4.8 HYDROLOGY AND WATER QUALITY

INTRODUCTION

This section provides a discussion of existing conditions related to climate, water resources, hydrology, and water quality within the vicinity of the project site, including the extent and quality of surface water and groundwater, runoff and drainage patterns, and flood conditions. Following the existing conditions discussion is a summary of the regulatory framework related to water resources. The significance criteria, which are used to determine whether the project would result in significant impacts to water resources, are listed. Finally, potential impacts to the water resources and hydrology that could result from the project are described. The hydrologic and water quality impacts of filling the pond as part of project construction are included in this section. Additional discussion of impacts of filling the pond related to wildlife habitat is included in Section 4.3, Biological Resources.

ENVIRONMENTAL SETTING

Existing conditions related to water resources, hydrology, and water quality are described below.

CLIMATE

The project site has a mild Mediterranean climate with long, dry, warm summers and cooler, rainy winters. The vast majority of precipitation occurs between October and May. Based on historical weather data from stations near the project site, the mean annual precipitation ranges from 37 to 47 inches (WRCC, 2014a; WRCC, 2014b). The mean daily high temperature is around 71 degrees Fahrenheit (ºF) with the mean daily low temperature around 45 ºF (WRCC, 2014a).

GROUNDWATER RESOURCES

The project site is located in the San Francisco Bay Central Hydrologic Planning Area, as defined in the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) prepared by the San Francisco Bay Regional Water Quality Control Board (RWQCB, 2013). The project site is located within the Ross Valley Groundwater Basin (Subbasin No. 2-28). This basin is bounded by San Francisco Bay to the east and Corte Madera Creek to the north, and has a surface area of approximately 2.8 square miles (DWR, 2003). Geotechnical investigations indicate that groundwater is typically encountered at 5 to 10 feet below ground surface (bgs) but could be encountered as shallow as 4 feet bgs after periods of heavy rain (Miller Pacific, 2013).

Existing and potential beneficial uses of the Ross Valley Groundwater Basin include municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply. Although the Basin Plan lists it as a beneficial use, groundwater resources from the local groundwater basin area are not used for drinking water (Town of Corte Madera, 2008).

SURFACE WATER RESOURCES

A man-made pond, sometimes referred to as Edgewater Lagoon or the Inn Pond, is located in the northeastern portion of the project site. The pond is irregularly shaped and approximately 300 feet long by 160 feet wide, with a depth of about 7 feet. The pond is fed by a 30-inch stormwater pipe that connects to Lagoon #1 (see **Figure 4.8-1**). The stormwater pipe has no gates or pumps, so gravity maintains the surface level of the pond and Lagoon #1 at equal elevation. A slide gate is located near the north end of the pond (see Figure 4.8-1) which can be opened to allow water from the pond (and the connected Lagoon #1) to flow to a Caltrans drainage ditch which is connected to Shorebird Marsh, east of Highway 101. Under certain conditions, the slide gate can be used to drain water from Shorebird Marsh into the pond. In practice, the gate is not used and would only be opened during emergency flood conditions (Town of Corte Madera, 2005).

The pond was developed in the late 1950s, during the same period when the project site was filled and the existing hotel was initially developed (Miller Pacific, 2013). Topographic mapping performed in 1971 shows that the northern end of the pond was historically part of a major slough system that connected marshlands to San Francisco Bay (Town of Corte Madera, 2005). Based on this history, the pond is considered a "jurisdictional water" in accordance with Sections 401 and 404 of the federal Clean Water Act, and modifications to the pond are subject to requirements of the United States Army Corps of Engineers (Corps) and Regional Water Quality Control Board (RWQCB), discussed further under "Regulatory Framework" below.

The pond is part of the Town's stormwater management and flood control system, described in more detail in the next subsection. During periods of dry weather, Lagoon #1 is regularly flushed by Town staff by opening sluice gates and pumps with the High Canal (see Figure 4.8-1) and allowing tidal action to partially drain and refill the lagoon. The project site pond drains and refills during these actions, but due to limitations of the flood control system including the limited capacity of the stormwater pipe between the pond and Lagoon #1, the flushing action is less effective for the pond. Accordingly, water quality in the pond is fresh to slightly brackish during the winter months and brackish to saline during the rest of the year (Town of Corte Madera, 2005). In the summer the pond's diminished water quality results in odor complaints (Town of Corte Madera, 2005).

Water from the pond and Lagoon #1 that is discharged to the High Canal empties into Corte Madera Creek, approximately 0.65 mile north of the project site, and ultimately to San Francisco Bay. San Anselmo Creek and Ross Creek to the northwest join to form Corte Madera Creek, which is the largest stream in Marin County. Corte Madera Creek drains the Ross Valley Watershed, which includes 44 miles of stream channels and has an area of 24.7 square miles (Marin County Watershed Program, 2014).

The Basin Plan lists beneficial uses for the San Francisco Central Bay Region, which includes Corte Madera Creek and San Francisco Bay. Existing and potential San Francisco Bay beneficial uses include industrial service supply, industrial process supply, commercial and sport fishing, shellfish harvesting, estuary habitat, fish migration, preservation of rare and endangered species, fish spawning, wildlife habitat, water contact recreation, noncontact water recreation, and navigation (RWQCB, 2013).

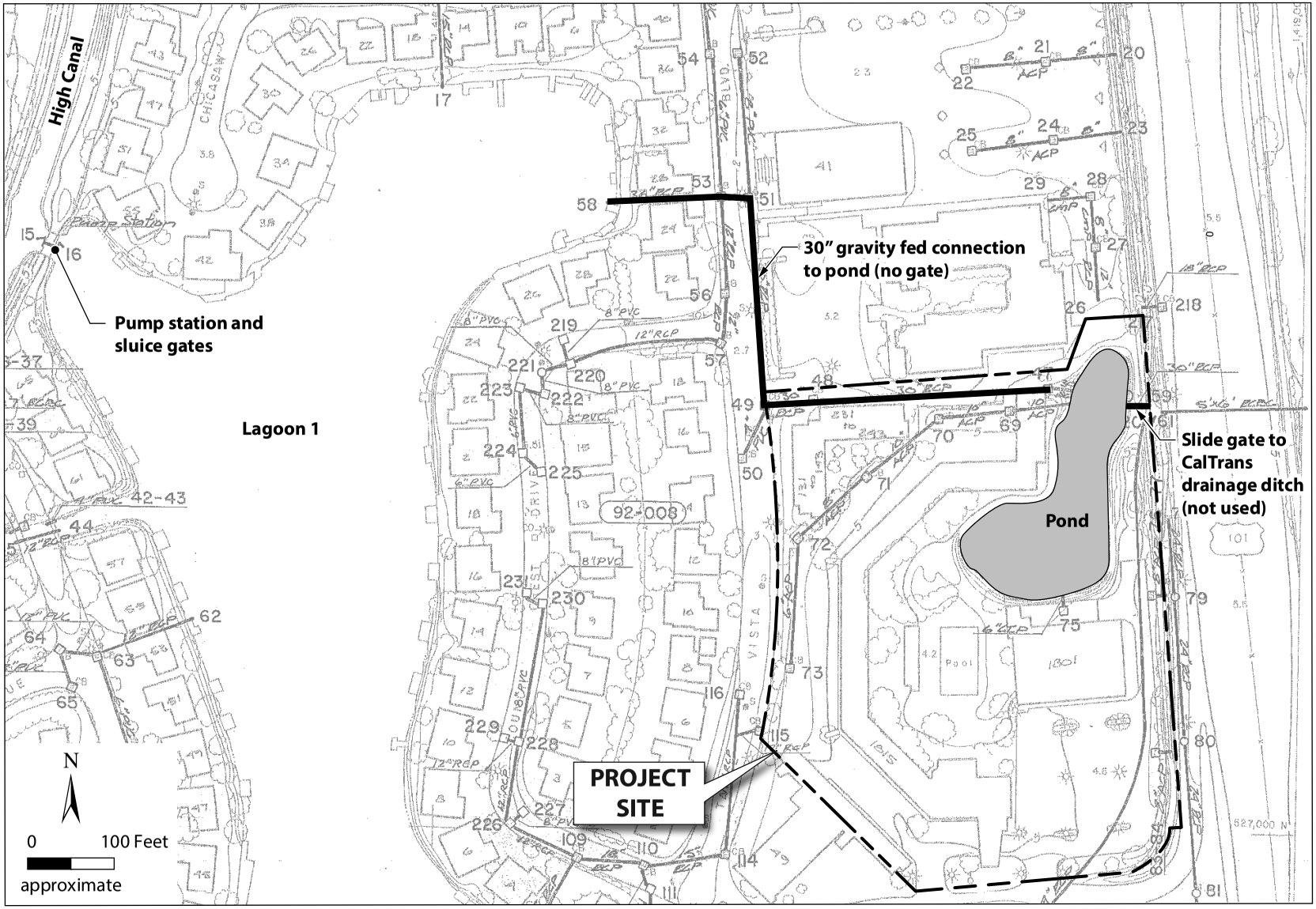

Figure 4.8-1

TOWN STORM WATER AND FLOOD CONTROL INFRASTRUCTURE NEAR THE PROJECT SITE

SOURCE: Town of Corte Madera and Baseline Environmental, 2014

Corte Madera Creek's existing and potential beneficial uses include cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, wildlife habitat, water contact recreation, and noncontact water recreation (RWQCB, 2013).

FLOOD ZONES

The project site is located in a 100-year flood zone mapped by the Federal Emergency Management Administration (FEMA) (FEMA, 2014). The base flood elevation for the project site is 9 feet North American Vertical Datum (NAVD)[1]. This indicates that there is a one percent chance each year for flood waters to reach or exceed an elevation of 9 feet NAVD (or approximately 6 feet above mean sea level) at the project site. Since the project site elevation is 5 to 8 feet (NAVD) (Miller Pacific, 2013), this suggests a one percent chance each year of flood waters covering the ground surface to a depth of 1 to 3 feet.

FEMA is currently in the process of updating the Flood Insurance Rate Maps (FIRM) for Marin County. The preliminary FIRM being processed by FEMA increases the base flood elevation to 10.0 NAVD, or 1 foot higher than the existing elevation. It's anticipated that this preliminary FIRM will become effective in late 2015.

HISTORIC FLOODING

Flooding in the lowlands of Corte Madera, such as at the project site, typically occurs during heavy storms that coincide with high tides, when the high water levels inhibit normal stormwater drainage to San Francisco Bay (Town of Corte Madera, 2008). The worst flooding in recent history occurred during January 1982, during a peak tide, when floodwaters closed San Clemente Drive, to the southeast of the project site, and flooded stores in the Paradise Shopping Center (Town of Corte Madera, 2008). As a response to this event and other flooding problems, the Town has overseen $30 million in improvements to its stormwater drainage and flood control system.

STORMWATER DRAINAGE AND FLOOD CONTROL SYSTEM

The Town has been divided into 10 separate watersheds for the management of storm drainage. The watersheds drain via nine local pump stations and/or the storm drainage network to Corte Madera Creek, San Clemente Creek, or directly to wetlands adjacent to San Francisco Bay.

The project site is located within Watershed 1, and the key components of the stormwater drainage system near the project site include Lagoon #1, the High Canal, and a pump station at the junction of Lagoon #1 and the High Canal (see Figure 4.8-1). During summer months, when significant precipitation is unlikely, the water level in Lagoon #1 is maintained at 0.1 feet (Town of Corte Madera, Storm Water and Water Quality Management Policy, Oct. 2001)). During winter months, the water level is maintained at -0.2 feet and, prior to a precipitation event, the Town Engineer opens six 24-inch gates between Lagoon #1 and the High Canal to reduce the water level in Lagoon #1 to -1.9 feet. As the pond at the project site is connected to Lagoon #1, this reduces the water level in the project site pond to the same elevation.

[1] Mean sea level at the project site is approximately 2.7 feet below the NAVD datum.

The reduction in water level in Lagoon #1 takes approximately 2 hours to complete (Kramer, 2014). Lagoon #1 has a surface area of 9.2 acres and the project site pond has a surface area of 0.64-acre (a combined area of 9.85 acres or approximately 429,000 square feet), so reducing the water level in Lagoon #1 from -0.2 to -1.9 feet requires the draining of approximately 730,000 cubic feet of water. This is equivalent to a discharge rate of approximately 100 cubic feet per second (cfs) over the 2 hour drainage time. The Lagoon #1 pump station also has four pumps with a designed discharge rate of 45 cfs, and an actual operating capacity of 59 cfs (CSW/Stuber-Stroeh, 2005), though these are not used during normal operations (Kramer, 2014).

TSUNAMI AND SEICHES

A tsunami is a large ocean wave generated by an earthquake in or near the ocean. A seiche is an earthquake-generated wave within a large, enclosed body of water, such as a reservoir or lake. According to planning-level tsunami information maps produced by the California Emergency Management Agency (CalEMA), the project site is not located in an area that could potentially require evacuation during a tsunami (CalEMA, 2009). There are no large enclosed bodies of water likely to generate a significant seiche at or near the project site (Miller Pacific, 2013).

SEA LEVEL RISE

A predicted rise in sea levels will exacerbate already existing coastal flooding hazards in the project site vicinity over the next century. Over the last few decades, the rate of sea level rise has been accelerating. Between 1961 and 2003, global sea level rose by an average of 0.07 inch per year, while from 1993 to 2003 the rate has increased to 0.12 inch per year (BCDC, 2011). The San Francisco Bay Plan from the San Francisco Bay Conservation and Development Commission (BCDC) anticipates a rise in Bay waters of 16 inches by 2050 and 55 inches by 2100. Mapping by BCDC has indicated that flooding hazards at the project site may increase due to sea level rises of these magnitudes (BCDC, 2011). This mapping is based on elevation and existing flood hazard zone data, and does not predict specific flooding issues at the project site or the ability of the Town's stormwater management and flood control system to address higher sea levels. However, it does indicate that additional measures may be required in the project site vicinity to address flooding hazards in the future.

BCDC, in partnership with the federal National Oceanic and Atmospheric Administration (NOAA), is sponsoring the Adapting to Rising Tides (ART) pilot program, which aims to aid local governments in planning for sea level rise over the next century. The ART program has developed assessment of existing conditions and vulnerabilities and is currently developing and evaluating adaptation strategies.

The Town of Corte Madera, through its General Plan policies and implementation measures, has committed to coordinating with BCDC and FEMA and incorporating the latest climate change science in evaluating and mitigating future flooding hazards related to sea level rise. These provisions are listed in more detail under "Regulatory Framework" below.

DAM INUNDATION AREAS

The project site is not located in a mapped dam inundation area (ABAG, 2003).

WATER QUALITY

A review of published information by the California Department of Water Resources did not identify any information regarding the quality of groundwater in the Ross Valley Groundwater Basin that underlies the project site, though limited reports in 1972 suggested that salt-water intrusion may have affected groundwater quality in the lower portions of the basin, including the project site vicinity (DWR, 2003). No water quality data are available for the project site pond, though anecdotally the pond water becomes increasingly brackish during the summer months, spawning odor complaints (Town of Corte Madera, 2005).

Like many San Francisco Bay Area urban creeks, Corte Madera Creek is on the Clean Water Act Section 303(d) list of impaired waters due to diazinon and is subject to the Total Maximum Daily Load (TMDL) for diazinon and pesticide-related toxicity (SWRCB, 2006). The TMDL for all San Francisco Bay Area urban creeks was incorporated as a Basin Plan amendment by the RWQCB in November 2005 through Order R2-2005-0063, which was ultimately approved by the United States Environmental Protection Agency (U.S. EPA) in May 2007. As the TDML was being developed by the RWQCB, it became clear that replacements for diazinon (such as pyrethroids) would pose similar water quality and sediment concerns as diazinon, so the TDML was designed to address pesticide-related aquatic toxicity in general. Corte Madera Creek has no other listing of impairments.

REGULATORY FRAMEWORK

FEDERAL AND STATE

The Federal Clean Water Act (CWA) is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. In general, the CWA prohibits discharges to surface waters unless specifically authorized by a permit. These permits are administered by federal and state agencies, including the Corps and RWQCB. Specific sections of the CWA that apply to the project are discussed in more detail below.

Sections 401 and 404 – Waste Discharge and Dredge or Fill Disposal

Under Section 401 of the CWA, every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certifications that the proposed activity will comply with state water quality standards. For the proposed project, which proposes to fill a pond, the project applicant must file a Report of Waste Discharge with the RWQCB and receive a CWA Section 401 water quality certification.

Under Section 404 of the CWA, the Corps regulates any fill or discharge into all "waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." This includes "other waters such as rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, [or] ....impoundments."

The RWQCB has adopted the U.S. EPA's Section 404(b)(1), "Guidelines for Specification of Disposal Sites for Dredge or Fill Material," dated December 24, 1980, in the Basin Plan. These guidelines prohibit all discharges of fill material into regulated waters of the United States unless a discharge, as proposed, constitutes the least environmentally damaging practicable alternative that will achieve the basic project purpose.

Section 402 – Stormwater Program Requirements

Pursuant to Section 402 of the CWA and the California Porter-Cologne Water Quality Control Act, municipal stormwater discharges at the project site are regulated under the statewide National Pollutant Discharge Elimination System (NPDES) General Permit for the Discharge of Storm Water from Small Municipal Separate Storm Sewer Systems (Small MS4 Permit). Locally, the NPDES program is overseen by the RWQCB. The Marin County Stormwater Pollution Prevention Program (MCSTOPPP) assists cities, towns, and Marin County with coordination and consistency of approaches across the County in implementing the RWQCB requirements.

Operation of the project would be subject to compliance with requirements of the MS4 permit. For projects completed after July 1, 2015, these requirements would be based on the State Water Resources Control Board's Phase II Small Municipal Separate Storm Sewer Systems (MS4s) Permit, issued in February 2013 by Order 2013-0001-DWQ. Projects considered complete by June 30, 2015 are subject to the similar requirements of the previous MS4 permit.

Section E.12 of the 2013 Phase MS4 Permit addresses requirements for retention and treatment of stormwater generated by development projects. If the project creates or replaces more than 2,500 square feet of impervious surfaces, the proposed project would be subject to these requirements. Attachment 4 of the previous MS4 permit applies to development projects creating 5,000 square feet of outdoor parking with 25 or more spaces, so would apply to the project if completed before June 30, 2015. Section E.12 and Attachment 4 both require preparation of a Stormwater Control Plan (SCP). The SCP must include measures to capture and treat runoff from impervious surfaces. The SCP must incorporate site design measures to reduce project site runoff, such as porous pavement, green roofs, or vegetated swales.

Additional stormwater requirements apply to construction sites. The SWRCB adopted an NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit) (Order No. 2009-0009-DWQ, NPDES No. CAR000002) on September 2, 2009, as amended by Orders No. 2010-0014-DWQ and 2012-0006-DWQ. To obtain coverage under the Construction General Permit, a discharger must submit to the SWRCB, a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit.

Construction activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation, that result in soil disturbances of at least 1 acre of total land area (or smaller sites that are part of a common plan of development or sale that disturbs more than one acre of land surface). A SWPPP must be prepared by a Qualified SWPPP Practitioner (QSP) that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is 1) to help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges, and 2) to describe and ensure the implementation of best management practices (BMPs) to reduce or eliminate sediment and other

pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. The Construction General Permit mandates certain requirements based on the risk level of the project (Level 1, Level 2, or Level 3), which is based on the risk of sediment discharge and the receiving water risk.

The SWPPP must also include a Construction Site Monitoring Program. The monitoring program includes, depending on the project risk level, visual observations of site discharges, water quality monitoring of site discharges (pH, turbidity, and non-visible pollutants, if applicable), and receiving water monitoring (pH, turbidity, suspended sediment concentration, and bioassessment).

LOCAL

Corte Madera Municipal Code

Title 16, Chapter 16.10 of the Corte Madera Municipal Code includes provisions to protect development projects from flooding hazards. These include requirements for all development projects within flood hazard zones to be built with finished floors at least one foot above FEMA established flood elevations.

Corte Madera's Municipal Stormwater Ordinance is located under Title 9 of the Town's Municipal Code, Chapter 9.33, Urban Runoff Pollution Prevention Ordinance. It requires stormwater protection measures for stormwater discharges not regulated under an NPDES permit. It includes prohibitions on littering, housekeeping standards for parking lots and similar structures, and requirements for implementation of BMPs for new development and redevelopment projects.

Corte Madera General Plan

The following policies and implementation measures related to hydrology and water quality from the Town of Corte Madera General Plan would apply to the project:

Policy F-1.1: Develop and maintain an ongoing planning process that shall be the basis for flood control projects and managing development in flood prone areas of the community.

Implementation Program F-1.1.a: Master Plan. Continue to administer the Storm Drainage Master Plan. The Master Plan identifies preferred options and long-range solutions for reducing flood hazards. The Master Plan recommends policies for areas that are subject to flooding, but are not within the FEMA 100-year flood zone, and also recommends projects that will provide "100 year" protection for areas within the FEMA flood zone. The Master Plan also evaluates the existing informal drainage system to assess areas that are deficient in providing flood and drainage control. Continue to use the Master Plan as guidance for maintaining and improving the storm drain system.

Implementation Program F-1.1.c: Flood Control Ordinance. Update Chapter 16 of the Municipal Code, "Protection of Flood Hazard Areas" as recommended FEMA revisions become available.

Implementation Program F-1.1.d: BCDC Shoreline Studies. Consider working with BCDC to implement strategies for adapting to Bay-related impacts of climate change. Strategies may include

shoreline vulnerability analyses and shoreline management issues that cross jurisdictional boundaries.

Implementation Program F-1.1.e: FEMA Coordination. Continue to coordinate with FEMA and other agencies in the evaluation and mitigation of future flooding hazards that may occur as a result of sea level rise.

Policy F-1.2: Continue to budget Capital Improvement Funds for flood control improvements as one of the Town's highest priorities after the protection of life.

Policy F-1.3: Work with FEMA to periodically update the Town's FEMA flood maps.

Implementation Measure F-1.4.b: Implementation of Hazard Plan. Complete and implement provisions of a Local Hazard Mitigation Plan, consistent with the requirements of FEMA.

Policy F-2.1: Require new development and redevelopment in areas subject to flooding to minimize or eliminate flooding hazards.

Implementation Program F-2.1.a: 100-Year Flood Protection. Continue to review new development and remodeling proposals in areas subject to flooding for compliance with Chapter 16, Flood Damage Prevention, of the Municipal Code. Require improvements that provide a minimum flood protection level equal to a 100-year storm event.

Implementation Program F-2.1.b: Reduce Flood Hazards. Require individual development projects located in areas subject to flooding to reduce or alleviate flood hazard conditions through preparation of hydrological studies and incorporation of mitigation measures. Individual development project mitigation shall demonstrate, through qualified engineering analyses, that no adverse flooding impacts are created by development on upstream and downstream properties in the project vicinity. Compliance requirements shall be consistent with those prescribed in Chapter 16 (Flood Damage Prevention) of the Municipal Code.

Policy F-2.2: Require construction of storm drainage facilities and Low Impact Development (LID) techniques for new development.

Implementation Program F-2.2.a: Drainage Improvements. As a condition of approval for new development and redevelopment of existing sites, require storm water detention or retention facilities (on- or off-site), if necessary, to prevent flooding due to run-off or where existing storm drainage facilities are unable to accommodate increased storm water drainage.

Implementation Program F-2.2.c: Water. Require the use of innovative storm drainage facilities such as bioretention, rain gardens, and pervious pavement.

Policy F-2.5: Utilize Best Management Practices (BMPs) to prevent storm water pollution from construction-related actions.

Policy F-3.2: Work closely with Marin County to ensure implementation of all applicable National Pollutant Discharge Elimination System requirements relative to storm drainage and storm water run-off.

Policy F-4.3: Ensure adequate provision of storm drainage facilities within the Town.

Implementation Program F-4.3.a: Storm Drainage Upgrades. Review plans for new development or redevelopment of existing sites to ensure necessary upgrades are provided to the Town's storm drainage system.

ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

Based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines, implementation of the proposed project would have a significant effect on hydrology and water quality if it would:

- 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 of as a result of the failure of a levee or dam; or
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow.

LESS-THAN-SIGNIFICANT IMPACTS

Groundwater Resources

The project would not substantially deplete groundwater resources or interfere with groundwater recharge. Changes in impervious surface as part of proposed project would be minor compared to the 24.7 square miles of the Ross Valley Watershed, and no significant changes in groundwater recharge would be expected as a result of development associated with the project. No groundwater wells are present at the project site and no groundwater use is proposed by the project. Water for the project site would continue to be provided by the Marin Municipal Water District (MMWD). MMWD does not rely on groundwater for water supply, as most of MMWD water originates from rainwater within MMWD watershed areas, with a small amount imported from the Russian River (MMWD, 2012). Therefore, groundwater impacts would be less than significant.

Erosion and Siltation Due to Alteration in Drainage Patterns

The project would not result in alteration of drainage patterns causing erosion and siltation. The proposed project would not alter the course of a stream or a river. The project site is in an urban area and although redevelopment of the site would affect local drainage patterns, no significant impact related to erosion or siltation would be anticipated. The magnitude of the impact would be further reduced through compliance with construction- and operation-phase stormwater requirements (Mitigation Measures HYDRO-1a and HYDRO-1b, below).

Exceedance of Existing or Planned Stormwater Drainage System Capacity

The project would not result in the exceedance of existing or planned stormwater drainage system capacity. The volume of stormwater generated by the project site during storm events would be reduced through compliance with required stormwater management provisions (Mitigation Measure HYDRO-1b, below). However, the project would reduce capacity of the Town's stormwater management and flood control system by filling the pond at the project site. Stormwater runoff that would normally be collected in the project site pond would instead be redirected and collected in Lagoon #1.

An analysis of the potential hydrologic effects of filling the pond indicated that loss of the pond would raise water levels in Lagoon #1 by 0.08 foot during a 100-year storm event (CSW/Stuber-Stroeh, 2005). A recent review of this analysis indicated that no flood control system modifications have been installed since the time of that report and that the findings of the analysis remain valid (CSW/Stuber Stroeh, 2014).

Given the surface area of Lagoon #1 (9.2 acres or approximately 400,000 square feet), the Town would need to pump an additional 32,000 cubic feet of water prior to a 100-year storm event to keep the water level in Lagoon #1 identical to current conditions (compensating for the 0.08 foot difference). Based on the drainage rate between Lagoon #1 and the High Canal (approximately 100 cfs or 60,000 cubic feet per minute), this would add less than 1 minute to the current 2 hours it takes to drain Lagoon #1 prior to a winter storm event. This would require only an insignificant change to current Town storm preparation procedures.

Although the project would increase the area of impervious surfaces at the site, bioretention planters are proposed to retain and treat runoff from building roofs and parking lots, in accordance with MCSTOPP guidance. Based on the conceptual hydrologic analysis, this would result in an overall decrease in stormwater discharge from the site, compared to current conditions (CSW/Stuber-Stroeh, 2013). During the 100-year storm, peak stormwater discharge from the project site would be 14.23 cfs compared to 16.23 cfs under current conditions (CWS/Stuber-Stroeh, 2013). This is a beneficial impact of the project. Stormwater would be conveyed through the existing 30-inch pipe from the project site to Lagoon #1 (Figure 4.8-1). Based on a Town-Wide Storm Drainage and Flood Control Study, the capacity of Lagoon #1 and other major storm drainage infrastructure in the vicinity of the project site is adequate (A-N West, 2008). Therefore, no additional stormwater drainage system capacity would be required, and the proposed project would not result in adverse impacts due to stormwater discharges exceeding existing or planned stormwater drainage system capacity.

Other Water Quality Concerns

The project would not otherwise substantially degrade water quality. Operation of the proposed project would not result in any substantial changes to on-site water quality, with the exception of potential impacts associated with stormwater runoff. Adherence to stormwater requirements, as described in Mitigation Measures HYDRO-1a and HYDRO-1b, described below, would reduce these potential impacts on water quality to less than significant levels. No other impacts related to water quality would occur as a result of the project.

Housing-Related Flood Hazards

The project would not expose people or structures to other flooding hazards, including levees and dams. The project site is not located within a mapped dam failure inundation area (ABAG, 2003) and is not protected from flooding by levees. The project would have no impact in relation to this significance criterion.

The project would not expose people or structures to hazards from seiches, tsunamis, and mudflows. The geotechnical report for the project site concluded that no significant impacts related to seiches exist at or near the project site (Miller Pacific, 2013). The project site is not located in a mapped tsunami hazard zone (CalEMA, 2009). The project site and vicinity are level and not located in an area susceptible to mudflows. Please refer to Section 4.5, Geology and Soils, for further information regarding mudflows, a type of landslide. The project's impact would be less than significant in relation to this significance criterion.

POTENTIALLY SIGNIFICANT IMPACTS

Impact HYDRO-1: Construction and operation of the proposed project could adversely affect stormwater quality, resulting in a violation of water quality standards. (PS)

Stormwater runoff quality could be affected during project construction and operation. Since Corte Madera Creek is an impaired water body, as defined by CWA Section 303(d), there may be a

potential for contaminants from the project site to be entrained in stormwater, adversely affecting receiving waters and violating water quality standards.

Construction-Related Impacts

Improper drainage of the pond during construction activities could result in significant discharges of sediment-laden water to the Town stormwater drainage system. Earthmoving activities during construction, such as grading at the project site and replacement of the Monona Drive sewer pipe between Lakeside Drive and Madera Boulevard, could cause sediment to be entrained in storm runoff and further affect water quality.

Operation-Related Impacts

The proposed project would fill the pond and significantly increase the area of buildings and pavement. This would increase impervious surfaces at the site to slightly more than 176,700 square feet (approximately 4.0 acres) (CSW/Stuber-Stroeh, 2013), an increase of approximately 30,500 square feet (0.64-acre) relative to existing conditions. A conceptual hydrologic analysis determined that by incorporating bioretention planters to treat runoff from building roofs and parking lots in accordance with MCSTOPP guidelines would reduce the overall volume and discharge rate of stormwater from the project site and would adequately treat runoff to meet MS4 water quality requirements (CSW/Stuber-Stroeh, 2013). Additional MS4 requirements would be required for the project, including preparation of a detailed SCP incorporating site design measures to reduce project site runoff, such as porous pavement, green roofs, or vegetated swales.

Filling the pond would require compliance with the requirements of CWA Sections 401 and 404, described above under "Regulatory Framework." The filling of the pond would produce a small, though unquantified beneficial impact on water quality, as water quality in the pond was generally worse than in the connected Lagoon #1, especially during the summer months. Mitigation to address potential habitat loss as a result of the filling will likely be required. Discussion of the potential biological impacts related to filling the pond and regulatory requirements for compliance with the Section 401 and 404 requirements are discussed in detail in Section 4.3, Biological Resources.

> *Mitigation Measure HYDRO-1a: Consistent with the requirements of the statewide Construction General Permit, the project applicant shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) designed to reduce impacts on surface water quality through the project construction period.*
>
> *The SWPPP shall be prepared by a qualified stormwater professional (QSP). The SWPPP shall include the minimum best management practices (BMPs) required in Attachment C for Risk Level 1 discharges, Attachment D for Risk Level 2 dischargers, or Attachment E for Risk Level 3 dischargers (as applicable, based on final determination of the proposed project's Risk Level status [to be determined as part of the Notice of Intent for coverage under the Construction General Permit]). BMP implementation shall be consistent with the BMP requirements in the most recent version of the California Stormwater Quality Association Stormwater Best Management Handbook-Construction or similar guidance. BMPs shall*

include all measures necessary to prevent sediment from the project site pond from being discharged during drainage.

The SWPPP shall include a construction site monitoring program that identifies requirements for dry weather visual observations of pollutants at all discharge locations, and as appropriate, depending on the proposed project Risk Level, sampling of the site effluent and receiving waters (receiving water monitoring is only required for some Risk Level 3 dischargers). If the proposed project is Risk Level 2 or 3, the project applicant shall also include requirements for Rain Event Action Plans as part of the SWPPP; a Rain Event Action Plan is a written document that must be prepared within 48 hours of any likely precipitation event, describing actions that will be implemented to protect all exposed portions of the site from the predicted precipitation. BMPs shall include measures for dust control, erosion prevention, sediment control, construction vehicle traffic controls and tire washes, and material storage, spill prevention, and housekeeping protocols. (LTS)

Mitigation Measure HYDRO-1b: As a condition of approval for all grading and construction permits for the project site, the applicant shall prepare and implement a Stormwater Control Plan (SCP) for the project site consistent with all requirements of the Marin County Stormwater Pollution Prevention Program (MCSTOPP) and the MS4 National Pollutant Discharge Elimination System (NPDES) Permit. The SCP shall include, but not be limited to, BMPs designed into project features and operations to reduce potential impacts to surface water quality and to manage changes in the timing and quantity of runoff associated with development of the project site. The BMPs shall include Low Impact Development (LID) measures, such as minimizing disturbed areas and impervious cover and then infiltrating, storing, detaining, evapotranspiring, and/or biotreating stormwater runoff close to its source, to the maximum extent practicable. Funding for the maintenance of all BMPs for the life of the proposed project shall be specified. (LTS)

Impact HYDRO-2: Development of the project would place housing within a 100-year flood hazard area, which could impede or redirect flood flows and could expose future workers and patrons to a significant risk from flood hazards. (PS)

The project is located within a 100-year flood zone with a base flood elevation of 9 feet NAVD, as mapped by FEMA (FEMA, 2014). Although no permanent residences are proposed, patrons would be housed at the project site and would be exposed to potential flood risks. Buildings at the project site, which has an elevation of 5 to 8 feet NAVD, could be inundated in the event of a 100-year flood event and could impede or redirect flood flows affecting nearby properties. Historic flooding in the project site vicinity, most notably in 1982, has resulted in significant property damage.

Current Town law (Municipal Code Chapter 16.10) requires that all finished floors for new development be elevated at least one foot above the FEMA-designated base flood elevation. A new "preliminary" Flood Insurance Rate Map (FIRM) has been prepared by FEMA and is in process to be adopted in late 2015. The 100-year Base Flood Elevation (BFE) shown on this preliminary FIRM will be 10 NAVD, meaning a one-foot increase from the existing BFE. The proposed project has been designed to accommodate Town law and the proposed tidal elevation change (CSW/Stuber-Stroeh, 2014b). Elevation of finished floors to at least 1 foot above anticipated future base flood elevation levels would reduce potential impacts from flooding hazards to less-than-significant levels.

Mitigation Measure HYDRO-2: Prior to issuance of construction and grading permits for the project site, the applicant shall submit verification that project design complies with Corte Madera Municipal Code Chapter 16.10, as modified by proposed Federal Emergency Management Agency (FEMA) tidal elevation changes and that all finished floors for the project are located at an elevation of at least 1 foot above the revised 100-year base flood elevation. (LTS)

CUMULATIVE IMPACTS

Stormwater discharged from past and existing projects within the project site vicinity has contained pollutants that have contributed to impairment of the water quality of receiving waters, including San Francisco Bay. Stormwater regulations have become progressively more stringent since the passing of the federal CWA, and current requirements now require new developments to manage and treat all significant sources of stormwater pollutants; in particular stormwater runoff from past, present, and existing development is treated in accordance with NPDES requirements. As such, a reduction in overall pollutant loads in stormwater is anticipated over time. Therefore, no significant adverse impacts would be expected from cumulative water quality conditions, as these conditions would be expected to cumulatively improve.

The project would slightly reduce the capacity of the Town's storm drainage and flood control system by filling the 0.64-acre project site pond. Although the reduction in capacity was determined to be less than significant, stormwater discharges would decrease as a result of the project, and no future Town projects propose further reductions in the capacity of the storm drainage and flood control system, there may be a potential for this capacity reduction to result in the exacerbation of future flooding hazards in the event of projected sea level rise. There are currently no guidelines or codified requirements for addressing potential future flooding impacts that may result from climate change. Town of Corte Madera General Plan Implementation Programs F-1.1.d and F-1.1.e commit the town to coordinating with BCDC and FEMA to assess and address flooding issues that result from climate change. General Plan Policy F-1.2 establishes flood control as the highest priority for capital improvements after the protection of human life. These policies and implementation programs would reduce any potential cumulative impact related to flooding to a less-than-significant level.

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