential for significant quantities of residual drilling fluids to remain in the aquifer after the fluids are removed through drilling circulation and well development and thus would have negligible effect on groundwater. Therefore, degradation of groundwater quality during drilling operations is considered less than significant and no mitigation is required.

Significance: Less-than-Significant Impact.

Long-Term Operational Impacts

The PWIMP involves the construction and operation of six (6) new groundwater wells that would each have a 2,000 gpm capacity that could result in the extraction of up to approximately 2.9 mgd or approximately 19,350 afy of groundwater. As a result, these new groundwater wells could substantially deplete groundwater supplies or interfere with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. However, and in contrast, the PWIMP also involves the construction and operation of ten (10) new IPR/ASR wells and standby wells – each with 3 monitoring wells that could involve the injection of up to approximately 18.75 mgd (i.e. 21,000 afy) of advanced treated wastewater into the groundwater basin that could help offset those extractions from the new groundwater water supply wells. In addition, the use of recycled water in lieu of additional groundwater pumping would also help preserve groundwater supplies.

This impact analysis evaluates whether the pumping distribution and aquifer recharge of purified water would alter hydrogeologic conditions to the extent that unfavorable groundwater conditions would occur in the groundwater basin. For the purposes of this analysis, unfavorable groundwater conditions are those that result in an appreciable decrease in the quantity of available groundwater. In practice, this could result from the PWIMP Reuse Program conditions causing physical damage and a loss of yield in nearby wells by lowering static groundwater levels below the top of the well screen. As the PWIMP would recharge the groundwater basin through the use of the ten (10) IPR/ASR wells, unfavorable conditions could also be characterized as an increase in groundwater elevations that result in groundwater mounding (higher than normal groundwater elevations surrounding a recharge well, somewhat like a reversed cone of depression) that raises groundwater levels above the ground surface.

A significant environmental impact on groundwater resources would occur if the proposed pumping distribution and managed active recharge would cause permanently depressed groundwater levels, damaged or reduced yield in City and non-City wells or caused groundwater levels to increase to the ground surface. To date, the City has not performed any groundwater modeling to either prove or disprove the potential to adversely affect existing groundwater conditions. As a result, potentially significant impacts could occur. However, with the implementation of the following mitigation measure, any impacts would be considered less than significant.

Long-Term Operational Mitigation Measures

Mitigation Measure 3.9-2a: Prepare Groundwater/Hydrogeologic Plan and/or Monitoring/Modeling. The City shall, in conjunction with the requirements of SGMA and other local requirements, prepare an implementation plan for the groundwater that is extracted and recharged from this Project in the PWIMP planning area and including on the southern Oxnard Plain and Pleasant Valley areas. This plan will provide the details of how groundwater will be recovered and the best management practices that will be implemented, including, but not limited to:

- The City shall continue to contribute to the UWCD ongoing basin-wide groundwater monitoring program for the Oxnard Plain and Pleasant Valley areas program to assist with the collection of data that are necessary to monitor and evaluate the effects from groundwater that is extracted and recharged by the PWIMP facilities. It is assumed that the City will have full access to the UWCD groundwater monitoring database to assist the City with performing the routine annual evaluation described below.

- The City shall perform annual groundwater/hydrogeologic evaluations and prepare annual evaluation reports to document the groundwater/hydrogeologic conditions and effects from implementation of the PWIMP facilities including but not limited to surface and groundwater interactions, seawater intrusion, and water quality impacts such as turbidity, taste, odor, nutrients, and TDS. These reports will be submitted to UWCD, FCGMA, and other interested stakeholders involved with water resources management in the Oxnard Plain and Pleasant Valley areas.

- As necessary, the City shall adjust the groundwater that is extracted and/or recharged on the southern Oxnard Plain and Pleasant Valley areas to reduce potential significant impacts to groundwater resources. These adjustments, in part, will be based on comments received by UWCD, FCGMA, and other interested stakeholders involved with water resources management in the Oxnard Plain and Pleasant Valley areas.

Significance after Mitigation: Less than Significant.

Impact 3.9-3: Construction and operation of the PWIMP could 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 on- or off-site flooding or exceed the capacity of existing or planned stormwater drainage systems. The potential temporary construction and long-term operational impacts are discussed below.

Temporary Construction and Long-Term Operational Impacts

The construction and/or operation of the PWIMP facilities would not result in any new significant impervious surfaces and would not create new areas of low permeability. The new and/or rehabilitated PWIMP facilities would be located primarily within existing developed areas and/or within existing roadways. The new and/or rehabilitated PWIMP facilities or areas would be returned to pre-construction conditions and would not increase the impervious surfaces and therefore would not create new areas of low permeability. In addition, the construction of the filtration upgrades would not create a new impervious layer that would significantly affect permeability. As a result, no significant additional runoff is expected to be generated by the construction and/or operation of the PWIMP. Therefore, PWIMP would not result in exceeding the capacity of existing or planned stormwater drainage systems. In fact, many of the stormwater improvements would actually help with stormwater drainage in the PWIMP planning area. Any impacts are considered to be less than significant to beneficial and no mitigation is necessary.

Significance Determination: Less-than-Significant to Beneficial Impacts.

Impact 3.9-4: Construction and/or Operation of the PWIMP could: 1) Place new structures within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map; 2) Impede or redirect flood flows such that it would increase on- or off-site flood potential; 3) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; and/or 4) Be exposed to a substantial risk related to inundation by seiche, tsunami, or mudflow. The potential temporary construction and long-term operational impacts are discussed below.

Temporary Construction and Long-term Operational Impacts

As shown in Figure 3.9-4 above and other recent FEMA flood maps identify some areas within the PWIMP Planning Area as being within designated 100-year floodplains. These areas are primarily located along the Santa Clara River in the northern portion of the Planning Area and the flooding potential is largely due to a substandard levee along the western end of the Santa Clara River. The coastline is also designated as being located within a 100-year floodplain area. Development of the Project within or adjacent to these flood prone areas could expose project facilities to flooding hazards. However, most of these facilities are pipelines and conveyance facilities that once constructed would be in the 500-year flood zone, underground, and not be affected by flooding. Further, the stormwater improvements would also help drain the areas in the PWIMP Planning area in the event of storm and flooding events. In addition, the new above ground facilities would be required to be designed and developed to City and/or Ventura County design codes and regulations for flood control. As a result, any impacts associated with placing facilities within the 100-year flood zone(s) are considered to be less than significant.

In addition to flood hazards associated with 100-year flood zones, flood inundation resulting from dam failure due to a variety of factors is a potential hazard for the City. Failure of the Santa Felicia Dam at Lake Piru, Castaic Lake Dam, and Pyramid Lake Dam east and northeast of the Planning Area has the potential to inundate portions of the Planning Area. Inundation flooding would extend along the Santa Clara River and spread throughout the Planning Area. New developments or improvements under the Project (located nearest the Santa Clara River) could be subject to flood hazards associated with failure of any one of these dams. However, it is assumed that all dams have been constructed to the specifications set forth by State and federal agencies.

Additionally, regular inspections are conducted to identify any weaknesses or problems with the dams that could cause structural damage or overtopping of the dam. Although dam failure can result in major catastrophes, the safeguards in place mentioned above reduce the threat of dam failure and it is considered low and any impacts are considered to be less than significant.

The generation of a tsunami or seiche resulting from a seismic event could potentially inundate portions of the Planning Area nearest the coast (see Figure 3.9-4). As identified in the figure, the City's projected tsunami impact area extends inland from the coastline approximately one mile. Additionally, the City's Channel Islands Harbor and Mandalay Bay could potentially be affected by seiches. Although there are no existing methods to predict the events (i.e., seismic events, etc.) that generate these types of natural hazards, there are several methods to minimize their impacts. These methods include: 1) avoidance of the tsunami hazard zone; or 2) rely on early detection of an arriving tsunami hazard and appropriately evacuate tsunami impact zones. These impacts are considered to be less than significant.

Significance Determination: Less-than-Significant Impact

3.9.5 Cumulative Effects

Construction and operation of the PWIMP has the potential to have potentially significant impacts to hydrology and water quality. However, with the identified mitigation measures above, any impacts, including cumulative impacts would be reduced to less-than-significant levels.