

4.5 HYDROLOGY AND WATER QUALITY

This section analyzes impacts of the proposed project related to hydrology and water quality based on a review of existing city plans and other exiting data. This section also draws from the City of Santa Cruz *General Plan 2030* EIR (SCH#2009032007), which was certified on June 26, 2012, regarding background information on regulatory setting and surface and groundwater hydrology. The General Plan EIR is incorporated by reference in accordance with section 15150 of the State CEQA Guidelines. Relevant discussions are summarized in subsection 4.3.1. The General Plan EIR is available for review at the City of Santa Cruz Planning and Community Development Department (809 Center Street, Room 107, Santa Cruz, California) during business hours: Monday through Thursday, 8 AM to 12 PM and 1 PM to 5 PM. The General Plan EIR is also available online on the City's website at:

<http://www.cityofsantacruz.com/government/city-departments/planning-and-community-development/general-plan>.

Public and agency comments related to hydrology and water quality were received during the public scoping period in response to the Notice of Preparation (NOP). Issues raised in these comments include:

- ☐ Potential risks of flood hazards, impacts from flooding and requirements for buildings to be elevated if located within a floodplain.
- ☐ Use of Low Impact Development Best Management Practices and standards should be evaluated in the EIR to reduce or eliminate runoff and pollution discharges into the River.

To the extent that issues identified in public comments involve potentially significant effects on the environment according to the California Environmental Quality Act (CEQA) and/or are raised by responsible agencies, they are identified and addressed within this EIR. Public comments received during the public scoping period are included in Appendix B.

4.5.1 Environmental Setting

Regulatory Setting

The following overview summarizes key regulations regarding hydrology and water quality. See the General Plan 2030 EIR (DEIR volume, pages 4.7-1 – 4.7-5), which is incorporated by reference, for further discussion on regulations.

Federal and State Regulations

The Federal Emergency Management Agency (FEMA) – a former independent agency that became part of the new Department of Homeland Security in March 2003 – is tasked with responding to, planning for, recovering from, and mitigating against disasters. Formed in 1979 under an executive order by President Jimmy Carter to merge many of the separate disaster-

related responsibilities of the federal government into one agency, FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers studies and approved agencies studies and for coordinating the federal response to floods, earthquakes, hurricanes, and other natural or man-made disasters and providing disaster assistance to states, communities and individuals. FEMA distributes the Flood Insurance Rate Maps (FIRMS), which are used in the National Flood Insurance Program (NFIP). These maps identify the locations of special flood hazard areas (SFHAs), including the 100-year flood zone.

The U.S. Environmental Protection Agency (EPA) is the lead federal agency responsible for water quality management. The Clean Water Act of 1972 (CWA, codified at 33 United States Code Sections 1251-1376) is the primary federal law that regulates the discharge of pollutants to waters of the United States from any point source. Section 401 of the CWA requires water quality certification for any activity, including the construction or operation of a facility, which may result in any discharge into navigable waters. Section 404 of the CWA requires a permit for the discharge of dredged fill material into navigable waters at specified disposal site. In 1987, amendments to the CWA added Section 402(p), which establishes a framework for regulating non-point source stormwater discharges under the National Pollutant Discharge Elimination System (NPDES). Various elements of the CWA address water quality, and they are discussed below.

The California State Water Resources Control Board (State Board) and the nine Regional Water Quality Control Boards (RWQCB) have the responsibility in California to protect and enhance water quality, both through their designation as the lead agencies in implementing the Section 319 non-point source program of the federal Clean Water Act, and through the state's primary water pollution control legislation, the Porter-Cologne Water Quality Control Act of 1969, codified in Division 7 of the California Water Code). Under the Act, the State must adopt water quality policies, plans, and objectives that protect the State's waters for the use and enjoyment of the people. Such "waters of the State" include streams, groundwater, isolated wetlands, and other bodies of water that are not under federal jurisdiction as "waters of the United States" (under the Clean Water Act). The Act sets forth the obligations of the SWRCB and RWQCBs to adopt and periodically update water quality control plans (Basin Plans). Basin Plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Act also requires waste dischargers to notify the RWQCBs of their activities through the filing of Reports of Waste Discharge (RWD) and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), National Pollutant Discharge Elimination System (NPDES) permits, Section 401 water quality certifications, or other approvals.

Urban runoff and other "non-point source" discharges are regulated by the 1972 Federal Clean Water Act (CWA), through the National Pollutant Discharge Elimination System (NPDES) permit program that has been implemented in two phases through the California Regional Water Quality Control Boards (RWQCB). Phase I regulations, effective since 1990, require NPDES

permits for stormwater discharges for certain specific industrial facilities and construction activities, and for municipalities with a population size greater than 100,000. Phase II regulations expand the NPDES program to include all municipalities with urbanized areas and municipalities with a population size greater than 10,000 and a population density greater than 1,000 persons per square mile. Phase II regulations also expand the NPDES program to include construction sites of one to five acres (City of Santa Cruz, April 2012, DEIR volume).

Construction activity on projects that disturb one or more acres of soil must obtain coverage under the State's General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 99-08-DWQ). Construction activity subject to this permit includes clearing, grading, and disturbances to the ground such as stockpiling or excavation. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP must list best management practices (BMPs) that the discharger will use to protect stormwater runoff and the placement of those BMPs.

Local Regulations

Stormwater Management Program. The City of Santa Cruz (City) has developed a Storm Water Management Program (SWMP) in order to fulfill the requirements of the Phase II NPDES General Permit for Discharges of Storm Water from Small Municipal Separate Storm Sewer Systems (MS4) (General Permit) and to reduce the amount of pollutants discharged in urban runoff. In compliance with the Phase II regulations, the City's comprehensive SWMP is designed to reduce the discharge of pollutants to the Maximum Extent Practicable (MEP) and to protect water quality (City of Santa Cruz, April 2012, DEIR volume).

In 1998, the City of Santa Cruz adopted an ordinance for "Storm Water and Urban Runoff Pollution Control" (Chapter 16.19 of the city's Municipal Code) as part of its Storm Water Management Program in accordance with the RWQCB's requirements. The ordinance identifies prohibited discharges and required Best Management Practices (BMPs) for construction and new development.

As indicated above, construction activity on projects that disturb one or more acres of soil must obtain coverage under the State's General Permit for Discharges of Storm Water Associated with preparation and implementation of a SWPPP and BMPs to protect water quality during construction. The proposed project would result in grading and development that would disturb over one acre, and thus, the project would be subject to preparing a SWPPP. The City's regulatory requirements and BMPs, as detailed in the "Stormwater Best Management Practices Manual" published by the City's Public Works Department, must be implemented.

The project is subject to the Central Coast Post-Construction Requirements that were enacted by the CCRWQCB in July 2013. Based on the amount of impervious area created by the project, which is greater than 22,500 SF, the project has to meet Tiers 1 thru 4 (Site Design, Water Quality Treatment, Runoff Retention and Peak Flow Management).

Municipal Code Requirements. The Zoning Ordinance, Title 24 of the Municipal Code, currently contains provisions to ensure that new development is designed and constructed in a manner that limits alteration of drainage patterns, prevents erosion, and minimizes long-term impacts on water quality. Chapter 24.14 – Environmental Resource Management – contains a section on Conservation Regulations that includes general provisions for drainage and erosion controls. Section 24.14.050 requires that a drainage plan be submitted for projects, both large and small, when existing drainage patterns would be altered by new construction. A drainage plan must be submitted and reviewed as part of the project approval. In addition, the ordinance requires that stormwater runoff resulting from project development be minimized.

Section 24.14.060 requires preparation and implementation of an erosion control plan for all projects within or adjacent to an erosion hazard area and for development proposals located on slopes in excess of 10 percent. The section sets forth the requirements for the plan.

The Grading Ordinance is a subset of Title 18, Buildings and Construction, of the City’s Municipal Code and is included in Chapter 18.45 – Excavation and Grading Regulations.” It provides technical regulations of grading and excavation, in conjunction with the Environmental Resource Management provisions (Municipal Code, Title 24, Chapter 24.14), in order to safeguard life, health, safety and the public welfare; protect fish and wildlife, riparian corridors and habitats, water supplies, and private and public property, and to protect the environment from the effects of flooding, accelerated erosion and/or deposition of silt. The ordinance accomplishes this by providing guidelines, regulations, and minimum standards for clearing, excavation, cuts, fills, earth moving, grading operations (including cumulative grading), water runoff and sediment control. In addition, the ordinance includes provisions regarding administrative procedures for issuance of permits and approval of plans and inspections during construction and subsequent maintenance. Section 18.45.110 also provides erosion control requirements for cut/fill slopes in addition to the requirements outlined in Section 24.14.060.

Study Area

The project area consists of the downtown area generally covered by the Downtown Recovery Plan (DRP) and the Central Business District zone, and specifically the lower downtown area generally between Soquel Avenue and Laurel Street on the north and south, and Cedar Street and the San Lorenzo River on the west and east. (Locations are shown on Figures 1-2 and 2-1 in Section 3, Project Description.) The study area includes properties adjacent to the western San Lorenzo River levee. Since the proposed project includes an amendment to the land use designation text for the Regional Visitor Commercial land use designation, the study area also includes downtown lands located within this designation.

Regional Hydrological Setting

The City of Santa Cruz encompasses approximately 12 square miles between the Monterey Bay and the Santa Cruz Mountains and lies on a narrow coastal plain at the mouth of the San Lorenzo

River. A total of 39 miles of watercourses occur within the City (City of Santa Cruz, April 2012, DEIR volume).

The San Lorenzo River originates in the Santa Cruz Mountains and is the largest drainage in the region. The river flows southward from the Santa Cruz Mountains, traverses through the center of the City, and forms a major physical feature of the region. The downtown area of the City of Santa Cruz is situated on the floodplain of the lower San Lorenzo River.

The San Lorenzo River drains a 138-square mile watershed, featuring forested and urbanized areas within the City and Santa Cruz County. Within the City limits, the lower San Lorenzo River flows southward from the Sycamore Grove area of Pogonip through the center of Santa Cruz, to Monterey Bay. The lower 2.5 miles (south of Highway 1) are channelized in a levee flood control project developed in cooperation with the U.S. Army Corps of Engineers (ACOE) in the late 1950s (City of Santa Cruz, April 2012, DEIR volume). Significant flood improvements along the river were completed in 2000 as part of the ACOE's San Lorenzo River Flood Control and Environmental Restoration Project. This project raised the river levee heights, provided landscaping and improved the pedestrian/bicycle path on the levee, and rehabilitated three of the four downtown bridges (over the San Lorenzo River) to increase flood flow capacity. The habitat enhancement efforts focused on the landside of the levees in the study area which were landscaped with native trees, shrubs, and groundcover.

Stormwater Drainage

The City's storm drain system is comprised of a wide variety of conveyance systems such as underground pipes, small open drainage channels, creeks, and the San Lorenzo River. The system includes numerous storm drain inlets and catch basins (approximately 1,450) throughout the City, and five pump stations that discharge stormwater directly into the San Lorenzo River (City of Santa Cruz, April 2012, DEIR volume).

In general, the City's downtown area drains to the San Lorenzo River. Although some stormwater reaches the river by absorption and gravity, the five pump stations along the river were installed in order to transfer the majority of the stormwater over (actually through) the river levees. There are three pump stations located on the west side of the river and two on the east side (City of Santa Cruz, April 2012, DEIR volume).

State and federal storm water regulations require development and remodeling projects to incorporate design standards BMPs in order to reduce pollutant and storm water discharges to the Maximum Extent Practicable. All future development projects will be subject to the City's mandatory BMPs, including the use of Low Impact Development (LID). LID is a site design approach that uses techniques to slow and infiltrate storm water, mimicking the natural, pre-development hydrology. LID design strategies can be applied to most new or redevelopment projects to meet storm water regulations, reduce downstream flooding and protect natural resources (City of Santa Cruz (City of Santa Cruz, 2014).

The project study areas are primarily located with “Urban Sustainability Areas” defined in the City’s BMP Manuals. These areas encompass the City’s business centers and primary transportation corridors where the City’s General Plan 2030 vision is to promote “Smart Growth” concepts of high density mixed-use development. Certain exemptions to stormwater retention requirements are allowed for high-density projects that meet specified requirements.

Water Quality

Urban development often results in the degradation of water quality due to the introduction of pollutants and erosion due to construction and development. Development and pervious pavement can result in increased runoff and higher velocities in creeks and streams. These changes can, in turn, cause erosion. Urban pollutants may include toxic metals, hydrocarbons, nutrients, suspended solids, and many other chemicals (City of Santa Cruz, April 2012, DEIR to treat stormwater runoff in compliance with federal and state laws.

The primary pollutants of concern in the City watersheds are sediment and silt and fecal indicator bacteria. The City has targeted these primary pollutants of concern in the SWMP because certain water bodies within the City are listed on the Clean Water Act Section 303(3) list as impaired for these specific pollutants as further discussed below (Ibid.). As previously indicated, the City’s SWMP is a comprehensive program to reduce the amount of pollutants discharged in urban runoff and to improve and protect water quality that includes requirements for stormwater treatment in development projects in accordance with the federal state requirements.

The Clean Water Act requires states to identify and prepare a list of water bodies that do not meet water quality objectives, and to establish Total Maximum Daily Loads (TMDL) for each water body to ensure attainment of water quality objectives. The City of Santa Cruz storm drain system (MS4) discharges into four water bodies that are currently on the 303(d) list of impaired water bodies, one of which is the San Lorenzo River. The San Lorenzo River is listed for: sediment, nutrients and pathogens. The City’s SWMP addresses the primary pollutants of concern through City measures and BMPs to the Maximum Extent Practicable.

Flood Hazards

Flooding and coastal storms present essentially the same risks and are frequently related types of hazards in the City of Santa Cruz. A flood is a natural event for rivers and streams. Coastal storms can cause increases in tidal elevations (called storm surge) wind speed and erosion as well as flooding. Floodplains are lowlands adjacent to rivers, lakes and oceans that are subject to recurring floods (City of Santa Cruz, September 2013).

The City of Santa Cruz Climate Adaptation Plan considers flooding and severe coastal storms to be a considerable, potential risk to the city and its residents. Intense, increased rainfall may lead

to larger flood flows. Noted in the CAP are the potential for greater storm surges, wind speeds and resultant coastal erosion. These events are predicted to occur more frequently due to climate change impacts, including the impacts from sea level rise (City of Santa Cruz, 2013).

Flood Hazards

The San Lorenzo River runs through the downtown corridor and the majority of the downtown area is in the San Lorenzo floodplain. Flooding along the coast of Santa Cruz may occur with the simultaneous occurrence of large waves and storm swells during the winter. When storms occur simultaneously with high tides, flood conditions including flooding at the mouth of the San Lorenzo River are exacerbated.

The downtown area and a portion of the beach area are located within the 100-year floodplain of the San Lorenzo River. The Flood Insurance Rate Map (FIRM) is an official map of a community for which the Federal Insurance and Mitigation Administration has delineated the Special Flood Hazard Area. All known areas of the City subject to natural flooding hazards have been designated and mapped by the Federal Emergency Management Agency (FEMA), such as the 100 year floodplain boundaries which appear on FEMA's Flood Insurance Rate Maps (City of Santa Cruz, 2013).

The City of Santa Cruz has worked to improve the flood capacity of the San Lorenzo River levees over the past twenty years. In 2002, FEMA re-designated much of the downtown and beach area from A-11 to the A-99 Flood Zone designation in recognition of the significant flood improvements resulting from the San Lorenzo River Flood Control and Environmental Restoration Project. Under the A-99 designation, new buildings and improvements are no longer mandated to meet FEMA flood construction requirements (City of Santa Cruz, 2013).

The City's adopted "Local Hazard Mitigation Plan, 2012-2017" includes measures that the City intends to implement in response to flood hazards. The City addresses land use within the flood plain in the General Plan as well as actively enforcing building and zoning codes, and other land use regulations concerning development within the 100-year flood plain. The City will continue to work with FEMA and the Army Corps of Engineers to minimize impacts of flooding in Santa Cruz.

High Tide intrusion into the San Lorenzo River and Downtown. The downtown area is situated on the San Lorenzo River floodplain that is underlain by permeable sands and gravels so that the groundwater level beneath the City is essentially the same as the river level. During high tides, and when the San Lorenzo River has been dammed by the sand bar that typically forms across the river mouth in mid- to late summer, the impounded water level rises, at times extending upstream as far as the Highway One bridge. There appears to be a direct connection between the elevation of the water table and the level of the San Lorenzo River. The resulting elevated water table historically led to ground water seeping into the basements of the downtown buildings, resulting in the need for pumping and dewatering during construction. The City Public Works Department pumps ground water as much as 15 hours a day from beneath the

Locust Street parking garage when the river backs up in the summer months (Griggs, Haddad, January 2011).

Due to sediment accumulation in the San Lorenzo River flood control channel, many of the gravity outlets that were constructed to carry water from the low lying areas next to the levees back into the river began to be covered over years ago. The City has replaced flap gates with these new valves on the San Lorenzo River.

Tsunami Hazards

A tsunami is a series of waves generated by an impulsive disturbance in the ocean or in a small, connected body of water. Tsunamis are produced when movement occurs on faults in the ocean floor, usually during very large earthquakes. An earthquake anywhere in the Pacific can cause tsunamis around the entire Pacific basin. Since the Pacific Rim is highly seismically active, tsunamis are not uncommon, although there has been minimal damage and loss of life in Santa Cruz during recorded history (City of Santa Cruz, 2013). However, a tsunami generated by a 9.0 magnitude earthquake in Japan in March 2011 reached Santa Cruz and caused substantial damage to the Santa Cruz Small Craft Harbor. The National Oceanic and Atmospheric Administration operates a tsunami warning system, giving several hours' notice to allow evacuation of threatened areas to prevent injuries.

There are two primary types of tsunami vulnerability in Santa Cruz. The first is a distant source tsunami from elsewhere in the Pacific Ocean. This type of tsunami is capable of causing significant destruction in Santa Cruz. However, this type of tsunami would usually allow time for the Tsunami Warning System for the Pacific Ocean to warn at risk and threatened coastal areas in time for evacuation (City of Santa Cruz, 2013). The more vulnerable risk to the City of Santa Cruz is a tsunami generated as the result of an earthquake along one of the many earthquake faults in the region. A local source tsunami generated by an earthquake on any of the faults affecting Santa Cruz would arrive just minutes after the initial shock. The lack of warning time from such a nearby event would result in higher casualties than if it were a distant tsunami (Ibid.). The City's mitigation strategy includes continuation of an up-to-date Emergency Operations Plan, an effective public information program and continuing collaborative efforts with the County, other Cities, agencies and community organizations to facilitate collaborative efforts in providing up-to-date tsunami mapping, preparation, information, warning dissemination and education.

According to maps prepared for the *General Plan 2030* and included in the General Plan EIR, the downtown and beach areas are located within a potential tsunami inundation area, as are most of the downtown and beach areas of Santa Cruz (City of Santa Cruz, April 2012, DEIR volume-Figure 4.7-2).

Sea Level Rise Hazards

The rise in global sea level is attributed to the thermal expansion of ocean water and the melting of mountain glaciers and ice sheets around the globe. Sea level rise will result in direct and indirect impacts including increased risk of flooding, storm surges and inundations, erosion, and shoreline retreat. Average global sea level has risen between five to nine inches during the 20th century as reported by the International Panel on Climate Change (IPCC), nearly one-tenth of an inch each year (California Environmental Protection Agency, August 2013). Along California's coast, sea level already has risen by an average of seven inches over the last century – three inches at Los Angeles, eight inches at San Francisco, and an estimated six inches at La Jolla near San Diego (Ibid.).

Although sea level rise is not a new phenomenon, having been a major natural component of coastal change throughout time, the current concern is that with increased global warming and melting of ice sheets on Greenland and West Antarctica, the rate of change may increase. The "State of California Sea-Level Rise Guidance Document" (March 2013) provides guidance for incorporating sea-level rise projections into planning and projects in California in response to Governor Schwarzenegger's Executive Order S-13-08, issued on November 14, 2008 that directed state agencies to plan for sea level rise and coastal impacts. According to this document¹, sea level rise is projected (using the year 2000 as a baseline) as: 0.13-0.98 feet between 2000 and 2030; 0.39-2.0 feet between 2000-2050; and 1.38-5.48 feet between 2000 and 2100 (see Table 4.5-1). Impacts of sea level rise in California include flooding and inundation, increased coastal erosion, changes in sediment supply and movement, and saltwater intrusion to varying degrees along the California coast (California Coastal Commission, August 2015).

Portions of downtown and beach areas have been mapped as being within areas of sea level rise. As sea level continues to rise, seawater could extend farther upstream in the San Lorenzo River flood control channel more frequently, and rising gradually to higher elevations. This would lead to a rise in the water table beneath downtown, likely resulting in the need for more pumping and implementation of other adaptation strategies (Griggs, Haddad, January 2011).

In response to impacts of climate change, including rising sea levels, the City has prepared a "Climate Adaptation Plan" with funding from FEMA. The objectives of this Plan are to identify and evaluate the potential impacts of climate change on the City of Santa Cruz, analyze the severity of the hazards that the City faces, and develop potential adaptation responses to reduce the risk and exposure of the City to these hazards. The potential risks were identified in a "Vulnerability Study", prepared as a collaborative effort between the City's Adaptation Team and

¹ The State of California supported the preparation of the 2012 National Research Council's Report, *Sea-Level Rise for the Coasts of California, Oregon and Washington: Past, Present, and Future*, which is currently considered the best available science on sea level rise for California (California Coastal Commission, August 2015). This estimate is current reference by California: a) March 2013-"State of California Sea Level Rise Document"; b) August 2013-"Indicators of Climate Change in California"; and c) August 2015-"California Coastal Sea Level Rise Policy Guidance."

University of California (UCSC) scientists. The study identified potential facilities vulnerable to risks of sea level rise, including beaches, West Cliff Drive, the City's wastewater treatment facility and the Santa Cruz Harbor (Griggs, Haddad, January 2011). The study also addressed coastal storm and cliff erosions hazards, as well as the potential for increased precipitation and flooding.

TABLE 4.5-1: Sea Level Rise Projections for California

TIME PERIOD	NORTH OF CAPE MENDOCINO	SOUTH OF CAPE MENDOCINO
By 2030	2 – 9 in (-4 – +23 cm)	2 – 12 in (4 – 30 cm)
By 2050	-1 – 19 in (-3 – + 48 cm)	5 – 24 in (12 – 61 cm)
By 2100	4 – 56 in (10 – 143 cm)	17 – 66 in (42 – 167 cm)

SOURCE: National Research Council, 2012 as cited in State of California Sea Level Rise Document, 2013

Based on the Vulnerability Study, the Climate Adaptation Plan identifies 41 priorities and actions to respond to specific risks and hazards related to climate change. Priority actions include #A-9 to protect downtown and the beach area from San Lorenzo River flooding. Activities under consideration for this priority action include evaluation of levees and/or dredging the river to improve water flow. Climate change mitigation and adaptation planning also was identified as a critical action item in the City's Local Hazard Mitigation Plan. FEMA reviews and approves LHMPs and requires an update on a five-year cycle.

4.5.2 Impacts and Mitigation Measures

In accordance with the California Environmental Quality Act (CEQA); State CEQA Guidelines (including Appendix G); City of Santa Cruz plans, policies, and/or guidelines; and agency and professional standards, a project impact would be considered significant if the project would:

- 5a Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river in a manner that could result in substantial off-site erosion or siltation;
- 5b Substantially increase the rate or amount of surface runoff, which would exceed capacity of existing or planned storm drain facilities, cause downstream or off-site drainage problems, or increase the risk or severity of flooding in downstream areas;
- 5c Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality;
- 5d Result in construction of habitable structures within a 100-year floodplain as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard

delineation map, which would expose people or structures to a significant risk of loss, injury or death due to flooding;

- 5e Locate structures within a 100-year flood hazard area that would impede or redirect flood flows;
- 5f Expose people or structures to a significant risk of loss, injury, or death involving flooding as a result of the failure of a levee or dam;
- 5g Expose people or structures to a significant risk of loss, injury or death as a result in inundation by seiche, tsunami, or mudflow.

Analytical Method

The proposed project consists of amendments to the City's Downtown Recovery Plan, General Plan, Local Coastal Plan and Zoning Code regarding development in the downtown area and Central Business District. The proposed project would not directly result in new development. However, the proposed Downtown Plan amendment would expand areas for potential additional building height that could accommodate intensified redevelopment of existing developed sites. The proposed General Plan amendment would increase FAR in areas designated as RVC in the General Plan, but would not lead to development on sites not already considered in the General Plan and General Plan EIR. The proposed LCP and Zoning Code amendments would not result in changes that could indirectly lead to intensified development. The following impact analyses are based on review of existing data and studies.

Impacts and Mitigation Measures

The following impact analyses address potential stormwater impacts (5a, 5b), water quality impacts (5c), and exposure to flood (5d-f) or tsunami (5g) hazards.

Impact 4.5-1: Stormwater Drainage. Future development accommodated by the proposed plan amendments could result in stormwater runoff, but would not substantially alter the existing drainage pattern of the area, substantially increase the rate or amount of surface runoff, exceed the capacity of existing or planned storm drain facilities, cause downstream or off-site drainage problems, or increase the risk or severity of flooding in downstream areas (4a, 4b). This is considered a *less-than-significant impact*.

The proposed project would not directly result in new development, but could lead to intensified development in the project study area. The study area is currently developed or paved, and stormwater runoff would not be expected to substantially increase as the area already is developed with impervious surfaces. Stormwater runoff from future development sites would be conveyed to existing storm drainage facilities that ultimately discharge into the San Lorenzo River. Existing City regulations will serve to manage stormwater runoff from future development accommodated by the proposed Plan amendments. Additionally, General Plan policies and

actions require that new development maintain pre-development runoff levels (CC5.1.8). Therefore, the compliance with the City's stormwater regulations will be required of future developments that may result from the proposed project. Thus, the project would not indirectly lead to potentially significant stormwater or drainage impacts. Additionally, it is noted that redevelopment of properties in the study area could occur without the proposed project.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.5-2: Water Quality. Future development accommodated by the proposed plan amendments could result in water quality degradation to San Lorenzo River from automobile oils and greases carried in stormwater runoff. Project grading could also result in erosion and potential downstream sedimentation if not properly managed (4c). However, with compliance with City stormwater regulations and implementation of required controls, this is considered a *less-than-significant impact*.

As indicated in the Impact 4.5-1 discussion, the proposed project would not directly result in new development, but could lead to intensified development in the project study area. The study area is currently developed, and it is expected future development would include enclosed parking garages instead of paved lots. Future development projects will be required to comply with the City's stormwater regulations and required BMPs, which require pre-treatment of runoff. Compliance with City regulations, which were adopted pursuant to federal and state requirements, would include the required measures to protect water quality as determined at the project level, and the proposed project would not indirectly result in a substantial degradation of surface water quality.

Grading for future development projects will be subject to City approval of a grading permit, which includes an approved erosion control plan. For projects over one acre in size, preparation of a Stormwater Pollution Prevention Plan (SWPPP) also is required pursuant to the State's NPDES program. The purpose of a SWPPP is to identify 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 stormwater as well as non-stormwater discharges. For projects over one acre in size, a Notice of Intent also is filed with the SWPPP to the RWQCB. The project will be subject to these requirements. Preparation and implementation of the SWPPP and required erosion control plan will ensure that future development projects would not cause any increase in sedimentation, turbidity, or hazardous material concentrations within downstream receiving waters.

With compliance with City stormwater regulations and BMPs, and implementation of SWPPP and erosion control plans as may be required, potential water quality degradation would be controlled, resulting in a less-than-significant impact.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

Impact 4.5-3: Flood Hazards. Future development accommodated by the proposed plan amendments could result in exposure to flood hazards, including watercourse flooding, sea level rise or tsunamis. (5d-g). However, with compliance with federal flood requirements and implementation of City plans and programs, the proposed project would not lead to indirect impacts related to exposure to flood hazards (5d-g). This is considered a *less-than-significant impact*.

Future development accommodated by the proposed general plan could be subject to flood hazards in limited areas. These include areas of the downtown that are located in the San Lorenzo River floodplain, although recent levee improvements have increased flood protection in these areas. As sea level continues to rise, seawater could extend farther upstream in the San Lorenzo River flood control channel more frequently, and rising gradually to higher elevations. This would lead to a rise in the water table beneath downtown. This area of the City has always been vulnerable to an elevated water table but this will become a more significant issue in the future, likely resulting in the need for more pumping and implementation of other adaptation strategies (Griggs, Haddad, January 2011). Recommendations include continued monitoring of City pump stations along the San Lorenzo River with installation of additional monitoring wells and increase pumping capacity as necessary (Ibid.). The City's adopted Climate Adaptation Plan includes a high priority action to implement measures to protect downtown from flooding.

The proposed project would not lessen or worsen the potential for tsunami damage, although it would indirectly lead to intensified development with an increase in the number of people potentially exposed to a tsunami hazards. However, because dangerous tsunamis typically have originated at such a great distance, it is possible to issue fairly long-range warnings of their approach and evacuate people if necessary. Thus, the City's efforts to continue to periodically update its emergency evacuation procedures for tsunami hazard areas as well as coordination with other agencies as outlined in the City's adopted Hazard Mitigation Plan would respond to this concern.

Mitigation Measures

No mitigation measures are required as a significant impact has not been identified.

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