10. HYDROLOGY AND WATER QUALITY

10.1 INTRODUCTION

The Hydrology and Water Quality chapter of the EIR describes existing drainage patterns on the proposed project site, current stormwater flows and stormwater infrastructure. The chapter also evaluates potential impacts of the proposed project with respect to increases in impervious surface area and associated stormwater flows, degradation of water quality, and increases in on- and off-site flooding. Information used for this chapter was primarily drawn from reports prepared for the proposed project by RFE Engineering, Inc (RFE), which include the following: a Preliminary Drainage Study & Stormwater Quality Plan[1]; a Memorandum constituting an addendum to the Preliminary Drainage Study & Stormwater Quality Plan;[2] and the Dry Creek Vineyard Road Tributary Basin Ultimate Development Drainage Study[3] (see Appendix I). In addition, information was drawn from the Placer County General Plan,[4] the Placer County General Plan EIR,[5] the Dry Creek-West Placer Community Plan (DCWPCP),[6] the *Dry Creek Watershed Coordinated Resource Management Plan* (DCWCRMP),[7] and the *Update to the Dry Creek Watershed Flood Control Plan*.[8] It should be noted that issues associated with water supply availability are addressed in Chapter 15, Utilities and Service Systems, of this EIR.

10.2 EXISTING ENVIRONMENTAL SETTING

The section below describes regional hydrology, the existing drainage patterns within the project site, including peak flows, existing water quality, and groundwater conditions.

Regional Hydrology

The project site is located within the DCWPCP plan area within Placer County, California. According to the DCWPCP, the hydrologic characteristics in the plan area are largely affected by seasonal rainfall. The majority of the watercourses in the area are seasonal, and only support flows during the rainy season. However, Dry Creek, the largest water feature within the DCWPCP area, flows year-round. In all, the Dry Creek watershed drains approximately 101 square miles.[9] The watershed begins west of Auburn and drains into Steelhead Creek. Flows from Steelhead Creek discharge to the American River, and ultimately to the Sacramento River.

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1 RFE Engineering, Inc. *Preliminary Drainage Study & Stormwater Quality Plan for Brady-Vineyard Subdivision*. April 2, 2019.
2 RFE Engineering, Inc. *Memorandum: Brady Vineyard Post-Project vs. Pre-Project Drainage Addendum*. October 25, 2019.
3 RFE Engineering, Inc. *Dry Creek Vineyard Road Tributary Basin Ultimate Development Drainage Study for Brady Vineyard Subdivision*. October 11, 2019.
4 Placer County. *Countywide General Plan Policy Document.* August 1994 (updated May 2013).
5 Placer County. *Countywide General Plan EIR*. July 1994.
6 Placer County. *Dry Creek-West Placer Community Plan*. Amended May 12, 2009.
7 Placer and Sacramento Counties. *Dry Creek Watershed Coordinated Resource Management Plan.* December 31, 2003.
8 Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan.* November 2011.
9 Placer and Sacramento Counties. *Dry Creek Watershed Coordinated Resource Management Plan*. December 31, 2003.

According to the DCWCRMP, higher peak flows and total storm flows are not being adequately conveyed through stream channels (and structures) within the Dry Creek watershed that were originally developed (or were modified) for conveyance of lower flows. This results in localized flooding. Additionally, several areas within the watershed have degrading/unstable banks, incising streams, and are experiencing sedimentation of the streambed due, in part, to the modified flow regime caused by increases in impervious surface area that have occurred as a result of development activities in the area.

Modification of watershed hydrology is also compounded by modification of the instream configuration by channelization, levees, dredging, structures (dams, bridges, other), and reduced floodplain area. Such modifications also result in altered stream flow where flow is faster in some areas, contributing to erosion and faster peak flow timing, but slower in other areas (behind dams and other impeding structures), contributing to flooding and sediment deposition.

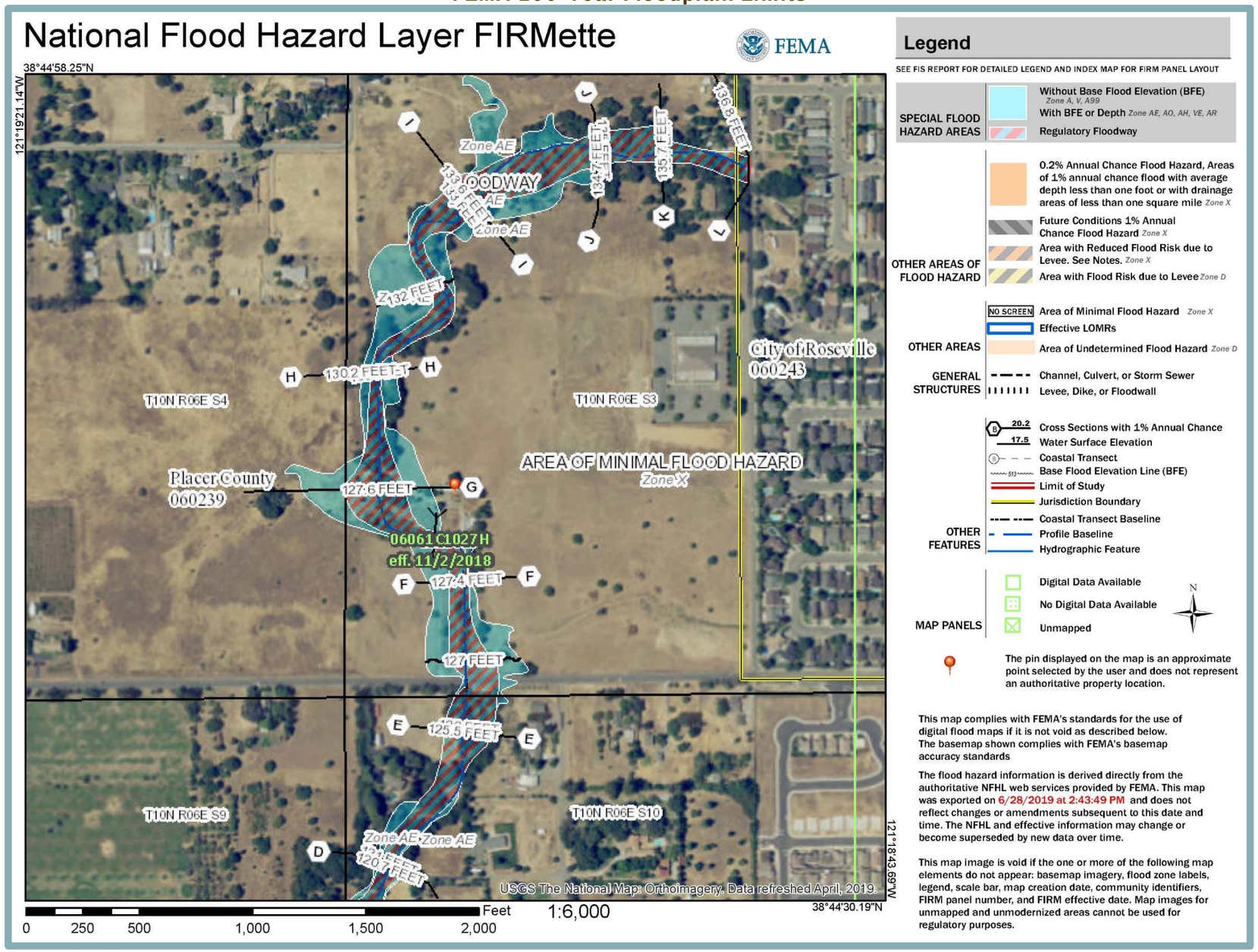
Dry Creek has an extensive record of flooding and flood damage to areas within the lower portion of the creek's watershed. Historic flooding in the area occurred in 1986, 1995, and 1997. Flooding generally occurs from October through April, when soils become saturated during winter rain events followed by high intensity storm systems. The lower portion of Dry Creek is characterized by high peak flows of moderate duration. Flooding from cloudburst storms of high intensity can occur from late spring to early fall; however, runoff resulting from the summer storms tends to be significantly less in peak and volume. Though significant progress has been made towards reducing flood risks in the Dry Creek watershed through the implementation of local improvement projects, including bridge replacements, flow bypasses, building elevation projects and residential buyouts, numerous flood hazard areas and roadway stream crossings still do not have adequate capacity.[10]

Project Site and Surrounding Area Drainage

The western edge of the project site contains an unnamed creek that runs southward. For the purposes of this analysis, the unnamed creek is hereafter referred to as the Dry Creek Vineyard Road tributary. Prior to entering the northern boundary of the project site, the Dry Creek Vineyard Road tributary receives drainage from approximately 500 acres of land within unincorporated portions of Placer County and the City of Roseville. After leaving the southwestern portion of the project site, the Dry Creek Vineyard Road tributary flows approximately one mile southwest before draining into Dry Creek. By the time the Dry Creek Vineyard Road tributary discharges to Dry Creek, the Dry Creek Vineyard Road tributary receives drainage from a total of 1,000 acres. The stretch of the Dry Creek Vineyard Road tributary between the project site and Dry Creek passes in close proximity to several existing residential structures, as well as the Dry Creek Wastewater Treatment Plant. The entirety of the Dry Creek Vineyard Road tributary within the project site is within a Federal Emergency Management Agency (FEMA) mapped AE floodplain zone (see Figure 10-1). The FEMA AE zone is defined as being areas subject to inundation by the one percent annual chance flood event, and FEMA provides base flood elevations for such areas.

[10] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. ES-2]. November 2011.

Figure 10-1
FEMA 100-Year Floodplain Limits



Source: FEMA Flood Map Service Center, 2019.

The majority of the project site slopes toward the Dry Creek Vineyard Road tributary; however, several small, shallow linear depressions exist within the project site as well. As a result of the existing slopes and small valleys within the site, stormwater within the site either sheet flows to the Dry Creek Vineyard Road tributary or is intercepted by one of the valleys and directed toward the Dry Creek Vineyard Road tributary. Some of the valleys within the project site contain depressions where stormwater collects, creating seasonal wetlands.

In addition to drainage of stormwater falling on the project site, the project site currently receives stormwater from several off-site sources. A portion of Brady Lane, as well as a portion of the existing subdivision opposite the project site across Brady Lane, direct stormwater into a stormwater pipe beneath Brady Lane, which outlets into an open drainage ditch on the east side of the project site. The open drainage ditch travels westward through the project site prior to intersecting with the on-site portion of the Dry Creek Vineyard Road tributary. Portions of the vacant parcel to the north of the project site and the developed church site to the northeast of the project site drain onto the project site and sheet flow to the Dry Creek Vineyard Road tributary.

A six-foot by 15-foot box culvert runs underneath Vineyard Road, south of the project site, and the Dry Creek Vineyard Road tributary is directed through the culvert prior to exiting the project site. After flowing through the Vineyard Road culvert, runoff flows unobstructed within the Dry Creek Vineyard Road tributary to the confluence of the Dry Creek Vineyard Road tributary and Dry Creek. The entire length of the Dry Creek Vineyard Road tributary from the beginning of the tributary at Brady Lane to the confluence with Dry Creek is approximately two miles, with the first mile stretching from Brady Lane, northeast of the project site, to the southwest corner of the project site. The second mile continues from the southwest corner of the site to Dry Creek.

To provide an accurate model of the entirety of the Dry Creek Vineyard Road tributary, RFE Engineering, Inc. (RFE) used Placer County's Dry Creek Hydrologic Engineering Center (HEC) Model and extracted the applicable sheds that contribute to the Dry Creek Vineyard Road tributary. RFE concluded that twelve drainage sheds drain to the Dry Creek Vineyard Road tributary. For analysis purposes, three of the drainage sheds were split into multiple sheds in order to separate the off-site and on-site areas of the sheds. A summary of the drainage sheds draining to the Dry Creek Vineyard Road tributary is provided in Table 10-1 below.

Table 10-1
Dry Creek Vineyard Road Tributary Drainage Sheds

Drainage Shed ID	Drainage Area (Square Feet)	Drainage Area (Square Miles)
DC25B	388.605	0.6072
DC25e	16.075	0.0251
DC25C	47.798	0.0747
DC25D	35.247	0.0551
DC25F-offsite	12.388	0.0194
DC25F-onsite	5.544	0.0087
DC25G	41.825	0.0654
DC25L-offsite north	7.065	0.0110
DC25L-offsite south	8.722	0.0136
DC25L-onsite	29.253	0.0457
DC25N-onsite	2.820	0.0044
DC25N-offsite	31.386	0.0490

(Continued on next page)

Table 10-1 Dry Creek Vineyard Road Tributary Drainage Sheds		
Drainage Shed ID	**Drainage Area (Square Feet)**	**Drainage Area (Square Miles)**
DC25I	110.582	0.1728
DC25H	43.582	0.0681
DC25M	88.585	0.1384
DC25K	195.828	0.3060
Source: RFE, 2019.		

Figure 10-2 depicts the major sheds in proximity to the project site. In addition, the stormwater runoff estimates for existing conditions on the project site are summarized in Table 10-2 below.

Table 10-2 On-site Peak Flow Characteristics – Existing Condition (cubic feet per second)					
Drainage Shed	**10-Year Peak Flow**	**25-Year Peak Flow**	**50-Year Peak Flow**	**100-Year Peak Flow**	**500-Year Peak Flow**
DC25F-onsite	2.1	2.8	3.5	4.0	5.9
DC25L-onsite	7.2	10.3	12.9	14.8	22.5
DC25N-onsite	0.8	1.1	1.4	1.8	2.6
Source: RFE, 2019.					

Water Quality

Activities and/or conditions that have the potential to degrade water quality include but are not limited to, construction activities and urban stormwater runoff.

Construction activities have the potential to cause erosion and sedimentation associated with groundbreaking and clearing activities, which could cause unstabilized soil to be washed or wind-blown into nearby surface water. In addition, the use of heavy equipment during construction activities, especially during rainfall events, have the potential to cause petroleum products and other pollutants to enter nearby drainages.

Water quality degradation from urban stormwater runoff is primarily the result of runoff carrying pollutants from the land surface (i.e., streets, parking lots, etc.) to the receiving waters (i.e., streams and lakes). Pollutants typically found in urban runoff include facility maintenance and lawn-care/landscaping chemicals (insecticides, herbicides, fungicides and rodenticides), heavy metals (such as copper, zinc and cadmium), oils and greases from automobiles and other mechanical equipment, and nutrients (nitrogen and phosphorus). Per the Phase I and limited Phase II Environmental Site Assessments prepared for the project site, the project site does not contain any known hazardous materials and past agricultural uses on the site did not result in contamination of the project site with any materials that could act as pollutants in nearby waterways.[11]

[11] ACE Quality Control. *Limited Phase II Environmental Site Assessment*. April 2, 2019.

Figure 10-2
Dry Creek Vineyard Road Tributary Drainage Sheds

Source: RFE, 2019.

Groundwater

The proposed project site is located within the North American Subbasin and the jurisdiction of the West Placer Groundwater Sustainability Agency (WPGSA). The WPGSA was formed in 2017 as a partnership between Placer County, the cities of Roseville and Lincoln, the Placer County Water Agency, and the California American Water Company in order to comply with the requirements of the Sustainable Groundwater Management Act (SGMA). The goal of the WPGSA is to manage portions of the North American Subbasin by protecting against overdraft and creating sustainable water supplies.

Groundwater levels in southwestern Placer County and northern Sacramento County have generally decreased in recent history, with many wells experiencing declines at a rate of approximately 1.5 feet per year.[12] However, per the San Juan Water District *2015 Urban Water Management Plan*, the North American Subbasin, within which the project site is located, is not identified by the California Department of Water Resources (DWR) as being in a state of overdraft.[13] Groundwater overdraft is a condition within a developed groundwater basin in which the amount of water pumped from the basin exceeds the sustainable yield of the basin over the long term.

During soil explorations completed by ACE Quality Control, as part of the Preliminary Geotechnical Engineering Study prepared for the project site, groundwater was observed at approximate depths ranging between 13 and 21 feet below ground surface.[14]

10.3 REGULATORY CONTEXT

The following is a description of federal, State, and local environmental laws and policies that are relevant to the review of hydrology and water quality under the CEQA process.

Federal Regulations

The following section includes federal environmental goals and policies relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

Federal Emergency Management Agency (FEMA)

The FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. FEMA is also responsible for distributing the Flood Insurance Rate Maps (FIRMs), which are used in the National Flood Insurance Program (NFIP). The FIRMs identify the locations of special flood hazard areas, including the 100-year floodplains.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within flood hazard areas, depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through construction codes and local ordinances; however, these regulations only apply to residential and non-residential structure improvements. Although roadway construction or modification is not explicitly addressed in the FEMA regulations, the California Department of Transportation

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12 California Department of Water Resources. *California's Groundwater, Bulletin 118, Sacramento Valley Groundwater Basin, North American Subbasin*. January 20, 2006.
13 San Juan Water District. *2015 Urban Water Management Plan* [pg. 6-3]. June 2016.
14 ACE Quality Control. *Preliminary Geotechnical Engineering Study Brady Residential Subdivision*. July 25, 2017.

(Caltrans) has also adopted criteria and standards for roadway drainage systems and projects situated within designated floodplains. Standards that apply to floodplain issues are based on federal regulations (Title 23, Part 650 of the CFR). At the State level, roadway design must comply with drainage standards included in Chapters 800-890 of the Caltrans Highway Design Manual. CFR Section 60.3(c)(10) restricts cumulative development from increasing the water surface elevation of the base flood by more than one foot within the floodplain.

Federal Clean Water Act

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the federal Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that the Environmental Protection Agency (EPA) must consider in setting effluent limits for priority pollutants.

Nonpoint sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff, but is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such nonpoint sources are generally exempt from federal NPDES permit program requirements. However, two types of nonpoint source discharges are controlled by the NPDES program – nonpoint source discharge caused by general construction activities, and the general quality of stormwater in municipal stormwater systems. The 1987 amendments to the CWA directed the federal EPA to implement the stormwater program in two phases. Phase I addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) municipalities and certain industrial activities. Phase II addresses all other discharges defined by EPA that are not included in Phase I.

Section 402 of the CWA mandates that certain types of construction activities comply with the requirements of the NPDES stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than one acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB), implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs).

As of July 1, 2010, all dischargers with projects that include clearing, grading or stockpiling activities expected to disturb one or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ. The General Permit requires all dischargers, where construction activity disturbs one or more acres, to take the following measures:

1. Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to include a site map(s) of existing and proposed building and roadway footprints, drainage patterns and stormwater collection and discharge points, and pre- and post- project topography;
2. Describe types and placement of Best Management Practices (BMPs) in the SWPPP that will be used to protect stormwater quality;
3. Provide a visual and chemical (if non-visible pollutants are expected) monitoring program for implementation upon BMP failure; and

4. Provide a sediment monitoring plan if the area discharges directly to a water body listed on the 303(d) list for sediment.

To obtain coverage, a SWPPP must be submitted to the RWQCB electronically and a copy of the SWPPP must be submitted to Placer County. When project construction is completed, the landowner must file a Notice of Termination (NOT).

State Regulations

The following section includes the State regulations relevant to the CEQA review process pertaining to the hydrology and water quality aspects of the proposed project.

State Water Resources Control Board

The SWRCB and the RWQCBs are responsible for ensuring implementation and compliance with the provisions of the federal CWA and California's Porter-Cologne Water Quality Control Act. The project site is situated within the jurisdictional boundaries of the Central Valley RWQCB (CVRWQCB) (Region 5). The CVRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their jurisdiction.

Central Valley Regional Water Quality Control Board

As authorized by the Porter-Cologne Water Quality Control Act, the CVRWQCB primary function is to protect the quality of the waters within its jurisdiction for all beneficial uses. State law defines beneficial uses of California's waters that may be protected against quality degradation to include, but not be limited to: domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

The CVRWQCB implements water quality protection measures by formulating and adopting water quality control plans (referred to as basin plans, as discussed below) for specific groundwater and surface water basins, and by prescribing and enforcing requirements on all agricultural, domestic, and industrial waste discharges. The CVRWQCB oversees many programs to support and provide benefit to water quality, including the following major programs: Agricultural Regulatory; Above-Ground Tanks; Basin Planning; CALFED; Confined Animal Facilities; Landfills and Mining; Non-Point Source; Spills, Leaks, Investigations, and Cleanups (SLIC); Stormwater; Total Maximum Daily Load (TMDL); Underground Storage Tanks (UST), Wastewater Discharges (including the NPDES); Water Quality Certification; and Watershed Management.

The CVRWQCB is responsible for issuing permits for a number of varying activities. Activities subject to the CVRWQCB permitting requirements include stormwater, wastewater, and industrial water discharge, disturbance of wetlands, and dewatering. Permits issued and/or enforced by the CVRWQCB include, but are not limited to, the NPDES Construction General Permit, NPDES Municipal Stormwater Permits, Industrial Stormwater General Permits, Clean Water Act Section 401 and 404 Permits, and Dewatering Permits.

Basin Plans and Water Quality Objectives

The Porter-Cologne Water Quality Control Act provides for the development and periodic review of water quality control plans (basin plans) that are prepared by the regional water quality control boards. Basin plans designate beneficial uses of California's major rivers and groundwater basins, and establish narrative and numerical water quality objectives for those waters. Beneficial uses

represent the services and qualities of a water body (i.e., the reasons why the water body is considered valuable), while water quality objectives represent the standards necessary to protect and support those beneficial uses. Basin plans are primarily implemented through the NPDES permitting system and by issuing waste discharge regulations to ensure that water quality objectives are met.

Basin plans provide the technical basis for determining waste discharge requirements and taking regulatory enforcement actions if deemed necessary. The proposed project site is located within the jurisdiction of the CVRWQCB. A basin plan has been adopted for the Sacramento and San Joaquin River Basin (Basin Plan), which covers all of the project area.

The Basin Plan sets water quality objectives for the surface waters in its region for the following substances and parameters: ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, radioactivity, salinity, sediment, settleable material, suspended material, taste and odor, temperature, toxicity, turbidity, and pesticides. For groundwater, water quality objectives applicable to all groundwater have been set for bacteria, chemical constituents, radioactivity, taste, odors, and toxicity.

Senate Bill 5

In 2007, the State of California set the 200-year event as the Urban Level of Flood Protection (ULOP) for the State through a series of laws included in Senate Bill (SB) 5. Along with other related legislation, SB 5 established a mandate for local governments to amend their general plans and zoning codes to be consistent with State law on floodplain management. Specifically, SB 5 requires all cities and counties within the Sacramento-San Joaquin Valley, as defined in California Government Code Sections 65007(h) and (j), to make findings related to an ULOP or the national FEMA standard of flood protection before: (1) entering into a development agreement for any property that is located within a flood hazard zone; (2) approving a discretionary permit or other discretionary entitlement, or a ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or (3) approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone. The primary purpose of the law is to ensure that appropriate flood protection is provided in urban and urbanizing areas. Placer County has amended the County's flood management policies to bring the County into compliance with State law and provide for increased flood protection for urban areas, consistent with SB 5.[15]

A project would be subject to the requirements of SB 5 if the project would meet all of the following five criteria:

1. Located within an urban area that is a developed area, as defined by Code of Federal Regulations Title 44, Section 59.1, with 10,000 residents or more, or an urbanizing area that is a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years.
2. Located within a flood hazard zone that is mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) FIRM for the NFIP.
3. Located within the Sacramento-San Joaquin Valley.
4. Located within an area with a potential flood depth above 3.0 feet, from sources of flooding other than localized conditions that may occur anywhere in a community, such as localized

[15] Placer County. *Placer County moves to meet state flood standards for urban areas.* Available at: https://www.placer.ca.gov/news/2015/nov/placer-meets-state-flood-standards. November 5, 2015.

rainfall, water from stormwater and drainage problems, and water from temporary water and wastewater distribution system failure.

5. Located within a watershed with a contributing area of more than 10 square miles.

The proposed project would meet criteria 1-4; however, because the project site is located within the Dry Creek Vineyard Road tributary subwatershed, which is approximately 1.67 square miles, the project does not meet Criterion 5. Thus, the proposed project would not be subject to the requirements of SB 5. It should be noted that with respect to Criterion 4, only within the limits of the on-site tributary would there be flood depths in excess of 3.0 feet.

Local Regulations

Relevant goals and policies from the Placer County General Plan and the DCWPCP, as well as various other local guidelines and regulations related to hydrology and water quality, are discussed below.

Placer County General Plan

The following policies from the Placer County General Plan related to hydrology and water quality are applicable to the proposed project:

Goal 4.E To collect and dispose of stormwater in a manner that least inconveniences the public, reduces potential water-related damage, and enhances the environment.

Policy 4.E.1 The County shall encourage the use of natural stormwater drainage systems to preserve and enhance natural features.

Policy 4.E.2 The County shall support efforts to acquire land or obtain easements for drainage and other public uses of floodplains where it is desirable to maintain drainage channels in a natural state.

Policy 4.E.4 The County shall ensure that new storm drainage systems are designed in conformance with the Placer County Flood Control and Water Conservation District's Stormwater Management Manual and the County Land Development Manual.

Policy 4.E.8 The County shall consider recreational opportunities and aesthetics in the design of stormwater ponds and conveyance facilities.

Policy 4.E.9 The County shall encourage good soil conservation practices in agricultural and urban areas and carefully examine the impact of proposed urban developments with regard to drainage courses.

Policy 4.E.10 The County shall strive to improve the quality of runoff from urban and suburban development through use of appropriate and feasible mitigation measures including, but not limited to, artificial wetlands, grassy swales, infiltration/sedimentation

basins, riparian setbacks, oil/grit separators, and other best management practices (BMPs).

Policy 4.E.11 The County shall require new development to adequately mitigate increases in stormwater peak flows and/or volume. Mitigation measures should take into consideration impacts on adjoining lands in the unincorporated area and on properties in jurisdictions within and immediately adjacent to Placer County.

Policy 4.E.12 The County shall encourage project designs that minimize drainage concentrations and impervious coverage and maintain, to the extent feasible, natural site drainage conditions.

Policy 4.E.13 The County shall require that new development conforms with the applicable programs, policies, recommendations, and plans of the Placer County Flood Control and Water Conservation District.

Policy 4.E.14 The County shall require projects that have significant impacts on the quantity and quality of surface water runoff to allocate land as necessary for the purpose of detaining post-project flows and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.

Policy 4.E.15 The County shall identify and coordinate mitigation measures with responsible agencies for the control of storm sewers, monitoring of discharges, and implementation of measures to control pollutant loads in urban storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Division of Environmental Health, Placer County Department of Public Works, Placer County Flood Control and Water Conservation District).

Goal 4.F To protect the lives and property of the citizens of Placer County from hazards associated with development in floodplains and manage floodplains for their natural resource values.

Policy 4.F.1 The County shall require that arterial roadways and expressways, residences, commercial and industrial uses and emergency facilities be protected, at a minimum, from a 100-year storm event.

Policy 4.F.4 The County shall require evaluation of potential flood hazards prior to approval of development projects. The County shall require proponents of new development to submit accurate topographic and flow characteristics information and depiction of the 100-year floodplain boundaries under fully-developed, unmitigated runoff conditions.

Policy 4.F.5 The County shall attempt to maintain natural conditions within the 100-year floodplain of all rivers and streams except under the following circumstances:

a. Where work is required to manage and maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, California Department of Fish and Game regulations, and Clean Water Act provisions administered by the U.S. Army Corps of Engineers; or
b. When facilities for the treatment of urban runoff can be located in the floodplain, provided that there is no destruction of riparian vegetation.

Goal 6.A To protect and enhance the natural qualities of Placer County's streams, creeks and groundwater.

Policy 6.A.2 The County shall require all development in the 100-year floodplain to comply with the provisions of the *Placer County Flood Damage Prevention Ordinance*.

Policy 6.A.4 Where creek protection is required or proposed, the County should require public and private development to:

a. Preserve creek corridors and creek setback areas through easements or dedication. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a creek is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval;
b. Designate such easement or dedication acres (as described in a. above) as open space;
c. Protect creek corridors and their habitat value by actions such as: 1) providing an adequate creek setback, 2) maintaining creek corridors in an essentially natural state, 3) employing creek restoration techniques where restoration is needed to achieve a natural creek corridor, 4) utilizing riparian vegetation within creek corridors, and where possible, within creek setback areas, 5) prohibiting the planting of invasive, non-native plants (such as Vinca major and eucalyptus) within creek corridors or creek setbacks, and 6) avoiding tree removal within creek corridors;
d. Provide recreation and public access near creeks consistent with other General Plan policies;

e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas; and/or are stabilized with permanent vegetation that will prevent the transport of sediment off site; and 2) temporary vegetation sufficient to stabilize disturbed areas.
f. Provide for long-term creek corridor maintenance by providing a guaranteed financial commitment to the County which accounts for all anticipated activities.

Policy 6.A.5 The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and urban runoff and to encourage the use of BMPs for agricultural activities.

Policy 6.A.7 The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

Goal 8.B To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards.

Dry Creek-West Placer Community Plan

The following goals and policies from the Community Development and Environmental Resources Management Elements of the DCWPCP related to hydrology and water quality are applicable to the proposed project:

Community Development Element: Land Use

Policy 25 Continue to implement zoning policies which minimize potential loss of property and threat to human life caused by flooding and prohibit the creation of new building sites within the floodplain.

Policy 29 Review proposed developments for their potential adverse affect on air and water quality.

Policy 30 Encourage application of measures to mitigate erosion and water pollution from earth disturbing activities such as grading and road construction.

Community Development Element: Public Services

Goal — Flood Control: Protect the lives and property of the citizens of the Dry Creek West Placer area from unacceptable impacts from development in the Dry Creek drainage basin or other watershed in the Plan Area.

Policy 2 — Evaluate potential flood hazards in an area prior to approval of any future development by requiring submittal of accurate topographic information and depiction of the 100-year floodplain boundaries.

Policy 4 — Maintain natural conditions within the 100-year floodplain of all streams except where work is required to maintain the stream's drainage characteristics and where such work is done in accordance with the Placer County Flood Damage Prevention Ordinance, Department of Fish and Game regulations and Clean Water Act provisions administered by the U.S. Army Corps of Engineers, or when facilities for the treatment of urban runoff can be located in the floodplain providing that there is no destruction of riparian vegetation.

Policy 5 — Designate the 100-year floodplain of Dry Creek, including the major tributaries as open space, and provide for some compatible use of these areas in order to encourage their preservation.

Policy 9 — Provide storm drains which can collect water for appropriate conveyance to Dry Creek for developing areas with a higher density than Rural-Residential.

Policy 11 — Require a water quality analysis for all projects which have a density in excess of one unit per acre and/or have the potential of contaminating surface waters or the aquifer.

Policy 12 — Require a feasibility analysis of improving the water quality of urban run-off for all commercial and industrial projects and those residential projects with densities of 1 d.u./acre or greater before run-off enters the Dry Creek watercourse. Said analysis shall consider all feasible mitigation measures including, but not limited to, artificial wetlands, infiltration/sedimentation basins, riparian setbacks, oil/grit separators, or other effective means, where appropriate.

Policy 13 — Require the allocation of land, when necessary, for all projects which have significant impacts on the quantity and quality of surface water runoff, for the purpose of detaining post project flows and/or for the incorporation of mitigation measures for water quality impacts related to urban runoff.

Policy 14 — Identify and coordinate mitigation measures with responsible agencies for the control of storm sewers, monitoring of discharges and implementation of measures to control pollutant loads in urban

storm water runoff (e.g., California Regional Water Quality Control Board, Placer County Division of Environmental Health, Placer County Department of Public Works, etc.).

Environmental Resources Management: Natural Resources

Goal 3 Manage the groundwater resource in such a way as to protect it from degradation and to maintain the water table.

Goal 4 Safeguard and maintain natural waterways to ensure water quality, species diversity, and unique habitat preservation.

- Policy 2 Preserve in their natural condition all stream environment zones, including floodplains, and riparian vegetation areas.
- Policy 3 Seek to maintain or improve the quality of water in the major creeks, especially Dry Creek and its tributaries.
- Policy 4 Make every attempt to maintain the existing high quality of the groundwater and preserve aquifer recharge areas.
- Policy 10 Improve water quality in the aquifer and the Dry Creek watershed by eliminating existing water pollution sources and by discouraging activities which include the use of hazardous materials around wetland and recharge areas.
- Policy 25 Intermittent streams often become permanent streams concurrent with the development of an area. Therefore, these waterways shall be protected from land development activities which have a potential for detrimental impacts (e.g., grading, channelization, etc.).

NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit

The NPDES Municipal Stormwater Permitting Program regulates stormwater discharges from separate storm sewer systems. NPDES Municipal Stormwater Permits are issued in two phases. Phase I regulates stormwater discharges from large- and medium-sized municipal separate storm sewer systems (those serving more than 100,000 persons). Most Phase I permits are issued to a group of co-permittees encompassing an entire metropolitan area. Phase II provides coverage for smaller municipalities, including nontraditional small storm sewer systems, which include governmental facilities such as military bases, public campuses, and prison and hospital complexes. The NPDES Municipal Stormwater Permits require the discharger to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable.

The CVRWQCB issued the NPDES General Permit No. CAS000004 Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, which became effective on July 1, 2013. An “MS4” is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying stormwater;

(ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW). Both Placer County and the City of Roseville are Phase II MS4 permittees. Projects subject to the requirements of the Phase II MS4 NPDES permit must submit the appropriate Post-Construction Stormwater Plan based on the project type/development category. Regulated Projects include projects that create or replace 5,000 sf or more of impervious surface. Regulated Projects that create and/or replace one or more acres of impervious surface are considered regulated hydromodification management projects. The proposed project would create more than one acre of impervious area, and, thus, is considered a Regulated Hydromodification Management Project subject to Phase II MS4 NPDES permit post-construction stormwater treatment requirements.

Regulated Projects are required to divide the project area into Drainage Management Areas (DMAs) and implement and direct water to appropriately-sized Site Design Measures (SDMs) and Baseline Hydromodification Measures to each DMA to the Maximum Extent Practicable (MEP). Regulated Projects must additionally include Source Control Best Management Practices (BMPs) where possible. SDMs and Baseline Hydromodification Measures include, but are not limited to:

- Rooftop and impervious area disconnection;
- Porous pavement;
- Rain barrels and cisterns;
- Vegetated swales;
- Bio-retention facilities;
- Green roofs; or
- Other equivalent measures.

A detailed description of the requirements for Regulated Hydromodification Management Projects, such as the proposed project, is included in the *West Placer Storm Water Quality Design Manual.*[16]

Placer County Flood Control and Water Conservation District

Formed by SB 1312, the Placer County Flood Control and Water Conservation District (PCFCWCD) is responsible for regional strategies for flood control management. A Stormwater Management Manual (SWMM) was developed by the PCFCWCD to relate the policies, guidelines, and specific criteria for evaluating hydrologic conditions associated with new development projects. In 2011, the PCFCWCD published the *Update to the Dry Creek Watershed Flood Control Plan*, which identifies potential flooding issues associated with the Dry Creek Watershed and provides recommendations for feasible means to reduce future flood damages.[17]

Placer County Land Development Manual

Section 5 of the Placer County Land Development Manual (1996) provides supplemental design considerations for drainage facilities, and includes specific criteria used for preparation of drainage reports identical to those in the SWMM (as described above under Placer County Flood Control and Water Conservation District). The Land Development Manual states that in case of conflict with the SWMM, the most stringent requirement shall apply. The Land Development

[16] Placer County, City of Roseville, City of Lincoln, City of Auburn, Town of Loomis. *West Placer Storm Water Quality Design Manual.* April 2016.

[17] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan.* November 2011.

Manual also contains general information with regard to erosion control and BMPs for stormwater drainage.

Placer County Code

Chapter 15, Building and Development, of the Placer County Code includes ordinances associated with hydrology and water quality. The applicable ordinances are discussed in further detail below.

Stormwater Quality Ordinance

Article 8.28, Stormwater Quality Ordinance, is intended to ensure that Placer County is compliant with State and federal laws related to stormwater quality by enhancing and protecting the quality of waters of the State in Placer County through reducing pollutants in stormwater discharges to the maximum extent practicable and controlling non-stormwater discharges to the storm drain system. The Stormwater Quality Ordinance requires the use of BMPs to reduce adverse effects of polluted runoff discharges on waters of the State, and prohibits illicit discharges to the storm drain system. The Stormwater Quality Ordinance establishes the County's authority to adopt requirements for stormwater management, including source control requirements, to reduce pollution to the maximum extent practicable; requirements for development projects to reduce stormwater pollution and erosion both during construction and after the project is complete; and enable the County to implement and enforce any stormwater management plan adopted by the County.

Grading, Erosion and Sediment Control Ordinance

Article 15.48, Grading, Erosion and Sediment Control Ordinance, of the Placer County Code regulates grading on property within the unincorporated area of Placer County in order to safeguard life, limb, health, property and public welfare; to avoid pollution of watercourses with hazardous materials, nutrients, sediments, or other earthen materials generated on or caused by surface runoff on or across the permit area; and to ensure that the intended use of a graded site is consistent with the Placer County General Plan, any specific plans adopted thereto and applicable Placer County ordinances including the Zoning Ordinance, Flood Damage Prevention Ordinance (Article 15.52 of the Placer County Code), Environmental Review Ordinance (Chapter 18 of the Placer County Code), and applicable chapters of the California Building Code. In the event of conflict between applicable chapters and Article 15.48, the most restrictive shall prevail. Part 6 of Article 15.48 sets forth design standards for grading activities such as excavation, slopes, fill soil, setbacks, and drainage.

Dry Creek Watershed Drainage Improvement Zone Ordinance

The Dry Creek Watershed Drainage Improvement Zone Ordinance (Article 15.32 of the Placer County Code) establishes a drainage improvement zone for the Dry Creek watershed. In addition, the Ordinance requires the payment of specified fees and annual assessments as a condition of new development within the watershed area; such fees and assessments are used for the installation and maintenance of roadway drainage and stormwater drainage improvements. Mitigation fees are required for new development, and the expansion of existing development, within portions of the Dry Creek watershed that impose a burden on the creeks and drainage infrastructure within the watershed by adding additional impervious surface and accelerating runoff, thereby increasing discharge rates.

Flood Damage Prevention Ordinance

Article 15.52, Flood Damage Prevention Ordinance, is intended to minimize public and private losses due to flood conditions in specific areas by provisions designed to protect human life and health; minimize the need for rescue and relief efforts associated with flooding; 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; provide for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas; ensure that potential buyers are notified that property is in an area of special flood hazard; and ensure that those who occupy areas of special flood hazard assume responsibility for their actions. The Flood Damage Prevention Ordinance provides methods for reducing flood losses, and sets forth standards for construction in all areas of special flood hazards.

10.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology used to analyze and determine the proposed project's potential impacts related to hydrology and water quality. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines, a significant impact would occur if the proposed project would result in any of the following:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - Result in substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff either during construction or in the post-construction condition; or
    - Impede or redirect flood flows;
- Place housing or improvements within a 100-year flood hazard area either as mapped on a federal Flood Hazard boundary or Flood Insurance Rate Map or other flood hazard delineation map which would:
    - Impede or redirect flood flows;
    - Expose people or structures to risk of loss, injury or death involving flooding; or
    - risk release of pollutants due to project inundation; and/or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The proposed project's impacts associated with erosion or siltation on- or off-site are discussed in Chapter 8, Geology and Soils, of this EIR.

Method of Analysis

The impacts analysis for this chapter is based primarily on the Preliminary Drainage Study & Stormwater Quality Plan prepared for the proposed project by RFE. The Drainage Report included hydrologic modeling for the proposed project (both pre-project and post-project conditions) using the HEC computer program. In particular, RFE used a combination of the HEC Hydrologic Modeling System (HEC-HMS) and HEC River Analysis System (HEC-RAS) software. The HEC-HMS was used to calculate peak flows for individual drainage sheds for the pre-construction and post-construction conditions. The 10-, 25-, 50-, 100- and 500-year frequency storm events were analyzed.

Using the peak flows from each shed calculated through the HEC-HMS software, RFE created a HEC-RAS model of the Dry Creek Vineyard Road tributary and added the HEC-HMS hydrographs to the HEC-RAS model as lateral inflows. The HEC-RAS model relied on light detection and ranging (LiDAR) remote sensing topographical data provided to RFE by the County to model cross-cut sections of the Dry Creek Vineyard Road tributary. The LiDAR data allowed RFE to model cross sections of the Dry Creek Vineyard Road tributary every 100 feet from the beginning of the open channel, east of Brady Lane, to the tributary's confluence with Dry Creek. Downstream conditions at the tributary's confluence with Dry Creek were modeled under two conditions. Under the first condition, the downstream boundary condition was set to a normal depth based on a flat 0.001 slope to represent the existing conditions. Based on comments from the County, RFE modeled a second scenario, which created duplicate unsteady flow data with downstream boundary conditions set to a constant-elevation stage hydrograph, where the elevation was set to 114-feet to represent the Dry Creek Base Flood Elevation (BFE) at the confluence of the tributary and Dry Creek. The BFE Scenario was modeled according to a pending FEMA Flood Insurance Study and revised floodplain mapping. The BFE Scenario provides a conservative analysis by assuming that Dry Creek has reached BFE prior to peak flow inputs from the project.

In addition to the two scenarios related to downstream boundary conditions, RFE analyzed potential impacts under two improvement scenarios for the widening of Vineyard Road. Scenario 1 included the placement of approximately 500 cubic yards (CY) of fill added to the west property line shared with APN 473-020-001 – representing the proposed Vineyard Road widening. Scenario 2 included placement of approximately 700 CY fill added including through the neighboring parcel (APN 473-020-001), and to the west property line of the not a part of this subdivision (NAPOTS) portion of the project parcel, which is shared with APN 474-070-015 – representing Vineyard Road's ultimate widening condition. Only one cross section – tributary station 7492.13 – in the HEC-RAS model changed as a result of the two foregoing fill conditions. Results of the HEC-RAS modeling for the two fill conditions were compared to modeling results representing 100-year flow conditions, post-construction without fill, under the Dry Creek BFE boundary condition.

Furthermore, RFE performed a floodplain analysis by comparing the outputs of the HEC-RAS model with the floodplain limits from the pending FEMA Flood Insurance Study. To prepare the Flood Model Exhibits in Appendix B of the Preliminary Drainage Study & Stormwater Quality Plan, RFE combined the outputs of the more precise HEC-RAS model with the floodplain limits from the pending FEMA Flood Insurance Study to create a worst-case map of floodplains. However, as noted in the addendum to the Preliminary Drainage Study prepared by RFE on October 25,

2019, upon reevaluation of the methods implemented in preparation of the figures included in Appendix B of the Preliminary Drainage Study, RFE concluded that including only WSEs from their HEC-RAS model would provide a more accurate depiction of the potential flood plains. Consequently, the analysis within this chapter, and the figures presented herein, rely on outputs solely from the HEC-RAS model. Thus, for the project-level analysis presented in this Chapter, the floodplain elevation figures presented in this Chapter originate from the addendum to the Preliminary Drainage Study.

RFE assumed that development of the project site would include development of each residential lot with an overlay of approximately 65 percent impervious surfaces, in addition to the impervious roads. Although RFE included this assumption in their model, the actual impervious surface coverage of each lot may be less, depending on whether the proposed residences are one- or two-stories, include more than the typical amount of concrete patios, etc.

It should be noted that in addition to the 119 single-family residential units included in the proposed project, the Project Description chapter of this EIR recognizes the potential for up to 12 additional on-site residential units (Accessory Dwelling Units) to be included in the project in order to meet the County's affordable housing requirements. However, the total number of proposed residential lots, as well as the overall disturbance area associated with the project, would remain unchanged and the overall amount of impervious surfaces would not be anticipated to be substantially different than what was analyzed by RFE. Therefore, the potential inclusion of additional Accessory Dwelling Units on-site would not result in new impacts or substantially more severe impacts beyond the analysis presented herein.

The County has reviewed the technical analysis prepared for the proposed project and preliminarily concurs with the methodology applied by RFE, as well as the conclusions provided therein.

Cumulative Analysis

To analyze potential impacts related to implementation of the proposed project in the cumulative scenario, RFE prepared a supplemental report that estimated future conditions in the Dry Creek Vineyard Road tributary drainage shed. Future conditions in the drainage shed were estimated by adjusting the HEC-RAS modeling used for the project-level analysis to reflect potential future development in the surrounding area. Potential future development of the area was based on average development densities derived from existing zoning for parcels within the drainage shed, after accounting for the amount of existing development in each drainage shed. Based on the average development densities, model parameters, such as the percent of impervious surfaces in each drainage shed, were updated. The existing zoning designations for areas within the drainage shed provide the most accurate estimation of future development within the drainage shed area. The specific assumptions used by RFE are presented in the supplemental report included as part of Appendix I to this EIR.

For the cumulative analysis RFE used the Dry Creek BFE as a constant downstream boundary condition. As discussed above, the use of the Dry Creek BFE as a constant downstream boundary condition represents a worst-case scenario, and the water surface elevations (WSE) results should represent a conservative scenario when compared to actual realistic conditions under a 100-year storm event. Because use of the Dry Creek BFE was assumed to represent a conservative, but realistic, downstream condition, RFE only modeled downstream cumulative

conditions under the single BFE scenario (unlike the project-level analysis, which evaluated both a BFE scenario and a normal depth condition).

Project Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the proposed project in comparison with the standards of significance identified above.

10-1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during construction. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

Construction of the proposed project would include grading, excavation, trenching for utilities, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. In addition, soil would be disturbed during construction of the proposed widening of Vineyard Road and Brady Lane, as well as during construction of the proposed sewer line in Vineyard Road to Foothills Boulevard. All such activities have the potential to affect water quality and contribute to localized violations of water quality standards if impacted stormwater runoff from construction activities enters the Dry Creek Vineyard Road tributary, which eventually drains to Dry Creek.

Soils exposed by the aforementioned types of construction activities have the potential to affect water quality in two ways: 1) suspended soil particles and sediments transported through runoff; or 2) sediments transported as dust that eventually reach local water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites also have the potential to enter runoff. Typical pollutants include, but are not limited to, petroleum and heavy metals from equipment and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment or contaminants should enter receiving waters in sufficient quantities. Discharge of polluted stormwater or non-stormwater runoff could violate waste discharge requirements. However, in general, impacts from construction-related activities would generally be short-term and of limited duration.

Because the proposed project would require construction activities that would result in a land disturbance of approximately 30 acres (greater than one acre), the project applicant would be required by the State to comply with the most current Construction General Permit requirements. Per the requirements, a SWPPP would be prepared for the overall project, which would include the site map, drainage patterns and stormwater collection and discharge points, BMPs, and a monitoring and reporting framework for implementation of BMPs, as necessary. In addition, a Notice of Intent (NOI) would be filed with RWQCB.

As discussed in further depth in Chapter 8, Geology and Soils, of this EIR, the proposed project would be subject to State guidelines, Articles 8.28 and 15.48 of the Placer County Code, and Policy 6.A.5 of the Placer County General Plan, which require project implementation of BMPs designed to control erosion and other non-stormwater

management and materials management BMPs. Implementation of BMPs to control erosion, and thus sediment related pollution, is further mandated by Mitigation Measures 8-2(a) through 8-2(d) within Chapter 8 of this EIR.

Non-stormwater management and material management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The Construction General Permit prohibits the discharge of materials other than stormwater and authorized non-stormwater discharges (such as irrigation and pipe flushing and testing). Non-stormwater BMPs tend to be management practices with the purpose of preventing stormwater from coming into contact with potential pollutants. Examples of non-stormwater BMPs include preventing illicit discharges, and implementing good practices for vehicle and equipment maintenance, cleaning, and fueling operations, such as using drip pans under vehicles. Waste and materials management BMPs include implementing practices and procedures to prevent pollution from materials used on construction sites. Examples of materials management BMPs include the following:

- Good housekeeping activities such as storing of materials covered and elevated off the ground, in a central location;
- Securely locating portable toilets away from the storm drainage system and performing routine maintenance;
- Providing a central location for concrete washout and performing routine maintenance;
- Providing several dumpsters and trash cans throughout the construction site for litter/floatable management; and
- Covering and/or containing stockpiled materials and overall good housekeeping on the site.

While the final materials management BMPs to be used during construction of the proposed project are currently unknown, the project would likely include a combination of the BMP examples listed above. Final BMPs for the proposed project construction would be chosen in consultation with the applicable California Stormwater Quality Association Stormwater BMP Handbooks and implemented by the project contractor.

In accordance with the Construction General Permit, the project site would also be inspected during construction before and after storm events and every 24 hours during extended storm events in order to identify maintenance requirements for the implemented BMPs and to determine the effectiveness of the implemented BMPs. As a “living document”, the site-specific SWPPP that would be prepared for the proposed project would be modified as construction activities progress. A Qualified SWPPP Practitioner (QSP) would ensure compliance with the SWPPP through regular monitoring and visual inspections during construction activities. The QSP for the project would amend the SWPPP and revise project BMPs, as determined necessary through field inspections, to protect against substantial erosion or siltation on- or off-site.

Compliance with the State NPDES Construction General Permit and Article 8.28 and 15.48 of the Placer County Code, as described above and required by Mitigation Measures 8-2(a) through 8-2(d) within this EIR, would minimize the potential degradation of stormwater quality and downstream surface water associated with construction of the proposed project. In addition, BMPs would be required to be designed in accordance with

the California Stormwater Quality Association Stormwater Best Management Practice Handbooks for Construction and for New Development/Redevelopment (or other similar source as approved by the Engineering and Surveying Division). Therefore, with implementation of the following mitigation measures, the proposed project would avoid a ***significant*** impact related to short-term construction-related water quality.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-1 Implement Mitigation Measures 8-2(a) through 8-2(d).

10-2 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during operations. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

Development of the proposed project would result in the conversion of a rural area to single-family residential uses and associated amenities, such as parks and landscaping. Such new land uses could result in new stormwater pollutants being introduced to the project area. Pollutants associated with the operational phase of the proposed project could include nutrients, oil and grease, metals, organics, pesticides, bacteria, sediment, trash, and other debris. Nutrients that could be present in post-construction stormwater include nitrogen and phosphorous resulting from fertilizers applied to landscaping. Excess nutrients could affect water quality by promoting excessive and/or a rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Pesticides, which are toxic to aquatic organisms and can bioaccumulate in larger species, such as birds and fish, can potentially enter stormwater after application to landscaped areas within the project site. Oil and grease could enter stormwater from vehicle leaks, traffic, and maintenance activities. Metals could enter stormwater as surfaces corrode, decay, or leach. Clippings associated with landscape maintenance and street litter could be carried into storm drainage systems. Pathogens (from pets, wildlife, and human activities) have the potential to affect downstream water quality.

Development of the proposed project could also increase polluted non-stormwater runoff (e.g., car wash water, other wash water, and landscape irrigation runoff). Such non-stormwater runoff could flow down sidewalks, parking areas, and streets, and pick up additional pollutants deposited on impervious surfaces prior to discharge into the storm drain system and surface waters. Discharge of polluted stormwater or non-stormwater runoff could violate waste discharge requirements.

Phase II MS4 Permit Requirements

As discussed previously, the proposed project is located within the permit area covered by Placer County's MS4 Permit (NPDES General Permit No. CAS000004, Order No. 2013-0001-DWQ), pursuant to the NPDES Phase II program. Project-related stormwater discharges are subject to all applicable requirements of said permit. Specifically, as noted above, regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately-sized SDMs and Baseline Hydromodification Measures

to each DMA. Source control measures must be designed for pollutant-generating activities or sources consistent with recommendations from the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on the Improvement Plans. Additional details related to hydromodification management requirements associated with the Phase II MS4 permit are discussed under Impact 10-4 below.

Proposed Storm Drain System

Per the Preliminary Drainage Study & Stormwater Quality Plan prepared for the proposed project, the proposed project would include an on-site storm drain system composed of the following Low Impact Development (LID) components: downspout disconnection and bio-retention planters. Consistent with MS4 permit requirements and the *West Placer Storm Water Quality Design Manual*, the proposed project site would be divided into 20 DMAs. The 20 DMAs include the on-site portion of the Dry Creek Vineyard Road tributary and all areas of the site east of the Dry Creek Vineyard Road tributary. However, because the portion of the project site to the west of the Dry Creek Vineyard Road tributary would not be disturbed as part of the project, the area to the west of the Dry Creek Vineyard Road tributary was not divided into any additional DMAs.

Impervious surfaces proposed as part of the project include building roofs, driveways, and roadways. RFE assumed that each residential lot would be graded to allow drainage to flow to the front of the lot without the use of subdrains. Due to the anticipated grading of each lot, downspouts from the proposed residences can be disconnected from the underground drainage system, which would allow stormwater falling on proposed structures to flow overland through the lots before reaching bio-retention planters, street curbs, or gutters. Overland flow of stormwater across the lots would allow infiltration of stormwater into the ground within the lots, and the remaining stormwater will be directed into bio-retention planters located adjacent to the proposed internal roadways, as shown in Figure 10-3.

SWQPs prepared for proposed projects should specify source control measures to be implemented for each potential pollutant-generating activity or source present on the proposed project site. The source control measures may include, but are not limited to, measures related to proper storage of all project materials, use of environmentally-friendly materials for indoor and structural pest control, and compliance with manufacturer recommendations and regulations related to pesticide use. The source control measures should be designed consistent with the recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or from another equivalent manual. The source control measures included in the proposed project are discussed below.

RFE calculated that approximately 65 percent of each lot would consist of impervious surfaces with the remaining 35 percent consisting of pervious surfaces, such as landscaping and turf. The *West Placer Storm Water Quality Design Manual* allows for the provision of impervious to pervious surfaces on a project site at a ratio of 2:1 as a site design measure. Thus, the disconnection of downspouts within residential lots and the provision of 35 percent of each lot in pervious surfaces meets the impervious to pervious ratio and is considered a site design measure.

Additionally, stormwater falling on proposed roadways would be directed to bio-retention planters. Bio-retention planters on-site would be composed of a mulch layer above approximately 18 inches of sandy loam material with a minimum infiltration rate of five inches per hour, with six inches of permeable material underlying the sandy loam material. A perforated underdrain, clean out, and planter overflow structure would be built into each bio-retention planter. The underdrain and planter overflow would connect to proposed underground stormwater drainage infrastructure, which would be composed of 12, 15, and 24-inch storm drain pipes within proposed internal roadways. The proposed storm drain pipes would outfall into the Dry Creek Vineyard Road tributary. As shown in Figure 10-3, most of the bio-retention planters would be located at intersections of the proposed internal street network. Stormwater that overflows the bio-retention planters or flows through the bio-retention planters would enter the proposed on-site underground storm drainage system.

The proposed bio-retention planters would be sized to treat the first flush, which includes a majority of the larger pollutants (sand, soil, silt, grease and trash) as well as smaller pollutants (sediment, nutrient, metals, pesticides and organics). Thus, project runoff entering the Dry Creek Vineyard Road tributary would be properly treated, and would not pollute downstream waterways.

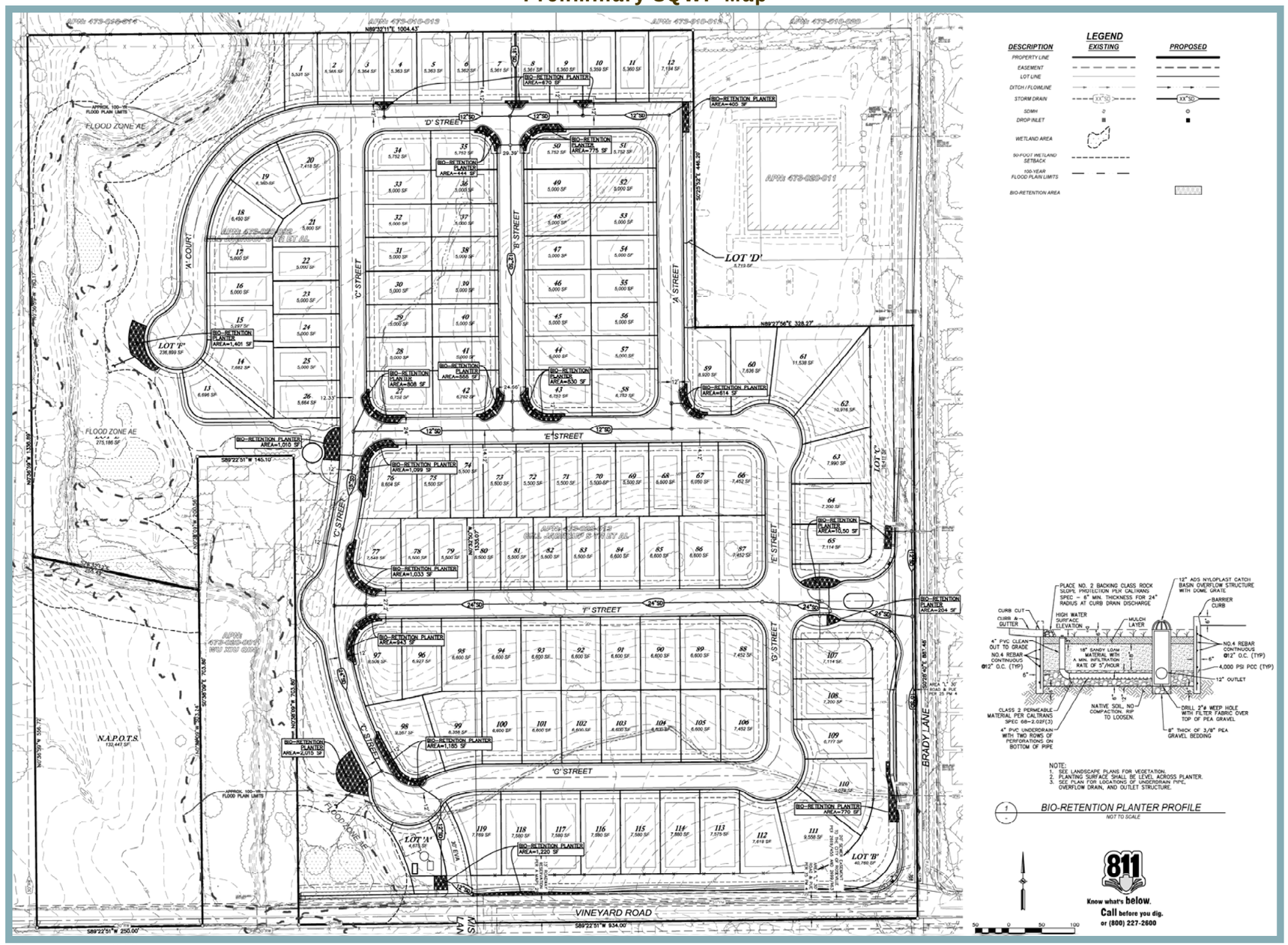
Maintenance and Inspection

In order to ensure continued operation of the proposed bio-retention planters, the SWQP must include detailed, site-specific inspection and maintenance procedures to be implemented by the project applicant. For example, plants and vegetation within the bio-retention planters should be inspected monthly, and the basins should be inspected for the presence of standing water 72 hours after rain events. Required maintenance activity should include, but not necessarily be limited to, removal of debris from bio-retention planters and removal of debris from outlets of bio-retention planters. Without implementation of such measures, the bio-retention planters could fail to ensure that polluted runoff would not enter downstream water bodies during the continued operation of the project.

Conclusion

Based on the above, the proposed project includes site design measures to ensure that stormwater runoff is properly treated prior to discharge to the Dry Creek Vineyard Road tributary. Thus, urban pollutants entering and potentially degrading local water quality would not be expected to occur as a result of the project. However, because a final SWQP has not been prepared, ongoing maintenance of the proposed bio-retention planters and the incorporation of proper source control measures cannot be ensured. Should the project applicant fail to prepare and implement such documentation, the proposed project could result in a ***significant*** impact related to a violation of water quality standards or waste discharge requirements or otherwise substantial degradation of surface or ground water quality during operations.

Figure 10-3
Preliminary SQWP Map



Source: RFE, 2019.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-2(a) *Implement Mitigation Measure 8-2(a), 8-2(c), and 8-2(d).*

10-2(b) *The Improvement Plans shall include the message details, placement, and locations showing that all storm drain inlets and bio-retention planters within the project area shall be permanently marked/embossed with prohibitive language such as "No Dumping! Flows to Creek." or other language and/or graphical icons to discourage illegal dumping as approved by the Engineering and Surveying Division (ESD). ESD-approved signs and prohibitive language and/or graphical icons, which prohibit illegal dumping, shall be posted at public access points along channels and creeks within the project area. The Property Owners' association is responsible for maintaining the legibility of stamped messages and signs.*

10-2(c) *This project is located within the permit area covered by Placer County's Small Municipal Separate Storm Sewer System (MS4) Permit (State Water Resources Control Board National Pollutant Discharge Elimination System (NPDES)). Project-related storm water discharges are subject to all applicable requirements of said permit.*

The project shall implement permanent and operational source control measures as applicable. Source control measures shall be designed for pollutant generating activities or sources consistent with recommendations from the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and shall be shown on the Improvement Plans.

The project is also required to implement Low Impact Development (LID) standards designed to reduce runoff, treat storm water, and provide baseline hydromodification management as outlined in the West Placer Storm Water Quality Design Manual.

10-2(d) *Per the State of California NPDES Phase II MS4 Permit, this project is a Regulated Project that creates and/or replaces 5,000 square feet or more of impervious surface. A final Stormwater Quality Plan (SWQP) shall be submitted, either within the final Drainage Report or as a separate document that identifies how this project will meet the Phase II MS4 permit obligations. Site design measures, source control measures, and Low Impact Development (LID) standards, as necessary, shall be incorporated into the design and shown on the Improvement Plans. In addition, per the Phase II MS4 permit, projects creating and/or replacing one acre or more of impervious surface are also required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained to equal or below pre-project flow rates for the 2 year, 24-hour storm event, generally by way of infiltration, rooftop and impervious area disconnection,*

bio-retention, and other LID measures that result in post-project flows that mimic pre-project conditions.

10-3 Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin or conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Based on the analysis below, the impact is *less than significant*.

The proposed project would result in an increase in on-site impervious surfaces, which would reduce the infiltration of groundwater as compared to existing conditions. Groundwater relies on annual rainfall and percolation through pervious soils to recharge the system. As discussed in the Geology and Soils Chapter of this EIR, the predominant soils within the project site are of the Ramona and Cometa series. The Ramona series is characterized as a Group C hydrologic soil, with slow infiltration rates and soil layers that may impede the downward movement of water. The Cometa series is characterized as Group D, which exhibits very slow infiltration rates. Because the majority of the site is characterized by soils in Group C or D, the project site would not be considered an important groundwater recharge area protected by Policy 6.A.10b of the Placer County General Plan. Furthermore, the proposed project would not include any development within the channel of the Dry Creek Vineyard Road tributary; thus, infiltration of water moving through the tributary would continue to occur and contribute to groundwater recharge.

Given the limited recharge potential of the portion of the project site that would be developed with impervious surfaces, the proposed project would not interfere substantially with groundwater recharge. Furthermore, the groundwater subbasin within which the project site is located is not currently in a state of overdraft. As further discussed in Chapter 15, Utilities and Service Systems, of this EIR, the water supply for the proposed project would not be derived from groundwater sources. Considering that the project site is not considered an important groundwater recharge area, stormwater from the project site would continue to replenish groundwater through percolation into soils within the Dry Creek Vineyard Road tributary, and that the project would not involve increased demand on groundwater supplies within an area in a state of overdraft, the proposed project would not create a conflict with, or impede the implementation of, a sustainable groundwater plan. Thus, impacts related to groundwater would be ***less than significant***.

Mitigation Measure(s)

None required.

10-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff either during construction or in the post-construction condition. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

The only impervious surfaces that currently exist within the project site are those related to Brady Lane and Vineyard Road. Implementation of the proposed project would result in an increased amount of impervious surfaces related to roofs, driveways, and roadways, including improvements to Brady Lane and Vineyard Road. As such, the project has the potential to substantially alter the existing drainage pattern of the site and increase runoff water.

It should be noted that the potential for the proposed project to result in substantial additional sources of polluted runoff, including erosion, is addressed under Impacts 10-1 and 10-2 above. Further discussion regarding erosion is provided in Chapter 8, Geology and Soils, of this EIR.

Peak Flows and Volumes

Increases to peak runoff flows or volumes resulting from alterations to the existing drainage pattern of the site have the potential to result in exceedance of existing or planned stormwater drainage systems or flooding on- or off-site.

The design of the project divides the site into 20 DMAs where development would occur. Within the DMAs that encompass areas of the site proposed for residential development, site grading would direct stormwater runoff overland to the curb and gutter linings proposed for all on-site streets. The proposed curbs and gutters would convey runoff to the bio-retention planters shown in Figure 10-3.

Runoff from Vineyard Road would be collected along a proposed dike and conveyed and directed to a bio-retention planter near Lot A. Currently, a portion of the runoff from Brady Lane is collected by an existing curb and gutter system and flows into an underground pipe system that discharges onto the project site. The proposed project would include extension of the curb and gutter system along Brady Lane to the intersection of Brady Lane and Vineyard Road. Runoff from the east side of Brady Lane would continue to be captured in the existing underground drain system, which would be routed to connect to the proposed underground storm drain system within the project site. Runoff from the westside of Brady Lane would be collected in proposed bio-retention planters near the project entrances on Brady Lane.

Runoff from the entire project site and portions of Vineyard Road and Brady Lane that percolates through the bio-retention planters, or that enters the proposed overflows during

larger storm events, would be directed into the underground storm drain system and conveyed to the discharge point at the southwest corner of the proposed subdivision. The inclusion of overflows in the bio-retention planters would ensure that the proposed changes in site drainage patterns would not result in on-site flooding. The discharge point would direct all stormwater into the Dry Creek Vineyard Road tributary.

To assess the changes in runoff volumes from the project site that could occur due to the proposed project, RFE calculated the pre- and post-construction peak flow volumes for on-site drainage sheds. Pre- and post-construction peak flows are presented in Table 10-3 below.

Table 10-3
Peak Flow Characteristics: Pre- and Post-Construction Peak Flows (cubic feet per second)

Drainage Shed	10-Year Peak Flow	25-Year Peak Flow	50-Year Peak Flow	100-Year Peak Flow	500-Year Peak Flow
Pre-Construction					
DC25F-onsite	2.1	2.8	3.5	4.0	5.9
DC25L-onsite	7.2	10.3	12.9	14.8	22.5
DC25N-onsite	0.8	1.1	1.4	1.8	2.6
Post-Construction					
DC25F-onsite	4.6	6.2	7.6	9.0	12.6
DC25L-onsite	28.6	37.8	44.8	51.8	72.4
DC25N-onsite	3.1	4.2	5.1	5.9	8.4

Source: RFE, 2019.

As shown in Table 10-3, implementation of the proposed project would result in increased peak flows from all on-site drainage sheds under the 10-, 25-, 50-, 100-, and 500-year frequency storm events.

Per the County's Phase II MS4 permit, hydromodification management projects, such as the proposed project, are typically required to demonstrate hydromodification management of stormwater such that post-project runoff is maintained equal to or below pre-project flow rates for the 2-year, 24-hour storm event, generally by way of infiltration, rooftop and impervious area disconnection, bio-retention, or other LID measures that result in post-project flows that mimic pre-project conditions. However, the Dry Creek Watershed Flood Control Plan notes that the use of local detention basins to limit peak runoff has the potential to result in higher overall peak flows within Dry Creek, which could result in off-site flooding.[18] Specifically, detaining flows in the lower portion of the Dry Creek Watershed, within which the project site is located, could delay the time when the peak flow in lower portions of the Dry Creek Watershed occurs such that the peak flow would coincide with the arrival of peak flows from the upper portion of the watershed. Based on calculations completed by RFE, in the absence of detention basins, peak flow from the proposed on-site development would not coincide with peak flows from the upstream Dry Creek Vineyard Road tributary as a whole. Therefore, while inclusion of on-site detention could reduce increased peak flows from the project site, on-site detention

[18] Placer County Flood Control and Water Conservation District. *Update to the Dry Creek Watershed Flood Control Plan* [pg. 66]. November 2011.

would have the potential to increase flooding hazards and conflict with the Dry Creek Watershed Flood Control Plan.

Considering the above, and the recommendations of the Dry Creek Watershed Flood Control Plan, the proposed project does not include on-site detention basins that could otherwise lower the post-project rate of runoff equal to or below pre-project flow rates.

Nonetheless, the proposed project would be required to comply with Placer County's Dry Creek Watershed Drainage Improvement Ordinance, which requires new development that increases impervious surface areas within the Dry Creek Watershed to pay fees to fund regional flood control and future drainage improvement projects within the watershed. District flood control projects include the Miners Ravine Off-Chanel Detention Basin and Antelope Creek Flood Control Project. These regional flood control projects were constructed to mitigate for increased runoff associated with development within the Dry Creek watershed. The fees include a one-time fee that is paid prior to start of construction and an annual fee that is included in the parcel's property tax.

Downstream Conveyance Capacity

RFE analyzed the potential for the proposed project to result in impacts related to increased flow and altered WSE within the Dry Creek Vineyard Road tributary upstream and downstream from the project site. Table 10-4 presents the analysis for increased flow, measured in cubic feet per second (cfs), and altered WSE, measured in feet (ft), under the two boundary condition modeling scenarios discussed in the Method of Analysis section above. Each tributary station in Table 10-4 represents a stream cross section.

Under both downstream boundary conditions, RFE determined that the proposed project would result in an approximately seven cfs increase in overall peak flow in the Dry Creek Vineyard Road tributary just downstream of the Vineyard Road culvert (tributary station 7446.46) during the 100-year storm event. The incremental increase in peak flow grows from seven cfs at station 7446.46 to approximately 14 cfs downstream of tributary station 5553.77 is due to converging peak flows from sheds DC25H and DC25I, which are shown in Figure 10-2. Tributary station 5553.77 is located immediately downstream of another small drainage that converges with the Dry Creek Vineyard Road tributary.

Considering the timing of peak flows through the Dry Creek Vineyard Road tributary, relative to the increase in on-site peak flow in the post-construction condition of over 45 cfs the resulting downstream increase of between seven and 14 cfs to the Dry Creek Vineyard Road tributary is considered a relatively small increase in peak flow.[19] The relatively small increase of between seven and 14 cfs demonstrates that the on-site peak flow of 45 cfs leaves the site before the much larger upstream peak flow arrives at the project site. Therefore, peak flows from the project site, although increasing, would not be anticipated to coincide with larger upstream peak flows, and would not be anticipated to cause flooding off-site.

[19] RFE Engineering, Inc. *Preliminary Drainage Study & Stormwater Quality Plan for Brady-Vineyard Subdivision*. April 2, 2019.

Table 10-4
Selected Flows and WSE from HEC-RAS

Tributary Station	100-Year Pre-Construction Peak Flows (csf)	100-Year Post-Construction Peak Flows (csf)	100-Year Pre-Construction WSE (ft)	100-Year Post-Construction WSE (ft)
Normal Depth Boundary Condition				
9764.85	428.81	428.78	132.89	132.89
9161.5	436.34	436.12	131.77	131.77
8292.18	439.46	439.94	127.68	127.68
7877.8	464.91	465.93	126.89	126.89
7588.69	464.20	465.02	125.27	125.31
7492.13[1]	490.22	496.96	124.96	125.00
7446.46[2]	490.19	496.90	124.04	124.06
7346.34	490.17	496.88	123.92	123.94
6748.04	495.31	502.04	121.18	121.20
5618.96	502.49	508.38	117.65	117.71
5553.77	577.76	591.65	117.52	117.57
4081.21[3]	585.69	598.89	113.23	113.28
2833.94[4]	592.64	605.40	109.79	109.83
1316.1	684.5	702.83	106.49	106.54
Dry Creek BFE Boundary Condition				
9764.85	428.75	428.77	132.89	132.89
9161.5	436.25	436.15	131.77	131.77
8292.18	439.37	439.96	127.68	127.68
7877.8	464.81	465.93	126.89	126.89
7588.69	464.09	465.03	125.27	125.31
7492.13[1]	490.10	496.99	124.95	125.00
7446.46[2]	490.07	496.92	124.04	124.06
7346.34	490.05	496.91	123.92	123.94
6748.04	495.19	502.07	121.18	121.20
5618.96	502.29	509.41	117.66	117.72
5553.77	577.56	591.71	117.53	117.58
4081.21[3]	587.63	601.68	114.44	114.46
2833.94[4]	585.67	594.15	114.06	114.06
1316.1	655.98	697.52	114.01	114.01

1 Tributary station just upstream of Vineyard Road culvert.
2 Tributary station just downstream of Vineyard Road culvert.
3 Tributary station at the north end of the Roseville Dry Creek Wastewater Treatment Plant.
4 Tributary station at the south end of the Roseville Dry Creek Wastewater Treatment Plant.

Source: RFE, 2019.

Under both boundary conditions, as shown in Table 10-4, the peak flow increase due to the proposed project during the 100-year storm would raise the peak WSE by only 0.06 feet immediately downstream of the project site. Based on the topographic data downstream of the site, the 0.06-foot increase in WSE would not subject any downstream structures to flooding, as all downstream structures are more than one foot above the post-construction WSE. Furthermore, the Vineyard Road culvert has capacity to pass even the flows from the 500-year storm without the WSE reaching the top of the culvert. Accordingly, implementation of the proposed project would not result in any off-site flooding impacts that necessitate the installation of on-site detention. Specifically, the HEC-RAS calculations completed by RFE show that 100-year drainage flows would not overtop the existing or proposed Vineyard Road pavement for the pre-project or post-project conditions. Therefore, the project would not affect the requirement that the traveled way of Vineyard Road (a collector road) shall remain clear in a 25-year storm and the center 12 feet shall remain clear in a 100-year storm as set forth in the Placer County Storm Water Management Manual. This conclusion is unaffected by the proposed minor fill within the floodplain, discussed below.[20]

Proposed Fill Within Floodplain

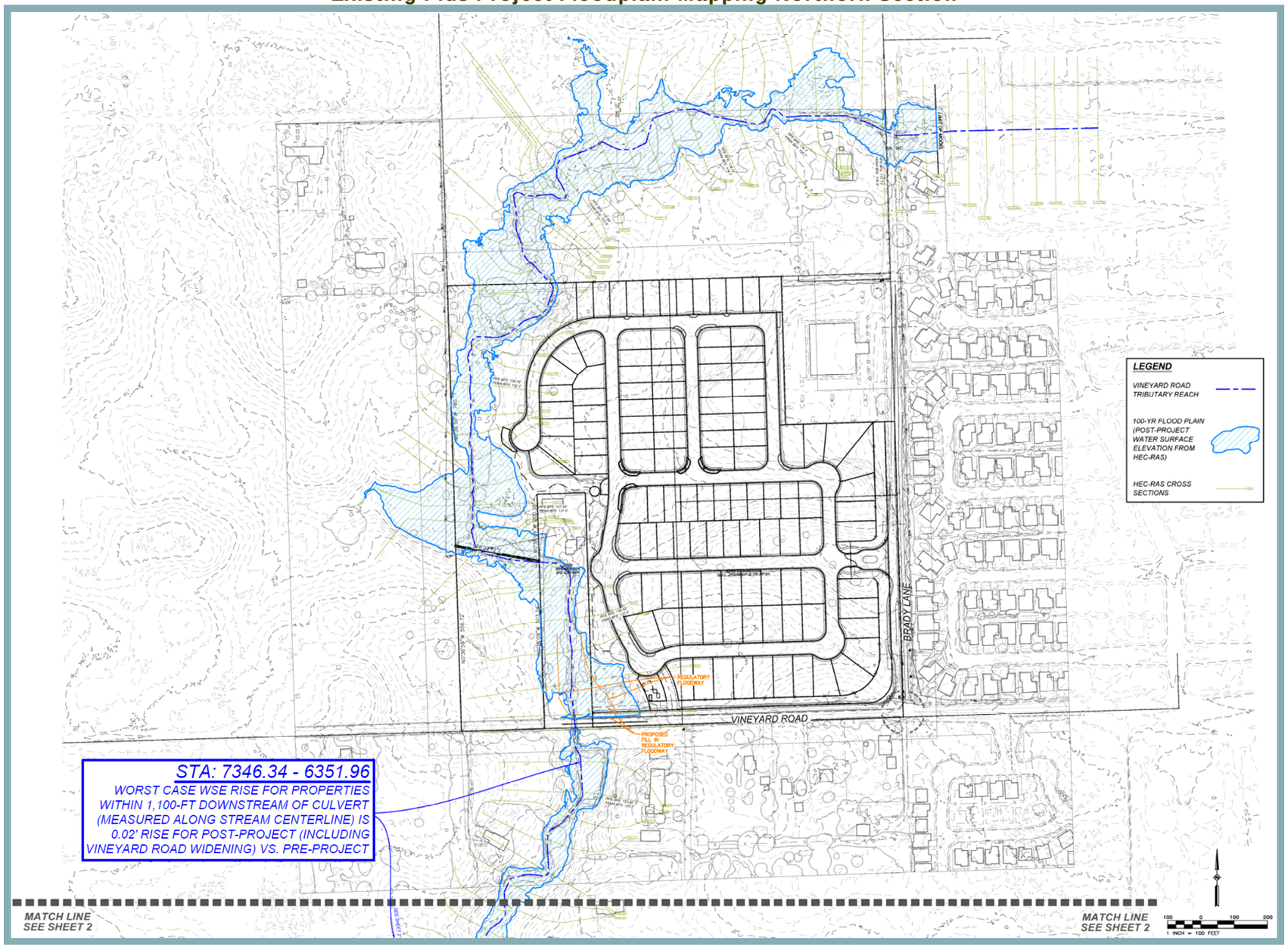
The proposed project would include widening of Vineyard Road along the project site frontage. The widening of Vineyard Road would include between 11 and 14 feet of new pavement on the north side of Vineyard Road, which requires the placement of fill within the floodplain and regulatory floodway of the Dry Creek Vineyard Road tributary. As noted in the Method of Analysis section of this chapter, RFE modeled widening of Vineyard Road under two separate scenarios, with Scenario 1 representing an interim widening, and Scenario 2 representing the ultimate widening of Vineyard Road. Results of the HEC-RAS modeling for the two fill conditions were compared to modeling results representing 100-year flow conditions, post-construction without fill, under the Dry Creek BFE boundary condition.

Project improvements, including fill in the floodway/floodplain needed to widen Vineyard Road per Placer County requirements, would increase peak flows in the Dry Creek Vineyard Road tributary. However, the overall WSE increase in the tributary would be minimal. Figure 10-4 and Figure 10-5 provide an overview of the modeled 100-year floodplain resulting from existing flows and implementation of the proposed project, under Scenario 1 (i.e., interim fill), including the locations of the cross sections included in the HEC-RAS modeling.

Under Scenario 1 (interim widening of Vineyard Road), the maximum WSE increase for the first 1,100 feet downstream of the Vineyard Road culvert would be limited to 0.02-feet for the post-construction condition versus the pre-construction condition (see Figure 10-4). The maximum WSE increase under the existing vs. post-project 100-year flow condition would occur at Station 5618.96, where a of 0.07-foot increase would occur under the Dry Creek BFE Condition (see Figure 10-5). The increase in WSE under Scenario 2 (ultimate widening) would be limited to 0.08-foot. This maximum WSE increase would also occur at Station 5618.96. Per RFE, such increases (both less than one inch) would not constitute a significant risk to downstream properties.

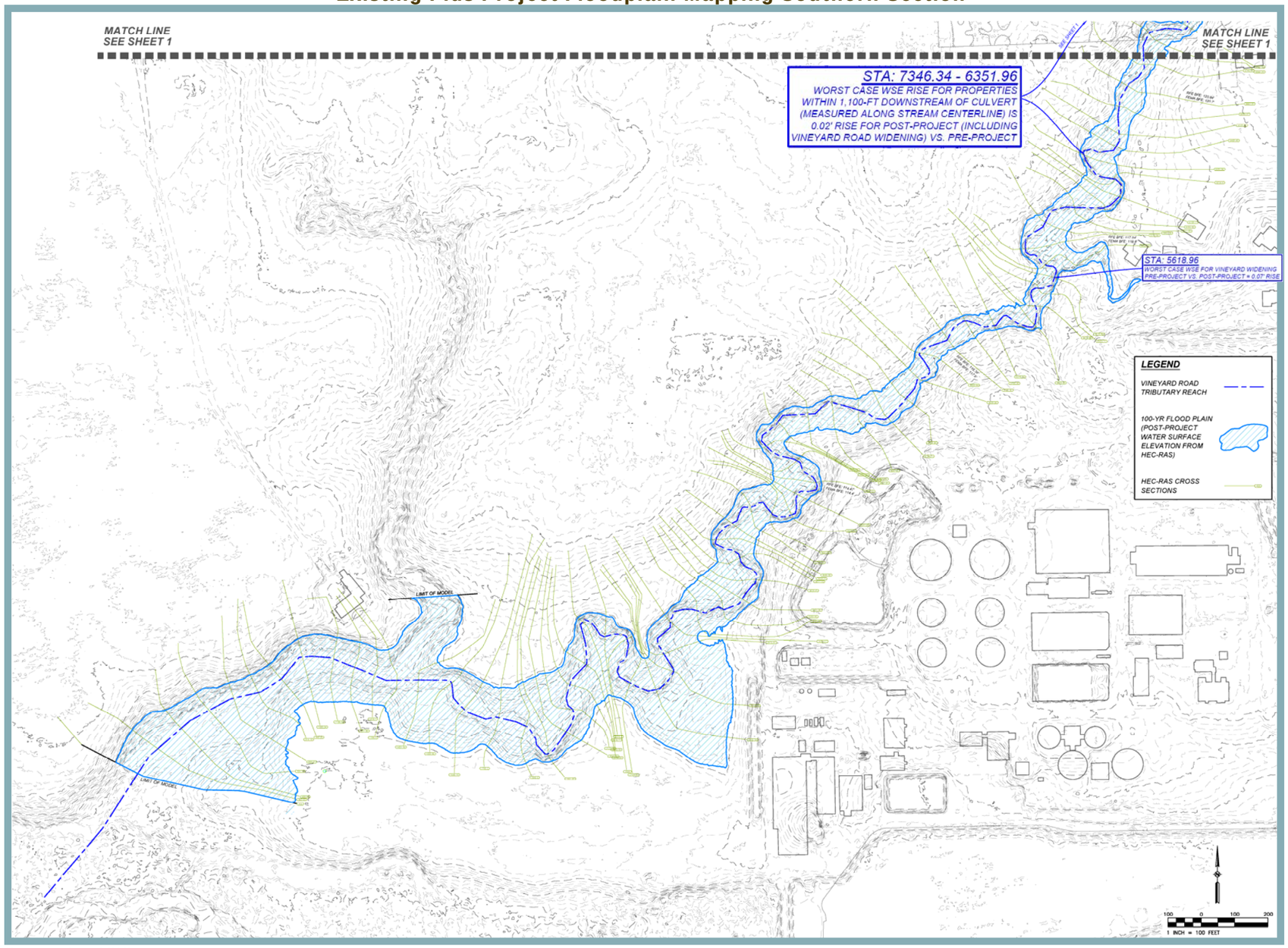
[20] Somers, Shawn, P.E., Engineering Manager, RFE Engineering, Inc. Personal communication [phone] with Nick Pappani, Vice President, Raney Planning & Management, Inc. October 25, 2019.

Figure 10-4
Existing Plus Project Floodplain Mapping Northern Section



Source: RFE, 2019.

Figure 10-5
Existing Plus Project Floodplain Mapping Southern Section



Source: RFE, 2019

Despite the increases in WSE between the pre-construction and post-construction conditions, due to the terrain in the channel of the Dry Creek Vineyard Road tributary, the increased WSE would result in an imperceptible change in the BFE floodplain boundaries.

Conclusion

Based on the above, the proposed project would result in a relatively minor increase in peak runoff relative to existing conditions. In addition, the project applicant would be required to pay fees in accordance with the Dry Creek Watershed Drainage Improvement Ordinance. Payment of such fees would help to fund regional flood control and future drainage facility improvement projects within the Dry Creek watershed. Nevertheless, the proposed project could result in a ***significant*** impact related to substantially altering the drainage pattern of the site or area, or increasing the rate or amount of surface runoff.

Mitigation Measure(s)

Implementation of the following mitigation measures would reduce the above impact to a *less-than-significant* level.

10-4(a) *As part of the Improvement Plan submittal process, the preliminary Drainage Report provided during environmental review shall be submitted in final format. The final Drainage Report may require more detail than that provided in the preliminary report, and will be reviewed in concert with the Improvement Plans to confirm conformity between the two. The report shall be prepared by a Registered Civil Engineer and shall, at a minimum, include: A written text addressing existing conditions, the effects of the proposed improvements, all appropriate calculations, watershed maps, changes in flows and patterns, and proposed on- and off-site improvements to accommodate flows from this project. The report shall identify water quality protection features and methods to be used during construction, as well as long-term post-construction water quality measures. The final Drainage Report shall be prepared in conformance with the requirements of Section 5 of the Land Development Manual and the Placer County Storm Water Management Manual that are in effect at the time of Improvement Plan submittal.*

10-4(b) *This project is subject to the one-time payment of drainage improvement and flood control fees pursuant to the "Dry Creek Watershed Interim Drainage Improvement Ordinance" (Ref. Article 15.32, Placer County Code). The current estimated development fee is $26,656 ($224 per single family residential unit), payable to the Engineering and Surveying Division prior to Building Permit issuance. The fees to be paid shall be based on the fee program in effect at the time that the application is deemed complete.*

10-4(c) *This project is subject to payment of annual drainage improvement and flood control fees pursuant to the "Dry Creek Watershed Interim Drainage Improvement Ordinance" (Ref. Chapter 15, Article 15.32, Placer County Code). Prior to Building Permit issuance, the applicant shall cause the subject property to become a participant in the existing Dry Creek Watershed County Service Area for purposes of collecting such annual*

assessments. The current estimated annual fee is $4,165 ($35 per single family residential unit).

10-4(d) *On the Improvement Plans and Informational Sheet(s) filed with the Final Subdivision Map(s), show the limits of the future, unmitigated, fully developed, 100-year flood plain (after grading) for the Dry Creek Vineyard Road tributary (western drainageway) and the FEMA floodplain and designate same as a building setback line unless greater setbacks are required by other conditions contained herein.*

10-4(e) *On the Improvement Plans and Informational Sheet(s) filed with the Final Subdivision Map(s), show that finished house pad elevations for all Lot's along the floodplain shall be a minimum of two feet above the 100-year flood plain line (or finished floor -three feet above the 100-year floodplain line). The final pad elevation shall be certified by a California registered civil engineer or licensed land surveyor and submitted to the Engineering and Surveying Division. This certification shall be done prior to construction of the foundation or at the completion of final grading, whichever comes first. No building construction is allowed until the certification has been received by the Engineering and Surveying Division and approved by the floodplain manager. Benchmark elevation and location shall be shown on the Improvement Plans and Informational Sheet (s) to the satisfaction of Development Review Committee.*

10-5 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows or expose people or structures to risk of loss, injury or death involving flooding through the placement of housing in a flood hazard area. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

As discussed throughout this chapter, the project site contains a portion of the Dry Creek Vineyard Road tributary. RFE used County provided LiDAR data to determine whether the proposed project would have the potential to impede or redirect flood flows. RFE prepared updated floodplain figures based on project-specific floodplain modeling. The updated floodplain figures are presented in Figure 10-4 and Figure 10-5 and provide an overview of the modeled 100-year floodplain resulting from existing flows and implementation of the proposed project, under Scenario 1, including the locations of the cross sections used in the HEC-RAS modeling.

Slight differences exist between the floodplain mapping prepared by RFE and FEMA. Such differences may be due to the greater extent of upstream tributary areas incorporated in the project-specific modeling prepared by RFE, or the higher spatial resolution used by RFE, as compared to FEMA. Despite the differences in floodplain mapping, none of the proposed structures would be located within the identified floodplains. Furthermore, the proposed project would not result in any substantial changes

in the floodplain of the Dry Creek Vineyard Road tributary that would expose off-site structures or people to risks of loss, injury or death due to flooding.

Although the proposed project would not include development of structures within the identified floodplains nor place housing within a flood hazard area, RFE concluded that placement of fill in the FEMA identified floodplains for the interim widening of Vineyard Road, which the project is responsible for, would have the potential to affect upstream WSE and flow velocity in the vicinity of the Vineyard Road culvert. With regard to changes to the WSE, RFE determined that the proposed fill would result in negligible effects to the WSE beyond the first 100-feet upstream of the culvert (station 7588.69). Downstream of the culvert, the change in WSE varied and some downstream portions of the tributary were unaffected. As noted under Impact 10-4 above, compared to the pre-construction 100-year flow condition without fill, the proposed fill would result in a maximum increase in WSE of 0.07-feet downstream of the culvert at Station 5618.96 (see Figure 10-5). In a supplemental letter, RFE affirmed that the maximum increase of 0.07-feet would not constitute a significant risk to downstream properties.[21] Accordingly, placement of fill in FEMA floodplains would not substantially impede or redirect flood flows nor would placement of fill expose people or structures to risk from flooding. Placer County has reviewed the methodology applied by RFE, and preliminarily concurs with the conclusions reached by RFE.

Because of the increase in BFE of the Dry Creek Vineyard Road tributary in the post-construction condition compared to the pre-construction condition, and because of fill required in the floodway/floodplain to widen Vineyard Road, a Conditional Letter of Map Revision (CLOMR) would be required to be submitted to FEMA prior to Improvement Plan approval to ensure the project's compliance with existing regulations related to alterations of floodplains.

Considering the above, the proposed project is not anticipated to result in the impediment or redirection of flood flows such that on- or off-site structures would be exposed to flood risk. However, as noted previously, a CLOMR would be required prior to Improvement Plan approval in order to ensure the project's compliance with existing regulations. Therefore, in the absence of a CLOMR submitted to FEMA, a ***significant*** impact could occur related to alteration of the existing drainage pattern of the site or area, including through alteration of a course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above impact to a *less-than-significant* level.

10-5 *Prior to Improvement Plan approval, the applicant shall obtain from the Federal Emergency Management Agency (FEMA), a Conditional Letter of Map Revision (CLOMR) or Conditional Letter of Map Revision based on Fill (CLOMR-F) for fill within a Special Flood Hazard Area, if required. A copy of the letter shall be provided to the Engineering and Surveying Division. A Letter of Map Revision (LOMR), or a Letter of Map Revision*

[21] RFE Engineering, Inc. *Re: Brady Vineyard Project Drainage Impacts*. March 4, 2019.

based on Fill (LOMR-F) from FEMA shall be provided to the Engineering and Surveying Division prior to acceptance of project improvements as complete.

10-6 In a flood hazard zone, risk release of pollutants due to project inundation. Based on the analysis below, the impact is *less than significant*.

As noted previously, the project site contains a floodplain related to the Dry Creek Vineyard Road tributary. However, as show in Figure 10-4, the only project related improvement that would occur within the identified floodplain would be the placement of fill related to the widening of Vineyard Road. None of the proposed structures, infrastructure, or common areas would be placed within a flood hazard zone. As discussed in Impact 10-5, the project would not result in the impediment or redirection of flood flows in a flood hazard zone, nor would the project expose people or structures on- or off-site to risk of loss injury, or death involving flooding. Consequently, the project would not risk the release of pollutants due to inundation at any off-site locations.

It should be noted that the proposed project is residential in nature. Residential projects do not involve the storage of large amounts of pollutants, and all stormwater exiting the project site would be directed to on-site stormwater quality features to ensure that any pollutants entrained within stormwater from the project site are removed prior to discharge.

Considering that the proposed project would not include development within the identified floodplain, the proposed project would not have the potential to create a risk of release of pollutants due to inundation on- or off-site. Consequently, the proposed project would result in a ***less-than-significant*** impact related to the release of pollutants due to inundation.

Mitigation Measure(s)

None required.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, “cumulative impacts” refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

The cumulative setting for impacts related to hydrology and water quality encompasses the Dry Creek Vineyard Road tributary drainage sheds and the remaining portions of the Dry Creek watershed.

10-7 Cumulative impacts related to the violation of water quality standards or waste discharge requirements, groundwater quality, management, and recharge, and impacts resulting from the alteration of existing drainage patterns. Based on the analysis below, the project's incremental contribution to this significant cumulative impact is *less than cumulatively considerable*.

Impacts related to stormwater quality, groundwater, and drainage patterns are discussed separately below.

Stormwater Quality

Construction activities have the potential to affect water quality and contribute to localized violations of water quality standards if stormwater runoff from construction activities enters receiving waters. Runoff from additional construction sites within the project area could carry sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products, which could result in water quality degradation if runoff containing such sediment or contaminants should enter receiving waters in sufficient quantities. Thus, construction activities associated with the proposed project, in combination with construction activities associated with other reasonably foreseeable projects in the Dry Creek watershed, could result in cumulative impacts related to water quality. However, all construction projects resulting in disturbance of more than one acre of land are required to comply with the most current Construction General Permit requirements. Conformance with the Construction General Permit would require preparation of SWPPPs for all such projects, and subsequent implementation of BMPs to prevent the discharge of pollutants. Considering the existing permitting requirements for construction activity in the project area, cumulative construction within the Dry Creek watershed would be heavily regulated and impacts related to the degradation of water quality would be minimized to the extent feasible.

Similar to the proposed project, cumulative development within the DCWPCP would be subject to Phase II MS4 stormwater requirements, including source control and treatment control features. Specifically, regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately-sized SDMs and Baseline Hydromodification Measures to each DMA. Source control measures must be designed for pollutant-generating activities or sources consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on Improvement Plans.

Based on the conceptual stormwater design, during operations, the stormwater runoff would be properly treated prior to discharge from the site. Thus, urban pollutants entering and potentially polluting the local drainage system would not be expected to occur as a result of the project. A final drainage report would be required with submittal of the Improvement Plans for County review and approval to substantiate the preliminary report's LID sizing calculations. In addition, per Phase II MS4 requirements, a Post Construction Stormwater Control Plan would be required for the proposed project. The project would be subject to NPDES Construction General Permit requirements, including implementation of BMPs and preparation of a site-specific SWPPP. Cumulative

development projects within the project area would also be subject to Phase II MS4 stormwater requirements, as well as all County requirements related to stormwater treatment and control. Compliance with the foregoing regulations would ensure that impacts related to the alteration of drainage patterns, the discharge of pollutants, and flooding are minimized to the extent feasible.

Groundwater

Cumulative development within the project region would result in increased amounts of impervious surfaces, which would reduce the infiltration of groundwater within the project region. Although cumulative development would increase the amount of impervious surfaces in the project region, stormwater would continue to be discharged to the Dry Creek Vineyard Road tributary, and other local waterways, where stormwater could infiltrate into the soil and recharge groundwater. Furthermore, the project site itself is not considered a site of substantial groundwater recharge; thus, development of the project would not result in a significant cumulative loss of groundwater recharge.

Groundwater in the project region is managed on a subbasin level. The North American Subbasin, within which the project is located, is not in a state of overdraft, and the WPGSA will continue to manage groundwater in the region.

Because groundwater is managed on a subbasin level, and the project would not result in a substantial site-specific loss of groundwater recharge, the proposed project, in combination with cumulative development within the region, would not result in a significant cumulative impact to groundwater recharge.

Drainage Patterns

Concurrent implementation of the proposed project and cumulative development within the Dry Creek Vineyard Road tributary drainage shed area would result in changes to the drainage pattern of the project area. Changes in drainage patterns would primarily be attributed to the development of currently undeveloped areas within the drainage shed, which would result in the conversion of pervious surfaces to impervious surfaces. RFE prepared an analysis of cumulative conditions to assess the potential impact of the proposed project's incremental effects on future peak flows and WSEs in the cumulative setting. The results of RFE cumulative analysis are summarized in Table 10-5 below.

The cumulative analysis demonstrated that the proposed project would moderately increase peak flows in the Dry Creek Vineyard Road tributary under the cumulative setting. Specifically, most peak flows downstream of the Vineyard Road culvert (tributary station 7492.13) would be increased by at least 10 cfs, with the maximum increase of 40.46 cfs occurring at tributary station 1386.3. Further downstream the peak flows are affected by the Dry Creek constant downstream BFE boundary condition, which creates a backwater condition that skews the peak flow results in the Dry Creek Vineyard Road tributary.

Table 10-5
HEC-RAS Flows and WSEs – Cumulative Conditions With and Without Proposed Project

Tributary Station	100-Year Cumulative Peak Flows Without Project (csf)	100-Year Cumulative Peak Flows With Project (csf)	100-Year Cumulative WSE Without Project (ft)	100-Year Cumulative WSE With Project (ft)
10016.43	126.93	126.87	133.44	133.44
9841.26	436.24	436.25	133.03	133.03
8488.69	447.19	448.67	128.23	128.24
7588.69	478.48	479.24	125.31	125.39
7492.13[1]	506.68	519.15	124.80	124.87
7446.46[2]	506.61	519.06	124.09	124.13
6748.04	510.97	523.59	121.22	121.25
5618.96	514.32	525.42	117.78	117.87
5008.64	613.16	635.01	116.24	116.31
4081.21[3]	621.84	644.53	114.49	114.52
2833.94[4]	618.15	643.81	114.07	114.08
2416.71	612.88	642.09	114.05	114.06
1760.2	596.26	636.01	114.03	114.03
1386.3	592.89	633.35	114.02	114.02

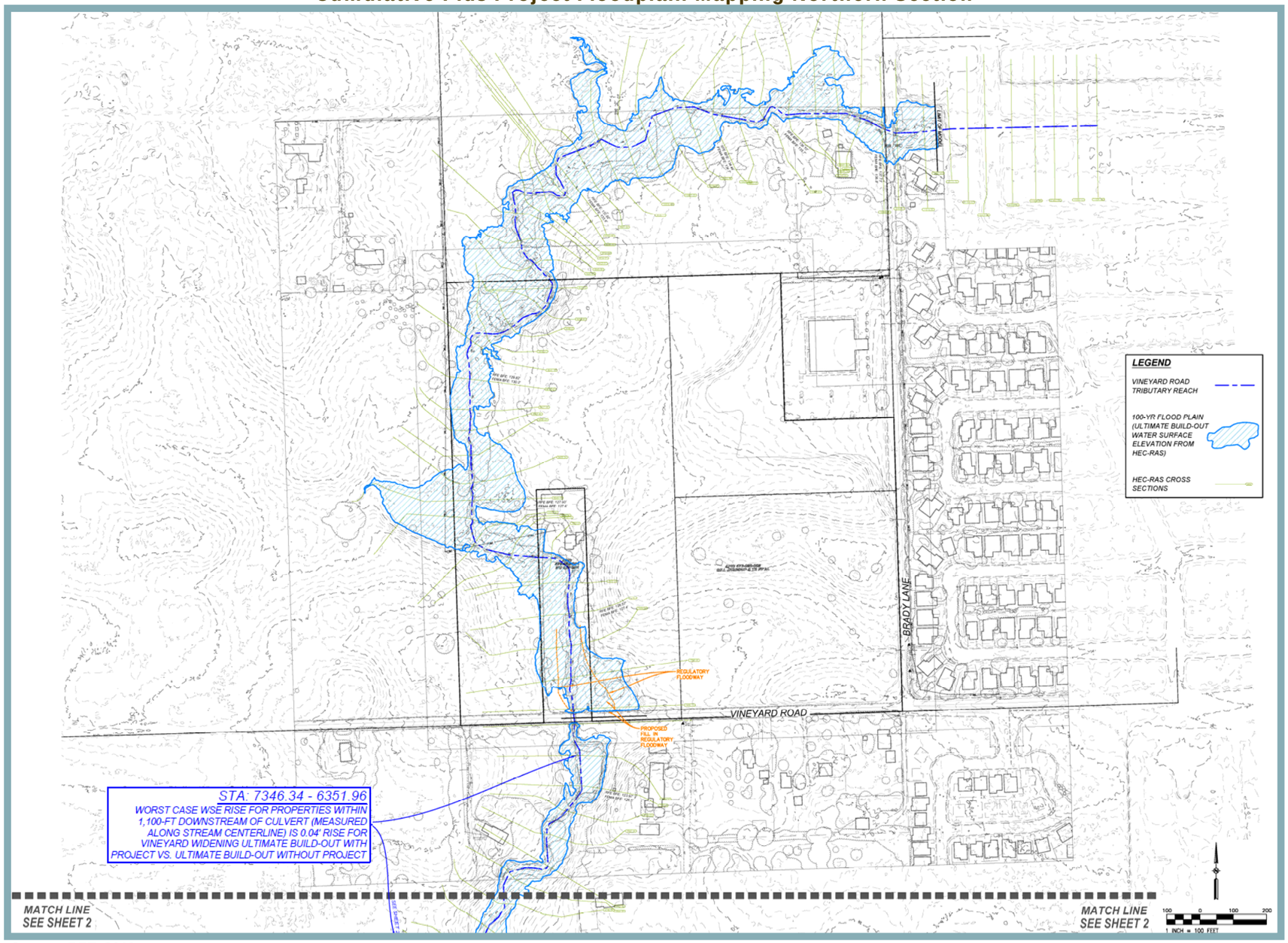
[1] Tributary station just upstream of Vineyard Road culvert.
[2] Tributary station just downstream of Vineyard Road culvert.
[3] Tributary station at the north end of the Roseville Dry Creek Wastewater Treatment Plant.
[4] Tributary station at the south end of the Roseville Dry Creek Wastewater Treatment Plant.

Source: RFE, 2019.

Implementation of the proposed project would not result in changes to the WSE at any tributary station upstream of the project site, with the exception of tributary station 7588.69, which is the first cross section upstream of the Vineyard Road culvert. The WSE at tributary station 7588.69 would be increased by 0.09-feet with implementation of the proposed project under the cumulative condition. Downstream of the Vineyard Road culvert, the maximum WSE increase would be an increase of 0.09-feet at station 5618.96, which is just downstream of inflows from another natural drainage channel that is unmapped by FEMA. For comparison, the project-level analysis presented in Impact 10-4 determined that in the existing setting, implementation of the project would increase WSE by only 0.07 feet downstream of the project site with the Dry Creek BFE boundary condition. A maximum cumulative increase of 0.09-feet is not significantly greater than the 0.07-foot increase anticipated to occur due to development of the project under existing conditions, and the baseline WSEs for the existing and cumulative scenarios are not significantly different. Figure 10-6 and Figure 10-7 provide an overview of the modeled floodplain resulting from the ultimate buildout flows.[22]

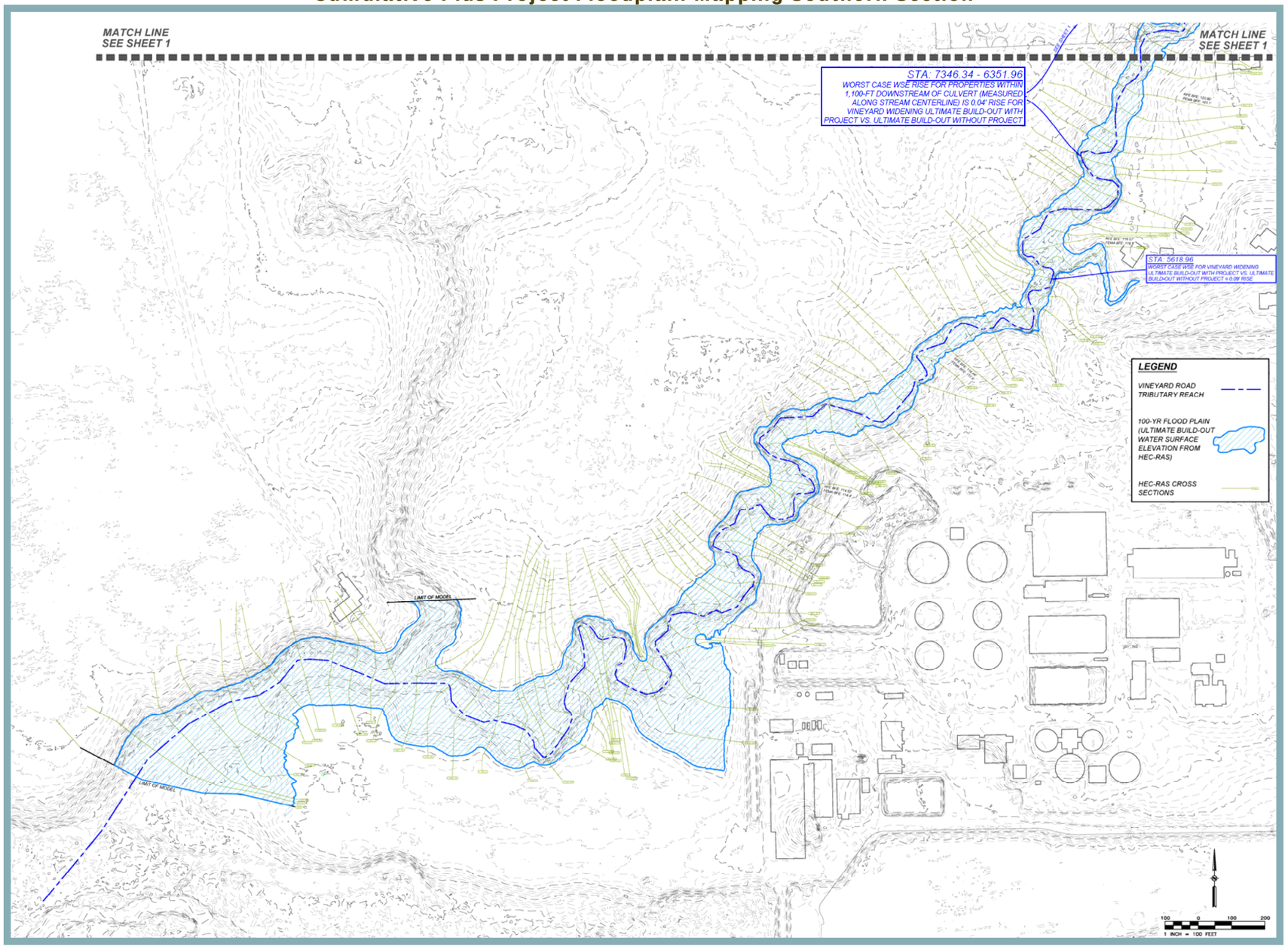
[22] It should be noted that these exhibits for the buildout condition assume full widening of Vineyard Road (i.e., Scenario 2 discussed in the Methods section).

Figure 10-6
Cumulative Plus Project Floodplain Mapping Northern Section



Source: RFE, 2019.

Figure 10-7
Cumulative Plus Project Floodplain Mapping Southern Section



Source: RFE, 2019

As shown in the figures, the ultimate buildout flows would not result in inundation of any on- or off-site structures or improvements. Thus, similar to the project-level conclusion, based on the topographic data downstream of the site, the 0.09-foot increase in WSE would not subject any downstream structures to flooding. Consequently, the proposed project would not result in a cumulatively significant impact to drainage patterns in the drainage shed.

Conclusion

As discussed throughout this chapter, implementation of the proposed project would include LIDs and BMPs to minimize the potential for the proposed project to result in impacts related to hydrology and water quality. Moreover, RFE estimated drainage conditions under cumulative conditions for the Dry Creek Vineyard Road tributary with and without the proposed project. Based on the findings of RFE implementation of the proposed project would not result in a significant incremental contribution to cumulative impacts related to peak flows or flooding due to changes in drainage patterns at the project site.

Given the analysis presented in this chapter, the conclusions reached by RFE, and the highly regulated nature of cumulative development in the project region, the project's incremental contribution to the significant cumulative impact would be ***less than cumulatively considerable***.

Mitigation Measure(s)

None required.