3.8 HYDROLOGY AND WATER QUALITY

This section describes the existing physical and regulatory setting related to hydrology and water quality and discusses the potential effects of the EIS Alternatives on hydrology and water quality.

3.8.1 Affected Environment

This section describes the local climate, hydrology, water quality, and groundwater in the immediate vicinity of the existing SFVAMC Fort Miley Campus and in the Mission Bay area. Floodplains, wetlands, and coastal management are discussed in Section 3.5.

Climate

The potential project sites are located in San Francisco, which is considered semiarid with a moderate, Mediterranean climate characterized by cool, dry summers and mild, wet winters. The approximate annualized average high temperature is 64 degrees Fahrenheit (ºF); the average low temperature is 51ºF. Annual rainfall for the project area during the period between 1948 and 2010 averaged approximately 20 inches, 95 percent of which occurred during the winter rainy season (October–April), with the heaviest rainstorms typically occurring in December, January, and February (WRCC, 2011).

Regional Hydrologic Setting

Historically, numerous streams and creeks provided drainage channels from San Francisco's hills and valleys to San Francisco Bay and the Pacific Ocean. Today, most of San Francisco's creeks are buried underground in culverts or are filled, so watersheds are intimately linked to San Francisco's sewer system.

The San Francisco Public Utilities Commission (SFPUC) is the public agency charged with the management and treatment of San Francisco's sewage and stormwater runoff. SFPUC's approach to managing flows in combined sewer areas is to capture, store, and treat all wet-weather flows, thereby providing a high level of protection to San Francisco Bay and the Pacific Ocean. All street runoff during dry weather receives full secondary treatment; most storm flows receive full secondary treatment; and all storm flows receive treatment to wet-weather primary effluent equivalence before being discharged through a designated outfall (SFPUC, 2010).

Combined sewers serve most of San Francisco. The combined system carries stormwater and wastewater together through San Francisco's underground pipes to one of two main wastewater treatment plants. The topography of San Francisco naturally divides the system into two watersheds: the Oceanside and the Bayside.

During wet weather when the combined flows exceed system capacity and available storage, the combined flows on the east side of San Francisco are discharged to San Francisco Bay through 29 combined sewer overflow (CSO) structures, and the combined flows on the west side of San Francisco are discharged to the Pacific Ocean through seven CSO structures. These overflows are subject to "flow-through treatment" consisting of removal of settleable and floating solids. Discharge occurs in accordance with the terms of the National Pollutant Discharge Elimination System (NPDES) permits described below under "Section 402—NPDES Permits." Discharges during heavy rain events typically comprise 94 percent treated stormwater and 6 percent treated sanitary flow (SFPUC, 2012). Up to 10 CSO events per year are permitted by the State Water

Resources Control Board (SWRCB) from the CSO outfalls at and north of Islais Creek in the central basin area of San Francisco; one CSO event per year is permitted from the area of Yosemite Slough south to the San Francisco boundary; four events per year are permitted along the city's north shore area; and eight events per year are permitted on the west side area of San Francisco (San Francisco Bay RWQCB, 2008).

Local Hydrologic Features

Existing SFVAMC Fort Miley Campus

No watercourses are located within the existing SFVAMC Fort Miley Campus, which is mostly developed with 1.2 million square feet of facilities in addition to parking areas, walkways, and roads, and occupies an approximately 29-acre site. The Campus contains primarily impermeable surfaces (approximately 62 percent) that allow little infiltration of rainfall into the soil and generate high levels of runoff. Most of the permeable area is located in the north slope area and in the southwest corner of the Campus.

The SFVAMC Fort Miley Campus is bordered by the Golden Gate National Recreation Area to the north, east, and west, and by the residential Richmond District to the south. The original sanitary sewer and storm drainage system for the Campus was completed in 1934, with several expansions completed since that time. The majority of the stormwater collected from Campus parking lots, streets, pedestrian walkways, landscaped areas, and building roofs is conveyed via a storm drainage system consisting of drainage inlets and stormwater piping to the SFPUC combined sewer interceptor on Clement Street. The combined sewer system collects both sanitary sewage and stormwater. Combined sewer flows from the city's west side, including the SFVAMC Fort Miley Campus, are then treated at the City's Oceanside Water Pollution Control Plant before being discharged to the Pacific Ocean.

A small separate storm drainage system conveys stormwater off-site on the north side of the existing SFVAMC Fort Miley Campus along the north-facing slope. The drainage area being served by this separated system is relatively small. This separate system appears to have adequate capacity for its current drainage area and no known drainage problems (HGA, 2010).

Major and minor landslides and surface slumping have historically occurred on the slope below the northern portion of the SFVAMC Fort Miley Campus as a result of high rainfall, seismic movement, and land erosion. The North Slope Seismic/Geologic Stabilization Project recently completed at the Campus included replacement of the storm drain system that discharges stormwater onto the north slope.

The impacts of discharging stormwater onto the north slope were included in geotechnical investigations performed for the North Slope Seismic/Geologic Stabilization Project, and the recommendations were incorporated into the design of the outfalls to reduce the potential for slope failure on both VA and National Park Service properties (VA, 2010a). The geotechnical investigation that was completed in March 2010 identified the discharge of surface water onto the northern slope as a major destabilizing factor contributing to on-going slope failure, which could result in the potential for on- and off-site erosion, an increased risk of localized landsliding downslope from the proposed retaining walls, and the potential for undermining the proposed retaining walls because of continued landslide movement. Storm drain improvements as part of this project included replacement of the existing catch basins, manholes, and storm drain piping to the north slope, which were old and damaged. The new pipelines were placed above ground to allow monitoring for potential damage or movement of the pipe

over time and to facilitate maintenance. The pipelines discharge to energy dissipaters that reduce the erosional forces of the water. The energy dissipaters consist of rock riprap embedded in concrete and underlain by overlapping sheets of a puncture-resistant vapor barrier. The project also reduced the slope gradient, which reduced slide potential and eliminated areas where water previously ponded. Two retaining walls were installed as part of the project; native shrubs and trees were planted below the retaining walls after construction. A long-term monitoring and maintenance plan has been put into effect to maintain the drainage system in good repair so that it is effective in controlling localized erosion (VA, 2010a). The management measure states the following (VA, 2010a:27):

> A long-term monitoring and maintenance program shall be established for continued stormwater discharge to the north slope. The program shall include periodic monitoring and maintenance of the aboveground stormwater outfall pipes for movement and damage, as well as the discharge areas for erosion.

Mission Bay Area

Historically, the Mission Bay area was part of San Francisco Bay, with the bay waters at ordinary high tide being roughly bounded by Townsend Street on the north, Eighth Street on the west, and 16th Street on the south. Marshes with intersecting sloughs penetrated as far north as Mission Street between Seventh and Eighth Streets and Folsom Street between Fourth and Eighth Streets (Sharpsteen, 1941).

Mission Creek once was a navigable body of water that flowed from Mission Dolores to San Francisco Bay. In 1854 the California Legislature declared Mission Creek to be a navigable stream; although it has been filled in, it retains the designation today (Sharpsteen, 1941). The only remaining portion of Mission Creek above ground is the Mission Creek Channel, which drains into China Basin.

Stormwater from the Mission Bay area is part of the Bayside Drainage and is collected in the combined sewer system and treated at the City's Southeast Water Pollution Control Plant before being discharged to San Francisco Bay. Combined sewer transport and storage structures are located underground around the Mission Creek Channel and up the shoreline, and connecting pipes, tunnels, and force mains are used to transport flows to the Southeast Water Pollution Control Plant. As part of the Mission Bay redevelopment plans, a separate stormwater system is being developed in this area to handle flows generated by larger storms.

Water Quality

The quality of surface water in San Francisco is affected by past and current land uses. Surface water pollution is expected to contain typical constituents of urban areas such as oil, grease, petroleum, metals (nickel, lead, and copper), dirt, bacteria, coliforms, solvents, trash, and other chemicals. The first flash events of rainstorms generate high loads of these pollutants, which are carried into the combined sewer and treated before disposal; subsequent rainfall generates smaller pollutant loads.

In a cooperative effort between SFPUC and the San Francisco Department of Public Health, shoreline bacteria are monitored weekly year round at 14 stations on San Francisco's perimeter where water contact recreation may occur. Beach water quality information is then made available to the public via a toll-free hotline and on the Internet. Additional monitoring is conducted whenever a treated discharge from San Francisco's combined sewer

system occurs and affects a monitored beach. Monitoring locations consist of three stations in the Candlestick Point State Recreation Area, two stations at Aquatic Park, two stations along Crissy Field Beach, three stations at Baker Beach, one at China Beach, and three stations along Ocean Beach.

Water quality in the San Francisco estuarine system is under the jurisdiction of the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay RWQCB). The San Francisco Bay RWQCB's *San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan)*, referred to as the Basin Plan, identifies uses for surface water bodies in the San Francisco estuarine system that are critical to management of water quality in California. Water quality objectives and effluent limitations from the SWRCB's *Water Quality Control Plan for Ocean Waters of California* (California Ocean Plan) and *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (also referred to as the Thermal Plan) apply to ocean waters. Discharges that extend beyond the 3-mile limit of State waters into federal waters are regulated by the U.S. Environmental Protection Agency (EPA).

Existing SFVAMC Fort Miley Campus

San Francisco Bay

The Basin Plan identifies the following beneficial uses for the Golden Gate Channel, which is generally located between the Pacific Ocean (Point Bonita–Point Lobos) and the Golden Gate Bridge: commercial, marine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. In addition, the Basin Plan identifies the following existing beneficial uses for the Central Bay[1]: industrial service supply; ocean, commercial, and sport fishing; shellfish harvesting; estuarine habitat; fish migration; preservation of rare and endangered species; wildlife habitat; water contact recreation; noncontact water recreation; and navigation. The Basin Plan also identifies fish spawning as a potential beneficial use of the Central Bay (San Francisco Bay RWQCB, 2010).

EPA has identified the Central Bay as an impaired water body in compliance with Section 303(d) of the Clean Water Act (CWA). (For further information about CWA Section 303[d], see "Clean Water Act Section 303" in Section 3.8.2, "Regulatory Framework.") The pollutants that have been identified as causing impairment in the Central Bay include chlordane, dichloro-diphenyl-trichloroethane (better known as DDT), dieldrin, dioxin compounds, exotic species, furan compounds, mercury, selenium, and polychlorinated biphenyls (PCBs). The potential sources of pollutants identified in the Central Bay are nonpoint sources, atmospheric deposition, ballast water, industrial and municipal point sources, resource extraction, natural sources, and unknown sources (EPA, 2007). The 2009 Final Staff Report on proposed changes to the CWA Section 303(d) list also listed the Central Bay as impaired for trash (San Francisco Bay RWQCB, 2009). A total maximum daily load (TMDL) for mercury in San Francisco Bay has been developed, and on February 12, 2008, EPA approved a Basin Plan amendment incorporating the mercury TMDL into the Basin Plan. A TMDL for PCBs has also been developed for San Francisco Bay and was approved by EPA on March 29, 2010. The TMDLs for mercury and PCBs include numeric targets for concentrations in suspended sediment and/or fish tissue.

[1] The Basin Plan refers to the portion of San Francisco Bay adjacent to the Pacific Ocean and Golden Gate Channel, as well as east of the Mission Bay area, as the San Francisco Bay Central (Central Bay).

In compliance with CWA Section 303(d), EPA has identified the waters off of Baker Beach at Lobos Creek, Horseshoe Cove northwest and northeast, as an impaired water body for indicator bacteria from an unknown source (EPA, 2007). This area is located approximately 4,500 feet northeast of the existing SFVAMC Fort Miley Campus. Indicator bacteria are surrogates used to measure the potential presence of fecal material and associated fecal pathogens. This listing was made by EPA in 2006, and a TMDL is expected in 2019.

Pacific Ocean

The Basin Plan identifies the following beneficial uses for the Pacific Ocean in San Francisco County: industrial service supply; ocean, commercial, and sport fishing; shellfish harvesting; marine habitat; fish migration; preservation of rare and endangered species; fish spawning; wildlife habitat; water contact recreation; noncontact water recreation; and navigation.

The California Ocean Plan is used by EPA as the set of guidelines addressing the criteria listed under CWA Section 403(c). The California Ocean Plan outlines the following beneficial uses for ocean waters of California: industrial water supply; water contact and noncontact recreation, including aesthetic enjoyment; navigation; commercial and sport fishing; mariculture; preservation and enhancement of designated Areas of Special Biological Significance; rare and endangered species; marine habitat; fish migration; and fish spawning and shellfish harvesting (SWRCB, 2009).

Mission Bay Area

The beneficial uses and Section 303(d) impairments described previously for the Central Bay also apply to the shoreline of the Mission Bay area. Because of historic industrial activity, urban uses, and the start of development under the Mission Bay redevelopment plans, surface water runoff from the Mission Bay area commonly contains pollutants consisting of heavy metals, oil and grease, suspended solids, asbestos, cyanide, and phenols (UCSF, 2005).

Mission Creek, which empties into the Mission Creek Channel in Mission Bay, has also been identified by the EPA as an impaired water body for ammonia, hydrogen sulfide, and polycyclic aromatic hydrocarbons. Sediment has also been identified as impaired for chlordane, dieldrin, lead, mercury, PCBs, silver, and zinc from CSO and industrial point sources (EPA, 2007). A TMDL for PCBs has been developed for San Francisco Bay and Mission Creek and was approved by EPA on March 29, 2010. This TMDL includes numeric targets for concentrations in suspended sediment and/or fish tissue.

Groundwater

San Francisco has seven underlying groundwater basins: Westside, Downtown, Lobos, Marina, Islais Valley, South, and Visitacion Valley. The larger Bay Area is all part of the approximately 2.88-million-acre (4,500-square-mile) San Francisco Bay Hydrologic Region. Groundwater recharge in urban areas such as San Francisco is affected by the extent of impervious surfaces such as paved roads and buildings, which inhibit the natural recharge of groundwater. Recharge of San Francisco’s groundwater basins is hindered not only by the vast extent of impervious surfaces citywide, but also by the historic channelization of nearly all surface water drainages into the combined sewer system.

Existing SFVAMC Fort Miley Campus

The Westside Groundwater Basin (Westside Basin) underlies the existing SFVAMC Fort Miley Campus, incorporates Lake Merced, and extends farther south along the east side of the peninsula to South San Francisco Bay. The Westside Basin is the largest groundwater basin underlying San Francisco. Before the 1930s, water from the Westside Basin was used for San Francisco's drinking supply and for nonpotable purposes. Since the 1930s, groundwater has been used only for nonpotable purposes; however, SFPUC is developing plans to use groundwater from the Westside Basin for municipal supply again (SFPUC, 2009).

The Westside Basin incorporates a total surface area of 25,400 acres (40 square miles) in both San Francisco and San Mateo Counties. The Westside Basin is separated from the Lobos Basin to the north by northwest-trending bedrock ridge, the San Bruno Mountains bound the Westside Basin on the east, the San Andreas Fault and Pacific Ocean form its western boundary, and the southern limit of the Westside Basin is defined by a bedrock high that separates it from the San Mateo Plain Groundwater Basin (DWR, 2006).

Sources of groundwater recharge to the Westside Basin include infiltration of rainfall and irrigation water and leakage from water and sewer pipes. Average groundwater recharge in the Westside Basin for water years 1987 and 1988 was estimated to be 4,846 acre-feet per year (DWR, 2006). A study conducted by the U.S. Geological Survey covering the period of 1987 to 1992 showed declining water levels in the Westside Basin that were attributed to the drought during that period. Existing beneficial uses identified in the Basin Plan for the portion of the Westside Basin underlying the existing SFVAMC Fort Miley Campus include agriculture and municipal and domestic supply. Industrial service supply and industrial process supply have also been identified in the Basin Plan as potential beneficial uses of the Westside Basin (San Francisco Bay RWQCB, 2010). The existing SFVAMC Fort Miley Campus is covered by approximately 18.1 acres of impervious surface, with the remaining 11.2 acres being pervious.

Mission Bay Area

The Mission Bay area is underlain by both the Downtown San Francisco Groundwater Basin (Downtown Basin) and the Islais Valley Groundwater Basin (Islais Basin). The Downtown Basin has a surface area of 7,600 acres (12 square miles) and is located on the northeastern portion of the San Francisco peninsula, separated from the five other basins in the eastern portion of San Francisco by bedrock ridges. In general, groundwater flow is northeast, following the topography, and the basin is made up of shallow, unconsolidated alluvium underlain by less permeable bedrock (DWR, 2004). Existing beneficial uses that have been identified in the Basin Plan for the Downtown Basin include agriculture and municipal and domestic supply. Industrial service supply and industrial process supply have also been identified in the Basin Plan as potential beneficial uses of the Downtown Basin (San Francisco Bay RWQCB, 2010).

The Islais Basin has a surface area of 5,930 acres (9.2 square miles) in both San Francisco and San Mateo Counties. The San Bruno Mountains bound the Islais Basin on the west; the basin is separated from the Downtown Basin to the north and the Visitacion Valley and South San Francisco Groundwater Basins to the south by bedrock topographic highs; and San Francisco Bay forms the Islais Basin's boundary along its entire eastern extent. Existing beneficial uses that have been identified in the Basin Plan for the portion of the Islais Basin underlying the Mission Bay area include agriculture and municipal and domestic supply, industrial service supply,

and industrial process supply. Agriculture and municipal and domestic supply have also been identified in the Basin Plan as potential beneficial uses of the Islais Basin (San Francisco Bay RWQCB, 2010).

Sources of groundwater recharge to the Downtown and Islais Groundwater Basins include infiltration of rainfall, landscape irrigation, and leakage of water and sewer pipes. Recharge to the Downtown Basin was estimated to be 5,900 acre-feet per year, with about half of it attributed to leakage from municipal water and sewer pipes (DWR, 2004). Groundwater levels in the Downtown and Islais Basins have remained relatively stable. The depth to groundwater in the area ranges from 3.5 to 9 feet below ground surface (bgs) (ESA, 2005).

Groundwater quality in the east side of the San Francisco peninsula is a mixed cation bicarbonate type, and considered generally "hard." Concentrations of most major dissolved constituents are within the guidelines recommended by EPA, with total dissolved solids (TDS) varying from about 200 parts per million to more than 700 parts per million (DWR, 2004). Elevated concentrations of nitrate and chloride are common, especially at shallower depths, and high concentrations of boron and TDS have been found. High nitrate levels are attributed to groundwater recharge from sewer pipe leakage, and possibly to fertilizer introduced by irrigation return flows. Elevated chloride and TDS levels are most likely caused by a combination of leaky sewer pipes, historic and current seawater intrusion, and connate water that is found in the pores of sedimentary rocks.

3.8.2 Regulatory Framework

Clean Water Act

The CWA (33 U.S. Code [USC] Section 1251 et seq.) is the major federal legislation governing the water quality aspects associated with the construction and operation of VA facilities. The CWA established the basic structure for regulating discharges of pollutants into waters of the United States (not including groundwater) and waters of the State of California. The objective of the act is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." The CWA establishes the basic structure for regulating the discharge of pollutants into waters of the United States.

The CWA authorizes EPA to implement pollution control programs. Under the CWA, it is unlawful for any person to discharge any pollutant from a point source into navigable waters, unless an NPDES permit is obtained. In addition, the CWA requires each state to adopt water quality standards for receiving water bodies and to have those standards approved by EPA. Water quality standards consist of designated beneficial uses for a particular receiving water body (e.g., wildlife habitat, agricultural supply, fishing), along with water quality objectives necessary to support those uses.

Responsibility for the protection of water quality in California resides with the SWRCB and nine RWQCBs. The SWRCB establishes statewide policies and regulations for the implementation of water quality control programs mandated by federal and State water quality statutes and regulations. The RWQCBs develop and implement water quality control plans (more commonly known as basin plans) that consider regional beneficial uses, water quality characteristics, and water quality problems. The San Francisco Bay RWQCB implements several federal laws, the most important of which is the federal CWA.

Water Quality Control Plan for the San Francisco Bay Basin

The Basin Plan was first adopted by the San Francisco Bay RWQCB and approved by the SWRCB in 1975. The Basin Plan identifies the beneficial uses of water bodies and provides water quality objectives and standards for waters of the San Francisco Bay Hydrologic Region. Federal and State laws mandate protection of designated "beneficial uses" of water bodies. State law defines beneficial uses as "domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves."

The beneficial uses of any specifically identified water body generally apply to all tributary streams to that water body. Those water bodies not specifically designated for beneficial uses in the Basin Plan are assigned the municipal and domestic supply (MUN) use, in accordance with SWRCB Resolution No. 88-63. Unless otherwise designated by the San Francisco Bay RWQCB, all groundwater is considered suitable or potentially suitable for MUN, agricultural supply, and industrial process supply and these beneficial uses must not be adversely affected by development of the SFVAMC LRDP.

Clean Water Act Section 303

Section 303(c)(2)(b) of the CWA requires states to adopt water quality standards for all surface waters of the United States based on the water body's designated beneficial use. Where multiple uses exist, water quality standards must protect the most sensitive use. Water quality standards are typically numeric, although narrative criteria based on biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards. Water quality standards applicable to the SFVAMC LRDP are listed in the Basin Plan.

Section 303(d) of the CWA requires states and authorized Native American tribes to develop a list of water quality–impaired segments of waterways. The list includes waters that do not meet water quality standards necessary to support a waterway's beneficial uses even after the minimum required levels of pollution control technology have been installed. Listed water bodies are to be priority ranked for development of a TMDL. A TMDL is a calculation of the total maximum daily load (or "amount") of a pollutant that a water body can receive on a daily basis and still safely meet water quality standards. The TMDLs include waste load allocations for urban stormwater runoff as well as municipal and industrial wastewater discharges, with allocations apportioned for individual municipal separate storm sewer systems (MS4s)[2] and wastewater treatment plants, including those in San Francisco. For stormwater, load reductions would be required to meet the TMDL waste load allocations within the 20 years required by the TMDLs.

The SWRCB, RWQCBs, and EPA are responsible for establishing TMDL waste load allocations and incorporating approved TMDLs into water quality control plans, NPDES permits, and waste discharge requirements (WDRs) in accordance with a specified schedule for completion. The San Francisco Bay RWQCB develops TMDLs for the San Francisco Bay area.

[2] An MS4 is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, or storm drains) that is designed or used to collect or convey stormwater; is not a combined sewer; and is not part of a publicly owned treatment works. The term "MS4" also refers to the jurisdiction that operates such a system.

Section 401—Water Quality Certification

Section 401 of the CWA requires states to certify that any activity subject to a permit issued by a federal agency, such as the U.S. Army Corps of Engineers (USACE), meets all state water quality standards. In California, the SWRCB and the nine RWQCBs are responsible for certifying activities subject to permits issued by USACE under Section 404 (or other USACE permits, such as permits issued under Section 10 of the Rivers and Harbors Act of 1899). In practice, most RWQCBs rely on applications for Section 401 certification to evaluate whether WDRs would also need to also be issued for a project. The RWQCB must review final NEPA documentation before taking an action on an application for water quality certification and/or WDRs.

Section 401 certification requirements are established for effluent discharges from San Francisco's water pollution control plant, to which the existing SFVAMC Fort Miley Campus and the Mission Bay area contribute flows. Because there are no streams, wetlands, or other permanent water bodies on the existing Campus and a federal permit is not required for the project, compliance with Section 401 requirements would not be required for Alternative 1 or Alternative 2. However, because waters of the United States, including wetlands, have been mapped for the Mission Bay area, a federal permit may be required for Alternative 3, depending on the project location, and compliance with Section 404 requirements would be required. A Section 401 certification (or waiver) is required for any discharge regulated under Section 404.

Section 402—NPDES Permits

The NPDES stormwater permitting program, under Section 402(d) of the federal CWA, is administered by the RWQCBs on behalf of EPA. Section 402(d) of the CWA establishes a framework for regulating nonpoint-source stormwater discharges (33 USC 1251). The objective of the NPDES program is to control and reduce levels of pollutants in water bodies from surface water discharges, which include municipal and industrial wastewater as well as stormwater runoff. Under the CWA, discharges of pollutants to receiving water are prohibited unless the discharge complies with an NPDES permit. The NPDES permit specifies discharge prohibitions, effluent limitations, and other provisions, such as monitoring deemed necessary to protect water quality based on criteria specified in the National Toxics Rule, the California Toxics Rule, and the Basin Plan.

The SWRCB has adopted a statewide NPDES general permit for stormwater discharges associated with construction activities (Construction General Permit; SWRCB Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ). For sites that disturb 1 acre or more, the project proponent must comply with the Construction General Permit and prepare and implement a storm water pollution prevention plan (SWPPP) that meets the conditions of the Construction General Permit. Coverage under the NPDES Construction General Permit is not required for projects in areas of San Francisco that drain to the combined sewer system (Ilejay, 2015). For sites served by the combined sewer system in San Francisco, construction stormwater discharges are subject to the requirements of Article 4.2 of the San Francisco Public Works Code, which incorporates and implements the City's NPDES permits[3] and minimum controls described in the federal CSO

[3] The City has two wastewater NPDES permits. The 2008 Bayside Permit (NPDES Permit No. CA0037664) is issued and enforced by the San Francisco Bay RWQCB for the Southeast Water Pollution Control Plant, North Point Wet-Weather Facility, and other bayside facilities that discharge into San Francisco Bay. The 2009 Oceanside Permit (NPDES Permit No. CA0037681) is issued and enforced by both the San Francisco Bay RWQCB and EPA because the Oceanside Water Pollution Control Plant discharges through the Southwest Ocean Outfall into federally regulated waters of the Pacific Ocean.

Policy. As described in more detail under San Francisco Public Works Code, Article 4.2, all projects disturbing more than 5,000 square feet are subject to the City's Construction Site Runoff Control Ordinance and must apply for a Construction Site Runoff Control Permit, submit an erosion and sediment control plan (ESCP) or SWPPP to the SFPUC, and implement best management practices (BMPs) to prevent illicit discharges into the combined sewer (SFPUC, 2010).

All project proponents must comply with requirements to ensure that the City's Construction Site Runoff Control Program reduces potential impacts of site runoff from construction. The following pollution prevention measures are typically implemented at construction sites:

- Develop a SWPPP or ESCP.
- Identify all storm drains and catch basins near the construction site and ensure that all workers are aware of their locations to prevent pollutants from entering them.
- Protect all storm drain and catch basin inlets.
- Develop spill response and containment procedures.
- Inspect the site regularly to ensure that BMPs are intact.
- Conduct daily site cleanings as needed.
- Educate employees and subcontractors about BMPs.
- Regularly maintain all BMPs at the project site.

Under the NPDES permits issued to the City and County of San Francisco to operate the Southeast and Oceanside Water Pollution Control Plants, the City is required to implement a pretreatment program. This program must comply with the regulations incorporated in the CWA and the General Pretreatment Regulations (Code of Federal Regulations [CFR] Title 40, Part 403). Regulations governing nondomestic discharges are contained in Article 4.1 of the City's Sewer Use Ordinance.

Excavation at the existing SFVAMC Fort Miley Campus under Alternative 1, Alternative 2, or Alternative 3 short-term projects is not anticipated to reach the water table because the excavation is not expected to exceed 24 feet below grade and dewatering activities are not expected. Should dewatering be required, however, SFVAMC would obtain the Batch Wastewater Discharge Permit from SFPUC no later than 45 days before discharge.

It can be assumed that the site of any particular Alternative 3 long-term project in the Mission Bay area would have shallow groundwater (Simpson, 2006; UCSF, 2005); therefore, temporary dewatering activities would likely be needed for construction activities. Under Article 4.1 of the San Francisco Public Works Code, the Batch Wastewater Discharge Permit issued by SFPUC regulates discharges to the combined sewer system from temporary dewatering of construction sites. Therefore, this permit must be obtained from SFPUC before the beginning of groundwater dewatering to the combined sewer system. SFPUC imposes specific permit terms and conditions to maintain its compliance with its own wastewater discharge permit issued by the San Francisco Bay RWQCB. Under the Batch Wastewater Discharge Permit, the discharge must meet specific numeric effluent limitations for toxic and conventional pollutants, and monitoring must be conducted to ensure compliance. Any dewatering that would take place during construction would be temporary and would not deplete groundwater resources.

San Francisco Public Works Code, Article 4.1

In accordance with Article 4.1 of the San Francisco Public Works Code, the existing SFVAMC Fort Miley Campus operates under an Industrial Class I Wastewater Permit issued by SFPUC (Permit No. 10-06550). This permit requires the implementation of a site-specific SWPPP that describes SFVAMC's stormwater management program and includes procedures to reduce or eliminate pollution related to stormwater runoff. Measures include protecting all storm drain and catch basin inlets, establishing perimeter controls, covering construction materials and mounds, maintaining wash-out areas for wet construction materials, conducting inspections, and completing regular maintenance.

San Francisco Public Works Code, Article 4.2

Article 4.2 of the San Francisco Public Works Code establishes requirements to "protect and enhance the water quality in the City and County of San Francisco's sewer system, stormwater collection system and receiving waters pursuant to, and consistent with federal and state laws, lawful standards and orders applicable to stormwater and urban runoff control, and the City's authority to manage and operate its drainage systems." Article 4.2 requires submittal of a stormwater control plan for development projects that meets guidelines adopted by SFPUC. Projects disturbing 5,000 square feet or more of ground surface are subject to the guidelines.

These guidelines contain requirements pertaining to the type, design, sizing, and maintenance of postconstruction stormwater BMPs. For project sites in combined sewer areas with existing imperviousness of greater than 50 percent, the stormwater runoff rate and volume must be decreased by 25 percent from the 2-year, 24-hour design storm. In separate sewer areas, the requirement is to capture and treat the rainfall from a design storm of 0.75 inch. The stormwater control plan must be approved by SFPUC. The project must also develop a maintenance plan for all proposed stormwater controls and submit it as part of the preliminary and final stormwater control plan. Although it is a federal facility, SFVAMC would be required to comply with Article 4.2 because of CWA requirements (Section 313[a][2]) (Webster, pers. comm., 2015).

In November 2013, the Board of Supervisors approved and the Mayor signed the Construction Site Runoff Control Ordinance (Ord. 260-13), which amended Article 4.2 of the Public Works Code to add pollution prevention controls for construction site runoff discharges into the sewer system citywide. Under the ordinance, any construction project that disturbs 5,000 square feet or more of land must apply to the SFPUC for a Construction Site Runoff Control Permit prior to the start of work and to submit an ESCP that sets forth BMPs intended to control erosion control and sediment. The ESCP must include a vicinity map showing the location of the site in relationship the surrounding area's water courses, water bodies, and other significant geographic features; a site survey; suitable contours for the existing and proposed topography, area drainage, proposed construction and sequencing, proposed drainage channels: proposed erosion and sediment controls; dewatering controls where applicable: soil stabilization measures where applicable; maintenance controls; sampling, monitoring, and reporting schedules; and any other information deemed necessary by SFPUC (SFPUC, 2015). The ordinance requires that permittees perform daily inspections and maintain and repair all graded surfaces and erosion and sediment controls, drainage structures, or other protective devices, plantings, and ground cover installed while construction is active. The ordinance also provides for enforcement of violations. Any project requiring a SWPPP under the Construction General Permit may submit the SWPPP in lieu of an ESCP in order to comply with the Construction Site Runoff Control Program at the SFPUC.

In addition to the Construction Site Runoff Control Ordinance, as described previously, construction stormwater controls are mandated by Article 4.1 of the Public Works Code and the Industrial Waste Ordinance.

Ocean Discharge Criteria

San Francisco's treated effluent from the Oceanside Water Pollution Control Plant discharges beyond the 3-mile California water boundary into federal waters. Federal requirements (40 CFR 125) specify that discharges must not cause unreasonable degradation of marine environments, although no specific receiving-water standards have been established for ocean discharges. EPA uses the California Ocean Plan as the set of guidelines to address the criteria listed under Section 403(c) of the CWA. The existing SFVAMC Fort Miley Campus drains to the Pacific Ocean directly via a small separate storm drainage system that conveys stormwater off-site on the north side of the Campus; therefore, ocean discharge criteria in 40 CFR 125 are applicable to the EIS Alternatives.

Section 438 of the Energy Independence and Security Act

The Energy Independence and Security Act (EISA) of 2007 was enacted in December 2007. Section 438 of the EISA establishes new stormwater design requirements for federal development and redevelopment projects to reduce the impacts of stormwater runoff associated with new construction and help to sustain water resources. Federal facility development or redevelopment projects that have a footprint greater than 5,000 square feet must "maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow" (EPA, 2009). Section 438 of the EISA is to be implemented using Low Impact Development (LID) techniques to mimic the site's predevelopment stormwater runoff conditions by using site design techniques that store, infiltrate, evaporate, and detain runoff. The "maximum extent technically feasible" criterion requires full employment of accepted and reasonable stormwater retention and reuse technologies (e.g., bioretention areas, permeable pavements, cisterns/recycling, and green roofs), subject to site and applicable regulatory constraints. Among these constraints are site size, soil types, vegetation, demand for recycled water, existing structural limitations, and State or local prohibitions on water collection.

Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," signed by President Barack Obama on October 5, 2009, required EPA to issue guidance on the implementation of Section 438 of the EISA. The technical guidance was issued in December 2009 in document EPA 841-B-09-0001, *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act*.

EPA's technical guidance creates two options for complying with the EISA. The first option is to design, construct, and maintain stormwater management practices that control rainfall on-site and prevent runoff from all precipitation events less than or equal to the 95th-percentile rainfall event to the "maximum extent technically feasible." Where technically feasible, 100 percent of the volume of stormwater from storms less than or equal to the 95th percentile event should not be discharged to surface waters, but rather, should be infiltrated or captured and reused. The second option is to rely on site-specific hydrologic conditions and investigations to design, construct, and maintain stormwater management practices that preserve predevelopment runoff conditions after construction. After the appropriate studies have been completed, this goal can be achieved through the use of infiltration, evapotranspiration, and/or rainwater harvesting and use. The EIS Alternatives involve a footprint of greater than 5,000 square feet, whether implemented at the existing SFVAMC Fort Miley Campus or at the

potential new SFVAMC Mission Bay Campus. Therefore, Section 438 of the EISA would be applicable to the SFVAMC LRDP.

U.S. Department of Veterans Affairs Site Utility Design Manual

VA's *Site Utility Design Manual* (July 2010) (Design Manual) includes hydrologic and hydraulic design requirements for drainage and storm sewer systems. The Design Manual requires that a hydrologic assessment be conducted for the 2-, 5-, 10-, 50- and 100-year storm events, and that the system be sized for a minimum 10-year, 1-hour storm event. Stormwater systems must also comply with the requirements of the off-site receptor of stormwater. The Design Manual "conveys the general and specific VA design philosophy for medical and support facilities" (page 1-1), including SFVAMC.

3.8.3 Environmental Consequences

Significance Criteria

A NEPA evaluation must consider the context and intensity of the environmental effects that would be caused by, or result from, the EIS Alternatives. Other environmental assessment documents were reviewed and the criteria listed below were selected as relevant to this evaluation.

An Alternative analyzed in this EIS is considered to result in an adverse impact related to hydrology and water quality if it would:

- violate existing water quality standards or otherwise substantially degrade water quality,
- result in substantial water quality changes that would adversely affect beneficial uses,
- result in substantive undesirable flooding impacts as a result of drainage alteration or increase in impervious area, or
- result in substantive groundwater depletion.

Assessment Methods

The aforementioned significance criteria were applied to determine impact significance using a qualitative approach. Specifically, the following is a discussion of hydrology and water quality impacts associated with potential project-related drainage alterations, increased impervious areas, or water quality degradation. This analysis focuses on the effects of both the construction and facility operations proposed in the SFVAMC LRDP.

Alternative 1: SFVAMC Fort Miley Campus Buildout Alternative

Short-Term Projects

Construction

Water Quality Degradation Caused by Erosion, Sedimentation, or Construction Contaminants

Construction activities for Alternative 1 short-term projects would include development or retrofitting of buildings and parking structures at the existing SFVAMC Fort Miley Campus. Demolition, excavation, grading, and construction on the project site would require temporary disturbance of surface soils and removal of existing on-site pavements and subsurface structures (Table 2-1 and Figure 2-1). All construction staging would occur on-site. During the construction period, excavation and grading activities would expose soil to water runoff and entrain sediment in the runoff. If dewatering would be necessary during construction, the water would likely contain sediments and could require settling before conveyance to the combined sewer system.

Sediment in discharge water and deposits of soil and debris from haul truck tires on local streets could cause increased sediment to be carried off-site in the storm drain/sewer, clogging inlets and reducing the functional capacity of the pipes to convey flows. Mobilized sediment could accumulate in new locations as runoff occurs and could block flows, potentially resulting in increased localized ponding or flooding.

The delivery, handling, and storage of construction materials and waste and the use of construction equipment could introduce a risk of stormwater contamination that could adversely affect water quality. Spills or leaks from heavy equipment and machinery could also adversely affect water quality through contamination by oil, grease, and hydrocarbons. The on-site construction staging area could also be a source of pollution because of the use of paints, solvents, cleaning agents, and metals during construction. If improperly handled, these pollutants could be transported in stormwater runoff that ultimately leads to the Pacific Ocean and/or groundwater.

As part of the Fort Miley Campus is located in the separate sewer system, SFVAMC would apply for coverage under the Construction General Permit (SWRCB Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ), which requires the development and implementation of a SWPPP. The SWPPP would be prepared for the entire project site to minimize potential water quality degradation throughout the projects' construction period under Alternative 1 short-term projects. The SWPPP would include specific and detailed BMPs designed to reduce the amount of sediment and other construction-related pollutants in discharges associated with construction activities. At a minimum, BMPs would include practices to minimize the contact of construction materials, equipment, and maintenance supplies (e.g., fuels, lubricants, paints, solvents, adhesives) with stormwater. The SWPPP would specify the use of properly designed, centralized storage areas to keep these materials from flowing into the combined sewer system. The SWPPP would identify and specify:

- the pollutants that are likely to be used during construction that could be present in stormwater drainage and nonstormwater discharges, including fuels, lubricants, and other types of materials used for equipment operation;

- the means of waste disposal;

- spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used for equipment operation, and emergency procedures for responding to spills;

- personnel training requirements and procedures that must be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP;

- the appropriate personnel responsible for supervisory duties related to implementation, inspection, and maintenance of BMPs; and

- the effective combination of robust erosion and sediment-control BMPs and construction techniques, accepted by local jurisdictions for use in the project area, that would reduce the potential for runoff and the release, mobilization, and exposure of pollutants from project construction sites. These may include temporary erosion control and soil stabilization measures, coir logs, sedimentation ponds, stormwater inlet protection, and silt fences. Drainage swales, ditches, and/or earth dikes/berms would be used to control erosion and runoff by conveying surface runoff down sloping land, preventing sheet flow over sloped surfaces, preventing an accumulation of runoff at the base of a grade, and avoiding flood damage along roadways and facility infrastructure. Where applicable, BMPs identified in the SWPPP would be in place throughout site work and construction activities. Permanent vegetative cover would be established to reduce erosion in areas disturbed by construction by slowing runoff velocities, trapping sediment, and enhancing filtration and transpiration.

The stormwater runoff from the portion of the project site that drains to the combined sewer system would be collected and treated at the Oceanside Water Pollution Control Plant before being discharged to the Pacific Ocean. Treatment would be provided to the effluent discharge limitations set by the plant's NPDES permit. The SFVAMC would also be required to apply for a Construction Site Runoff Control Permit from the SFPUC and submit a copy of the SWPPP. A separate ESCP would not be required by the SFPUC if a copy of the SWPPP is submitted.

In addition, SFVAMC would be required to comply with the requirements of Article 4.1 of the San Francisco Public Works Code, which regulates the quantity and quality of discharges to the combined sewer system. (See SFPUC Industrial User Class I Wastewater Permit No. 10-06550 [effective June 18, 2010] for the existing SFVAMC Fort Miley Campus.) These requirements include controlling sediments and erosion and implementing BMPs for construction materials and waste management and handling.

SFPUC's Bureau of Systems Planning, Environment, and Compliance must be notified about projects necessitating dewatering, and may require a water analysis before discharge. Dewatering is not anticipated to be required during construction under Alternative 1. Should dewatering be required, SFVAMC would obtain the Batch Wastewater Discharge Permit from SFPUC no later than 45 days before discharge. The permit would contain numeric effluent limitations for toxic and conventional pollutants and other appropriate requirements that must be achieved before discharge into the combined sewer system may commence. As a condition of the Batch Wastewater Discharge Permit, monitoring would also be conducted to ensure compliance.

SFVAMC would also minimize potential construction impacts by implementing the requirements for land resource protection outlined in VA Specification Section 015719, "Temporary Environmental Controls." These include requirements such as setting work area limits, protecting the landscape, reducing exposure of unprotected

soils, protecting disturbed areas, installing erosion and sediment-control devices, managing spoil areas, and following good-housekeeping procedures.

SFVAMC would comply with the aforementioned stormwater requirements to avoid or minimize water quality degradation to the maximum extent practicable. Therefore, impacts of Alternative 1 short-term projects on water quality during construction would be minor.

Depletion of Groundwater Resources

Groundwater, which fluctuates with the seasons, was measured in 2004 and 2009 at depths of approximately 32.2 and 34.2 feet bgs, respectively, on the southeast side of the existing SFVAMC Fort Miley Campus, where a groundwater monitoring well is located (VA, 2010b). Further soil sampling also indicates that the depth-to-groundwater levels are about 16 feet bgs on the north end of the site and 32 feet bgs on the south end. Should groundwater be encountered during construction, temporary dewatering would be necessary to keep the work area dry. Dewatering could result in lowering of local groundwater levels; however, any changes in groundwater levels would be temporary and minimal.

More than half (approximately 62 percent) of the existing 29-acre SFVAMC Fort Miley Campus is covered by the impervious surfaces of the existing SFVAMC buildings, parking areas, roads, and other developed areas, which effectively prevent infiltration of surface water into the soil. Stormwater runoff generated at the Campus that does not drain to the north slope is also directed to the combined sewer system, which further reduces the amount of water that infiltrates into the soil on-site. The amount of impervious surfaces at the Campus would increase by a maximum of approximately 4 percent (0.69 acre) as a result of construction of Alternative 1 short-term projects. New buildings may be designed to drain runoff to landscaped areas such as bioswales for infiltration before entering the combined sewer system. Therefore, although the impervious surface area on the project site would increase slightly, this would not noticeably affect the overall infiltration and groundwater recharge quantities in the project area because areas of infiltration would increase over current levels. Thus, no measureable change in infiltration characteristics would result from implementation of Alternative 1 short-term projects.

In addition, groundwater would not be used as a water supply during project construction (e.g., for potable uses, dust suppression, or other nonpotable uses). Implementation of Alternative 1 short-term projects would not result in groundwater extraction for consumptive uses. Therefore, construction-related impacts of Alternative 1 short-term projects on groundwater would be minor.

Operation

Downstream Flooding or Increase in the Frequency or Severity of Combined Sewer Overflow Events as a Result of Altered Drainage Patterns or an Increase in Impervious Surfaces

Operation of Alternative 1 short-term projects would not alter the course of a stream or river because none are present on or near the existing SFVAMC Fort Miley Campus.

The surface drainage pattern of the site (that is, the urban condition dominated by impermeable surfaces of buildings, streets, and sidewalks) would remain similar to the existing pattern with construction of Alternative 1 short-term projects. Flows would be directed toward the existing combined sewer system, or in the case of the

north slope area, to the recently reconfigured discharge points. However, total or peak runoff volume from the site could increase as the locations and configurations of infrastructure and open space change. In addition, the wastewater flows contributing to the combined sewer system would increase because of the larger number of hospital employees, staff, and patients associated with project operation. An increase in total or peak runoff volume from the site compared to existing conditions could contribute to the frequency or severity of CSO events and/or downstream flooding.

Construction of Alternative 1 short-term projects would result in an increase of approximately 0.69 acre in impervious area (a 4 percent increase compared to existing conditions) on previously disturbed land at the existing SFVAMC Fort Miley Campus. As described in Chapter 2.0, "Alternatives," design considerations for stormwater facilities would include methods of reducing impervious area and improving on-site stormwater treatment facilities to manage stormwater quality before off-site discharge. The SFVAMC LRDP also states that stormwater design would incorporate vegetation in stormwater management strategies. These strategies would serve to maintain the site's predevelopment stormwater discharge rates and volumes by using design techniques that infiltrate, filter, store, evaporate, and detain runoff close to the source, such as green roofs and bioswales, as well as energy dissipaters to prevent concentrated flows. Site drainage would flow via at-grade catch basins and area drains to landscaped areas, and to underground gravity lines. In addition, the building and site contours would be designed to minimize stormwater runoff. However, total or peak runoff volume from the Campus could increase without implementation of stormwater management controls. An increase in stormwater runoff volume from the Campus could contribute to the frequency or severity of CSO events and/or downstream flooding.

SFVAMC would be required to comply with Section 438 of the EISA because construction at this federal facility would have a new footprint greater than 5,000 square feet. LID techniques (e.g., bioretention areas, permeable pavements, cisterns/recycling, and green roofs) must mimic predevelopment stormwater runoff conditions by using site design techniques that store, infiltrate, evaporate, and detain runoff. SFVAMC also would be required to comply with Article 4.2 of the San Francisco Public Works Code, which requires submittal of a stormwater control plan that meets SFPUC guidelines. For compliance with Article 4.2, the stormwater runoff rate and volume from the portion of the project site that drains to the combined sewer would be required to decrease by 25 percent from the 2-year, 24-hour design storm.

The area of the project site located in the separate sewer areas would be required to capture and treat the rainfall from a design storm of 0.75 inch. Stormwater that drains to the north slope would be conveyed via surface piping that was constructed as part of the North Slope Seismic/Geologic Stabilization Project (completed in 2011). As part of that project, discharge points were armored and constructed to spread out the flows and dissipate energy, reducing erosion risk. Discharge piping is surface-mounted and was designed to remain effective under minor slope movements. The project also regraded a large portion of the slope, eliminating areas where water previously ponded.

Technical guidance from EPA's *Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects under Section 438 of the Energy Independence and Security Act* would be used to either (1) design, construct, and maintain stormwater management practices that control rainfall on-site and prevent runoff from all precipitation events less than or equal to the 95th-percentile rainfall event to the "maximum extent technically feasible"; or (2) use site-specific hydrologic conditions and investigations to design, construct, and

maintain stormwater management practices that preserve predevelopment runoff conditions after construction through the use of infiltration, evapotranspiration, and/or rainwater harvesting and use.

Through assumed compliance with stormwater runoff requirements and implementation of LID or other techniques to infiltrate, evaporate, and detain stormwater to maintain predevelopment stormwater runoff conditions, impacts related to downstream flooding or increase in the frequency or severity of CSO events would be minor. In addition, implementation of Management Measure HYD-1 at the existing SFVAMC Fort Miley Campus would confirm the proper sizing of infrastructure to handle stormwater and wastewater flows to protect against down-gradient flooding hazards.

Management Measure HYD-1: Prepare and Submit Final Drainage Plans and Implement Requirements Contained in Those Plans

Before the approval of grading plans and building permits, SFVAMC will submit final drainage plans to SFPUC for all projects demonstrating that off-site up-gradient runoff would be appropriately conveyed through the project site, and that project-related on-site runoff would be appropriately contained to reduce flooding impacts. The plans will include but will not be limited to the following items:

1. *SFVAMC will conduct a utility investigation before and during project design to ensure that combined sewer infrastructure is properly sized to handle stormwater and wastewater flows. An accurate calculation of preproject and postproject runoff scenarios will be obtained using appropriate engineering methods that accurately evaluate potential changes to runoff, including increased surface runoff. This investigation will estimate stormwater and sanitary sewer peak flows and identify potential conflicts between proposed new buildings and existing sanitary sewer and storm drain pipes.*

2. *The system capacity of the separate storm drain system that drains areas to the north of the SFVAMC Fort Miley Campus will be determined as part of a hydrologic and hydraulic analysis of stormwater flows during project design.*

   Drainage and storm sewer systems will be designed in accordance with VA's Site Utility Design Manual, which requires that a hydrologic assessment be conducted for the 2-, 5-, 10-, 50- and 100-year storm events, and that the system be sized for a minimum 10-year, 1-hour storm event.

3. *Sustainable stormwater design BMPs, which may include but will not be limited to LID techniques to eliminate stormwater runoff at the point of origination, will be implemented to infiltrate, evaporate, and detain stormwater and achieve predevelopment stormwater runoff conditions at the site after construction. These BMPs may include but will not be limited to the following:*

   - *Bioretention and rain gardens*
   - *Rooftop green roof gardens*
   - *Sidewalk storage*
   - *Vegetated swales, buffers, and strips*
   - *Rain barrels and cisterns*
   - *Permeable pavement*

- *Soil amendments*

Implementing Management Measure HYD-1 at the existing SFVAMC Fort Miley Campus would confirm the proper sizing of infrastructure to handle stormwater and wastewater flows to protect against down-gradient flooding hazards. In addition, LID or other techniques would be used to infiltrate, evaporate, and detain stormwater, thus maintaining predevelopment stormwater runoff conditions. Furthermore, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). Thus, with implementation of Management Measure HYD-1, Alternative 1 short-term projects would not substantially contribute to the frequency or severity of CSO events and/or downstream flooding, and this impact would be minor.

Water Quality Degradation Caused by Changes in the Intensity of Land Use and Increases in Impervious Surfaces

Development of Alternative 1 short-term projects could result in long-term increases in pollutant concentrations in stormwater, because of the 0.69-acre increase in impervious surfaces at the site and because the potential increases in vehicular traffic or the size of parking facilities could cause a larger amount of pollutants to reach stormwater. Leaks of fuel or lubricants, tire wear, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals, and sediment, increasing the pollutant load in runoff. This could result in direct adverse impacts on water quality under Alternative 1.

All sanitary wastewater from the proposed buildings and most stormwater runoff from the existing SFVAMC Fort Miley Campus would flow into the City's combined sewer system, to be treated at the Oceanside Water Pollution Control Plant before being discharged into the Pacific Ocean. Treatment would be provided pursuant to the effluent discharge limitations set by the plant's NPDES permit; therefore, the plant would comply with all local wastewater discharge requirements. Stormwater runoff from the north slope of the Campus would flow to the small separate storm drainage system and would be conveyed off-site through piping equipped with energy dissipaters.

In addition, Management Measure HYD-1 would be implemented to minimize potential degradation of water quality during project operations. Implementing this management measure could result in improvements in water quality compared to existing conditions because sustainable stormwater-design BMPs (e.g., green roofs, vegetated swales, stormwater detention) would be installed to provide on-site stormwater treatment before off-site discharge. In addition, SFVAMC would monitor stormwater runoff to the separate storm drain system that drains areas north of the SFVAMC Fort Miley Campus, pursuant to requirements in the Industrial Class I Wastewater Permit issued by SFPUC (Permit No. 10-06550). Furthermore, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). Overall, implementing Alternative 1 short-term projects would not provide substantial additional sources of polluted runoff or otherwise degrade water quality; therefore, with implementation of Management Measure HYD-1, the impact of Alternative 1 short-term projects related to water quality degradation would be minor.

Long-Term Projects

Construction

Water Quality Degradation Caused by Erosion, Sedimentation, or Construction Contaminants

Like the activities for the short-term projects under Alternative 1, demolition, excavation, and grading activities associated with the Alternative 1 long-term project (Table 2-2 and Figure 2-2) would expose soil to water runoff and entrain sediment in the runoff. In addition, the delivery, handling, and storage of construction materials and waste and the use of construction equipment could introduce a risk of stormwater contamination that could adversely affect water quality.

To minimize potential water quality degradation during construction of the Alternative 1 long-term project, SFVAMC would be required to comply with the requirements of Article 4.1 of the San Francisco Public Works Code for runoff into the combined sewer system. SFVAMC would be required to apply for coverage under the Construction General Permit (SWRCB Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ). This would require SFVAMC to prepare and implement a SWPPP to reduce pollution of surface water throughout the projects' construction period. At a minimum, the SWPPP would include specific and detailed BMPs designed to reduce the amount of sediment and other construction-related pollutants in discharges associated with construction activities. The SFVAMC would also be required to apply for a Construction Site Runoff Control Permit from the SFPUC and submit a copy of the SWPPP. A separate ESCP would not be required by the SFPUC if a copy of the SWPPP is submitted.

In addition, the stormwater runoff from most of the project site would be collected and treated at the Oceanside Water Pollution Control Plant before being discharged to the Pacific Ocean. Treatment would be provided to the effluent discharge limitations set by the plant's NPDES permit. SFVAMC would also minimize potential construction impacts by implementing the requirements for land resource protection outlined in VA Specification Section 015719, "Temporary Environmental Controls."

Through assumed compliance with these stormwater requirements, construction-related impacts of the Alternative 1 long-term project on water quality would be minor.

Depletion of Groundwater Resources

Any dewatering that would take place during construction of the Alternative 1 long-term project would be temporary and would not deplete groundwater resources. Implementing these projects would not result in an increase in impervious surfaces. Infiltration characteristics at the SFVAMC Fort Miley Campus would not measurably change because the proposed Building 213 would be constructed on the footprint of existing Building 12, which is planned for demolition as part of Alternative 1 short-term projects. In addition, groundwater would not be used as a source of drinking water or consumptive water supply during construction. Therefore, construction-related impacts of the Alternative 1 long-term project on groundwater resources would be minor.

Operation

Downstream Flooding or Increase in the Frequency or Severity of Combined Sewer Overflow Events as a Result of Altered Drainage Patterns or an Increase in Impervious Surfaces

As under the short-term projects for Alternative 1, the surface drainage pattern on the site of the Alternative 1 long-term project would remain similar to the existing pattern. Most flows would be directed toward the existing combined sewer system. The site's runoff volume and wastewater flows could increase as the locations and configurations of infrastructure and open space change; however, the Alternative 1 long-term project consists only of the construction of one building on the footprint of existing Building 12, which is planned for demolition as part of Alternative 1 short-term projects. Construction of the Alternative 1 long-term project would not result in an increase in impervious area.

To minimize potential downstream flooding or an increase in the frequency or severity of CSO events during project operation, LID techniques would be used to infiltrate, evaporate, and detain stormwater in compliance with Section 438 of the EISA. Using these techniques would maintain predevelopment stormwater runoff conditions to the maximum extent technically feasible. LID techniques also would be used to achieve compliance with Article 4.2 of the San Francisco Public Works Code. Thus, the Alternative 1 long-term project would not contribute to the frequency or severity of CSO events and/or downstream flooding, and this impact would be minor.

Water Quality Degradation Caused by Changes in the Intensity of Land Use and Increases in Impervious Surfaces

As with the short-term projects for Alternative 1, with implementation of the Alternative 1 long-term project, sanitary wastewater from the proposed buildings and most stormwater runoff from the existing SFVAMC Fort Miley Campus would flow into the City's combined sewer system and would be treated before discharge in accordance with the effluent discharge limitations set by the plant's NPDES permit. The building constructed for the Alternative 1 long-term project (Building 213) would be constructed on previously disturbed and impervious areas and therefore would not result in an increase in impervious surfaces. Thus, the Alternative 1 long-term project would comply with all local wastewater discharge requirements. Stormwater runoff from the north slope of the Campus would flow to the small separate storm drainage system and would be conveyed off-site through piping equipped with energy dissipaters. Therefore, impacts related to water quality degradation would be minor.

Alternative 2: SFVAMC Fort Miley Campus Buildout Alternative

Short-Term Projects

Alternative 2 short-term projects at the existing SFVAMC Fort Miley Campus would be the same as Alternative 1 short-term projects, with one exception. Specifically, retrofitting of the existing Buildings 1, 6, and 8 would not occur as part of Alternative 2 short-term projects (Table 2-3 and Figure 2-3), but would instead be accomplished in the long term. Construction under Alternative 2 would involve 16 projects that would occur over 6 years. Construction under Alternative 2 includes construction of a total of 485,445 gross square feet (gsf), which is 115,547 gsf less than for short-term projects under Alternative 1. Therefore, impacts of Alternative 2 short-term projects would be similar to or less than those of Alternative 1 short-term projects. Any impacts on water quality and hydrology would be minor.

Construction

Water Quality Degradation Caused by Erosion, Sedimentation, or Construction Contaminants

Like the activities for Alternative 1 short-term projects, demolition, excavation, and grading activities for Alternative 2 short-term projects would expose soil to water runoff and entrain sediment in the runoff. In addition, the delivery, handling, and storage of construction materials and waste and the use of construction equipment could introduce a risk of stormwater contamination that could adversely affect water quality.

To minimize potential water quality degradation during construction of Alternative 2 short-term projects, SFVAMC would be required to comply with the same stormwater requirements as described above for Alternative 1 short-term projects. Through assumed compliance with these stormwater requirements, construction-related impacts of Alternative 2 short-term projects on water quality would be minor.

Depletion of Groundwater Resources

As described for Alternative 1 short-term projects, any dewatering that would take place during construction of Alternative 2 short-term projects would be temporary and would not deplete groundwater resources. The amount of impervious surfaces at the SFVAMC Fort Miley Campus would increase by a maximum of approximately 4 percent as a result of construction of Alternative 2 short-term projects. Although the impervious surface area on the project site would increase slightly, this would not noticeably affect the overall infiltration and groundwater recharge quantities in the project area because areas of infiltration would increase over current levels with the addition of stormwater management areas such as bioswales. Thus, no measureable change in infiltration characteristics would result from implementation of Alternative 2 short-term projects. In addition, groundwater would not be used as a source of drinking water or consumptive water supply during construction. Therefore, construction-related impacts of Alternative 2 short-term projects on groundwater resources would be minor.

Operation

Downstream Flooding or Increase in the Frequency or Severity of Combined Sewer Overflow Events as a Result of Altered Drainage Patterns or an Increase in Impervious Surfaces

As under the short-term projects for Alternative 1, the surface drainage pattern of the site of the Alternative 2 short-term projects would remain similar to the existing pattern. Most flows would be directed toward the existing combined sewer system. However, the site's runoff volume and wastewater flows could increase as the locations and configurations of infrastructure and open space change, and these increases could contribute to the frequency or severity of CSO events and/or downstream flooding.

Also identical to short-term projects under Alternative 1, construction of Alternative 2 short-term projects would result in an increase of approximately 0.69 acre in impervious area (a 4 percent increase compared to existing conditions) on previously disturbed land at the existing SFVAMC Fort Miley Campus. Unlike Alternative 1 short-term projects, however, Alternative 2 short-term projects would not include the seismic retrofit of existing Buildings 1, 6, and 8. Still, without the information necessary to demonstrate that all stormwater criteria and standards are being met, it cannot be assumed that potentially adverse impacts would not occur. Therefore,

implementing Alternative 2 short-term projects could result in an adverse impact related to downstream flooding or an increase in the frequency or severity of CSO events.

To minimize potential downstream flooding or an increase in the frequency or severity of CSO events during project operation, LID techniques would be used to infiltrate, evaporate, and detain stormwater in compliance with Section 438 of the EISA, thus maintaining predevelopment stormwater runoff conditions. LID techniques would also be used to achieve compliance with Article 4.2 of the San Francisco Public Works Code. In addition, Management Measure HYD-1 would be implemented at the Campus so that infrastructure would be properly sized to handle stormwater and wastewater flows to protect against down-gradient flooding hazards. Furthermore, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). Thus, with implementation of Management Measure HYD-1, implementation of Alternative 2 short-term projects would not contribute to the frequency or severity of CSO events and/or downstream flooding, and this impact would be minor.

Water Quality Degradation Caused by Changes in the Intensity of Land Use and Increases in Impervious Surfaces

As with the short-term projects for Alternative 1, implementation of Alternative 2 short-term projects would result in a net addition of 0.69 acre of impervious area and a potential increase in the pollutant load in runoff. This could result in direct adverse impacts on water quality under Alternative 2. Sanitary wastewater from the proposed buildings and most stormwater runoff from the existing SFVAMC Fort Miley Campus would flow into the City's combined sewer system, would be treated before discharge in accordance with the effluent discharge limitations set by the plant's NPDES permit, and would comply with all local wastewater discharge requirements. Stormwater runoff from the north slope of the Campus would flow to the small separate storm drainage system and would be conveyed off-site through piping equipped with energy dissipaters. Incorporation of LID or other techniques described in Management Measure HYD-1 would also serve to protect water quality during project operation. In addition, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). Therefore, with implementation of Management Measure HYD-1, impacts related to water quality degradation would be minor.

Long-Term Projects

Alternative 2 long-term projects at the existing SFVAMC Fort Miley Campus would be the same as the Alternative 1 long-term project, with one exception. Specifically, three additional existing buildings—Buildings 1, 6, and 8—would be retrofitted as part of Alternative 2 long-term projects (Table 2-4 and Figure 2-4). Alternative 2 long-term projects include construction of a total of 285,487 gsf, which is 115,487 gsf more than under the Alternative 1 long-term project, because Alternative 2 includes construction of Building 213 along with the seismic retrofit of Buildings 1, 6, and 8. Therefore, construction impacts of Alternative 2 long-term projects would be similar to, although slightly greater than, those of the Alternative 1 long-term project. Impacts on water quality and hydrology would be minor.

Construction

Water Quality Degradation Caused by Erosion, Sedimentation, or Construction Contaminants

Like the activities for Alternative 2 short-term projects, demolition, excavation, and grading activities associated with Alternative 2 long-term projects would expose soil to water runoff and entrain sediment in the runoff. In addition, the delivery, handling, and storage of construction materials and waste and the use of construction equipment could introduce a risk of stormwater contamination that could adversely affect water quality. To minimize potential water quality degradation during construction of Alternative 2 long-term projects, SFVAMC would be required to comply with the same stormwater requirements as described above for short-term projects under Alternatives 1 and 2. Through assumed compliance with these stormwater requirements, construction-related impacts of Alternative 2 long-term projects on water quality would be minor.

Depletion of Groundwater Resources

Any dewatering that would take place during construction of Alternative 2 long-term projects would be temporary and would not deplete groundwater resources. Implementing these projects would not result in an increase in impervious surfaces. Infiltration characteristics at the SFVAMC Fort Miley Campus would not measurably change because the proposed Building 213 would be constructed on the footprint of existing Building 12, which is planned for demolition as part of Alternative 2 short-term projects. Other activities associated with Alternative 2 long-term projects include seismic retrofits of existing Buildings 1, 6, and 8, which would not result in an associated increase in impervious area or a change in Campus infiltration characteristics. In addition, groundwater would not be used as a source of drinking water or consumptive water supply during construction. Therefore, construction-related impacts of Alternative 2 long-term projects on groundwater resources would be minor.

Operation

Downstream Flooding or Increase in the Frequency or Severity of Combined Sewer Overflow Events as a Result of Altered Drainage Patterns or an Increase in Impervious Surfaces

As under the long-term projects for Alternative 1, the surface drainage pattern on the site of Alternative 2 long-term projects would remain similar to the existing pattern. Most flows would be directed toward the existing combined sewer system. The site's runoff volume and wastewater flows could increase as the locations and configurations of infrastructure and open space change; however, Alternative 2 long-term projects consist only of the seismic retrofit of three existing buildings and the construction of one building on the footprint of existing Building 12, which is planned for demolition as part of Alternative 2 short-term projects. Construction of the Alternative 2 long-term projects would not result in an increase in impervious area. As under the Alternative 1 long-term project, LID techniques would be used to infiltrate, evaporate, and detain stormwater in compliance with Section 438 of the EISA, thus maintaining predevelopment stormwater runoff conditions to the maximum extent technically feasible. LID techniques would also be used to achieve compliance with Article 4.2 of the San Francisco Public Works Code. Thus, Alternative 2 long-term projects would not contribute to the frequency or severity of CSO events and/or downstream flooding, and this impact would be minor.

Water Quality Degradation Caused by Changes in the Intensity of Land Use and Increases in Impervious Surfaces

As with the short-term projects for Alternative 2, with implementation of Alternative 2 long-term projects, sanitary wastewater from the proposed buildings and most stormwater runoff from the existing SFVAMC Fort Miley Campus would flow into the City's combined sewer system and would be treated before discharge in accordance with the effluent discharge limitations set by the plant's NPDES permit. Thus, Alternative 2 long-term projects would comply with all local wastewater discharge requirements. The building constructed for the Alternative 2 long-term projects (Building 213) would be constructed on previously disturbed and impervious areas and therefore would not result in an increase in impervious surfaces. Likewise, the seismic retrofit of three buildings would not result in an increase in impervious surfaces. Stormwater runoff from the north slope of the Campus would flow to the small separate storm drainage system and would be conveyed off-site through piping equipped with energy dissipaters. Incorporating LID would also serve to protect water quality during project operation. Therefore, implementing Alternative 2 long-term projects would not provide substantial additional sources of polluted runoff or otherwise degrade water quality. Impacts related to water quality degradation would be minor.

Alternative 3: SFVAMC Fort Miley Campus Plus Mission Bay Campus Alternative

Short-Term Projects

Alternative 3 short-term projects (during both construction and operation) would be the same as Alternative 1 short-term projects (see Table 2-1 and Figure 2-1). Therefore, the impacts of Alternative 3 short-term projects would be the same as the impacts of Alternative 1 short-term projects. These impacts would be minor.

Long-Term Projects

Alternative 3 long-term projects, including the ambulatory care center and associated parking structure uses, would be located at the potential new SFVAMC Mission Bay Campus (Table 2-5 and Figure 2-5).

Construction

Water Quality Degradation as a Result of Erosion, Sedimentation, or Construction Contaminants

Alternative 3 would entail excavation and grading activities for construction of the potential new SFVAMC Mission Bay Campus in the Mission Bay area on an approximately 0.98-acre site. These construction activities would expose soil to water runoff and entrainment of sediment in the runoff. The delivery, handling, and storage of construction materials and waste and the use of construction equipment could introduce a risk of stormwater contamination that could adversely affect water quality.

Soil and groundwater underlying the site of the potential new SFVAMC Mission Bay Campus may also be contaminated by historic fill from industrial and commercial activities. Potential water quality impacts from contaminated soil and groundwater at the potential new Campus are discussed and analyzed in Section 3.12, "Solid and Hazardous Materials and Hazards."

If portions of the site drain to a separate storm system, SFVAMC would apply for coverage under the Construction General Permit (SWRCB Order 2009-0009-DWQ, as amended by Orders 2010-0014-DWQ and 2012-0006-DWQ), and would implement a SWPPP to reduce pollution of surface water throughout the project's construction period. The SFVAMC would also be required to apply for a Construction Site Runoff Control Permit from the SFPUC and submit a copy of the SWPPP, if prepared. If a SWPPP is not required by the Regional Board, an ESCP would be prepared and submitted to the SFPUC that sets forth BMPs to reduce potential runoff and erosion impacts. A separate ESCP would not be required by the SFPUC if a copy of the SWPPP is submitted. SFVAMC would also minimize potential construction impacts by implementing the requirements for land resource protection outlined in VA Specification Section 015719, "Temporary Environmental Controls."

Should dewatering be required, SFVAMC would obtain the Batch Wastewater Discharge Permit from SFPUC no later than 45 days before discharge, and monitoring would be conducted to ensure compliance. Because groundwater from the specified reclaimed area may have been exposed to hazardous-waste contamination, any groundwater encountered during temporary dewatering for construction of the potential new SFVAMC Mission Bay Campus may require special analysis to comply with Article 4.1 of the San Francisco Public Works Code.

In addition, the stormwater runoff from the site of the potential new SFVAMC Mission Bay Campus would be collected and treated at the Southeast Water Pollution Control Plant before discharge to the San Francisco Bay. Treatment would be provided to the effluent discharge limitations set by the plant's NPDES permit. SFVAMC would also minimize potential construction impacts by implementing the requirements for land resource protection outlined in VA Specification Section 015719, "Temporary Environmental Controls." SFVAMC would comply with the aforementioned stormwater requirements to avoid or minimize water quality degradation to the maximum extent practicable. Therefore, impacts of constructing the potential new Campus under Alternative 3 long-term projects would be minor.

Depletion of Groundwater Resources

Any dewatering that would take place during construction of the potential new SFVAMC Mission Bay Campus under Alternative 3 long-term projects would be temporary and would not deplete groundwater resources. In addition, the increase in impervious surfaces resulting from construction of the potential new Campus would not cause a measurable change in infiltration characteristics at the site, because much of the Mission Bay area is already covered by impervious surfaces. Groundwater would not be used as a source of drinking water or consumptive water supply during construction. Therefore, impacts on groundwater resources from constructing the potential new Campus under Alternative 3 long-term projects would be minor.

Operation

Downstream Flooding or Increase in the Frequency or Severity of Combined Sewer Overflow Events as a Result of Altered Drainage Patterns or an Increase in Impervious Surfaces

Construction of Alternative 3 long-term projects would take place on approximately 0.98 acre. However, because the precise location of the potential new SFVAMC Mission Bay Campus is unknown at this time, the extent to which the existing surface drainage pattern of the project site would change is also unknown. It is therefore assumed that the total or peak runoff volume from the site and wastewater flows would increase as the locations and configurations of infrastructure and open space change, and these increases could contribute to the frequency

or severity of CSO events and/or downstream flooding. Without the necessary information to demonstrate that all stormwater criteria and standards are being met, it cannot be assumed that potentially adverse impacts would not occur. Therefore, implementing Alternative 3 long-term projects could result in an adverse impact related to downstream flooding or increase in the frequency or severity of CSO events.

To minimize potential downstream flooding or an increase in the frequency or severity of CSO events during project operation, LID or other techniques would be used to infiltrate, evaporate, and detain stormwater, thus maintaining predevelopment stormwater runoff conditions, and aiding SFVAMC in its compliance with Section 438 of the EISA and Article 4.2 of the San Francisco Public Works Code. In addition, Management Measure HYD-1 would be implemented at the potential new SFVAMC Mission Bay Campus so that infrastructure would be properly sized to handle stormwater and wastewater flows to protect against down-gradient flooding hazards. Furthermore, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). Thus, with implementation of Management Measure HYD-1, operation of the potential new Campus under Alternative 3 would not substantially contribute to the frequency or severity of CSO events and/or downstream flooding. Any resulting impact would be minor.

Water Quality Degradation Caused by Changes in the Intensity of Land Use and Increases in Impervious Surfaces

Because the precise location of the potential new SFVAMC Mission Bay Campus is unknown at this time, the extent to which the potential new Campus would intensify land use and cause increases in impervious surfaces is unknown. Given the unknown extent of additional impervious area, as well as a potential increase in the pollutant load in runoff resulting from the intensified use of the project site, Alternative 3 could have an adverse impact on water quality.

It can be assumed that all sanitary wastewater from the proposed buildings and stormwater runoff from the project site would flow into the City's combined sewer system and would be treated before discharge to San Francisco Bay, in accordance with the effluent discharge limitations set by the NPDES permit for the City's Southeast Water Pollution Control Plant. Incorporating LID or other techniques required for compliance with Section 438 of the EISA and Article 4.2 of the San Francisco Public Works Code would also serve to protect water quality during operation of Alternative 3 long-term projects. As described in Management Measure HYD-1, above, sustainable stormwater design (e.g., green roofs, vegetated swales, stormwater detention) would provide on-site stormwater treatment before off-site discharge.

If stormwater runoff from the potential new SFVAMC Mission Bay Campus would flow into a separate stormwater system, runoff must comply with SFPUC's Stormwater Design Guidelines, which would incorporate LID or other practices to protect water quality. In addition, VA would run any future stormwater and water storage plans that avoid contributing to geologic instability by CCC for review and concurrence (CCC, 2015). By complying with all local wastewater discharge requirements and with implementation of Management Measure HYD-1, impacts related to water quality degradation would be minor.

Alternative 4: No Action Alternative

Short-Term and Long-Term Projects

Construction

Under Alternative 4, there would be no new construction or retrofitting of existing buildings. Therefore, no construction-related water quality or groundwater impacts would occur.

Operation

Under Alternative 4, the LRDP would not be implemented. Therefore, no operational water quality or flooding impacts would occur.

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