4.H Surface Water Hydrology and Water Quality

4.H.1 Introduction

This section describes existing surface water resources in the Project Site vicinity. It also evaluates the impacts of proposed development of the Project Site on surface water runoff rates, water quality, and, flooding. The historic industrial uses at the Project Site – the former railyard and the Brisbane landfill – left contaminants classified as hazardous waste in the soil and groundwater in the area. Groundwater is not currently used at the Project Site and no groundwater use is proposed under Project Site development. For this reason discussion of existing groundwater conditions is limited to the impacts to water quality due to the former industrial activities at the Project Site and can be found in Section 4.G, *Hazards and Hazardous Materials*, of this EIR. Feasible mitigation measures are identified to reduce significant impacts.

4.H.2 Environmental Setting

Climate

The Project Site is located on the western margin of San Francisco Bay in northern San Mateo County. The San Francisco Bay Area has a Mediterranean climate with cool, wet winters (October through April) and relatively warm, dry summers (April through October). Sustained rainy periods can occur during the winter and coastal fog is common in summer. The temperature is moderated by proximity to San Francisco Bay and the Pacific Ocean.

The mean annual rainfall in the vicinity of the Project Site is approximately 20 inches, with January being the wettest month and the vast majority of rainfall between October and May. This mean, however, is not necessarily representative of a typical year. The San Francisco Airport station has recorded only 24 of 67 water years with total precipitation between 16 and 24 inches. This period included eight water years with over 30 inches of precipitation and two years with less than 10 inches.

Relatively short duration precipitation depths are significant to site drainage design and flood control considerations. The largest storm of record occurred January 4-5, 1982, with a measured 24-hour precipitation depth of 5.7 inches. This is estimated to be an event that would, on average, be equaled or exceeded once every 100 years. Other recent severe storms occurred December 11-12, 1995 and February 2-3, 1998. Both of these storm events had 24-hour precipitation depths of approximately 3.2 inches and would be expected to be equaled or exceeded once every five years.

Visitacion-Guadalupe Valley Watersheds

Historically, the Project Site, commonly known as the Brisbane Baylands, was part of an estuarine ecosystem through which upland drainage flowed into tidal marshes and mudflats before reaching deeper waters of San Francisco Bay. The Project Site is located within the Visitacion-Guadalupe Valley Watershed, which generally consists of a large bowl straddling San Francisco and San Mateo Counties. The watershed drains the area bounded by Bayview Hill, McLaren Ridge, and San Bruno

Mountain. The two main drainages of the watershed are Visitacion Creek and Guadalupe Creek, which originate in the upland areas to the west and drain toward San Francisco Bay. Visitacion Valley has been divided into two unnamed subwatersheds due to the fact that the northern portion is pumped northward into the San Francisco combined sanitary/stormwater sewer system. The southern portion, which includes Visitacion Creek, drains by gravity to San Francisco Bay, but much of it is channelized. Guadalupe Creek also drains by gravity to the Bay via Brisbane Lagoon.

Topography

The Project Site is located on the eastern flanks of the San Francisco Peninsula, which is characterized by a northwest-trending coastal mountain range with drainages that flow either to the Pacific Ocean or toward San Francisco Bay. Topographic elevations at the Project Site generally range from approximately 0 to 60 feet above mean sea level, except at Icehouse Hill, which reaches to approximately 200 feet above mean sea level. Slopes vary from flat, in much of the area between Bayshore Boulevard and the Caltrain tracks, to steep at Icehouse Hill, with varying slope elevations in areas of fill. Elevations east of the railroad tracks are undulating and vary due to the stockpiling of materials.

Local Surface Water Features

Figure 4.H-1 shows key existing drainage facilities in the vicinity of the Project Site. The primary surface water features on the Project Site are the open channel portion of Visitacion Creek that receives flows from Visitacion Valley via a brick arch and timber box system, and Brisbane Lagoon, which receives flows from Guadalupe Creek. Visitacion Creek receives runoff from over 1,000 acres with an outfall just north of the lagoon. Brisbane Lagoon receives runoff from approximately 2,150 acres. Both of these systems drain under US Highway 101 through box culverts into San Francisco Bay. The majority of the Project Site drains into Visitacion Creek, while a portion south of Visitacion Creek drains into Brisbane Lagoon.

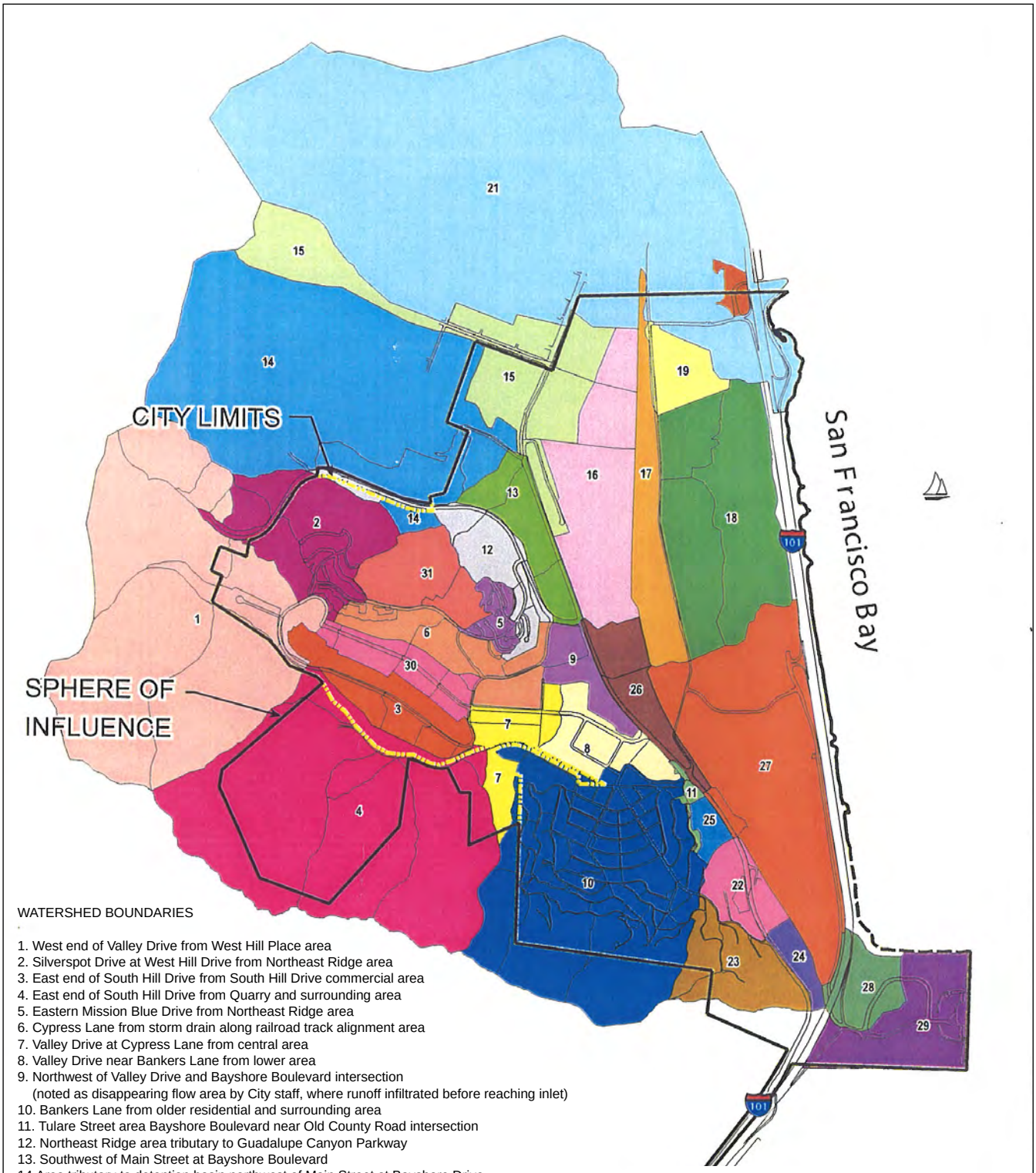
Surface flows along the northern end of Tunnel Avenue and Beatty Avenue are collected in the Beatty Avenue storm drain. The Beatty Avenue storm drain serves a small portion of the northern end of the Project Site and drains into San Francisco's Sunnydale storm drain facility that detains and pumps flows for treatment.

The City of Brisbane Storm Drainage Master Plan divides the drainage area tributary to the 12-foot-by-12-foot culvert under US Highway 101 into six watersheds that are further subdivided as part of the detailed analysis in that plan (RBF, 2003). Land uses within the watersheds include undeveloped and open space areas, single-family residential, retail, government, and manufacturing districts. **Figure 4.H-2** illustrates existing land uses and the subwatershed boundaries from the City's Storm Drainage Master Plan.

SOURCE: ESA, 2012

Brisbane Baylands . 206069

Figure 4.H-1
Existing Drainage Facilities



WATERSHED BOUNDARIES

1. West end of Valley Drive from West Hill Place area
2. Silverspot Drive at West Hill Drive from Northeast Ridge area
3. East end of South Hill Drive from South Hill Drive commercial area
4. East end of South Hill Drive from Quarry and surrounding area
5. Eastern Mission Blue Drive from Northeast Ridge area
6. Cypress Lane from storm drain along railroad track alignment area
7. Valley Drive at Cypress Lane from central area
8. Valley Drive near Bankers Lane from lower area
9. Northwest of Valley Drive and Bayshore Boulevard intersection
   (noted as disappearing flow area by City staff, where runoff infiltrated before reaching inlet)
10. Bankers Lane from older residential and surrounding area
11. Tulare Street area Bayshore Boulevard near Old County Road intersection
12. Northeast Ridge area tributary to Guadalupe Canyon Parkway
13. Southwest of Main Street at Bayshore Boulevard
14. Area tributary to detention basin northwest of Main Street at Bayshore Drive
15. Area tributary to Industrial Avenue/Bayshore Boulevard Intersection
16. Area tributary to Brick Arch at Oil Channel
17. Area tributary to open channel downstream from timber box at Tunnel Avenue
18. Eastern Bayshore area below Tunnel Avenue tributary to open channel at Hwy 101
19. Tunnel Avenue at Beatty Avenue (drains toward Sunnydale Pump Station)
20. Alanna Way area
21. Sunnydale Pump Station Area tributary to Bayshore Boulevard outfall into central lagoon
22. San Bruno Avenue at Bayshore Boulevard
23. Southeast of Bayshore Boulevard and San Bruno Avenue intersection
24. Bayshore Boulevard at southern end of lagoon
25. Bayshore Boulevard at central lagoon
26. Main channel at railroad crossing
27. Lagoon and proximity
28. Sierra Point northwest
29. Sierra Point (other)
30. Valley Drive at North Hill Drive from central area
31. Central Mission Blue Area

SOURCE: RBF Consulting, 2003

Brisbane Baylands . 206069

Figure 4.H-2
Watershed Boundaries

Surface Water Quality

Surface water quality data have been collected from various locations on the Project Site, including stormwater outfalls, surface seeps along the waterways, and in receiving waters at Brisbane Lagoon.

Stormwater runoff samples have been collected from eight storm drain locations throughout the Project Site since 2002 (GeoSyntech, 2010). Stormwater monitoring was performed for compliance with the General Industrial Permit for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities (97-03-DWQ, CAS 0000001). The Industrial General Permit is intended to regulate industrial activities that discharge stormwater runoff and requires collection and analysis of storm-water discharge samples (for a specific suite of parameters that are based on Standard Industrial Classifications), as well as visual observations of runoff in wet and dry weather. According to this permit, four indicator water quality parameters are required to be monitored, including pH, total suspended solids (TSS), specific conductance (SC), and oil and grease. Most of the pH values for the stormwater sampling locations were well within normal ranges, while a few samples exceeded the maximum contaminant level (MCL) and United States Environmental Protection Agency (U.S. EPA) Parameter Benchmarks. TSS concentrations generally exceed the U.S. EPA Parameter Benchmark and the SC data generally exceeds its MCL. The SC would be expected to be higher than the MCL, given the connectivity and tidal influence of the southern part of San Francisco Bay. TSS has been reported to be an issue in the past at the Project Site.

An assessment of sediment sources for Brisbane Lagoon identified the Project Site as a significant source of sediment. In 2004, stormwater best management practices (BMPs) began to be implemented, and there is a noticeable decreasing trend in TSS at all sampling locations from 2002 to the present (GeoSyntech, 2010). Oil and grease appear to be a more localized water quality issue (GeoSyntech, 2010).

Flooding

Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (FEMA) (Community-Panel Number 0603140001B) for San Mateo County have been recently updated in 2013. The current approved FEMA maps show only areas along Visitacion Creek and between Bayshore Boulevard and Industrial Way as being within the 100-year flood hazard area (see **Figure 4.H-3**). Flood Insurance Rate Maps show the remaining areas of the Project Site as being outside the 100-year flood hazard area. A detailed analysis completed for the Brisbane Storm Drainage Master Plan in 2003 identifies additional low-lying areas that may be flooded during a 100-year storm event (RBF, 2003). These include an area between Bayshore Boulevard and the railroad tracks, and portions of Bayshore Boulevard adjacent to the Project Site (RBF, 2003).

One of the major issues with the existing stormwater system at the Project Site is flooding in the area along Bayshore Boulevard and Main Street. According to consulting engineers, the existing brick arch sewer under Bayshore Boulevard, if cleaned of debris, may be able to handle a five-year storm, but not more significant events (BKF, 2011). Two other restrictions in the system

SOURCE: ESA, 2012; FEMA, 1983

Brisbane Baylands . 206069

Figure 4.H-3

100-Year Flood Zones

which can cause flooding are the 36-inch culvert on the PG&E property and the 36-inch storm drain on Bayshore Boulevard north of Main Street. The inlets at the intersection of Industrial Way and Bayshore Boulevard were identified as needing improvements (BKF, 2011).

Tidal Influences and Sea Level Rise

Both Visitacion Creek and Brisbane Lagoon are directly connected to San Francisco Bay, and are influenced by tidal conditions on the Bay. Historically, flooding in areas affected by tides was evaluated by FEMA based on the assumption that the probability of an infrequent high tide coinciding with an infrequent storm event would not warrant combining the two events. FEMA maps showing the 100-year floodplain are thus generally based on the higher of the five-year flow during a 100-year high tide and the 100-year flow at mean higher high water (MHHW). However, a more recent analysis than these FEMA maps based on correlating peak discharge and tidal records in the vicinity of San Francisco Bay indicated that storm surges, driven by the low atmospheric pressures and strong onshore winds, make significantly higher than average tides likely during extreme wet weather conditions (RBF, 2003). Brisbane's Storm Drainage Master Plan was based on a statistically-based tidal cycle to evaluate flooding conditions and potential improvements (RBF, 2003).

Tidal conditions create backwater conditions along Visitacion Creek that restrict outflow from the Levinson Overflow Area (the off-channel detention basin located at the northwest corner of Main Street and Bayshore Boulevard), and higher tides can contribute to flooding along Bayshore Boulevard. A potential future rise in sea level could exacerbate this condition.

The science of estimating sea level rise continues through a stepwise process of refinement, and additional research will provide better estimates in the future, as the science develops. Sea level rise associated with climate change may pose a substantial risk of inundation to existing and proposed development that is located in low-lying areas close to San Francisco Bay. Climate-induced flooding could occur as a result of climate-induced increases in the level of San Francisco Bay waters, combined with other factors such as tidal cycles, wind waves and swell, or seismic waves.

The magnitude of projected sea level rise is difficult to predict and varies substantially among the thousands of scientific research documents available on climate change and sea level rise. Based on widely accepted literature from the Intergovernmental Panel on Climate Change, California Climate Change Center, and San Francisco Bay Conservation and Development Commission (BCDC), the following examples provide plausible low, medium, and high estimates of the magnitude of climate-induced sea level rise that would be likely to occur within the Bay:

- ***Low Rate of Increase*:** Sea level rise will continue to occur according to the low sea level rise projections for the emissions scenarios presented by the Intergovernmental Panel on Climate Change (IPCC, 2007). Relative to sea levels in the year 2000, sea level is projected to rise three inches by 2050 and 12 inches by 2100.
- ***Medium Rate of Increase:*** Sea level rise will continue according to predictions forwarded by the California Climate Change Center, which indicate that sea level is projected to rise

by up to 35 inches by 2100 (CEC, 2009). This is similar to mid-range projections made by Rahmstorf (Rahmstorf, 2007).

- ***High Rate of Increase:*** Sea level rise will continue at a higher rate, resulting in an increase of 16 inches by 2050 and 55 inches (or higher) by 2100 (Heberger et al., 2009). These values have been adopted as an interim standard by the California Coastal Conservancy and are consistent with recent predictions made by the Pacific Institute (Pacific Institute, 2012).

According to maps compiled by BCDC, an increase of 16 inches would not affect the Project Site outside of Brisbane Lagoon (BCDC, from Knowles, 2008). However, a projected sea level rise of 55 inches would inundate areas near the Roundhouse and along Visitacion Creek under current topographic conditions, (BCDC, from Knowles, 2008) as shown in **Figure 4.H-4**.

4.H.3 Regulatory Setting

Development within the Project Site boundaries must comply with federal, state, regional, and local regulations. This section discusses these requirements to the extent that they affect the way development occurs with the Project Site development.

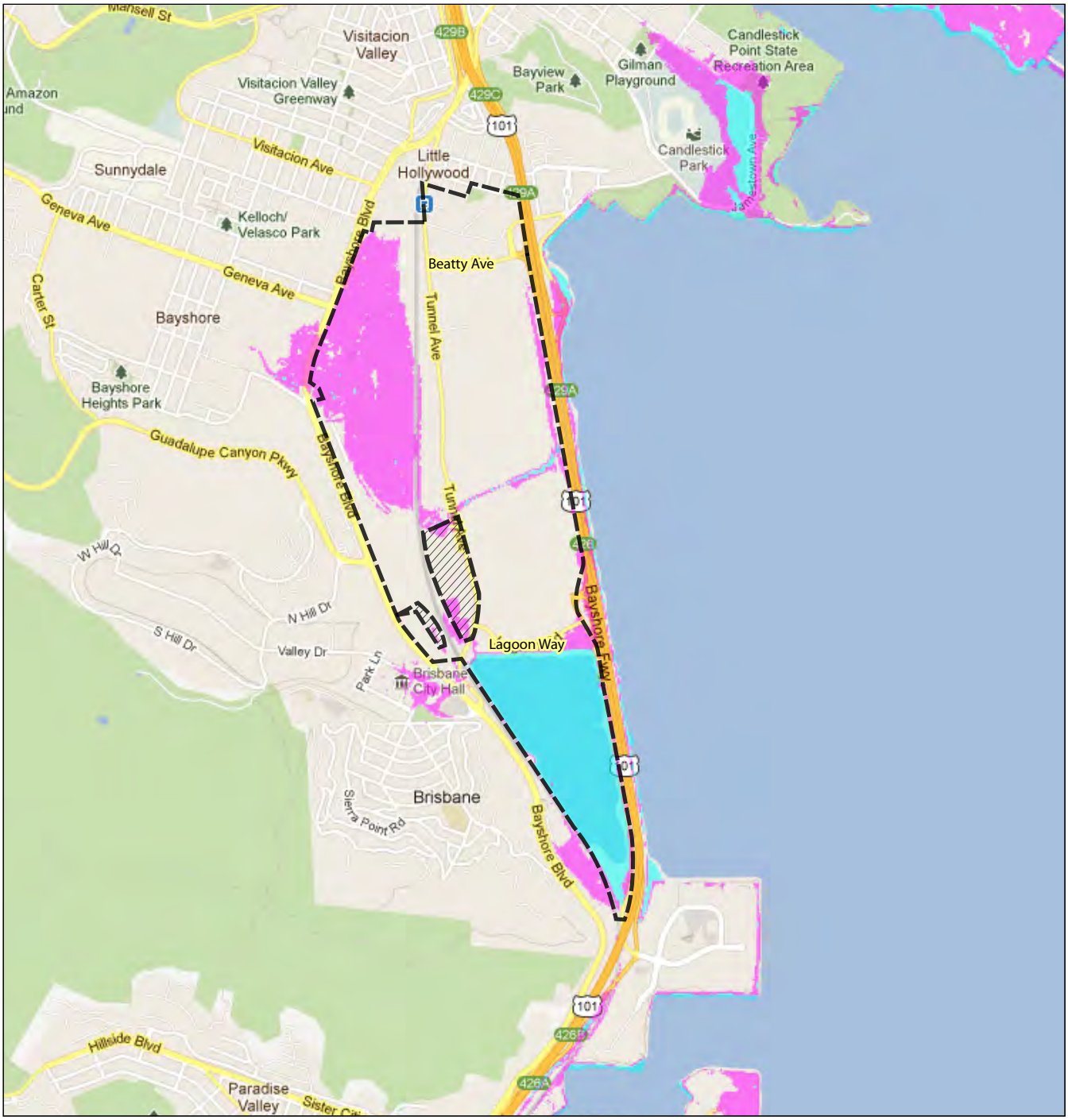
Hydrology and surface water quality at the Project Site are subject to a variety of federal, state, and local regulations, as discussed below.

Federal Regulations

The City of Brisbane and San Mateo County are participants in the National Flood Insurance Program (NFIP) administered by FEMA. Participants in the NFIP must satisfy certain mandated floodplain management criteria. Established in 1968 with the passage of the National Flood Insurance Act, the NFIP is a federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages. Participation in the NFIP is based on an agreement between communities and the federal government. If a community adopts and enforces a floodplain management ordinance to reduce future flood risk to new construction in floodplains, the federal government will make flood insurance available within the community as a financial protection against flood losses. This insurance is designed to provide an affordable insurance alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Communities are occasionally audited by the Department of Water Resources to ensure the proper implementation of FEMA floodplain management regulations.

State Regulations

The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The SWRCB provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of state and federal laws and regulations. The RWQCBs adopt and



Current Area at Risk

Area at Risk with a 1.4 Meter Sea-Level Rise

Project Site

Not a part of Proposed Project

0 2000

Feet

SOURCE: Pacific Institute, 2012

Brisbane Baylands . 206069

Figure 4.H-4

Projected Sea Level Rise

implement water quality control plans that recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

The Project Site lies within the jurisdiction of the RWQCB-San Francisco Bay Region, which has adopted the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) to implement plans, policies, and provisions for water quality management. Beneficial uses of surface waters within the San Francisco Bay Region are described in the Basin Plan and are designated for major surface waters and their tributaries. Beneficial uses of Central San Francisco Bay include ocean, commercial, and sport fishing, estuarine habitat, industrial service supply, fish migration, fish spawning, navigation, rare and endangered species preservation, recreation, shellfish harvesting, and wildlife habitat.

Total Maximum Daily Load (TMDL) – Section 303(d) of the Clean Water Act

California has identified waters that are polluted and need further attention to support their beneficial uses. These water bodies are listed pursuant to Clean Water Act Section 303(d). Specifically, Section 303(d) requires that each state identify water bodies or segments of water bodies that are "impaired" (i.e., not meeting one or more of the water quality standards established by the state). Approximately 500 water bodies or segments have been listed in California. Once the water body or segment is listed, the state is required to establish TMDL for the pollutant causing the conditions of impairment. The TMDL is the quantity of a pollutant that can be safely assimilated by a water body without violating water quality standards. Listing of a water body as impaired does not necessarily suggest that the pollutants are at levels considered hazardous to humans or aquatic life or that the water body segment cannot support the beneficial uses. The intent of the 303(d) list is to identify the water body as requiring future development of a TMDL to maintain water quality and reduce the potential for continued water quality degradation.

In accordance with Section 303(d) of the Clean Water Act, the RWQCB-San Francisco Bay Region has identified impaired water bodies within its jurisdiction and the pollutant or stressor impairing water quality, and set priorities for developing a TMDL. San Francisco Bay is included on the Section 303(d) list. Pollutants or stressors identified on the Section 303(d) list for Central San Francisco Bay include chlordane, dichlorodiphenyltrichloroethane (DDT), dieldrin, dioxin compounds, exotic species, furan compounds, mercury, non-dioxin-like polychlorinated biphenyls (PCBs), PCBs (dioxinlike), and selenium.

A TMDL has been established for San Francisco Bay for chlordane, DDT, dieldrin, mercury, PCBs (non-dioxin-like), and the RWQCB is working on TMDLs for the Bay for dioxin compounds, excotic species, furan compounds, PCBs, and selenium, as well as a revision to the mercury TMDL. The RWQCB has also adopted a TMDL for pesticide toxicity in urban creeks.

While the Clean Water Act does not expressly require the implementation of TMDLs, the United States Environmental Protection Agency has established regulations requiring that National Pollutant Discharge Elimination System (NPDES) permits be revised to be consistent with any approved TMDL.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act works in tandem with the Clean Water Act to establish the SWRCB, which oversees the nine RWQCBs. The SWRCB, and thus each RWQCB, is responsible for protecting California's surface waters and groundwater supplies.

The Porter-Cologne Water Quality Control Act provides for Basin Plans that designate the beneficial uses of California's rivers and groundwater basins. The Basin Plans also establish narrative and numerical water quality objectives for those waters. Basin Plans are updated every three years and provide the basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Water Quality Control Act also allows the SWRCB and RWQCBs to implement Clean Water Act Sections 401-402 and 303(d).

National Pollutant Discharge Elimination System Program

Section 402 of the Clean Water Act regulates point-source discharges to surface waters through the NPDES program. In California, the SWRCB oversees the NPDES program, which is administered by the RWQCBs. The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. The NPDES program covers municipalities, industrial activities, and construction activities. The NPDES program includes an industrial stormwater permitting component that covers ten categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. Construction activities, also administered by the SWRCB, are discussed below. Section 402(p) of the federal Clean Water Act, as amended by the Water Quality Act of 1987, requires NPDES permits for stormwater discharges from municipal separate storm sewer systems (MS4s), stormwater discharges associated with industrial activity (including construction activities), and designated stormwater discharges, which are considered significant contributors of pollutants to waters of the United States. On November 16, 1990, U. S. EPA published regulations (40 CFR Part 122), which prescribe permit application requirements for MS4s pursuant to The Clean Water Act 402(p). On May 17, 1996, U. S. EPA published an Interpretive Policy Memorandum on Reapplication Requirements for Municipal Separate Storm Sewer Systems, which provided guidance on permit application requirements for regulated MS4s. MS4 permits include requirements for construction and post-construction control of stormwater runoff in what is known as Provision C.6 and Provision C.3, respectively.

Provision C.6 states that each Permittee, such as the City of Brisbane which is part of the San Francisco Regional MS4 Permit, shall implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with each Permittee's respective Enforcement Response Plan, to prevent construction site discharges of pollutants and impacts on beneficial uses of receiving waters. Inspections shall confirm implementation of appropriate and effective erosion and other construction pollutant controls by construction site operators/developers; and reporting shall demonstrate the effectiveness of this inspection and problem solution activity by the Permittees.

The goal of Provision C.3 is for the Permittees, such as the City of Brisbane, to use their planning authorities to include appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address both soluble and insoluble stormwater runoff pollutant discharges and prevent increases in runoff flows from new development and redevelopment projects. This goal is to be accomplished primarily through the implementation of low impact development (LID) techniques.

Construction Activity Permitting – National Pollutant Discharge Elimination System

The RWQCB-San Francisco Bay Region monitors and enforces the NPDES stormwater permitting for the region. The NPDES permit program was established by the Clean Water Act to regulate municipal and industrial discharge to surface waters of the United States from their municipal stormwater systems. The SWRCB has issued the General Permit for Discharges of Stormwater Runoff Associated with Construction Activity (General Construction Permit). The General Construction permit covers any construction or demolition activity, including, but not limited to, clearing, grading, grubbing, or excavation, or any other activity that results in a land disturbance of equal to or greater than one acre. To obtain coverage under the General Construction Permit, a project sponsor must submit a Notice of Intent and a Storm Water Pollution Prevention Plan (SWPPP) to the SWRCB.

General Permit Provisions

The General Construction Permit authorizes the discharge of storm water to surface waters from construction activities that result in the disturbance of one or more acres of land, provided that the discharger satisfies all permit conditions. The General Construction Permit establishes three possible levels of risk for a construction site: Risk Level 1, Risk Level 2 and Risk Level 3. The Risk Level is calculated in two parts: (1) project sediment risk, and (2) receiving water risk. Project sediment risk is based on the location and duration of construction activities. Receiving water risk is based on whether a project drains to a sediment-sensitive water body that (1) is on the most recent 303d list for water bodies impaired for sediment, (2) has a U.S. EPA-approved TMDL implementation plan for sediment, or (3) has the beneficial uses of cold, spawn, and migratory. The risk level calculated for Project Site development will dictate monitoring and sampling requirements. Project sediment risk requires site specific calculations based on a number of factors which have not been calculated for the Project Site, but will likely end up as Risk Level 2.

The General Construction Permit defines technology-based Numeric Action Levels and Numeric Effluent Limitations for pH and turbidity. Risk Level 2 projects are subject to Numeric Action Levels and Risk Level 3 projects are subject to Numeric Effluent Limitations. Risk Level 2 and Risk Level 3 projects are required to conduct effluent monitoring and reporting for pH and turbidity in storm water discharges. Additionally, Risk Level 3 projects should sample receiving water when Numeric Effluent Limitations are exceeded.

Storm Water Pollution Prevention Plans

A SWPPP must contain a site map that shows the construction site perimeter, existing and proposed buildings, lots, roadways, stormwater collection and discharge points, general topography, and drainage patterns across the project site. Components of SWPPPs typically include project risk determination, visual inspection requirements, identification of sampling locations, collection and handling procedures (for Risk Level 2 and Risk Level 3 projects), and specifications for BMPs to be implemented during project construction for the purpose of minimizing the discharge of pollutants in stormwater from the construction area. In addition, a SWPPP includes measures to minimize the amount of pollutants in runoff after construction is completed, and identifies a plan to inspect and maintain project BMPs and facilities at the end of the construction project. This plan includes information regarding how the SWPPP will be met.

The SWPPP has two major objectives: to help identify the sources of sediment and other pollutants that affect the quality of stormwater discharges, and to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in both stormwater and in non-stormwater discharges.

BMPs include activities, practices, maintenance procedures, and other management practices that reduce or eliminate pollutants in stormwater discharges and authorized non-stormwater discharges. BMPs include treatment requirements, operation procedures, and practices to control site runoff, spillage, leaks, waste disposal, and drainage from raw materials storage. BMP implementation must take into account changing weather conditions and construction activities, and various combinations of BMPs may be used over the life of a project to maintain compliance with the Clean Water Act. The NPDES General Permit gives the owner the discretion to determine the most economical, effective, and innovative BMPs to achieve the performance-based goals of the NPDES General Permit.

There are two types of BMPs: structural and nonstructural. Structural BMPs are the specific construction, modification, operation, maintenance, or monitoring of facilities that would minimize the introduction of pollutants into the drainage system or would remove pollutants from the drainage system. Nonstructural BMPs are activities, programs, and other nonphysical measures that help reduce pollutants from nonpoint sources to the drainage system. In general, nonstructural BMPs are source control measures.

The issue of pollution in stormwater and urban runoff has been recognized by both federal and state agencies, and there has been a growing concern regarding activities that discharge water affecting California's surface water, coastal waters, and groundwater. Discharges of water are classified as either point source or nonpoint source discharges. A point source discharge usually refers to waste emanating from a single, identifiable point. Regulated point sources include municipal wastewater, oil field wastewater, winery discharges, solid waste sites, and other industrial discharges. Point source discharge must be actively managed to protect the state's waters. A nonpoint source discharge usually is a waste emanating from diffused locations. As a result, specific sources of nonpoint source pollution may be difficult to identify, treat, or regulate. The goal is to reduce the adverse impact of nonpoint source discharges on water resources

through better management of these activities. Nonpoint sources include drainage and percolation from a variety of activities such as agriculture, forestry, recreation, and storm runoff.

Local Regulations

San Francisco Bay Conservation and Development Commission– San Francisco Bay Plan

The McAteer-Petris Act is a provision under California law that preserves San Francisco Bay from indiscriminate filling. The act established the BCDC as the agency charged with preparing a plan for the long-term use of the Bay and regulating development in and around the Bay while the plan was being prepared. The San Francisco Bay Plan, completed in January 1969, includes policies on 18 issues critical to the wise use of the Bay, ranging from ports and public access to design considerations and weather. The McAteer-Petris Act authorizes BCDC to incorporate the policies of the Bay Plan into state law (BCDC, 2012). The Bay Plan has two features: policies to guide future uses of the Bay and shoreline, and maps that apply these policies to the Bay and shoreline. BCDC conducts the regulatory process in accordance with the Bay Plan policies and maps, which guide the protection and development of the Bay and its tributary waterways, marshes, managed wetlands, salt ponds, and shoreline (BCDC, 2012).

Several policies of the Bay Plan are aimed at protecting the Bay's water quality, safety of fills, and guiding the dredging activities of the Bay's sediment. The Bay Plan policies related to water quality and hydrology are as follows:

- **Water Quality**

  ***Policy 1*:** Bay water pollution should be prevented to the greatest extent feasible. The Bay's tidal marshes, tidal flats, and water surface area and volume should be conserved and, whenever possible, restored and increased to protect and improve water quality. Fresh water inflow into the Bay should be maintained at a level adequate to protect Bay resources and beneficial uses.

  Policy 2: Water quality in all parts of the Bay should be maintained at a level that will support and promote the beneficial uses of the Bay as identified in the San Francisco Bay Regional Water Quality Control Board's Basin Plan. The policies, recommendations, decisions, advice and authority of the State Water Resources Control Board and the San Francisco Bay Regional Water Quality Control Board should be the basis for carrying out BCDC's water quality responsibilities.

  Policy 3: New projects should be sited, designed, constructed and maintained to prevent or, if prevention is infeasible, to minimize the discharge of pollutants into the Bay by: (a) controlling pollutant sources at the project site; (b) using construction materials that contain nonpolluting materials; and (c) applying appropriate, accepted and effective best management practices, especially where water dispersion is poor and near shellfish beds and other significant biotic resources.projects.

  Policy 4: When approving a project in an area polluted with toxic or hazardous substances, the Commission should coordinate with appropriate local, state and federal agencies to ensure that the project will not cause harm to the public, to Bay resources, or to the beneficial uses of the Bay.

Policy 5: The Commission should support the efforts of federal, state, and local agencies in developing non point source pollution control programs.

Policy 6: To protect the Bay and its tributaries from the water quality impacts of nonpoint source pollution, new development should be sited and designed consistent with standards in municipal stormwater permits and state and regional stormwater management guidelines, where applicable, and with the protection of Bay resources. To offset impacts from increased impervious areas and land disturbances, vegetated swales, permeable pavement materials, preservation of existing trees and vegetation' planting native vegetation and other appropriate measures should be evaluated and implemented where appropriate.

Policy 7: Whenever practicable, native vegetation buffer areas should be provided as part of a project to control pollutants from entering the Bay, and vegetation should be substituted for rock riprap, concrete, or other hard surface shoreline and bank erosion control methods where appropriate and practicable.

- **Sea Level Rise**

  Risk Assessments: Sea level rise risk assessments are required when planning shoreline areas or designing larger shoreline projects. If sea level rise and storms that are expected to occur during the life of the project would result in public safety risks, the project must be designed to cope with flood levels expected by mid-century. If it is likely that the project will remain in place longer than mid-century, the applicant must have a plan to address the flood risks expected at the end of the century.

  - Risk assessments are NOT required for repairs of existing facilities, interim projects, small projects that do not increase risks to public safety, and infill projects within existing urbanized areas.
  - Risk assessments are ONLY required within BCDC's jurisdiction.
  - Risk assessments for projects located only in the shoreline band, an area within 100 feet of the shoreline, need only address risks to public access.

The portion of the Project Site within 100 feet of the shoreline of San Francisco Bay is subject to permitting regulations of the BCDC because San Francisco Bay and "all areas that are subject to tidal action from the south end of the Bay to the Golden Gate… including all sloughs, and specifically, the marshlands lying between mean high tide and five feet above mean sea level; tidelands (lands lying between mean high tide and mean low tide); and submerged lands (lands lying below mean low tide)" are included (BCDC, 2012).

The San Francisco Bay Plan, developed by BCDC in 1969, designates shoreline uses and conservation areas throughout San Francisco Bay. The Bay Plan was last amended in September 2006. The 1969 McAteer-Petris Act amendment made BCDC a permanent agency and the Bay Plan state law.

BCDC's jurisdiction within the Project Site includes the Brisbane Lagoon, Visitacion Creek, and a 100-foot shoreline band around these features, each of which are designated Waterfront Park, Beach in the Plan(see Figure 4.I-2, included in Section 4.I, *Land Use and Planning Policy*, of this EIR).

City of Brisbane General Plan

Hydrology- and Water Quality-Related Policies and Programs

The following hydrology- and water quality-related policies and programs from the Conservation Element of the Brisbane General Plan are relevant to Project site development:

Policy 130: Conserve water resources in the natural environment.

Program 130a: As an ongoing part of land use planning and CEQA analysis, determine whether proposals could affect water resources.

Program 130b: Require, as appropriate, project analysis of drainage, siltation, and impacts on vegetation and on water quality.

Policy 131: Emphasize the conservation of water quality and of riparian and other water-related vegetation, especially that which provides habitat for native species, in planning and maintenance efforts.

Program 131a: Encourage studies by responsible agencies and conservation groups of the environmental values and conservation and maintenance requirements of the various water courses in the planning area.

Policy 133: Reduce the amount of sediment entering waterways.

P*rogram 133a:* Participate in programs to improve water quality in the Lagoon and the Bay.

Program 133b: Require all development, especially that involving grading, to exercise strict controls over sediment.

Policy 134: Reduce the amount of pollutants entering waterways.

Program 134a: Cooperate with the Water Quality Control Board and County Department of Environmental Health and participate in the NPDES Program to monitor and regulate point and non-point discharges.

Program 134b: Provide public information on how individual citizens can contribute to the reduction of pollutants in the storm drain and sewer systems.

Program 134c: Encourage wetlands restoration projects to remove or fix toxicants and reduce siltation.

Program 134d: Utilize wetlands restoration projects to remove or fix toxicants and reduce siltation where appropriate.

Policies and Programs Regarding Drainage Facilities and Flood Hazards

The General Plan provides policy guidance for drainage facilities located on both public and private properties within the city that are either built or are currently undeveloped. The following General Plan policies and programs address issues related to drainage facilities and flood hazards:

Policy 153: Require the construction of new improvements and the upgrade of existing stormwater infrastructure to mitigate flood hazard. (See *Policy 130.2*.)

Program 153a: Construct improvements to the GVMID storm drainage system to accommodate stormwater from the Northeast Ridge and increase the overall capacity

of the drainage system, as required in the conditions of approval for the Northeast Ridge Development Project.

Program 153b: Work with Daly City and affected property owners to design improvements to alleviate flooding on the section of Bayshore Boulevard between Geneva Avenue and Main Streets.

Program 153c: In conjunction with design of infrastructure to serve the Baylands, require that the property owner address the issue of flooding around the open drainage channel that flows west to east across the property.

Policy 155: Pay special attention to the condition and maintenance of storm drain facilities to avoid flooding.

Program 155a: Schedule regular maintenance to remove silt and debris from storm drain facilities.

Program 155b: As a part of Capital Improvements Planning, replace and repair, as economically feasible, storm drain facilities as needed to prevent flooding.

Program 155c: Study the drainage basins to determine responsibility for siltation of storm drain facilities. Consider methods of assessing maintenance costs to responsible properties.

Policy 221: If new development occurs, require storm drain systems to be installed to City standards.

Program 221a: In conjunction with land use development applications for vacant lands, require studies to determine design requirements to collect and remove stormwater from the property or reuse stormwater to benefit the public. Require facilities to be designed and installed to City standards, at developer's expense.

Policy 222: Require that all storm drain lines be installed within dedicated public streets.

Policy 223: Storm drains in undeveloped areas where facilities do not currently exist shall be installed at the property owner or developer's expense.

Policy 226: Undertake drainage studies to determine responsibility for siltation of the system and seek opportunities to assess the responsible parties for maintenance costs.

Program 226a: Consider environmental sensitivities in conjunction with drainage studies.

Policy 227: Cooperate with Daly City, responsible property owners, and responsible agencies to develop plans to improve the storm facilities on Bayshore Boulevard to relieve flooding.

Policy 228: Establish requirements in the Municipal Code for the installation of stormwater collection systems on private properties.

Program 228a: Require new construction and substantial renovation projects to provide roof gutters and leaders that direct stormwater through the curb to the City street so that the water can be collected in City facilities.

Program 228b: Require drainage plans to be submitted in conjunction with land use development applications, including those for building permits, as applicable to the project.

Program 228c: Provide public information on the safety aspects of dealing with stormwater and encourage homeowners and businesses to make necessary improvements and repairs.

Program 228d: Comply with National Pollutant Discharge Elimination System, as required.

San Mateo Countywide Water Pollution Prevention Program

The San Mateo Countywide Water Pollution Prevention Program is administered by the City/County Association of Governments of San Mateo County including the City of Brisbane. The program's former name was the San Mateo Countywide Stormwater Pollution Prevention Program. Municipalities are listed as co-permittees in a Municipal Regional Stormwater NPDES Permit (MRP) adopted by the RWQCB-San Francisco Bay Region in November 2011. The MRP includes more prescriptive requirements for incorporating post-construction stormwater control/ LID measures into new development and redevelopment projects than those included in the previous countywide stormwater permit. These requirements are known as Provision C.3 requirements. Beginning December 1, 2011, the MRP requires stormwater treatment requirements to be met by using evapotranspiration, infiltration, rainwater harvesting and reuse. Where this is infeasible, landscape-based biotreatment will be allowed.

Project Site development will require preparation of a Stormwater Management Plan that identifies specific measures to meet Provision C.3 of the NPDES permit.

4.H.4 Impacts and Mitigation Measures

Significance Criteria

Criteria outlined in the CEQA Guidelines were used to determine the level of significance of identified impacts on hydrology and water quality. Appendix G of the CEQA Guidelines indicates that a project would have a significant effect on the environment if it were to:

- Violate any water quality standards or waste discharge requirements;
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;

- Otherwise substantially degrade water quality;
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- Cause inundation by seiche, tsunami, or mudflow.

Impact Assessment Methodology

The conceptual grading and storm drain system plan provided in the draft Brisbane Baylands Specific Plan and the Infrastructure Plan (see Appendices B and C of this EIR) were used to assess hydrology impacts of the four Project Site development scenarios since it was determined that site grading requirements would be similar for each scenario, and that drainage facility requirements for each scenario would also be similar, as described in Chapter 3, *Project Description,* of this EIR. Additionally, models for existing conditions drainage system analysis prepared as part of the Brisbane Storm Drainage Master Plan by RBF Consulting in 2003 and proposed conditions analysis prepared by BKF Engineers in 2008 were compared to assess impacts.

Site preparation activities and backbone infrastructure construction would be relatively similar for all four development scenarios in terms of significant changes to existing conditions and regulations that would apply. Therefore, alteration of the Project Site in ways that would alter hydrology and impact water quality would be similar under each of the proposed scenarios. As a result, the analysis of impacts associated with each of the four proposed Project Site development scenarios, each of which include remediation of existing contamination, is grouped together in this section. The proposed water transfer agreement would result in changes to flow rates in the Tuolomne River below Hetch-Hetchy reservoir that could reduce groundwater recharge during drought years and impact streamside meadows and other alluvial deposits. This impact is discussed in *Section 4.O, Utilities, Service Systems, and Water Supply,* and would be considered a significant but mitigable impact as a result of implementation of Mitigation Measure 4.O-1b. Thus, no additional discussion of flooding hazards related to the proposed water supply agreement needs to be undertaken.

Project Impacts and Mitigation Measures

Impact 4.H-1: Would the Project violate water quality standards or waste discharge requirements?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

A project's impacts on water quality generally occur during three time periods: (1) during the earthwork and construction phase of project site development, when the potential for erosion, siltation and sedimentation is the greatest; (2) following

construction, prior to the establishment of any ground cover, when erosion potential remains relatively high; and (3) following completion of future development, when impacts related to sedimentation decrease markedly, but those associated with urban runoff and waste discharges increase. In the case of Project Site development, remediation activities would also be a source of potential erosion, similar to grading activities. All four Project Site development scenarios are analyzed together because while they vary in scope of development and increased amount of impervious surfaces (and resulting runoff) onsite, they all include substantial changes to existing drainage patterns as well as remediation of existing contamination and would all be subject to similar stormwater runoff and waste discharge requirements.

Water Quality Impacts of Construction Activities

Erosion and Sedimentation. Construction and grading within the Project Site would require temporary disturbance of surface soils. During the construction period, grading, excavation, and remediation activities would result in exposure of soil to runoff, causing erosion and entrainment of sediment and contaminants in the runoff. Soil stockpiles and excavated areas within the Project Site would be exposed to runoff from initial demolition and site clearing until grading, excavation, and remediation activities are completed and ground cover (landscaping, hardscape, paving, buildings) is established. If not managed properly, runoff from exposed ground would cause erosion and increased sedimentation and pollutants in stormwater. The potential for chemical releases is present at most construction sites given the types of materials used, including fuels, oils, paints, and solvents. Because of contaminants within surface soils[1], erosion could also result in release of those contaminants. Once released, these substances could be transported to the Bay in stormwater runoff, causing an incremental reduction in water quality. The proximity of the Project Site to the Bay reduces the chances that the pollutants in stormwater runoff (e.g., sediment, petroleum hydrocarbons, and lubricants) would be naturally attenuated prior to discharge to the Bay.

Contaminated Groundwater Encountered During Construction. As discussed in Section 4.G, *Hazards and Hazardous Materials*, of this EIR, groundwater beneath various portions of the Project Site, including the former landfill and railyards (Operable Unit No. 1 and Operable Unit No. 2) contains certain pollutants at concentrations above regulatory action levels (see Tables 4.G-1 through 4.G-6 for a listing of contaminants present within the Project Site). In addition, the Recology site and Schlage Lock site located north of the Project Site are also undergoing active groundwater remediation, as described in Section 4.G, *Hazards and Hazardous Materials,* of this EIR.

While the investigation and remediation efforts described in Section 4.G, *Hazards and Hazardous Materials,* are looking at both shallow and deeper aquifer systems, the shallow groundwater aquifer would be the one encountered during Project Site construction. The depths to the shallow groundwater range from approximately less than one foot up to 16 feet below the current ground surface. The construction of some of buildings, utilities, and infrastructure within the Project Site

[1] See Section 4.G, *Hazards and Hazardous Materials,* of this EIR, for a discussion of onsite contamination and remediation requirements.

may require excavation to depths that would encounter shallow groundwater. The excavations would have to be dewatered through temporary pumping to enable construction.

While the groundwater is being actively remediated, the extracted groundwater could contain constituents above action levels that, without proper handling procedures, could expose workers to adverse effects or reach downstream natural waters, resulting in water quality degradation. However, dewatering activities would be subject to site specific NPDES permit requirements that prohibits discharge of contaminated groundwater. In addition, General Construction permit requirements also contain measures to protect water quality. Implementation of these mandatory measures as required by the mitigation measures below would be adequate to ensure that construction within the Project Site would not violate water quality standards or waste discharge requirements.

Conclusion: With the substantial amount of earthwork, grading, and remediation activities required under construction for any of the four Project Site development scenarios, water quality standards would be violated, resulting in a significant impact. **Mitigation Measures 4.H-1a** and **4.H-1b** would be required for all Concept Plan scenarios to avoid the significant impact of water quality violations.

Mitigation

Mitigation Measure 4.H-1a: Prior to issuance of a grading permit, an applicant for any site specific development project to be constructed within the Project Site shall file a Notice of Intent to the RWQCB to comply with the statewide General Permit for Discharges of Storm Water Associated with Construction Activities and shall prepare and implement a SWPPP for construction activities on the Project Site in accordance with the NPDES General Construction Permit and the demonstrate compliance with the City of Brisbane's Municipal Regional Stormwater Permit Order No. 2011-0083 Provision C.3. The SWPPP shall include all provisions of the Erosion and Sediment Control Plan submitted as part of grading and construction permits. In addition to meeting the regulatory requirements for the SWPPP, the site-specific SWPPP shall include provisions for the minimization of sediment disturbance (i.e., production of turbidity) and release of chemicals to the Bay.

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

Mitigation Measure 4.H-1b: Prior to issuance of a grading permit, an applicant for any site specific development project to be constructed within the Project Site shall comply with any site-specific NPDES permit requirements for dewatering activities, as administered by the RWQCB. The RWQCB could require compliance with certain provisions in the permit, such as treatment of the flows prior to discharge, depending on the particular site conditions. Discharge of the groundwater generated

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

during dewatering to the sanitary sewer or storm drain system shall only occur with authorization of and required permits from the applicable regulatory agencies, including the Bayshore Sanitary District or the RWQCB.

Conclusion with Mitigation: Implementation of **Mitigation Measures 4.H-1a** and **4.H-1b** would ensure that Project Site development construction would not violate water quality standards and that the impact would be less than significant.

Water Quality Impacts During Post-Construction and Project Operation

Sedimentation would not be considered a significant impact during post-construction and operation of Project Site development because most of the site would be paved or landscaped, which would stabilize soils for the long term. However, paved areas would result in an increase in the amount of impervious surfaces within the Project Site and would increase stormwater runoff generation and flows. In addition, Project Site development would result in greater vehicular use of new and existing nearby roadways, which would lead to the accumulation and release of petroleum hydrocarbons, lubricants, sediments, and metals (generated by the wear of automobile parts). The management of landscaped areas would in runoff and/or infiltration of herbicides and pesticides. These types of common urban pollutants would be transported in runoff, adversely affecting the quality of waters of the Bay or groundwater. Therefore, after construction and during the life of Project Site development, nonpoint source pollutants would be the primary contributors to potential water quality degradation. Nonpoint source pollutants would be washed by rainwater from rooftops and landscaped areas into onsite and local drainage networks. Potential nonpoint source pollutants include products used in landscaping (e.g., pesticides, herbicides and fertilizers); oil, grease, and heavy metals from automobiles; and petroleum hydrocarbons from fuels.

Pollutant concentrations in runoff from a site depend on numerous factors, including:

- Land use conditions;
- Implementation of BMPs;
- Site drainage conditions;
- Intensity and duration of rainfall; and
- Climatic conditions preceding a rainfall event.

Nonpoint source pollutants in runoff that reaches San Francisco Bay would result in a significant impact. However, to reduce impacts, stormwater control/LID[2] measures would be required as standard conditions of approval for Tentative Subdivision Map and building permit application submittals, along with compliance with RWQCB Municipal Regional Stormwater Permit Order No. 2011-0083 Provision C.3 (Provision C.3). As required by the permit, the specific project applicant would incorporate LID strategies, such as stormwater reuse, onsite infiltration, and

[2] The goal of LID is to reduce runoff and mimic a site's predevelopment hydrology by minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source. LID employs principles such as preserving and recreating natural landscape features and minimizing imperviousness to create functional and appealing site drainage that treats stormwater as a resource, rather than a waste product. Practices used to adhere to these LID principles include measures such as rain barrels and cisterns, green roofs, permeable pavement, preserving undeveloped open space, and biotreatment through rain gardens, bioretention units, bioswales, and planter/tree boxes.

evapotranspiration as initial stormwater management strategies. Secondary methods would include the use of natural, landscape based stormwater treatment measures, as identified by Provision C.3.

Stormwater treatment measures would also be required in the final design plans in accordance with the San Mateo Countywide Water Pollution Prevention Program C.3 Stormwater Technical Guidebook. The treatment measures would vary from "local" improvements at individual building sites to "areawide" concepts such as stormwater treatment wetlands with large open space areas. The treatment BMPs would be required to include one or more of the following: bioretention areas (including bioretention swales), flow-through planters, tree well filters, vegetated buffer strips, infiltration trenches, extended detention basins, pervious paving, green roofs, and media filter. Areas located above the former landfill would not be able to incorporate features that encourage infiltration due to the low permeability cap and the need to avoid creation of leachate within the waste materials. However, green roofs, planter boxes, and other treatment measures such as mechanical filters, retention basins and other similar methods could still be applied.

Activities that take place at industrial facilities within the Project Site, such as hazardous material handling and storage, can be exposed to the weather. Stormwater runoff that comes into contact with these activities can pick up pollutants and transport them offsite if not managed appropriately. To minimize the impact of stormwater discharges from industrial facilities, the NPDES program includes an industrial stormwater permitting component that covers 10 categories of industrial activity that require authorization under an NPDES industrial stormwater permit for stormwater discharges. If an industrial facility can demonstrate that its materials and operations are not exposed to stormwater, it can be exempt from NPDES permitting program with continued notification every five years. Industrial activities would also include discharges of wastewater produced during operation of the proposed onsite recycled water plant that would be required to adhere to a Waste Discharge Requirements permit from the RWQCB. A Waste Discharge Requirement permit can be specific to a facility's operation or fall under one of the general industry category permits for certain common types of industry. The Industrial General Permit requires that each facility notify the state, prepare and implement a SWPPP, and monitor to determine the amount of pollutants leaving the site. Although the plan does not have to be submitted to the SWRCB it must be available at each facility. The permitted company must also submit an annual report to the RWQCB.

Each of the four development scenarios includes development of an onsite recycled water plant that would produce recycled water upon completion, which could be as late as 15 years into Project Site development due to the need to generate sufficient onsite wastewater flows from new development to provide for efficient operation of the facility and sufficient recycled water supply for irrigation purposes. Construction and operation of an onsite recycled water plant would require detailed engineering design, development and approval of wastewater treatment requirements by RWQCB, and further project-level environmental evaluation specific to recycled water plant construction and operation. The facility would be designed and engineered to produce tertiary treated effluent that conforms to the requirements of California Code of Regulations Title 22 for unrestricted reuse. Construction and operation of an onsite recycled water plant would be required to comply with all applicable requirements of the RWQCB and would include

the preparation of separate CEQA documents specific to the design, operation, and maintenance of the recycled water plant.

Conclusion: Development that would occur under Project Site development would result in changes to existing drainage patterns that could affect water quality of stormwater runoff. **Mitigation Measure 4.H-1c** would be required to avoid the significant impact of water quality violations.

Mitigation

Mitigation Measure 4.H-1c: Applicants for site-specific development projects to be constructed within the Project Site shall prepare and implement a Final Stormwater Management Plan (SMP) in accordance with the most recent NPDES C.3 requirements to be reviewed and approved by the City Engineer prior to approval of final design plans. The SMP shall be prepared by licensed professionals and act as the guiding document detailing best management practices for mitigating water quality impacts in the post-construction phase. Industrial uses shall prepare a SMP in accordance with NPDES permit requirements for Industrial Activity. Industrial applicants shall include management measures that will achieve the performance standard of best available technology economically achievable and best conventional pollutant control technology in accordance with the General Industrial Permit as approved by the RWQCB and shall demonstrate compliance within an annual report be submitted each July 1. The SMP shall provide operations and maintenance guidelines for all of the BMPs identified in the SMP, including LID measures and other BMPs designed to mitigate potential water quality degradation of runoff from all portions of the completed development, and shall clearly identify the funding sources for the required ongoing maintenance. The SMP shall be developed in conjunction with the Storm Drain Master Plan to ensure that the treatment designs support the hydraulics and hydrology of the proposed storm drainage system.

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

Conclusion with Mitigation: Implementation of **Mitigation Measure 4.H-1c** would be adequate to ensure that operation of Project Site development would not violate water quality standards or waste discharge requirements and that this impact would be less than significant.

Overall Conclusion

With implementation of **Mitigation Measures 4.H-1a, 4.H-1b,** and **4.H-1c,** construction, post-construction, and operational impacts related to water quality and waste discharge requirements would be less than significant.

Impact 4.H-2: Would the Project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
LTS	LTS	LTS	LTS

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Depletion of Groundwater Supplies

Project Site development would increase demands for water supplies. Groundwater is not currently used at the Project Site and no groundwater use is proposed under any of the scenarios (see Section 4.G, *Hazards and Hazardous Materials*, for full discussion of groundwater at the Project Site). The City does not have its own groundwater water supplies, and purchases potable water from the San Francisco Public Utilities Commission (SFPUC), which obtains its water supplies primarily from the Hetch Hetchy Reservoir in Yosemite National Park; however, occasionally the water may be supplemented or come directly from SFPUC's reservoirs in the East Bay or San Mateo Peninsula. As discussed in Section 4.O, *Utilities, Service Systems, and Water Supply* of this EIR, water supply for Project Site development would come from a proposed water transfer agreement with the Oakdale Irrigation District. Therefore, Project Site development would not substantially deplete groundwater supplies.

Interference with Groundwater Recharge

Project Site development would ultimately result in the construction of new impervious surfaces even with the implementation of LID stormwater drainage improvements that would allow for some onsite infiltration. The net increase in impervious surfaces would reduce the amount of direct groundwater recharge at the site by reducing the amount of area available for infiltration such that there could be a net deficit in aquifer volume or a lowering of the local groundwater table level.

However, groundwater is not currently used at the Project Site, and no groundwater use is proposed for Project Site development. As part of the proposed Final Closure and Postclosure Maintenance Plan for the former landfill required under Title 27 of the California Code of Regulations and the RWQCB Waste Discharge Order 01-041 (described in Section 4.G, *Hazards and Hazardous Materials*), the design of the soil cap will in fact require that infiltration is minimized to the maximum extent possible in order to prevent accumulation of leachate within the underlying waste material.

In addition, there are no downstream users of groundwater because the Project Site is immediately adjacent to Brisbane Lagoon and San Francisco Bay. As such, even if groundwater levels were to be reduced (and with its close proximity to the lagoon and Bay there may be a negligible effect), there are no potential groundwater uses or users that would be affected. Therefore, Project Site development would not interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

Conclusion: Project Site development would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge, and the impact would be less than significant. No mitigation is required.

Impact 4.H-3: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Changes to Existing Drainage Patterns

The Project Site is located within three existing drainage areas: Bayshore, Brisbane Lagoon, and Beatty Avenue. The site area within the Bayshore drainage area drains to the Visitacion Creek; the site area within the Brisbane Lagoon drainage area drains to Brisbane Lagoon, and the Beatty Avenue site area drains to the Beatty Avenue storm drain system.

The DSP and DSP-V scenarios would retain the existing drainage pattern of the Bayshore and Brisbane Lagoon drainage areas, but would alter the Beatty Avenue drainage area by redirecting runoff from approximately 47 acres (see watershed no. 19 on Figure 4.H-2) away from Beatty Avenue to a proposed storm drain discharging to the Visitacion Creek. The CPP and CPP-V scenarios would result in similar substantial changes to existing drainage patterns although by preserving a larger amount of open space, the total amount of impervious surface area in the CPP and CPP-V scenarios would be less than in the DSP and DSP-V scenarios.

Project Site development would collect and convey onsite runoff through a modified storm drainage system that would be constructed in accordance with the City's requirements and regional MS4 NPDES permit requirements to accommodate the increase in runoff due to the net addition of impervious area and changes to existing drainage patterns. Since the developed site would consist of ground covered either by paved areas, building, or landscape that is subject to post-construction drainage control requirements that minimize erosion, impacts related to the potential for erosion and siltation would be less than significant.

Impacts from Construction and Grading

Erosion and Sedimentation. Project Site development involves construction and grading activities that would result in exposure of disturbed surface soils to runoff, potentially causing erosion and entrainment of sediment into natural water bodies including Visitation Creek during site remediation and day-lighting of the creek channel to accommodate anticipated sea level rise. Soil stockpiles and excavated areas on the Project Site would be exposed to runoff and, if not managed properly, the runoff could cause erosion and increased sedimentation and pollutants in stormwater and waters that drain to natural water bodies. As previously discussed under Impact

4.H-1, implementation of **Mitigation Measure 4.H-1a** (Storm Water Pollution Prevention Plan) would be required to mitigate this impact during construction.

Impacts on Visitacion Creek. Project Site development would not alter the actual existing course (location) of Visitacion Creek east of the railroad right of way which traverses the site from north to south along the western portion of the Baylands, but would daylight the currently subsurface portion of the creek from the railroad right of way east and extending to the Roundhouse. This proposed design accommodates the 100-year design storm event incorporating anticipated changes to tidal flow considering the estimated sea level rise which is anticipated to occur over the next century. While the proposed creek enhancements could cause potential erosion of creek banks during construction if not implemented correctly, design and construction activities would be subject to specific standards contained in BMPs required for site grading as well as the standards established by the City's Municipal Code that are designed to protect watercourses and riparian areas[3]. With implementation of appropriate construction and operation-related BMPs (see **Mitigation Measures 4.H-1a** and **4.C-1g**), regulatory agency's post-construction re-vegetation requirements (see **Mitigation Measures 4.C-2a** through **4.C-2c**), and habitat restoration requirements as discussed further in Section 4.C, *Biological Resources*, erosion and sedimentation during and after construction would be minimized. Furthermore, Project Site development in the Visitation Creek corridor would be subject to requirements to prepare and implement a Wetland Mitigation and Monitoring Program as part of obtaining Army Corps of Engineers permit approvals. And because the work would occur within the 100-foot shoreline band that defines BCDC jurisdiction (see Section 4.C discussion of Regulatory Setting) coordination and approval from that agency would also be required. Therefore, creek enhancements proposed to accommodate the 100-year design storm event with tidal flow and 100 years of anticipated sea level rise would serve to increase the onsite length as well as the riparian functions and values provided by the on-site riparian corridor composed of Visitation Creek and would not result in an increase in sediment or stormwater runoff into natural water bodies. With Project Site development compliance with these requirements, erosion impacts in the Visitacion Creek drainage areas would be less than significant.

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[3] Site remediation and creek improvement remediation would be subject to on-site restoration to restore habitat functions and values of impacted areas pursuant to Section 404 of the Clean Water Act, and were previously addressed in a 2006 Nationwide Permit (File no: 28050S) that subsequently expired with no action recorded. Since issuance of the 2006 permit, Nationwide 404 Permits have been modified and updated. Therefore, the previous permit mechanism for cleanup at the creek is no longer valid, and a new permit must be secured as part of Project Site development.

Impact 4.H-4: Would the Project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Bayshore Boulevard near Industrial Way, at the western boundary of the site, experiences flooding during the 100-year storm event due to overflow of the Levinson Overflow Area and surface flows from the Pacific Gas & Electric (PG&E) substation. Approximately 2.2 feet of flooding is expected during a 100-year storm event. Flooding effects have also been observed on the Project Site during large storm events, due to capacity deficiencies in the existing storm drain system.[4]

Each of the proposed Project Site development scenarios would add a substantial amount of new impervious area that would reduce the rate of infiltration of precipitation and increase the amount of runoff generated during a rain event. Thus, if not properly designed, development would exacerbate existing flooding onsite and offsite.

The proposed Project Site storm drainage collection system for the DSP and DSP-V scenarios would be designed in compliance with City of Brisbane, NPDES, and the City of Brisbane Storm Drainage Master Plan (SDMP) requirements. Runoff from most of the Project Site would be conveyed through onsite storm drain facilities that would discharge to an improved Visitacion Creek. Per the requirements of **Mitigation Measure 4.H-4a**, drainage facilities are to be provided that accommodate an increase in peak runoff during the 100-year design storm event with tidal flow, and with consideration of estimated sea level rise over the next century in accordance with City of Brisbane, NPDES, and SDMP regulations. The drainage plan for Project Site development would also include LID measures, as required to comply with Provision C.3 requirements, which include measures to minimize offsite flows.

The CPP and CPP-V scenarios would also add a substantial amount of new impervious area that would increase runoff generated onsite, although not to the same extent as the DSP and DSP-V scenarios. This is because the CPP and CPP-V scenarios propose more open space acreage than the DSPP and DSP-V scenarios, which would also have some development south of Visitacion Creek. The CPP and CPP-V scenarios do not propose development south of Visitacion Creek, except for a small park concession area (see figures in Chapter 3, *Project Description*, of this EIR).

[4] It should be noted that some improvements to the existing drainage system are already in progress, such as the San Francisco Public Utilities Commission's improvements to the combined sewer/storm line along Sunnydale Avenue that includes the intersection of Bayshore Boulevard and Sunnydale Avenue. These improvements will assist in alleviating some flooding issues. However, because SFPUC requirements do not permit Brisbane to discharge combined wastewater/drainage flows to SFPUC facilities, drainage from the Recology site drainage would be directed to a new separated drainage system that would keep stormwater separate from wastewater flows.

To further minimize flooding impacts, final design plans would include systemwide drainage improvements that accommodate all increased runoff in accordance with City of Brisbane SDMP requirements and correct known existing deficiencies as described above including the Levinson Overflow Area and the existing Brick Arch Sewer system The specifics for the CPP and CPP-V drainage plans would be developed as part of the required specific plan should either the CPP or CPP-V Concept Plan be selected by the City, but would similarly be required to adhere to City of Brisbane SDMP requirements.

Conclusion: Project Site development would result in changes to existing drainage patterns which could potentially result in flooding impacts onsite and offsite. **Mitigation Measures 4.H-4a, 4.H-4.b,** and **4.H-4c** would be required for Project Site development to avoid the significant impact of flooding onsite and offsite.

Mitigation

Mitigation Measure 4.H-4a: Prior to issuance of a building permit, all site-specific development plans within the Project Site shall include systemwide drainage improvements that shall accommodate all increased runoff in accordance with City requirements and correct known existing deficiencies (e.g., Levinson Overflow Area and the PG&E property). On-site storm drainage collection facilities shall be sized to convey the peak flow rate from a 25-year storm event entirely within the piping system. Drainage improvements shall accommodate the 100-year peak storm event within the piping system and streets such that building finished floor elevations provide a minimum of 1-foot of freeboard above the 100-year storm event hydraulic grade line water elevation with tidal flow and 100 years of estimated sea level rise. The proposed system design shall be submitted to the City Engineer for approval and shall hydraulically isolate existing drainage inlets fronting Levinson Overflow Area and the PG&E property from existing Brick Arch Sewer system.

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

Mitigation Measure 4.H-4b: Prior to issuance of a building permit, all site-specific development plans within the Project Site shall include additional conveyance capacity by incorporating new storm drain facilities along Bayshore Boulevard north of Industrial Avenue. Development plans shall also require addition of a new inlet near the Bayshore Boulevard and Industrial Way intersection that is large enough to intercept surface flows from Levinson Overflow Area and the PG&E property in accordance with and as approved by the City. Review and approval by the City engineer shall be required to confirm that conveyance capacity is sufficient to accommodate the 100-year peak storm event within the piping system and streets such that building finished floor elevations provide a minimum of 1-foot of freeboard above the 100-year storm event hydraulic grade line water elevation with tidal flow and 100 years of estimated sea level rise.

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

Mitigation Measure 4.H-4c: Prior to issuance of a building permit, all development plans in the Baylands shall include conveyance improvements to existing Visitacion Creek in the final drainage plan design and extend it further west of Tunnel Road to the Roundhouse area as approved by the City and in accordance with Army Corps of Engineers and California Department of Fish and Wildlife requirements. Improvements to tidal portions of Visitacion Creek will be made in accordance with requirements stipulated in permits from the BCDC. Project Site development and infrastructure design shall also incorporate a detention zone within the newly extended channel. Project Site development shall remove the existing Timber Box Culvert between Tunnel Road and the Caltrain mainline tracks and replace it with an open channel system prior to Project site development completion. The design shall accommodate increases in peak runoff during 100-year design storm event with tidal flow, and with consideration of estimated sea level rise over the next century and provide protection of new structures for human occupancy from the 100-year design storm event throughout and after Project Site development.

Conclusion with Mitigation: With the inclusion of **Mitigation Measures 4.H-4a, 4.H-4.b,** and **4.H-4c**, impacts related to onsite or offsite flooding would be less than significant.

Impact 4.H-5: Would the Project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM
SU = Significant Unavoidable SM = Significant but Mitigable LTS = Less than Significant - = no impact			

DSP, DSP-V, CPP, and CPP-V

Project Site development would result in a net increase of impervious area and therefore would result in increases in the peak volume of runoff generated onsite.

Exceedance of Storm Drainage System Capacity

The capacity of the existing stormwater system, specifically the Brick Arch Sewer, Visitacion Creek, Timber Box Culvert, and Bayshore Boulevard drainage system, is currently exceeded during large storm events in which runoff floods low-lying areas of the Bayshore Drainage Area including areas of the Project Site. Under current conditions, substantial improvements would be required to accommodate the 100-year peak storm event within drainage systems and streets with tidal flow and 100 years of estimated sea level rise.

Under all of the proposed development scenarios, Project Site development would include adding substantial increases in impervious surfaces as discussed above that would result in additional stormwater runoff volumes. Preliminary drainage calculations were prepared for the DSP and DSP-V scenarios demonstrating the lack of adequate capacity of the Project Site's existing storm drainage system, quantifying increases in runoff, and providing preliminary design for needed

drainage improvements (see **Appendix B**, *Infrastructure Plan*). While the CPP and CPP-V scenarios would result in a lesser increase in stormwater runoff than would the DSP and DSP-V scenarios, it would still exceed the capacity of the existing system, which does not have capacity to handle any increases in runoff rates and volumes as evidenced by existing problem areas.

As noted above, Project Site development design would incorporate upgrades to the existing storm drainage system in order to accommodate increases in runoff from the Project Site following proposed development. As noted above, future development would be required to safely convey the 25-year storm event entirely within the piping system, and accommodate the 100-year peak storm event within the piping system and streets such that building finished floor elevations provide a minimum of 1-foot of freeboard above the 100-year storm event hydraulic grade line water elevation with tidal flow and 100 years of estimated sea level rise. Additionally, as noted above, **Mitigation Measure 4.H-1c** requires a Final Stormwater Management Plan to be prepared and submitted to the City of Brisbane for approval prior to the submittal of any grading permits to meet the drainage criteria cited at the beginning of this paragraph. **Mitigation Measures 4.H-4a, 4.H-4b,** and **4.H-4c** also require improvements on specific areas of current undersized or inadequate facilities to meet this performance standard. Meeting the performance standard will involve calculation of increases in impervious surface area, the total estimated stormwater flows from the site, a detailed review of the stormwater treatment alternatives, hydraulic calculations, BMPs, system layouts, phasing, plans, and maintenance requirements in accordance with the City of Brisbane Stormwater Master Plan. The plan also would demonstrate compliance with the performance standards set in the EIR mitigation measures, as well as compliance with existing City of Brisbane stormwater regulations and policies and applicable Municipal Storm Water NPDES Permit requirements. According to modeling performed by BKF Engineers, the proposed infrastructure and Central Drainage Canal is capable of supporting the onsite 25-year design storm drain runoff without ponding and would reduce offsite flooding on Bayshore Boulevard for the 100-year storm event (BKF, 2011).

Conclusion: Project Site development would result in changes to existing drainage patterns that would result in flooding impacts onsite and offsite. **Mitigation Measures 4.H-4a, 4.H-4.b,** and **4.H-4c** establish criteria that new development would be required to meet to ensure adequate protection of uses onsite, including criteria for the performance of any stormwater conveyance improvements to avoid the significant impact of flooding onsite and offsite.

Polluted Runoff

Project Site development would introduce new impervious surfaces that would be the source of new stormwater runoff pollutants typical of urban settings, such as pollutants associated with automobiles (rubber residue from tires, oil, grease, gasoline, metals and other automotive fuels), which, if not managed appropriately, would violate water quality standards. The management of landscaped areas would also present the potential for runoff and/or infiltration of herbicides and pesticides. These types of common urban pollutants could be transported in runoff, potentially adversely affecting the quality of waters of receiving surface waters or groundwater. Nonpoint source pollutants would be washed by rainwater from rooftops and landscaped areas into onsite and local drainage networks. Runoff from landscaped areas, including roadway parkways, parks,

and other irrigated open space areas would carry various pesticides and herbicides typically used in landscape maintenance. Discharge of these source pollutants to the Bay could further impair the water quality of the Bay and would be considered a significant impact if not addressed in the Project Site development design and stormwater infrastructure.

The introduction of new paved areas, building rooftops, parking lots etc., would present the potential for accumulation and release of petroleum hydrocarbons, lubricants, sediments, and metals (generated by the wear of automobile parts). Pollutant concentrations in runoff from a site depend on numerous factors, including:

- Land use conditions;
- Implementation of BMPs;
- Site drainage conditions;
- Intensity and duration of rainfall; and
- Climatic conditions preceding a rainfall event.

However, in general, existing local stormwater management plans and policies, and State Water Board requirements, which implement CWA requirements, would minimize the creation of pollution generating surfaces. CWA Section 402 NPDES MS4 permits require stormwater management plans, which in turn require source and treatment control measures. NPDES MS4 requirements include measures to reduce the severity of impacts by requiring stormwater drainage control/ LID design measures that are in compliance with RWQCB Municipal Regional Stormwater Permit Order No. 2011-0083 Provision C.3 (Provision C.3). As required by Provision C.3, for new development that would introduce 10,000 square feet of new impervious surfaces, the specific project applicant would incorporate LID strategies, such as stormwater reuse, onsite infiltration, and evapotranspiration as initial stormwater management strategies. Secondary methods would include the use of natural, landscape based stormwater treatment measures, as identified by Provision C.3. Treatment control measures may include use of vegetated swales and buffers, grass median strips, detention basins, wet ponds, or constructed wetlands, infiltration basins, and other measures. Filtration systems may be either mechanical (e.g., oil/water separators) or natural (e.g., bioswales and settlement ponds). Redevelopment projects may even result in improved water quality compared to existing conditions where existing development was constructed under older less stringent stormwater requirements.

The City of Brisbane operates under the 2011 RWQCB San Francisco Bay Region Municipal Regional Stormwater NPDES MS4 Permit (Order R2-2011-0083, NPDES Permit No. CAS612008). As required by the permit, the City implements specific BMPs to help reduce pollutants and eliminate non-stormwater discharges to the storm drain system (RWQCB, 2011). As described above, Project Site development would be required to comply with Provision C.3 of NPDES Permit No. CAS612008 to include operational BMPs such as LID measures to minimize the potential impact from polluted stormwater runoff, including:

- **Source Control Requirements**

  Source control measures are required, at a minimum, to include the following:

- Minimize stormwater pollutants of concern in urban runoff through measures that may include plumbing of the following discharges to the sanitary sewer:
  - Discharges from indoor floor mat/equipment/hood filter wash racks or covered outdoor wash racks for restaurants;
  - Dumpster drips from covered trash, food waste and compactor enclosures;
  - Discharges from covered outdoor wash areas for vehicles, equipment, and accessories;
  - Swimming pool water, if discharge to onsite vegetated areas is not a feasible option; and
  - Fire sprinkler test water, if discharge to onsite vegetated areas is not a feasible option;
- Properly designed covers, drains, and storage precautions for outdoor material storage areas, loading docks, repair/maintenance bays, and fueling areas;
- Properly designed trash storage areas;
- Landscaping that minimizes irrigation and runoff, promotes surface infiltration, minimizes the use of pesticides and fertilizers, and incorporates other appropriate sustainable landscaping practices and programs such as Bay-Friendly Landscaping;
- Efficient irrigation systems; and
- Storm drain system stenciling or signage.

- **Site Design and Stormwater Treatment Requirements**
  - Implement at least the following onsite:
    - Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
    - Conserve natural areas, including existing trees, other vegetation, and soils;
    - Minimize impervious surfaces;
    - Minimize disturbances to natural drainages; and
    - Minimize stormwater runoff through one or more of the following:
      - Direct roof runoff into cisterns or rain barrels for reuse.
      - Direct roof runoff onto vegetated areas.
      - Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
      - Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
      - Construct sidewalks, walkways, and/or with permeable surfaces.
      - Construct driveways, bike lanes, and/or uncovered parking lots with permeable surfaces.

- Treat runoff with LID treatment measures.
    - LID treatment measures are harvesting and re-use, infiltration, evapotranspiration, or biotreatment.
    - A properly engineered and maintained biotreatment system may be employed only if it is infeasible to implement onsite harvesting and re-use, infiltration, or evapotranspiration.

Conclusion: Project Site development would result in creation of new impervious surfaces that would increase stormwater runoff volumes and present potential sources of polluted runoff. This would result in a significant impact. Implementation of **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4b, 4.H-4c** and **4.H-5** is recommended to reduce this impact to a less-than-significant level.

Mitigation

Mitigation Measure 4.H-5: Prior to issuance of an occupancy permit for site-specific development within the Project Site, an integrated pest management plan shall be prepared and implemented, subject to City review and approval, to set forth a preventative, long-term, low toxicity program to control pests. The plan shall provide guidelines for landscape and building maintenance with the emphasis on minimizing the use of pesticides while controlling pests. At a minimum, the integrated pest management plan shall include:

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

- ***Identification of acceptable pest levels*** (action thresholds) with an emphasis on *control*, not *eradication*, identifying site and pest specific action thresholds, and the controls to be use if those thresholds are exceeded.
- ***Preventive practices*****:** Design, construction, and maintenance of landscape facilities, and buildings, as well as operation of uses that prevent or minimize pest problems.
- ***Monitoring*****:** Regular observation, including inspection and identification.
- ***Mechanical controls*****:** Should a pest reach an unacceptable level, provide for mechanical methods as the first options, including include simple hand-picking, erecting insect barriers, using traps, vacuuming, and tillage to disrupt breeding.
- ***Biological Controls*****:** Provide for use of natural biological processes and materials for control, including promoting beneficial insects that prey on eat target pests and biological insecticides derived from naturally occurring microorganisms.
- ***Responsible Pesticide Use*****:** Provide for use of synthetic pesticides generally only as required when preferred methods are infeasible or ineffective, including use of the least toxic pesticide that will do the job and is the safest for other organisms and for air, soil, and water quality; use of pesticides in bait stations rather than sprays; or spot-spraying rather than general application.

Conclusion with Mitigation: With the inclusion of **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4.b, 4.H-4c**, and **4H-5**, the stormwater drainage design would be required to minimize potential

sources of pollution such that impacts related to increased stormwater runoff and polluted runoff would be less than significant for Project Site development.

Impact 4.H-6: Would the Project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	-	-

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

CPP and CPP-V

The CPP and CPP-V propose no residential development and therefore would have no impact in relation to this criterion.

DSP and DSP-V

Flood Insurance Rate Maps prepared by FEMA (Community-Panel Number 0603140001B) for the Project Site region have been recently updated in 2013. The current approved FEMA maps show only areas along Visitacion Creek and between Bayshore Boulevard and Industrial Way that are within the 100-year flood hazard area; the maps for the remaining areas of the Project Site are shown as being outside the 100-year flood hazard area. A detailed analysis completed for the Brisbane Storm Drainage Master Plan in 2003 identifies additional low-lying areas that may be flooded during a 100-year storm event (RBF, 2003). These include an area between Bayshore Boulevard and the railroad tracks, and portions of Bayshore Boulevard adjacent to the Project Site (RBF, 2003).

The DSP and DSP-V scenarios propose housing in areas that have been mapped as 100-year flood hazard areas based on existing topography. However, these areas are prone to flooding primarily due to insufficient capacities in the existing drainage system, which would be corrected through implementation of **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4b,** and **4.H-4c,** as well as regulatory compliances discussed in Impact 4.H-1, Impact 4.H-3 and Impact 4.H-4. In addition, the finished floor elevations for housing under the DSP and DSP-V scenarios are proposed to be 13 feet and higher than current ground levels, which would be well above the existing flood-prone areas. Therefore the potential for flooding is considered low.

Conclusion: Development that would occur under the DSP and DSP-V scenarios would construct housing in areas currently mapped as within the 100-year flood zone. As mentioned above, **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4b,** and **4.H-4c,** which is recommended under all four proposed development scenarios, would require a Final Stormwater Management Plan and improvements to existing system deficiencies as mentioned above.

Conclusion with Mitigation: With the inclusion of **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4.b,** and **4.H-4c**, impacts related to placement of housing in a 100-year flood zone would be less than significant under the DSP and DSP-V scenarios.

Impact 4.H-7: Would the Project place structures within a 100-year flood hazard area that would impede or redirect flood flows?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM= Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Project Site development would allow construction of structures in areas between Bayshore Boulevard and the Caltrain tracks that, as described under Impact 4.H-6 above, could become flooded during a 100-year storm event. As also discussed under Impact 4.H-4 above, Project Site development would be required to improve the existing system conveyance capacity to reduce flooding onsite and offsite.

With incorporation of the design features described above under Impact 4.H-4 and in Section 4.O, *Utilities, Service Systems, and Water Supply*, of this EIR, placement of fill materials that raises ground elevations to minimum requirements above flood zone levels, along with implementation of applicable agency permitting requirements, Project Site development would not result in significant environmental effects related to placing structures within a 100-year flood hazard area that would impede or redirect flood flows.

Conclusion: Development that would occur under the all of the proposed scenarios would construct structures in areas currently mapped as within the 100-year flood zone. As mentioned above, **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4b,** and **4.H-4c** would require a Final Stormwater Management Plan and improvements to existing system deficiencies as mentioned above. Implementation of these mitigation measures is recommended under all four proposed development scenarios to reduce impacts related to the placement of structures within the flood zone.

Conclusion with Mitigation: With the inclusion of **Mitigation Measures 4.H-1c, 4.H-4a, 4.H-4.b,** and **4.H-4c**, impacts related to placement of structures in a 100-year flood zone would be less than significant under Project Site development.

Impact 4.H-8: Would the Project expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
SM	SM	SM	SM

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Flooding Due to Levee or Dam Failure

The Project Site is located adjacent to the Levinson Overflow Area (the off-channel detention basin located at the northwest corner of Main Street and Bayshore Boulevard). This detention basin is designed to detain high flows during large storm events and alleviate downstream flows. When flows reach elevations above the weir, water is redirected into the Levinson Overflow Area. The weir elevation of the Levinson Overflow Area eastern berm is 11.8 feet National Geodetic

Vertical Datum 29 (NGVD 29). Under existing conditions, during a 100-year design storm event, the water surface elevation reaches 12.52 feet, which is approximately 1.48 feet below the surrounding lowest proposed pad elevation (BKF, 2011). Therefore, even if the berm were to fail during a 100-year storm event, flows would flood Bayshore Boulevard and surrounding areas that are below 12.52 feet but would not inundate proposed structures which would have finished floor elevations of at least 14 feet. In addition, Project improvements to drainage capacities of the system that incorporate Levinson Overflows would also reduce the potential for flooding in this area.

Conclusion: According to maps compiled by the Association of Bay Area Governments, the Project Site is not otherwise located in any inundation area for any dams or reservoirs (ABAG, 2012). Therefore, impact due to failure of a levee or dam would be less than significant for Project Site development.

Flooding Due to Sea Level Rise

Project Site development could expose people or structures to flooding or tidal events that may result from rising sea levels.

Over the last 100 years, the temperature of the earth's surface has risen approximately 0.6 degree Celsius (1.8 degrees Fahrenheit). Global warming causes melting of the earth's glaciers and polar ice fields, as well as thermal expansion of the upper layers of the ocean, which increases the volume of water. Historically, global sea level has been rising at a rate of 0.5 to 0.6 foot per century. Over the past decade there has been a growing concern that increased emissions of carbon dioxide and other greenhouse gasses will cause an increase in global temperature that could accelerate the rate of sea level rise.

Such increases in sea level, if sustained over long periods of time (e.g., 50 to 100 years or more), could create or exacerbate existing coastal flooding hazards for the Project Site by elevating mean sea levels. The most recent region-specific estimate from BCDC predicts an increase of 16 inches by mid-century and 55 inches at the end of century. BCDC models indicate that an 11.8-inch rise in sea level would shift the 100-year storm surge-induced flood event to once every 10 years.

It is not possible to project exactly what the future effects of sea level rise will be within the Brisbane Baylands, largely due to the uncertainty surrounding groundwater movements that would occur in response to gradual rise in sea level (LaClair, 2012). BCDC is currently researching this issue, but has not completed that work (LaClair, 2012). The storm drainage model prepared by BKF Engineers uses a tidal cycle with a maximum elevation of 6.0 feet (NGVD 29) overlapped with the 100-year storm event when developing the water levels and hydraulic grade line within Visitacion Creek. A model was completed by BKF to assess the impacts of sea level rise on the water levels in Visitaction Creek as part of the conceptual drainage plan for the DSP and DSP-V scenarios (BKF, 2011). When the anticipated sea level rise is incorporated into the model, the maximum 100-year water surface elevation in Visitacion Creek at the Roundhouse rises to approximately 9.9 feet by mid-century and 11.9 feet by the end of the century compared to the lowest elevation of 14 feet for any proposed structure (BKF, 2011). The Roundhouse itself is at a sufficiently high elevation as to

not be affected by sea level rise and other existing lower lying existing structures that could be affected are proposed for demolition.

As noted in Section 4.G, *Hazards*, sea level rise may cause changes to groundwater conditions at the Project Site, although it is not possible to project exactly what future effects would be (LaClair, 2012). Water infiltration from either groundwater or flood waters from the Bay could potentially mobilize contaminants and affect water quality of the surrounding groundwater and even the Bay. However, the Project Site as well as some surrounding areas are currently under cleanup orders from the RWQCB and the Department of Toxic Substances Control. Final landfill closure and remediation would not occur until the potential exposure risk from any remaining contamination has been reduced to less-than-significant levels and would incorporate the potential for higher groundwater levels due to sea level rise.

According to the conceptual grading plan for the Project Site (see Appendix B of this EIR), development of the Project Site would re-grade the low-lying portions of the Project Site by adding fill materials so that the site would be more resilient to flooding from sea level rise. The mounded elevation of the landfill area from decades of use as a municipal landfill and clean fill storage area has already raised the area out of the projected 55-inch sea level rise flood zone. The grading plan would also provide additional soil to be imported to the western portion (former railyard) of the Project Site would protect the upland portions of the site from flooding due to sea level rise. Lower-lying areas would be part of the proposed open space network, or include substantial landscaped areas, which would provide areas for stormwater filtration. In addition, as required by **Mitigation Measure 4.H-8**, development would require compliance with BCDCs Bay Plan policies related to sea level rise for areas located within their jurisdiction.

Conclusion: Over time, Project Site development could be subject to impacts related to sea level rise. Implementation of **Mitigation Measure 4.H-8** is recommended to avoid impacts related to the exposure of people or structures to a significant risk of loss, injury, or death involving flooding.

Mitigation

Mitigation Measure 4.H-8: Concurrent with submittal of development applications, site-specific development projects within the area south of the proposed Geneva extension shall submit design plans along with a Sea Level Rise Risk Assessment Report to the City. Site specific development projects within portion of the Project Site under BCDC jurisdiction shall submit design plans and a Sea Level Rise Risk Assessment Report to BCDC in accordance with the most current San Francisco Bay Plan policies. Site-specific development within the Project Site shall incorporate protection measures that demonstrate ability to handle the flood levels expected by mid-century in accordance with the San Francisco Bay Plan. Any BCDC requirements after review of the Sea Level Rise Risk Assessment report shall also be incorporated into Project design prior to issuance of a building permit. Sea level rise analyses shall be based on the California Climate Action Team's sea level rise projections for the West Coast, unless otherwise substantiated to the satisfaction of BCDC. For site-specific development projects

Mitigation Measure Applicability by Scenario			
DSP	**DSP-V**	**CPP**	**CPP-V**
✓	✓	✓	✓
✓ = measure applies - = measure does not apply			

within the area subject to BCDC jurisdiction, discretionary permits from the City such as grading or building permits shall be obtained prior to final approval of the BCDC permit.[5]

Conclusion with Mitigation: With the inclusion of **Mitigation Measure 4.H-8**, implementation of Project Site development would not result in significant environmental impacts related to sea level rise and this impact would be less than significant**.**

Overall Conclusion

Impacts related to failure of a levee or dam would be less than significant for all four scenarios. With implementation of **Mitigation Measure 4.H-8**, environmental impacts related to sea level rise would be less than significant for all four scenarios.

Impact 4.H-9: Would the Project expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?

Impact Significance by Scenario (before Mitigation)			
DSP	**DSP-V**	**CPP**	**CPP-V**
LTS	LTS	LTS	LTS

SU = Significant Unavoidable
SM = Significant but Mitigable
LTS = Less than Significant
- = no impact

DSP, DSP-V, CPP, and CPP-V

Tsunami and Seiche Impacts

According to FEMA, tsunamis are a series of large waves created by an underwater disturbance such as an earthquake, landslide, volcanic eruption, or meteorite. A tsunami can move hundreds of miles per hour in the open ocean and reach land with waves as high as 100 feet or more. According the United States Geological Survey, a seiche is a standing wave in an enclosed or partly enclosed body of water. Seiches are normally caused by an earthquake or high wind activity and can affect harbors, bays, lakes, rivers and canals. Coastal developments are sometimes at risk of inundations associated with tsunamis or other large wave events.

A total of 51 tsunamis have been recorded or observed within the San Francisco Bay since 1850 (CGS, 2005).[6] Of these, only the tsunamis generated by the 1960 Chile earthquake and the 1964 Alaska earthquake caused damage in San Francisco Bay. The 1964 tsunami event caused the most damage of the two most notable events and had a recorded amplitude of approximately 3.7 feet at

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5 Depending on the site specific development project, BCDC would issue one of three types of permits:

Regionwide Permit for *routine maintenance* work that qualifies for approval under an existing Commission regionwide permit can be authorized by the Commission's executive director without Commission review or a public hearing.

Administrative Permit can be issued for an activity that qualifies as a *minor repair or improvement* without a public hearing on the application. The project is reviewed against the same policies that are used to determine whether a major permit can approved.

Major Permit A major permit is issued for work that is more extensive than a minor repair or improvement. A public hearing is held on an application for a major permit and the application may be reviewed at hearings held by the engineers and designers who advise the Commission.

6 This total does not include the more recent March 2011 earthquake in Japan, which produced a small but noticeable tsunami wave that entered the Bay.

the Presidio in San Francisco. According to newspaper articles in the San Francisco Chronicle (March 29, 1964) and Marin Independent Journal (March 30, 1964), damage in San Francisco Bay was largely to small boats.

Given the history of tsunamis in San Francisco Bay which has never reported any significant damage, the risk of a tsunami exceeding the height observed in 1964 at the Project Site is considered low (CGS, 2005). The potential hazard related to tsunamis within San Francisco Bay has been analyzed in regional studies and mapped for South San Francisco USGS quadrant which shows no inundation areas that coincide with the Project Site (CalEMA, 2009). As noted, the finished floor elevation of Project Site development would be 14 feet and higher. Therefore, the risk of flooding due to a tsunami event is considered low, and the impact would be less than significant.

The Project Site is located in the western part of San Francisco Bay, which is not subject to potential flooding by wind-induced seiches because of the predominant eastward winds. In addition, no seismically induced seiche waves have been documented in the Bay.

Mudflow Impacts

The Project Site is located in a relatively low-lying area in a developed urbanized region that is not susceptible to mudflows, and therefore the impact of Project Site development would be less than significant.

Conclusion: Project Site development would not expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow. Therefore, this impact would be less than significant.

References – Surface Water Hydrology and Water Quality

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