3.2 WATER RESOURCES

This section describes the existing physical and regulatory setting and discusses the potential effects of the EA Alternatives related to hydrology, water quality, floodplains, and coastal management.

3.2.1 Regulatory Framework

Clean Water Act

The Clean Water Act (CWA) (33 U.S. Code [USC] 1251 et seq.) is the major Federal legislation governing the water quality aspects of implementing the Proposed Action. 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 CWA authorizes the USEPA 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 a National Pollutant Discharge Elimination System (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 USEPA. 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 State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs). The SWRCB establishes State-wide 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, which consider regional beneficial uses, water quality characteristics, and water quality problems.

Water Quality Control Plan for the San Francisco Bay Basin

The Basin Plan for the San Francisco Bay Hydrologic Region identifies the beneficial uses of water bodies and provides water quality objectives and standards. Federal and State laws mandate protection of designated "beneficial uses" of water bodies. The beneficial uses of any specifically identified water body generally apply to all tributary streams to that water body. 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." 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.

Clean Water Act Section 303

Section 303(c)(2)(b) of the CWA requires states to adopt water quality standards for each surface water body of the U.S. 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 applicable to the Proposed Action are listed in the Basin Plan.

Section 303(d) of the CWA requires each state and authorized Native American tribe 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. The 303(d) List for San Francisco Bay is developed through development of a draft list by the San Francisco Bay RWQCB, adoption by the SWRCB, and approval by EPA.

Listed water bodies are priority ranked for development of a total maximum daily load (TMDL). A TMDL is a calculation of the "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. 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 in accordance with a specified schedule for completion.

Clean Water Act 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 and establishes a framework for regulating nonpoint-source stormwater discharges (33 U.S. Code [U.S.C.] 1251). The objective of the NPDES program is to control and reduce discharges of pollutants to water bodies from surface water, which includes both municipal and industrial wastewater and stormwater runoff. Under the CWA, discharges of pollutants to receiving water are prohibited unless the discharge is in compliance 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 State-wide NPDES general permit for stormwater discharges associated with construction activities (Construction General Permit) (Order 2009-0009-DWQ), which became effective on July 1, 2010. Compliance with the Construction General Permit and preparation and implementation of a stormwater pollution prevention plan (SWPPP) that meets Construction General Permit conditions is required for sites that disturb 1 acre or more and drain to the separate sewer system. Construction activities subject to the Construction General Permit include clearing, grading, stockpiling, and excavating. Dischargers must eliminate or reduce non-stormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to consider the use of permanent post-construction management measures that would remain in service to protect water quality throughout the life of the project. All NPDES permits also have inspection, monitoring, and reporting requirements.

The requirements of the Municipal Regional Stormwater NPDES Permit (adopted October 14, 2009) are implemented by local agencies through the Alameda Countywide Clean Water Program. The Municipal Regional Stormwater NPDES Permit covers stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara Counties, and the cities of Fairfield, Suisun City, and Vallejo.

Executive Order 11988: Floodplain Management Act

EO 11988 was passed in 1977 in furtherance of the National Flood Insurance Act of 1968, and the Flood Disaster Protection Act of 1973. The aim of this executive order is to avoid, to the extent possible, the long- and short-term

adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

If no floodplain impact is identified, the action may proceed without further consideration. If the agency determines that a proposed action is located in or would affect a floodplain, a floodplain assessment must be undertaken and included in the NEPA documentation. If there is no practicable alternative to locating in or affecting the floodplain, the agency must act to minimize potential harm to the floodplain. The agency also must act to restore and preserve the natural and beneficial values of floodplains as part of the analysis of all alternatives under consideration.

Coastal Zone Management Act

The Coastal Zone Management Act (CZMA) (U.S.C. Sections 3501 et seq., as amended in 1990 under the Coastal Zone Act Reauthorization Amendments), administered by the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management, provides for management of the nation's coastal resources and balances economic development with environmental conservation. The overall program objectives of CZMA remain balanced to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone."

California has a Federally approved Coastal Management Program, which includes the California Coastal Act and the McAteer-Petris Act. The program established the San Francisco Bay Conservation and Development Commission (BCDC) as the coastal management and regulatory agency responsible for governing coastal resources within San Francisco Bay. In accordance with its role in implementing CZMA, the BCDC is responsible for conducting Federal consistency reviews for projects along the San Francisco Bay segment of the California coastal zone. The coastal management plan for the east side of San Francisco consists of the McAteer-Petris Act (California Public Resources Code Section 66600 *et seq.*), the *San Francisco Bay Plan* (Bay Plan) (BCDC, 2006), and local management programs. The coastal management plan, in conjunction with other BCDC laws and regulations, forms the BCDC's management program for complying with CZMA.

Federal lands, including the VA Transfer Parcel are outside the coastal zone, but Federal activities on land outside the coastal zone that affect resources of the coastal zone must be conducted consistent with the Bay Plan and related policies to the maximum extent practicable.

Section 438 of the Energy Independence and Security Act

In December 2007, Congress passed the Energy Independence and Security Act (EISA) of 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 projects that have a footprint greater than 5,000 gross square feet (gsf) or that would expand the footprint of existing facilities by more than 5,000 gsf must "maintain or restore, to the maximum extent technically feasible, the predevelopment[1] hydrology of the property with regard to the temperature, rate, volume, and duration of flow" (EPA, 2011).

[1] Before any "development" (i.e., greenfields site).

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., bio-retention areas, permeable pavements, cisterns/recycling), subject to site and applicable regulatory constraints (e.g., site size, soil types, vegetation, demand for recycled water, existing structural limitations, State or local prohibitions on water collection).

Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," was signed on October 5, 2009, and required EPA to issue guidance on implementing 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*. This guidance creates two options for compliance with the stormwater runoff requirements contained in the EISA.

3.2.2 Affected Environment

Climate

Alameda Island, including the VA Transfer Parcel is located in the City of Alameda, which is considered semiarid with a moderate, Mediterranean climate characterized by cool dry summers and mild wet winters. Annual rainfall for the project site between 1971 and 2010 averaged approximately 23 inches, 95% of which occurred during the winter rainy season (October–April). The wettest month of the year is January, with an average rainfall of 4.9 inches (IDcide, 2012).

Hydrologic Features

VA Transfer Parcel

The VA Transfer Parcel's topography is flat. Its San Francisco Bay shoreline (on western and southern boundary) breakwater is lined rock riprap. No creeks or other natural watercourses cross the parcel, which is covered in large part by runway surfaces of the former NAS Alameda. Therefore, no designated wild and scenic rivers flow through the VA Transfer Parcel (USFWS, 2009). Seasonal flooding occurs, and there are jurisdictional wetlands on the parcel, as described in Section 3.1 (Biological Resources). Surface water occurs as sheet flow and is collected in a stormwater drainage system that conveys the water from the VA Transfer Parcel directly to receiving waters.

The Navy installed the existing storm drainage system at the former NAS Alameda in the early 1940s. The system, which consists of drains, catch basins, and discharge outfalls, is a gravity system; a pump station was installed on Main Street to reduce nuisance flooding[2] in the area (APCP, 2003). See Section 3.11 (Utilities) for additional discussion of stormwater drainage and the condition and operation of existing stormwater drainage infrastructure. Since the closure of NAS Alameda, the City of Alameda has been responsible for maintaining the existing storm drain system.

[2] Nuisance flooding is flooding that causes public inconvenience, but little or no property damage.

Surrounding Area

The VA Transfer Parcel is located in the western half of the former NAS Alameda (now referred to as Alameda Point), within the northern portion of the South Bay Basin as designated by the San Francisco Bay RWQCB in its *Water Quality Control Plan for the San Francisco Bay Basin* (i.e., Basin Plan) (SFBRWQCB, 2011). The South Bay Basin extends from eastern Livermore west to central San Francisco and Skyline Boulevard, and from Interstate-80 south to the Santa Clara County/Stanislaus County line just north of Henry W. Coe State Park.

Alameda Point is bordered by water on two sides, with San Francisco Bay to the west and south and the Oakland Estuary to the north. Historical records indicate that Alameda Point was formerly a shallow mudflat consisting of young Bay Mud with depths generally ranging from 20 feet to more than 100 feet thick. Over an extended period of time, from 1906 to about 1956, the area was filled to create land. Fill material largely consisted of dredge spoils from the surrounding San Francisco Bay and Oakland Inner Harbor (VA, 2009). The 7-mile-long Oakland Estuary separates the cities of Alameda and Oakland. North of Alameda Point, the Oakland Estuary has a north-south width of approximately 1,000 feet.

The Oakland Estuary has been heavily modified by dredging and bank stabilization projects that began in the mid 1800s, and it is heavily used by commercial ships to access Port of Oakland berths and by recreational boaters for boating and to access marinas located along the estuary. The Oakland Estuary is maintained by the USACE (ARRA, 2005). The Port of Oakland completed a 10-year dredging operation in late 2009 that deepened the estuary from 42 feet to a depth of 50 feet below mean lower low water[3] to accommodate the newest generation of deep-draft container ships. The Port of Oakland conducts annual maintenance dredging to maintain project depths (DredgingToday.com, 2011).

The existing uses of lower San Francisco Bay within the South Bay Basin, as established in the San Francisco Bay RWQCB's Basin Plan, are industrial service supply, commercial and sport fishing, shellfish harvesting, estuarine habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation. Lower San Francisco Bay generally extends from the Bay Bridge south to the Dumbarton Bridge (State Route 84).

The existing uses of the Oakland Inner Harbor within the South Bay Basin are estuarine habitat, wildlife habitat, water contact recreation, noncontact water recreation, and navigation (SFBRWQCB, 2011). Beneficial uses are explained in "Water Quality Control Plan for the San Francisco Bay Basin," below.

Water Quality

VA Transfer Parcel

The Oakland Estuary and San Francisco Bay are the receiving water bodies for runoff from the VA Transfer Parcel. Rainwater is the only runoff source on the VA Transfer Parcel.

[3] Mean lower low water is a tidal datum. It is the average of the lower low water height of each tidal day observed over the National Tidal Datum Epoch. The lower low water is the lower of the two low waters of any tidal day.

Surrounding Area

The Oakland Estuary and San Francisco Bay are the receiving water bodies for runoff for the area south of the VA Transfer Parcel. Within the former NAS Alameda property, the existing storm drainage system has historically been determined to be a reservoir and conveyance for contaminants, including petroleum hydrocarbons, metals, radiologic materials, and polycyclic aromatic hydrocarbons. The sources of these contaminants have included untreated industrial wastewater (before an industrial wastewater treatment system was implemented at Alameda Point in 1975) and contaminated surface soils entrained in stormwater (ARRA, 2005). Currently no industrial runoff occurs as these Navy operations have ceased.

Groundwater

VA Transfer Parcel

The VA Transfer Parcel is located in the East Bay Plain Subbasin within the Santa Clara Valley Groundwater Basin (DWR, 2004). Geotechnical studies specific to the VA Transfer Parcel have shown a groundwater depth of between 1 foot and 4.5 feet below the ground surface (AG, 2012). No aquifers are located underneath the VA Transfer Parcel (EPA, 2012).

Surrounding Area

The Alameda Point area is located in the East Bay Plain Subbasin within the Santa Clara Valley Groundwater Basin (DWR, 2004). Groundwater has been encountered quite close to the present ground surface. This shallow water-bearing zone is not considered part of a regionally extensive aquifer (ARRA, 2005). The shallow groundwater at Alameda Island was historically of excellent quality and was recharged by rainfall. However, over pumping of shallow groundwater wells resulted in saltwater intrusion and closure of most of the wells by 1900. Only minor pumping of groundwater from the aquifer underlying Alameda Island has occurred since then (ARRA, 2005).

Based on the vulnerability of the shallow groundwater at Alameda Point to contaminants, low yield to wells, high levels of total dissolved solids, and likely land subsidence that may occur with extraction, the San Francisco Bay RWQCB’s Basin Plan does not list any designated beneficial uses for this groundwater. Groundwater is not presently used for drinking water and is not considered a potential drinking water source because of its poor quality (Battelle, 2010).

The EPA defines a sole-source aquifer as an underground water source that supplies at least 50% of the drinking water consumed in the area overlying the aquifer. Areas that depend on sole-source aquifers have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water. No sole-source aquifers are located underneath the Alameda Point area (EPA, 2012).

Floodplains

A VA Transfer Parcel

Elevations within the VA Transfer Parcel vary from 0 msl to approximately 10 feet above msl (CH2M Hill, 2011). Some locations within the VA Transfer Parcel may be subject to flooding during heavy rainstorms. In addition, the parcel is located within the tsunami inundation area (CDC, 2009). The VA Transfer Parcel may be subject to heavy stormwater runoff and from tsunamis. Although USACE indicates that it is not subject to significant tidal flooding hazards (ARRA, 2005), the low-lying portions of the VA Transfer Parcel are subject to inundation from the 100-year tidal event. Further, the San Francisco Bay and its tidally influenced tributaries are partially protected from inundation and damage associated with tsunamis because of restricted sea wave access at the Golden Gate (ARRA, 2005). In addition, the former NAS Alameda property, on which the proposed VA Transfer Parcel would be located, includes riprap constructed up to heights of approximately 15 feet in some areas; however, parts of the site are below the stillwater elevation and could be subject to inundation by water seepage through the riprap or overtopping of low areas (Navy, 1999).

Surrounding Area

The former NAS Alameda, including the VA Transfer Parcel, has not been included in FEMA's regional flood hazards mapping program; therefore, Flood Insurance Rate Maps (FIRMs), which typically delineate 100-year flood hazard zones, have not been prepared for the site. FEMA currently categorizes the former NAS Alameda property (FEMA Map #060001C0062G) as Zone D, "possible but undetermined flood hazards." The FEMA base 100-year flood elevation at the former NAS Alameda has been identified to be 7 feet above msl (Navy, 1999). The former NAS Alameda is not located within an identified area of dam-failure inundation hazards (CalEMA, 2009). Seasonal flooding may occur because of flat topography and the sheet flow nature of runoff.

A tsunami is a sea wave produced by an offshore earthquake, a volcanic eruption, or a landslide. Tsunamis can be exceedingly destructive upon reaching exposed coastlines, where they are capable of rising to 100 feet in height and moving at 30 miles per hour. Tsunami modeling for the San Francisco Bay and estuary has been performed by the University of Southern California's Tsunami Research Center. A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near shore landslides. Based on this modeling, the former NAS Alameda is located within the tsunami inundation area (CDC, 2009). According to Garcia and Houston's *Type 16 Flood Insurance Study: Tsunami Predictions for Monterey and San Francisco Bays and Puget Sound* technical report (1975), simulated tsunami run-up heights for the probable 100-year tsunami ranges from elevation 4.7 to 5.5 feet above msl around the perimeter of NAS Alameda; the 500-year tsunami run-up ranges from 7.5 to 9.5 feet above msl (Navy, 1999). Another analysis of the 100-year tsunami run-up indicates that the northern, western, and southern margins of the NAS Alameda site may be inundated by such an event as a result of water seepage through the riprap or overtopping of low areas (Navy, 1999).

Extreme high tides in San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors including winds, barometric pressure, ocean temperatures, and freshwater runoff. The USACE indicates that northern Alameda County lacks tidal flooding problems substantial enough to

warrant further evaluation of tidal flood control projects (ARRA, 2005). Maximum wave heights in major storm with winds of 60 knots have been calculated at 4 to 6 feet (Navy, 1999).

In addition, based on sea level rise predictions of 16 inches by 2050 and 55 inches by 2099 (BCDC, 2009), sea level rise could cause flooding in some of the coastal areas of Alameda Island, including the VA Transfer Parcel and the VA Development Area. See Section 3.8 (Greenhouse Gases and Climate Change) for more information on projected sea level rise associated with climate change.

3.2.3 Environmental Consequences

Assessment Methods

Implementing the Proposed Action would change existing drainage patterns, introduce landscaping, and develop new structures on the site. The Proposed Action also would involve constructing a new drainage system to collect, drain, and discharge runoff from the VA Development Area to the Oakland Estuary and San Francisco Bay. The Proposed Action would include a new irrigation system for the proposed NCA Cemetery and other vegetation in the VA Development Area. Site preparation, construction, and operation activities would affect water resources.

The site of the Proposed Action is not located in an area containing a sole-source aquifer or a river designated as Wild and Scenic. Therefore, no impact would occur related to sole-source aquifers or Wild and Scenic Rivers, and these issues are not discussed further in this EA.

Alternative 1

Construction

Water Quality

Excavation, grading, and construction within the VA Development Area would require temporary disturbance of surface soils and removal of existing on-site pavement. Grading would employ the use of scrapers, dump trucks, and bulldozers. All construction staging would be located within the VA Development Area. All installation of off-site utilities would occur in previously disturbed areas within existing roadways. During the construction period, excavation and grading activities would expose soil to water runoff and entrain sediment in the runoff.

Dewatering and use of a geotextile layer[4] may be required for base stability where excavations extend to near the shallow water table. Should dewatering be necessary during construction, the water could contain sediments and may require settling before discharge to San Francisco Bay receiving water. Sediment in discharge water as well as soil and debris on the haul truck tires, which in turn can be deposited on local streets, could cause increased sediment to be carried off site into the storm drain/sewer, potentially clogging inlets and reducing the functional capacity of the pipes to convey flows. In addition, such mobilized sediment could accumulate in new locations as runoff occurs and result in blockage of stormwater flows, potentially resulting in increased localized ponding or flooding.

[4] Geotextile layers are made of synthetic fibers manufactured in a woven or loose nonwoven blanket-like manner and are used for erosion control.

The delivery, handling, and storage of construction materials and waste, as well as the use of construction equipment, might introduce stormwater contamination. Spills or leaks from heavy equipment and machinery could also affect water quality through oil, grease, and hydrocarbon contamination. The on-site construction staging area could also be a source of pollution because paints, solvents, concrete, cleaning agents, and metals would be used during construction. If improperly handled, these pollutants could be transported in stormwater runoff that ultimately leads to San Francisco Bay and/or groundwater.

In order to avoid any potential stormwater adverse impacts, construction stormwater runoff will be managed in accordance with the requirements set forth in the State-wide NPDES Construction General Permit (Order 2009-0009-DWQ).Order 2009-0009-DWQ) requires that project applicants (or its contractor, on the applicant's behalf) develop and implement a SWPPP to reduce/eliminate surface water pollution throughout the project's construction period. The SWPPP would include, at a minimum, specific and detailed management measures designed to mitigate construction-related pollutants. The SWPPP typically includes the following specific information:

- The pollutants that are likely to be used during construction that could be present in stormwater drainage and non-stormwater 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 management measures specified in the SWPPP;
- The appropriate personnel responsible for supervisory duties related to implementation, inspection, and maintenance of management measures; and
- The effective combination of erosion- and sediment-control management measures and construction techniques accepted by the Alameda County Clean Water Program, Alameda County Public Works Agency's Clean Water Division, or other applicable local jurisdictions for use in the VA Development Area during construction that would reduce the potential for runoff and the release, mobilization, and exposure of pollutants from Proposed Action–related 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 runoff accumulation at the base of a grade, and avoiding flood damage along roadways and facility infrastructure.

Should dewatering be necessary during construction, the effluent may require on-site treatment before being discharged to San Francisco Bay. The Construction General Permit requires that any discharge resulting from dewatering activities be impounded in a sediment retention basin or other holding facility to settle the solids and provide treatment before discharge to receiving water to meet effluent limits for priority pollutants. Dewatering holding and/or treatment facilities will be located within the VA Development Area and will be operated throughout construction, as required and in compliance with applicable regulations. As stated in the Construction General Permit, all dewatering effluent must:

- Be filtered or treated, using appropriate technology;
- Meet the numeric effluent limitations and numeric action levels for pH and turbidity; and
- Not cause or contribute to a violation of water quality standards.

Although authorized non-stormwater discharges are allowed under the NPDES Construction General Permit from uncontaminated groundwater dewatering (SWRCB, 2010), it is unknown at this time whether dewatering effluent would be uncontaminated. If dewatering effluent is contaminated, the San Francisco Bay RWQCB may require an individual NPDES permit for dewatering effluent discharges.

Potential construction impacts also would be minimized by implementing the requirements for protection of land resources 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.

Therefore, through compliance with these requirements and regulations, construction-related impacts of Alternative 1 on water quality would not be significant.

Groundwater

Groundwater at the VA Development Area has been encountered at a depth of between 1 foot and 4.5 feet below the ground surface. Subsurface exploration was conducted using 25 borings over approximately 80 acres within the VA Development Area (AG, 2012:Figure 1). The installation of approximately 800 stone columns along the main access road located along the northern portion of the VA Development Area would be porous in nature and would allow the free movement of groundwater. Although there could be some mounding of groundwater in the vicinity of the columns during high rain events, the impacts to groundwater would be minimal. Should groundwater be encountered during construction, temporary dewatering would be necessary to keep the work area dry. Dewatering could lower local groundwater levels, but any changes in groundwater levels would be temporary and minimal. In addition, groundwater would not be used as a water supply during construction activities (e.g., for potable uses, or for dust suppression or other non-potable uses). Construction activities would not result in groundwater extraction for consumptive uses. Therefore, Alternative 1 construction-related impacts on groundwater would not be significant.

Floodplains

Parts of the former NAS Alameda are located below the FEMA base 100-year flood elevation of 7 feet above msl (Navy, 1999). FEMA has not included areas of the former NAS Alameda within a FIRM. FEMA mapping completed for areas adjacent to the site indicates that portions of Alameda Point may be susceptible to inundation during the 100-year flood. In addition, if sea level rises as predicted (see Section 3.8 [Greenhouse Gas Emissions and Climate Change]), flood magnitude and frequency at the site could increase with time, exposing people and property to unacceptable flood-related hazards in the future. Although unlikely, a tsunami run-up of more than 2 feet coincident with high tides could inundate the western portion of the VA Transfer Parcel (ARRA, 2005).

Approximately 440,000 cubic yards of fill material would be used to prepare for Alternative 1 construction, which would include the VHA OPC, VBA Outreach Office, Conservation Management Office, approximately 20 acres of cemetery area, and associated infrastructure. Additional fill would be imported for the remaining cemetery area during later phases of development. The proposed final elevation for the VHA OPC and NCA Cemetery would be 13.5 feet above msl. Roadways, parking areas, and the Conservation Management Office would be constructed at 12.5 feet above msl. Thus, the finished elevation of the project facilities would be located above the FEMA base 100-year flood elevation of 7 feet above msl. Therefore, the operational impact of Alternative 1 associated with flooding would not be significant.

Coastal Resources

No significant adverse impact would be expected. The VA Transfer Parcel (i.e., Federally owned lands) is located outside the coastal zone, but Federal activities on land outside the coastal zone that potentially affect resources of the coastal zone must be consistent to the maximum extent practicable with the provisions of the Federally approved state coastal management program, which includes the Bay Plan. The Proposed Action is consistent with the CZMA and the provisions of the Bay Plan.

Operation

Downstream Flooding Resulting from Alteration of Drainage Patterns or Increase in Impervious Surfaces

Implementing Alternative 1 would not alter the course of a stream or river, because none are present at or near the VA Transfer Parcel. As a result, potential flooding hazards caused by alteration of a watercourse would not be an issue under Alternative 1.

Implementing this alternative would reduce the amount of paved (i.e., impervious) surface within the VA Development Area from approximately 70 acres to 60.5 acres, a difference of approximately 9.5 acres. Because the overall impervious surface would be reduced, no increase in stormwater runoff and possible resultant flooding would be expected.

Under Alternative 1, VA would be required to comply with Section 438 of the EISA because construction at these Federal facilities would have a footprint greater than 5,000 gsf. It is anticipated that 9 months of mass grading and soil import would be necessary for initial project construction, and final drainage patterns could result in flooding. Grading and alteration of drainage patterns might result from implementing Alternative 1.

Therefore, VA would implement LID techniques (e.g., bioretention, permeable pavements, green roofs, cisterns) to mimic the site's predevelopment stormwater runoff conditions, along with measures to store, infiltrate, evaporate, and detain runoff to reduce the impacts of stormwater runoff associated with new construction. To comply with Section 438 of the EISA, VA would also conduct hydrologic and hydraulic analyses following one of the two options:

- *Option 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."

- *Option 2*—Use site-specific hydrologic conditions and investigations to design, construct, and maintain stormwater management practices that preserve predevelopment runoff conditions after construction.

Under Alternative 1, VA also would be required to conduct a hydrologic assessment for the 2-, 5-, 10-, 50-, and 100-year storm events in accordance with VA's *Site Utility Design Manual* (VA, 2010) and size the proposed drainage system for a minimum 10-year, 1-hour storm event.

Water use and efficiency management outlined in the *Department of Veterans Affairs Strategic Sustainability Performance Plan* would also require efficient use of outdoor irrigation water, requiring a 20 % reduction in water use by 2020 compared to the 2010 base year. This performance standard would reduce nuisance runoff associated with irrigation.

Although approval of drainage plans by Alameda County would not be required for this Federal project located in the county's unincorporated area, the City of Alameda would likely review and comment on the drainage plans. It is assumed that final drainage plans would comply with VA's *Site Utility Design Manual* (VA, 2010) and Section 438 of the EISA. Therefore, operational impacts of Alternative 1 related to downstream flooding resulting from alteration of drainage patterns or increases in impervious surfaces would not be significant.

Water Quality

Implementing Alternative 1 would not substantially degrade water quality or contaminate the public water supply. All sanitary wastewater from the proposed buildings would flow into the sewer system, to be treated at EBMUDs main wastewater treatment plant before discharge into San Francisco Bay. Treatment would be provided pursuant to the effluent-discharge limitations set by the plant's NPDES permit, and thus, VA would comply with all local wastewater-discharge requirements.

Vehicle traffic and parking could increase in the VA Development Area with project operation under Alternative 1, which could, indirectly, result in increased pollutant concentrations in stormwater in the long term. Leaks of fuel or lubricants, tire wear, and fallout from exhaust contribute petroleum hydrocarbons, heavy metals, and sediment to the pollutant load in runoff. Runoff from common landscaped areas and turf grass areas of the proposed NCA Cemetery may contain residual pesticides and nutrients used during regular maintenance operations, which could introduce contaminants into the Oakland Estuary and San Francisco Bay. Surface water and runoff that infiltrates at the project site could contaminate groundwater if it were to contain any hazardous materials or high concentrations of constituents such as fertilizers or pesticides.

Implementing Alternative 1 would reduce the amount of impervious surface on the site by approximately 9.5 acres, creating additional opportunities for infiltration of stormwater runoff on site. Stormwater runoff from the VA Development Area that does not infiltrate into the ground would flow into a new storm drain network, which is included as part of Alternative 1. This network is not yet fully designed; the intent, however, is for the storm drain network to have three new outfalls upon final project buildout—two to the north into the Oakland Estuary and a third to the west into San Francisco Bay. Runoff would be treated through bioswales or other stormwater quality measures before entering the new storm drain network.

The project would be designed to meet the requirements of Executive Order 13514, "Federal Leadership in Environmental, Energy, and Economic Performance," and Section 438 of the EISA. These requirements include

the implementation of sustainable stormwater design management measures (e.g., green roofs, vegetated swales, stormwater detention) that would provide on-site stormwater treatment prior to off-site discharge. In addition, the project would be required to use the *Department of Veterans Affairs Sustainable Design and Energy Reduction Manual* (VA, 2010b) to comply with VA Directive 0055. VA Directive 0055, "VA Energy and Water Management Program" (January 15, 2010), establishes comprehensive water management policies to comply with Federal mandates and achieve internal goals at all VA facilities. The *Sustainable Design and Energy Reduction Manual* describes techniques that can be used to treat stormwater on site, such as reducing source contaminants; using bioswales, vegetated filter strips, and green roofs; and using stormwater retention tanks that could also be used for rainwater harvesting and water reuse. None of these specific management measures have been committed to at this time, but the Proposed Action ultimately would be designed to meet the requirements of the Alameda Countywide Clean Water Program.

The project would be required to pursue the commitment to pollution prevention and water use efficiency described in the *Department of Veterans Affairs Strategic Sustainability Performance Plan* (VA, 2011). VA Directive 0057 includes a policy to reduce or eliminate the quantity of toxic and hazardous chemicals and materials acquired, generated, used, and/or disposed, to the extent possible (VA, 2010a). VA Handbook 0057.2, *Chemicals Management and Pollution Prevention*, would be used to ensure compliance with VA Directive 0057, thereby reducing the potential for water quality impacts associated with operating the proposed VA facilities.

Overall, operation of the facilities proposed under Alternative 1 would not provide substantial additional sources of polluted runoff or otherwise degrade water quality. It is assumed that facility operation would comply with Section 438 of the EISA and VA Directives 0055 and 0057. Therefore, the operational impact of Alternative 1 related to water quality degradation would not be significant.

Depletion of Groundwater Resources

The former NAS Alameda contains impervious paved runway surfaces, which effectively prevent surface water from infiltrating into the soil. Approximately 70 acres (63 %) of the VA Development Area for Alternative 1 is currently paved. With implementation of Alternative 1, the amount of impervious surfaces would decrease from 70 acres to 60.5 acres; approximately 54.5 % of the total VA Development Area for Alternative 1. The remaining 50.5 acres would be planted as either shrubs/ground cover or maintained lawn areas.

The decrease in impervious surface on the site either would have a neutral effect or would serve to increase overall infiltration and groundwater recharge quantities at Alameda Point, because areas of infiltration would increase over current levels. In addition to the decrease in impervious surface, permanent management measures would be implemented to infiltrate, evaporate, and detain stormwater before it enters the new storm drain network. Implementing these management measures to achieve compliance with Section 438 of the EISA may also serve to increase groundwater recharge quantities. Thus, no measurable change in infiltration characteristics would result from implementation of Alternative 1.

In addition, groundwater would not be used as a water supply during operation of the Proposed Action (e.g., for potable uses or other nonpotable uses), so Alternative 1 would not result in groundwater extraction for consumptive uses. Therefore, operational impacts on groundwater would not be significant under Alternative 1.

Flooding as a Result of Location within a Floodplain

Parts of the former NAS Alameda are located below the FEMA base 100-year flood elevation of 7 feet above msl (Navy, 1999). FEMA has not included areas of the former NAS Alameda within a FIRM. FEMA mapping completed for areas adjacent to the site indicates that portions of Alameda Point may be susceptible to inundation during the 100-year flood. In addition, if sea level rises as predicted by EPA, flood magnitude and frequency at the site could increase with time, exposing people and property to unacceptable flood-related hazards in the future. Although unlikely, a tsunami runup of more than 2 feet coincident with high tides could inundate the western portion of the VA Transfer Parcel (ARRA, 2005).

Approximately 440,000 cubic yards of fill material would be used to prepare for Alternative 1 construction, which would include the OPC area, Conservation Management Office, access road, and approximately 20 acres of cemetery area. Additional fill would be imported for the remaining cemetery area. The proposed final elevation for the OPC would be 13.5 feet above msl. Roadways, parking areas, and the Conservation Management Office would be constructed at 12.5 feet above msl. Thus, the finished elevation of the project facilities would be located above the FEMA base 100-year flood elevation of 7 feet above msl. Therefore, the operational impact of Alternative 1 associated with flooding risk would not be significant.

Refer to Section 3.8 (Greenhouse Gas Emissions and Climate Change) for discussion regarding flooding associated with climate change and sea level rise.

Coastal Resources

The VA Transfer Parcel (i.e., Federally owned lands) are outside the coastal zone, but Federal activities on land outside the coastal zone that potentially affect resources of the coastal zone must be consistent to the maximum extent practicable with the provisions of the Federally approved state coastal management program, which includes the Bay Plan. The Proposed Action is consistent with the provisions of the Bay Plan.

Alternative 2 (Preferred Alternative)

Construction

Water Quality

Alternative 2 would involve the same project components as Alternative 1; however, under Alternative 2, the VA Development Area would be located farther north. Therefore, the construction-related impacts of Alternative 2 would be the same as those described for Alternative 1. Compliance with regulatory/administratively required stormwater requirements throughout construction, construction-related impacts of Alternative 2 on water quality would not be significant.

Groundwater

Like Alternative 1, any dewatering that would take place during construction of Alternative 2 would be temporary and would not deplete groundwater resources. Groundwater also would not be used as a source of drinking water

or consumptive water supply during construction. Therefore, construction-related impacts of Alternative 2 on groundwater resources not be significant.

Coastal Resources

No significant adverse impact would be expected. In accordance with the Federal Coastal Zone Management Act (CZMA) of 1972, as amended, and the National Oceanic and Atmospheric Administration Federal Consistency Regulations (Title 15 Code of Federal Regulations Part 930), VA has determined that the Proposed Action is consistent to the maximum extent practicable with the Coastal Management Program for the San Francisco Bay segment of the California Coastal Zone (i.e., Bay Plan). As defined in Section 304 of the CZMA, the term "coastal zone" does not include "lands the use of which is by law subject solely to the discretion of or which is held in Trust by the Federal government." The Proposed Action is located on land wholly owned by the federal government and is excluded from the coastal zone; however, VA recognizes that actions outside the coastal zone may affect land or water uses or natural resources located within the coastal zone. Consequently, an analysis of the potential effects of the Proposed Action on the coastal zone was conducted to determine consistency with the CMP. VA submitted a consistency determination to BCDC identifying that the Proposed Action is consistent to the maximum extent practicable with the Bay Plan on July 1, 2013 (see Appendix I). VA will continue to coordinate with BCDC through the conclusion of the consistency determination process.

Operation

Downstream Flooding Resulting from Alteration of Drainage Patterns or Increase in Impervious Surfaces

Like Alternative 1, Alternative 2 would not alter the course of a stream or river, because none are present at or near the VA Transfer Parcel. Implementing this alternative would reduce the amount of paved (i.e., impervious) surface within the VA Development Area from approximately 68.5 acres to 47.7 acres, a difference of approximately 20.8 acres (Pahed, pers. comm., 2012). Because the overall impervious surface would be reduced, no increase in stormwater and possible resultant flooding would be expected.

Grading and alternation of drainage patterns, however, might result from implementing Alternative 2. Under Alternative 2, VA would be required to comply with Section 438 of the EISA because construction at this Federal facility would have a footprint greater than 5,000 gsf. VA also would be required to conduct a hydrologic assessment for the 2-, 5-, 10-, 50-, and 100-year storm events in accordance with VA's *Site Utility Design Manual* (VA, 2010c) and size the proposed drainage system for a minimum 10-year, 1-hour storm event. Existing seasonal flooding problems caused by deteriorating storm drains would be reduced by installing new storm drainage infrastructure, which would be sized to the specifications set out by VA in its *Site Utility Design Manual*.

Implementing the requirements of the Section 438 of the EISA in the VA Development Area would ensure that infrastructure would be properly sized to handle stormwater and wastewater flows to protect from down-gradient flooding hazards. VA would also be required to use LID techniques for infiltration, evaporation, and detention of stormwater to comply with Section 438 of the EISA; using such techniques would preserve pre-development stormwater runoff conditions. Thus, with implementation of the requirements of Section 438 of the EISA, Alternative 2 would not substantially contribute to downstream flooding. Therefore, operational impacts related to downstream flooding resulting from alteration of drainage patterns or increases in impervious surfaces would not be significant.

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

As under Alternative 1, wastewater from the buildings proposed as part of Alternative 2 would flow into the sewer system and would be treated at East Bay Municipal Utility District's main wastewater treatment plant before discharge into San Francisco Bay, pursuant to the effluent discharge limitations set by the plant's NPDES permit. Thus, VA would comply with all local wastewater-discharge requirements.

Implementing Alternative 2 would reduce the amount of impervious surface on the site by approximately 20.8 acres, creating additional opportunities for infiltration of stormwater runoff on site. Stormwater runoff from the VA Development Area that does not infiltrate into the ground would flow into a new storm drain network, which is included as part of Alternative 2 and would be designed according to the VA's *Site Utility Design Manual*, as well as to meet the requirements of the Alameda Countywide Clean Water Program. Runoff would be treated through bioswales or other stormwater quality measures, as applicable. Incorporating LID or other techniques required by Section 438 of the EISA would also serve to protect water quality during project operation. As a result, operation of the facilities proposed under Alternative 2 would not provide substantial additional sources of polluted runoff or otherwise degrade water quality. Therefore, the operational impact of Alternative 2 related to water quality degradation would not be significant.

Depletion of Groundwater Resources

Similar to Alternative 1, the VA Development Area under Alternative 2 contains impervious paved runway surfaces, which effectively prevent surface water from infiltrating into the soil. Approximately 68.5 acres (61 %) of the VA Development Area for Alternative 2 is currently paved. With implementation of Alternative 2, the amount of impervious surface would decrease from 68.5 acres to 47.7 acres (approximately 42 % of the total VA Development Area for Alternative 2). The remaining 64.7 acres would be planted as either shrubs/ground cover or maintained lawn areas. Landscape planting within the VA Development Area would prioritize native shrub and herbaceous species over nonnative species, and none of the species would be invasive.

As described for Alternative 1, the decrease in impervious surface on the site should serve to increase overall infiltration and groundwater recharge quantities at Alameda Point. In addition to the decrease in impervious surface, permanent management measures would be implemented to infiltrate, evaporate, and detain stormwater before it enters the new storm drain network. Implementing these management measures to achieve compliance with Section 438 of the EISA may also serve to increase groundwater recharge quantities. Groundwater would not be used as a water supply during operation of Alternative 2. The operational impact of Alternative 2 on groundwater resources would not be significant.

Flooding as a Result of Location within a Floodplain

As under Alternative 1, it is anticipated that approximately 440,000 cubic yards of fill material would be needed to prepare for construction under Alternative 2, which would include the OPC area, the Conservation Management Office, approximately 20 acres of cemetery development, and on-site access roads. Additional fill would be imported for the remaining cemetery area. As described for Alternative 1, the proposed final elevation for the OPC would be 13.5 feet above msl. Roadways, parking areas, and Conservation Management Office would be constructed at 12.5 feet above msl. Thus, the finished elevation of the project facilities would be located

above the FEMA base 100-year flood elevation of 7 feet above msl (Navy, 1999). The operational impact of Alternative 2 associated with flooding risk would not be significant.

Refer to Section 3.8 (Greenhouse Gas Emissions and Climate Change) for additional discussion regarding flooding associated with sea level rise.

Coastal Resources

No significant adverse impact would be expected. The VA Transfer Parcel (i.e., Federally owned lands) is located outside the coastal zone, but Federal activities on land outside the coastal zone that potentially affect resources of the coastal zone must be consistent to the maximum extent practicable with the provisions of the Federally approved state coastal management program, which includes the Bay Plan. The Proposed Action is consistent with the CZMA and the provisions of the Bay Plan. The VA submitted a consistency determination to BCDC identifying that the Proposed Action is consistent to the maximum extent practicable with the Bay Plan on July 1, 2013 (see Appendix I). VA will continue to coordinate with BCDC through the conclusion of the consistency determination process.

No Action Alternative

Construction

Under the No Action Alternative, the Fed-to-Fed transfer would not take place and the proposed development (e.g., VHA OPC, VBA Outreach Office, NCA Cemetery, etc.) would not be built. Therefore, no significant construction impacts on water resources would occur.

Operation

Under the No Action Alternative, the Fed-to-Fed transfer would not take place and the proposed development would not be built. Therefore, no significant operational impacts on water resources would occur.

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