4.J Greenhouse Gases

Introduction

This section summarizes information on the potential greenhouse gas (GHG) emissions associated with the environment in St. Helena and provides an evaluation of the GHG-related effects of the proposed General Plan Update. The analysis considers both direct and indirect GHG emission sources in the area for both the existing and projected buildout conditions. Mitigation measures are recommended that address General Plan Update policies and implementing actions.

Setting

Greenhouse gases trap heat in the atmosphere and regulate the earth's temperature.

GHGs are gases that trap heat in the atmosphere and regulate the earth's temperature. This effect, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. The most common GHGs are carbon dioxide and water vapor but there are also several others, most importantly methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). These are released into the earth's atmosphere through a variety of natural processes and human activities. Key points about GHGs include the following:

- Carbon dioxide and nitrous oxide are byproducts of fossil fuel combustion;
- Nitrous oxide is also associated with agricultural operations such as fertilization of crops;
- Methane is commonly created by off-gassing from agricultural practices (e.g. keeping livestock), composting and landfill operation;
- Chlorofluorocarbons were widely used as refrigerants, propellants, and cleaning solvents, but their production has been mostly eliminated by international treaty;
- Hydrofluorocarbons are now used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the earth's energy balance. This is expressed in terms of a global warming potential (GWP), with carbon dioxide being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger with a GWP of 23,900. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of carbon dioxide equivalents (CO2e).

An expanding body of scientific research supports the theory that global warming is currently affecting changes in weather patterns, average sea level, ocean acidification, chemical reaction rates, and precipitation rates, and that it will increasingly do so in the future. The climate and several naturally occurring resources within California could be adversely affected by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion (a particular concern in the low-lying Sacramento–San Joaquin Delta, where potable water delivery pumps could be threatened), and degradation of wetlands. Mass migration and/or loss of plant and animal species could also occur. Potential effects of global climate change that could adversely affect human health include more extreme heat waves and heat-related stress; an increase in climate-sensitive diseases; more frequent and intense natural disasters such as flooding, hurricanes, and drought; and increased levels of air pollution.

Regulatory Framework

Global climate change resulting from greenhouse gas emissions is an emerging environmental concern at the international, national, and state levels.

Global climate change resulting from GHG emissions is an emerging environmental concern being raised and discussed at the international, national, and state levels. At each level, agencies are considering strategies to control emissions of gases that contribute to global warming.

Federal Laws and Regulations

The United States participates in the United Nations Framework Convention on Climate Change (UNFCCC). While the United States signed the Kyoto Protocol, which would have required reductions in GHGs, Congress never ratified the protocol. The federal government chose voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science. In 2002, the United States announced a strategy to reduce the GHG intensity of the American economy by 18 percent over a 10-year period from 2002 to 2012.

In 2009, the United States Environmental Protection Agency (USEPA) issued a final rule for mandatory reporting of GHG emissions. This rule applies to fossil fuel suppliers, industrial gas suppliers, direct GHG emitters, and manufactures of heavy-duty and off-road vehicles and vehicle engines, and requires annual reporting of emissions. The Final Rule went into effect on December 29, 2009, with data collection beginning on January 1, 2010, and the first annual reports due in March 2011. This rule does not regulate the emission of GHGs; it only requires the monitoring and reporting of greenhouse gas emissions for those sources above certain thresholds. The USEPA adopted a Final Endangerment Finding for the six defined GHGs on December 7, 2009. The Endangerment Finding is required before the USEPA can regulate GHG emissions under the federal Clean Air

Act (CAA).[1] Most recently, the USEPA in association with the National Highway Transportation Safety Administration has begun regulating mobile GHG emissons.

State Laws and Regulations

The effects of climate change on California's ecosystem and economy remain uncertain. The state has many areas of concern regarding climate change with respect to global warming. According to the 2006 Climate Action Team Report (California Environmental Protection Agency, 2006), the following climate change effects and conditions can be expected in California over the course of the next century:

- A diminishing Sierra snowpack, affecting the state's water supply;
- Increasing temperatures from 8 to 10 degrees Fahrenheit under the higher emission scenarios, leading to a 25- to 35-percent increase in the number of days ozone pollution standards are exceeded in most urban areas;
- Coastal erosion along the length of California and seawater intrusion into the Sacramento River Delta from a 4- to 33-inch rise in sea level, exacerbating flooding in already vulnerable regions;
- Increased vulnerability of forests due to pest infestation and increased temperatures;
- Increased challenges for the state's important agricultural industry from water shortages, increasing temperatures, and saltwater intrusion into the Delta; and
- Increased electricity demand, particularly in the hot summer months.

The California Energy Commission regulates electricity production, which is one of the major sources of greenhouse gases.

California has been directly and indirectly regulating emissions of GHGs, beginning in 1975 when the Legislature created the California Energy Commission (CEC). The CEC regulates electricity production, which is one of the major sources of GHGs.

Title 24, Part 6 of the California Code of Regulations (1978)

The Energy Efficiency Standards for Residential and Nonresidential Buildings were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The 2008 Title 24 building code standards, which include building energy efficiency standards, went into

[1] In 2007, the U.S. Supreme Court ruled in Massachusetts v. Environmental Protection Agency (549 U.S. 497) that the USEPA has authority to regulate greenhouse gases under the CAA.

effect on January 1, 2010. Among the updates for new residences are requirements for better insulation, heat-reflecting windows and "cool roofs" to reduce air conditioning loads. Warehouse buildings must install skylights to take advantage of daylighting and cut electricity consumption. CALGreen supplements Title 24 and requires all new buildings in the state to incorporate energy-saving features. New standards address water efficiency, construction waste, interior finishes, and landscape irrigation.

Assembly Bill 1493 (2002)

Assembly Bill (AB) 1493 required the California Air Resources Board (CARB) to develop and adopt regulations that reduce GHGs emitted by passenger vehicles and light duty trucks.

State of California Executive Order S-3-05 (2005)

In June 2005, the Governor of California signed Executive Order S-3-05, which identified the California Environmental Protection Agency (Cal/EPA) as the lead coordinating state agency for establishing climate change emission reduction targets in California. A "Climate Action Team," a multi-agency group of state agencies, was set up to implement Executive Order S-3-05. The Governor's Executive Order established aggressive emissions reductions goals: by 2010, GHG emissions must be reduced to 2000 levels; by 2020, GHG emissions must be reduced to 1990 levels; and by 2050, GHG emissions must be reduced to 80 percent below 1990 levels. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

Assembly Bill 32, California Global Warming Solutions Act (2006) and AB 1493, SB 1078, and SB 107

AB 32 requires that California cap greenhouse gas emissions at 1990 levels by 2020.

In 2006, the Governor of California signed AB 32, the Global Warming Solutions Act, into legislation. AB 32 requires that California cap GHG emissions at 1990 levels by 2020. This legislation requires CARB to establish a program for statewide GHG emissions reporting and monitoring/enforcement of that program. CARB recently published a list of discrete GHG emissions reduction measures that can be implemented immediately. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. CARB's Early Action Plan identified regulations and measures that could be implemented in the near future to reduce GHG emissions.

The AB 32 Scoping Plan was adopted in late 2008 (CARB, 2008). Central to this plan is a cap and trade program covering 85 percent of the state's emissions. This program will be developed in conjunction with the Western Climate Initiative, comprised of seven states and three Canadian provinces, to

create a regional carbon market. The plan also proposes that utilities produce a third of their energy from renewable sources such as wind, solar, and geothermal, and proposes to expand and strengthen existing energy efficiency programs and building and appliance standards. The plan also includes full implementation of the Pavley standards to provide a wide range of less polluting and more efficient cars and trucks to consumers who will save on operating costs through reduced fuel use. It also calls for development and implementation of the Low Carbon Fuel Standard (LCFS), which will require cleaner domestic-produced fuels.[2] The regulatory process to implement the plan began in 2009. The details in regulating emissions and developing targeted fees to administer the program will be developed through this process, which is expected to last two years. Measures must be enacted by 2012.

The transportation sector will account for the greatest reduction in GHG emissions. Many of the measures to reduce GHG emissions from transportation will come from CARB. AB 1493, the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. CARB's AB 32 Early Action Plan released in 2007 included a strengthening of the Pavley regulation for 2017 and included a commitment to develop the LCFS. CARB's AB 32 Scoping Plan assigned an approximate 20-percent reduction in emissions from passenger vehicles with implementation of AB 1493. The newly adopted LCFS is expected to reduce emissions by over 7 percent. Additional measures to increase existing vehicle fuel efficiency (both trucks and autos) are expected to reduce emissions by almost 3 percent.

California's Renewable Portfolio Standard was established in 2002 under SB 1078, accelerated in 2006 under SB 107 and expanded in 2011 under SB 2. Under AB 32, the Renewable Portfolio Standard will require the renewable portion of the retail portion of energy production to reach 33 percent by 2020. About 12 percent of PG&E's current portfolio qualifies as renewable, so a 21-percent gain would occur under the new rules (BAAQMD, 2010a).

Senate Bill 97, Modification to the Public Resources Code (2007)

Pursuant to Senate Bill 97 (SB 97), the Governor's Office of Planning and Research (OPR) developed and adopted revisions to the CEQA Guidelines addressing GHGs. The guidelines incorporate proposed text changes related to the significance criteria for evaluating GHG emissions on the environment. The draft guidelines were formalized on March 18, 2010 and all CEQA documents prepared after this date are required to comply with the OPR-approved amendments to the CEQA Guidelines. As part of these

[2] Note that the LCFS is intended to reduce the carbon intensity in fuels by 10 percent; however, the reduction will be on the order of 7 percent when considering the life-cycle of the fuel (e.g., producing, refining, and transportation).

guidelines, OPR recommends that each agency develop an approach to addressing GHG emissions that is based on the best available information. The approach includes three basic steps: (1) describe, calculate and estimate emissions, (2) assess the significance of the emissions, and (3) if emissions are significant, identify mitigation measures or alternatives that would reduce the impact to a less-than-significant level.

Senate Bill 375, California's Regional Transportation and Land Use Planning Efforts (2008)

To control indirect greenhouse gas emissions caused by urban sprawl, SB 375 provides incentives for local governments and developers to implement new, conscientiously planned growth patterns.

Recently, California enacted legislation (SB 375) to expand the efforts of AB 32 by controlling indirect GHG emissions caused by urban sprawl. SB 375 develops emissions-reduction goals that regions can apply to planning activities. SB 375 provides incentives for local governments and developers to implement new, conscientiously planned growth patterns. This includes incentives for creating attractive, walkable, and sustainable communities and revitalizing existing communities. The legislation also allows developers to bypass certain environmental reviews under CEQA if they build projects consistent with the new “Sustainable Community Strategies.” Development of more alternative transportation options that would reduce vehicle trips and miles traveled, along with traffic congestion, will be encouraged. SB 375 enhances CARB’s ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035. CARB will work with the metropolitan planning organizations (e.g., Association of Bay Area Governments and Metropolitan Transportation Commission) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. A similar process is used to reduce transportation emissions of ozone precursor pollutants in the Bay Area.

Executive Order S-13-08 (2008)

This Executive Order directed California agencies to assess and reduce the vulnerability of future construction projects to impacts associated with sea level rise.

California’s Heavy Duty Vehicle Greenhouse Gas Emissions Reduction Measure

On December 12, 2008 (one day after adopting the AB 32 Climate Action Plan), CARB adopted the Heavy Duty Vehicle GHG Emission Reduction measure that requires long-haul truckers to install fuel-efficient tires and aerodynamic devices on their trailers. This measure will reduce GHG emissions through improved fuel economy.

Bay Area Air Quality Management District (BAAQMD) Programs

In 2005, the Bay Area Air Quality Management District (BAAQMD) initiated a Climate Protection Program that integrates climate protection activities into existing BAAQMD programs and functions. Current BAAQMD climate action activities include grant programs, CEQA commenting, regulations, inventory development, and outreach. BAAQMD awarded $3 million to 53 local climate protection programs aimed at reducing GHG emissions in the Bay Area. Elementary school teaching curriculums have been developed by the BAAQMD. BAAQMD also provides technical assistance to local governments and other interested parties, and promotes collaborative efforts among stakeholders. BAAQMD has been a supporter of Napa County's effort to develop a Climate Action Framework (described below).

A regional GHG emission inventory for 2002 was developed by BAAQMD and recently updated for 2007 conditions (BAAQMD, 2010a). This inventory provides an overview of GHG emission sources in the Bay Area, including a breakdown by county levels and emission sectors. The inventory allows BAAQMD staff and others to identify emission sectors where potential GHG and criteria pollutant emission reductions can be achieved.

In 2008, BAAQMD adopted a fee program that applies to permitted stationary sources. These fees are used to fund BAAQMD's climate protection programs, while providing an incentive for sources to reduce their emissions.

BAAQMD is currently developing a comprehensive clean air plan update to address regional air pollution, which is known as the "2016 Clean Air Plan/Regional Climate Protection Strategy." This plan will also include BAAQMD plans to reduce GHG emissions.

The Bay Area Air Quality Management District recently adopted new CEQA Thresholds of Significance that address greenhouse gas emissions from projects and plans.

BAAQMD recently adopted new CEQA Thresholds of Significance that address GHG emissions from projects and plans. For planning activities, the new thresholds judge the significance based on the projected emissions per capita. Alternatively, the significance of the impact could be evaluated based on the consistency of the plan with an adopted GHG Reduction Strategy that is found to be consistent with AB 32 reduction goals; if the plan is consistent, it would not result in a significant impact. The BAAQMD CEQA Guidelines lay out the requirements that qualify an acceptable GHG Reduction Strategy (BAAQMD, 2010b).

Association of Bay Area Governments (ABAG) Plan Plan 2040

In 2013, the Association of Bay Area Governments adopted the Bay Plan 2040 policy document to assist local governments in the Bay Area plan for future transportation needs and preserve the character of communities. The Bay Plan 2040 is a state-mandated integrated transportation, land use and housing plan that. among other goals, will reduce air quality emissions and greenhouses gasses in the environment. The Plan has been prepared to respond to the requirements of Senate Bill 375.

Napa Countywide Community Climate Action Framework

The Napa Countywide Community Climate Action Framework outlines 53 actions that, when translated into local programs and projects, will help meet climate protection targets.

The community review draft of the Napa Countywide Community Climate Action Framework was released in December 2009 (NCTPA et al., 2009). Preparation of this document was supported by BAAQMD, Napa County Transportation and Planning Agency (NCTPA), Napa Valley Community Foundation, Napa County, and the cities of American Canyon, Calistoga, Napa, St. Helena, and Yountville. The Community Climate Action Framework provides a consensus-based context for further more detailed planning efforts. Building upon the emissions inventories developed for all six Napa County jurisdictions (including St. Helena), the framework outlines a package of 53 actions that, when translated into locally specific programs and projects countywide, will help meet climate protection targets. This policy framework is meant to be followed by locally appropriate implementation plans, designed for each jurisdiction, focusing on specific programs and projects. The Climate Action Framework document is anticipated to be considered for approval by the Napa County Board of Supervisors in July, 2016 (Hade, Napa County Planner, 2015)

City of St. Helena Greenhouse Gas Emission Reduction Action Plan

The City of St Helena Greenhouse Gas Emission Reduction Action Plan provides five measure-specific plans to reduce City-controlled greenhouse gas emissions by more than 20 percent.

The City of St Helena is implementing the International Council for Local Environmental Initiatives (ICLEI) program to reduce the GHG emissions from City-controlled sources (Tellus, 2009). The City of St Helena Greenhouse Gas Emission Reduction Action Plan provides five measure-specific plans to reduce City-controlled GHG emissions by more than 20 percent. The plan actually includes five plans to reduce GHG emissions to meet the overall goal. These plans consist of numerous measures to reduce GHG emissions, reduce energy costs, address equipment problems, and reduce the volatility of the City's annual energy costs.

Greenhouse Gas Inventories

U.S. Inventory

As part of the commitments to UNFCCC, the USEPA has developed an inventory of anthropogenic emissions by sources and removals by sinks of all GHGs. This inventory is periodically updated, with the latest update being 2008. The USEPA reported that total U.S. emissions rose by 14.7 percent from 1990 to 2006, while the U.S. gross domestic product increased by 59 percent over the same period. A 1.1-percent decrease in emissions was noted from 2005 to 2006, which is reported as attributable to (1) climate conditions, (2) reduced use of petroleum products for transportation, and (3) increased use of natural gas over other fuel sources. The inventory noted that the transportation sector emits about 33 percent of carbon dioxide emissions, with 60 percent of those emissions coming from personal automobile use. Residential uses, primarily from energy use, accounted for 20 percent of carbon dioxide emissions (USEPA, 2010).

As a part of its responsibility to develop and update an inventory of U.S. GHG emissions and sinks, the USEPA compared trends of other various U.S. data. Over the period between 1990 and 2006, GHG emissions grew at a rate of about 0.9 percent per year. Population growth was slightly higher at 1.1 percent, while energy and fossil fuel consumption were more closely related at 1.0 percent. Gross domestic product (GDP) and energy generation grew at much higher rates.

State of California Inventory

California is the second largest emitter of greenhouses gases in the United States and one of the largest emitters in the world.

California emissions of GHGs or CO_2-equivalent emissions in 2013 were estimated at 459 million metric tons of equivalent CO_2 emissions ($MMTCO_2e$).[3] Transportation is the largest source of GHG emissions in California, contributing about 37 percent of the emissions. Industrial activities account for 23 percent of the emissions. Electricity generation is at over 10 percent, but California imports electricity during the summer, bringing energy sources up to about 20 percent. On a per-person basis, GHG emissions are lower in California than most other states; however, California is a populous state and the second largest emitter of GHGs in the United States, and one of the largest emitters in the world (CARB, 2008).

CARB staff has estimated the 1990 statewide emissions level to be 431 $MMTCO_2e$.

[3] California Greenhouse Gas Emission Inventory - 2015 Edition, see http://www.arb.ca.gov/cc/inventory/data/data.htm - accessed on January 13, 2016..

Bay Area Inventory

Napa County emissions are the lowest in the Bay Area. As in most Bay Area counties, a majority of Napa County's emissions are from transportation.

BAAQMD estimated GHG emissions for the Bay Area at 102.7 million metric tons of equivalent CO_2 $MMCO_2e$ in 2007 (BAAQMD, 2010a). This inventory was updated for 2011to 86.6 $MMCO_2e$[4]. The inventory is broken down by county, where Napa County emissions are the lowest in the Bay Area at under 2 percent (1.5 $MMCO_2e$). As in most Bay Area counties, a majority of Napa County's emissions are from transportation (cars and trucking), accounting for 60 percent of the county's emissions. About 40 percent of the entire Bay Area inventory is attributable to transportation.

Napa County Inventory

Based on the most recent BAAQMD inventory (for 2007), Napa County GHG emissions are 1,690,586 metric tons of CO_2e. The 2005 inventories for Napa County were 1,167,235 metric tons of CO2e. These inventories were produced by a partnership of the ICLEI with staff from NCTPA, all six Napa County jurisdictions, and climate action plan consultants. These emission inventories vary due primarily to the differences in methodology used. For instance, BAAQMD uses the state's EMFAC2007 emission factor model to forecast travel within Napa County, which includes freight traffic and off-road equipment. The inventory prepared by the ICLEI and the county does not account for freight and non-road transportation sources such as the airport.

St. Helena Inventory

St. Helena's emissions are dominated by commercial/ industrial and residential energy usage.

As part of the ICLEI process to develop countywide emissions for 2005, inventories were developed for each of the six jurisdictions, including St. Helena. This inventory was updated for 2010 emissions[5]. According to the ICLEI modeling for the 2005 inventory, St. Helena produced 43,831 metric tons of CO2e per year and these emissions increased slightly to 44,008 metric tons of CO2e in 2010 (ICLEI 2011). This is a small fraction of the total emissions for the county. While the inventory for most communities is dominated by transportation sources, energy usage in the commercial/industrial and residential sectors dominates the inventory in St. Helena.[6] Note that the St. Helena emission inventory does not include emissions from traffic outside of the city that is generated by City land uses. Based on Association of Bay Area Governments (ABAG) projections, St. Helena's emission inventory would grow by just under 8 percent between 2005 and 2020. However, the ABAG projections show very small growth in

[4] BAAQMD. 2015. Bay Area Emissions Inventory Summary Report: Greenhouse Gases Base Year 2011.
[5] ICLEI 2011. City of St. Helena 2005 and 2010 Community-Wide Greenhouse Gas Emissions Inventory.
[6] Reported in the January 23, 2009 memo from the Napa Countywide Climate Action Plan Project Team to Carol Poole.

population and jobs in St. Helena. A previous inventory prepared for the City indicated that City-controlled GHG emissions were just over 1,000 metric tons per year (Tellus, 2009). These emissions do not include community-wide emissions.

Impacts and Mitigation Measures

Significance Criteria

Significance determinations are based on the BAAQMD guidelines for evaluating air quality impacts from plans (BAAQMD, 2010b and 2010c). The standards established by these guidelines address the CEQA thresholds identified in Appendix G of the CEQA Guidelines.

Based on Appendix G of the CEQA Guidelines, implementation of the proposed General Plan Update would have a significant GHG impact if it would:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gas

The BAAQMD CEQA thresholds have identified emissions-based thresholds that apply to the evaluation of general plans. These thresholds are based on meeting the AB 32 GHG emissions reductions targets. BAAQMD adopted an efficiency measurement that can be applied to the evaluation of plans in Bay Area jurisdictions. Under these thresholds, a plan would have a significant environmental impact if it allowed development that would generate more than 6.6 metric tons of CO2e per service population per year.[7]

Relevant Policies

Section 4.D, Air Quality, of this EIR identifies relevant policies to reduce air quality, which include policies pertaining to climate change, land use and growth management, circulation, community design, and open space and conservation. The Climate Change Element of the proposed General Plan Update includes the following policies:

CC1.1. Promote a “walkable” and “bikeable” city.

CC1.2. Support transportation planning efforts to optimize fuel efficiency and reduce vehicle miles traveled on local roads

CC2.1. Encourage measures to reduce energy demand through conservation and efficiency.

[7] Service population is defined as a combination of projected population and employment.

CC2.2. Support local efforts to improve the energy supply by switching from fossil fuels to renewables.

CC3.1. Enhance recycling, composting and source reduction services for residential and commercial uses to support Napa County's countywide waste reduction goal to achieve overall waste diversion of 75 percent to 90 percent by 2020.

CC4.1. Support efforts to protect and increase the amount of vegetation and biomass in soil, and reduce emissions from agricultural sources.

CC4.2. Encourage responsible and sustainable agricultural and landscaping practices.

CC4.3. Strengthen water conservation measures that result in significant reductions in local water use and the protection of local water resources.

CC4.4. Support efforts to expand and improve the City's managed urban forest program in order to reduce greenhouse gas emissions and improve overall air quality.

CC5.1. Support local efforts to market programs and conduct community outreach through schools, non-profit groups, community organizations and the business community to increase participation in greenhouse gas (GHG) reduction efforts.

CC5.2. Engage and advocate for collaborative programs, policies and legislative solutions at the regional, state, federal and global levels to reduce global GHG emissions.

CC5.3. Expand local awareness about gardening, composting and agriculture.

CC6.1. Ensure that the City leads by example in managing its local government operations while implementing the following policy directions:

- Encourage the reduction of fossil fuel consumption by local government operations.
- Improve energy efficiency and reduce greenhouse gas emissions in City and county facilities and operations.
- Reduce solid waste from City and County operations and facilities.

Impact Analysis

Less-than-Significant Impacts

The projected growth in population and economic activity allowed by the proposed General Plan Update would potentially conflict with AB 32 efforts

to reduce statewide GHG emissions, but this potential impact is considered less than significant for the reasons described below.

The BAAQMD CEQA Guidelines outline the procedures for evaluating GHG emissions associated with plans. The underlying premise in the guidelines is to demonstrate consistency with AB 32, which requires 2020 statewide greenhouse gas emissions to be reduced to year 1990 levels. The strategy to reduce GHG emissions assumes a certain amount of growth in population and economic activity in California. A five-step process is involved in the evaluation of GHG emissions from a General Plan as follows:

- Develop GHG reduction strategy;
- Inventory existing GHG emissions;
- Project GHG emissions for 2020 and General Plan buildout;
- Determine existing and projected service population; and
- Compare service population to 2020 GHG projections and thresholds of significance.

GHG Reduction Strategy

As previously described, St. Helena is developing strategies to reduce GHG emissions at both the municipal and community level. In addition to developing GHG emission reduction strategies in the General Plan Update, the City has participated in the development of the Napa County Climate Action Plan. This plan is intended to help achieve a 30-percent reduction in countywide emissions by 2020. The draft plan details six goals with 53 high-priority, countywide actions intended to achieve the emissions goals. Staff from all Napa County cities/towns and the County of Napa participated in drafting the 53 actions. The General Plan Update Climate Change Element policies reflect St. Helena's local efforts to implement 51 of these actions. Since St. Helena is mostly built out, much of the reduction would come from new development that encourages increased pedestrian, bicycle, and transit modes of travel. Reductions in energy consumption, especially associated with new development or redevelopment, are targeted in the General Plan Update.

As a result, the General Plan Update would not conflict with any attempts to develop or implement a Climate Action Plan. As discussed above, St. Helena is part of the Napa Countywide Community Climate Action Framework. The General Plan Update includes a Climate Change Element that contains policies and implementing programs that were developed as part of the countywide process.

Inventory of GHG Emissions

BAAQMD recommends quantifying communitywide GHG emissions from a general plan. The emissions inventory should be conducted for a base year at or before the current year of the plan, and should follow published CARB protocols for municipal and community-wide inventories (when available). BAAQMD recommends that the base year inventory be expressed in terms of metric tons CO2e emissions and account for municipal and community-wide emission sectors applicable in the jurisdiction such as transportation, commercial, residential, water use and treatment, solid waste, and agriculture. BAAQMD recommends use of the CalEEMod model to predict CO2e emissions for the various sectors attributable to land use projects.

As part of the Napa Countywide Community Climate Action Plan Framework, GHG emissions in St. Helena were inventoried for 2005 and 2010. Since population and employment have not changed substantially, the 2010 emissions are expected to be representative of current GHG emissions in the City of St. Helena.

Table 4.J-1 shows GHG emissions for St. Helena assuming existing land uses and population. These emissions are projected out to 2020 and 2035 assuming there is no change in St. Helena land uses. These emissions represent those from transportation, energy usage (in terms of natural gas combustion and electricity consumption), area sources, water and wastewater usage, and solid waste. While this inventory is not complete, it is expected to capture at least 95 percent of the emissions produced within St. Helena. The emissions inventory was developed as follows.

Transportation. The California Emissions Estimator model (CalEEMod) was used to predict CO2e emissions using the inventory of St. Helena and uses and existing traffic trips produced for the General Plan Update by Fehr & Peers. This model produces transportation emissions based on the latest version of CARB's on-road mobile source emission model, EMFAC2011. The model generates vehicle miles traveled based on the land uses inventoried in St. Helena and the projected trip generation data for the city (see Appendix A of this EIR). Unlike the 2005 and 2010 inventory, this analysis accounted for all trips with originations and or destinations in St. Helena. Thus, the modeling includes travel outside of St. Helena that is associated with the proposed General Plan Update. Because St. Helena is small, internal trips (those with originations and destinations in St. Helena) were adjusted to one mile based on the approximate size of the city. Traffic that passes through St. Helena is not included.

TABLE 4.J-1
ANNUAL GREENHOUSE GAS EMISSIONS IN ST. HELENA BASED ON EXISTING LAND USES (Metric Tons CO2E)[a]

Source	Calculation Methodology	Existing Conditions (2015)	Existing Conditions Projected to 2020	Existing Conditions Projected to 2030
Transportation	CalEEMod adjusting to 2010 trip generation data reported by Fehr & Peers	32,915	28,447	26,570
Energy Usage	Based on Residential Commercial and Industrial emissions reported for 2005 inventory that includes electricity and natural gas consumption	26,390	17,197	17,197
Area Sources	CalEEMod - landscape and fireplaces	412	412	412
Water and Wastewater	CalEEMod/BGM using PG&E CO2 emission rate	3,863	3,863	3,863
Solid Waste	Based on Solid Waste emissions reported for 2005 inventory	1,053	842	842
Total		**64,633**	**50,762**	**48,886**

[a] Projections show no growth in St. Helena.

SOURCE: Illingworth & Rodkin, 2016

Energy Usage. The 2010 inventory produced through the Climate Action Framework developed emissions for energy usage in St. Helena based on records from Pacific Gas & Electric Company (PG&E) regarding natural gas and electricity consumption. These projections for 2010 are considered to be more accurate than projections using land use-type models. Since St. Helena has grown little since 2010, these projections were used in this inventory. Future energy usage emissions were adjusted using CPUC's 2020 projected CO2 intensity factor for PG&E and PG&E's certified rate for 2010.

Area Sources. CalEEMod produces area source emissions associated with use of landscape equipment and fireplaces.

Water and Wastewater Usage. The conveyance and treatment of water and wastewater require energy. The CalEEMod model predicts these emissions based on the various land uses. The CalEEMod model is adjusted to account for PG&E emission rates, since much of the energy used for water and wastewater is provided by the utility.

Solid Waste. Emissions from solid waste were developed for the 2005 and 2010 inventory and are expected to be similar in 2015. These emissions are

anticipated to decrease in the future by 20 percent due to increased recycling or waste diversion and better controls on landfills.

Projected Emissions Inventory for 2020 and 2035 General Plan Update Buildout

The incremental General Plan Update land use projections for development allowed by the Growth Management System were modeled using CalEEMod to predict the increase in emissions. These emissions are shown in Table 4.J-2.

Transportation emissions are based on the CalEEMod default values, but have been reduced by 18 percent, which was the estimate that Fehr & Peers predicted in 2010 as internal trips. The CalEEMod default trip generation rates, trip types and trip lengths were used. The CalEEMod model does not reflect the changes in vehicle emissions associated with new development under the General Plan Update that would encourage higher rates of pedestrian and bicycle modes of travel, since these forecasts are not available.

Increases in energy usage were computed using future 2020 projected PG&E emission rates and assuming that newly constructed buildings would be 20 percent more energy-efficient. New construction would have to meet the latest State building code requirements that are assumed to be much more efficient than historical usage prior to 2008 when CalEEMod was developed. The solid waste diversion rate was assumed to be 20 percent greater by 2020, which is well below the lower end of the 75- to 90-percent goal of the General Plan Update.

TABLE 4.J-2
GROWTH IN ANNUAL GREENHOUSE GAS EMISSIONS IN ST. HELENA BASED ON GENERAL PLAN UPDATE (Metric Tons CO2E)

Source	Calculation Methodology	Growth in 2020 [a]	Growth in 2030[a]
Transportation	CalEEMod with default inputs adjusted for internal trips	5,113	4,777
Energy Usage	CalEEMod for electricity and natural gas using PG&E CO2 2020 emission rate	2,282	2,282
Area Sources	CalEEMod - landscape and fireplaces	19	19
Water and Wastewater	CalEEMod using 2020 PG&E CO2 emission rate	113	113
Solid Waste	CalEEMod assuming a 75 percent waste diversion rate	223	223
Total		**7,750**	**7,413**

[a] This is the cumulative, Full Buildout Scenario projection that is addressed under cumulative impacts in Chapter 6.

SOURCE: Illingworth & Rodkin, 2016

Since there is no 2020 projection for General Plan Update buildout, the buildout scenario under the Growth Management scenario was assumed to occur in 2020. GHG emission rates for transportation and electricity decrease in the future due to Federal and State requirements on these sources. With growth under the General Plan Update, GHG emissions would decrease by 9 percent if all growth occurred by 2020 and by 12 percent if all growth occurred in 2035, while population would increase by 13 percent and employment would increase by 10 percent. Table 4.J-3 reports the projected emissions inventory for 2020 and 2035. This is the 2010/2015 inventory adjusted to the future to account for reductions from motor vehicles plus the emissions for the General Plan Update reported in Table 4.J-2.

TABLE 4.J-3
PROJECTED ANNUAL GREENHOUSE GAS EMISSIONS IN ST. HELENA BASED ON GENERAL PLAN UPDATE (Metric Tons CO2E)

Source	Existing Conditions (2015)	General Plan Update 2020 [a]	General Plan Update 2035[a]
Area Sources	412	431	431
Energy Usage	26,390	19,480	19,480
Transportation	32,915	33,560	31,347
Solid Waste	1,053	1,065	1,065
Water and Wastewater	3,863	3,977	3,977
Total	64,633	58,512	56,299
Population	5,900	6,532	6,532
Employees	5,590	6,131	6,131
Per Capita Emissions[b]	**5.6**	**4.6**	**4.5**

a This is the cumulative, Full Buildout Scenario projection that is addressed under cumulative impacts in Chapter 6.
b Per capita emissions are calculated by dividing emissions by total population and employees ("service population").

SOURCE: Illingworth & Rodkin, 2016

The emissions reported in Tables 4.J-2 and 4.J-3 account for reductions expected from adopted state regulations that would affect mobile sources and electricity generation. Modeled emissions reflect some of the statewide efforts under AB 32 to reduce emissions. The following adjustments to the statewide inventory are expected by 2020 that were not accounted for in the St. Helena inventory:

- Natural gas emissions associated with Title 24 energy usage are anticipated to be reduced by 20 percent as a result of programs to increase energy efficiency statewide. Several programs are being implemented to reduce natural gas usage, most notably increases to energy efficiency requirements in the State Building Code (Title 24).

- Electricity GHG emissions associated with PG&E electricity would be reduced from the current rate of about 430 pounds per megawatt hour to 290 pounds in 2020. There are no reliable emission rates for PG&E electricity generation in years beyond 2020. Emissions from existing conditions were adjusted based on a 2005 rate of 489 pounds per megawatt hour to 290 pounds in 2020.

- The rate of solid waste generation is anticipated to decrease by at least 20 percent over existing conditions as state-mandated waste diversion programs and implementing policies of the General Plan Update become effective.

Projected Service Population

The BAAQMD CEQA Guidelines identify an efficiency-based threshold to evaluate emissions associated with general plans. This metric is based on the "service population," which is a combination of projected population and employment associated with the growth projections assumed in the general plan. The service population for the General Plan Update projections is shown in Table 4.J-3.

Conclusion

Emissions reported in Table 4.J-3 are divided by the "service population" to evaluate the significance. For 2020, BAAQMD has identified a efficiency threshold of 6.6 metric tons per capita per year. Table 4.J-3 also reports this metric for the 2035 buildout scenario. In 2020, the General Plan Update with assumed full development allowed by the Growth Management System is modeled to have per-capita emissions of 4.6 metric tons per capita per year. In 2035, assuming the same buildout, the efficiency would be 4.5 metric tons per capita per year, reflecting the same growth but lower transportation-related emissions. Since per-capita emissions would be below the BAAQMD threshold, the impact of GHG emissions from General Plan Update buildout would be less than significant.

In addition, the General Plan would not hinder or conflict with development of an applicable climate action plan. The Climate Change Element of the General Plan Update includes the policies and implementing programs applicable to St. Helena that have been developed as part of the countywide process (i.e., Napa Countywide Community Climate Action Framework).

Potentially Significant Impacts

The proposed General Plan Update would not have any potentially significant impacts related to GHGs.

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4.K Geology and Soils

Introduction

This section describes existing geologic conditions, including geologic and seismic hazards, in St. Helena; applicable regulatory framework regarding geology, soils, and seismicity and the potential geologic, soils, and seismic impacts of future development in the community in accordance with the proposed General Plan Update.

Background information for this section is drawn from published and unpublished regional geologic reports and maps from the United States Geological Survey (USGS), the California Geological Survey (CGS), the Natural Resources Conservation Service (NRCS), and other sources.

Setting

St. Helena is located within California's Coast Range Geomorphic Province, a geologically young and seismically active region. The Coast Range Province is characterized by a series of northwest-trending mountain ranges with intervening, alluvium-filled valleys. Specifically, St. Helena is located in the northern portion of the Napa Valley where the alluvial fans of York and Sulphur creeks blend across the floor of the valley and intersect the Napa River. The composition of topography, geologic material, soils and groundwater conditions affect the geologic hazards in any given area.

Geology

Most of St. Helena is located on the floor of the Napa Valley.

The City of St. Helena encompasses approximately 2940 acres of land, the majority of which is located on the floor of the Napa Valley. The valley floor is primarily layered with Holocene alluvium with small low lobes of Pleistocene alluvium exposed near the western margin. Alluvium consists mainly of unconsolidated gravel, sand, silt, and clay deposits that have been subject to redistribution by fluvial (stream) processes. St. Helena includes some upland areas both to the west (foothills of the Mayacamas Mountains) and east (foothills of the Vaca Mountains) of the valley floor. To the east, a 245-acre hillside area along Howell Mountain Road, above Silverado Trail, consists primarily of Sonoma Volcanics (Pliocene rhyolite, dacite, tuff, and pyroclastic rocks). To the northwest, between State Route 29 and Spring Mountain Road, additional low ridges of Sonoma Volcanics extend into the valley and into the city limits. To the southwest of Spring Mountain Road, moderate hills of Franciscan Complex mélange (sandstone, shale, chert, conglomerate, and greenstone) wrap around the city to the south, with limited exposure areas of serpentinized ultramafic rock and Sonoma Volcanics amidst overlying hillslope deposits (Clahan, 2006; Wagner, 1982; Graymer,

2006). Table 4.K-1 provides an overview of the various geologic units in the Planning Area.

TABLE 4.K-1
GEOLOGIC UNITS IN THE PLANNING AREA

Unit Name	Age	Description
Alluvium – Terrace Deposits	Holocene – Pleistocene	Alluvium, lake, playa, and terrace deposits; unconsolidated and semi-consolidated. Mostly nonmarine.
Sandstone – Conglomerate	Pliocene and/or Pleistocene	Sandstone, shale, and gravel deposits.
Dacite – Rhyolite	Tertiary	Volcanic flow rocks; minor pyroclastic deposits.
Rhyolite – Dacite	Tertiary	Pyroclastic and volcanic mudflow deposits.
Franciscan Complex	Jurassic to Cretaceous	Sandstone with smaller amounts of shale, chert, limestone, and conglomerate.
Franciscan Complex – Mélange	Jurassic to Cretaceous	Mélange of fragmented and sheared Franciscan complex rocks.
Serpentinite – Peridotite	Middle to Late Jurassic	Ultramafic rocks, mostly serpentine. Minor peridotite, gabbro, and diabase.

SOURCE: Ludington, 2007

Topography

The broad plain of the valley bottom slopes gently from the northwest to the southeast.

The broad plain of the valley bottom slopes gently from the northwest to the southeast, with an elevation of approximately 320 feet NGVD[1] at the foot of the northwestern hills and approximately 200 feet NGVD near the filtration plant and Napa River to southeast. In the foothills of the Vaca Mountains east of the Napa River, the properties above Silverado Trail rise to a maximum elevation of approximately 720 feet NGVD. Along the western edge of the city, the incorporated area includes portions of the foothills of the Mayacamas to about 540 feet NGVD, with a maximum elevation of approximately 740 feet NGVD atop a small knob just west of Dean York Lane (USGS, 1993; USGS, 1973). The majority of the City of St. Helena is within the level terrain of the valley floor, west of the Napa River.

[1] National Geodetic Vertical Datum of 1929, which is roughly equivalent to mean sea level.

Soils

Soil is generally defined as the unconsolidated mixture of mineral grains and organic material that mantles the land surfaces of the earth. Soils can develop on unconsolidated sediments, such as alluvium, and weathered bedrock. The characteristics of soil reflect the five major influences on their development: topography, climate, biological activity, parent (source) material, and time.

Many of St. Helena's soils are moderately expansive.

The City of St. Helena contains approximately 28 different individual soil types; however, these are grouped by type and character into soil "associations" or "complexes." Generally, these groups have similar geophysical characteristics. Roughly 72 percent of the soils of St. Helena (most of the valley floor) are Bale, Cole, Cortina or Pleasanton loams (NRCS 2009). Many of these soils are moderately corrosive to concrete, and moderately to highly corrosive to steel. They are also moderately expansive, and may cause shrink-swell damage to structures. Implications of soil characteristics from a geologic hazard perspective (e.g., expansive soils) are discussed below in the Seismic and Geologic Hazards subsection.

Seismic Conditions

St. Helena is located in the seismically active San Francisco Bay Area but does not contain any known active earthquake faults.

St. Helena is located in the seismically active San Francisco Bay Area. The main feature generating seismic activity in the region is the tectonic plate boundary between the North American and Pacific plates. Locally, this boundary is referred to as the San Andreas Fault Zone (SAFZ) and includes numerous active faults found by the California Geological Survey under the Alquist-Priolo Earthquake Fault Zoning Act to be "active" (i.e., to have evidence of fault rupture in the past 11,000 years). Some of the major active faults within the SAFZ include the San Andreas, Hayward, Rodgers Creek, Calaveras, San Gregorio-Seal Cove, Maacama, West Napa, Green Valley, Concord, Greenville, and Calaveras faults. St. Helena is located approximately 13 miles east of the Alquist-Priolo Earthquake Fault Hazard Zone (APEFHZ) for the Rodgers Creek Fault Zone and approximately 17 miles southwest of the APEFHZ for the Hunting Creek Fault. The West Napa fault is located approximately 21 miles south of St. Helena in the Napa Valley (CDMG, 1988). No known active faults are present in the City of St. Helena. Information on active regional faults is shown in Table 4.K-2 and active fault locations are shown in Figure 4.K-1.

Geologic and soil conditions in an area can influence the shaking effects of an earthquake. The Association of Bay Area Governments (ABAG) earthquake hazard mapping indicates that a magnitude 7.9 event on the San Andreas Fault (similar to the 1906 earthquake) or a 6.5 event on the

TABLE 4.K-2
ACTIVE FAULTS IN THE VICINITY OF ST. HELENA

Fault	Location and Direction from St. Helena	Slip Rate[1] and Recurrence Interval[2]	A-PEFZA[3] Fault Classification	Historical Seismicity	M_w[4]
Rodgers Creek	13 miles west – Petaluma Valley. Connects by means of right steps the Hayward Fault to the Maacama Fault.	Greater than 5.0 mm/year. Recurrence interval of 131-370 years (best estimate of 230 years).	Active	M5.6, 1969 M5.7, 1969 M6.4, 1898 M5.6, 1893	7.0
Maacama (Central)	14 miles northwest – From Laytonville in Mendocino County to Mark West Creek in Sonoma County	Greater than 5.0 mm/year. Recurrence interval of 220 years.	Active	No recorded earthquakes greater than M6.0.	7.1
Hunting Creek – Berryessa	17 miles northeast – From the Wilson Valley south-southeast to the Cedar Roughs area west of Lake Berryessa.	Approximately 6 mm/year. Recurrence interval ~194 years.	Active	No recorded earthquakes greater than M6.0.	6.9
Concord – Green Valley	18 miles southeast – Wooden Valley south to Suisun Bay.	Between 1.0 and 5.0 mm/year. Recurrence interval unknown.	Active	No recorded earthquakes greater than M6.0.	6.9
West Napa	21 miles south – Along the western edge of the Napa Valley.	Between 0.2 and 1.0 mm/year. Recurrence interval unknown.	Active	M5.8, 1891 August 2014	6.5 6.0
San Andreas	33 miles west – The San Andreas fault zone extends 700 miles from the Gulf of California to the Mendocino fault zone.	Between 16 and 25 mm/year. Recurrence interval is approximately 227 years.	Active	M7.1, 1989 M8.25, 1906 M7.0, 1838 Many <M6	7.9

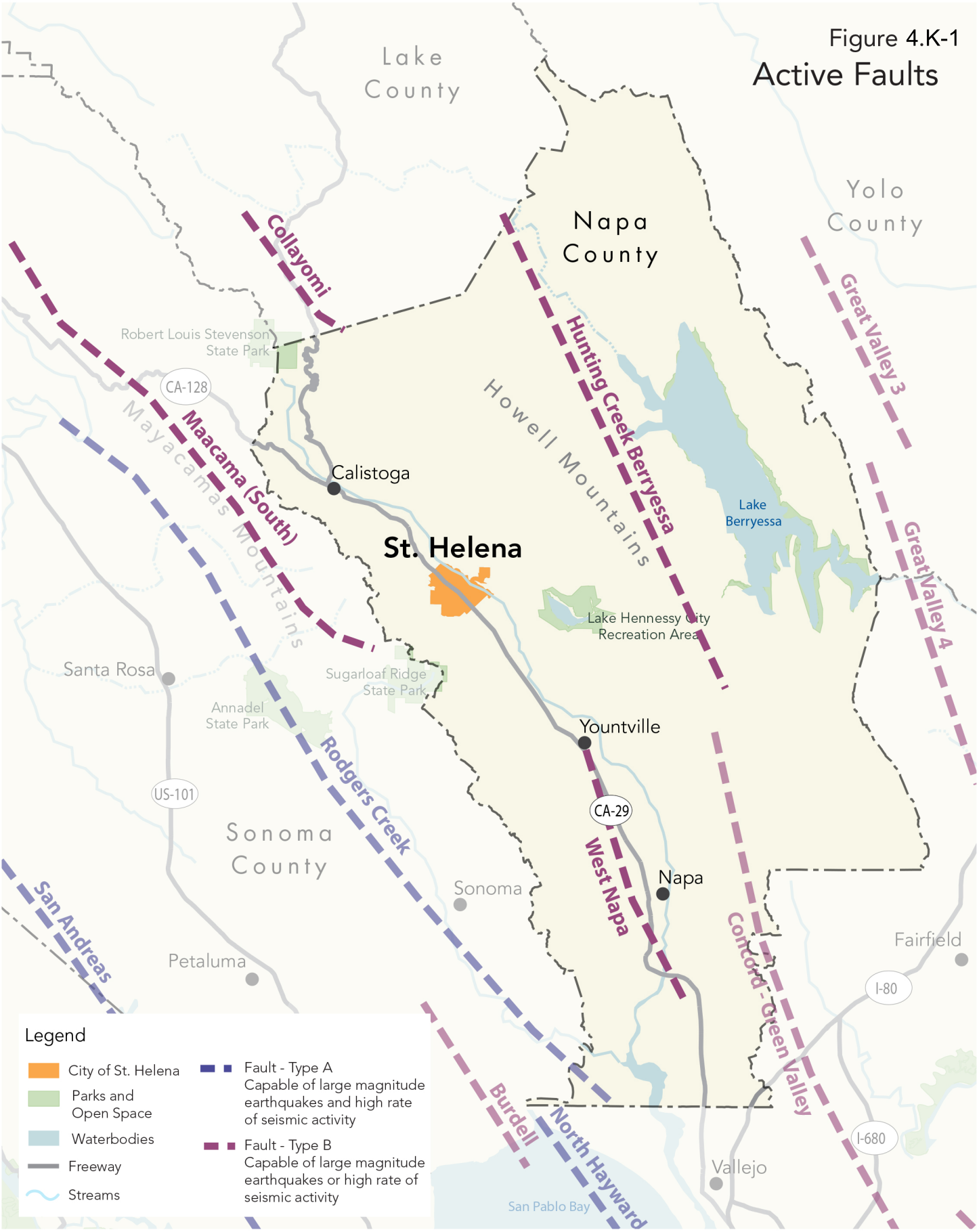
NOTES:
1 Slip Rate refers to the relative movement across the fault zone by opposing blocks, in millimeters (mm) per year.
2 Recurrence Interval estimates relies on studies of past individual fault activity for time between significant events.
3 A-PEFZA refers to the Alquist-Priolo Earthquake Fault Zoning Act.
4 Maximum Moment Magnitude (M_w) is the strongest earthquake that is likely to be generated along a fault zone, based on the geologic character of the fault and earthquake history (CDMG, 1996).

mm: millimeters

SOURCE: Jennings, 1994; CDMG, 1996; ICBO, 1998; CGS, 2009

West Napa Fault would result in strong to very strong (MMI-VII/VIII)[2] shaking in the area of St. Helena. Based on USGS mapping, the St. Helena vicinity ranges from a low hazard for liquefaction susceptibility (in the upland areas west of downtown) to highly susceptible in the lowlands adjacent to the Napa River. Slope stability issues and landslides have been mapped in the hillsides of the Napa Valley, and USGS maps indicate upland areas may be prone to slope instability and serve as source areas for debris flows.

2 MMI refers to Modified Mercalli Intensity Scale which measures the intensity of earthquakes.



Source: City of St. Helena; Napa County
Map Revised: April 2016

In a fact sheet published in 2003, the U.S. Geological Survey estimated that there was a 62-percent probability that between 2003 and 2032, a 6.7 or greater magnitude earthquake will occur in the San Francisco Bay Region. The probability of a 6.7 magnitude or greater earthquake occurring along individual faults was estimated to be 21 percent along the San Andreas Fault, 27 percent along the Hayward-Rodgers Creek Fault, and 11 percent along the Calaveras Fault (USGS, 2003).

On August 24, 2014 a 6.0 earthquake struck the Napa Valley. This was the largest earthquake to occur in the San Francisco Bay Area since the 1989 Loma Prieta quake. The earthquake occurred approximately four miles northwest of American Canyon, six miles southwest of Napa and nine miles southeast of Sonoma, according to the USGS. The quake, according to the USGS, was estimated to be about 11.3 kilometers deep and was considered "strong" by the USGS. Major quakes start at a 7.0 magnitude, according to the USGS scale. Seismologists considered the West Napa Fault to be the possible source of the quake, but the quake could not be attributed to a specific fault due to lack of conclusive surface expression. While damage from the quake was substantial in parts of the City of Napa, particularly in downtown area, along with some limited damage in the City of Vallejo, St Helena experienced very little to no damage as a result of the earthquake.

Seismic and Geologic Hazards

This subsection describes the hazards associated with the geologic conditions and the potential for seismic events in the City of St. Helena.

Fault Rupture Damage

Surface rupture occurs when the ground surface is broken due to fault movement during an earthquake. The location of surface rupture generally can be assumed to be along an active major fault trace.

Regional faults identified by the CGS are shown in Figure 4.K-1. The nearest Alquist-Priolo active or potentially active fault to the City of St. Helena is the Rodgers Creek Fault, which extends from San Pablo Bay up the eastern flank of the Petaluma Valley, across Sonoma Mountain and then north, past Santa Rosa. The related Maacama Fault has an active segment located just west of Franz Valley and extending to the northwest. The maximum expected earthquake for this fault complex is estimated to be magnitude (M_w) 6.9 (ICBO, 1998). The fault has caused Holocene (i.e., the last 11,000 years) displacement, but not during historic times (approximately the last 200 years).

The fault rupture hazard for the city is low.

A number of unnamed, relatively small, older faults are located at the base of the Sonoma and Vaca mountains along the margins of the Napa Valley; however, based on available information, displacement of these faults occurred more than 10,000 years ago. The CGS has not mapped any of these as an Alquist-Priolo Earthquake Fault Zone, indicating that, at the present time, the CGS does not consider them likely to generate surface rupture. Accordingly, these faults are generally considered inactive.

The fault rupture hazard for the city is considered to be low. Fault rupture hazards in the city would need to be reevaluated if future data were to suggest that such a hazard is present.

Seismic Shaking

In addition to the Rodgers Creek, Napa and Green Valley faults, noted above, major regional faults outside the City of St. Helena but in the Coast Ranges are capable of producing ground shaking in the city.

Seismic shaking (or ground shaking) is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions. Magnitude is a measure of the energy released by an earthquake; it is assessed by seismographs that measure the amplitude of seismic waves. Intensity is a subjective measure of the perceptible effects of seismic energy at a given point and varies with distance from the epicenter and local geologic conditions. The Modified Mercalli Intensity Scale (MMI) is the most commonly used scale for measurement of the subjective effects of earthquake intensity (see Table 4.K-3). Intensity can also be quantitatively measured using accelerometers (strong motion seismographs) that record ground acceleration at a specific location, a measure of force applied to a structure under seismic shaking. Acceleration is measured as a fraction or percentage of the acceleration under gravity (g). In addition to the Rodgers Creek, Napa and Green Valley faults, noted above, major regional faults outside the City of St. Helena but in the Coast Ranges are capable of producing ground shaking in the city.

Peak Acceleration

The State of California has made estimates of the peak ground acceleration for the area based on probabilistic models that account for multiple seismic sources. Under these models, consideration of the probability of expected seismic events is incorporated into the determination of the level of ground shaking at a particular location. The expected peak horizontal acceleration (with a 10-percent chance of being exceeded in the next 50 years) generated by any of the seismic sources potentially affecting the St. Helena area is estimated by the California Geological Survey at about 0.36g[3] on the

[3] Measured as a fraction or percentage of the acceleration compared to gravity (g).

alluvium of the valley floor to 0.31g in the foothills (CGS 2008). This level of ground shaking is a potentially significant hazard.

Liquefaction

Liquefaction is the rapid transformation of saturated, loose, fine-grained sediment to a fluid-like state because of earthquake ground shaking. In the process, the soil undergoes transient loss of strength, which commonly causes ground displacement or ground failure to occur. Since saturated soils are a necessary condition for liquefaction, soil layers in areas where the groundwater table is near the surface have higher liquefaction potential than those in which the water table is located at greater depths. Liquefaction can

TABLE 4.K-3
MODIFIED MERCALLI SCALE

M[a]	Category	Definition
	I	Not felt except by a very few under especially favorable circumstances.
3	II	Felt only by a few persons at rest, especially on upper floors of buildings. Delicately suspended objects may swing.
	III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibration like passing of truck. Duration estimated.
4	IV	During the day felt indoors by many, outdoors by few. At night some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
	V	Felt by nearly everyone, many awakened. Some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned. Disturbances of trees, poles, and other tall objects sometimes noticed. Pendulum clocks may stop.
5	VI	Felt by all, many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.
6	VII	Everybody runs outdoors. Damage negligible in building of good design and construction; slight to moderate in well-built ordinary structures; considerable in poorly built or badly designed structures; some chimneys broken. Noticed by persons driving motor cars.
	VIII	Damage slight in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures. Panel walls thrown out of frame structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned. Sand and mud ejected in small amounts. Changes in well water. Persons driving motor cars disturbed.
7	IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse. Buildings shifted off foundations. Ground cracked conspicuously. Underground pipes broken.
8	X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked. Rails bent. Landslides considerable from river banks and steep slopes. Shifted sand and mud. Water splashed (slopped) over banks.
	XI	Few, if any, (masonry) structures remain standing. Bridges destroyed. Broad fissures in ground. Underground pipelines completely out of service. Earth slumps and land slips in soft ground. Rails bent greatly.
	XII	Damage total. Practically all works of construction are damaged greatly or destroyed. Waves seen on ground surface. Lines of sight and level are distorted.

[a] Richter Magnitude correlation.

SOURCE: CGS, 2002

result in substantial loss of life, injury, and damage to property. In addition, liquefaction increases the hazard of fires because of explosions induced when underground gas lines break, and because the breakage of water mains substantially reduces fire suppression capability.

Liquefaction potential is very low to moderate in most of St. Helena.

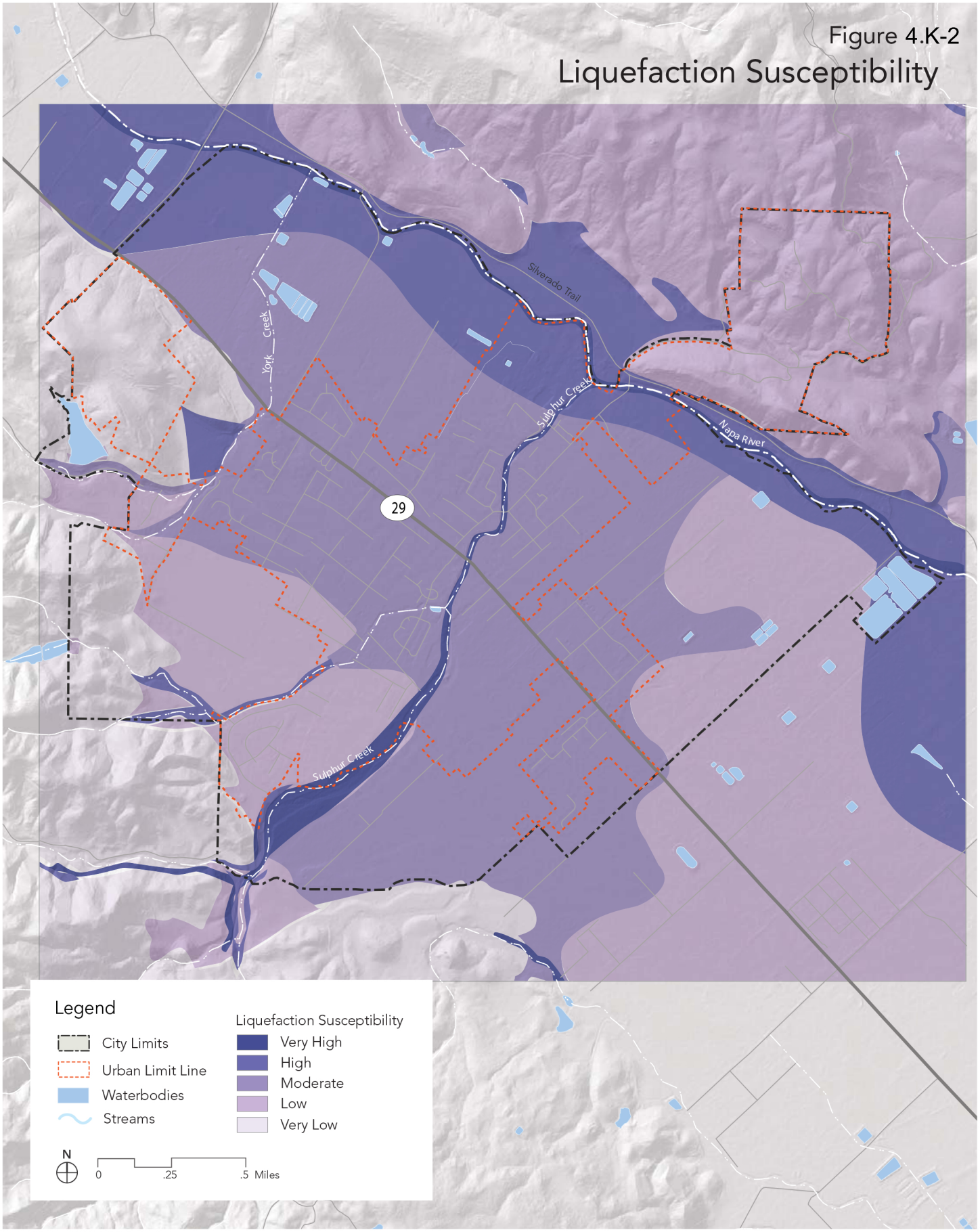
Most of St. Helena is underlain by materials that have very low to moderate liquefaction potential (Knudsen et al., 2000). In particular, the upland areas have a very low potential for liquefaction. Liquefaction potential increases in the vicinity of the Napa River at the east side of the city and locally near

creeks where loose granular sediments have accumulated as a result of stream processes. The approximate boundaries and hazard levels for liquefaction risk are shown in Figure 4.K-2. The potential for liquefaction also depends on soil conditions and groundwater levels, which may fluctuate. In general, where there is any potential for liquefaction, site-specific studies are needed to determine the extent of the hazard if development were to occur in the area.

Lateral spreading is a form of horizontal displacement of soil toward an open channel or other "free" face, such as an excavation boundary. Lateral spreading can result from either the slump of low cohesion unconsolidated material or more commonly by liquefaction of either the soil layer or a subsurface layer underlying soil material on a slope, resulting in gravitationally driven movement. Lateral spreading (lurching) may also occur where open banks and unsupported cut slopes provide a free face. Excavations for building foundations and other improvements, such as trenching for utilities installation, can provide opportunity for earth failures, such as lateral spreading, to occur. In addition, over-steepened banks and sudden grade changes, unless properly engineered, may also provide opportunity for lateral spreading. Ground shaking, especially when inducing liquefaction, may cause lateral spreading toward unsupported slopes. Areas most prone to lateral spreading are those that consist of fill material that has been improperly engineered, that have steep, unstable banks, and that have high groundwater tables. Damage caused by liquefaction and lateral spreading is generally most severe when liquefaction occurs within 15 to 20 feet of the ground surface.

Landsliding and Slope Stability

The strong ground motions that occur during earthquakes are capable of inducing landslides, generally where unstable slope conditions already exist. Slope instability is discussed below. Slope failure can occur as either rapid movement of large masses of soil ("landslide") or slow, continuous movement ("creep"). The primary factors influencing the stability of a slope are (1) the nature of the underlying soil or bedrock; (2) the geometry of the slope (height and steepness); (3) rainfall; and (4) the presence of previous landslide deposits. Landslides are commonly triggered by unusually high rainfall and the resulting soil saturation, by earthquakes, or a combination of these conditions. The general term "landslide" may include a wide range of slope failures, including but not limited to rock falls, deep failure of slopes, earthflows, and shallow debris flows. Some landslides occur as a result of human activities, such as timber harvest, undermining of a slope, or improper drainage-water management.



Source: City of St. Helena; Napa County, ABAG
Map Revised: April 2016

The Napa Valley floor is mapped as *Category 1, Stable areas of less than five percent slope and not underlain by landslide deposits*. The foothills in the western part of St. Helena are mapped as either *generally to marginally stable* and includes slopes of 5 to 15 percent, or as areas greater than 15 percent that are *not underlain by landslide deposits or are underlain by bedrock units that are not susceptible to landslide* (Nilsen et al., 1979). The foothills of the Vaca Mountains (the eastern rise above the Napa River) include areas mapped as unstable, specifically as being underlain by, or adjacent to, existing landslide deposits.

Expansive Soils

St. Helena's soils range from low to high shrink-swell potential.

Expansion and contraction of soil volume can occur when expansive soils undergo alternating cycles of wetting (swelling) and drying (shrinking). During these cycles, the volume of the soil changes markedly. As a consequence of such volume changes, structural damage to buildings and infrastructure may occur if the potentially expansive soils were not considered in building design and during construction.

The soils of the St. Helena area range from low to high shrink-swell potential. Moderate to high shrink-swell potential soils are classified as expansive soils and construction will require appropriate engineering (NRCS 2009). Limited areas of highly expansive soil exist in St. Helena, primarily in silt-loam soils near the Napa River.

Subsidence

Subsidence is the lowering of the land-surface elevation. The mechanism for subsidence is generally related to groundwater pumping and subsequent consolidation of loose aquifer sediments. The primary hazards associated with subsidence are increased flooding hazards and damage to underground utilities. Other effects of subsidence include changes in the gradients of stormwater and sanitary sewer drainage systems in which the flow is gravity-driven. Subsidence has not been reported to be a significant problem in the upper Napa Valley where St. Helena is located (Jones and Stokes, 2005).

Settlement and Differential Settlement

Differential settlement or subsidence could occur if buildings or other improvements were built on low-strength foundation materials (including imported fill) or if improvements straddle the boundary between different types of subsurface materials (e.g., a boundary between native material and fill). Although differential settlement generally occurs slowly enough that its effects are not dangerous to inhabitants, it can cause significant building damage over time.

Portions of St. Helena that contain loose or uncontrolled (non-engineered) fill may be susceptible to differential settlement.

Portions of St. Helena that contain loose or uncontrolled (non-engineered) fill may be susceptible to differential settlement. Regional surficial deposits mapping by the USGS does not indicate human-made fill in the vicinity of St. Helena (Helley, 1979); however, local dumping or casual fill activities may have occurred in the area and would not be mapped at the regional scale. Soil strength information is included with the individual soil descriptions by the NRCS, but interpretation of soil strength engineering implications for building projects requires site-specific soil identification and testing.

Regulatory Framework

This section describes the applicable federal, state, and local regulations that pertain to the City of St. Helena.

Federal Regulations

The National Earthquake Hazards Reduction Program (NEHRP) was established by the U.S. Congress when it passed the Earthquake Hazards Reduction Act of 1977, Public Law (PL) 95–124. In establishing NEHRP, Congress recognized that earthquake-related losses could be reduced through improved design and construction methods and practices, land use controls and redevelopment, prediction techniques and early-warning systems, coordinated emergency preparedness plans, and public education and involvement programs. The four basic NEHRP goals remain unchanged:

- Develop effective practices and policies for earthquake loss reduction and accelerate their implementation;
- Improve techniques for reducing earthquake vulnerabilities of facilities and systems;
- Improve earthquake hazards identification and risk assessment methods, and their use; and
- Improve the understanding of earthquakes and their effects.

Several key federal agencies contribute to earthquake mitigation efforts. There are four primary NEHRP agencies:

- National Institute of Standards and Technology (NIST) of the Department of Commerce;
- National Science Foundation (NSF);
- United States Geological Survey (USGS) of the Department of the Interior; and
- Federal Emergency Management Agency (FEMA) of the Department of Homeland Security.

Implementation of NEHRP priorities is accomplished primarily through original research, publications, and recommendations to assist and guide state, regional, and local agencies in the development of plans and policies to promote safety and emergency planning.

State Regulations

Applicable state regulations include the California Building Code, Alquist-Priolo Earthquake Fault Zoning Act, and Seismic Hazards Mapping Act.

California Building Code

Compliance with the 2007 California Building Code requires that structures for human occupancy be designed and constructed to resist the effects of earthquake motions.

The 2013)\ International Building Code (IBC) is published by the International Code Council (ICC) and is the widely adopted model building code in the United States. The (2013) California Building Code (CBC) is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code (CBSC). The CBC incorporates by reference the IBC requirements with necessary California amendments. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. Compliance with the 2013 CBC requires that (with very limited exceptions) structures for human occupancy be designed and constructed to resist the effects of earthquake motions. The Seismic Design Category for a structure is determined in accordance with either CBC Section 1613 – *Earthquake Loads* or American Society of Civil Engineers (ASCE) Standard No. 7-05, *Minimum Design Loads for Buildings and Other Structures*. In brief, based on the engineering properties and soil-type of soils at a proposed site, the site is assigned a Site Class ranging from A to F. The Site Class is then combined with Spectral Response (ground acceleration induced by earthquake) information for the location to arrive at a *Seismic Design Category* ranging from A to E, with E being the most severe conditions. The classification of a specific site and related calculations must be determined by a qualified person and is site-specific.

Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA)

The A-PEFZA requires the State Geologist to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults.

The Alquist-Priolo Earthquake Fault Zoning Act (A-PEFZA) was passed in December 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The A-PEFZA's main purpose is to prevent the construction of buildings used for human occupancy across the surface trace of active faults. The A-PEFZA only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. (As discussed below, the Seismic Hazards Mapping Act, passed in 1990, addresses

non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides.)

The A-PEFZA requires the State Geologist to establish regulatory zones, known as Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and the development of most structures for human occupancy. Before a project can be permitted, cities and counties must require a geologic investigation of the project site to demonstrate that proposed buildings will not be constructed across active faults. The evaluation of a specific site and written report must be prepared by a licensed geologist. If an active fault is found, any structure for human occupancy must be set back a minimum of 50 feet from the fault trace as the area within 50 feet of such active faults is presumed to be underlain by active branches of that fault unless proven otherwise by an appropriate geologic investigation and report.

Seismic Hazards Mapping Act (SHMA)

The SHMA established a statewide mapping program to identify areas subject to violent shaking and ground failure.

In 1990, following the 1989 Loma Prieta earthquake, the California Legislature enacted the Seismic Hazards Mapping Act (SHMA) to protect the public from the effects of strong ground shaking, liquefaction, landslides, and other seismic hazards. The SHMA established a statewide mapping program to identify areas subject to violent shaking and ground failure. The program is intended to assist cities and counties in protecting public health and safety. The SHMA requires the State Geologist to delineate various seismic hazard zones and requires cities, counties, and other local permitting agencies to regulate certain development projects within these zones. As a result, the CGS is mapping SHMA Zones and has completed seismic hazard mapping for the portions of California most susceptible to liquefaction, ground shaking, and landslides: primarily the San Francisco Bay Area and Los Angeles basin. At the time of the preparation of this Draft EIR, the City of St. Helena had not yet been mapped in conformance with the SHMA, and CGS has not indicated a schedule for completion of the study.

Surface Mining and Reclamation Act

In 1975, California enacted the Surface Mining and Reclamation At (SMARA). This act provides a comprehensive surface mining policy that allows continued extraction of minerals from watercourses and other surface mines as well as the protection and subsequent beneficial use of mined areas.

Existing St. Helena General Plan

The existing St. Helena General Plan, adopted in 1993, outlines policies, standards, and programs that together provide a comprehensive, long-term plan for physical development within the city. Individual development projects proposed within the city must demonstrate general consistency with the goals and policies outlined within the General Plan, which articulates and implements the city's long-term vision, including provisions related to geology and soils.

Gravel operations along Sulphur Creek

The proposed project analyzed in this EIR is the St. Helena General Plan Update, which is an update of the existing General Plan. Once the General Plan Update is adopted, future developments within the city will be subject to policies outlined in the updated document.

Impacts and Mitigation Measures

Significance Criteria

Based on Appendix G of the CEQA Guidelines, the proposed General Plan Update would have a significant effect related to geology and soils if it would:

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:

  i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault (refer to Division of Mines and Geology Special Publication 42);

  ii) Strong seismic ground shaking;

  iii) Seismic-related ground failure, including liquefaction;

  iv) Landslides.

- Result in substantial soil erosion or the loss of topsoil;

- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;

- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property; or

- Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

Relevant Policies

The following relevant policies and implementing actions of the General Plan Update address geology, soils and seismicity:

PS3.1. Minimize risk of injury, loss of life and property damage from seismically-induced and other known geologic hazards.

PS3.2. Restrict the intensity of development and the level of landform alteration in the hillside areas in order to minimize the potential for slope failure.

PS3.3. The required soils and geotechnical reports for new development shall include geotechnical analysis for construction in areas with potential geological hazards and/or for purposes of environmental analysis. The analysis shall investigate all potential geo-hazard issues for the site where there is substantial evidence of a potential risk.

PS3.4. Geological reports for new development shall describe hazards and include mitigation measures to reduce risks to acceptable levels. Where appropriate, an engineer's or geologist's certification shall be required stating that risks have been mitigated to an acceptable level.

PS3.A. Require a soils and geologic report to be submitted for new construction prior to the issuance of grading and building permits and the submission of final maps.

PS3.B. Prohibit any development—including any land alteration, grading for roads and structural development—in areas of slope instability or other geologic concerns until mitigating measures are taken to limit potential damage to levels of acceptable risk.

PS3.C. Require prompt revegetation of development areas on slopes prone to instability. Use native and drought-tolerant plant species for landscaping on slopes where excess watering might induce landslides and/or erosion.

Impact Analysis

Less-than-Significant Impacts

Implementation of the General Plan Update would not result in development in areas having soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems. Certain areas (lands designated Woodland and Watershed) are outside the area served by the City of St. Helena's sanitary sewer system and would continue to be served by on-site wastewater systems. Applications for new development in areas not served by the sanitary sewer system would be required to apply to the Napa County Health and Human Services Department for installation of an on-site treatment system. The application and review process includes engineering and testing requirements to ensure that appropriate soils are present and/or

required specially designed systems are proposed to mitigate site constraints prior to system approval (County of Napa, 2010). For those areas within St. Helena served by the City system, General Plan Update Policies PF2.1 through PF2.4 would "ensure adequate sewage treatment capacity at the City treatment plant to meet the needs of population growth," as well as address system extension, and capacity improvements to the system. Implementing actions PF2.A through PF2.D would provide that nearly all new units (except those few noted above) must connect to the City wastewater system and would limit system growth to areas within the St. Helena Urban Limit Line. Thus, no significant impacts related to septic systems would result.

Potentially Significant Impacts

Impact GEO-1. Future uses that would be allowed under the General Plan Update could expose residents, visitors and employees as well as public and private structures to substantial risk from geologic and/or seismic hazards.

This discussion addresses the first four significance criteria listed above. The growth and changes from the General Plan Update would result in increased development, increased population, and/or other physical changes in St. Helena that could involve geological or seismic hazards (geohazards). Implementation of the General Plan Update would therefore result in additional people and structures being exposed to geohazards, including seismic risks, liquefaction, slope instability, potential soil settlement or compaction, and/or adverse soil conditions (e.g., expansive soils, corrosive soils). Some of these geohazards, particularly those related to seismic shaking, could result in injuries and/or fatalities; all of the geohazards discussed could result in damage to structures and property.

Existing federal and state programs, including NEHRP and the CBC, are designed to (1) provide accurate and timely information detailing seismic hazards, (2) impose regulatory requirements regarding geotechnical and soils investigations, (3) provide limitations on the locations of structures for human habitation, (4) impose requirements for hazard notices to potential users, and (5) establish structural standards for requirements for buildings and grading projects.

The policies and implementing actions of the General Plan Update would guide new development and reduce impacts relative to geohazards. It is the stated intent of the Public Health, Safety and Noise Element of the General Plan Update that it " . . . ensure that St. Helena's residents, workers and visitors are protected from negative exposure to . . . geologic and seismic hazards." Implementing Action PS3.A of the General Plan Update specifies that the City of St. Helena "require a soils and geologic report to be

submitted for new construction prior to the issuance of grading and building permits and the submission of final maps." Implementing Action PS3.B would prohibit or limit development in areas of slope instability unless adequate measures are taken to limit potential damage to levels of acceptable risk. Implementing Action PS3.C would require revegetation to stabilize slopes and reduce erosion potential post construction. For Implementing Action PS3.A, site-specific geologic investigation and analysis by a licensed professional and conducted in accordance with standard industry practices and state-provided guidance, such as the CGS Special Publication 117 of 2008, Guidelines for Evaluating and Mitigating Seismic Hazards in California, would serve to minimize risk associated with geohazards. In particular, site-specific geotechnical reports would be required to address all potential seismic hazards including seismic shaking, liquefaction, and potential for fault rupture. Although there are no mapped Alquist-Priolo faults within St. Helena, the significance criteria specify that faults be evaluated as indicated under the findings of the State Geologist or "as based on other substantial evidence of a known fault."

Due to the distances to major regional faults compared to some parts of California, St. Helena is subject to relatively low risk from violent seismic shaking. Nonetheless, active local faults like the Rodgers Creek, Maacama, Hunting Creek, or West Napa faults may result in significant shaking in St. Helena. Potential impacts from geohazards such as expansive or corrosive soils can also be mitigated by implementing the recommendations of site-specific geotechnical investigations and standard remedial measures (e.g., soil removal, foundation design). Similarly, slope stability issues, such as those in the eastern and western highlands of St. Helena, can be addressed by site-specific geotechnical investigations.

Adherence to the goals and implementing actions contained in the General Plan Update as well as the California Building Code and other regulations intended to reduce geologic and seismic hazards to an acceotable level of risk.

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4.L Hazards and Hazardous Materials

Introduction

This section of the EIR presents a general discussion of hazardous materials[1] and public health and safety impacts within the City of St. Helena. This discussion is largely based on information contained in the General Plan Update Phase I Findings Report (EDAW, 2008), the Natural Environment General Plan Update Working Paper (EDAW, 2007), and supplemented with information from City staff and regulatory agency records, 2015. Potential impacts related to hazardous materials and public health and safety hazards that could result from implementation of the policies and implementing actions of the Draft St. Helena General Plan Update are described and evaluated, with mitigation measures provided to address significant impacts, as appropriate.

Setting

Hazardous Materials

Products as diverse as gasoline, paint, solvents, household cleaning products, refrigerants, and radioactive substances are categorized as hazardous materials. What remains of a hazardous material after use, or processing, is considered to be a hazardous waste. Of concern to all communities are the handling, transportation, and disposal of such wastes, as well as proper handling of hazardous materials.

Beginning in the 1970s, governments at the federal, State, and local levels became increasingly concerned about the effects of hazardous materials management on human health and the environment. Numerous laws and regulations were developed to investigate and mitigate these effects. As a result, the storage, use, generation, transport, and disposal of hazardous materials and waste are highly regulated by federal, State, and local laws and regulations.

[1] The California Health and Safety Code defines a hazardous material as "...any material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety, or to the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, radioactive materials, and any material which a handler or the administering agency has a reasonable basis for believing that it would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment" (California Health and Safety Code Section 25501).

Contamination Investigation and Cleanup

Releases of hazardous materials may occur during use, storage, transfer, and disposal of these materials, and can contaminate soil, air nd groundwater at these sites. Releases that affect groundwater can migrate and contaminate other nearby sites. The San Francisco Bay Regional Water Quality Control Board (Water Board) records identify 46 hazardous materials release sites in the City of St. Helena, of which one currently under active regulatory oversight (RWQCB, 2015). The majority of these hazardous materials release sites in the City of St. Helena (29 of 46) are related to leaking underground storage tanks. Although current regulations requiring double-wall construction and leak monitoring equipment for underground storage tanks should reduce the number of releases in the future, many underground tanks installed in previous decades have failed, causing petroleum contamination in soils and groundwater. These releases are often discovered during tank removal or upgrade activities.

Typically, the most significant hazardous materials sites affecting public health are overseen by the California Department of Toxic Substances Control (DTSC). DTSC reports one on-going cleanup in St. Helena. A manufactured gas plant (MGP) operated on Mitchell Drive from 1883 until 1926. In 1930, PG&E acquired the site, dismantling the MGP upon introduction of natural gas to the region in 1931. Polycyclic aromatic hydrocarbons, petroleum hydrocarbons, arsenic, and lead have been detected in subsurface investigations at the site. Groundwater cleanup of this site is nearing completion, with DTSC requiring monitoring wells to be in place for the next five years until the year 2020.

Approximately 24 sites in the vicinity of St. Helena are listed by the County as users of hazardous materials (County of Napa, 2015). Of these filings, 20 are now listed as closed cases by the local regulatory agency, the Enviromental Health Division of the County Planning, Building and Environmental Services Department (PBES). The remaining four sites includes twogas stations, a winery and a radiator shop.

Other Hazardous Materials and Hazard Issues in the City of St. Helena

Aerially-Deposited Lead near Major Roadways

Aerially-deposited lead is a common hazardous materials issue in urban areas. Soils adjacent to major roadways often contain elevated concentrations of lead. The lead deposition is the result of airborne particulates and surface water runoff associated with tailpipe emissions prior to the time lead was phased out of vehicle fuels. Studies by the California Department of

Transportation (Caltrans) suggest that hazardous waste levels of lead, if present, are generally found in soils within 30 feet of the edge of the pavement (DTSC, 2000).

The City of St. Helena contains several heavily-trafficked roadways, including Main Street and Silverado Trail. Properties located adjacent to roadways may contain elevated concentrations of lead in exposed surface soils, which could pose a health hazard to construction workers and users of the properties. Lead is a State-recognized carcinogen (causes cancer) and reproductive toxicant (causes birth defects or other reproductive harm) (Cal/EPA Office of Environmental Health Hazard Assessment, 2007). Exposure of construction workers or future site occupants to lead in soil could result in adverse health effects, depending on the duration and extent of exposure.

Schools and Other Sensitive Receptors

Some populations, such as children, the elderly, and the infirm, are more susceptible to health effects of hazardous materials than the general population. Hazardous materials use near schools, day care centers, senior housing, and hospitals must consider potential health effects to these populations, often referred to as “sensitive receptors.” Construction or redevelopment on contaminated properties that could potentially generate vapors or fugitive dust containing contaminants may potentially pose a health risk to these populations. In addition, commercial businesses in proximity to sensitive receptors may have hazardous emissions or handle hazardous or acutely hazardous materials or wastes that could pose a health risk to these sensitive receptors.

Section 17210 et seq. of the State Education Code, Sections 21151.2, 21151.4, and 21151.8 of the Public Resources Code require that prospective school sites be reviewed to determine that such sites are not a current or former hazardous waste disposal site, a hazardous substance release site, or the site of hazardous substance pipelines. These laws also require consultation with local hazardous materials agencies and air quality districts to ensure that no sites within one-quarter mile of a school that handle or emit hazardous substances would potentially endanger future students or workers at the prospective school site.

All school districts receiving State funds must prepare a Phase I environmental assessment on prospective school sites. The Phase I assessment would detail the historical uses of the property and indicate any potential for contamination. DTSC must review this assessment and make one of the following findings: 1) that no further action is required; or 2) that concerns about contamination exist and the district must conduct a Preliminary Endangerment Assessment

(PEA). The PEA process entails site sampling and the development of a detailed risk assessment of any contaminants present on the proposed school property.

Lead, Asbestos, and Other Hazardous Materials in Building Materials

Hazardous materials are commonly found in building materials that may be affected during demolition and renovation activities associated with redevelopment. Prior to 1978, lead compounds were commonly used in interior and exterior paints and were banned on that year. Prior to the 1980s, building materials often contained asbestos fibers, which were used to provide strength and fire resistance and were banned. In addition, other common items are present in buildings, such as electrical transformers, fluorescent lighting, electrical switches, heating/cooling equipment, and thermostats that can contain hazardous materials, which may pose a health risk if not handled and disposed of properly.

Demolition of buildings has the potential to release lead particles, asbestos fibers, and/or other hazardous materials to the air where they may be inhaled by construction workers and the general public. Federal and State regulations govern the demolition of structures where lead or material containing lead is present. During demolition, lead-based paint that is securely adhering to wood or metal may be disposed of as demolition debris, which is a non-hazardous waste. Loose and peeling paint must be disposed of as a California and/or federal hazardous waste if the concentration of lead exceeds applicable waste thresholds. State and federal construction worker health and safety regulations require air monitoring and other protective measures during demolition activities where lead-based paint is present.

Federal, State, and local requirements also govern the removal of asbestos or suspected asbestos-containing materials (ACMs), including the demolition of structures where asbestos is present. All friable (crushable by hand) ACMs, or non-friable ACMs subject to damage, must be removed prior to demolition in accordance with applicable requirements, including notification to the BAAQMD. Friable ACM must be disposed of as an asbestos waste at an approved facility. Non-friable ACM may be disposed of as non-hazardous waste at landfills that will accept such wastes. Workers conducting asbestos abatement must be trained in accordance with State and federal Occupational Safety and Health Administration (OSHA) regulations.

Fluorescent lighting tubes and ballasts, computer displays, and several other common items containing hazardous materials are regulated as “universal wastes” by the State of California. Universal waste regulations allow common, low-hazard wastes to be managed under less stringent requirements

than other hazardous wastes. Management of other hazardous wastes is governed under DTSC hazardous waste rules.

Aviation

The City of St. Helena does not have an airport. The County of Napa has one public use airport in the southern portion of the County (Napa County Airport), and a smaller airport in Angwin (Parrett Field). None are within two miles of St. Helena (Napa County Airport Land Use Comaptibility Plan, 1999).

Emergency Response

County-wide, the Napa County Office of Emergency Services (OES) works with County departments, State agencies, and community groups to handle major disasters that affect County residents. In the event of a disaster, an Emergency Operations Center (EOC) is set up and staffed with trained professionals who coordinate all communications, logistics, resources, and recovery programs.

The City of St. Helena has a published comprehensive emergency preparedness plan. Thethe St. Helena Emergency Preparedness (flood) plan, and the Disaster Preparedness (power outages) plans provide recommendations for citizens on preparing for flooding, power outage and post-earthquake scenarios. The City of St. Helena has a paid call/volunteer fire department and traditional police department which would be responsible for providing safety and guidance in the event an evacuation were required (St. Helena, 2009).

Wildland Fires

In accordance with California Public Resource Code Sections 4201-4204 and 51175-51189, the California Department of Forestry and Fire Protection (CDF) has mapped areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), represent the risks associated with wildland fires. Under Government Code, Section 511182 areas within very high fire hazard risk zones must comply with specific building and vegetation management requirements intended to reduce property damage and loss of life within these areas. No portion of St. Helena is classified as very-high fire risk. In the western uplands of the City of St. Helena are areas classified as having moderate to high wildfire risk, with the with the remainder of St. Helena either classified as unban un-zoned or non-wild land/non urban, representing minimal wildfire risk (CalFire, 2009) (see Figure 4.L-1).

Regulatory Agency Framework

A myriad of laws and regulations at the federal, State, and local levels regulate the management of hazardous materials,as noted above. In California, the U.S. Environmental Protection Agency (U.S. EPA) has granted most enforcement authority over federal hazardous materials regulations to the California Environmental Protection Agency (Cal/EPA). In turn, a local agency, the Napa County Planning, Building and Environmental Services Department (PBES) has been granted responsibility for implementation and enforcement of many hazardous materials regulations in St. Helena under the Certified Unified Program Agency (CUPA) Program (described below).

In California, regional agencies are responsible for programs regulating emissions to the air, surface water, and groundwater. In the City of St. Helena, the Bay Area Air Quality Management District (BAAQMD) has oversight over air emissions, and the San Francisco Bay Regional Water Quality Control Board (Water Board) regulates discharges and releases to surface and groundwater. The Cal/EPA Department of Toxic Substances Control (DTSC) regulates remediation of sites where discharges to land could potentially present a public health risk.

Oversight of investigation and remediation of sites affected by hazardous materials releases can be performed by State agencies, such as DTSC, regional agencies, such as the Water Board, or local agencies, such as DEM, which oversees investigation and remediation of leaking underground petroleum storage tank (LUST) sites in St. Helena.

The U.S. Department of Transportation (DOT) is the Federal administering agency for hazardous materials transportation safety. The DOT Office of Hazardous Materials Safety oversees a national safety program to minimize the risks related to commercial transportation of hazardous materials. The Federal hazardous materials transportation law (49 United States Code 5101 et seq.) is the basic statute regulating hazardous materials transportation in the United States. Federal hazardous materials transportation regulations are contained in 49 Code of Federal Regulations Parts 171-180. In California, the California Department of Transportation (Caltrans) is the implementing agency for DOT laws and regulations.

Hazardous Materials Management Programs

Routine hazardous materials management in California is administered under the Certified Uniform Program Agency (CUPA) program. The CUPA program was established under the 1993 California Senate Bill 1082 to reduce the cost and improve the efficiency of enforcement of hazardous materials laws and regulations. The City of St. Helena’s hazardous materials

programs are administered and enforced by PBES under the CUPA program. The CUPA program encompasses several hazardous materials programs: Hazardous Materials Management Plans (HMMP) program, California Accidental Release Prevention (CalARP) program, underground storage tank (UST) programs, aboveground storage tank (AST) programs, and hazardous waste generation and disposal. The five hazardous materials programs administered under the CUPA program are described briefly below (County of Napa, 2015).

Hazardous Materials Management Plan

Businesses that store hazardous materials in excess of specified quantities must report their chemical inventories to PBES by preparing an HMMP, also known as a Business Plan. These plans must be filed with both the DEM and the City planning director (City of St. Helena, 2015). Approximately 24 facilities in the City of St. Helena are listed by the County as users of hazardous materials (County of Napa, 2015). This information informs the community on chemical use, storage, handling, and disposal practices. It is also intended to provide essential information to firefighters, health officials, planners, elected officials, workers, and their representatives so that they can plan for and respond to potential exposures to hazardous materials.

California Accidental Release Prevention Program

Under the CalARP Program, businesses that use large quantities of acutely hazardous materials must prepare a detailed engineering analysis of the potential accident factors present at a business and the mitigation measures that can be implemented to reduce this accident potential. There are currently 10 facilities in Napa County subject to the CalARP program. They are all wineries with the exception of one compressed gas distributor (County of Napa, PBES, 2015).

Underground Storage Tank (UST) Programs

Due to fire hazards, flammable liquids, such as gasoline, have historically been stored in USTs, which, over time, tend to leak, resulting in potential risks for the general public and the environment. Current regulations require that USTs be installed, monitored, operated, and maintained in a manner that protects public health and the environment. Tanks must be constructed with primary and secondary levels of containment and be designed to protect public health and the environment for the lifetime of the installation. The USTs must be monitored for leaks and built such that a leak from the primary container into the secondary container will be detected. When a UST is proposed to be removed, a detailed permit application must be submitted to PBES, which oversees removal activities to identify evidence of leakage.

Aboveground Storage Tank Programs

Inspections and permits are required for facilities storing hazardous materials in aboveground storage tanks (ASTs) by PBES. In addition, any facility operating ASTs with an aggregate tank capacity of 1,320 gallons or more must: 1) complete a Spill Prevention Control and Countermeasure (SPCC) plan to provide a detailed engineering analysis of the potential for release from ASTs present at a facility and the measures, such as secondary containment and emergency response that can be implemented to reduce the release potential; and 2) file a storage statement, as required by the State Water Resources Control Board (SWRCB). There are no AST sites reported by PBES in the City of St. Helena (County of Napa 2015).

Hazardous Waste Generation and Disposal

Once a hazardous material has been used or processed, what remains may be considered a hazardous waste. Many items routinely used by residents and businesses, such as paints and thinners, cleaning products, and motor oil, are considered hazardous waste once they are ready for disposal. Nearly all businesses and residences in St. Helena are expected to generate some amount of hazardous wastes (including household hazardous wastes). Hazardous waste generation and disposal regulations are administered and enforced by PBES. Businesses that generate more than 100 kilograms of hazardous waste per month, or more than one kilogram of acutely hazardous waste[2], must be registered with U.S. EPA's Resource Conservation and Recovery Act (RCRA) program and are subject to extensive regulations regarding storage and disposal.

Hazardous waste management oversight in St. Helena is primarily a responsibility of PBES. Household hazardous wastes in the City of St. Helena go to the Napa-Vallejo Household Hazardous Waste Collection Facility. Residents deliver their household hazardous wastes to the permanent collection facility located at 889A Devlin Road, American Canyon.

Agricultural Hazardous Materials Issues

The Napa County Agricultural Commissioner (NCAC)and staff are responsible for the implementation of Federal, State, and local regulatory

[2] USEPA defines acutely hazardous waste as those that "contains such dangerous chemicals that it could pose a threat to human health and the environment even when properly managed. These wastes are fatal to humans and animals even in low doses."

programs within Napa County. Specifically, these programs are designed to protect people and the environment and promote agriculture within the County of Napa. Agriculture in and around St. Helena uses a variety of hazardous materials, including fuels and maintenance fluids for farm equipment, and fertilizers, herbicides, fungicides, and insecticides. The use of agricultural chemicals can leave residues in soils that can harm people and the environment. Chemicals used today are less-persistent, organic compounds compared to agricultural chemicals used prior to the 1970s which often included highly persistent compounds such as DDT. In addition, inorganic compounds containing heavy metals such as arsenic, lead, and mercury were commonly used prior to the 1950s and could persist for many decades. If present in elevated concentrations, these residues could pose a potential health risk to future construction workers, residents, and other persons who may come in direct contact with surface soils.

Pesticides are regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) by the U.S. EPA. This includes labeling and registration of pesticides as to how they may be used. U.S. EPA delegates pesticide enforcement activities in California to the California Department of Pesticide Regulation (DPR), under Title 3 of the California Code of Regulations and the California Food and Agriculture Code. The DPR registers pesticides for use in California, and licenses pesticide applicators and related pilots, advisors, dealers, brokers, and businesses. In turn, the NCAC acts as the local enforcement agent for DPR. The NCAC registers licensed pest control businesses, and agricultural pest control advisors in Napa County; requires permits and advanced notification for buying or using California restricted-use pesticides; and requires the completion of pesticide use reports for pesticides applied in County, including St. Helena. In addition, the NCAC investigates pesticide-related injuries and illnesses, and oversees enforcement of worker training in pesticide management.

Worker Health and Safety

The U.S. Department of Labor, OSHA regulates worker health and safety at the federal level. The Federal Occupational Safety and Health Act of 1970 authorizes states (including California) to establish their own safety and health programs with OSHA approval. The California Department of Industrial Relations (DIR) regulates implementation of worker health and safety in California. The DIR includes the Division of Occupational Safety and Health (DOSH), which acts to protect workers from safety hazards through its California OSHA (Cal/OSHA) program and provides consultative assistance to employers.

California standards for workers dealing with hazardous materials are contained in Title 8 of the California Code of Regulations (CCR) and include practices for all industries (General Industrial Safety Orders), and specific practices for construction and other industries. Workers at hazardous waste sites (or working with hazardous wastes as might be encountered during excavation of contaminated soil) must receive specialized training and medical supervision according to the Hazardous Waste Operations and Emergency Response (HAZWOPER) regulations (Title 8, CCR Section 5192). Additional regulations have been developed for construction workers potentially exposed to lead (Title 8, CCR Section 1532.1) and asbestos (Title 8, CCR Section 1529). Cal/OSHA enforcement units conduct on-site evaluations and issue notices of violation to enforce necessary improvements to health and safety practices.

Impacts and Mitigation Measures

Significance Criteria

For the purposes of this EIR, adoption of the proposed General Plan would have a significant effect related to hazards and hazardous materials if it would exceed the following Standards of Significance, adapted from Appendix G of the CEQA Guidelines:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (the "Cortese List") and, as a result, create a significant hazard to the public or the environment;
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in an aviation safety hazard for people residing or working in the project area;
- For a project within the vicinity of a private airstrip, result in an aviation safety hazard for people residing or working in the project area;
- Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan; or
- Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Relevant Policies and Implementing Actions

The following relevant policies and implementing actions of the General Plan Update address hazards and hazardous materials:

OS4.2. Encourage the clean-up of contaminated sites to protect the environment and public well-being.

OS4.3. Promote best management practices that encourage protection of , groundwater and surface water resources from industrial, agricultural and other uses that produce or dispose of hazardous or toxic substances.

PS4.1. Maintain a transitional zone around industrial areas to protect the health and safety of residential neighborhoods.

PS4.2. Limit development in hillside areas where wildfire hazard is high to very low-intensity, or maintain them as open space in order to prevent the loss of lives, injuries and property damage due to wildfires.

PS4.3. Protect St. Helena residents from health and safety impacts related to the use, storage, manufacture and transport of hazardous materials.

PS4.4. Discourage new uses that rely extensively on the use of hazardous materials.

PS4.5. Facilitate communication and education about fire safety, non-point source pollution, household hazardous waste disposal and recycling opportunities.

PS4.6. Ensure that all streets and roads are adequate in terms of width, turning radius and grade in order to facilitate access by City firefighting apparatus, and to provide alternative emergency routes of ingress and egress.

PS4.A. Designate areas in St. Helena that are prone to fire hazards and make this information available to the community.

PS4.B. Develop an ordinance to regulate development and building methods and materials used in fire-prone areas. Integrate best practices in fire resistance for all new and remodeled structures. Continue to require fire-resistant building materials and automatic sprinkler systems to be used in all new structures located in these areas.

PS4.C. Require all structures in high wildfire hazard areas to maintain a clearance of flammable vegetation away from structures, and to use fire-resistant ground covers. The minimum clearance distance should be 30 feet.

PS4.D. Require all new development to meet the minimum fire flow rates specified by the City's Fire Code.

PS4.E. Require all new development plans to be approved by the Fire Department prior to the issuance of building permits, grading permits or final map approval.

PS4.F. Develop a program to inform and educate the community about potential risks, resources and roles and responsibilities for addressing fire safety in St. Helena. Inform residents of homes adjacent to public lands of their responsibility to provide fire breaks adjacent to their homes.

PS4.G. Review all new development proposals for their potential to introduce the production, use, storage and/or transport of hazardous materials, and require reasonable controls on such materials.

PS4.H. Develop a Hazardous Materials Response Plan that includes guidelines, protocols and strategies to respond to a local hazardous materials spill.

PS4.I. Strengthen regulations for the safe production, transport, handling, use and disposal of hazardous materials that may cause air, water or soil contamination. Require buffers for operations which handle substantial amounts of hazardous materials. When siting new facilities or expanding existing facilities, require buffer zones between hazardous materials facilities and residential uses, parkland, trails and open space facilities.

PS4.J. Develop and launch a citywide education campaign to encourage the use of green products in order to reduce non-point source pollution. Target efforts towards the reduction of household chemical use and hazardous waste disposal.

PS4.K. Require environmental assessments during the planning for development in areas previously used for agricultural, commercial or industrial uses. Remediation of identified contamination that may result from health risks or construction workers and future owners and users shall be required prior to approval of construction, demolition and grading permits for development.

Impact Analysis

Impact HAZ-1. Proposed approval and development of land uses allowed under the General Plan Update could result in the routine use of hazardous materials by businesses, households and public uses.

Current land uses, as well as future land uses under the General Plan Update, involve or could involve the use, storage, generation, and disposal of hazardous materials. As detailed in the Setting Section, many businesses in the City currently use hazardous materials and generate hazardous wastes, which require regulatory oversight to protect human health and the environment. This includes current and former hazardous materials use sites and agricultural tank sites at and adjacent to Potential Land Use Change Areas 1 through 8 and several Housing Opportunity and Pipeline Project sites (Figures 3-4 and 4.H-1). These uses are regulated by the Napa County PBES under State and Federal laws and regulations. General Plan Policy OS4.3 and Implementing Actions PS4.G, PS4.H, and PS4.I would require review of development proposals and use of best management practices to ensure hazardous materials are managed safely within the City.

Households in the community could also typically use small quantities of potentially hazardous materials for garden care and building maintenance, including but not limited to garden chemicals, paints, solvents and car care products. Similar materials are also maintained for public buildings and uses, such as the City Corporation yard and City Hall.

Although the use and storage of hazardous materials releases cannot feasibly be eliminated, implementation of General Plan policies and existing regulatory programs would reduce potential impacts of routine transport, use,

or disposal of hazardous materials and reasonably foreseeable upset or accident conditions to a less-than-significant level.

Impact HAZ-2. Proposed approval and development of land uses allowed under the General Plan Update could result in the use of potentially hazardous materials near schools and other sensitive receptors.

Sensitive receptors, which include children, the elderly, and the infirm, are more susceptible to health effects from hazardous materials than the general population. Under State law, schools must be sited to prevent them from being located near hazardous materials sites. In addition, Policy PS4.1 and Implementing Action PS4.I of the General Plan call for buffer zones between industrial properties and "residential uses, parkland, trails and open space facilities." Implementing Action PS4.K would require detailed analysis and remediation, if necessary, when properties historically devoted to agriculture, commercial or industrial are redeveloped for other uses. These measures as required by the General Plan Update, in coordination with existing regulatory programs, would reduce this impact to a less-than-significant level,..

Impact HAZ-3. Future land uses allowed under the General Plan Update could result in structures ands people being subject to aviation hazards .

As described in the Setting Section, above,, no public use airports or private airstrips are located within two miles of the General Plan area. Nor are there any airport land use plans affecting any potyiopon of the City of St. helena. Thus, no significant aviation hazards would be expected with the adoption of the General Plan Update.

Impact HAZ-4. Future development allowed under the General Plan Update could result in structures ands people being subject to hazards from wildfire .

As described in the Setting Section, no areas within St. Helena have been classified by the State as having "very-high" fire risk, which would require implementation of State wildfire prevention measures. However, some areas in the western uplands of the city have been classified as having "high" fire risks, including a portion of General Plan Potential Change Area 9 (Figures 3-4 and 4.H-2). Several policies and implementing actions in the General Plan address these potential fire hazards. Policy PS4.2 would limit development in areas where potential wildfire hazards exist, and Policy PS4.5 encourages fire safety education. Implementing Actions PS4.A

thorough PS4.F include the implementation of building design and vegetation management requirements in “high” fire risk areas comparable to State requirements for “very-high” risk areas. In addition, all new structures and land uses in these are will be subject to review by the St. Helena Fire Department to ensure that hazards from wildfire will be reduced to a less-than-significant level.

Impact HAZ-5. New development that could occur with implementation of the General Plan Update could affect groundwater or surface water resources through the use and disposal of hazardous materials.

New development that could be allowed under the General Plan Update could result in releases of hazardous materials which could become entrained in stormwater runoff and affect local creeks, or percolate through soil and affect groundwater resources. Adherence to General Plan Update Polich OS4.4 for new developments will reduce this impat to a less-than-significant level.

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4.M Hydrology and Water Quality

Introduction

This section describes existing hydrology, hydrologic and water quality conditions in St. Helena; federal, state, and local regulations pertaining to water quality, flood management, and related hazard mitigation; and potential impacts of development allowed under the proposed General Plan Update on surface and groundwater quality, groundwater recharge, stormwater drainage, hydrologic function of receiving waters, and flooding.

Setting

Climate

St. Helena's climate is characterized by long, dry, warm summers and mild, relatively wet winters.

The City of St. Helena has a Mediterranean climate, with distinct wet and dry seasons. The climate is characterized by long, dry, warm summers and mild, relatively wet winters. The average maximum temperature during the months of July and August is about 90 degrees Fahrenheit (°F), and average minimum temperatures drop to 30 to 40°F in winter. The mean annual precipitation is about 33 inches, with most of the rainfall occurring between November and April and the highest average rainfall totals occurring in January and February (West Yost Associates, 2003; National Climatic Data Center, 2009). Snowfall in Napa County is not uncommon at higher elevations. However, the vast majority of the precipitation occurs as rain, and snow generally does not persist for more than a few days following a storm event except at the very highest elevations.

Topography

Napa County is located in the northern Coast Range of California. The Coast Range parallels the coastline from the Oregon border to just north of the Los Angeles Basin. Napa County is bordered to the east by the Central Valley and to the west by the Coast Range. Topography within the county consists of a series of parallel northwest-trending mountain ridges and intervening valleys. The Napa Valley is about three miles wide and 40 miles long.

The City of St. Helena is within the Napa River watershed.

The City of St. Helena is within the Napa River watershed. The watershed consists of a valley floor surrounded by mountains. Napa Valley floor elevations range from approximately 400 feet above mean sea level (msl) in the northern mountains to sea level at San Pablo Bay. The valley is bound to the west by the Mayacama Mountains ranging from 1,000 to 2,700 feet above msl, to the north by Mount St. Helena, and to the east by a northwest-trending range of mountains (Vaca Mountains) that are generally 2,000 feet

above msl and higher. The highest peak surrounding the valley is Mount St. Helena at an elevation of 4,343 feet (Napa County Conservation, Development and Planning Department, 2005).

Groundwater Resources

The city overlies the Napa-Sonoma Valley Groundwater Basin and the Napa Valley Groundwater Subbasin (San Francisco Bay Basin Plan Subbasin I.D. 2-2.01) (RWQCB, 2007). The groundwater subbasin area is 45,900 acres (approximately 72 square miles) (DWR, 2003). Depth to groundwater in the water-bearing aquifers ranges from approximately 50 to 300 feet below ground surface (Napa County Conservation, Development and Planning Department, 2005).

Generally, the groundwater flow direction is from the sides of the valley toward the Napa River and its tributaries, and south toward San Pablo Bay.

Generally, the groundwater flow direction is from the sides of the valley toward the Napa River and its tributaries, and south toward San Pablo Bay. The subbasin is recharged by rain, irrigation water, and percolation from some streams and tributary channels. However, the Napa River contributes very little recharge to groundwater, and in some locations, groundwater discharges to the river and its upper tributaries, characterizing the river as a "gaining" stream[1] in these reaches. Outflow from the subbasin occurs through pumping, discharge to surface water, springs, and evapotranspiration (West Yost Associates, 2003).

Beneficial uses of the subbasin include municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply. Along with surface water resources, the groundwater subbasin is used for the city's potable water supply, which is discussed in more detail in Section 4.R, Utilities and Service Systems, of this EIR.

Surface Water Resources

The city's surface water resources are within the San Pablo Basin Hydrologic Planning Area, as designated in the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) (RWQCB, 2007). The Napa River watershed is within this hydrologic planning area. The Napa River is the largest river in Napa County, with a watershed area of approximately 426 square miles (Napa County Resource Conservation District, 2002). The river drains numerous tributaries on its 55-mile run from its headwaters at Mount St. Helena to San Pablo Bay. The lowest reaches of the Napa River and tributaries in the lower Napa Valley are tidally influenced because of their proximity to San Pablo

[1] A gaining stream is a stream in which groundwater discharges contribute significantly to the stream flow volume.

Bay; the Napa River is tidally influenced northward into the City of Napa (south of the city). Surface water resources in the city such as the Napa River including its tribuutaries, York Creek, and Sulphur Creek. as shown on Figure 4.M-1.

Beneficial uses of the Napa River as indicated in the Basin Plan (RWQCB, 2007) include agricultural supply, municipal and domestic supply, cold freshwater habitat, fish migration, preservation of rare and endangered species, fish spawning, warm freshwater habitat, wildlife habitat, water contact recreation, non-contact water recreation, and navigation.

York Creek Subwatershed

York Creek enters St. Helena from the west near the Lower Reservoir and flows north into the Napa River west of Pratt Avenue.

York Creek originates on the eastern slope of the Mayacamas Mountains and flows easterly to its confluence with the Napa River.The length of the channel is approximately 7.2 miles and the watershed drainage area is approximately 4.4 square miles (Prunuske Chatham, Inc., 2007). York Creek enters the city from the west near the Lower Reservoir and flows north into the Napa River west of Pratt Avenue. Within the city, York Creek has been modified through riparian vegetation removal, bank hardening, levee construction, and bridge placement (USACE, 2006).

The Upper Reservoir is located on York Creek approximately one-and-a-half miles upstream of the city. Use of the Upper Reservoir for water storage and supply ended in the 1980s due to sedimentation issues. Low flows from York Creek entering the reservoir are directed to a drop-inlet standpipe located just behind the face of the dam. During periods of high flow, a concrete spillway parallel to Spring Mountain Road conveys storm flows approximately 100 feet downstream, where the flows rejoin York Creek. The York Creek diversion dam is located about one-half mile downstream of the Upper Reservoir. Its function is to divert water from York Creek to the Lower Reservoir.

The Upper Reservoir captures all of the coarse sediment produced in its 2.4-square-mile drainage area. The channel below the dam has adjusted to a sediment-starved condition over the last 100 years. Channel incision that has occurred in both York Creek and the Napa River has been attributed in part to the construction of the Upper Reservoir and the associated reductions in gravel supply (Prunuske Chatham, Inc., 2007).

Existing beneficial uses of York Creek as stated in the Basin Plan (RWQCB, 2007) include cold freshwater habitat, fish migration, fish spawning, wildlife habitat, water contact recreation, non-contact water recreation, and navigation. Potential beneficial uses include water contact recreation and non-contact water recreation.

Sulphur Creek Subwatershed

Sulphur Creek flows into the city from the south along Sulphur Springs Road and flows north to its confluence with the Napa River near the Pope Street Bridge.

The Sulphur Creek watershed area is 9.3 square miles. Sulphur Creek has two main stems, Heath Canyon and the main stem of Sulphur Creek, which come to a confluence immediately before Sulphur Creek exits Sulphur Canyon and begins to flow across the valley. Heath Canyon and Sulphur Creek have a channel length of approximately 12.7 miles, and the lower one-and-a-half miles of Sulphur Creek flow through the city. Sulphur Creek flows into the city from the south along Sulphur Springs Road and flows north and east to its confluence with the Napa River near the Pope Street Bridge. The lower reach of Sulphur Creek is referred to as the historic gravel mining reach because of the extensive gravel deposition in the area and historic gravel mining activities that occurred (Sulphur Creek Watershed Task Force et al., 2004).

Beneficial uses for Sulphur Creek are not specifically listed in the Basin Plan; however, the Basin Plan states that beneficial uses of any specifically identified water body generally apply to its tributaries (RWQCB, 2007).

Flooding

Information on flooding and dam inundation zones within the city is available from the Federal Emergency Management Agency (FEMA), the California Office of Emergency Services (via the Association of Bay Area Governments [ABAG]), and the City of St. Helena's Comprehensive Flood Protection Project ("2006 Plan"). The U.S. Army Corps of Engineers has not identified flood hazards in Napa County or areas subject to inundation due to the possible failure of levees or floodwalls associated with state flood protection or water supply projects; Napa County also has no state-defined levee protection zones, although levees do exist (County of Napa, 2008). There are no floodway maps available from the Central Valley Flood Protection Board for Napa County. The Department of Water Resources only has Awareness Floodplain Mapping Program maps for the portion of Napa County that discharges to the Central Valley and therefore does not have floodplain mapping for the City of St. Helena.

Napa River

The majority of the flooding in Napa County occurs within the Napa Valley floor.

The majority of the flooding in Napa County occurs within the Napa Valley floor. The Napa River channel contains about a ten-year flood (12,500 cubic feet per second [cfs]) before spilling onto the valley floor. Napa River flows are largely influenced by precipitation, with peak flows occurring generally in January or February and the lowest flows occurring August through November. Flow rates on the Napa River typically range from over 20,000 cfs in large peak flow events to less than five cfs under summer low flow conditions (City of St. Helena, 2003).

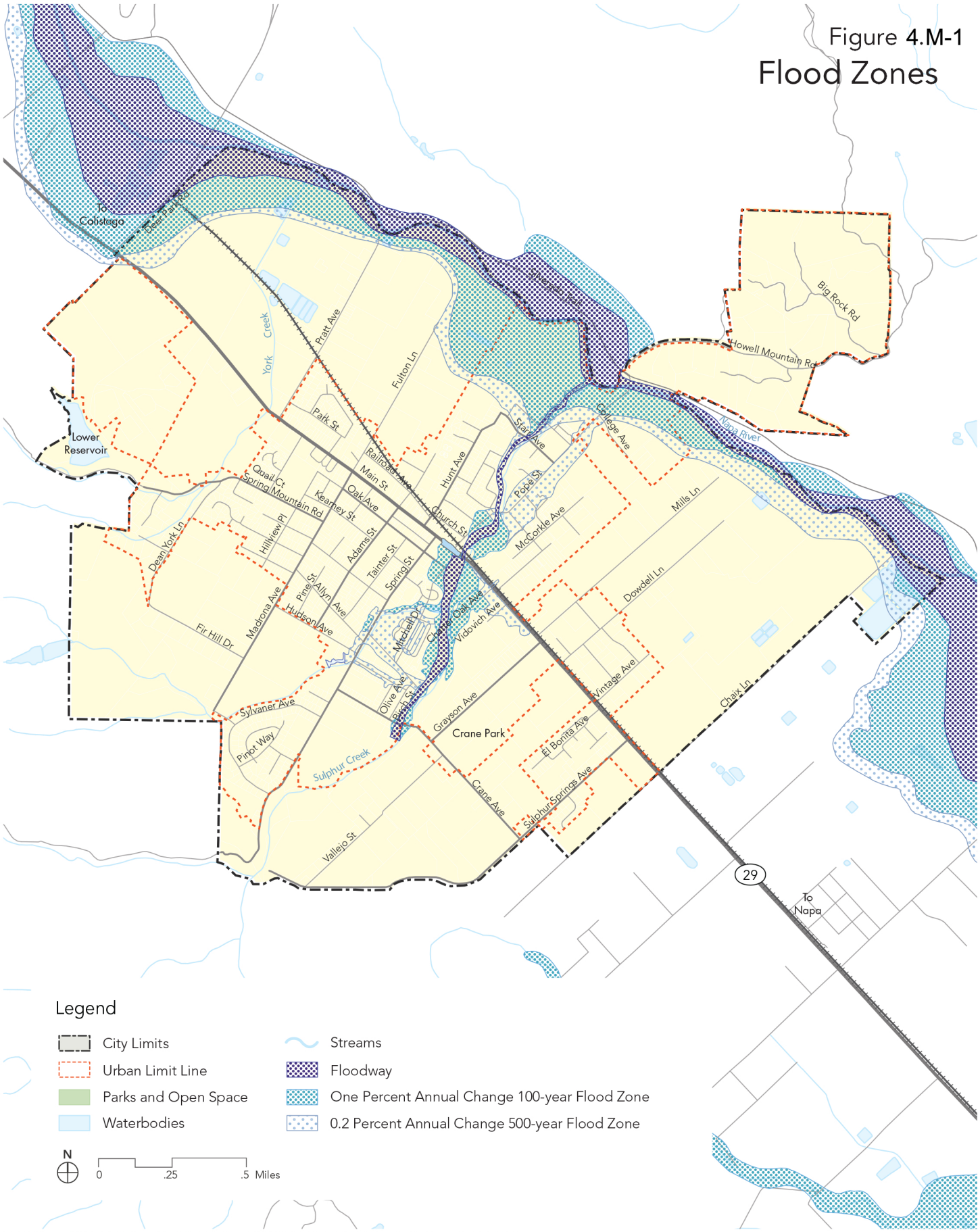
Between 1961 and 1997, flooding caused $540 million in property damage in the county. Since 1862, 28 major floods have occurred in the Napa Valley. Floods in 1986 and 1995 overtopped existing flood control structures along the Napa River, causing damage in the City of St. Helena exceeding $50 million. Flooding from tidal fluctuations in the county does not cause significant economic damage and is limited to areas in the lowland sloughs in the southern portion of the county, south of the St. Helena (Wadsworth, 1998; Napa County Conservation, Development and Planning Department, 2005; EDAW, 2007; Napa County General Plan, 1996).

In October 1998, the City of St. Helena joined in a collaborative effort with the Napa County Board of Supervisors and the Napa County Flood Control District to perform a joint study of the Napa River to better understand the hydraulics of flood flows in the Napa River from Deer Park Road to below Pope Street. The study's conclusions indicated a more serious flood hazard to the community than previously established by FEMA and resulted in the enlargement of the city's 100-year floodplain (EDAW, 2007). In 2006, the City of St. Helena developed the components and design measures for a comprehensive flood protection project, referred to as the "2006 Plan." The Natural Environment Background Working Paper (EDAW, 2007) describes the primary components of the "2006 Plan, which include construction of a floodplain terrace, levee, floodwall and detention basin; removal of mobile homes; bank restoration; and riparian vegetation management.

These flood control improvements, as envisioned in the 2006 Plan have been constructed. FEMA updated the Flood Insurance Rate Map for properties located adjacent to the Napa River. The current map indicates that a smaller portion of St. Helena is designated as flood hazard as a result of completing the 2006 Plan. Figure 4.M-1 shows 100-year flood zones (Special Flood Hazard Areas) as designated by FEMA.

York Creek

Flooding from York Creek can significantly affect residential and industrial properties (Prunuske Chatham, Inc., 2007). In 2005, Beringer winery buildings and the Culinary Institute of America's dorms were inundated and sustained damage. In addition, the Beringer water treatment plant flooded and ponds overflowed into York Creek. Vineyards on both sides of York



Source: City of St. Helena; Napa County, Federal Emergency Management Agency (FEMA), 2008, Digital Flood Insurance Rate Map Database
Map Revised: April 2016

Creek downstream of Highway 29 to the Napa River were flooded and many had to be replaced.

Sulphur Creek

Flood hazards in the Sulphur Creek watershed are due primarily to channel bed aggradation[2] in the lower reach where gravel mining was historically conducted. Sulphur Creek continues to supply and deposit substantial amounts of sediment in this reach, and local observations suggest that as much as five feet of material have accumulated in the channel bed since the cessation of gravel mining in 1999. Historically, gravel mining removed approximately 40,000 to 50,000 cubic yards of material annually. Consequently, the increased volume of sediment currently stored in the channel decreases the volume available for floodwater, potentially causing an increased flood hazard locally and within the City of St. Helena (Sulphur Creek Watershed Task Force et al., 2004). It is expected that the streambed will continue to aggrade without the removal of coarse sediment from the braided[3] channel.

Multiple channel crossings and constrictions exist along Sulphur Creek and its tributaries. The main stem of Sulphur Creek has seven major road crossings comprised of bridges and box culverts. Additional, smaller crossings are located on tributaries. Most of the seven major crossings are large enough to handle flood flow, but many smaller crossings and culverts on the tributaries have been identified as undersized (Sulphur Creek Watershed Task Force et al., 2004). Channel modifications, including both on- and off-stream reservoirs, are altering flow patterns in the Sulphur Creek watershed. The watershed currently contains ten on- and off-stream reservoirs, which intercept and retain storm flows, acting to reduce the peak of the hydrograph and flooding. However, several of these reservoirs have inadequate overflow protection (i.e., spillways) and have the potential to cause severe erosion. Inadequate overflow protection also has the potential to cause catastrophic failure of a reservoir (USACE, 2006).

Dam Failure Inundation Zones

One das – the St. Helena Lower Reservoir is located within St. Helena.

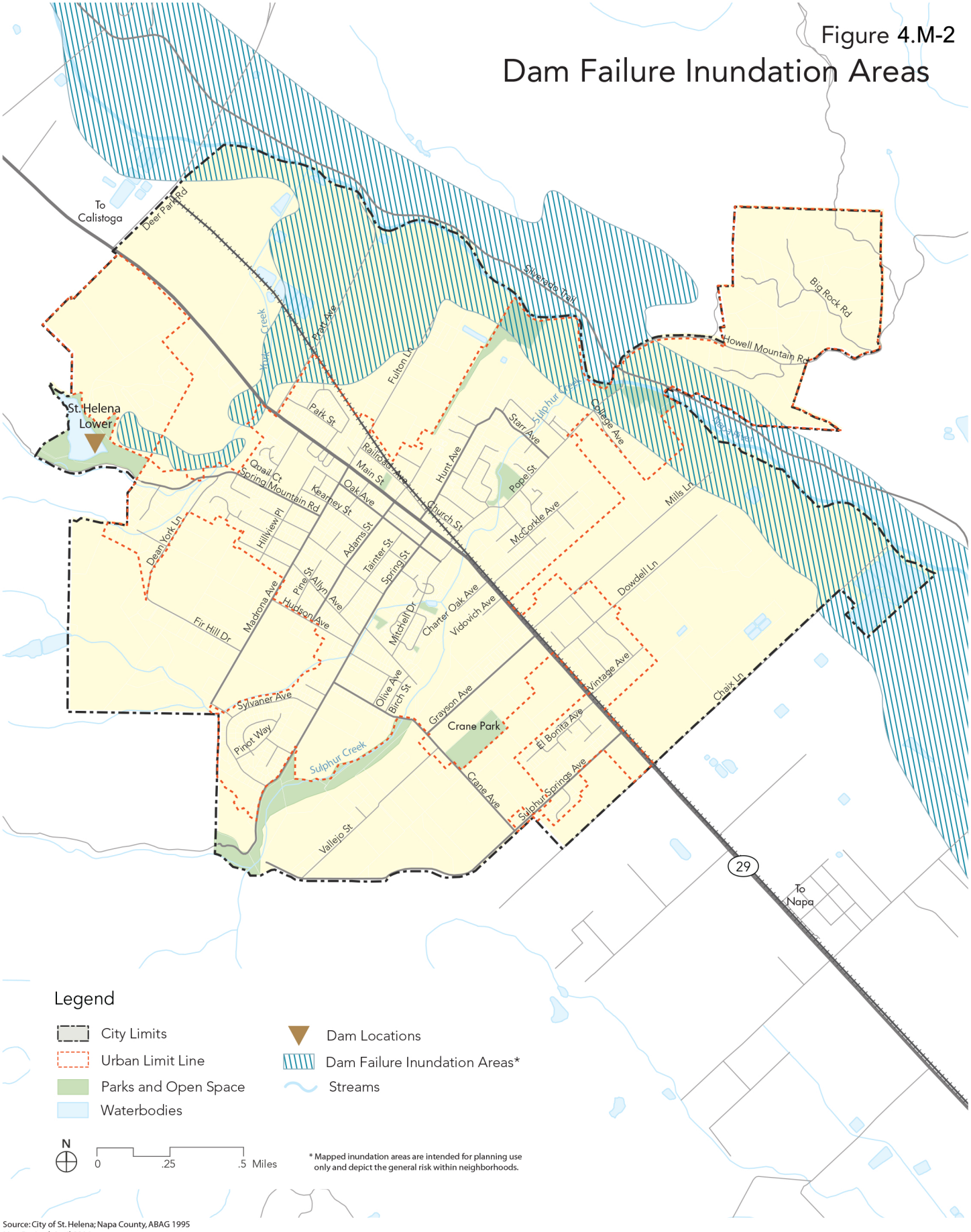
Areas subject to flooding from structural dam failure are determined by the California Office of Emergency Services, and the inundation data were obtained from ABAG. One dam is located within the City of St. Helena (Figure 4.M-2). This is the St. Helena Lower Reservoir (approximately

2 Aggradation refers to the increase in land elevation due to the deposition of sediment. Aggradation occurs in areas in which the supply of sediment is greater than the amount of material that the system is able to transport.

3 A braided channel is a stream channel in which separate channels that convey flows are divided by islands or bars.

Figure 4.M-2

Dam Failure Inundation Areas



Legend

- City Limits
- Urban Limit Line
- Parks and Open Space
- Waterbodies
- Dam Locations
- Dam Failure Inundation Areas*
- Streams

N

0 .25 .5 Miles

* Mapped inundation areas are intended for planning use only and depict the general risk within neighborhoods.

Source: City of St. Helena; Napa County, ABAG 1995
Map Revised: April 2016

230 acre-feet of storage). Portions of the City of St. Helena that are mapped as a dam failure inundation zone, including inundation from the Bell Canyon Reservoir located outside city limits, are shown on Figure 4.M-3 (ABAG, 2009). Failure of the St. Helena Lower Reservoir, and Bell Canyon Reservoir could severely affect people and structures in the general vicinity of the mapped inundation zone. As discussed above, the St. Helena Upper Reservoir is currently not used for water storage, and consequently there is no current flooding risk associated with the structural failure of the Upper Reservoir. The active dams are overseen by the California Department of Water Resources, Division of Safety of Dams (DOSD).

Coastal and Bay Hazards

Sea Level Rise

The earth has gone through several cycles of cooling and warming over recent geologic time, resulting in periods of glaciation with an associated sea level lowering, and climate warming with sea level rise. The most recent cycle of global climate change is a warming trend of the earth's atmosphere (an increase of approximately 1.8°F in the last 100 years), which has resulted in sea level rise. Based on long-term monitoring of stationary tidal gauges around the world, it is estimated that the current background rate of sea level rise is 0.07 to 0.08 inch per year (Titus and Narayanan, 1995).

With Napa Valley floor elevations at approximately 400 feet above mean sea level, sea level rise is not likely to affect Napa County or the City of St. Helena in the near future.

Rates of sea level rise may vary at specific locations, as local subsidence or uplift affects the relative change in sea level between land masses and the ocean. In the San Francisco Bay area, the background rate of sea level rise has been estimated to be approximately 0.08 inch per year over the past 100 years (NOAA, 2007). With Napa Valley floor elevations at approximately 400 feet above msl, sea level rise is not likely to affect Napa County or the City of St. Helena in the near future.

Seiche

A seiche is a standing wave in an enclosed or partially enclosed body of water. Seiches have been observed in lakes, bays, and harbors, and can be triggered by strong winds, changes in atmospheric pressure, earthquakes, tsunami, or tides. Coastal measurements of sea level often show seiches with amplitudes of a few centimeters and periods of a few minutes due to oscillations of the local harbor, estuary, or bay, superimposed on the normal tidal changes.

Earthquake faults in the Bay Area such as the San Andreas Fault and the Hayward Fault, as well as active faults within Napa County such as the Green Valley, West Napa, Cordelia, and Hunting Creek faults, could produce ground shaking within the County (Napa County Conservation, Development and

Planning Department, 2007). Seiches would be limited to the larger reservoirs in the county (e.g., Lake Berryessa, Bell Canyon Reservoir, Lake Hennessey, Rector Reservoir, and Milliken Reservoir). The potential for loss of life and damage to structures is considered low because development immediately along the shorelines of these reservoirs is largely restricted, given the use of the reservoirs as municipal water supply sources and Napa County General Plan land use designations and zoning (County of Napa, 1996).

Tsunamis

Tsunamis are long-period water waves caused by underwater seismic events, volcanic eruptions, or undersea landslides. Tsunamis affecting the San Francisco Bay region would most likely originate west of the bay, in the Pacific Ocean. Areas that are highly susceptible to tsunami inundation tend to be low-lying coastal areas, such as tidal flats, marshlands, and former bay margins that have been artificially filled.

The potential for damage by a tsunami in St. Helena is low because the city is not directly exposed to the open ocean and lacks bay front.

The potential for damage by a tsunami in the City of St. Helena is considered low because the city is not directly exposed to the open ocean and lacks bay front. Estimates made by the U.S. Geological Survey indicate that the risk of a damaging event is approximately a 0.5-percent risk in any year, and that the degree of hazard is also low, because the maximum run-up height is ten feet at Point Richmond and one foot at the Carquinez Strait (County of Napa, 1996).

Extreme High Tide

Extreme high tides in San Francisco Bay result from the combined effects of astronomical high tides (related to the lunar cycle) and other factors, including winds, barometric pressure, ocean temperatures, and freshwater runoff. In California, the highest astronomical tides occur in the summer and winter, and therefore extreme high tides are most likely to occur during these times. Based on the 129-year record of daily high tide, the U.S. Army Corps of Engineers has developed an estimated 100-year high tide elevation (an extreme high tide with a probability of occurrence every 100 years) for various locations in the bay. The elevation of the estimated 100-year tide at the Petaluma River at San Pablo Bay and Sonoma Creek near San Pablo Bay is 6.5 feet NGVD (USACE, 1984). The San Francisco Bay Conservation and Development Commission (BCDC) evaluated the effects of sea level rise due to climate change on 100-year tides (BCDC, 1988). The BCDC projects the 100-year high tide at Sonoma Creek will change from 6.5 feet NGVD to 6.9 feet NGVD. Consequently, it is unlikely that the one-percent (100-year) tide would have a significant environmental impact on the Napa River in St. Helena, as Napa Valley floor elevations are approximately 400 feet above msl.

Water Quality

The quality of surface water and groundwater resources is affected by past and current land uses within the watersheds as well as by the composition of geologic materials in the vicinity.

Groundwater Quality

Groundwater quality throughout most of the Napa Valley region is generally suitable for most urban and agricultural uses, with only local impairments occurring. The primary constituents of concern are total dissolved solids (TDS), nitrate, boron, and organic compounds (City of St. Helena, 2006).

Throughout most of the Napa Valley, groundwater quality is generally suitable for most urban and agricultural uses.

The City of St. Helena has two active groundwater wells that are sources of potable water for the city. These groundwater supplies are treated to remove iron and manganese and are chlorinated prior to entering the City of St. Helena's distribution system (City of St. Helena, 2003). Drinking water supply is discussed in more detail in Section 4.R, Utilities and Service Systems, of this EIR.

Surface Water Quality

With the exception of data collected by volunteer monitoring programs, such as programs managed by the Napa County Resource Conservation District, there are limited recent surface water quality data available for the Napa River watershed.

Impaired Water Bodies and Total Maximum Daily Loads

The Napa River is included on the 2006 Clean Water Act (CWA) 303(d) list of water quality limited segments due to impairment from nutrients, pathogens, and sedimentation/siltation. Development of a nutrient Total Maximum Daily Load (TMDL) is in progress.[4] The pathogen TMDL has been completed by the San Francisco Bay Regional Water Quality Control Board (RWQCB) and the TMDL has been incorporated into the Basin Plan as an amendment. The Basin Plan amendment includes water quality targets for pathogen indicators *Escherichia coli (*E. coli), fecal coliform, and total coliform, as well as density-based (load) limits for these pathogen indicators. The Basin Plan amendment also includes wasteload allocations[5] for individual municipal dischargers including on-site sewage disposal systems, sanitary sewer systems, municipal stormwater runoff, grazing lands, and confined animal facilities.

4 TMDLs are described later under Regulatory Framework.
5 A wasteload allocation is the maximum load of pollutants each discharger of waste is allowed to release into a water body.

View of Sulphur Creek

The RWQCB also adopted a Basin Plan amendment incorporating a TMDL for sediment and a Habitat Enhancement Plan for the Napa River. The amendment includes numeric targets for spawning gravel permeability[6] and streambed scour.[7] The TMDL also includes load allocations (for non-point sources) for land areas upstream and downstream of dams, in addition to wasteload allocations for urban runoff and wastewater discharges. San Pablo Bay is on the 2006 Clean Water Act (CWA) 303(d) list due to impairment from chlordane, DDT, dieldrin, dioxins and furans, exotic species, mercury, nickel, PCBs, and selenium. TMDLs in development include the PCB TMDL for San Francisco Bay (which includes San Pablo Bay), and the Selenium TMDL for the North San Francisco Bay (which includes a portion of the Sacrament/San Joaquin Delta, Suisun Bay, Carquinez Strait, San Pablo Bay, and the Central Bay).

The mercury TMDL for San Francisco Bay (which includes San Pablo Bay) has been completed and the Basin Plan amendment has been approved. The Basin Plan amendment includes numeric water quality objectives for mercury in fish tissue, and also includes load and wasteload allocations by source category, including urban stormwater and municipal wastewater.

In addition, the City of St. Helena is subject to the TMDL for diazinon and pesticide-related toxicity in all San Francisco Bay Area urban creeks, which was incorporated as a Basin Plan amendment in 2005. The TMDL imposes toxicity targets for urban creek water and sediment, and a diazinon concentration target for urban creeks. TMDL targets shall be achieved through regulatory programs, education and outreach, and research and monitoring. The TMDL attainment strategy will primarily focus on integrated pest management and the use of less toxic pest control methods. The U.S. Environmental Protection Agency (EPA) phased out urban diazinon applications at the end of 2004; however, replacements for diazinon (such as pyrethroids) may now pose potential water quality and sediment concerns.

Meeting Water Quality Standards

In summary, the adopted TMDLs discussed above contain water quality standards in the form of wasteload allocations that quantify the amount of pollutants that may be discharged into an impaired water body from the various contributing sources, in addition to water quality objectives for receiving waters. This includes water quality standards for urban runoff (and wastewater discharges) with which the City of St. Helena must comply. One strategy used by local urban runoff (stormwater) management programs to

6 Spawning gravel is used by fish to lay eggs. Permeability is a measure of the rate that water and oxygen moves through the gravel.

7 Streambed scour is the lowering of the streambed elevation, or cutting by sediment entrainment. Generally, when sediment supply increases and/or becomes richer in fines, the depth of streambed scour increases.

move toward achieving TMDL standards is to identify the sources of TMDL pollutants in urban runoff and then to implement control measure programs for these pollutants. Stormwater regulations that pertain to the City of St. Helena are discussed under Regulatory Framework below.

Regulatory Framework

Responsibility for water resources and flood protection in the City of St. Helena is distributed among many agencies at various levels of government.

Responsibility for water resources and flood protection in the City of St. Helena is distributed among many agencies at various levels of government. At the federal level, the primary agencies are the EPA, FEMA, and U.S. Army Corps of Engineers (USACE). At the state level, the primary agencies are the California Emergency Management Agency (formerly the California Office of Emergency Services), State Water Resources Control Board, and the Regional Water Quality Control Board. At the local level, agencies include the Napa County Flood Control and Water Conservation District, the Napa County Stormwater Management Program, and the City of St. Helena Public Works Department.

Federal Regulations

Federal Clean Water Act (CWA) of 1972

The Clean Water Act (CWA) of 1972 is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands, and is administered by the EPA. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the primary regulatory tool of the CWA.

The following sections of the CWA are particularly relevant to the implementation of the General Plan Update:

- Section 303 — Water Quality Standards and Implementation Plans
- Section 401 — Dredge/Fill and Wetlands Certification Program
- Section 402 — National Pollutant Discharge Elimination System
- Section 404 — USACE Fill or Dredge Discharge Permits

With the exception of the 404 permits, the EPA has delegated its authority to implement and enforce the provisions of these sections to the individual states. In California, the provisions are enforced by nine Regional Water Quality Control Boards under the auspices of the State Water Resources Control Board. Additional information on the requirements imposed by CWA Sections 303, 401, and 402 is provided below.

CWA Section 402—National Pollutant Discharge Elimination System (NPDES) Program

Section 402 of the Clean Water Act regulates stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program.

CWA Section 402, enacted as an amendment to the original act in 1972, regulates construction-, industrial-, and municipal-related stormwater discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program provides for general permits and individual permits. In California, the State Water Resources Control Board is authorized by the EPA to oversee the NPDES program through the Regional Water Quality Control Boards via the Porter-Cologne Act, as described below.

Stormwater runoff can entrain pollutants from a variety of sources. Many types of human activity, including new construction projects, industrial activity, agriculture, and urbanization, can result in discharge of pollutants to surface waters. The NPDES program contains several sub-programs: the construction, industrial, and municipal stormwater runoff programs, as discussed under “State Regulations,” below. These programs could apply to projects and activities in the City of St. Helena.

CWA Section 303(d)—Total Maximum Daily Load (TMDL) Program

Section 303(d) of the Clean Water Act requires that the states make a list of waters that are not attaining water quality standards.

Section 303(d) of the CWA requires that the states make a list of waters that are not attaining water quality standards after the technology-based limits on point sources are put into place. For impaired waters on this list, the states must develop TMDLs. A TMDL is a written plan that describes how an impaired water body will meet water quality standards. The plan must which contain:

- A measurable feature to describe attainment of the water quality standard(s);
- A description of required actions to remove the impairment; and
- An allocation of responsibility among dischargers to act in the form of actions or water quality conditions for which each discharger is responsible.

A TMDL must account for all sources of the pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (federally permitted discharges) and contributions from non-point sources (such as agricultural runoff). The impaired water body list and TMDLs must be approved by the EPA prior to adoption by the State Water Resources Control Board and Regional Water Quality Control Board.

CWA Section 401—Dredge/Fill and Wetlands Certification

Section 401 of the Clean Water Act grants each state the right to ensure that the state's interests are protected in any federally permitted activity occurring in or adjacent to "Waters of the State.

Section 401 of the CWA grants each state the right to ensure that the state's interests are protected in any federally permitted activity occurring in or adjacent to "Waters of the State." If a proposed project requires a USACE CWA Section 404 permit, or involves dredge or fill activities that may result in a discharge to "Waters of the State," the project proponent is required to obtain a CWA Section 401 Water Quality Certification and/or Waste Discharge Requirements (Dredge/Fill Projects) from the State Water Resources Control Board, to verify that the project activities will comply with state water quality standards. Section 401 of the CWA gives the State Water Resources Control Board the authority to consider the impacts of the entire project and require mitigation for volume, velocity, and pollutant load of the discharge from new outfalls to surface waters, when issuing certifications.

Federal Flood Insurance Program

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. The NFIP makes federally backed flood insurance available for communities that agree to adopt and enforce floodplain management ordinances to reduce future flood damage. FEMA manages the NFIP. FEMA creates Flood Insurance Rate Maps (FIRMs) that designate 100-year floodplain zones and delineate other flood hazard areas. A 100-year floodplain zone is the area that has a one in 100 (one-percent) chance of being flooded in any one year based on historical data. Relevant flood management requirements for the City of St. Helena are discussed under "Local Regulations."

State Regulations

Porter-Cologne Act and State Implementation of Clean Water Act Requirements

The Porter-Cologne Water Quality Control Act (California Water Code, Division 7, Water Quality), promulgated in 1969, implements the federal CWA. It established the State Water Resources Control Board and divided the state into nine hydrologic regions, each overseen by a Regional Water Quality Control Board. The State Water Resources Control Board is the primary state agency responsible for protecting the quality of the state's surface water and groundwater resources, but much of its daily implementation authority is delegated to the nine Regional Water Quality Control Boards.

The City of St. Helena is located within the San Francisco Bay Basin Plan region.

The Porter-Cologne Act also provides for the development and tri-annual review of Water Quality Control Plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives to protect the beneficial uses of those waters. Basin Plans are primarily implemented through NPDES permits, waste discharge requirements, TMDLs, discharge prohibitions, and watershed management efforts. Basin Plans provide the technical basis for determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Act assigns responsibility for implementing the NPDES and Total Maximum Daily Load programs to the State Water Resources Control Board and the Regional Water Quality Control Boards. The City of St. Helena is located within the San Francisco Bay Basin Plan region.

Drinking Water Standards

Maximum contaminant levels (MCLs) for various contaminants are identified and are made enforceable regulatory standards under the federal Safe Drinking Water Act. Title 22 of the California Code of Regulations (CCR) outlines drinking water standards for California. MCLs must be met by all public drinking water systems to which they apply. At a minimum, surface water and groundwater with a designated beneficial use as domestic or municipal supply in the Basin Plan shall not contain concentrations of constituents in excess of the MCLs or secondary MCLs specified in Title 22, which are incorporated by reference into the Basin Plan.

Construction General Permit

Construction activities on one acre or more of land are subject to National Pollutant Discharge Elimination System (NPDES) permitting requirements.

Construction activities on one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activity Activities, Order No. 2009-0009-DWQ (Construction General Permit). To obtain coverage under the Construction General Permit, the discharger must provide via electronic submittal, a Notice of Intent, a Storm Water Pollution Prevention Plan (SWPPP), and other documents required by Attachment B of the Construction General Permit. Activities subject to the Construction General Permit include clearing, grading, and disturbances to the ground, such as grubbing or excavation. The permit also covers linear underground and overhead projects such as pipeline installations.

The Construction General Permit exercises a new risk-based permitting approach and mandates certain requirements based on the risk level of the project (Level 1, Level 2, or Level 3). The risk level of the project is based on the risk of sediment discharge and the receiving water risk. The sediment discharge risk depends on the project location and timing (i.e., wet season

versus dry season activities). The receiving water risk depends on whether the project would discharge to a sediment-sensitive receiving water, defined by the beneficial uses of the receiving water in the Basin Plan (e.g., cold freshwater habitat), a listing on the 303(d) list due to sediment impairment, or having a TMDL in place to address excessive sedimentation.

The performance standard in the Construction General Permit is that dischargers shall minimize or prevent pollutants in stormwater discharges and authorized non-stormwater discharges through the use of controls, structures, and management practices that achieve Best Available Technology (BAT) for treatment of toxic and non-conventional pollutants and Best Conventional Technology (BCT) for treatment of conventional pollutants.[8] The permit also imposes numeric action levels (Level 2 and Level 3 projects) and numeric effluent limits (Level 3 projects) for pH and turbidity, as well as minimum Best Management Practices (BMPs) that must be implemented at all sites.

A SWPPP must be prepared by a Qualified SWPPP Developer that meets the certification requirements in the Construction General Permit. The purpose of the SWPPP is to (1) help identify the sources of sediment and other pollutants that could affect the quality of stormwater discharges, and (2) describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater as well as non-stormwater discharges resulting from construction activity. BMPs must be overseen by a Qualified SWPPP Practitioner that meets the requirements in the permit. For Level 2 and Level 3 projects, the discharger must also prepare a Rain Event Action Plan as part of the SWPPP that must be designed to protect all exposed portions of the construction site within 48 hours prior to any likely precipitation event.

The SWPPP must also include a construction site monitoring program. Depending on the project risk level, the monitoring program will include 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 oversight is provided by the Regional Water Quality Control Board.

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8 As defined by U.S. EPA, Best Available Technology (BAT) is a technology-based standard established by the CWA as the most appropriate means available on a national basis for controlling the direct discharge of toxic and non-conventional pollutants to navigable waters. The BAT effluent limitations guidelines, in general, represent the best existing performance of treatment technologies that are economically achievable. Best Conventional Technology (BCT) is a technology-based standard that applies to treatment of conventional pollutants, such as total suspended solids.

Industrial General Permit

The State Water Resources Control Board regulates stormwater runoff from industrial sources under a statewide general permit.

Stormwater runoff from industrial sources and associated pollutants is regulated in California by the State Water Resources Control Board under the statewide General Permit for Stormwater Discharges associated with Industrial Activities (Water Quality Order No. 97-03-DWQ, General Permit No. CAS000001). The Industrial General Permit presents the requirements for compliance of certain industries with the NPDES program. A wide range of industries – including mining operations, lumber and wood products facilities, petroleum refining, metal industries, and some agricultural product facilities, such as dairies – are covered under the Industrial General Permit. Coverage is determined by Standard Industrial Classification (SIC) code. New industrial facilities with SICs requiring permit coverage are required to obtain coverage under the Industrial General Permit and comply with the permit requirements, which include preparation and implementation of a facility-specific SWPPP, monitoring, and annual reporting to the State Water Resources Control Board. Local oversight is provided by the Regional Water Quality Control Board.

Municipal Stormwater Permit

California's municipal stormwater permitting program regulates stormwater discharges from municipal separate storm sewer systems.

California's municipal stormwater permitting program regulates stormwater discharges from municipal separate storm sewer systems (MS4s). MS4 Permits were issued in two phases. Under Phase I, which was initiated in 1990, the Regional Water Quality Control Boards adopted individual NPDES stormwater permits for medium municipalities (serving between 100,000 and 250,000 people) and large municipalities (serving 250,000 people). Most of these permits were issued to a group of co-permittees encompassing an entire metropolitan area. As part of Phase II, the State Water Resources Control Board adopted a statewide General Permit for the Discharge of Storm Water from Small MS4s (Water Quality Order No. 2003-0005-DWQ, General Permit No. CAS000004) (Phase II General Permit) to provide permit coverage for smaller municipalities, including non-traditional small MS4s such as military bases, public campuses, and prison and hospital complexes.

The City of St. Helena is regulated under the Phase II General Permit as part of the Napa County Stormwater Management Program; more details are provided under "Local Regulations" below. Local oversight is provided by the Regional Water Quality Control Board.

State Water Board Low Impact Development Policy

On January 20, 2005, the State Water Resources Control Board adopted the Low Impact Development (LID) Policy which, at its core, promotes the idea of "sustainability" as a key parameter to be considered during the design and planning process for future development. The State Water Resources Control

Board has directed its staff to consider sustainability in all future policies, guidelines, and regulatory actions.

The sustainability practice promotes LID to benefit water supply and contribute to water quality protection. LID has been a proven approach in other parts of the country and is seen in California as an alternative to conventional stormwater management. The Regional Water Quality Control Boards are advancing LID in California in various ways, including provisions for LID requirements in renewed Phase I municipal stormwater NPDES permits. The Phase II General Permit, includes additional LID requirements to achieve water quality goals and to protect against stream channel hydromodification.[9]

Dam Inundation Mapping Requirement and Dam Oversight

Section 8589.5 of the the California Government Code and Title 19 of the Code of Regulations, Sections 2575 to 2578.3 requiresthat dam owners submit flood routing information, land surveys to delineate the floodplain, and a technical report to support a dam failure inundation map to the California Office of Emergency Services. The purpose of the program is to provide decision support for emergency preparedness planning, mitigation, and response to and recovery from potential damage to life and property from dam inundation flood waves. Based upon approved inundation maps (or the delineated areas), cities and counties with territory in the mapped areas are required to adopt emergency procedures for the evacuation and control of populated areas below the dams.

The Lower Reservoir– the active dam with failure inundation zones within the City of St. Helena – is overseen by the California Department of Water Resources, Division of Safety of Dams (DOSD). DOSD engineers and engineering geologists review and approve plans and specifications for the design of dams and oversee their construction to ensure compliance with the approved plans and specifications. Reviews include site geology, seismic setting, site investigations, construction material evaluation, dam stability, hydrology, hydraulics, and structural review of appurtenant structures. In addition, DOSD engineers inspect over 1,200 dams annually to ensure the dams are performing and being maintained in a safe manner.

[9] Hydromodification or hydrograph modification causes stream bank erosion, channelization, increased flood flows, and other physical modifications that can adversely affect aquatic ecosystems due to increased sedimentation and reduced water quality (e.g., higher water temperatures, lower dissolved oxygen concentrations).

California Assembly Bill 2140 (2006)

Assembly Bill 2140 allows cities and counties to adopt a local hazard mitigation plan as a part of the safety element of the general plan.

Assembly Bill 2140, enacted in September 2006, allows cities and counties to adopt a local hazard mitigation plan as a part of the required safety element of the general plan. The hazard mitigation plan must include (1) an initial earthquake performance evaluation of public facilities that provide essential services, shelter, and critical governmental functions; (2) an inventory of private facilities that are potentially hazardous, including multi-unit, soft story, concrete tilt-up, and concrete frame buildings, and (3) a plan to reduce the potential risk to private and governmental facilities in the event of a disaster. Hazards mitigation plans are to include an evaluation of tsunami, seiche, and dam failure risks. Assembly Bill 2140 is not a mandate, and compliance is optional. Local jurisdictions that have not adopted a local hazard mitigation plan shall be given preference by the California Office of Emergency Services to receive FEMA funding to assist in developing such a mitigation plan.

California Assembly Bill 162 (2007)

Assembly Bill 162 calls for flood safety planning to be better integrated into local general plans.

Assembly Bill 162, enacted in October 2007, calls for flood safety planning to be better integrated into local general plans. Specifically, Assembly Bill 162 includes the following requirements related to flood risks:

- The land use element of the general plan must identify and annually review those areas covered by the general plan that are subject to flooding, as identified by floodplain mapping prepared by FEMA or the California Department of Water Resources.
    - Upon the next revision of the housing element, on or after January 1, 2009, the conservation element of the general plan must identify rivers, creeks, streams, flood corridors, riparian habitat, and land that may accommodate floodwater for purposes of groundwater recharge and stormwater management.
    - A city or county general plan must contain a safety element for the protection of the community from any unreasonable risks associated with the effects of seismically-induced surface rupture, ground shaking, ground failure, tsunami, seiche, and dam failure, slope instability leading to mudslides and landslides, subsidence, liquefaction, and other seismic, geologic, and fire hazards.

California Assembly Bill 1739 (201)/ California Senate Bills 1168 & 1319 (2014))

These three bills are collectively known as the Sustainable Groundwater Management Act. The act allows local jurisdictions to develop and

implement local groundwater management plans tailored to unique areas of the state.

Local Regulations

Napa County Stormwater Pollution Prevention Program

The cities of Napa and St. Helena, the Town of Yountville, and the County of Napa

The Stormwater Management Plan developed by the Napa County Stormwater Management Program in 2003 allows for coordination among the cities of Napa and St. Helena, the Town of Yountville, and the County of Napa.

formed the Napa County Stormwater Pollution Prevention Program (NCSPPP). These jurisdictions, including the City of St Helena, are regulated under Phase II General MS4 Permit, Order No. 2013-0001.

Together the NCSPPP works to implement BMPs, measurable goals, and timetables for implementation in five program areas – Public Education, Public Participation, Illicit Discharge Detection and Elimination, Construction Site Storm Water Runoff Control, and Post Construction Storm Water Management. Although the County of Napa and each of the cities and towns implement their own individual stormwater pollution prevention programs, the NCSPPP allows for coordination and consistency of approaches among the individual participants and documents their efforts in annual reports that are submitted to the Regional Water Quality Control Board.

St. Helena Municipal Code

The St. Helena Municipal Code contains provisions for stormwater and runoff pollution control, flood damage protection, and drainage.

The following provisions of the St. Helena Municipal Code are relevant to hydrology and water quality issues.

Title 13, “Public Services,” includes Chapter 13.32, “Stormwater and Runoff Pollution Control Ordinance,” which details requirements that consist of:

- Prohibiting illicit discharges to the stormwater conveyance system;
- Establishing minimum requirements for stormwater management, including source control requirements, to prevent and reduce pollution;
- Establishing requirements for development project site design to reduce stormwater pollution and erosion;
- Establishing requirements for the management of stormwater flows from development projects, both to prevent erosion and to protect and enhance existing water-dependent habitats; and

- Establishing standards for the use of off-site facilities for stormwater management to supplement on-site practices at new development sites.

Title 15, "Buildings and Construction," includes Chapter 15.52, "Flood Damage Protection." This chapter calls for minimization of public and private losses from flood conditions in specific areas through provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood-control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage; and
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and ensure that those who occupy the areas of special flood hazard assume responsibility for their actions. (Ordinance 06-8, Section 3 [part]: prior code Section 5B.3)

Title 16, "Subdivisions," includes Chapter 16.32, "Design Standards and Improvements" and includes the following provisions:

- Section 16.32.070, "Drainage," which requires stormwater runoff from the subdivision to be collected and conveyed by an approved storm drainage system. The storm drainage system shall be designed by a registered civil engineer for ultimate development of the watershed and shall be capable of collecting and conveying runoff generated by the ten-year flood. The system shall provide for the protection of abutting and off-site properties that may be adversely affected by any increase in runoff attributed to the development; off-site

storm drain improvements may be required to satisfy this requirement. In addition, retention ponds, drainage swales and/or check dams may be required to reduce off-site peak storm flow generated by projects to the historic flow.

Title 17, "Zoning," includes:

- Section 17.88.030, "Subdivisions," which requires that all subdivision proposals and other proposed new developments be reviewed by the City engineer to assure that (1) all such proposals are consistent with the need to minimize flood damage; (2) all public utilities and facilities, such as sewer, gas, electrical and water systems are located, elevated, and constructed to minimize or eliminate flood damage; and (3) adequate drainage is provided so as to reduce exposure to flood hazards.

- Section 17.88.040, "Utilities," which requires that new or replacement water supply systems and/or sanitary sewer systems be designed to minimize or eliminate infiltration of floodwaters into the systems and discharges from the systems into flood waters, and on-site waste disposal systems shall be located so as to avoid impairment of them or contamination from them during flooding. (Prior code Section 27.168).

- Section 17.88.050, "FEMA Requirement," which requires that new construction or replacement of existing construction be in conformance with the standards and regulations of the Federal Emergency Management Agency (FEMA). (Prior code Section 27.169).

City of St. Helena Stormwater Management Standards (Construction and Post-Construction Standards)

The City of St. Helena has developed stormwater management standards that apply to discretionary and ministerial projects requiring a use permit, building permit, and/or grading permit.

The City of St. Helena has developed stormwater management standards to comply with the Phase II General Permit that apply to discretionary and ministerial projects submitting an application for a use permit, building permit, and/or grading permit (City of St. Helena, 2005a). The standards include both a construction and post-construction phase review and permitting process implemented by the St. Helena Public Works Department.

Construction-Phase Erosion Control Plans and Storm Water Pollution Prevention Plans

If a project is subject to construction-phase requirements, the applicant must prepare an Erosion Control Plan (ECP) for sites of less than one acre and a

Storm Water Pollution Prevention Plan (SWPPP) for sites of one acre or more. The plans must depict BMPs that will be implemented during construction to eliminate or minimize the discharge of pollutants.

For projects with slopes of less than 15 percent, any person may prepare ECPs or SWPPPs. For projects with steeper slopes, however, only persons specified in the standards (e.g., a licensed civil engineer, a certified erosion and sediment control specialist) may prepare the documents. Prior to obtaining a building or grading permit, applicants with projects disturbing one or more acres must provide a copy of the Waste Discharge Identification Number issued for coverage under the Construction General Permit.

Grading deadlines in the standards mandate that clearing of vegetation, grading, and/or any other soil-disturbing activities shall only occur between April 15th and October 15th of any given year. Erosion and sediment control measures shall be fully implemented by October 15th of each year and maintained through April 15th. In addition, when the ECP/SWPPP requires installation of sediment retention devices, these devices must be installed and functional no later than October 1st of that year.

The City's Public Works Department conducts site inspections to evaluate the effectiveness of the construction-phase BMPs using the following performance standards:

- No measurable increase of pollution (including but not limited to sediment, concrete and stucco, automotive fluids, hazardous materials, and pathogens) in runoff from the site;
- No slope erosion; and
- Water velocity moving offsite must not be greater than pre-construction levels.

Post-Construction Stormwater Runoff Management Plans

In order to comply with the Phase II General MS4 Permit, the City has adopted the Bay Area Stormwater Management Agencies Association (BASMAA) Post Construction Manual to regulate and provide design guidance to projects within the City. All projects within the City must comply with the BASMAA Manual, which uses a tiered approach to implement low impact development principles on all projects that create or replace 2,500 square feet or more of impervious surface.

Existing St. Helena General Plan

The existing St. Helena General Plan, adopted in 1993, outlines policies, standards, and programs that together provide a comprehensive, long-term plan for physical development within the city. Individual development projects proposed within the city must demonstrate general consistency with the goals and policies outlined within the General Plan, which articulates and implements the city's long-term vision, including provisions for hydrology and water quality.

The proposed project analyzed in this EIR is the St. Helena General Plan Update, which is an update of the existing General Plan. Once the General Plan Update is adopted, future developments within the city will be subject to policies outlined in the updated document.

Impacts and Mitigation Measures

Significance Criteria

Based on Appendix G of the CEQA Guidelines, implementation of the proposed General Plan Update would have a significant effect on hydrology and water quality if it would:

- Violate any water quality standards or waste discharge requirements;
- 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 that 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 site 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 that would result in flooding on site or off site;
- Create or contribute runoff water that would exceed the capacity of existing or planned storm sewer 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 that 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
- Expose people or structures to inundation by seiche, tsunami, or mudflow.

This issue of depletion of groundwater supplies is addressed in Section 4.R, Utilities and Service Systems, of this EIR.

Relevant Policies

The following relevant policies and implementing actions of the General Plan Update address hydrology and water quality:[10]

CD1.4. Strengthen water conservation measures for development and construction that result in significant reductions in local water use and protection of local water resources.

CD1.5. Require stormwater management techniques that minimize surface water runoff in public and private developments. Utilize low impact development techniques such as bioswales and other best management practices to manage stormwater.

CD1.B. Adopt a Green Building and Landscaping Ordinance that establishes green building and landscaping site design standards customized to meet the unique climatic context of the community. Partner with third party agencies, such as PG&E, to encourage the inclusion of energy-efficient systems in remodels and retrofits of existing buildings and residences. Offer incentives for improving energy-efficiency in existing buildings. Landscaping standards should limit impervious paving and identify standards and incentives that encourage the use of locally-propagated native, low-water, drought-tolerant planting and integrated pest management practices.

CD3.1. Limit building envelope sizes and require adequate side and rear setbacks to preserve the character of existing residential areas and to

[10] When portions of policies are relevant to policies and implementing actions, only those portions are shown.

avoid overbuilt lots. Require future development to conform to the pattern and density of neighboring areas in order to complement existing town character and protect against incursion into vineyard agricultural areas.

CD3.B. Review the existing ordinance language limiting lot coverage/floor area ratio according to parcel size in residential areas in order to preserve neighborhood character, reduce adverse view and shade impacts on existing homes, improve groundwater infiltration, and avoid overbuilt conditions. At the same time, care needs to be taken that any ordinance revision does not impair the ability to build second units on existing lots where appropriate.

CD4.2. Integrate open space, including parks, community gardens, natural areas and agriculture into the community to strengthen the connection to St. Helena's agricultural heritage and provide a sense of openness.

LU1.1. Require new development to occur within well-defined boundaries and be consistent with the ability to provide urban services. New development should mitigate infrastructure impacts by using sustainable, best management practices in green building and stormwater management, while minimizing effects on water, energy and natural resources.

LU1.2. Allow urban development to occur only within the Urban Limit Line. Consider an exception for on-site employee housing on agricultural lands. Urban services, such as sewer, water and storm drainage will only be extended to development within the Urban Limit Line.

OS1.1. Preserve and enhance St. Helena's riparian corridors for their value in providing wildlife habitat, biodiversity, natural drainage and visual amenity.

OS1.A. Develop and adopt an ordinance for the protection, restoration and enhancement of creek corridors. The ordinance should consider the following:

- Establish development setbacks to allow for all new development projects to protect stream function and riparian habitat, while allowing for limited recreational uses and success of the stream corridor for maintenance and flood control.
- Limit use of herbicides and insecticides in areas near and adjacent to creeks, and ensure best management practices for all developments and industries;
- Provide access for creek maintenance and public use through easements and cooperative agreements with landowners;
- Establish sufficient buffer width adjacent to waterways to allow for wildlife habitats, trails and greenbelts;
- Adhere to Living River Principles that allow the river to meander, reconnect to its historic floodplain and retain natural channel features to support continuous fish migration and the health of riparian corridors; and

- Encourage the use of bioswales, off-stream detention ponds and other green best practices for stormwater management.

- Implement an Integrated Pest Management ordinance that includes provisions to minimize the reliance on pesticides that threaten water quality and to require the use of integrated pest management in municipal operations; and.
- Incorporate relevant actions and performance standards in TMDL implementation strategies for the Napa River to control discharges of pathogens and sediment.

OS1.B Restrict development on open space-designated parcels along Sulphur Springs Creek west of the Crane Avenue Bridge. All development must be outside the stream corridor and structures must be set back from the creek's edge, consistent with California Department of Fish and Wildlife standards.

OS1.H. Require all proposed projects adjacent to a creek corridor or located in the City's hillside areas to submit a management plan for protecting natural habitats, including provisions to:

- Employ supplemental planting and maintenance of grasses, shrubs and trees of similar quality and quantity to provide adequate vegetation cover to keep the watersheds on steep slopes and along streams in good condition, and to provide shelter and food for wildlife.

- Provide protection for wildlife habitat.

OS1.I. Require new development to be sited to maximize the protection of native tree species, riparian vegetation, important concentrations of natural plants and sensitive wildlife habitat.

OS1.L. Discourage removal of trees for agricultural or other development in hillside areas.

OS1.N. Conduct a study to determine the most appropriate method for managing and mitigating the build-up of gravel in Sulphur Springs Creek to avoid the risk of flooding. Study and create a map of the 200-year flood zone to help educate residents of flood risks and available State and Federal insurance opportunities. Ensure that implementation measures contribute positively to the preservation of the creek and its corridor.

OS2.6. Support floodplain management strategies that ensure adequate open space for flood management consistent with Living River Principles, FEMA and State requirements at a minimum.

OS3.1. Promote stormwater management techniques that minimize surface water runoff in public and private developments. Utilize low impact development techniques to best manage stormwater through conservation,

on-site filtration and water recycling, and ensure compliance with the National Pollution Discharge Elimination System (NPDES) permit.

OS3.2. Reduce stormwater runoff in developed areas to protect water quality in creeks. Utilize sustainable and "green" infrastructure that facilitates natural drainage.

OS3.A. Manage stormwater runoff in compliance with the City's Stormwater and Runoff Pollution Control Ordinance, Stormwater Management Standards for Construction and Post-Construction, and the Development Manual Stormwater Standards, to ensure compliance with the City's NPDES permit. Implement a surface water quality monitoring program to evaluate the effectiveness of stormwater management program activities in reducing the discharge of pollutants to receiving waters to the maximum extent practicable.

OS3.B. Prevent water pollution from point and non-point sources, including runoff from agriculture through implementation of City adopted Best Management Practices in applicable permits, Total Maximum Daily Load (TDML). and the Plan for California's Nonpoint Source Pollution Control Program. Continue to adopt new or more effective and efficient best management practices and programs.

OS3.C. Minimize stormwater runoff and pollution by encouraging low impact design features, such as pervious parking surfaces, bioswales and filter strips in new development projects. The City should be a model for incorporating low impact design elements as it implements streetscape and landscape improvements. In addition, The City should retrofit the existing public landscape with natural vegetative coverings promote infiltration into the ground that can help detain stormwater and reduce pollution attributable to runoff.

OS3.D. Maintain the City's water management program for implementing water conservation efforts for households, businesses, industries, public infrastructure and agricultural activities. This program should include the following measures:

- Identify building, plumbing and landscape standards and technologies that conserve water especially during water shortages;
- Implement standards that require low-flow appliances and fixtures in all new developments; and
- Encourage and model the use of drought tolerant and native plants in landscaping.

OS3.E. Promote the installation of drought tolerant and native plants in landscaping throughout the City. Potential measures include:

- An education program that details water conservation measures for the use in local landscaping.

- Working with local nurseries to encourage education, demonstration and sales of drought tolerant and native plants and water-wise irrigation systems.

- Require City parks and properties to be landscaped with drought tolerant native plants that allow for high shade capacity whenever possible and use water-wise irrigation systems as a model for residents and businesses.

OS4.E. Explore a citywide program for residents, businesses, industries and agricultural uses that provides information on pollution prevention, disposal of hazardous waste and chemicals, liability and clean-up.

PF2.A. Require all new units on parcels less than two acres, except those in Woodlands and Watershed Districts, to connect to the City sewer. All existing units within 200 feet of an existing sewer shall connect to the City sewer whenever feasible. Many of the residential units cannot expand without abandoning on-site septic systems and connecting to the sewer which may, in some cases, require an extension of the sewer.

PF2.C. Urban services such as sewer, water and storm drainage will only be extended to development within the Urban Limit Line. Exceptions will be permitted when undue hardship can be demonstrated, and when proposed improvements are not found to induce growth.

PF3.1. Ensure that new developments provide adequate drainage improvements to mitigate stormwater runoff attributable to the development.

PF3.2. Ensure that encroachments into the 100-year floodplain do not result in any increase in flood levels during the occurrence of the base flood discharge..

PF3.3. Improve York Creek channel capacity in flood-prone areas through removal of channel-obstructing gravel bars and vegetation.

PF3.A. Require developers to provide adequate drainage improvements to mitigate storm runoff from the site to the nearest major waterway. Drainage improvements can include measures such as creating settling basins, bio-swales and the use of pervious materials for driveways and parking areas. Key waterways include York Creek, Sulphur Creek and the Napa River.

PF3.B. Require developers to finance and pay for the extension of existing downstream drains to ensure adequate capacity to accommodate new development. The City may provide future reimbursement for oversizing costs at the time of connection by others.

PF3.C. Consistent with Municipal Code Section 16.32.170, continue to prohibit new residential lots that will be subject to periodic inundation from floodwaters. New development proposals on existing lots of record must identify flood hazard areas and mitigate all impacts to base flood

levels and potential damage from grading, filling and construction through proper drainage, construction and location of utilities, in accordance with FEMA requirements.

PF3.D. Update the City's Stormwater Master Plan to include changes and upgrades since the last plan and to help streamline the approval process.

PF3.E. At the time of development review, require that post-project runoff be limited to pre-project flow rates as a condition of approval.

PS5.1. Minimize the risk to Site new development to minimize potential damage from a 100-year flood. Continue to require that any new development that is allowed within the floodplain is constructed so that the lowest floor elevation adheres to current FEMA standards. Prohibit the siting of uses within Flood Hazard Areas that could result in health and safety hazards including those due to the release of chemicals or other substances as a result of inundation or erosion. Assure that any new flood protection projects comply with State Department of Water Resources (DWR) standards.

PS5.2. Ensure that new development within the 100-year floodplain is properly graded to mitigate flood effects and does not cause increases or expansion of the flood area.

PS5.3. Within the 100-year floodplain, encourage open space uses, such as parks or natural areas.

PS5.4. Ensure that construction of flood barriers does not adversely affect natural floodplains, stream channels and natural barriers that help accommodate or channel flood waters.

PS5.5. Prohibit new development within areas designated as Floodway in the current FEMA Flood Insurance Study (FIS) and Flood Insurance Rate Map (FIRM).

PS5.A. Coordinate with the County Flood Control District to ensure that stream channels are routinely cleared of vegetation and debris which could impede stormwater flows, while protecting riparian habitat.

PS5.B. Require developers with land adjacent to the Napa River to construct or contribute a fair share toward the construction of necessary flood control improvements.

PS5.C. Strengthen and enforce regulations that prohibit the dumping of litter, fill and waste materials into creeks and waterways. Educate the public about flooding and health hazards associated with these activities.

PS5.D. Require that sewer and water lines in areas subject to flooding are sited to avoid contamination and flooding when pipelines break.

PS5.E. Prohibit the introduction of intensive urban development in designated Flood Hazard Areas.

PS5.F. Review Municipal Code Chapter 15.52, Flood Damage Prevention, to ensure that regulations reflect best practices. Periodically update the City's flood hazard recommendations in accordance with FEMA/NFIP regulations.

Impact Analysis

This section describes the potential impacts on the local and regional hydrologyand water quality resulting from buildout of the land uses described in the proposed General Plan Update

Impact HYDRO-1. Potential development that could be allowed under the General Plan Update could interfere with groundwater recharge.

New development occurring under the proposed General Plan Update would add new impervious surfaces that could affect the ability for rain and surface runoff to infiltrate into the groundwater aquifer. Policies CD3.1 and Implementing Actions CD3.B, and CD4.A would limit building envelope sizes and lot coverage and promote open space and landscaped buffers, which would reduce the amount of impervious area associated with new development that could adversely affect groundwater recharge. Policy OS3.1 and other policies and implementing actions (discussed under Impact HYDROLOGY-1 below) that would promote open space conservation and low impact development (in accordance with the NPDES stormwater municipal permit) would also help to maintain groundwater recharge. Adverse impacts on groundwater recharge associated with the proposed General Plan Update would therefore be less than significant.

Impact HYDRO-2. Potential developemt under the General Plan Update could result in potentially significant impacts to water quality during the construction phases of future development projects.

Construction of the residential, commercial, industrial, and related Pipeline Projects under the General Plan Update would include various activities that could impair water quality, if not properly controlled. These activities include, but are not limited to, removing vegetation; grading; excavating; dewatering; cutting and filling; constructing buildings, roads, and other paved areas; and installing utilities. Potential pollutants that could be discharged into receiving waters include sediment, pollutants attached to sediment (such as metals or oil and grease), trash, paint, solvents, sanitary waste from portable restrooms, and concrete curing compounds. Stormwater runoff impacts associated with construction activities occurring under the General Plan Update would be reduced to a less-than-significant level

through compliance with the Construction General Permit. The Construction General Permit requires development and implementation of a SWPPP that includes minimum BMPs for the following activities: erosion and sediment control; site management/housekeeping/waste management; management of non-stormwater discharges; run-on and runoff controls; and BMP inspection, maintenance, and repair activities. The BMPs must meet the performance standard specified in the permit, and certain discharges are subject to numeric action levels and numeric effluent limits. BMPs must be implemented and maintained by personnel that meet the specific qualifications in the Construction General Permit. The Construction General Permit also has a monitoring and reporting program that requires submittal of the SWPPP, BMP inspections and corrective actions, monitoring data, and staff training records to the State Water Resources Control Board.

General Plan Update projects must also comply with the City's Stormwater Management Standards for construction site runoff, and would be subject to the City's dry season grading requirements (unless approved by the Public Works Director), which would significantly reduce the amount of on-site erosion and sediment discharge. In addition, the City's Public Works Department would conduct inspections of construction sites to evaluate the effectiveness of the site stormwater management practices for preventing erosion and controlling the discharge of pollutants. Through compliance with the Construction General Permit, the City's Stormwater Management Standards for construction, and the City's grading requirements, adverse water quality impacts caused by proposed General Plan Update construction activities would be less than significant.

Impact HYDRO-3. Potential development that could be allowed under the General Plan Update could result in potentially significant amounts of erosion and siltaton into nearby bodies of water.

Erosion and siltation could be caused by the construction and operation of future individual development projects, both public and private under the proposed General Plan Update. As discussed under Construction-Phase Water Quality Impacts, adverse impacts from erosion or siltation during construction would be reduced to a less-than-significant level by complying with the Construction General Permit, the City's Stormwater Management Standards for construction activity, and the City's grading requirements.

For the operational phase of the General Plan Update projects, drainage improvements required under Implementing Action PF3.A would adequately mitigate for erosion and siltation. The additional following policies and implementing actions would also apply: Policies CD1.5, OS3.1, and OS3.2; elements of Implementing Actions OS1.A and OS1.H; and Implementing

Actions OS1.B, OS1.I, OS1.L, OS3.A, OS3.B, and OS3.C. Such policies and implementing actions include incorporating low impact development and other stormwater BMPs into development projects, requiring infrastructure that facilitates natural drainage, preserving open space, requiring development setbacks, and maintaining adequate vegetation adjacent to creek corridors, all of which would reduce or prevent substantial erosion or siltation. Therefore, adverse impacts associated with erosion or siltation would be less than significant.

Impact HYDRO-4. Future development that could be allowed under the General Plan Update could expose future residents, employees and visitors to St. Helena to potentially significant imapcts from upstream dam failure.

A very small portion of the potential growth areas identified in the proposed General Plan Update are within dam failure inundation areas. The potential for dams to fail and inundate the city is low, due to oversight from the DOSD. Levees that could cause flooding within the city if a failure occurred are inspected and maintained by the Napa County Flood Control and Water Conservation District. The DOSD has several programs that ensure dam safety. When a new dam is proposed, DOSD engineers and geologists inspect the site and review the subsurface exploration information to understand the geologic conditions. Upon submittal of an application to construct a dam, the DOSD reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements, and that the design is appropriate for the known geologic conditions. After approval of the application, the DOSD oversees the dam construction to ensure the work is being done in accordance with the approved plans and specifications. Following construction, the DOSD inspects each dam annually to ensure the dam is safe, performing as intended, and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews of the dam surveillance network data. Finally, the DOSD periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California.

When unsafe conditions develop, the DOSD works with dam owners and their consultants to address and remedy the condition in a timely manner. To minimize risk, the DOSD may impose a reservoir restriction limiting the water surface to a level that is judged safe. The DOSD may request that the owner develop an emergency action plan in coordination with local authorities. General Plan Update Policy PS6.1 and Implementing Actions PS6.A and PS6.C would ensure that adequate emergency response procedures are in place in the case of a dam failure that requires evacuation.

Consequently, the flooding impact associated with the failure of a dam or levee would be less than significant.

The City has initiated the process to remove the upper York Creek Dam. That work is expected to be complete in 2016.

Impact HYDRO-5. Future development that could be allowed under the General Plan Update could expose future residents, employees and visitors to St. Helena to potentially significant imapcts from seiche and tsunami action during a seismic event.

As discussed in under Setting above, the City of St. Helena's elevation above mean sea level and its distance away from coast and San Francisco/San Pablo Bay preclude the potential for inundation by a seiche or tsunami. General Plan Update Policy PS6.1 and Implementing Actions PS6.A and PS6.C would ensure that adequate emergency response procedures are in place in the case of a natural disaster that requires evacuation. This impact would be less-than-significant.

Impact HYDRO-6. Use of septic systems could result in potentially significant impacts to groundwater quality.

Operation of septic systems can adversely impair groundwater quality. Septic systems are a source of nitrate and other dissolved inorganic compounds (such as chlorides), pathogens, and dissolved organic compounds (such as pesticides, pharmaceuticals, and solvents) (SWRCB, 2010).

General Plan Update Implementing Action PF2.A would reduce groundwater impacts from new septic systems to less-than-significant levels by requiring all new developments on less than two acres (except those in Woodlands and Watershed districts) that require sanitary facilities to discharge to the City's sanitary sewer system. Implementing Action PF2.A would also reduce adverse water quality impacts from existing septic systems by requiring some existing parcels with septic systems to discontinue use of the system and to instead discharge to the sanitary sewer system. Water quality impacts from septic systems would therefore be less than significant.

Impact HYDRO-7. Future development that would be allowed under the General Plan Update could result in a potentially significant impact to water quality due to increases in the amount of imprevious surfaces.

Development that would be allowed under the General Plan would add new impervious surfaces to the community, including but not limited to sidewalks, pathways, parking areas and similar improvements. Unless

properly treated, runoff from these surfaces could include various pollutants, such as asbestos, oils, solvents and other pollutants that could be transported to local creeks and ultimately the Napa River. This would normally be considered a significant impact, but will be reduced to a less-than-significant level by ensuring that development project comply with Policies and implementing Actions contained in the General Plan.

These include Policies CD4.2 and OS1.1 and Implementing Actions CD1.B, CD4.A, OS1.B, OS1.H, OS1.L, OS3.D, and OS3.E would promote preservation of open space and existing vegetation and require development setbacks, use of drought-tolerant and native plants, and proper use of pesticides and herbicides. Open space conservation reduces impervious area, which may reduce stormwater pollutants. Use of native plants would improve water quality by reducing pesticide and fertilizer use and reducing irrigation requirements, which would reduce the volume of dry weather nuisance flows into the stormwater drainage system and/or receiving waters. Dry weather nuisance flows would also be reduced by increasing the use of non-native drought-tolerant plants, which is also promoted by the General Plan policies and implementing actions.

Implementing Action OS1.D would require coordination with various agencies to augment the flow in the Napa River to minimize pollution. Implementing Action OS4.D would provide outreach to residents, businesses, industries, and agricultural uses on water quality pollution prevention. Implementing Action OS3.B would require the City to prevent water pollution from both point sources (such as stormwater runoff from developments) and non-point sources including agricultural runoff.

These General Plan Update policies and implementing actions, along with continued participation in the Napa County Stormwater Pollution Prevention Program, compliance with the City’s Stormwater Ordinance and BASMAA Post-Construction Manual for construction and post-construction stormwater runoff requirements, and compliance with the General Industrial Permit for industrial facilities, would reduce the potential adverse surface water quality impacts. However, policy and implementing action changes are recommended below to ensure that no significant water quality impacts would occur from implementation of the proposed General Plan Update.

Impact HYDRO-8. Future development in St. Helena that would be allowed under the General Plan Update could violate waste discharge requirements or other water quality standards, provide substantial amounts of polluted runoff or otherwise substantially degrade water quality.

New development that would occur under the General Plan Update would add or replace impervious surfaces, which could increase the volume of stormwater runoff and pollutant loading into local receiving waters. Pollutants associated with the land uses allowed under the General Plan Update include sediment, heavy metals, pathogens, nutrients, pesticides, petroleum hydrocarbons, oil and grease and other organic compounds, and trash and debris. In addition, soil erosion and management of agricultural land uses could introduce pollutants such as sediment (and pollutants associated with sediment), pathogens, nutrients, dissolved solids and pesticides. Of particular concern are pollutants that have adopted TMDLs or are on the 303(d) list for the Napa River and/or the San Pablo Bay, for which urban or agricultural stormwater runoff is a potential pollutant source. Examples of these pollutants include nutrients, pathogens, mercury, and sediment. (Refer to Regulatory Framework above for a summary of all pollutants associated with the 303(d) list/TMDLs.)

General Plan Update Policies LU1.1, CD1.5, OS3.1, and OS3.2 and Implementing Actions OS1.A, OS3.A, and OS3.C would reduce water quality impacts resulting from the operational phase of development by complying with the City's NPDES stormwater municipal permit, which requires implementation of stormwater BMPs to reduce pollutants in stormwater runoff to the maximum extent practicable; this includes implementing Low Impact Development practices for new development and redevelopment. However, specific policy language changes are recommended below as mitigation measures to improve specificity.

Policies CD4.2 and OS1.1 and Implementing Actions CD1.B, CD4.A, OS1.B, OS1.H, OS1.L, OS3.D, and OS3.E would promote preservation of open space and existing vegetation and require development setbacks, use of drought-tolerant and native plants, and proper use of pesticides and herbicides. Open space conservation reduces impervious area, which may reduce stormwater pollutants. Use of native plants would improve water quality by reducing pesticide and fertilizer use and reducing irrigation requirements, which would reduce the volume of dry weather nuisance flows into the stormwater drainage system and/or receiving waters. Dry weather nuisance flows would also be reduced by increasing the use of non-native drought-tolerant plants, which is also promoted by the General Plan policies and implementing actions.

Implementing Action OS1.D would require coordination with various agencies to augment the flow in the Napa River to minimize pollution. Implementing Action OS4.D would provide outreach to residents, businesses, industries, and agricultural uses on water quality pollution prevention. Implementing Action OS3.B would require the City to prevent water pollution from both point sources (such as stormwater runoff from developments) and non-point sources including agricultural runoff.

These General Plan Update policies and implementing actions, along with continued participation in the Napa County Stormwater Pollution Prevention Program, compliance with the City's Stormwater Ordinance and BASMAA Post-Construction Manual for construction and post-construction stormwater runoff requirements,, and compliance with the General Industrial Permit for industrial facilities, would reduce the potential adverse surface water quality impacts to a less-than-significant level.

Impact HYDRO-9. Construction and operation of future development projects under the auspices of the General Plan Update could substantially alter existing drainage patterns, including the course of a stream or river or substantially increase the rate or amount of surface runoff in a manner that would result in flooding or create or contribute runoff water that could exceed the capacity of existng or planned drainage systems.

Development allowed under the General Plan Update would add new impervious surfaces that could increase the flow rate and volume of runoff that leaves a site. Policies CD1.5, LU1.1, OS1.1, PF3.1, and PF3.4 and Implementing Actions OS1.A, OS1.B, PF3.A, and PF3.E would require new development to provide adequate drainage improvements and development setbacks and to incorporate stormwater BMPs, which would reduce peak flow rates and stormwater runoff volumes from smaller, more frequently occurring storms. Extending stormwater drainage system utilities to the Urban Limit Line and updating the City's Stormwater Master Plan, as required by Policy LU1.2 and Implementing Actions PF2.D and PF3.D, would ensure that the storm drain system has adequate capacity to convey storm flows without flooding, accounting for existing and future land uses and development. Maintaining creek corridors and adhering to Living River Principles as required by Implementing Actions OS1.A, OS1.C, and OS1.N would help to maintain the natural hydrologic function of creeks, which would reduce the potential for flood flows to inundate developed or agricultural areas.

In addition, new inputs to the stormwater drainage system must comply with Title 16 of the Municipal Code, which requires a new stormwater drainage system to be designed by a registered civil engineer for ultimate development of the watershed, to convey runoff generated by the ten-year flood. Per Title 16, the stormwater drainage system must also be designed to provide for the protection of abutting and off-site properties, and off-site storm drain improvements may be required to satisfy this requirement. In addition, under Title 16, retention ponds, drainage swales, and/or check dams may be required to reduce the off-site peak storm flow that projects contribute to the historic flow. With adherence to the above, Impact HYDRO-9 would be less-than-significant.

Impact HYDRO-10. Future development that would be allowed under the General Plan Update could place housing within a 100-year flood hazard area or place structures within a 100-year flood hazard area that could impede or redirect floosd flows.

Development allowed under the General Plan Update could occur within a Special Flood Hazard Area, which could exacerbate existing flooding problems, create additional flood risks due to expansion of the 100-year floodplain, and expose additional people to flood hazards. Portions of Change Areas 2, 4, and 5, as well as the Key Housing Opportunity Site closest to the Napa River along Adams Street (see Figure 3-4 in Chapter 3, Project Description) are located within the 100-year floodplain. Regulatory requirements for flood damage prevention are contained in Chapter 15.52 of the St. Helena Municipal Code, and General Plan Update Implementing Action PS5.F would require review of the Municipal Code to ensure that regulations are consistent with FEMA requirements and reflect best practices.

General Plan Update Policies PF3.2, PF3.3, PS5.2, PS5.4, PS5.5, and OS2.6 and Implementing Actions PS5.A and PS5.C would mitigate against actions that could impede or redirect flood flows by ensuring that base flood elevations do not increase and that development activities do not expand the floodplain. Policies PF3.5, PS5.1, and PS5.3 and Implementing Actions PF3.C and PS5.E would limit the placement of new housing within a Special Flood Hazard Area and ensure that any new development complies with FEMA standards.

Policy PS5.1 and Implementing Action PS5.D would prevent injury to people and adverse impacts on surface waters by prohibiting siting of land uses in Special Flood Hazard Areas that could release chemicals or other substances, and by requiring water and sewer lines to be sited to avoid contamination and flooding if pipelines break.

Policies PS5.3 and OS2.6 would support flood management by encouraging open space uses within Special Flood Hazard Areas consistent with Living River Principles. The flood management objectives of Living River Principles include maintaining or restoring geomorphic equilibrium, maintaining natural slopes and channel widths, maintaining the connection of the river or creek to its floodplain, and providing adequate development setbacks to allow the river or creek to meander.

Policy PF3.5 and Implementing Action PS5.B would provide for flood protection measures for lands adjacent to Sulphur Creek and the Napa River.

With adherence to the above General Plan mandates, this impact would be less-than-significant.

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4.N Mineral Resources

Introduction

View of Sulphur Creek

This section addresses the presence of known mineral resources within the city limits of St. Helena and the likely impact on such resources from the projected growth associated with implementation of the proposed General Plan.

Setting

No aggregate mineral resources or other significant mineral resources have been mapped within the City of St. Helena (CA Department of Conservation, 2010). No Mineral Resource Zone maps exist for the bulk of Napa County, including the City of St. Helena (Napa County, 2008).

There is one known site for gravel mining in St. Helena, the Sulphur Creek historic gravel mining reach. This mining site has ceased operation, and a reclamation plan is in place.

Regulatory Framework

The California Surface Mining and Reclamation Act of 1975 (SMARA) identified mineral resources within California regions. SMARA maps identify and classify mineral resources as to their relative value for extraction, and the California Environmental Quality Act (CEQA) requires that potential impacts to known mineral resources that would be of value to the region or the residents of the State be assessed. The potential loss of locally-important mineral resource recovery sites identified in a local general plan or other applicable plan is also to be identified as part of the CEQA process.

Impacts and Mitigation Measures

Significance Criteria

Significant impacts to mineral resources would occur if implementation of the St. Helena General Plan Update:

- Results in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Results in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Relevant Policies

The following relevant policy of the General Plan Update addresses mineral resources:

> *OS2.2*. Preserve open space for mineral resources. Ensure compliance with State requirements in the preservation of known locations of mineral resources.

Impact Analysis

Less-than-Significant Impacts

The General Plan Update could result in impacts to mineral resources that are not yet mapped within the City. No known mineral resources have been mapped within the City of St. Helena. However, over the course of the 20-year planning horizon, the State of California may update its SMARA maps and may identify such resources. Compliance with Policy OS2.2 of the General Plan would ensure that the project would not result in the loss of known, important mineral resources assuming that such resources are mapped on open space lands that can be protected from development. No mitigation measures would be necessary.

Potentially Significant Impacts

No potentially-significant impacts related to mineral resources would occur.

References – Mineral Resources

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4.O Population and Housing

Introduction

This section of the EIR describes existing and projected population, housing, and employment in St. Helena and potential effects of the General Plan Update related to changes in population.

Setting

Population

Napa County

Napa County in 2015 has a population of approximately 140,300 (ABAG, 2013). As shown in Table 4.O-1, Napa County's population is the smallest among the nine Bay Area counties. By 2035, ABAG estimates that Napa County will have a population of approximately 158,400, an increase of approximately 18,000 from 2015.

The City of St. Helena had an estimated 2010 population of 6,100, making it the third largest city in Napa County.

City of St. Helena

As shown in Table 4.O-2, the City of St. Helena has an estimated 2015 population of 5,900, making it the third largest city in Napa County. This estimate represents an approximately one and one half percent (96-person) increase from 2010, when the city's population was 5,814 (ABAG, 2013). St. Helena's one and one half percent population growth rate was much slower than the approximately four percent growth rate of Napa County as a whole during the 2010-2015 period.

TABLE 4.O-1
EXISTING AND PROJECTED BAY AREA POPULATION BY COUNTY, 2010-2035

County	2015	2020	2025	2030	2035	% Change 2015-2035
Alameda	1,580,800	1,654,200	1,730,100	1,810,300	1,897,200	+20%
Contra Costa	1,085,700	1,123,500	1,172,600	1,224,400	1,280,300	+18%
Marin	256,700	261,100	266,600	272,100	278,600	+8%
Napa	**143,300**	**144,200**	**148,600**	**153,100**	**158,400**	**+10%**
San Francisco	847,000	890,400	934,800	981,800	1,032,500	+22%
San Mateo	745,400	775,100	805,600	836,100	869,300	+17%
Santa Clara	1,877,700	1,977,900	2,080,600	2,188,500	2,303,500	+23%
Solano	427,300	442,700	459,200	475,200	492,700	+16%
Sonoma	500,500	517,700	535,900	555,300	576,500	+15%
Bay Area	7,461,400	7,786,800	8,134,000	8,496,800	8,889,000	+19%

SOURCES: ABAG, 2015

TABLE 4.O-2
EXISTING AND PROJECTED POPULATION, ST. HELENA AND NAPA COUNTY, 2010-2035

Jurisdictional Boundary	2015	2020	2025	2030	2035	% Change 2015-2035
St. Helena	**5,900**	**6,000**	**6,100**	**6,100**	**6,200**	**+5%**
Napa	78,800	80,700	82,800	85,100	87,700	+11%
American Canyon	20,500	21,500	22,600	23,700	25,000	+22%
Calistoga	5,200	5,300	5,400	5,500	5,500	+6%
Yountville	3,000	3,100	3,300	3,400	3,600	+20%
Unincorporated	26,900	27,600	28,400	29,300	30,400	+13%
Napa County Total	**140,300**	**144,200**	**148,600**	**153,100**	**158,400**	**+13%**

SOURCES: ABAG, 2015

According to ABAG projections, summarized below in Table 4.O-2, St. Helena's population is anticipated to be approximately 6,200 (an increase of approximately five percent) by 2035. St. Helena's status as the third largest city in Napa County is expected to continue through 2035. ABAG projects a higher growth rate of about twelve percent for Napa County as a whole during the same 2015-2035 time period (ABAG, 2013).

Housing

Napa County

Between 2000 and 2010, the number of housing units increased throughout the Bay Area by approximately eight percent. During this period, Napa County experienced an approximate 12-percent growth in the housing stock, adding about 5,794 units (California Department of Finance, 2010). In percentage terms, this increase ranked third among Bay Area counties. Table 4.O-3 compares the number of housing units in 2000 and 2010 in each of the nine Bay Area counties.

City of St. Helena

The City of St. Helena contained approximately 2,751 housing units in 2015, with single-family housing accounting for 70 percent, multi-family housing accounting for 25 percent, and mobile homes accounting for 5 percent of the total.

The City of St. Helena contained approximately 2,751 housing units in 2015 (California Department of Finance), with single-family housing accounting for 70 percent, multi-family housing accounting for 25 percent, and mobile homes accounting for 5 percent of the total. Compared to Napa County as a whole, the city has a slightly lower proportion of single-family housing and a slightly higher proportion of multi-family housing. Table 4.O-3 presents the range of housing types currently provided in St. Helena and in Napa County as a whole.

TABLE 4.O-3
EXISTING HOUSING TYPES, ST. HELENA AND NAPA COUNTY, 2015

	Number of Housing Units	Distribution Percentage	
Housing Type	**City of St. Helena**	**City of St. Helena**	**Napa County**
Single-Family			
Detached	1,697	62%	67%
Attached	215	8%	7%
Multi-Family			
2-4 Units in Structure	216	8%	7%
5 Units or More in Structure	478	17%	12%
Mobile Homes	145	5%	7%
Total	2,751	100%	100%

SOURCE: California Department of Finance, 2015

The average household size in St. Helena is approximately 2.43 people, which is slightly lower than Napa County's average of approximately 2.62 people (ABAG, 2013). ABAG projects that the average household size in St. Helena will increase to approximately 2.48 people by 2035. The average household size in the county as a whole is expected to increase to approximately 2.87 people by 2035(ABAG, 2013).

Employment

Napa County

As shown in Table 4.O-4, the total number of jobs in Napa County was about 75,700 in 2015. By 2035, the county is projected to have approximately 86,880 jobs, representing an increase of about 15 percent between 2015 and 2035 (ABAG, 2013).

TABLE 4.O-4
EXISTING AND PROJECTED EMPLOYMENT, ST. HELENA AND NAPA COUNTY, 2015-2035

Jurisdictional Boundary	2015	2020	2025	2030	2035	% Change 2010 -2035
St. Helena	**5,590**	**5,860**	**5,910**	**5,970**	**6,110**	**+10%**
Napa	36,660	39,650	40,610	41,610	43,030	+17%
American Canyon	3,250	3,650	3,750	3,850	3,990	+21%
Calistoga	2,340	2,450	2,480	2,520	2,590	+10%
Yountville	1,700	1,810	1,840	1,870	1,930	+13%
Unincorporated	26,160	27,820	28,150	28,480	29,230	+11%
Napa County Total	**75,700**	**81,240**	**82,740**	**84,300**	**86,880**	**+15%**

SOURCES: ABAG, 2013;

By 2035, the number of jobs in St. Helena is expected to increase by approximately 6 percent to a total of about 6,110 jobs.

City of St. Helena

As shown in Table 4.O-5, there were approximately 5,590 jobs in St. Helena in 2015. By 2035, the number of jobs in St. Helena is expected to increase by approximately 10 percent to a total of about 6,110 jobs (ABAG, 2013 .

Regulatory Framework

State Assembly Bill 2853 (Regional Housing Needs Allocation)

Assembly Bill 2853 (AB 2853), enacted in 1980, requires all cities to address their regional “fair share allocation” of housing needs by income group in their General Plan Housing Elements. The City of St. Helena must therefore evaluate “regional fair share” as projected by ABAG, which is the council of governments for the nine-county San Francisco Bay region. ABAG’s determination of the local share of regional housing takes into consideration factors such as: market demand for housing; employment opportunities; availability of suitable sites and public facilities based on local plans; commuting patterns as they relate to the differences between job creation and labor supply; type and tenure of housing; and housing needs of farmworkers.

ABAG allocates housing needs for each city and county in the region according to four specified income levels, so that each jurisdiction can make plans to provide for its “fair share” of regional housing needs by income group. To describe these housing needs, ABAG uses the income categories of *very low* for household incomes of up to 50 percent of the median income for the region (i.e., the county), *low* for 51 to 80 percent of the regional median income, *moderate* for 81 to 120 percent of the regional median

income, and *above moderate* for household incomes greater than 120 percent of the regional median income.

ABAG's most recent projected housing needs are for the period 2015 to 2023. ABAG has determined that a total of 31 housing units would be needed in St. Helena during this eight -year period, consisting of 8 units affordable to *very low-income* households,5 units affordable to *low-income* households, 8 units affordable to *moderate-income* households, and 13 units affordable to *above moderate-income* households (ABAG, 2015). These "fair-share" totals represent the ABAG-projected number of units that would need to be added to St. Helena's housing stock over the period 2015 to 2023 in order to achieve an equitable distribution of housing opportunities.

Existing St. Helena General Plan

The existing St. Helena General Plan, adopted in 1993, outlines policies, standards, and programs that together provide a comprehensive, long-term plan for physical development within the city. Individual development projects proposed within the city must demonstrate general consistency with the goals and policies outlined within the General Plan, which articulates and implements the city's long-term vision, including provisions related to population and housing.

The proposed project analyzed in this EIR is the St. Helena General Plan Update (General Plan), which is an update of the existing General Plan. Once the General Plan Update is adopted, future developments within the city will be subject to policies outlined in the updated document.

St. Helena Residential Growth Management System

The St. Helena Residential Growth Management System (Municipal Code Section 17.152) limits the residential growth rate in the city to approximately two percent per year, while providing for development of both market-rate and affordable housing units.

The St. Helena Residential Growth Management System (Municipal Code Section 17.152) limits the residential growth rate in the city to nine new market rate housing units per year, while providing for development of both market-rate and affordable housing units. Neither affordable housing units nor second units count against this 9 units per year limit. Under this system, no more than nine building permits for market-rate housing may be issued each year. Permits remaining unused at the end of the year are carried over into the subsequent year, but are only available for allocation for the construction of market-rate units in development projects that include a minimum of 40 percent affordable units. The number of affordable housing units constructed is determined by the city council through the discretionary review process. The affordability agreements contain guarantees that the dwelling units would continue to be affordable to people of very low, low, or moderate income for an agreed-upon period of time (City of St. Helena, 2015).

Impacts and Mitigation Measures

Significance Criteria

Appendix G of the CEQA Guidelines provides that a project would have a significant population or housing impact if it would:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Relevant Policies

The following policies and implementing actions of the General Plan Update are relevant to population and housing impacts as defined by the significance criteria above (i.e., growth inducement and displacement of existing housing or residents):

LU1.7. Continue to limit the approval of market rate residential development to a maximum of nine (9) dwelling units per year. Regulated affordable units, and second units are exempt from this limitation.

LU1.A. Continue to allow the construction of second units – also known as "granny flats" or accessory dwelling units – and the division of single family homes into two or more units, in order to increase residential density and housing availability without requiring an extension of the Urban Limit Line.

LU1.C Continue to update the City's housing inventory to track the status of residential growth by unit type and affordability level.

LU1.D. Review the City's housing needs every five to eight years in conjunction with updates to the Housing Element to reassess housing priorities for the future years.

LU1.E. Restrict the use of housing units as short-term rentals, except for those allowed by the Short-Term Rental Ordinance.

LU3.C. Establish an inventory of all non-residential uses in the City and a program for monitoring future non-residential development. Combine this inventory with efforts to balance jobs and housing.

ES1.4. Encourage the creation of workforce housing to reduce the negative impacts of the City's jobs-housing imbalance and support the local employment base.

Impact Analysis

Less-than-Significant Impacts

Inducement of Population Growth

The Likely Buildout Scenario could induce population growth in the area. As discussed in Chapter 3, Project Description, the Likely Buildout Scenario would allow for residential development that would add an estimated 632 residents and 260 new housing units in the city by 2035. The 632 -person population increase would exceed the ABAG-projected population increase of 300 people for the 20-year time period between 2015 and 2035 (see Table 4.O-2). The ABAG projection is based on past trends and economic/ market constraints; St. Helena experienced limited residential growth in the past decade, and therefore the projection is low Policies and implementing actions included in the General Plan Update would limit the rate of residential development (Policy LU1.7) provide for development of affordable housing (Implementing Actions LU1.A and LU1.C, Policies HE1.1 and HE1.2), and seek to achieve a balance of jobs and housing (Implementing Action LU3.C, Policy ES1.4, Policy CC1.2, Policy HE1.4, and Implementing Actions HE1.A, HE1.B, HE1.C, HE1.E, and HE2.Q), thus helping to reduce the environmental impacts of population growth.

Population growth, in and of itself, is not considered a significant environmental impact. Instead, population growth constitutes an adverse environmental impact only to the extent that it would result in other physical environmental impacts (e.g., traffic, air quality, noise, etc). These potential environmental impacts of the General Plan Update are analyzed throughout Chapter 4 of this EIR.

Displacement of Existing Housing and Residents

Development under the Likely Buildout Scenario could result in the displacement of existing residents or housing units. However, the General Plan Update contains provisions that would mitigate these potential impacts, including policies and implementing actions that would encourage development of second units (Implementing Action LU1.A, Policy HE2.4, and Implementing Actions HE2.I, HE2.J, and HE2.K), mixed-use development (Policy HE2.3 and Implementing Action HE2.H), development at higher densities (Policies HE2.1, HE.2.2, and HE2.5, and Implementing Actions HE2.A, HE2.B, HE2.C, HE2.E, HE2.O, and HE2.P), and protection of the existing housing stock, including affordable housing and mobile homes (Implementing Action HE2.D, Policy HE3.1, Policy HE3.2, and

Implementing Actions HE.3.A, HE3.B, HE3.C, and HE3.D). With implementation of these provisions, no *net* population or housing displacement would be expected, and any potential displacement of existing residents and housing units would be reduced to a less-than-significant level.

Potentially Significant Impacts

The General Plan Update would not result in any potentially significant impacts related to population and housing.

References – Population and Housing

Association of Bay Area Governments (ABAG). 2013. *San Francisco Bay Area Housing Needs Plan, 2015-2035*, June. Available at http://www.abag.ca.gov/planning/pdfs/SFHousingNeedsPlan.pdf.

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